

Urban Forest Strategy 2012 to 2020 and Annexes 1 to 6

October 2012



**Nottingham
City Council**

FOREWORD

Worldwide, urban trees are under threat from pollution, disease and the pressures of the developing world. As a result over the last 100 years the tree canopy in our towns and cities has significantly declined.

Today about 14% of the city is covered by tree canopy. The loss of trees in our built environment reduces liveability. Balancing our city's growth, whilst protecting the environment, maintaining vibrant public spaces, creating recreational opportunities and fostering economic growth is an increasing and ongoing challenge.

Trees contribute to the natural environment in many ways, they improve the quality of the air removing dust particles and harmful gas emissions such as carbon dioxide. Trees in the urban areas help to reduce the heat island affect in reducing soil erosions and flash flooding by slowing down and capturing fast flowing water. In addition our trees help to improve biodiversity and provide landscape character whilst also adding a sense of place to our city centre, neighbourhoods and parks. These benefits all help to improve our health and wellbeing and in turn improve the quality of life in our city.

Whilst we recognise the benefits we also know that on occasions trees can cause a nuisance and localised difficulties. The Urban Forest Strategy will aim to minimise these problems by refocusing resources and delivering a more proactive maintenance programme.

The Urban Forest Strategy lays out actions ranging from improving tree care to more challenging opportunities for enhancing the tree canopy coverage city-wide. The Strategy sets out ways in which our communities, developers and the City Council can work together to achieve the necessary space for sustaining and enhancing the urban forest in years to come.

This strategy recognises that citizens like to have trees nearby and understand that trees provide an increasingly important legacy for future generations.

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CONTENTS:

Executive Summary

Urban Forest Strategy: The Council's analysis of the benefits of and challenges to Nottingham's Urban Forest (trees and woods in both public and private ownership), developed to form the vision, aims and principles that will guide decision making management and planning.

Annex 1 – Tree Safety Management Plan: The system the Council will employ to meet its duty of care regarding its trees and woods.

Annex 2 – Responsible Neighbour's Guide: Whilst it is recognised trees provide many benefits, it is also acknowledged that they can cause inconvenience to neighbours. This sets out how the Council will respond in a clear and consistent manner to many of the more frequently raised concerns.

Annex 3 – Nottingham's Response to Tree Root Claims: The approach the Council will adopt to manage its trees to lessen the risk of subsidence related damage to properties, and how it will respond in the event of such occurrences being reported to it.

Annex 4 – Nottingham's Guide to Right Tree, Right Place: Guidance to enable the selection of more appropriate species when replanting. Trees will be more likely to benefit Nottingham's communities and reduce the on-going maintenance and management costs.

Annex 5 – SPG, Trees and Development Sites: Guidance to provide additional advice to developers on how the Council's policies will be applied, and what will be required of developers seeking planning permission for developments that may affect trees

Annex 6 – City and Ward Action Plans: The priorities for the city and each ward to manage the urban forest in a sustainable manner.

EXECUTIVE SUMMARY

Introduction

The Nottingham Urban Forest Strategy is a key document for the city setting out a framework for the planning and management of the city's urban forest. The City Council are committed to the high quality and proactive management of its tree stock and has defined its vision for the future of trees and woodlands in the city as:

Create an urban forest that is managed sustainably for the benefit of Nottingham's communities.

Trees in the Urban Environment

Section two sets out the context for the strategy. It starts by summarising the value of trees in urban areas explaining the social, economic and environment benefits of trees and explaining why managing the urban forest is so important. Trees are clearly a very valuable asset for the city and need effective management, protection and planning to ensure they continue to thrive in the future.

Policy and Legislative Influences

Section three draws together current policy and legislative factors to ensure that the strategy is truly cross-cutting from a macro level, then more locally, complimenting the strategic vision of the Council. The strategy shows how trees can support the wider ambitions of the Council.

Nottingham's Urban Forest

Section four reviews the city's current trees and woods, identifying many of the challenges faced, and opportunities to increase the benefits. The tree canopy cover across the city is identified and issues relating to the population and diversity of species considered. This section also looks at the conflicts that can ensue and need to be addressed to maintain a sustainable urban forest.

Nottingham's Commitments and Policy

Section five sets out the commitments, policies and priorities that will guide decision making and the application of resources, to deliver a sustainable urban forest with the ambition of meeting the vision in the future. It sets a target of reversing recent loss, to the 2007 canopy cover of 14.1%. This is a key target in the lifetime of this strategy (2020). The longer term objective will be to increase canopy cover to 20% by 2030.

Delivery

An Action Plan takes the 12 principles of the strategy and identifies activities to support the delivery of these. Actions range from relatively small actions such as implementing promotional initiatives to secure sponsorship, to major actions such as setting aspirational targets for the future canopy cover city-wide.

Important to the success of the strategy is the involvement and support of the community. The strategy outlines how the community through the participation of area committees will develop area based actions plans for the delivery of the strategy at a local level.

To be successful, the urban forest strategy needs to be regularly reviewed and updated. Proposals are set out for the review and monitoring processes including a series of performance indicators. To monitor progress it is proposed to request the Champions Group, established to oversee the implementation of Breathing Spaces 2012-2020, to manage the implementation of this strategy.

Urban Forest Strategy 2012 to 2020

October 2012



Contents

1. Introduction	2
The “Urban Forest” and “Urban Forestry”	3
The “Tree”	4
2. Trees in the Urban Environment	6
Trees and People	7
Health Benefits of Trees	8
Trees and Noise	9
Trees and Urban Regeneration.....	9
Effects of Climate Change.....	10
Trees and Storm Water.....	13
Trees and the Natural Environment	14
3. Policy and Legislative Influences.....	16
Biodiversity	16
Climate Change	17
National Tree and Woodland Policy	18
National Planning Policy	19
Nottingham City’s Policy	20
Legislation	22
4. Nottingham’s Urban Forest	24
Nottingham’s Canopy Cover.....	26
Impacts of Nottingham’s Trees.....	31
Responsibility for the Urban Forest.....	33
Tree Safety Management Plan.....	33
Responsible Neighbours’ Guide	34
SPG: Trees on Development Sites.....	35
5. Nottingham’s Urban Forest Aims and Principles.....	36
Aim 1: To Design a Sustainable Urban Forest.....	38
Aim 2: To Manage a Sustainable Urban Forest.	39
The Principles of a Sustainable Urban Forest.	40
Measuring and Reporting Achievement.....	45
Review of the Strategy	47
6. Action Plan	
7. Abbreviations and Bibliography.....	1
Appendix 1: Summary of Aims and Principles.	3

1. INTRODUCTION

The Council's **Breathing Space Strategy**, identifies the positive contribution and role the natural environment and parks and open spaces have in Nottingham. It identifies the contribution the urban forest makes and the need to manage this asset in a strategic manner. The **Urban Forest Strategy** (UFS), has been written to replace the City Council's **Tree Strategy**, adopted in 1997, which supported the then current Local Plan and Nature Conservation Strategy.

Much has changed since the Tree Strategy was adopted. The role of the urban forest has developed from a niche function to improve the aesthetics of the urban landscape, to one increasingly seen as part of the solution to many of the more pressing urban environmental problems. These include:

- climate change adaptation and mitigation,
- helping to regenerate post-industrial areas
- Improving citizens health and well-being
- develop sustainable communities

Also, there is a greater awareness of the risks potentially posed by trees to people and property, all of this at a time when resources are becoming increasingly scarce.

The Urban Forest Strategy identifies the challenges faced in maintaining and enhancing the quality of trees and woods in Nottingham. This includes trees and woods in both public and private ownership, in particular focussing upon how the Council with its partners can influence this to greater benefit.

The strategy has four sections describing the importance of the urban forest to the health and well-being of the city, and setting out the Council's and its partners commitments to managing and sustaining this for the present and future benefits of Nottingham's communities and visitors:

Trees in the Urban Environment: A recognition of the important role trees play in the daily lives of the city's communities, and also awareness of the conflicts that can ensue and need to be addressed to maintain a sustainable urban forest.

Policy and Legislative Influences: This section sets out many of the principal influences, explaining the more important elements, including external and local policy, and legislation that influence decision making.

Nottingham's Urban Forest: A review of the city's current trees and woods, identifying many of the challenges faced, and opportunities to increase the benefits.

Nottingham's Aims and Principles: This section sets out the Council's and partners, commitments, policies and priorities that will guide decision making and the application of resources, to deliver a sustainable urban forest meeting the vision:

“CREATE AN URBAN FOREST THAT IS DESIGNED AND MANAGED SUSTAINABLY, FOR THE BENEFITS OF NOTTINGHAM’S COMMUNITIES.”

The measure of whether this has been achieved will be if the canopy cover can recover to 2007 level of 14.1%. The strategy is completed with annexes, more detailed guidance for the way in which the Council will deal with some of its key challenges. It is intended in the future to expand these to have a fuller suite of operational policy and delivery guides:

Annex 1 – Tree Safety Management Plan: The system the Council will employ to meet its duty of care regarding its trees and woods.

Annex 2 – Responsible Neighbour’s Guide: Whilst it is recognised trees provide many benefits, it is also acknowledged that they can cause inconvenience to neighbours. This sets out how the Council will respond in a clear and consistent manner to many of the more frequently raised concerns.

Annex 3 – Nottingham’s Response to Tree Root Claims: The approach the Council will adopt to manage its trees to lessen the risk of subsidence related damage to properties, and how it will respond in the event of such occurrences being reported to it.

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Annex 6 – City and Ward Action Plans: The priorities for the city and each ward to manage the urban forest in a sustainable manner.

The “Urban Forest” and “Urban Forestry”

The collective of all the trees and woods in Nottingham; their links to and benefits for the city’s communities forms its **Urban Forest**. The unitary district of Nottingham covers a land area of almost 7,500 hectares. Historically Nottingham is part of Sherwood Forest; today the city has an average canopy cover of 14% (1,054 hectares). The canopy coverage is not land dedicated to the natural environment and trees, but the area which trees branches and foliage overhang. This recognises the dynamic, multi-purpose of land in a city. Many of the trees forming an important and substantive role in the urban forest are not in the city’s parks and woods, but located in residential gardens, housing spaces, municipal precincts, and lining the city’s streets.

Urban Forestry is the science, art, technology and planning needed to manage the trees and woods which constitute the urban forest. Urban Forestry encompasses a broad spectrum of skills as the city endeavours to maximise the aesthetic, social, economic, environmental and physical

benefits of its trees. This means, to have a sustainable and vibrant urban forest many professions and communities come together in partnership, to share their skills, knowledge and enthusiasm.

The “Tree”

Trees are described as “*dynamic, self-optimising structures*”, that is their size, form and shape is continually changing and adapting to the environment in which they grow. The often massive structure of a mature tree above ground, consisting of its trunk, branches, twigs, and foliage (leaves, flowers and fruit), uses and stores solar energy and gases from the atmosphere. Below ground the far less obvious, extensive roots are equally efficient in absorbing water and minerals. Together the above and below ground parts of the tree combine to produce the materials and compounds needed to sustain a healthy long lived organism.

Trees absorb carbon dioxide, and emit oxygen. A mature tree in one growing season emits as much oxygen as ten people inhale in a year.

The benefits and values of trees in the urban environment mostly relate to that which can be seen above ground. However, it relies on the ability of roots to function in the urban soil, which is often hostile to tree growth to grow and maintain healthy a tree. It is the root system which is frequently ignored and damaged by people’s activities (such as excavation, construction and compaction), though it is also the roots, rather than the aerial parts of the tree that play a greater part in damaging adjacent infrastructure (lifting pavements or subsidence).

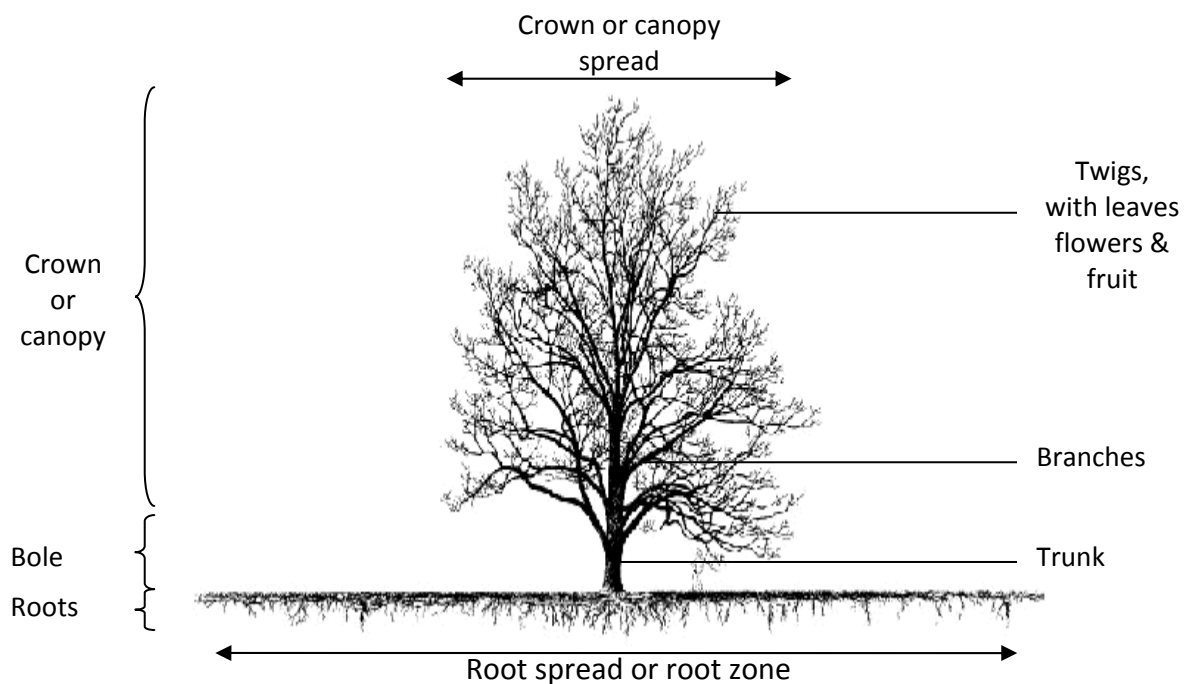


Diagram 1: Parts of the Tree

Despite their appearance of solidity and longevity, trees are easily damaged, and require all parts, both above and below ground to survive. For most trees under normal conditions, the root-shoot ratio is approximately 1:5; ie the top is 5 times heavier than the roots. If it were not for the weight

of the trunk and structural branches, though, the top and roots would weigh about the same and be of equal importance to the tree. The above diagram gives an indication of how a tree grows; the roots will spread out in a broad horizontal plane, just below the soil surface (they need oxygen to survive so grow above the permanent ground water table, with the vast majority in the top 600mm of the soil).

2. TREES IN THE URBAN ENVIRONMENT

Trees have long been held a valued place in the urban environment, though, as greater pressure is being exerted on using urban land, this is limiting the space available to trees. Thus an intuitive argument for the continued presence of trees and maintaining the urban forests canopy cover can carry little weight, unless it is understood in the context of the wider benefits the urban forest provides to a modern city and its communities. Today many of the things our forebears instinctively knew have been confirmed by research across the world.

Early planting in the city would have been to improve the visual landscape, to help disguise some of the uglier parts of a busy industrious city. Many philanthropists in the 19th Century also recognised the restorative value of trees, and their benefits to people’s well-being. Since then research across the world has been able to substantiate, with evidence, the observations of these early visionaries, as well as many other important benefits of trees in the urban environment.

Today trees are now recognised for their breadth of benefits, and their role in the urban environment continues to be relevant and an important component of a sustainable city. Though it is also recognised that care and maintenance is needed if trees are to fulfil their role without becoming a nuisance to neighbours, or a potential hazard

A PERFORMANCE SPECIFICATION FOR URBAN TREES

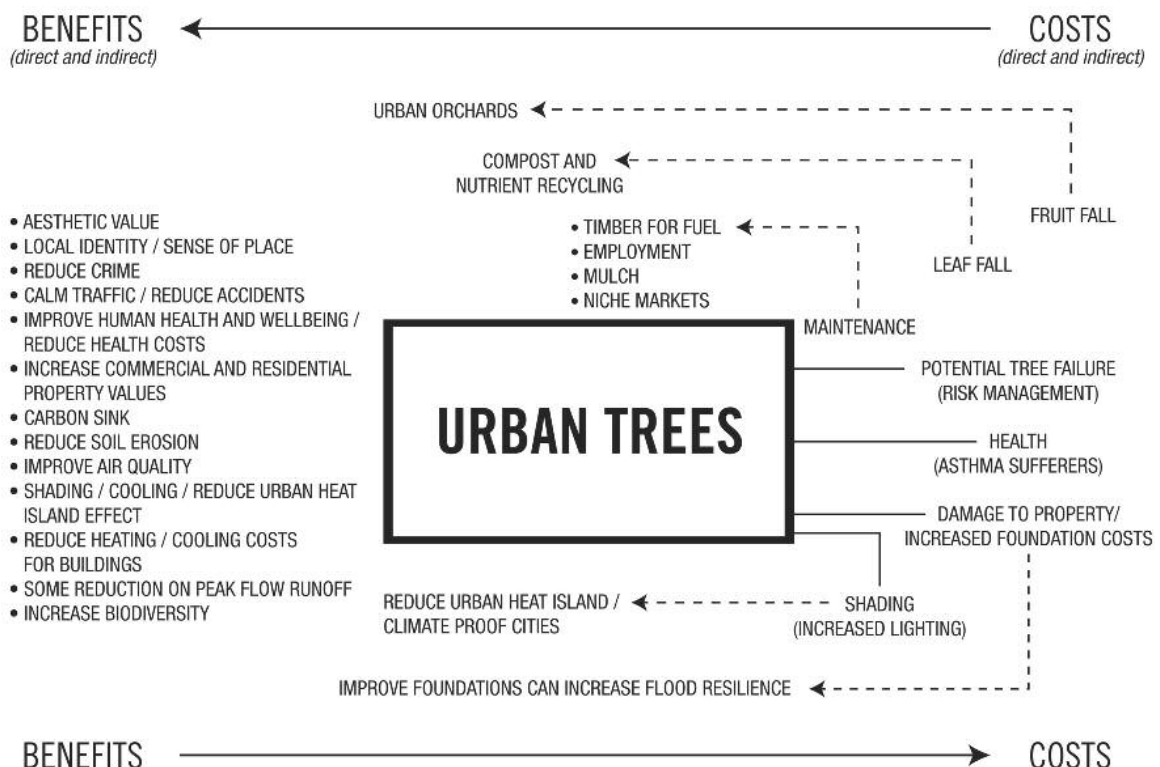


Diagram 2: The Benefits and Costs of Urban Forest
(From Johnson et al (page 189) in FC 2012)

The urban forest helps to define the character of Nottingham just as much as the architecture and fabric of particular communities will, for example the London planes in the Boulevards. The Council employs a team of skilled arboriculturalists in Parks and Open Spaces Service to manage and maintain the trees on its and Nottingham City Homes' land. They are complimented by a similar specialist in Planning Services advising on trees on private property and affected by development.

These are complimented by a host of colleagues across the Council in a multitude of disciplines, the Council's partners and the city's other large land owners, and an increasingly skilled and knowledgeable private sector of arboricultural consultants and tree surgeons. Also many professions come into regular contact with the urban forest, and have an important role in the care and protection of this living legacy.

Once removed from their natural woodland habitat and placed in the urban environment, the management of trees becomes markedly more intense and costly, particularly as community needs and expectations increase. The range of environmental, social and other "green" benefits to the citizen from the urban forest may be grouped under the following broad range of headings, although it is not always possible to distinguish the boundary between one benefit and another.

Trees and People

Trees and woodlands may be beautiful in their own right, providing colour and form to the landscape, also helping to mark the change of seasons, so have an amenity value, particularly if they are in a public place or visible to a significant number of people. Using accredited systems such as CAVAT (Capital Asset Value for Amenity Trees) which not only attributes a value for the visual impact of trees, but also its other contributions to the city. Individual specimens can have values in the region of £750,000. Therefore collectively trees and woods in the urban environment are an asset with value of many hundreds of millions pounds. Nottingham seeks to protect these assets through good practice, sustainable management of its trees, and ensuring trees are properly protected during development. Particularly important landscape trees may be further protected by tree preservation orders, and their position in conservation areas.

Trees create more pleasant environments, which have positive effects on people's behaviour, bringing about increased walking and cycling, talking, pride, care of place, association and therefore actual ownership and surveillance of homes, neighbourhoods, businesses and other public spaces. Trees and green space have also been linked to improvements in children's concentration; a child exposed to nature before undertaking a task performed better.

Urban areas with trees have potentially stronger and more stable communities. Residential areas with trees have been linked to higher property occupancy rates and reduced household 'turnover', suggesting a more stable community. Evidence suggests that in some locations, areas with high numbers of trees experience less crime. This is linked to increased use of community spaces when trees are present and the resultant increased interaction between community members. This relationship is now well established.

The opportunities for recreation within the urban forest offers benefits to children, allowing creativity of mind, encouraging exploration and adventure, promoting physical activity, building resilience and enhancing experiential learning. Well-treed parks, gardens and streets encourage spontaneous use for recreation, which may have multiple follow-on health benefits such as an improvement in general physical health and mental wellbeing

By providing the setting for community events throughout the city where groups of people can be brought together in the public realm, the urban forest will help to build community cohesion. One of the most important social benefits associated with green spaces and street trees, the building blocks of green networks, is their capacity to generate social action among local community members. Evidence shows that formal community and stakeholder engagement is required for the effective and sustainable implementation of urban greening initiatives, such as the development of green networks.

People often live in close proximity to trees, particularly in urban areas. These trees are either their own or their neighbours', or quite commonly belong to the Council. Trees can cause inconvenience to citizens when they grow near dwellings. A dilemma often occurs when the tree makes an important contribution to the local environment but also causes inconvenience to those living nearby.

With any population of trees there are a number of common sources of complaint including overhanging branches, shade, leaf/fruit fall, obstruction and physical damage etc. Many of these problems can be dealt with by careful pruning once the tree is established. However, sometimes the problem is a result of inappropriate species selection in the past and may be difficult or impossible to resolve in all parties' favour.

A very common concern for homeowners is potential foundation damage by tree roots. This type of damage only occurs in areas where the soil type is heavy, shrinkable clay, which is prone to fluctuations in volume caused by changing soil moisture levels. There has been a lot of concern about tree roots and foundations in recent years. Much of this is unsubstantiated and the incidence of proven tree root related claims against the City Council remains low despite the level of tree cover and much of the area having clay soils.

The Council's policy response and reaction to these issues, when they affect trees and woodland in its ownership, are set out in the annexes supporting the Urban Forest Strategy.

Health Benefits of Trees

The availability of local green spaces, the ease of access to those places, or even the simple ability to see green spaces and trees, has positive effects on people's wellbeing and can encourage hospital patient recoveries, reducing the amount of time spent in hospital. Whilst it is difficult to create a direct link and quantify exact cost savings, research suggests that a healthy green city helps to alleviate the financial burden on the National Health Service, especially the costs associated with sedentary behaviour, obesity and mental illness. Disease rates, including mental disease, have been shown to be of a lower prevalence in areas with higher percentage of green spaces within a 1km radius than those with lower percentages.

Mental health and well-being have become increasingly important in developed countries, where depression and anxiety rates have risen despite increases in living standards. Trees and woods are now promoted as “nature’s health service”. Studies demonstrate the association between access to local green space and people’s health and well-being. People living in areas of high quantities of green space have been found to be in better health; and populations in the lowest income groups benefiting the most from having green space near to their homes. Green space which is well treed has the greatest benefits.

The restorative effects are greatest for those who actively interact in the natural environment, but even just viewing trees and nature through a window can have psychological benefits.

The term “forest bathing or forest atmosphere” was coined in Japan in the 1980’s has come to be associated with the recognised restorative effects of trees and the green space in urban environment. The benefits are not just directed towards well-being, but also shown to reduce incidences of aggression and violence.

The physical size of trees and in particular the canopy formed, has indirect human health benefits, as their shade during hot summer days helps reduce localised day time temperatures by up to 2 degrees Celsius so contributing to a reduction in heat related illnesses. Shade from the canopy of trees can reduce overall exposure to ultra-violet (UV) radiation by up to 75 per cent, reducing sun exposure illnesses, such as skin cancer.

Trees and Noise

Noise, or unwanted sound, can be quite invasive and one of the most problematic issues in the urban environment. Optimally the most effective solution is to reduce the noise, but often this is not possible, nor is it possible to increase the distance between the source of the noise and the hearer.

Trees’ canopies can help to reduce noise pollution, absorbing and deflecting sound. However, on their own they require dense and wide planting (15 to 30m wide tree belt can provide 6 to 10dB reduction). Greater benefits can be gained by their use in combination with other barriers such as soil mounds.

Often it is not possible to provide effective barriers, in these instances trees may be able to provide a visual screen between the source of noise and hearer. Whilst the sound reduction is negligible, the lack of direct view creates the impression of greater noise reduction.

Trees and Urban Regeneration

Most infrastructure and design decisions are based on a simple Cost Benefit Analysis and so an understanding of urban forest’s financial value is critical and can give those decision makers sympathetic to the urban forest a very powerful tool.

The economic benefits of an urban forest include the following:

Reducing energy costs

Trees help improve the environmental performance of buildings – increasing tree cover in a well planned development can lower heating and cooling costs by 20%

Avoiding costs of infrastructure damage

Tree canopies and root systems play a key role in mitigating flood levels during extreme events and have the ability to lower storm water flows into the existing drainage infrastructure and so reduce the risk of damage.

Marketing the City

Tourism and city marketing can be boosted by a good quality urban forest as recognised by “Green Flag” awards. Green Flag urban parks can be marketed as city attractions and will provide attractive settings for various events and activities which will boost the local economy.

Increasing the value of property in a community will help to make the area attractive to inward investment from new residents and businesses. Tree planting in streets has been shown to directly enhance and improve the neighbourhood aesthetics and so increase property values by 7 – 15%.

Effects of Climate Change

Forests and woodlands are important parts of the landscape of the UK, covering over two and a half million hectares, which is 12% of the total land area (slightly larger than Wales). The tree species native to the UK have gradually adapted to the local climate, atmosphere and soils since the last glaciers retreated over 10 000 years ago. Human activities have resulted in many changes to this natural environment, especially during the past 200 years as urbanisation and industrial activity has accelerated.

Foremost among the environmental issues that can affect trees are climate change and the ‘greenhouse effect’, acid rain, and nitrogen enrichment. In addition, many of these aspects of environmental change interact with existing problems – such as disease and insect outbreaks, drought and temperature extremes – making their impacts more severe.

Climate change is now recognised as one of the most serious challenges facing us today and its potential impacts for trees and forests are well documented, and as its effects increase so the urban forest will become increasingly important.

The predictions of on-going changes show that the UK will probably have milder, wetter winters, whilst the summers will be hotter and drier, providing trees with longer growing seasons. The UK climate change scenarios (UKCIP, 2009) indicate average annual temperature increases could be 4.5°C by 2080. However, these scenarios do not take urban surfaces into account, which have the potential to further increase these predicted temperatures due to the urban heat island effect.

Temperature	<ul style="list-style-type: none"> ➤ Annual warming by the end of the century of between 1°C and 5°C depending on emission scenario ➤ Greater summer warming in the southeast than in the northwest ➤ Increase in the number of very hot days ➤ Decrease in the number of very cold days
Precipitation	<ul style="list-style-type: none"> ➤ Generally wetter winters for the whole of the UK (by up to 30 per cent), and increases in winter precipitation intensity ➤ The risk of flooding from rivers and the sea will at least double by the 2080s, and could increase by up to 20 times ➤ Substantially drier summers
Soil moisture	<ul style="list-style-type: none"> ➤ Decreases in summer and autumn, especially in the southeast
Sea level	<ul style="list-style-type: none"> ➤ Global average sea level will continue to rise for several centuries ➤ There will be significant regional differences in relative sea level rise around the UK ➤ For some coastal locations and some scenarios, storm surges will become more important

Table 1: Summary of Climate Change impacts in the UK.

Research confirms that the urban forest helps to mitigate the Urban Heat Island effect by; transpiration (helping to reduce day and night-time temperatures in cities, especially during summer), canopy shade (canopies provide shade for buildings, streets and footpaths and reflection (leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day).

Climate change could alter the growth and health of trees in a number of ways:

- Elevated CO₂ concentrations in the atmosphere act as a fertiliser for plants, allowing more photosynthesis to take place and resulting in faster growing trees. Experiments on young trees have shown growth increases of 35%. However, it is uncertain whether this 'CO₂ fertilisation effect' will occur to the same extent in mature woodland.
- Leaves will lose less water at higher CO₂ concentrations. However, this advantage may be offset by the increase in total leaf area.
- In the UK, warmer weather, particularly in winter, is likely to lead to longer growing seasons and increased tree growth.
- Cold and snow-related damage are likely to become less common.
- There will be opportunities to plant species which are currently not planted because they are sensitive to winter cold.
- Trees may become more susceptible to damage from late spring frosts as a result of earlier leafing.
- In the south of England, less summer rainfall may reduce tree growth and, as climate change progresses, severe summer droughts may kill increasing numbers of trees, particularly species such as birch and beech.
- Violent storms may occur more often, and more trees are likely to be blown down or suffer wind-snap.

During photosynthesis trees convert carbon dioxide and water into sugar and oxygen and then sequester (store) the carbon, making a significant contribution toward absorbing carbon from the atmosphere. Young trees and newly planted woods that are growing quickly take up carbon; old, mature forests do not, since the amount of carbon taken up by photosynthesis balances the carbon that is lost through tree death and decay. In the UK, the total amount of carbon locked up or *sequestered* in all our woodland is estimated to be increasing by between two and three million tonnes per year.

To place this in context, UK annual carbon emissions from all sources are about 150 million tonnes per year, or three tonnes for each person. Although the contribution from our woodland may seem small, it is important, since all reductions in carbon emissions and increases in the amount of carbon locked up will help to reduce the greenhouse effect in the future. A practical example of this is the estimate that one hectare of woodland will take up as much carbon as would be produced by two cars over the maturing lifetime of that woodland (60 years).

Once an area of woodland has matured, it has reached its full potential for carbon sequestration; further carbon can only be locked up if the trees are felled, the wood used, and the land replanted for continuing carbon sequestration. Short-lived products such as paper contribute little, but the use of timber in buildings and furniture could be important, particularly if replacing materials such as steel and concrete which require large fossil fuel inputs for their production. Wood or parts of the tree that are not normally harvested at present may be used to generate electricity or heat, replacing fossil fuels. Nottingham City Council recycles ALL its tree work by-products – material which is not used locally, such as mulch to control weeds and lessen water evaporation from soil, and wood for sculpture, furniture and firewood is sent to generate electricity – none goes to landfill.

Evidence shows that open space within towns and cities, rather than as a green belt, might be more effective in helping adaptation. The urban forest helps urban areas adapt to the impact of climatic change regardless of whether they are in parks, private gardens or street trees, but the space, size, quality and vegetation type and proportion of coverage all influence the level of impact. Modelling work based on Manchester suggested that adding 10 per cent green cover kept maximum surface temperatures in high density residential areas and town centres on the hottest summer days at or below the 1961-1990 level (the baseline projections are based on). However, removing 10 per cent canopy cover from these areas may increase the maximum surface temperatures by up to 8.2°C by the 2080s, assuming the highest emissions scenario.

The urban forest has an important role in ameliorating air pollution and greenhouse gases; by photosynthesis trees capture carbon dioxide, nitrous oxides, sulphur dioxide, carbon monoxide and ozone from the atmosphere. However, trees are affected by atmospheric pollutants, whether wet (acid rain) or dry (particulates). Whilst acid rain is a natural occurrence, man-made acidity (burning fossil fuels) increases the concentrations, in England up to 90% of the acidity arises from mans' activities, and whilst this is no longer the serious problem it was in the mid twentieth century it can still have a detrimental effect on trees, affecting their ability to photosynthesise.

Atmospheric particulates (emissions from industry and vehicles have been linked to increased incidences of illness in people (eg asthma and allergies). Trees have an important role in

combating (mitigating) these effects. Some particulates are absorbed and used as part of the trees growth processes, other, larger particulates are filtered from the atmosphere by attaching themselves to leaves. The closer trees (and greater their canopy) are, to the sources of pollution the greater their contribution and benefits.

A different climate will have implications for the costs of, and approaches to, maintaining the forest, such as increased watering during droughts, greater pressure on spaces as they are used more intensively and an effect on the health of some species. The urban forest will need to be well maintained to be at its most effective.

Trees and Storm Water

Urbanization changes many attributes of the land that is developed and built upon. One of these is a reduction in the permeability of surfaces leading to changes in patterns of runoff and increased loads of pollutants entering water courses.

Tree canopies and root systems reduce storm water flows and nutrient loads that might otherwise end up in our waterways. Broad canopies intercept and mitigate the impact of heavy rainfalls and healthy, fibrous tree roots help reduce the nitrogen, phosphorus and heavy metal content in storm water.

Rainfall interception in canopy

The volume of runoff is reduced by the evaporation of rainfall from leaf surfaces within the tree canopy. Rainfall interception by trees in the parks and streets of a Californian city equated to 1.6% of total precipitation; this equated to a saving of £2.37 in UK currency as at 15/01/2013, per tree on expenditure for storm water management. Rainfall interception is maximized with large, evergreen tree species as these affect storm water runoff all year round.

It is estimated, that trees in the Council's ownership contribute to a £250,000 saving on storm water management in Nottingham.

Increased infiltration of rainfall and soil water storage

Trees can increase the rate, or amount, of soil water infiltration and subsequently increase soil and groundwater recharge. A proportion of the rainfall temporarily held on the canopy will flow down the stem and trunk. In hard impervious surface areas this trunk flow increases the likelihood that rainfall is directed into soil at the base of the tree rather than onto surrounding impervious surfaces

Tree pits can be designed to maximize water storage, and the use of structural soil under pavement areas such as car parks and footpaths can be used to retain storm water. By providing increased rooting volumes through the use of structural soils, these systems should support larger-sized trees and will further mitigate storm water by rainfall interception and retention within the soil.

Pollutant removal

In addition to reducing the quantity of urban runoff, vegetation and its associated soil can play an important role in removing nutrients and heavy metals from storm water

Trees and the Natural Environment

The **National Ecosystem Assessment 2011**, highlighted the significant contribution of trees and forests in terms of the ecosystem services they provide to society, as well as through direct economic value and social amenity. Its key findings recognised:

“In future, the management of ecosystem services will need to be resilient and adaptive to societal (e.g. demographic), environmental (e.g. climate change) and land use (e.g. increased use of bio-energy) changes.”

(UNEP 2011: 53)

A healthy and sustainable urban forest will increase biodiversity in the city, becoming a home or roost to a wide range of species; even endangered animals and other species of high conservation value. Managing different age classes, and by planting a variety of tree species, biodiversity can be further enhanced. Trees often form the links between pockets of greenery around the city. The street trees and garden trees will link to the larger open spaces formed by Nottingham’s parks and open spaces, and the wider countryside.

All trees support a range of other wildlife which either feed directly on the tree itself, or indirectly on another species which feeds on the tree. Even the smallest sapling will have a range of sap-sucking and leaf eating insects attacking it and these in turn will attract other insects, birds and even small mammals which feed on them. In older trees, fissures in the bark will harbour a range of small invertebrates, depending on how gnarled and old the bark is and hence, how deep the fissures are. Knot holes and pockets may develop in the trunks and branches of older trees; these can provide nesting sites for birds, and bats.

Eventually the tree will begin to senesce and bits die back, and remaining attached, provides standing microhabitats. Old trees therefore develop a wealth of microhabitats for other organisms and a large surface area for colonization; and thereby extension, the older the tree, the greater its biodiversity. Veteran and ancient trees provide a wide range of opportunities for other wildlife, some of which are so specialized that they are only found on certain species of trees which are over 500 years old.

Whilst a diversity of species provides a varied and interesting mix, trees are susceptible to the impacts of pests and diseases. Where there is a high proportion of a single species or closely related species of trees the impact on the landscape, and the urban forest and its benefits can be considerable. The UK has dealt with the ravages of Dutch Elm Disease since the 1960’s. Currently the Forestry Commission lists 15 pests and diseases present in Britain that pose a major threat to tree health. This includes species that are common and prominent in Nottingham, including oak, ash, horse chestnut and London plane.

It is suggested that a healthy and sustainable urban forest has a diverse mix of tree species, and age groups. A single tree species or closely related species should not make up more than 10% of the tree population.

The city is not a natural habitat, but a human one. It is often harsh and difficult for trees to develop and grow healthily. Whilst native trees offer a habitat to a greater number of flora and fauna, the challenges presented by the urban environment means that native species are not always necessarily the most suitable. A species may be excellent at delivering some benefits, yet it may also have negative traits. The aim of the urban forest is to improve the welfare of urban residents and visitors, as well as providing habitat for wildlife, therefore a balance needs to be struck to ensure that the trees fit comfortably into this.

3. POLICY AND LEGISLATIVE INFLUENCES

Trees have been a feature of the international environmental agenda for many years: this document seeks to identify the key influences and associate them with Nottingham's core priorities beginning at the global scale then narrowing the focus to Nottingham.

The most significant recent influence has been the **United Nations Conference on Environment and Development**, known as the **Earth Summit**, held in Rio de Janeiro in June 1992, and the consequent summits in Kyoto and in Johannesburg.

Two of the key documents produced at the Earth Summit were:

- *Rio Declaration on Environment and Development*
- *Agenda 21*

The **Rio Declaration** consisted of 27 principles that were intended to guide future sustainable development around the world, of those principles two are:

- Principle 3. The Right to development
- *The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.*
- Principle 4. Environmental Protection in the Development Process
- *In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.*

Agenda 21 is an action plan related to sustainable development: it provided the current authoritative reference to the importance of the urban forest in helping to manage the urban environment, including storm water run off and fighting pollution, as well as providing social and recreational benefits. The implementation of Agenda 21 was intended to involve action at international, national, regional and local levels, such programmes are often known as 'Local Agenda 21' or 'LA21'.

In addition, two important legally binding agreements have emerged: the **Convention on Biological Diversity** which dealt with so-called uneconomic growth and the **Climate Change Convention**.

Biodiversity

The **Convention on Biological Diversity**, an international legally binding treaty, has three main goals:

- conservation of biological diversity;
- sustainable use of its components; and

- fair and equitable sharing of benefits arising from genetic resources

Its objective is to encourage the development of national strategies for the conservation and sustainable use of biological diversity.

The continuous development of sustainability and biodiversity legislation in the UK demonstrates that this issue continues to resonate with citizens and politicians, and yet has not been entirely satisfactorily addressed. The **Natural Environment and Rural Communities Act 2006** extended the duties of S74 of the **Countryside and Rights of Way Act 2000** to all public authorities to consider the natural environment and to make appropriate policy in connection with the exercise of its duties and functions. In this way it is hoped that the loss of biodiversity can be slowed or perhaps halted.

Climate Change

The objective of the international **Climate Change Convention** is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system. The parties to the convention have met annually from 1995 to assess progress in dealing with climate change. In 1997, the Kyoto Protocol established legally binding obligations for developed countries to reduce their greenhouse gas emissions.

The first global response to the threat posed by climate change was to concentrate on **mitigation** – to try to stop it happening. However, with the concentration of greenhouse gases in the atmosphere continuing to increase rapidly and climate models predicting more rapid rates of change, the need for **adaptation** strategies has become evident. This shift of emphasis means that managers better understand the role of the urban forest in a city's ability to cope with change, as well as how it can help the drive to reduce emissions.

The **Climate Change Act 2008** sets a legally binding target for reducing total greenhouse gas emissions in the UK. The **Climate Change Adaption Plan** is the City's response and it states:

“The case for adaptation is a strong one. There are significant economic incentives for the Council to implement adaptive actions, as highlighted in the Stern Review (2006). If we invest 2% of our annual Gross Domestic Product (GDP) now, it will prevent global GDP being up to 20% lower than it otherwise might be. Therefore the cost of adapting now is less than the cost of clearing up afterwards.”

“The UK Climate Impacts Programme 2009 UK projections predict:

- *Increased summer temperatures*
- *Increased winter temperatures*
- *Reduced summer rainfall*
- *Increased winter rainfall”*

(Nottingham City Council, 2011a: 5 & 9)

In 2007 Department for Communities and Local Government (DCLG) published a briefing paper setting out the contributions that urban green space will make to adaptation and mitigation of climate change. It identified:

*“All green spaces help urban areas adapt to the impact of climatic change.....
There is evidence that open space in town and cities, rather than as a green belt, might be more effective.
Policies could be used to encourage the optimal structure and composition of urban green space.....
As climate change increases, green spaces are likely to become increasingly important
A different climate though will have implications for the costs of, and approaches to, maintaining spaces.....”*

(DCLG 2007: 3-4)

National Tree and Woodland Policy

According to the Forestry Commission’s (FC) **Forest Standard**, which embraces all trees and woodlands, sustainable forest management is fundamental tenet of tree and woodland policy in the UK, at national, regional and local levels, often in partnership with other organisations.

The FC state that the UK is committed to maintaining or increasing its forest area, and to enhancing the environmental, economic and social values of its forest resources, including the conservation of biodiversity. The overarching policy for the sustainable management of forests, woodlands and trees at a UK level is a presumption against the conversion of forest land to other land uses – unless there are compelling reasons in the public interest for doing so.

In 2007 the Health and Safety Executive (HSE) published **Management of the risk from falling trees** (SIM 01/2007/05) which gave guidance on the standard of risk management of trees, including risk assessment and where appropriate, routine checks by a competent person. It noted that duty holders should have such systems in place to control risks from trees to their employees, contractors and members of the public.

In 2011 the National Tree Safety Group (NTSG), a star chamber with representatives from governmental and non-governmental agencies, professional and corporate bodies involved in the management of trees, published **Common sense risk management of trees**

“...in response to growing concern over the unnecessary removal of trees. Neither the law nor the regulators require the NTSG or anybody else to develop a single policy that states how safety should be managed in all circumstances. Management of the risk is the responsibility of the owners and managers of the land (and the trees). However, a coherent underlying risk philosophy articulated by such an inclusive organisation will undoubtedly aid all types of tree owner in considering what constitutes reasonable management in their particular circumstance.”

(NTSG, 2011: 79)

The Council also has responsibilities to apply its Tree Service resources in a manner which makes best use of them. In accordance with **Local Government Act 1999** the council has a general duty of best value to “make arrangements to secure continuous improvement in the way in which its functions are exercised, having regard to a combination of economy, efficiency and effectiveness.” The act also makes it clear that continuous improvement is underpinned by consultation.

National Planning Policy

The **National Planning Policy Framework** (NPPF) of March 2012 sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework within which local people can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

In seeking to describe sustainable development the NPPF states:

"The purpose of the planning system is to contribute to the achievement of sustainable development.....Three dimensions to sustainable development: economic, social and environmental."

(NPPF, 2012:3)

The urban forest already and will continue to have an important role in achieving this in a sustainable city. The NPPF recognises that planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change – trees and woods are very important in this respect.

In setting the role of the Local planning authorities, it states they should:

"set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure"

(NPPF,2012:26)

The need for good design is set out in **Planning Policy Statement 1: Delivering Sustainable Development** and reflected in Policy 10 of the Council's Emerging Core Strategy, which looks for design to make a positive contribution for the lifetime of the development. National standards, such as **Building for Life** (run by the Design Council, Home Builders Federation and Design for Homes) and **The Manual for Streets** (from the Department for Transport), provide benchmarks by which the overall design quality of a development can be measured.

As the local planning authority the City Council has a statutory duty to protect the trees that it believes make an important contribution to the public amenity of the City.

The imposition of statutory restrictions on the rights of a tree owner is always a potential source of conflict, however many of today's landmark trees would have been lost if such protection had not been used. Under the **Town and Country Planning Acts** the Council has powers to make and enforce Tree Preservation Orders (TPO) and designate Conservation Areas, within which all established trees are protected. Resources rarely allow for the proactive making of TPO or the required updating and re-surveying: a new TPO tends to be made when a threat to a tree or tree population becomes known.

Tree protection may also be achieved by the offer of freely given expert advice from the Council's officers, for example advice on suitable pruning regimes or the timing of a proposed felling, or

over the selection of a suitable local service provider. When sought in connection with a planning application this makes the process more efficient and therefore helps provide a cost effective tree service.

Nottingham City's Policy

The City's adopted **One Nottingham Plan - Sustainable Community Strategy** (SCS) sets the overall strategic direction and long term vision for the economic, social and environmental wellbeing of the City.

Breathing Space, the City's open spaces and green spaces strategy adopted in 2010, links a wide variety of plans and strategies produced by the Council and regional partners. The **Urban Forest Strategy** (UFS) is one of the documents that will guide the implementation of Breathing Space.

The vision and aims of UFS will also align with the **Land and Planning Policies** (LAPP), the City's emerging statutory planning document setting out policies for managing development and allocating sites for new development. The LAPP will form part of the **Statutory Development Plan** and as such it will be consistent with higher level documents and guidance, including the emerging Greater Nottingham Aligned Core Strategies (**Emerging Core Strategy**) and the SCS.

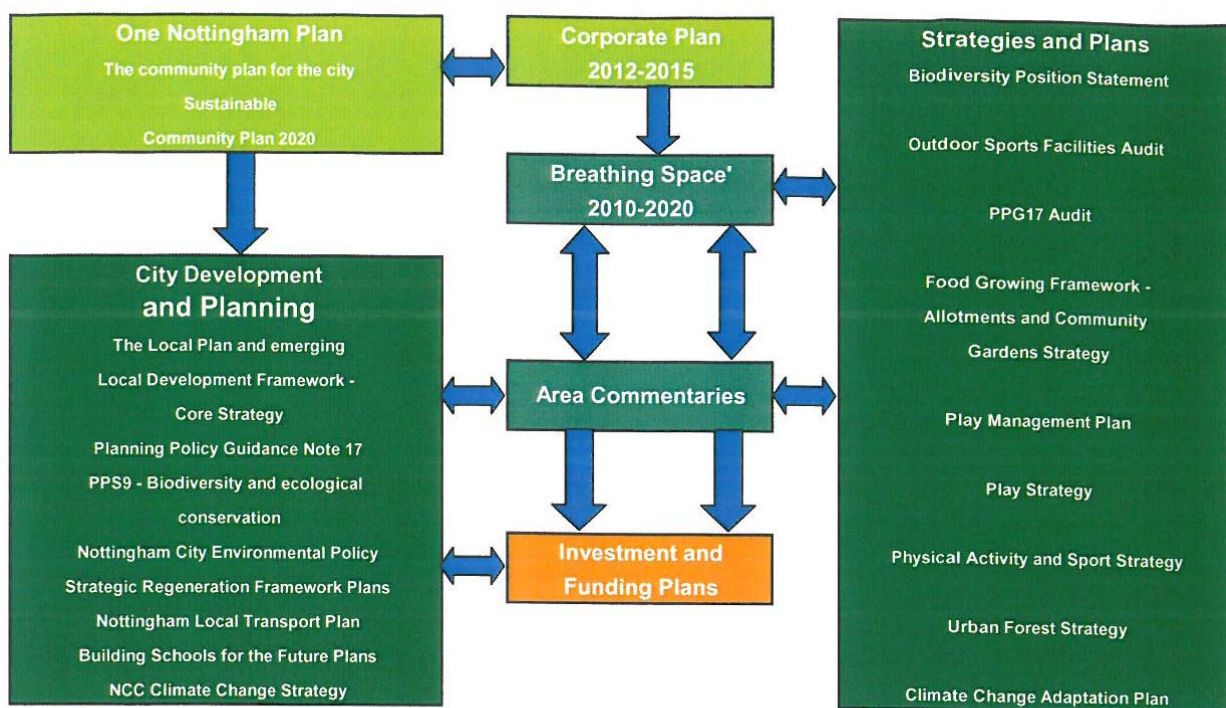


Diagram 3: Breathing Space - Strategy and Plan Links

Diagram 3: Breathing Space – Strategy and Plan Links
(adapted from Nottingham City Council, 2010a: 13)

The SCS has defined a broad direction of travel for the City of Nottingham in order to achieve its vision:

- “Nottingham in 2030 will be a city which has tackled deprivation and inequality by*
- being one of Europe’s top ten cities for science and innovation, sport and culture*
 - making every neighbourhood a great place to live*
 - giving the best start in life to all of our children and young people*
 - making poverty history”*

(Nottingham City Council 2010b: 27)

To achieve this it recognise the importance of communicating and ensuring communities are aware of what the Council is endeavouring to achieve and contributions they can (*“Social Responsibility”*) make to the betterment of the city and its neighbourhoods:

“If we can secure strong co-operation from all sectors behind the long term aims of this strategy, we will be able to mobilise significantly more resources than if we rely upon public services alone.”

(Nottingham City Council 2010b: 83)

The LAPP will provide the framework for neighbourhood planning, whilst considering the implications for the whole of the City: the purpose of the LAPP is:

“To promote sustainable development and growth across Nottingham City by providing for the specific, unique and varied needs of the different neighbourhoods and City Centre whilst delivering the objectives of the Core Strategy and the strategic priorities of the Sustainable Community Strategy.”

(Nottingham City Council 2011b: 5)

The Emerging Core Strategy sets out a target of 17,150 (net) new homes between 2011 and 2018 – approximately 1,010 new homes a year. The SCS accepts the target as achievable and desirable in terms of regeneration, improving the housing mix, meeting local needs and helping to create more balanced communities. The re-use of previously developed land will be the main focus for future housing development; achieving the target will bring challenges for existing trees which often have a significantly longer useful life than the built form they surround, and in making space for enhanced tree and woodland cover.

The housing growth target (and other Council programmes delivering community benefits) means that consideration will need to be given to how well the existing urban forest meets citizens’ needs. The UFS will have a strong presumption in favour of retaining existing trees and enhancing canopy cover as well as for making space for new trees that will make a positive future contribution to both offsetting climate change and to local amenity.

The objectives of the 1997 Tree Strategy stated:

*“Council will actively manage all council owned trees and woods for the benefit of the community and future generations, and will encourage the sustainable management of **all** trees within the City”.*

This is still pertinent, though the core influences, affecting the urban forest has evolved to make new priorities and policy, particularly as the multitude of benefits trees can make to the city is better and more widely understood. The increasing increased pressure on public expenditure, means that the City has to seek to achieve more for less.

Legislation

Whilst trees continue to be much appreciated and recognised for their benefits, they continue to cause problems. Legislation exists to protect, preserve and enhance these benefits, including simply their aesthetic value. Similarly, legislation has been used to identify when their more negative impacts have become unacceptable. These can be defined in four broad headings:

- Health and safety
- Planning
- Environmental protection
- Nuisance

As legislation and judicial commentary are constantly changing, specialists and managers are expected to continually review judgements and apply them appropriately to ensure that the vision, commitments and priorities of the council are delivered in accordance with its legal responsibilities and good practice.

Tree owners have a duty of care which requires them to take reasonable care to maintain their trees and woods in a safe condition. To meet those duties the Council will take appropriate action to lessen risk to acceptable levels to avoid liability, this is set out in more detail in [Annex 1 - Tree Safety Management Plan](#).

Local planning authorities (LPA) have a duty and powers to protect trees that are potentially at risk of damage or removal. The council can use planning conditions to protect trees during development, this is set out further in [Annex 5 – SPG, Trees and Development Sites](#). Also the LPA has the powers to protect trees and woods either by designating conservation areas, or serving tree preservation order (TPO).

Conservation Areas are 'areas of special architectural or historical interest the character or appearance of which it is desirable to preserve or enhance'. Designation allows the LPA to effect conservation policies over a particular area or neighbourhood, giving them control over demolition, strengthened controls over minor development and special provision for protection of trees.

A TPO protects trees and woodlands, and is an order made by the LPA. The principal effect of a TPO is to protect trees and woods and prohibit, without the LPA's prior consent, their:

- (1) cutting down,
- (2) uprooting,
- (3) topping,
- (4) lopping,
- (5) wilful damage, or
- (6) wilful destruction.

Environmental legislation goes beyond TPO's protecting trees not only for their own values, but also their importance to other wildlife as a habitat, nesting site or roost, including species which are endangered or of high conservation value, requiring licence from Natural England to carry out work when protected species are affected.

Judgements dating back many centuries are still relevant to trees, many of these relate to disputes between neighbours, and have been used to establish what a tree owner may be reasonably expected to do to manage their trees. The council's response to the more common concerns in the urban environment are set out in **Annex 2 – Responsible Neighbour's Guide** and **Annex 3 – Nottingham's Response to Tree Root Claims**.

4. NOTTINGHAM'S URBAN FOREST

Nottingham has evolved from a strategic river crossing to become the leading city in the East Midlands in terms of employment, leisure and retail, and one of the eight 'Core Cities' in England. The City Centre represents a key office and employment location in the East Midlands, and a driver of economic growth.

The city grew and industries developed supplied by an abundance of natural geological resources in the form of clean water, sandstone, limestone and coal, all within easy transportation distance of the city. Thus, by the early 20th century Nottingham was a major industrial centre of the East Midlands.

The city gained a Royal charter in 1155. In the Middle Ages, the main industry was woollen manufacture. The population rose from about 1500 at the time of the Norman invasion to 5000 at the end of the 17th century, and over 28 000 at the time of the first census in 1801. Industry expanded in the 19th and 20th centuries, with the main ones being textiles, cigarette manufacture, bicycles and pharmaceuticals. The population expanded rapidly in the 19th century but the city's response was poorly planned, much of the population experienced extreme deprivation many living in appalling slums. The latter part of the 20th century has seen a gradual move from an economy based on heavy industry to one based on light manufacturing and service sectors. The population now stands at about 300,000.

The city has always been dynamic and the human influence on the heavily urbanized Nottingham area has been substantial: over the centuries the landscape and layout has evolved to what we see today. Man's influence on the land has been significant, and apart from some peripheral areas, the trees we have today are a result of this influence. Most of the trees were planted at the same time as the neighbourhood in which they grow, was being developed and built. This helps to date the tree population, but also shows the importance of planning and design on large scale schemes incorporating the space needed for trees and woods. Trees are an integral part of the city's conservation areas, notably Park Estate and Mapperley Park.

The broad relatively flat valley floor contrasts with dissected high ground to the north and south of the river. Soil in the Nottingham area is usually a sandy clay, of variable pebble content, with a low to intermediate plasticity. The moisture content and bulk density vary within the area, the former ranging from 15 to 30% and the latter from 1.8 to 2.3 Mg m⁻³. Artificial, made ground in some areas may be thicker than the alluvial deposits beneath. For example, in the Dunkirk–Lenton Lane industrial area made ground is over 10 m in thickness in some areas.

Major flooding of urban areas occurred in November 2000; affecting the whole of the Trent valley, as well as its larger tributaries. In 2012 a new flood defence was built along the River Trent protecting the city's low lying communities, however, flooding still occurs in the north suburbs. The soils and bedrock have low infiltration capacities and adding extremely rapid rates of runoff and local flooding.

Nottingham has a temperate climate which is conducive to tree growth:

- Temperature:
Daytime range 6-21°C with highest record of 34 °C
Night time range 1-12 °C with records of -12 °C
- Sunshine
1,370 years per annum (1-6 hours per day)
- Rainfall
Approximately 650mm per annum evenly distributed across the months.

The long history of tree planting has provided a legacy of large, mature and important trees, often in places frequented by many people, and close to high value property. These landmark trees make the greatest contribution to offsetting climate change, and to local visual amenity, however, they also represent a degree of risk to people and property (both perceived and real) that the City has recognised by making provision within its services to care for its trees.

Early tree planting was motivated by the need to beautify the industrial and dense housing areas; examples of these plantings remain today in parks and the streets across the city. The broadening understanding of the benefits and importance of trees in the city has seen their continued planting and care through the decades.

The 19th century public parks movement was a conscious decision to provide for the majority of urban dwellers, mostly poor and hard working, whose physical and moral health needed access to open air and to nature. The Arboretum is an early example of this.

Latterly, concern for global warming and an understanding of trees' contribution to mitigation and adaptation responses to climate change has led to greater appreciation of their benefits in cities, particularly to absorb pollutants, slow storm water run-off and lessen the urban heat island effect. Research has identified that mature and large "forest" species make the greatest contribution to offsetting climate change, and local visual amenity. Whilst part of the city is situated on shrinkable clay soils, the instances of tree related subsidence reported to the Council is low (only a handful each year).

Although many of Nottingham's trees are in private ownership the Council remains the steward of the greatest proportion of the tree stock in the city, an estimated 110,000 individual trees and over 150 hectares of woods in a densely populated urban environment. A comprehensive survey of the Council's trees is at a mid point, so the distribution, condition and demographics of its trees are not fully known, but there are sufficient accurate data and knowledge of the remaining trees to come to considered conclusions.

Nottingham's Canopy Cover.

Two national surveys of urban trees have been carried out. Both called *"Trees in Towns"* the first one was published in 1992, the second was carried out in 2004, and published in 2007/8. In that time comparison between the number of trees per hectare showed that the East Midlands has dropped more than any other region,, from 54/ha to 45/ha. Trees in Town 2 (TT2) was the most detailed assessment of urban trees in England, providing a rich source of data to compare the health and quality of Nottingham's urban forest. For the purpose of that survey Nottingham came into the category of a large town. The map and table below on the next page shows the canopy cover across Nottingham.

Thematic Map Showing % Canopy Cover by Ward

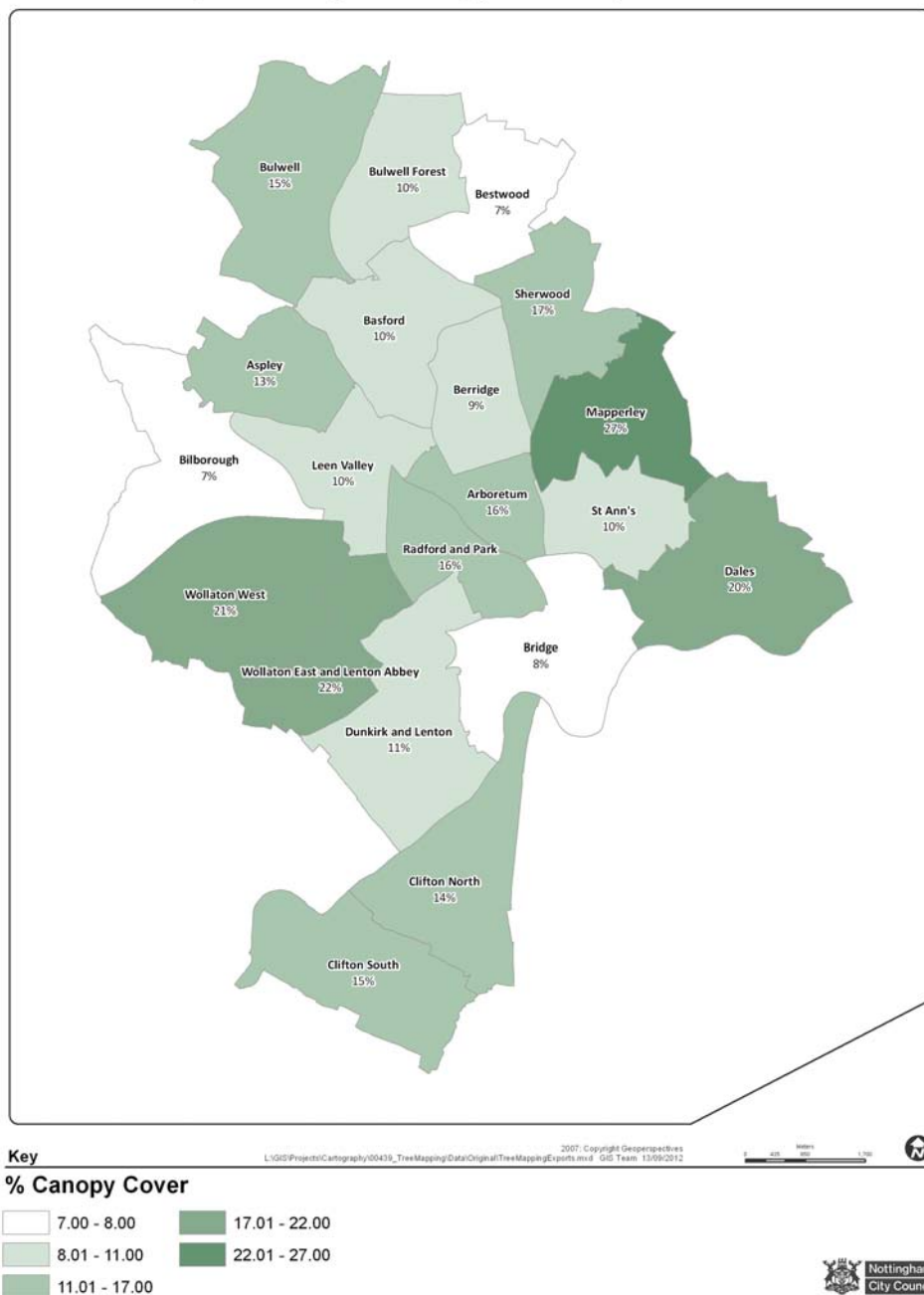



Diagram 4: Urban Forest Canopy Cover by Wards

The TT2 data were produced using sample data. In Nottingham this involved assessment of six sample plots. The survey carried out by Blue Sky on behalf of the Council was of 2007's aerial photographs. Initially it would appear that Nottingham has a higher than average canopy cover; Nottingham has a canopy cover average of 14.1%, compared to a regional average of 7.3%, and large town comparison of 8.7%. Contact with other Councils suggest that most have a higher canopy cover than that given in TT2. It is not clear why this may be. It could be that the samples were not sufficient to gather accurate data, or the use of aerial photography may include canopy of shrubs and scrub in its data. TT2 has proven to be an accurate benchmark in many other regards and the cross correlation of its data (eg tree species mix, age ranges and tree sizes) makes it a valuable comparator.

Ward	Ward Area (Ha)	Canopy Area (Ha)	Canopy Cover
Bestwood	294.70	19.88	6.7%
Bilborough	510.82	35.01	6.9%
Bridge	452.78	38.63	8.5%
Berridge	246.23	22.53	9.2%
St Ann's	254.25	24.55	9.7%
Bulwell Forest	331.59	32.54	9.8%
Basford	378.15	38.25	10.1%
Leen Valley	304.51	31.32	10.3%
Dunkirk & Lenton	521.13	57.99	11.1%
Aspley	281.53	36.79	13.1%
Clifton North	462.31	65.69	14.2%
Bulwell	537.65	81.45	15.1%
Clifton South	435.53	66.21	15.2%
Arboretum	175.05	28.00	16.0%
Radford and Park	241.58	39.33	16.3%
Sherwood	318.55	53.93	16.9%
Dales	514.56	104.71	20.3%
Wollaton West	554.77	116.46	21.0%
Wollaton East & Lenton Abbey	288.14	63.39	22.0%
Mapperley	360.54	97.64	27.1%
Nottingham City	7464.37	1054.29	14.1%
National Ave			8.2%
E Midlands Ave			7.3%
Large Town Ave			8.7%



**Sources: Nottingham data – Blue Sky analysis 2007 data
National and Regional data – Trees in Town 2**

Table 2: Nottingham's Urban Forest Canopy Cover 2007 – by ward.

Canopy cover varies widely across the city with the highest in Mapperley (27.1%), and lowest levels in Bestwood (6.7%) and Bilborough (6.9%). This does not appear to directly link to either the ownership of the land on which trees may grow, or land usage, suggesting there is potential to increase the city's canopy cover.

Ward	Number of Trees	Ward	Number of Trees
Aspley	1417	Dales	1513
Basford	2077	Dunkirk & Lenton	1254
Berridge	1942	Leen Valley	1276
Bestwood	1859	Mapperley	5562
Bilborough	2502	Radford & Park	968
Bridge	3422	Sherwood	6058
Bulwell	3380	St Anns	3578
Bulwell Forest	1496	Wollaton East & Lenton Abbey	1680
Clifton North	6365	Wollaton West	3465
Clifton South	3565	City Centre	430

Table 3: Number of Council owned trees, by ward.

The urban forest is an important characteristic of the city and trees owned by the Council form a significant part of this in every ward. The table below shows how these trees are distributed across departments

Service	Number of trees	
	Surveyed	Estimate total
Highways	10,000	11,500
Housing	11,500	18,500
Parks	19,000	23,000
Cemeteries	1,000	2,500
Schools	9,000	9,000
Chamber & Bridge Estates	500	15,000
Other	500	1,500
TOTAL	51,500	81,000

Table 4: Asset estimates by land owning departments (excluding woods)

Street Trees: Planted in pavements or road verges along the City's streets, trees help to filter traffic pollution, provide shade for car parking and improve the overall appearance of the street scene. The Boulevards sweeping through the west of the city centre that are lined with London planes are a feature as grand as any. Of the 10,000 street trees two species dominate (limes 33% and London planes 10%).

Parks and Open Spaces: These commonly contain the most significant trees in an area and have a profound effect on their visual appearance, upon the experience of park, as well as for visual amenity. In many of the parks (e.g. The Embankment, The Arboretum, Woodthorpe Grange and the grounds of Wollaton Hall) trees are defining features.

Housing Estate Areas: The majority were originally planted when the estates were built to enhance the local environment and landscape; the communal trees were complemented by planting in gardens by residents. Trees are now maturing, and still have long life expectancy, so have the potential to provide maturity and link with an area’s heritage as estates are redeveloped.

Woods: These include some of the remaining pockets of ancient woods that once covered the area. They are complemented by 19th century plantings which have evolved to take on a naturalistic appearance, and recent woodland that has colonised naturally on otherwise unutilised land. These are very important habitats and wildlife refuges in the city.

Other Sites: The Council own and maintain numerous other sites including schools, cemeteries and crematoria, and land held in trust for example; “Chamber land”. Many contain trees of considerable local importance, and contribute to the network of green infrastructure which criss-crosses the city connecting larger parks and woods. Early indications suggest that this is a major asset with 15,000 trees on Chamber and Bridge Estate land

Progress in tree surveying has been considerable in the past two years, and this will accelerate further in the next few months as investment is made to complete the survey by the end of 2012. With the knowledge gleaned from the survey, and other observations some conclusions can already be drawn:

- the lack of planting in the past thirty years is leading to an aging tree stock.
- as shorter lived species come to the end of their life the population is becoming dominated by the longer lived, large growing forest species, like plane maple and lime.
- the mix of species is becoming reduced leading to greater risk of decimation from pest or disease outbreaks.
- the aging tree population poses greater safety risk requiring more frequent inspection, and remedial pruning

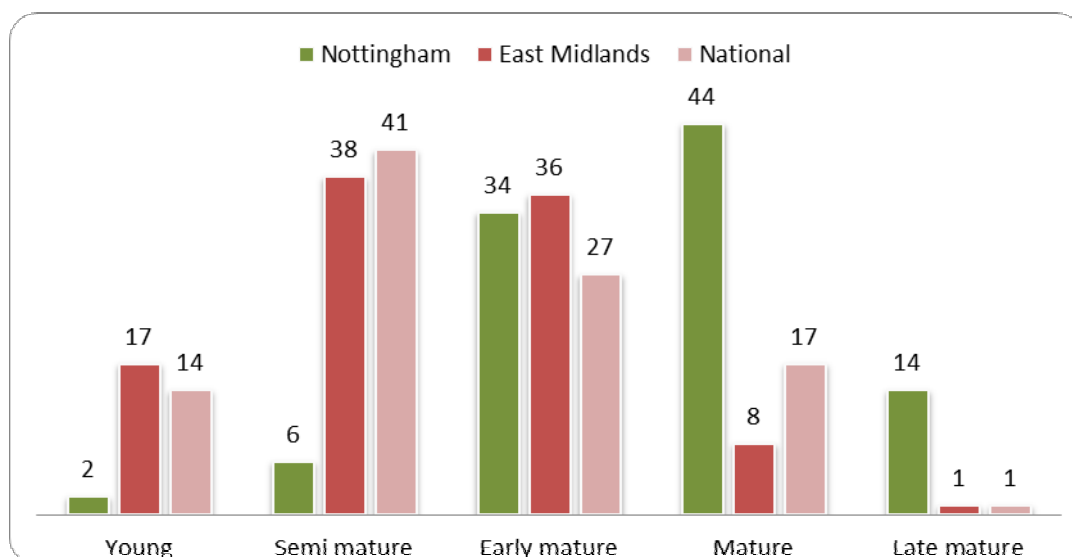


Table 5: Age demographics (based on 44,000 surveyed trees):

At the moment the lack of planting is producing unsustainable peaks in the population in maturity. Comparison with the more even distribution in TT2 highlights the aging population of trees in Nottingham.

Each year approximately 1,000 specimen trees are removed, whilst only a very small proportion are replaced. Being an urban environment, opportunities to maintain late mature and senile trees are limited, principally to parks and larger open spaces. Therefore it is expected that a critical point will be reached in the near future when many more trees will need to be removed. In order to plan for the future replacement of these trees, strategies now need to be developed to ensure that unnecessary risks are identified and managed.

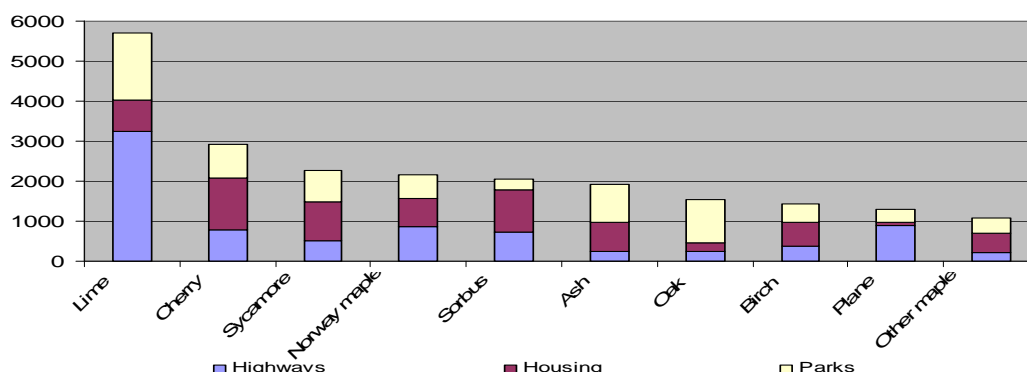


Table 6: Species demographics (based upon 35,000 highway, housing and park trees):

The tree population is dominated by a small number of species. The ten most common species in the three categories **Street Trees**, **Housing Estate Area** and **Park and Open Spaces** are represented above: the totals respectively represent 81%, 59% and 34% of the tree stock in each category. Many of the species are closely related to each other, and so are susceptible to the same diseases. At the moment diseases of oak and horse chestnut have potential to cause large scale losses across the country, plus emerging threats to London planes and ash.

The lack of replanting over the last 30 years, and lack of strategic tree removal and replacement, means that the Council's tree stock is becoming less sustainable with each passing year. The longer this goes on, the more difficult and more expensive it will be for the Council to re-establish a tree stock which meets the needs and expectations of it, and its communities.

Access to the countryside is poorer from some parts of Nottingham than others, in particular for some communities that also display relatively poor health and high levels of economic disadvantage. At present there is little opportunity for the Council to secure new areas of open and green space unless the land is being redeveloped. A challenge for the planning system is how best this inequality can be resolved to ensure fair and equitable access to open and green space. One way of doing this is by improving access to the open countryside that surrounds the built up areas within Nottingham by making use of existing green infrastructure corridors such as rivers, canals and the national cycle network.

As citizens are in close proximity to the urban forest there is a need to ensure that the environment is managed appropriately and sustainably so that it can have the greatest benefit and

impact on the local environment. The on-going inventory survey of the urban forest will provide data than can be used to

- identify risks to the current tree population, and
- identify suitable spaces for new tree planting.

In 2012 the **Strategic Service Review of Tree Services** was completed and approved. It identifies that the resources are under pressure to deliver a service which meets both statutory obligations and community expectation, but identified ways that those resources could be more effectively used to achieve greater efficiency. It sought and recommends several ways in which this can be achieved. At the moment approximately 55% of the resources are committed to ad-hoc one off responses to service requests about trees; this is an inevitable part of delivering a responsive service, but the extent should not be considered acceptable. The cyclical surveys associated with the Tree Safety Management Plan present the opportunity to identify many of these issues and address them at an early stage.

Urban forest on private property: Whilst the Council is the steward and owner of the largest individual portion of Nottingham's urban forest, the majority of trees are in private ownership. TT2 estimates that over half of the urban forest is in private ownership, this is predominantly in residential gardens.

There has been little research into the extent of this in Nottingham, however, from observations the majority of trees have been planted after the communities were built and have similar species those of the adjacent public land, though a greater proportion of smaller and ornamental species. The Council administers Tree Preservation Orders (TPO) to preserve trees it considers of high amenity value and under threat. Approximately 850 TPO's are in place, protecting more than 6,000 trees. The first TPO's were made in 1950, but the oldest one that is still valid is from 1966.

There is no pro-active programme of assessing the quality of privately owned trees and identifying or protecting the more important individuals groups and woods. Investment in such an approach could have positive benefits in the planning process, particularly speeding up consultation with potential developers and property owners.

Impacts of Nottingham's Trees

The urban forest in Nottingham effect the city's citizens and its infrastructure in many ways, the considerable benefits have been set out earlier, however, to maintain trees in a sustainable manner, the challenges of managing and maintaining them are recognised. The key challenge to the city's urban forest is:

- Increasing fragmentation: Smaller groups of trees and patches of woodland, become isolated by other land uses, and are more vulnerable to change and can support fewer species than larger areas.

Also management planning is needed to provide an integrated infrastructure approach taking into account the urban forest and:

Public realm tree issues

- pavements and highways are damaged by tree roots lifting surfacing and creating a trip hazard
- insufficient resources to remove the stumps from felled trees in the highway
- tree root damage by street trees to adjacent properties
- weed and sucker growth in tree pits around base of trees
- replacement street trees are needed to replace trees removed because they were diseased, dying or dead (there is currently no replacement programme)
- obstruction of CCTV sight lines and satellite dish reception lines by trees
- obstruction of street lights and traffic controls by street trees
- dangerous trees and tree limb failures causing personal injury or damage to properties
- requests from the public for tree pruning due to complaints about loss of light, obstruction of view etc.
- complaints about fruit, sap and bird mess from trees on vehicles, pavements and properties resulting in slip hazard
- better information required to inform local residents about planned tree works, tree replacements etc.
- trees in pavements can cause obstructions to the visually impaired and pedestrians with buggies
- aging tree stock which is not being replenished by new planting

Privately owned trees

- there is a need for more information on trees suitable for planting in private gardens
- limited knowledge of the extent and condition of trees on private ground
- the making and reviewing of Tree Preservation Orders is constrained by resources – this could lead to removal of important trees and unnecessary protection for trees which no longer have amenity merit.

Species-specific issues

- problems associated with mature ornamental cherry trees (*Prunus* sp.) (trees grafted onto native cherry root stock with large root system causing damage to surrounding pavement surface)
- large number of Limes (*Tilia* sp.) requiring annual maintenance (epicormic removal) resultant high maintenance costs
- loss of diversity as short lived species are removed, but not replaced.

Public awareness and understanding issues

- lack of citizen understanding about the Council's tree services
- limited procedures to liaise with communities when surveying and scheduling large scale works
- lack of understanding of tree pruning by citizens (frequency, types of pruning works etc)
- large number of tree-related enquiries by citizens

Technical and planning issues

- an unsustainable resource - link required between the removal of trees and their replacement

- new tree planting – need for appropriate species and appropriate tree pit specification and construction
- need to recognise contribution of trees to local character and implement measures to preserve and enhance the urban forest’s character
- land sold off or leased by Council with important parts of the urban forest not being protected (eg school grounds and neighbourhood open spaces)
- shortage of trees suitable for children to climb
- shortage of large ‘forest’ trees
- incomplete and out-dated record of TPOs
- low profile of trees and tree issues

Tree services section and tree works procurement

- inefficient procurement system for tree works – the restructure of Tree Services will resolve this problem
- incomplete survey data for Council owned trees. Full Tree Survey currently ongoing
- insufficient suitable technical staff to meet requirements of the service. The restructure of Tree Services will resolve this problem.
- no resources available within current allocations to carry out tree replacement

Responsibility for the Urban Forest

Private trees may belong to an individual household or commercial undertakings including independent schools, and landowners such as Network Rail and the Church. The Council has a role within Planning Services to be a steward of these trees. It is empowered to protect and preserve valued trees with the application of TPOs and Conservation Areas; and an important role in all phases the development process to ensure that the most important trees and woods are properly accounted for, and provision is made for new planting.

Public trees and woods are the responsibility of a number of different Council services or agencies, including Highways, Parks and Open Spaces, Nottingham City Homes, “Chamber land” and some of the educational establishments in the City, many of whom now have devolved governance and financial responsibility. Tree Services, in Parks and Open Spaces Section, are responsible for managing the Council’s trees, complying with the relevant legislation and case law, and responding as custodian for all the Council’s trees.

Within the framework of this Urban Forest Strategy, the Council has set out its responses to its key responsibilities, notably:

1. Tree Safety Management Plan
2. Responsible Neighbours’ Guide
3. SPG Trees on Development Sites

Tree Safety Management Plan

The risks posed by trees to people and property have been understood and reported for many years, frequent legislation and guidance has assisted in clarifying the duties of a reasonable and responsible tree owner. In 2007 the HSE published **Management of the risk from falling trees** (SIM 01/2007/05) which gave guidance on the standard of risk management of trees, and in early 2012 the National Tree Safety Group published **Common sense risk management of trees**.

Therefore, the Council has reviewed and revised its approach to the management of risk posed by trees. The requirement is to have a suitable and sufficient cyclical system of inspection and remediation, to manage risk as far as reasonably practicable.

The **Tree Safety Management Plan** sets out the Council’s approach to delivering a prioritised risk assessment and management system. The Council has adopted a zonal risk assessment based on the likelihood of someone being in close proximity to the tree. The tree’s condition is assessed, considering whether there is a defect and, if so, the **size of defect** and the **likelihood of failure**.

$$\text{Risk Rating} = \text{Impact of Failure} + \text{Size of Defect} + \text{Likelihood of Failure}$$

The decision making process is based upon a structured system of inspections with responsibilities defined and shared between the site managers and Council’s arboriculturalists (Tree Service staff). Site managers have a vital role in assisting in categorising a site’s zonal risk ranking (**impact of failure**) and due to their regular attendance are most likely to be the first to notice the more obvious changes in a tree’s appearance (e.g. broken branch, dieback, large fungal fruiting bodies etc), and then report this to Tree Services.

Tree Services will carry out the routine cyclical inspections and respond to concerns raised by site managers, colleagues and citizens. They will inspect the trees, evaluate the risk, establishing the **risk rating**, and specify and prioritise remedial action. The application of this approach means the individual risk rating of a tree can be ranked, and remediation prioritised, again, ensuring resources are utilised in accordance with greatest need and benefit.

The inspection cycles for trees are based upon the findings from the survey; given the high density of the city and pressure on land the vast majority of trees fall into the moderate to high risk categories. Trees are inspected on a cycle varying from annually and every five years depending upon their risk zone. Very low risk zones are reassessed on a five year basis, if their status changes then the trees therein will be inspected.

Accurate records are maintained as part of the duty of care. The records are on the Council’s “EzyTreev” database, it records details of the trees condition, species, age and size, along with record of its maintenance history and any enquiries made about it. The system is linked to an electronic mapping system. The **Tree Safety Management Plan** is attached hereto as Annex 1.

Responsible Neighbours’ Guide

Each year the Council receives approximately 2,000 enquiries regarding its trees, the **Responsible Neighbours’ Guide** (the Guide) has been written to clarify the responses the Tree Service will make to a range of enquires commonly made by citizens. It has been prepared within the context of affordability; however, this may change to reflect the annual budget setting process. The Guide helps to provide a consistent response to citizens and will inform Councillors of the usual response that can be expected to typical tree related enquiries. The Guide is attached hereto as Annex 2

An example, of the Council’s response within the Guide to a question of safety is:

“Where the condition of a council-managed tree poses a clear and foreseeable threat to personal safety of residents, visitors or property, Nottingham City Council will act to minimise the risk.

Risk due indirectly to a tree (e.g. slippery leaves on pavements in autumn) will be dealt with only in extraordinary circumstances and when there are no other options.

Pruning will be carried out only if there is good reason to do so.”

SPG: Trees on Development Sites.

First adopted in 1992, this has been updated in 2012 to reflect changes in planning legislation and industry guidance, including British Standard 5837 (2005) Trees in Relation to Construction. This guidance support and assist applicants understand the value of trees on development sites and to achieve a design and construction the helps protect and maintain their health and importance.

5. NOTTINGHAM'S URBAN FOREST AIMS AND PRINCIPLES

Having developed from a function often perceived as a niche, the urban forest is becoming increasingly recognised for its importance as part of the solution for more pressing urban problems. The urban forest therefore should not be an afterthought, but recognised for the role supporting the Council's wider strategic priorities for the City and focus on achieving broader benefits:

- Helping improve peoples' health and well-being
- Aiding climate change adaptation and mitigation
- Supporting urban regeneration
- Reducing noise and visual intrusion
- Lessening the effects of storm water run-off

As well as continuing to provide benefits that have been much longer recognised:

- Improving the appearance (visual amenity)
- Providing a habitat for wildlife.

However, the evidence from the canopy study shows that the urban forest is diminishing in size. Consequently the wider benefits of the urban forest are lessening, leading to increasing costs and pressures on other services and the city's communities.

The aims and principles of Nottingham's Urban Forest Strategy are summarised into its vision:

**“CREATE AN URBAN FOREST THAT IS DESIGNED AND MANAGED
SUSTAINABLY, FOR THE BENEFITS OF NOTTINGHAM'S COMMUNITIES.”**

From records of the Council's tree stock it is considered, since 2007, the City's urban forest canopy cover like many cities has declined. During the term of this strategy (to 2020) the target is to recover canopy cover to the 2007 14.1% to level. New data is anticipated to be available in 2013 which will set the scale of decline. This can then be used to identify areas of greatest decline and prioritise resources.

The longer term target will be to increase canopy cover to 18%; this will provide significant climate change adaptation and mitigation benefits, this should be the vision for the urban forest for year 2021 to 2030.

Breathing Space determined the custodial “One Council” role for the management of the Council's trees and woods to the Parks and Open Space Service (recommendation 1 of **Strategic Service Review**), this is complemented by the functions of City Planning and the council's partners and communities. A single contact point provides greatest efficiency and has been the basis for the formulation and delivery of the Urban Forest Strategy.

Delivery of the vision will require local interpretation and prioritisation, the **Urban Forest Action Plan** (The Plan) will be developed within six months, following the adoption of the UFS, extending to **Ward Actions and Priorities Plan for the Urban Forest**, over the subsequent three years.

Decision making will be based upon assessment of local need, available resources and whole landscape consideration. The Plan will co-ordinate aims and principles, prioritising them within the Council's available resources. The measures of success will enable delivery to be assessed and focussed as necessary.

It is not possible to anticipate every situation therefore it is important that whilst these aims and principles, and subsequent policies will guide decisions; they should not be considered absolutely prescriptive. Each individual case will be assessed on its merits, and occasionally a compromise will need to be sought where the tree in question causes inconvenience to someone whilst being of value in the surrounding area. Individual principles and policies should not be considered in isolation, but all relevant ones should be taken into account when reaching a decision which most closely matches the overarching vision.

Whilst there is more direct control over municipal land like parks, social housing and the roads, the urban forest would be sparse if these were the only places where trees grew. Ultimately the success of maintaining and developing the urban forest depends upon continued support of homeowners, businesses, and volunteers.

Parks and Open Spaces: **Tree Team** and City Planning: **Development Management** will be the primary instruments for delivery, providing the expertise to manage and advise on trees and woods and the main issues which affect them, as well as managing the available resources, with support of many different departments and agencies that have an interest in the benefits of this strategy and can affect its delivery. The Plan will indicate where major contributions are sought from others and where benefits are likely to assist them in their own priorities.

The Urban Forest Strategy will assist the Council in making strategic and sustainable decision on development and growth, economic planning, developing sustainable communities and direct asset management.

Increasing involvement of local communities in addressing these issues will be important, both for decision making, but also for active participation in achieving the vision. Private owners and managers should be encouraged and advised of the wider importance of their trees and woods and be involved in partnerships. Partnerships will greatly assist the Council to identify and secure external funding and sponsorship, and contribute to achieving the aims and objectives of the strategy.

To achieve the vision two aims have evolved, to create Nottingham's urban forest, each with its own guiding principles:

AIM 1: TO DESIGN A SUSTAINABLE URBAN FOREST

AIM 2: TO MANAGE A SUSTAINABLE URBAN FOREST.

Aim 1: To Design a Sustainable Urban Forest

The urban forest is an integral and important part of the infrastructure of a sustainable Nottingham. It should be considered at the most appropriate stages in any development. This will assist in ensuring the urban forest's benefits can be protected and maximised, and ensure that potential problems arising from trees can be minimised through careful design, construction and species retention and selection. This needs to include the environment needed to support the urban forest, allowing sufficient space for the roots and canopies of trees to develop.

Nottingham has targeted to increase the canopy cover of the urban forest to 18% by 2030. In the lifetime of this strategy (to 2020), though, the priority is to reverse the effects recent loss in canopy cover to re-establish 2007's coverage of 14.1%. To understand how the targets are to be achieved and maintained will require knowledge of the urban forest's history and coverage across the city. Further research into the distribution of trees and woods across the city is needed, in particular the recent past (last 30 years) so that losses and gains in the population, its health and demographics can be mapped, from this the priorities for the city and each ward will be planned. The council is rapidly building this detail knowledge of trees and woods on its land, but this needs to be supported by increasing the knowledge of privately owned parts of the urban forest. This would then support a more pro-active approach to the protection of important parts of the urban forest, which in turn will contribute to a more efficient, speedier planning process.

The urban forest is an area of public management where the Council need not tackle the task of managing and improving it alone. Much of the urban forest is in private ownership, ultimately, the success in maintaining it will depend on the continuing support of homeowners, businesses, and volunteers. Partners can be powerful contributors and supporters of the expansion and maintenance of the urban forest. This could be financial and volunteers support of projects or investment to offset some of the environmental impacts that arise in the city.

Much of the damage that occurs to trees and the urban forest occurs out of ignorance. The experience and response to the consultation process demonstrates that citizens are supportive, but lack the knowledge and understanding to make a positive contribution. The Council is the guiding authority in the city, if it expects improvements in the communities then it needs to lead by example.

The Council's behaviour in managing its parts of the urban forest shall be in accordance with good and best practice. When providing advice and guidance, whether this is colleagues, citizens or businesses and developers, it needs to be clear and consistent, giving the user confidence that the Council is doing this for the benefit of the city and its communities. The most common areas have already been addressed in the form of the annexes attached to this strategy. These will be expanded further as and when necessary.

The urban forest lends itself to supporting many of the other growth and development aspirations of a sustainable city, and similarly, the broader goals of the city, set out in the Sustainable Communities Strategy, by mutual re-enforcement.

To achieve the target of increasing the city's urban forest canopy coverage more planting and replacement of trees that have to be removed needs to be at the heart of design decisions. It is also recognised that resources are limited so care must be taken to ensure that trees are not planted that will subsequently be expensive to maintain. The Council has therefore drawn up a checklist in Annex 4 to enable the selection of the Right Tree in the Right Place.

Aim 2: To Manage a Sustainable Urban Forest.

The urban forest, like any other part of the city's infrastructure requires maintenance. By planning that maintenance, and including cost and other resource considerations into the design phase the cost can be managed and evenly spread out. The adoption of this strategy will make this much easier as the target and priorities are clearly identified.

In the past whilst, recognising the importance of trees within the community for their aesthetic value, the urban forest, the service has been managed in order to reduce costs. The movement towards recognising the benefits of the urban forest to the city means the urban forest will be viewed as an area in need of investment and through the better use of its resources it can be recognised for beneficial contributions to the health and wellbeing of the City rather than just the cost of the service. It is recognised that the councils budget will continue to reduce and therefore managing trees across multiple landowners within the city will form a part of the revised business model.

The development of clear management plans will help with budget profiling and planning. It will also assist the Council to continue to successfully apply for external funding to deliver specific projects and supplement its own investment. Further support may be possible through links with national and international projects such as "Trees in Cities". The Council should continue to build partnerships with organisations with similar aspirations and community groups prepared to volunteer to maintain assets such as Nottinghamshire Wildlife Trust and Friends of Colwick Woods. The investment needs to ensure that current resources are used to best possible effect, applying the recommendations in the 2010 service review as this will assist in getting more done within current funding, though this will not be sufficient to meet all the aspirations of this strategy.

The urban forest is a living entity, and therefore can be subject to unpredictable or quickly changing conditions such as the ravages of pest and diseases; as management is carried out so new lessons will be learnt, both requiring a flexible and adaptive approach to management.

As part of this strategy many of the annexes form the Council's management planning structures. Annex 1 is its policy for dealing with its duty of care to manage the low risk posed by trees at a low level. This includes provision for suitably qualified and experienced arboriculturalists, and the resources to carry out necessary remedial works.

Trees in close proximity to citizens' homes and work place provide greatest environmental, social and climate benefits, but also lead to requests to maintain and even to remove them. Annex 2 sets out the approach the Council will take to many of the more common concerns to ensure that it responds as a good neighbour, whilst maintaining the important role of the urban forest to the wider community. In Nottingham, on the shrinkable clay soils, occasionally subsidence occurs, and

can be very stressful to the homeowner therefore the council has adopted a national approach to ensure these are dealt with in as a clear and speedy manner as possible. This is set out in Annex 3.

Managing the health of the urban forest also includes ensuring its protection during work in the vicinity of trees. Annex 5 explains how the Council applies good practice to minimise the potential of such damage.

The Principles of a Sustainable Urban Forest.

Decision making involves many factors, and these are set out below as the principles which will guide the decision making that will enable the city to achieve its vision and target.

PRINCIPLE 1 ENSURE THAT THE TREE AND WOOD POPULATIONS ARE PROTECTED, ENHANCED AND, WHERE APPROPRIATE EXPANDED

- Ensure that the custodial roles of Tree Services and City Planning are clearly defined and communicated.
- Tree Services are consulted by all services, departments and organisations managing Council land to obtain consent before pruning, removing or planting any tree on land in the Council’s stewardship.
- City Planning is consulted when any tree is affected by development, to use planning and development management to secure the benefits to the urban forest.
- Parks and Open Spaces will be consulted on all matters relating to trees and woods in the Council’s stewardship.
- The Council will work to relevant national and regional standards
- The Council will identify and strive to enhance its contributions to tree management with partnership working and external funding
- Ensure City Planning is notified prior to the disposal or transfer of any land, owned or managed by the Council, with trees growing on it.

PRINCIPLE 2 MAINTAIN TREES AND WOODS IN ACCORDANCE WITH LANDOWNERS’ OBLIGATIONS, WITH PARTICULAR ATTENTION FOR THE SAFETY OF PEOPLE AND PROPERTY

- The Tree Service will continue its programme of inspections and management works to ensure the health and safety of trees is maintained and the potential for tree-related damage and nuisance is kept to a reasonable minimum, through the guidance set out in the **“Tree Safety Management Plan”** (Annex 1).
- The Tree Safety Management Plan will be reviewed on a five yearly basis, or sooner if any material changes occur.
- The Tree Service will use tree management software, to map all Council owned trees and record all individual tree attributes. A database of the Council’s tree stock will be monitored to inform the management of the trees.
- The Tree Service will manage its tree stock to minimise the risk of tree-related subsidence.
- The Council will manage and process claims in accordance with the LTOA’s

“Risk Limitation Strategy and the Joint Mitigation Protocol” (Annex 3).

- If a tree on private land is considered to be dangerous and causing a risk or hazard to the public, the Council reserves the right to apply its powers, to serve notice on the owner to remove the tree or make it safe. If remedial work is not satisfactorily undertaken, the Council will make arrangements for the necessary work to be carried out and claim compensation from the owner for the costs incurred

PRINCIPLE 3 **MANAGE TREES AND WOODS IN A MANNER WHICH BENEFITS LOCAL COMMUNITIES, WHILST ENSURING PROBLEMS ARE PROMPTLY AND APPROPRIATELY DEALT WITH.**

- Pruning and maintenance shall be prioritised on the basis of safety risk and available resources.
- The Tree Service will ensure all enquiries are dealt with in a prompt and courteous manner, endeavouring to amicably resolve any dispute.
- The Tree Service will prune trees for the following reasons only:
 - When an inspection has identified visible decay, fungal brackets or other structural defects;
 - To keep the highways infrastructure (e.g. street lights and road signs) clear of obstructions and maintain sightlines for vehicles and pedestrians;
 - To respond to requests from citizens, and colleagues in accordance with the guidance set out in the **“Responsible Neighbours’ Guide”** (Annex 2).
 - When reduction work has been specified in order to remediate a subsidence claim;
 - When the tree has been identified as dead or dying.
- Pollarding will only considered when no alternative method of tree maintenance is viable, and there are sufficient resources to continue the management practice.

PRINCIPLE 4 **ENCOURAGE NEW AND REPLACEMENT TREE AND WOOD PLANTING, USING APPROPRIATE TREE SPECIES**

- The Council will ensure that the location, species selection and planting specification of all new tree planting by the Council is approved by an arboriculturalist prior to implementation.
- The Tree Service will develop a programme of tree planting using appropriate species and specification
- The Tree Service will develop tree planting and establishment specification to be applied to all new trees planted on land in its stewardship.
- The council will secure new tree planting on or near development sites, through the planning process, and mitigate agreed losses through replacement planting.
- When a tree is removed land in the Council’s stewardship two replacements shall be planted, preferably at the same location. If this is not possible the replacements will be planted at a suitable nearby site.
- When planting trees, selection will be based on the principles of **“Nottingham’s Guide to Right Tree, Right Place”** (Annex 4). Where space permits, there will be a presumption in favour of large shade-producing

forest-scale trees with maximum opportunities for mitigating the effects of climate change

- New planting will take into account climate change implications
- The location and species for new tree planting will be selected to minimise the risk of tree-related subsidence, and other structural damage.
- The Tree Service will develop a programme for the replacement of street trees which have been removed, including those in the past but not replaced
- Where highways schemes are programmed, the Council will develop supporting tree planting programmes for the routes.
- To place a priority on the replacement of ageing street tree populations, particularly where these adjoin major traffic routes, planting large growing trees where appropriate.
- The Tree Service will establish an annual dedicated tree planting budget
- During the design phase of new construction and development ensure sufficient space is allowed for trees and their continued healthy growth to maturity.
- When trees are removed to facilitate construction and development replacements at agreed minimum ratio of 1:1 shall be planted. In the case of trees on Council owned and managed land the ratio shall be a minimum of 2:1 (ie two new trees for each one removed).
- Maintain a diverse mix of tree species (no single species, or closely related species shall be more than 10% of the total urban forest)
- Preference to be given to planting native species of local provenance, when the opportunity arises when applying Nottingham's Guide to Right Tree – Right Place criteria.

PRINCIPLE 5

THE REMOVAL OF TREES AND WOODS SHALL BE RESISTED, UNLESS THERE ARE SOUND ARBORICULTURAL OR OTHER REASONS TO INDICATE OTHERWISE.

- The Tree Service will develop a program that meets the expectation of the vision and target, for the removal of inappropriate trees and replacement with more appropriate species over the next twenty years. The species to be considered for removal and replacement will be identified by the Council's tree managers and may include:
 - London Planes planted within narrow streets:
 - Trees with large root stock causing severe damage to pavements;
 - Common Limes planted in narrow streets.
- Trees will not be removed to accommodate new vehicle crossovers unless an exceptional justification can be provided. If a request is for a new crossover, and it is necessary to remove a trees or trees, the applicant will be required to pay for the cost of tree removal and planting of minimum of two suitable replacements, for each tree removed.
Further guidance is available in Annex 2
- The Council will not approve the removal of trees covered by a TPO unless there are sound arboricultural or compelling other reasons. There will be a presumption of replacement planting.

PRINCIPLE 6 **MANAGE ITS WOODS IN A FULLY SUSTAINABLE MANNER.**

- The Parks and Open Space service will develop Woodland Management Plans, that have community involvement as an integral part, for each of its woodlands that accord with the Urban Forest Strategy.
- Planting in woodlands shall be of native species and, where possible, be of local provenance
- Natural regeneration of suitable species will be encouraged
- Seek the development of Woodland Management Plans for privately-owned woodlands and those owned by other public bodies

PRINCIPLE 7 **ALL TREE AND WOODLAND MANAGEMENT DECISIONS WILL TAKE APPROPRIATE ACCOUNT OF CLIMATE CHANGE, AND NATURAL ENVIRONMENT PROTECTION**

- The Tree Service will maintain its trees and woods accordance with the targets and objectives of the Climate Change Adaptation Plan
- The Tree Service will seek to ensure that tree and woodland planting and management makes a positive contributes to biodiversity.
- Examples of trees with dead wood and holes including over-mature and declining trees will be retained in parks, gardens and woodlands to provide a habitat for wildlife (subject to appropriate health and safety inspections)
- Take into account the benefits of the urban forest when considering their its needs
- Actively communicate the benefits of the urban forest to communities, colleagues and businesses.
- Continue to evaluate the benefits of the urban forest.

PRINCIPLE 8 **PROVIDE A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION TO INDUSTRY AND PEER BEST PRACTICE STANDARDS AND ACT AS AN EXAMPLE FOR OTHERS TO FOLLOW.**

- Work will be carried out in most cost effective manner to maintain a healthy and attractive tree stock
- Whenever practicable work and materials will be supplied from sustainable local sources
- The Tree Service will manage and maintain trees and woods to in accordance with good practice, and strive to achieve best practice.
- Whenever possible the Council shall work in accordance with established national guidance and standards,
- When work is carried out the Council and its partners will ensure that all arising are recycled in a responsible manner.
- Work will be carried out in a timely manner, while ensuring that it takes full account of environmental and legal considerations.
- The Tree Service will provide a 24 hour arboricultural service to respond to emergency situations.
- Parks and open spaces are identified as priority areas for planting and maintaining large-maturing trees.
- The Tree Service will promote a programme of recording and interpreting landmark, and veteran trees in the City, including identifying potential future trees and sites for planting of new future landmark trees

PRINCIPLE 9 **RESPOND TO TREE WORK APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**

- The council will make Tree Preservation Orders (TPOs) as necessary, in order to secure the retention of existing trees of amenity value on proposed development sites and other situations as a precautionary measure.
- There will be a presumption against the cutting down, topping, lopping or uprooting of any protected tree. The Council will not give consent to fell a protected tree or woodland unless it is satisfied that this is properly justified. Any such consent may be conditional upon appropriate replacement of the tree.
- The Tree Service will post site notices for all applications to fell protected trees.
- The Council will keep its TPOs under review and update them accordingly.
- Using data from the increased knowledge and understanding of the urban forest, the Council will proactively protect appropriate trees.

PRINCIPLE 10 **RESPOND TO PLANNING APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**

- The urban forest will be considered an integral part of the city's infrastructure, and ensure its inclusion in developments so they can enhance the city's environment.
- The Council will discourage development which it considers makes inadequate provision for the retention of trees and woods
- The Council will ensure that all infrastructure works in proximity to trees are carried out in the most appropriate manner to avoid direct or indirect damage, in accord with national standards.
- The Council will ensure adequate replacement planting on or near to development sites to mitigate agreed tree losses

PRINCIPLE 11 **APPLY RESOURCES IN A CONSIDERED MANNER TO ENSURE GREATEST COMMUNITY BENEFIT AND TO MEET ITS OBLIGATIONS**

- Priority will be given to ensuring that trees are managed in a safe condition, risk to citizens is as low as reasonably practicable
- Wherever practical work will be scheduled in the most cost effective manner. Preference will be given to cyclical management.
- The Tree Service aims to deliver 70% of its tree work under a cyclical programme in preference to *ad hoc* requests for service.
- Actively contribute to and assist in seeking external and capital funding.
- Actively support and encourage community involvement in the care and maintenance of trees and woods
- Seek partners who can support the Council in achieving the Urban Forest Strategy vision, and target.

PRINCIPLE 12

ENCOURAGE AND ENABLE GREATER AWARENESS AND BETTER UNDERSTANDING OF TREE AND WOOD MANAGEMENT, IN ORDER THAT COMMUNITY CONSULTATION AND INVOLVEMENT IS ENCOURAGED.

- The Tree Service will encourage community involvement, endeavouring to consult with adjoining residential properties when large scale work is proposed.
- The Council will seek to consult and involve local communities in new planting proposals
- The Tree Service will publicise its programme for planned tree works on its website and inform community organisations and ward councillors in advance of the works; setting out the type of work to be undertaken and why it is required. The Council will also notify the Highways Authority in advance of carrying out any tree works or excavations within the highway or footway.
- Where practical the Council will place a notice on any tree which is scheduled to be removed ten working days in advance of tree removal and will inform residents adjacent to the tree by letter, unless:
 - The tree has become dangerous and needs to be removed as a matter of urgency;
 - The tree is obviously dead;
 - The tree is part of a wider management scheme that has been publicised elsewhere or
 - placing of a notice is impractical.
- The Tree Service will encourage sponsorship of trees by residents, businesses and community groups with its adopt-a-tree initiative
- All documents produced by the Council as part of the Urban Forest Strategy to be available on a dedicated section of its website. These will include:
 - Urban Forest Strategy
 - Annexes
 - City and Ward Action Plans
- Adding when published Tree and Woodland Management Plans, and new annexes explaining policy.

Measuring and Reporting Achievement.

Implementing the urban forestry strategy will lead to greater activity in the management of trees and woods. Equally it will be an opportunity to increase appreciation and understanding of the importance of trees and woods and the urban forest. To evaluate its impact and decide how to act and revise the priorities the health of the urban forest needs to be monitored. The health should be evaluated on three criteria:

1. Canopy cover
2. Diversity of the tree population
3. Physical condition of the trees and woods

1. Canopy Cover.

Currently there is data for the canopy cover of the city for 2009 and 2012. Ideally two further precedent surveys should be carried out to confirm that the changes identified in the last three years reflect earlier trends. Recommend that two further aerial photo sets are reviewed one earlier in 2000's and one in the mid 1990's.

Moving forward further canopy cover reviews should be carried out and reported in 2015 and 2019 (the exact timing may depend upon future dates aerial photographs of Nottingham take place). Not only will these show the impact of the urban forest strategy now, but also be invaluable in its final review and setting the targets and priorities for the longer term – to 2030.

2. Diversity of the tree population

Over reliance on a small group of tree species, and failing to carry out successional planting will continue to limit the sustainable prospects, and lessen the benefits of the urban forest.

Demographic data will be analysed to ensure:

- The species mix becomes more diverse, with no single species (or group of closely related species), is greater than 10% of the total urban forest population. This will produce recommendations for creating a more diverse tree canopy.
- The age range is more even, showing an annually increasing proportion of young and newly planted trees.

Initially the data will only be available to carry out this study for trees maintained by the Council. Plot sampling should be carried out that elicits similar data for the portions of the urban forest on private land.

3. Physical Condition.

Whilst having a lot of trees making up the urban forest is desirable, but if it is in less than optimal state its benefits to the city will not be maximised.

The Tree Service carries out a survey of its trees on an average rolling three year cycle, as part of the Tree Safety Management Plan. This can be used to collect the data to evaluate any changes in the physical health of the tree population. The data should include changes in the urban forest's condition, particularly where this can link pest and disease outbreaks; be used to monitor the impacts of construction projects in proximity to trees; and also damage by trees to the city's infrastructure.

Health measure 2 and 3 above should report the city wide conclusions to the Breathing Spaces forum on an annual basis. Ward analysis should be reported when the ward is surveyed, and the ward action plan reviewed and revised on a three year cycle. Together analysis of the diversity and physical condition of the urban forest will assist in the prioritisation of resources.

As far as possible, a second tier of outcome indicators will be used, relevant to the strategic aims and the Council's wider objectives and priorities. These will link directly to each of the annexes.

This will provide the data needed to manage the urban forest, and in particular the Council's trees on a day to day basis.

Annex 1 – Tree Safety Management Plan:

- The number of trees in poor condition (target year on year reduction)
- The proportion of the annual budget used to carry out remedial work (target year on year reduction)
- The proportion of tree work carried out in a cyclical programmed basis (target 70%)

Annex 2 – Responsible Neighbour's Guide:

- The number of requests for service visited and responded to within 28 days (target 95%)
- The number of service requests received each year (target year on year reduction, and significant reductions for the areas where cyclical maintenance program has been carried out in previous two years)

Annex 3 – Nottingham's Response to Tree Root Claims:

- The number and value of claims per annum (target manage at current level)

Annex 4 – Nottingham's Guide to Right Tree, Right Place:

- The number of trees planted on council land each year (target to meet the increase in canopy cover)

Annex 5 – SPG, Trees and Development Sites:

- The Tree Service will develop through the Ward Action Plans for the Urban Forest local targets and priorities to ensure the most important trees are retained within new development and provision is made for new planting that addresses local needs.

Annex 6 – City and Ward Action Plans:

- Develop city action plan (target within six months of adoption of the urban forest plan)
- Develop ward action plans (target within three years of adoption of the urban forest plan)

Some of the measures will be quantitative, i.e. counting the numbers of service request or trees pruned or planted, however, experience has found that qualitative measures tend to provide richer data explaining why there is or is not service satisfaction and what actions have been positively received, these measures should be developed in conjunction with the Council's partners, and tree owner sections.

Review of the Strategy

The Urban Forest Strategy is a development of the [1997 Tree Strategy](#). It updates that strategy and reflects the Council's key responsibilities to manage the urban forest, and takes into account the council's own aspirations for its communities. There should be annual reviews of progress to facilitate budgeting and allocation of resources and more detailed review in 2020, when aims and policies could be changed or adjusted. The Breathing Spaces Champions Group will steer this, but regular meetings with the key tree owning services will also be essential.

Urban Forest Strategy Action Plan



The objectives and actions identified within the plan provide the **key focus for the development and management** of the Urban Forest for the next 8 years.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
Protect Enhance and Where Appropriate expand tree and woodland populations	Director SC&P. Head of Parks Service. Planning and Development	Define Tree Services and City Planning's custodial roles.	• Establish a protocol to ensure that Tree Services are consulted by all services, departments and organisations managing Council land, regarding all matters relating to tree and woodland management.	S
			• Establish a protocol to ensure that City Planning is consulted when any tree is affected by development.	S
			• Use planning processes to secure the benefits to the urban forest where possible.	M
	Head of Parks Service. Tree Services Manager <i>Champions Group.</i>	Measure future performance to meet all relevant national and regional standards.	• Parks and Open Spaces Service to establish benchmarks and collate performance information.	S
			• Set both medium and long term targets for improving the tree canopy cover city-wide.	S
	Head of Parks Service.	The Tree Service will obtain contributions to tree management through partnership working and external funding.	• Parks and Open Spaces services will take on the lead role in establishing relevant partnerships.	M
			• Performance will be measured against the number of projects delivered and funded by partner organisations.	M

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
	Director SC&P. Head of Parks Service. Planning and Development	Establish a process to ensure City Planning is notified prior to the disposal or transfer of any land, owned or managed by the Council, with trees growing on it.	<ul style="list-style-type: none"> Establish a cross-departmental protocol regarding the notification of future land disposals. Measure performance through the number of notifications received by Planning Services where trees and woodlands have been considered as part of the decision to dispose of land 	S M
Maintain trees and woodlands in accordance with landowners' obligations, with particular attention for the safety of people and property	Head of Parks Service.	The Tree Service will deliver a programme of inspections and management works to ensure the health and safety of all the councils trees is maintained and the potential for tree-related damage and nuisance is kept to a reasonable minimum, through the guidance set out in the " Tree Safety Management Plan ".	<ul style="list-style-type: none"> Council to adopt the Tree Safety Management Plan as its policy standard. The Tree Safety Management Plan will be reviewed on a five yearly basis, or sooner if any material changes occur. The Tree Service will use tree management software, to map all Council owned trees and record all individual tree attributes. A database of the Council's tree stock will be monitored to inform the management of the trees. 	S M
				S
	Director SC&P. Head of Parks Service. Strategic Finance	The Council will process claims in accordance with the LTOA's. " Risk Limitation Strategy and the Joint Mitigation Protocol ".	<ul style="list-style-type: none"> Council to adopt the Risk Limitation Strategy and the Joint Mitigation Protocol as its policy standard. 	S
	Head of Parks Service. City Homes.	The Tree Service will manage all its tree stock to minimise the risk of tree-related subsidence.	<ul style="list-style-type: none"> Parks and Open Service to implement the outcome of the Tree Services Review. 	S

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
	Head of Parks Service. Head of Legal Services.	The Council will use its powers to ensure that trees are managed on private land where dangerous trees are identified.	<ul style="list-style-type: none"> The Council reserves the right to apply its powers, to serve notice on the owner to remove the tree or make it safe. The number of interventions by the Council will be monitored on an annual basis. The number of interventions by the Council will be monitored on an annual basis. 	<p>S</p> <p>S</p>
Manage trees and woodlands for the benefit of local communities, whilst ensuring problems are promptly and appropriately dealt with.	Head of Parks Service. Locality Managers	The Tree Service will ensure all enquiries are dealt with in a prompt and courteous manner, endeavouring to amicably resolve any dispute.	<ul style="list-style-type: none"> Pruning and maintenance shall be prioritised on the basis of safety risk and available resources. Council to adopt <i>the Responsible Neighbours' Guide</i> which sets out policy criteria relating the Council's response to tree enquiries. 	<p>S</p>
				<p>S</p>
Provide opportunities for new and replacement tree and wood planting, using appropriate tree species	Head of Parks Service. Horticultural Service Manager	The Council will ensure that the location, species selection and planting specifications of all new tree planting by the Council is approved by an arboriculturalist prior to implementation.	<ul style="list-style-type: none"> Establish a protocol to ensure that Tree Services are consulted by all service, departments and organisations managing Council land in all matters concerning the planting of trees. 	<p>S</p>

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
	Head of Parks Services. Tree Services Manager.	The Tree Service will formulate a programme of tree planting using appropriate species and specification	<ul style="list-style-type: none"> • Parks and Open Spaces Service to produce a city-wide programme of tree planting which focuses on areas where tree canopy cover is thinnest. • The Council adopt the guide: Right Tree, Right Place. 	<p>M</p> <p>S</p>
	Head of Parks Services. Tree Services Manager and Landscape Architect	The Tree Service will develop tree planting and establishment specification to be applied to all new trees planted on land in its stewardship.	<ul style="list-style-type: none"> • The Parks and Open Spaces service to investigate alternative approaches to specifications such as the Stockholm system. 	<p>M</p>
	Head of Parks Services. Planning and Development. Tree Services Manager	The Tree and Planning Services will secure new tree planting on or near development sites, through the planning process, and mitigate agreed losses through replacement planting.	<ul style="list-style-type: none"> • Develop and implement the required process within Planning Services to ensure that tree planting is maximised on development sites • Two replacements shall be planted, preferably at the same or nearest suitable location for each tree lost. • Monitor tree losses and gains through the planning process and review annually. 	<p>M</p> <p>M</p> <p>M</p>
	Head of Parks Services. Head of City Services. Strategic Finance	The Tree Service will develop a programme for the replacement of street trees which have been removed, including those in the past but not replaced.	<ul style="list-style-type: none"> • Develop a joined-up approach to the development of programmes for the replacement of street trees. • To develop a long term plan for the replacement of ageing street tree populations, particularly where these adjoin major traffic routes, planting large growing trees where appropriate. • The Tree Service will identify reserves and set out an annual dedicated tree planting budget 	<p>M</p> <p>M</p> <p>M</p>

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
	Tree Services Manager	Maintain a diverse mix of tree species (no single species, or closely related species shall be more than 10% of the total urban forest)	<ul style="list-style-type: none"> To monitor the selection of tree species to ensure diversity of species is achieved long term. 	M
Resist the removal of trees and woodlands unless there are sound arboricultural or other reasons for removal.	Head of Parks Services. Tree Services Manager. Locality Managers. Highways Manager	The Tree Service will develop a program for the removal of inappropriate trees and replacement with more appropriate species over the next twenty years.	<ul style="list-style-type: none"> Work with the service and other departments to formulate a plan to tackle overly mature trees forest trees in urban situations. The plan will identify action to deal with London Planes planted within narrow streets, trees with large root stocks causing severe damage to pavements and Lime trees planted in narrow streets. 	M
	Planning and Development.	The Council will not approve the removal of trees covered by a TPO unless sound arboricultural or other safety or significant regeneration reasons indicate otherwise.	<ul style="list-style-type: none"> Planning Officers to maintain the current position relating to trees covered by a Tree Preservation Order. Establish a presumption to encourage replacement planting. 	S S

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
Manage its woods in a fully sustainable manner.	Parks Development Manager. Tree Services Manager	The Parks and Opens Spaces Team will develop Woodland Management Plans, that have community involvement as an integral part, for each of its woodlands that accord with the Urban Forest Strategy.	<ul style="list-style-type: none"> • Develop woodland management plans. • Seek the development of Woodland Management Plans for privately-owned woodlands and those owned by other public bodies. 	M
				M
All tree and woodland management decisions will take appropriate account of climate change, and natural environment protection	Head of Parks Services. Tree Services Manager	The Tree Service will maintain the City trees and woods accordance with the targets and objectives of the Climate Change Adaptation Plan	<ul style="list-style-type: none"> • Establish protocols to ensure that decisions reflect the Climate Change Adaption Plan. • Instigate service to training to improve the understanding of the Council's climate change agenda. • Monitor progress. 	S
				S
				M
	Biodiversity and Green Space Policy Officer	The Council will seek to ensure that tree and woodland planting and management makes a positive contributes to biodiversity.	<ul style="list-style-type: none"> • Monitor to ensure compliance with the Council's Biodiversity Position Statement. 	M
	Tree Services Officer. Marketing Team	Actively communicate the benefits of the urban forest to communities, colleagues and businesses.	<ul style="list-style-type: none"> • Develop communication plans to promote the urban forest both internally and externally. 	S

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
Provide a sustainable and high quality tree and wood population that represent Best Practice.	Horticultural Service Manager. Tree Services Manager	To implement the findings of the review of Tree Services.	<ul style="list-style-type: none"> • Monitor outputs to ensure that work is carried out in most cost effective manner. • Ensure work and materials are supplied from sustainable and local sources 	S
				M
	Horticultural Service Manager. Tree Services Manager	The Council will manage and maintain trees and woods to in accordance with good practice.	<ul style="list-style-type: none"> • Ensure all work is undertaken in accordance with established national guidance and standards. • Monitor service outputs against established benchmarks. • Maximise opportunities for recycling. 	M
				M
				S
	Head of Parks Services. horticultural Service Manager	The Tree Service will provide a 24 hour arboricultural service to respond to emergency situations.	<ul style="list-style-type: none"> • Undertake review in accordance with the recommendations of the Tree Services Review. 	S
	Head of Parks Services.	The Tree Service will record and interpret landmark and veteran trees in the City.	<ul style="list-style-type: none"> • Develop a programme to identify landmark and veteran trees. • Identify plans to secure the future of these trees. 	M
				M
Maintain a sustainable and high quality tree and wood population.	Tree Officer Planning Services	The council make Tree Preservation Orders (TPOs) in order to secure the retention of existing trees of amenity value on proposed. Development sites and other locations.	<ul style="list-style-type: none"> • The Council will keep its TPOs under review and update them accordingly. 	M

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
	Head of Parks Services. Champions Group.	Use an increased knowledge and understanding of the urban forest, the Council will proactively protect appropriate trees.	<ul style="list-style-type: none"> • Champions Group to undertake an annual review of the Urban Forest Strategy and this Action Plan. 	S
Apply resources in a considered manner to ensure greatest community benefit and to meet its obligations	Tree Services Manager	Priority will be given to ensuring that trees are managed in a safe condition	<ul style="list-style-type: none"> • Implement the principles of the <i>Tree Safety Management Plan</i>. 	S
			<ul style="list-style-type: none"> • Ensure that the Council delivers 70% of its tree work under a cyclical programme. 	M
	Head of Parks Services. Area Committees	Produce area based action plans	<ul style="list-style-type: none"> • To request Area Committees to identify key priorities for the Urban Forest at a local level. 	M
	Head of Parks Services. Locality Managers. Trees Services Manager	Actively support and encourage community involvement in the care and maintenance of trees and woods	<ul style="list-style-type: none"> • Identify specific initiatives to encourage community participation. 	M
			<ul style="list-style-type: none"> • Consult with residents when large scale works are proposed. 	S

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

ACTION PLAN				
Outcomes	Lead and Key Partners	Outputs	Actions	Timescale
Encourage and enable greater awareness and better understanding of tree and wood management, in order that community consultation and involvement is encouraged.	Tree Services Manager. Parks Development Manager	The Tree Service will publicise its programme for planned tree works.	<ul style="list-style-type: none"> • Provide information on the Parks and Open Spaces website. • Introduce a process for notifying organisation and ward councillors in advance of works 	S
				S
	Head of Parks Services.	The Parks and Open Spaces Team will encourage sponsorship of trees by residents, businesses and community groups with its adopt-a-tree initiative	<ul style="list-style-type: none"> • Parks and Open space service to prepare proposals to potential sponsors. • Design and implement promotional initiatives to secure sponsorship. • Monitor performance on the basis of (£s) secured. 	S
				S
				S
	Tree Services Manager.	Promote the Urban Forest Strategy.	<ul style="list-style-type: none"> • All documents produced by the Council as part of the Urban Forest Strategy to be available on a dedicated section of its website. • Published Tree and Woodland Management Plans, and new annexes explaining policy. 	S
				M

KEY S - Short Term (1-2 yrs). M - Medium Term (2-4yrs). L - Long Term (4+yrs)

Urban Forest Strategy 2012 to 2020: Creating an urban forest that is managed sustainably for the benefit of Nottingham communities.

7. ABBREVIATIONS AND BIBLIOGRAPHY

Abbreviations

BSI	British Standards Institute
CABE	Commission for Architecture and the Built Environment
CCTV	Closed-circuit television
DCLG	Department for Communities and Local Government
DfT	Department for Transport
FAO	Food and Agriculture Organization of the United Nations
FC	Forestry Commission
GDP	Gross Domestic Product
HSE	Health and Safety Executive
ISA	International Society of Arboriculture
LAPP	Land and Planning Policies
LTOA	London Tree Officers' Association
NJUG	National Joint Utility Group
NPPF	National Planning Policy Framework
NTSG	National Tree Safety Group
ODPM	Office of the Deputy Prime Minister
POST	Parliamentary Office of Science and Technology
SCS	Sustainable Communities Strategy
SWOT	Strength, Weakness, Opportunity, Threat
TDAG	Trees and Design Action Group
the Guide	Responsible Neighbours' Guide
TPO	Tree Preservation Order
TT2	Trees in Towns 2
UFS	Urban Forest Strategy
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
UV	Ultra-violet

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APPENDIX 1: SUMMARY OF AIMS AND PRINCIPLES.

The aims and principles of Nottingham's Urban Forest Strategy are summarised into its vision:

“CREATE AN URBAN FOREST THAT IS DESIGNED AND MANAGED SUSTAINABLY, FOR THE BENEFITS OF NOTTINGHAM'S COMMUNITIES.”

To achieve the vision two aims have evolved, to create Nottingham's urban forest, each with its own guiding principles:

- **AIM 1: TO DESIGN A SUSTAINABLE URBAN FOREST**
- **AIM 2: TO MANAGE A SUSTAINABLE URBAN FOREST.**

Decision making involves many factors, which sometimes can appear contradictory. These are set out below as the principles which will guide the decision making that will enable the city to achieve its vision and target.

- **PRINCIPLE 1: ENSURE THAT THE TREE AND WOOD POPULATIONS ARE PROTECTED, ENHANCED AND, WHERE APPROPRIATE EXPANDED**
- **PRINCIPLE 2: MAINTAIN TREES AND WOODS IN ACCORDANCE WITH LANDOWNERS OBLIGATIONS, WITH PARTICULAR ATTENTION FOR THE SAFETY OF PEOPLE AND PROPERTY**
- **PRINCIPLE 3: MANAGE TREES AND WOODS IN A MANNER WHICH BENEFITS LOCAL COMMUNITIES, WHILST ENSURING PROBLEMS ARE PROMPTLY AND APPROPRIATELY DEALT WITH.**
- **PRINCIPLE 4: ENCOURAGE NEW AND REPLACEMENT TREE AND WOOD PLANTING, USING APPROPRIATE TREE SPECIES**
- **PRINCIPLE 5: THE REMOVAL OF TREES AND WOODS SHALL BE RESISTED, UNLESS THERE ARE SOUND ARBORICULTURAL OR OTHER REASONS TO INDICATE OTHERWISE.**
- **PRINCIPLE 6: MANAGE ITS WOODS IN A FULLY SUSTAINABLE MANNER.**
- **PRINCIPLE 7: ALL TREE AND WOODLAND MANAGEMENT DECISIONS WILL TAKE APPROPRIATE ACCOUNT OF CLIMATE CHANGE, AND NATURAL ENVIRONMENT PROTECTION**
- **PRINCIPLE 8: PROVIDE A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION TO INDUSTRY AND PEER BEST PRACTICE STANDARDS AND ACT AS AN EXAMPLE FOR OTHERS TO FOLLOW.**
- **PRINCIPLE 9: RESPOND TO TREE WORK APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
- **PRINCIPLE 10: RESPOND TO PLANNING APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
- **PRINCIPLE 11: APPLY RESOURCES IN A CONSIDERED MANNER TO ENSURE GREATEST COMMUNITY BENEFIT AND TO MEET ITS OBLIGATIONS**
- **PRINCIPLE 12: ENCOURAGE AND ENABLE GREATER AWARENESS AND BETTER UNDERSTANDING OF TREE AND WOOD MANAGEMENT, IN ORDER THAT COMMUNITY CONSULTATION AND INVOLVEMENT IS ENCOURAGED.**

**Urban
Forest
Strategy**

Tree Safety Management Plan

**Annex 1
October 2012**





Tree Safety Management Plan

The code of practice, and delivery plan for the sustainable safety management of trees and woods owned or maintained by Nottingham City Council.

January 2009 (updated October 2012)



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CONTENTS.

Executive Summary	ii
1. Introduction	1
1.1 Risk from Trees.....	2
1.2 Benefits of Trees.....	2
1.3 Background.....	5
2. Current Tree Management	11
3. Managing Risk	12
3.1 Control Measures.....	12
3.2 Zonal Risk Assessment	12
3.3 Identification of Hazards	13
3.4 Quantifying the Risk.....	13
3.5 Prescribing Remediation.....	15
4. Tree Inspection	17
4.1 Competency.....	17
4.2 Methods of Inspection.....	18
4.3 Further Investigation	19
4.4 Inspection Methodology	20
5. Record and Review	22
5.1 Recording Inspections	22
5.2 Reviewing Tree Inspections.....	23
5.3 Amending Frequency of Inspection	23
5.4 Plan Review	23
6. Delivery Plan	24
6.1 Timescale.....	24
6.2 Resources.....	24
6.3 Actions and Measures	24
7. Other Considerations	26
7.1 Trees on Neighbouring Land	26
7.2 Trees and Wildlife	26
7.3 Protected Trees	26
7.4 Protecting Trees during Development	27
7.5 Design and Planting.....	27
7.6 Adoption of Trees.....	27
7.7 Recording and Responding to Enquiries	28
7.8 Integration with Other Works	28
8. References	29
A. Appendices	31
A1. Target Zoning.....	31
A2. Methodology of Risk Assessment Quantification.....	33
A3.1. Professional Tree Inspection and Survey Process (simplified).....	35
A3.2. Site Observer Inspection and Survey Process (simplified)	35
A4. Glossary of Terms and Abbreviations.....	36
A5: Summary of Aims and Principles	38

EXECUTIVE SUMMARY.

The risks posed by trees to people and property have been understood and reported for many years. Trees are subject to the obligations of statutory law and re-affirmed by tort; and in recent years though the reporting has become more urgent with incidents of fatalities and claims of negligence not reducing, and owners of large stocks of trees continuing to fail to meet their obligations.

The legislation and guidance has assisted in clarifying the duties of a reasonable and responsible tree owner, in legal cases, best practice and codes of practice. In 2007 the HSE published ***Management of the risk from falling trees*** (SIM 01/2007/05) regarding the investigation and its expectations with regarding its expectations as to what is a reasonable and proportionate approach to tree management.

A critical review of Nottingham City Council's tree management has been carried out. At present the Council does not have a system to manage these obligations due to inadequate resources. Comparison to its nearest neighbours (other core and East Midland cities) also revealed it is not responding appropriately to the risk, and is the poorest performer in all aspects.

This plan sets out to resolve these weaknesses by delivery of a prioritised risk assessment and management system. The requirement is to have a suitable and sufficient cyclical system of inspection and remediation, to manage risk as far as reasonably practicable.

The approach herein is to apply a quantifiable system of tree risk assessment. The decision making process is based upon a structured system of inspections with responsibilities defined and shared between the site managers and Council's arboriculturalists. This provides a cycle of inspection, based upon the trees location and condition, formulated to align resources with greatest need and make the system simple to deliver and maintain, whilst being sufficiently robust to meet the Council's duties.

The application of the quantified approach means the individual risk rating of a tree can be ranked, and remediation prioritised, again, ensuring resources are utilised in accordance with greatest need and benefit.

Accurate records will be maintained as part of the duty of care. It is recognised that the existing system needs to be improved. Consequently delivery will be by a rolling, cross-cutting program over three to five years starting from four loci and spreading out across every area of Nottingham City Council's corporate responsibility.

Achievement of this is dependent upon the resources available. However the Tree Service will seek to annually secure resources to carry out the risk assessment, maintain the records and undertake the priority remediation as an ongoing cycle of management. Throughout the delivery the approach and success will be scrutinised, reviewed, and if necessary reported and revised

1. INTRODUCTION.

This plan outlines the system of safety inspections used by Nottingham City Council in its duty to take reasonable care to identify possible sources of foreseeable danger posed by all council managed trees and to remove those dangers as far as reasonably practicable. The plan also covers action and process identified by remedial works.

The **Tree Safety Management Plan** forms an integral part of the Council's **Urban Forest Strategy** and shall be applied in accordance with the strategy's aims and principles. The vision for Nottingham's urban forest is:

“Create an urban forest that is designed and sustainably managed for the benefits of Nottingham's communities.”

To achieve this, the city has set the target of increasing the urban forests canopy cover from its current level of 14% to 18% by 2030. To delivery this 12 principles (core policies) have been adopted. The Tree Safety Management Plan is part of the Council's response to Principle 2 in particular, though all 12 are relevant in any consultation and decision making:

“Maintain trees and woods in accordance with landowners obligations, with particular attention for the safety of people and property.

The aims and principles of the Urban forest strategy are shown in appendix 5.

The management of the safety of trees is required to be an integral part of landowners' and occupiers' undertakings, under a duty of care as part of health and safety law. However, legislation requires wider social and environmental benefits be taken into account. The objectives of this Tree Safety Management Plan are to:

- Meet legal obligations.
- Manage the increasing expectation and importance of trees in the urban environment.
- Promote a responsible attitude to the risk posed by trees.
- Control the risks posed to people who work with trees, or maybe close to them.
- Avoid unnecessary removal, or disfigurement of amenity trees, or trees of high wildlife value.

This plan is part of the Council's Urban Forestry Strategy folio of documents, and is integral to the sustainable management of trees and woods, owned and, or managed by the council. Throughout this plan, trees should be taken to include, groups of trees in their many and various forms including, but not limited to such features as avenues and woodland.

Following a brief legal background, the plan then advises on the adopted process for managing risk, explaining the zonal approach to identifying hazards and remediation. The roles of the inspectors and site managers are explained, along with the method to record and review the process.

The successful delivery of this plan will be dependent upon the resources available and the clear understanding of those affected as to their roles and how they can contribute to its delivery. Every effort has been made to make this plan as practical as possible, with considerable focus upon ensuring it does not become more onerous on site managers than necessary.

1.1 Risk from Trees.

Whilst it is not practical to completely eliminate danger, there is a requirement that the owner takes all reasonable care to identify possible sources of foreseeable danger and to remove them ***as far as reasonably practicable***.

Doing what is reasonably practicable does not mean that all trees have to be individually examined on a regular basis, however a reasoned decision has to be taken as to what is reasonable, and will include consideration of the risk to which people or property may be exposed.

Each year between five and six people in the UK are killed when trees fall on them. Thus the risk is low; the risk of being struck and killed in a public space is even lower. Up to three people are killed each year by trees in public spaces, as almost the entire population of the UK is exposed, the risk is about one in 20 million. However the low level of risk may not be perceived in this way by the public and courts, particularly when the cost of maintenance of individual trees is so low. The level of tolerance of risk is already proving fickle with increasing numbers of dissatisfied and concerned customers. The 2000 plus enquiries received by the Council each frequently start with *"I like trees but....."*. The lack of management is turning affection for trees into fear.

Additionally insurers appear to mirror societal concern, and are conscious of the increasing costs of awards for damages to persons and property, and becoming less tolerant of landowners who lack clear systems of tree management. This is exacerbated by climate change impacts and the predicted increase in weather incidents that will damage trees, particularly with more strong winds.

However low the risk, if there is a tree failure, the Council must be able to demonstrate it has a system in place, from a legal and moral perspective, that shows risk is controlled as far as reasonably practicable. This plan will deliver this in a "one council" approach.

1.2 Benefits of Trees

It is easy to overlook the many benefits from trees, particularly when the immediate concern may be the condition of a tree and its potential impact on nearby people and property.

Council manages in excess of 100,000 individual trees, along with over 150 hectares of woods. These trees are sited in places where they can have greatest benefit and impact on the local environment, however, this brings people into close proximity to trees in the urban area on a regular basis, so there is a need to ensure that the environment is managed appropriately and sustainably.

Trees have long been held a valued place in the urban environment, though, as greater pressure is being exerted on using urban land, space available to trees is becoming more limited. Early planting in the city would have been to improve the visual landscape, disguise some of the uglier parts of a busy industrious city. The city's forebears recognised the restorative value of trees, and their benefits to people's well-being. Since then research has been able to substantiate, the observations of these early visionaries, as well as many other, important benefits of trees in a modern urban environment.

The urban forest helps to define the character of Nottingham just as much as the architecture and fabric of particular communities will, for example the London planes in the Boulevards, the Park Estate and Mapperley Park. Now recognised for their breadth of benefits, trees in the urban environment continue to be relevant and an important component of a sustainable city. Though it is also recognised that care and maintenance is needed if trees are to fulfil their role without becoming a nuisance to neighbours, or a potential hazard

Trees and People

- Beautiful in their own right, providing colour and form to the landscape, also helping to mark the change of seasons.
- Create more pleasant environments, which have positive effects on people's behaviour, bringing about stronger and more stable communities
- For recreation, the urban forest, offers benefits to children, allowing creativity of mind, encourages exploration and adventure, promotes physical activity, builds resilience and enhances experiential learning.

Health Benefits of Trees

- Positive effects on people's wellbeing and can encourage hospital patient recoveries, reducing the amount of time spent in hospital.
- Tree and woods are now promoted as "nature's health service". The restorative effects are greatest for those who actively interact in the natural environment, but even just viewing trees and nature through window can have psychological benefits.
- The canopy formed by trees has indirect human health benefits, their shade during hot summer days to a reduce heat related illnesses.

Trees and Noise

- Often it is not possible to provide effective barriers to noise, in these instances trees may be able to provide a visual screen between the source of noise and hearer. Whilst the sound reduction is negligible the lack of direct view creates the impression of greater noise reduction.

Trees and Urban Regeneration

- Trees help improve the environmental performance of buildings – increasing tree cover in a well planned development can lower heating and cooling costs by 20%

-
- Tree canopies and root systems play a key role in mitigating flood levels during extreme events and have the ability to lower storm water flows into the existing drainage infrastructure and so reducing the risk of damage
 - Tourism and city marketing can be boosted by a good quality urban forest as recognised by “Green Flag” awards. Green Flag urban parks can be marketed as city attractions and will provide attractive settings for various events and activities which will boost the local economy.
 - Tree planting in streets has been shown to directly enhance and improve the neighbourhood aesthetics and may increase property values by 7 – 15%

Effects of Climate Change

Climate change is now recognised as one of the most serious challenges facing us today and its potential impacts for trees and forests are well documented. The UK climate change scenarios indicate average annual temperature increases could be 4.5°C by 2080. However, these scenarios do not take urban surfaces into account, which have the potential to further increase these predicted temperatures due to the urban heat island effect.

- the urban forest helps to mitigate the Urban Heat Island effect by; transpiration (helping to reduce day and night-time temperatures in cities, especially during summer), canopy shade (canopies provide shade for buildings, streets and footpaths and reflection (leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day).
- During photosynthesis trees convert carbon dioxide and water into sugar and oxygen and then sequester (store) the carbon, making a significant contribution toward absorbing carbon from the atmosphere, and emit the oxygen we all breath.
- The urban forest helps urban areas adapt to the impact of climatic change regardless of whether they are in parks, private gardens or street trees, but the space, size, quality and vegetation type and proportion of coverage all influence the level of impact. Open space within towns and cities, rather than as a green belt, might be more effective in helping adaptation.
- Atmospheric particulates (emissions from industry and vehicles have been linked to increased incidences of illness in people (eg asthma and allergies). Trees have an important role in combating (mitigating) these effects. Some are absorbed and used as part of the trees growth processes, other, larger particulates are filtered from the atmosphere by attaching themselves to leaves. The closer trees (and greater their canopy) are to the sources of pollution the greater their contribution and benefits.

Trees and Storm Water

Urbanization changes many attributes of the land that is developed and built upon. One of these is a reduction in the permeability of surfaces leading to changes in patterns of runoff and increased loads of pollutants entering water courses.

-
- tree canopies and root systems reduce storm water flows and nutrient loads that might otherwise end up in our waterways. Broad canopies intercept and mitigate the impact of heavy rainfalls and healthy, fibrous, tree roots help reduce the nitrogen, phosphorus and heavy metal content in storm water.

Trees and the Natural Environment

- A healthy and sustainable urban forest will increase biodiversity in the city, becoming a home or roost to a wide range of species; even endangered animals and other biological species of high conservation value.
- All trees support a range of other wildlife which either feeds directly on the tree itself, or indirectly on something else which is feeding on the tree, even the smallest sapling

To provide these benefits, trees need space to grow and to be properly cared for. This plan will provide the council with the basis for a cyclical program of assessment, resulting in the scheduling of essential maintenance works, to provide a sustainable stock of trees and woods

1.3 Background

The plan constitutes Nottingham City Council's response to the publication of the Health and Safety Executive's (HSE) Sector Information Minute ***Management of the risk from falling trees*** (SIM 01/2007/05), and its broader responsibilities regarding trees, people and property.

Trees have been subject to dispute and legal recourse for many centuries, as a consequence there is a great deal of legislation and case law affecting trees which realistically, cannot all be reported herein. This, and the recognised level of risk posed by trees and tree management, has resulted in a highly regulated and frequently scrutinised industry.

Where the occupier fails to meet the requirements of their duty of care which subsequently results in harm or damage to persons, animals, or property and is deemed reasonably foreseeable, it is likely to be construed as negligence. This may be either by their action (eg. Using a person without sufficient skill to survey trees, incompetent pruning, or destabilising a tree by root severance) or omission (eg. failure to inspect on a reasonable basis or failure to carry out remedial actions).

"The person responsible for a tree is expected to take reasonable care to avoid acts or omissions, which could reasonably be foreseen to be likely to cause harm. This person is deemed to be whom ever has sufficient control over the land to appreciate the extent of any dangers and to take any actions."

(Mynors, 2002:25)

Employers as part of their carrying out of undertakings, or control of premises, including public spaces, have a duty of care under the Health and Safety at Work etc Act 1974 (The Act). In particular there is a duty to do what is reasonably practicable to ensure that they and other people are not exposed to risk. Section 3 of The Act confirms that an employer cannot pass on their legal duty by way of a contract to third parties.

The Management of Health and Safety at Work Regulations 1999 (MHSWR) require a risk assessment to be carried out to identify the nature and level of the risks associated with the works and associated operations. Regulation 3.1 states:

- “1. Every employer shall make a suitable and sufficient assessment of:*
- a. the risks to the health and safety of his employees to which they are exposed whilst they are at work; and*
 - b. the risks to the health and safety of persons not in his employment arising out or in connection with the conduct by him of his undertakings.”*

(Cited in Health and Safety Executive 2000:4)

MHSWR affects all parts of the tree management process, though in the context of this plan most particularly the undertaking of regular tree inspection and completing the necessary remediation.

The duty of care owed to visitors to land is covered under *“The Occupiers Liability Act 1957”*. The occupier owes a duty to all visitors to ensure that their visit is reasonably safe. Trespassers are protected under *“The Occupiers Liability Act 1984”*, from risks the occupier is aware of. Consideration, therefore, is needed to be given to any known risks and the actions necessary to reduce or remove them.

Other legislation requiring positive action in response to health and safety concerns includes the Highways Act 1981. The Government has, for at least three decades, published advice on the inspection and care of trees:

*“The Secretaries of State wish to draw your Council’s attention **once again** to the need for regular inspection of roadside trees in order that any considered to be a danger to road users can be made safe or felled.”*

(DOE, 1973:2)

“Trees growing within the highway are a most important amenity feature.....but can also present very real danger to persons using the highway.....they should be examined regularly.”

(DOE, 1975:1)

In England the local authority is also responsible for ensuring trees within falling distance of the highway, including those outside its ownership, and direct control do not endanger the highway and its users. Collectively street trees and trees within these wider duties are classed as “highway trees”. Recommendations in ***Well-maintained Highways***, code of practice include R9.3:

Highway safety inspections should include highway trees Inspectors [highway inspectors] should take note of any encroachment or visible obstruction and any obvious damage, a separate programme of tree inspections should be undertaken by arboricultural advisors. Authorities should include some basic arboricultural guidance in training for highway inspectors.”

(Roads Liaison Group, 2005:119)

To achieve this the local authority is expected to establish effective inspection, assessment and recording processes, the Roads Liaison Group's calling this "*a crucial component of highway maintenance*", to support any defence for negligence or questioning of competence, as to whether the authority "*knew, or could reasonably be expected to know, that the condition of the part of the highway to which the action relates was likely to cause danger to users of the highway*".

Statute law has been reinforced, clarified and extended through legal precedence in common law. Precedence from neighbour conflict date back to the 1790's and is still relevant, however it is some more recent cases which are particularly germane. In Chapman – v – Barking and Dagenham LBC (1997) there was a clear failure to inspect. Judge Viscount Colville of Culross QC stated:

"I am satisfied that, despite all encouragement and advice both from external sources and to some extent from their own officers, the defendant council did not at any relevant time appreciate the distinction between making lists of trees and routine maintenance, as opposed to systematic expert inspection as often as would be reasonably required. I find that no such inspections were ever made, that it was a clear duty on the defendants to make them, and that they have failed in that duty."

(Cited in Mynors, 2002:150)

This case affirmed the owner's duty to inspect trees, and in the case of trees on the highway that three years was too long an inspection, and this needs to be *systematic expert inspection*. It also clarified that trees next to public highway, and arguably by virtue of ownership all trees in the public realm, their inspection was not discretionary.

The need to use a suitably trained, experienced and/or qualified tree inspector was at the core of Poll – v – Bartholomew and Bartholomew (2006) when the claimant successfully sued the landowners for negligence. This also recognised that there are varying levels of skill in inspectors and it is the employers' duty to ensure that they employ and take regard to the appropriate level, re-asserted in Atkin – v – Scott (2008).

Edwards – v – National Coal Board (1949) provided a general precedence of what is **reasonably practical**. Lord Justice Asquith in his summing up narrowed the interpretation of this to:

"'Reasonably practicable' is a narrower term than 'physically possible' ... a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that, if it be shown that there is a gross disproportion between them – the risk being insignificant in relation to the sacrifice – the defendants discharge the onus on them."

(LJ Asquith, cited on hse.gov.uk)

This connotes that negligence would not be considered in terms of the overall cost but attributed to the cost of mitigating the immediate incident. Whilst the overall survey may appear a significant investment, the cost per tree is negligible.

In 1999, a tree failed in Birmingham, killing three passer-bys, the Council was successfully prosecuted for their failure to comply with Health and Safety at Work etc Act 1974, Section 3, Sub Section 1 (Crown – v – Birmingham City Council, 2002). An Improvement Notice was served, as part of the proceedings, requiring the Council to improve its systems to provide suitable and sufficient routine inspection, including **identifying all trees and woodland, procure competent advisors as necessary, and carry out and record necessary remedial actions**. Other incidents have resulted in similar Improvement Notices and requirements.

Harry Bowen & Others -v- The National Trust [2011] (Felbrigg Hall)

A falling branch killed a child and seriously injured three others. The Court held that the work the National Trust had been doing to assess the risk posed by the trees on its property was sufficiently robust to discharge their duty of care, both under the 1957 Occupiers' Liability Act and the common law duty in negligence.

At the time of the accident these trees had been reviewed and zoned into three risk categories (this has since increased to five). The categories were determined by assessing how many people passed a particular tree, the tree in question was deemed a "mid-risk" tree, and had been inspected by qualified professionals twice in the six months prior to the accident.

Whilst the claimants asserted that those carrying out the inspection of the tree should have recognised the risk that the branch was likely to fall, the Court ruled that, given the location of the tree, the visual inspections carried out were adequate and completed with sufficient care and attention by appropriately qualified personnel. It was deemed relevant that the tree was in the mid-risk category and that the growth on the tree which may have suggested it was diseased was not easily visible from the ground nor necessarily indicative that the branch would fall. The judgment emphasised the many steps taken by the National Trust to categorise the trees and to ensure they were inspected by specifically trained members of staff.

Micklewright v Surrey County Council [2007]

In August 2007, a man was struck by a large branch of an oak tree, which fell onto him whilst he was unloading bicycles from his car in a parking bay in Virginia Water, Surrey. He died several days later from his injuries.

It was found that the branch had a fungal infection which may have contributed to the failure, but was unlikely to have been the sole cause. The judge found that the defendant did not have an adequate system of inspection at the time, largely because there was little by way of an inspection process prior to 2004. Following a fatal tree-related accident in school grounds in Ashted in 2003, HSE had served an Improvement Notice on Surrey

County Council to address deficiencies in their tree safety management procedures (this was complied with).

The key issue was whether an adequate inspection scheme would have detected any defect in the branch such that remedial work could have prevented the accident. On the available evidence, the judge found that the claimant had failed to establish this, and on the balance of probabilities the accident was unforeseeable.

In October 2010 Court of Appeal judgment upheld the original decision and damages of £500,000 agreed.

From these two cases, it is apparent that the responsibilities for the management of trees in public places have to be carefully considered, and a suitable system be in place for inspection, remedial work and record keeping. Staff with responsibilities for tree inspection and decisions on remedial work should be trained and competent. It is important that any system also considers the benefits from trees and takes a proportionate approach to tree safety management, balancing risks with benefits. This is the key to achieving a defensible rather than defensive approach to managing trees.

More guidance on this was published by the National Tree Safety Group (NTSG) in January 2012. The NTSG is made up of landowners and organisations with an interest in tree risk management. It considers and promotes evaluation of what is reasonable should be based upon a balance between benefit and risk. This evaluation can be undertaken only in a local context, since trees provide many different types of benefit in a range of different circumstances.

The NTSG position is underpinned by five key principles:

- trees provide a wide variety of benefits to society
- trees are living organisms that naturally lose branches or fall
- the overall risk to human safety is extremely low
- tree owners have a legal duty of care
- tree owners should take a balanced and proportionate approach to tree safety management.

Managing the risk from trees is the responsibility of the owners and managers of the land on which they grow. In conclusion they stated on their website:

“Safety management should not be considered in isolation. It should be considered only as part of an integrated management plan that focuses on the wider management of the trees within a particular setting.”

(NTSG 2012 accessed 14/09/2012)

One of the individual contributors to the NTSG’s work was Jeremy Barrell, arboricultural consultant. He has also appeared as expert witness in a number of recent cases where injury occurred, due to failure of a tree, and has published his submission in peer journals. In an article published in the spring 2012 in conclusion he summarised his views thus:

“unless trees are so remote that there is no realistic potential for harm, it is likely that the courts would expect duty holders to manage their trees proactively. In the first instance, all that is required is a quick visual check and more detailed inspection would only be necessary if this check revealed matters of concern. This check should be carried out at least every five years, and possibly more frequently if there is an obvious elevated risk of harm. It is likely that householders could carry out this visual check without any specific training, but the standard would be higher for larger land holders with greater resources. In these circumstances, it is likely that the inspector should at least have a working knowledge of trees and be able to identify and react appropriately to any significant defects.”

(Barrell, 2011:17)

The principals in this plan will underpin tree management as a whole, as well as work in the vicinity of trees, recognizing that the design and construction stages of projects can have considerable impact on trees. New and replacement planting proposals must give due consideration to species selection and tree positioning.

2. CURRENT TREE MANAGEMENT.

The City Council is responsible for a densely populated urban environment, and is one England's eight core cities.

In Nottingham trees can be found in many situations, such as streets, parks and open spaces, cemeteries and crematoria, schools, and gardens. The long history of tree planting has provided a legacy of many large, mature and important trees in places frequented by many people, and close to high value property. Early tree planting was motivated by the need to beautify the industrial and dense housing areas. There are still examples of these plantings in parks and the streets across the city.

The broadening understanding of the benefits and importance of trees in the city has seen their continued planting and care through the decades. Latterly concern of global warming and trees contribution to mitigation and adaptation responses to climate change has led to greater appreciation of their benefits in cities particularly to absorb pollutants, slow storm water run-off and lessen the urban heat island effect.

Mature and large "forest" species make greatest contribution to offsetting climate change, and local visual amenity, however, they also bear a degree of risk to people and property. Nottingham City Council have recognised this for many years and made provision within its services to care for trees.

This investment has not kept pace with changes in the Council's obligations, particularly the demands of an aging tree stock, greater social demand and expectation, and critically increasing and clarifying legal responsibility.

In the last 3 years the Council has taken positive steps to improve its approach to tree management. Notably this has enabled it to commence a survey of all its trees; by the autumn of 2011 having inspected and recorded 45-55% of its tree stock. Work is currently being undertaken to complete the remaining tree survey. It is anticipated that the survey will be complete during 2013.

When last compared to the available data of the other core cities and East Midland cities (2009), Nottingham was the poorest performer by a considerable margin, but the current actions and prioritisation means that the Council is closing the gap and can demonstrate continued improvement. Until it has in place and is actively delivering a system of tree safety management Nottingham will be vulnerable to prosecution or claims for negligence in the event on an incident.

This plan seeks to redress these failings, by balancing the Council's statutory obligations with the benefits and risks from, and to, its trees and woods in an effective, efficient and economic manner.

3. MANAGING RISK.

The potential for a tree to structurally fail is determined by a variety of factors including species, age, size, history of damage, past pruning practice and adverse environmental conditions. A tree falling in an isolated location is less likely to cause harm to people or property than a falling tree where presence of people or property is constant.

A tree failing is defined as a hazard whilst the presence of people or property (target) is defined as risk. The frequency of the presence of people, and the value of property differentiates the levels of risk. This plan therefore adopts a presumption that it is appropriate to initially identify and monitor the level of risk as a pre-requisite to the identification of a potential hazard. This provides a method of prioritising the commitment of resources.

3.1 Control Measures

The control measures to reduce the risk from hazardous trees will be regular inspection and undertaking necessary remediation. Delivery of this will follow the HSE's principles of risk management set out in *SIM 01/2007/05* and *Five Steps*.

To decide on the prioritisation of inspection and remediation, hierarchical zonal risk assessment will be used to develop a cyclical and systematic approach to maximise resources and minimise cost. This will identify all trees and woods the Council has responsibility for, and identify the control measures to lessen risk a level as low as reasonably practical (ALARP). This will include risks associated with trees prior to planting.

Risk is quantified using a numeric system from which remedial priorities will be extrapolated. A database of trees will be maintained, including their demographic, inspection and history details; in conjunction with a sufficiently accurate mapping system to identify them. Normally trees will be recorded individually unless their habitat and proximity makes it more expedient to record them in closely related groups.

The level and frequency of inspection will depend upon the condition of the tree and / or its zonal risk assessment. Tree inspectors shall be suitably and sufficiently trained, skilled and experienced for the method of inspection they are undertaking. Arrangements will be in place to obtain the services of more skilled or specialist advice and have available such technical equipment as is necessary.

3.2 Zonal Risk Assessment

The amount of arboricultural work generated by the safety management of trees is potentially extensive. The allocation of resources must be balanced with other demands, and recognise all areas of the Council's holdings do not carry the same level of risk to persons or property.

In order to make a survey and remediation program manageable, it is necessary to direct most resources to areas where there is potentially greater risk to people and property. The designation

of risk zones is a matter of informed judgement, reflecting usage and kept under periodic review. The level of risk in a particular area may change over time as new facilities are developed or tree cover establishes. This is achieved by dividing the premises and sites, such as a park or open space into areas based upon their perceived level of risk, incidents and trends, and the characteristics of neighbouring assets.

Each zone is colour coded according to the level of risk, these are set out in more detail in **Appendix A1 Target Zoning** and will be reviewed at least every five years; more frequently if changes in the perceived risks alter:

- Very High Red
- High Amber
- Moderate Yellow
- Low Green
- Negligible Blue

Whilst it maybe desirable to create a record of maps showing the various risk zones it is considered such an approach will be onerous to establish and maintain. Also to ensure that all potential trees affecting a particular target are appropriately inspected and maintained the zone could be excessively large and involve the inspection of trees which pose little or no risk.

To overcome this, the zonal risk assessment will be attributed to the tree. Each tree or group of trees will be assessed and accorded a zonal classification based upon the highest risk target that could be harmed. For instance a tree set in a grassed area in a park would be classed as moderate risk. However, if this is also adjacent to a principle road the tree would be classed as a very high risk zone.

3.3 Identification of Hazards

If unmonitored for several years, the likelihood of a tree's condition deteriorating will increase. The purpose of a tree risk assessment is to identify the early indication of a deterioration of its biological health and any physical defects. Indications that a tree is subjected to stress can be present for some time before a trees structural integrity is compromised. The intention is then to manage the tree so that it does not regress into such a poor condition that it is in a state of imminent structural failure.

The physical appearance of a tree does not necessarily indicate structural integrity, necessitating that a suitably experienced and qualified arboriculturalist assesses the tree on a frequency appropriate to the location and potential harm to targets. However, some aspects, such as vigour of growth, bark formations, presence of fungal fruiting bodies etc may indicate symptoms of stress factors that a tree tries coping with. Once a potential hazard has been identified, a suitable and sufficient arboricultural assessment will be made of a tree before prescribing remedial action. Whatever the appearance of a tree, remedial action is only necessary when there is clearly a significant risk to life or property.

3.4 Quantifying the Risk

Experience has shown that when proactive tree management is first introduced, a backlog of urgent work may be found. In such circumstances work must be prioritized so that funding is initially targeted at the most imminent hazards. Formative work would be delivered at a later stage.

The system is based upon the prioritisation of the target and the likelihood, or otherwise, of part or whole of the tree falling onto it. To achieve this in a consistent, easy to apply and understandable manner the Council adopts an extended version of a risk assessment system developed in the USA.

Targets, that is, people and property, which are likely to be harmed or damaged by trees are ranked into five target zones, according to their frequency of use and value (see **Appendix A1**). Each zone is attributed a rating of one to five (five being the highest risk). High risk targets are those with constant use, by many people, such as roads or homes. Lower risk is parts of open space infrequently visited, such as meadows or woods, away from boundaries or paths.

The **target ratings** are:

5 Very high	Constant use, or permanently occupied structure
4 High	Frequent use
3 Moderate	Intermittent use
2 Low	Occasional use
1 Negligible	Irregular use

Each tree's condition and likelihood to fail is individually assessed by a suitably qualified and experienced tree inspector. The assessment of the defective part is rated according to its **size [of defect]**:

5 Very large	(Greater than 61cm diameter)
4 Large	(41 to 60cm diameter)
3 Medium	(26 to 40cm diameter)
2 Small	(11 to 25cm diameter)
1 Very small	(up to 10cm diameter)

Its **likelihood of failure** is similarly ranked:

5 Very high
4 High
3 Moderate
2 Low
1 Negligible

The sum of the three scores is then calculated giving the risk rating for each tree, or group of trees. Those with the highest risk ratings receive remedial action to lessen the risk to acceptable levels. All trees rated at 10 or higher receive remedial works, this may require the removal of the tree, or more commonly pruning, or the removal of a target.

This system is built into and recorded within the Council's tree management software. The risk rating thresholds are set out in **Appendix A2 Methodology of Risk Assessment Zoning**, these are kept under continual review will be amended as and when necessary.

3.5 Prescribing Remediation

Only a competent arboriculturalist is able to assess whether a tree is an appropriate species or size for its location; whether undue stress has induced a hazard; or a tree simply requires acceptable management or monitoring. It is desirable to proactively manage a trees environment or do formative work which negates the decline and ultimately removal of trees.

Only competent arboriculturalist shall prescribe the appropriate remedial action, and record **all** such actions on the Council's tree management database. The degree of remedial work required for a tree will depend on both hazard and level of risk. Safety considerations may at times also be linked with the landscape, wildlife and cultural value of the tree.

A tree regarded as a serious hazard, posing a significant risk, poor aesthetic form and ecologically inappropriate is likely to require removal. However a tree that constitutes a minor hazard in a moderate risk zone and has potential for retaining some habitat or landscape value may require less remedial work. A tree that is neither hazardous nor constitutes a significant risk, is unlikely to require any remedial work.

In high risk areas trees that show obvious signs of imminent collapse or are otherwise seriously hazardous should be dealt with immediately on the best advice available at the time. Otherwise once inspected and approved by a competent arboriculturalist, remedial action must be implemented without unreasonable delay. The more imminent the risk of failure, the sooner remedial action must be taken.

When the level of risk (**Appendix A2**) is considered very high or high specification for work should not be compromised by cost. In a moderate or low levels of risk area the specification of works may consider the reduced risk implied and need to prioritise resources to where there is a greatest risk.

**It is prudent to predict future hazards rather than
continually responding to problems.**

Where remedial work is necessary it maybe possible to mitigate landscape or habitat loss. Retaining logs and the provision of nest sites can be beneficial and cost effective. Dead trees can be reduced to decrease risk rather than removed altogether. In some instances remedial work may have additional benefits such as landscape improvements, habitat and wildlife conservation or timber / wood fuel production.

Other solutions should be considered before or in conjunction with remedial action to trees including:

- Retaining a tree for more frequent inspection
- Removal of targets e.g. move car parking away from trees

- Reduction of stress e.g. discontinue or move activities that cause compaction, protect from mowing, protect trees in accordance with best practice, such as British Standards.
- Formative tree work to prevent the development of structural defects.
- Aftercare of newly planted trees to establish healthy specimens more capable of resisting the stresses of the urban environment.

If remediation is required to abate a very high risk the tree must be re-inspected on completion by an arboriculturalist, and reassessed to ensure risk is reduced to a tolerable level.

4. TREE INSPECTION.

When an inspection identifies a potential hazard, it will often relate to an individual tree and require a more detailed inspection. In theory a person of lesser arboricultural knowledge may carry out a simple survey whilst a tree inspection will require more specialist knowledge. In practice the same person, if competent to do so, may carry out both the survey and inspection at the same time.

In occasional circumstances a tree may require more regular monitoring for very early signs of decline. This would typically be a tree whose removal would represent a significant loss, but poses a potential hazard if retained.

“Occasionally a duty holder will decide, usually for heritage reasons, to maintain a particular tree, despite the fact that it is very old or has serious structural faults that cannot be remedied. A specific assessment for that tree and specific management measures, including regular and detailed inspections are likely to be appropriate.”

(HSE, 2007:3)

The purpose of these surveys is to identify defects which are likely to create a danger or serious inconvenience to users of the site and wider community. For efficiency the detailed professional inspection shall also include routine condition surveying, to identify deficiencies in the fabric of the tree which if left untreated are likely to adversely affect its long term decline; or nuisances actionable within the Council’s tree management policies.

4.1 Competency

A competent person is someone who has the technical expertise, training and experience to carry out the appropriate element of the tree safety plan, and could be a member of staff, contractor or consultant.

“A competent person is defined as being any person with specific practical and theoretical knowledge as well as experience of a particular task or job. A competent person must know what the limits of their knowledge are and when to seek help or advise.”

(Nottingham City Council, 2006:1)

Typically a National Certificate in Arboriculture or an operations trained arboriculturalist who has completed and been awarded Professional Tree Inspection (Lantra¹) and some work shadowing, would be the minimum level of acceptable competence.

A competent arboriculturalist for technical tree inspections should hold the equivalent of a National Diploma in Arboriculture (level 3), with additional experience. They should hold depth of knowledge of tree physiology, pathogens and processes of tree biology that effect structural integrity.

¹ Skills council for the environmental and land based sector.

There are essentially five separately defined types of inspection to deliver this plan and the levels of competence differ for each, plus responding to customer enquiries. The first three form the routine structure of the plan, categories 4 and 5 are responsive to specific need or event:

1. Detailed Arboriculturalist Inspection
2. Arboriculturalist Observation Inspection
3. Site Observer Inspection
4. Technical Inspection
5. Reactionary Inspection

Inspection categories 1, 2 and 4 **must** only be carried out by professionally qualified arboriculturalists. Inspection categories 3 and 5 may be carried out by suitably knowledgeable lay persons. It is possible to recognise signs of damage or weakness without in-depth training. Site observers (lay inspectors) should be trained to be able to undertake these classes of inspection, and inducted into the Tree Safety Management Plan, as part of their Learning and Development Reviews.

Post storm and other reactionary checks can be made by any person with little or no arboricultural knowledge. These checks are simply part of the day to day management of any property (parks, schools, housing complex) and the responsibility of any colleague that is located at a site. Colleagues in essence, act as the eyes of the Tree Services Team. Their responsibility is to inform the Tree Services Team if at all concerned.

Persons undertaking operational work must be adequately trained in the technical aspects of arboriculture, and must hold a minimum of National Proficiency Test Council (NPTC) or equivalent certification relevant to the specific operations that they carry out

4.2 Methods of Inspection

The level of risk a tree potentially poses and the target rating of its location will dictate the frequency and standard of each inspection, and the prioritisation of remedial work. This plan endeavours to ensure these are adequate, whilst not being onerous on resources.

It is the responsibility of the person undertaking an inspection to understand their own limitations in both skill and knowledge, to ensure that they do not attempt to carry out a level of inspection they are not suitably and sufficiently knowledgeable, experienced and trained for. Within this plan there is opportunity for anyone inspecting a tree to refer the matter onwards for more detailed and skilled assessment, if the current level of inspection is proving inadequate.

Apart from technical inspections all other inspections of the trees will be ground level external visual assessments of symptoms of defect and disease from. If an inspection of any kind is constrained in any way the inspector / observer must record this as part of the assessment, and if necessary make arrangements to remove impediment to fulfil the requirements of the inspection.

The initial inspection of any tree or group (but not woodland or negligible risk sites) that is to be recorded on the Council's records database will be to the Detailed Arboricultural Inspection standard. At this level of assessment an adequate account of the tree's location can be made to

apportion it to a risk zone, inspect to sufficient detail to quantify hazards, prioritise remediation and modify the standard review timetable schedule.

1. Detailed Arboricultural Inspection (DAI)

All trees in target zones rated low or higher will require such an inspection at appropriate intervals. These are carried out by suitably qualified and experienced arboriculturalists. DAI's will be undertaken sufficiently near to the tree to assess all parts of the tree from ground level. The findings of the inspection are recorded onto the corporate tree management database, managed and maintained by Tree Services.

The inspection will include a review of the risk assessment, and when appropriate, schedule prioritised remediation. The DAI sets or revises the cycle of inspections when a cycle other than the standard is required. DAI will be the basis for service request inspections.

2. Arboricultural Observation Inspection (AOI)

The trees will be assessed by suitably qualified and experienced arboriculturalists, looking for changes to the most recent DAI. In the event of a change meriting an update to the trees record the inspection will revert to a DAI assessment.

After the initial inspection this will be the default inspection technique for all but the highest risk trees, The inspection will normally be a "walk-by", sufficiently near and paced to carry out a 360 degree assessment.

3. Site Observer Inspection (SOI)

It is anticipated that this inspection would take place in conjunction with the observers other responsibilities on site. Colleagues do not need to be, and would not be expected to be an arboriculturalist, but should have knowledge of the site they are inspecting. They would be conversant with risk assessment in accordance with council policy, and refer any findings of concern directly to Tree Services for more detailed professional assessment, often this will only require the e-mailing of a photograph of the tree and defect of particular concern.

The SOI would be expected to note recent changes in the tree's condition, such as, but not exclusive to, dead trees; presence of fungal fruiting bodies; broken, hanging and split limbs; unseasonal retention or shedding of leaves, damage to roots.

4.3 Further Investigation

4. Technical Inspections

When a detailed professional inspection is not adequate to assess the potential hazard the arboriculturalist made need to commission a more specific survey of the tree. As this is a

high cost approach it would normally be restricted to visually or habitat important trees; for lesser specimens a more pragmatic, but cautious approach would be expected.

A technical inspection may take a number of forms, and these may include aerial inspection, either by climbing the tree or from a MEWP, internal structural analysis by tomography, or referral for more specialist advice and second opinion.

5. Reactionary Inspections

The purpose of the proactive surveys is to reduce the likelihood of foreseeable hazards becoming accidents. Severe storms may still result in some damage to trees and associated reactionary work. Following severe weather conditions, additional checks for recent tree damage may be deemed necessary. Arboricultural knowledge is not necessarily required, as the purpose of these checks is simply to check for obvious storm damage such as torn or hanging branches. Any damage found or any other report from any person about any tree safety hazard should be investigated as soon as is reasonably possible. It is envisaged these checks would be scheduled and recorded by site manager, referring damage to Tree Services for further investigation and remediation

4.4 Inspection Methodology

Specimen trees will normally be identified and recorded individually, however where they grow in close proximity, share common demographic characteristics and it is prudent to do so they may be recorded as a group. The delineation between individuals and groups will be made by an arboriculturalist at time of initial tree inspection, and reviewed at each subsequent assessment.

Groups of trees may overlap and within a group individual specimens may be recorded. Avenues will be recorded as individual specimens, though woods would normally be recorded as coupes based upon their risk zoning and husbandry.

Due to the high residential density and constant ebb and flow of land use in the urban environment, and close proximity of trees to one another it is considered the most effective, and simple to understand and apply approach is to standardise the cycle upon which trees are re-assessed across the risk zones. When the initial inspection is completed the trees will be re-assessed on a 3 yearly cycle if they fall within a moderate to very high risk zone.

The risk zones will be applied to ensure if remedial action is necessary then it can be prioritised to locations where there is greatest risk and benefit. This will assist in ensuring most effective application of limited resources.

There are some trees of very high heritage and landscape value which by virtue of age and defects which cannot be remedied need more frequent inspection. These trees are classified as “**Landmark trees**” and will be inspected on an annual basis, each autumn (though sometimes more frequent inspection or at other seasons may be needed depending on their symptoms). Occasionally trees will be classed as landmark trees on a temporary basis, for example to monitor them following damage to roots.

Risk Zone	Detailed professional inspection	Professional observational inspection	Site observer inspection	Defect assessment
Landmark trees	Annually		As per normal duty routine	When called upon
Very High Risk	6 yearly	3 yearly	As per normal duty routine	When called upon.
High Risk	6 yearly	3 yearly	As per normal duty routine	When called upon.
Moderate Risk	6 yearly	3 yearly	As per normal duty routine	When called upon.
Low Risk	Initial survey, & when defect is identified	5 yearly	As per normal duty routine	When called upon.
Negligible Risk	When defect is identified		Annually, review every 5 years*	When called upon.

* Sooner if changes are known.

5. RECORD AND REVIEW.

5.1 Recording Inspections

As with all health and safety matters in the event of an accident Nottingham City Council may be required to demonstrate that it acted reasonably in relation to the management of risk, hence the need to retain records. This plan is, in part, an implicit record of the tree management process. It contains the detail required to ensure reasonable safety of others by undertaking the risk posed by tree on council land and making explicit the means by which the Council intends to manage them.

It may not be sufficient that routine inspection have resulted in tree work being undertaken to reduce the risk of tree failure. Records of inspection, tree surgery and other remedial works will be required.

By fulfilling the elements of an adequate and appropriate safety plan, the Council will be more readily able to demonstrate that they are complying with their legal obligations. Record keeping is fundamental to the management of health and safety. The records will also greatly aid the Council in its routine management of its trees for resource allocation, responding to service requests, providing analytical data needed to sustain and enhance the urban forest.

Trees that have been identified as being hazardous or potentially hazardous should be documented, either creating an individual record for each tree, or in the case of identifiable stands of trees, a group record. They need to be sufficiently accurate to demonstrate knowledge of distribution and condition of the tree stock to enable accurate risk assessment to be carried out and quantified

Whilst record keeping needs to be thorough it also needs to be realistic and manageable. It is sufficient to record that a given area of specified risk level was checked on a particular date and only record any problems found; it is not required to document individual trees that are assessed as posing no significant risk at every inspection. To be able to demonstrate cyclical routine inspections the date each site is visited, and trees assessed on an AOI will be recorded. This will be the same database as trees individual and group records are maintained on.

A potentially hazardous tree that is inspected by a competent arboriculturalist will require a detailed report to be completed. Records will be kept electronically (Ezytreev). The database should additionally be used to record both the remedial action prescribed and when it was undertaken. The priority for implementing remedial action will depend on both the assessment of risk and hazard and be recorded.

Records should be kept for a minimum of seven years and at least the last three inspections for every tree, though by recording inspections on the specialist software systems, it should be possible and preferable that they be kept for the life of the tree and five years after its removal.

5.2 Reviewing Tree Inspections

Part of the health and safety duty is to ensure that trees are inspected on a regular basis, commensurate with the risk they pose.

The target zoning will prescribe the timescale and degree for the re-inspection of trees. This will also prescribe the detail required at each inspection and whom is responsible for carrying this out.

Within the target zoning criteria the professional inspector may place a tree in a higher risk category if in their view the tree poses higher risk, that cannot be alleviated by remedial works, and the tree merits retention.

5.3 Amending Frequency of Inspection

Sometimes, it may be appropriate to lower the risk zone for a tree, thereby lessening its inspection frequency and intensity. Only professional inspectors can lower the risk due to the risk posed by the trees condition, position or structure. Only a site manager can lower the risk zone categorisation due to site specific factors.

5.4 Plan Review

The maintenance of accurate records will assist the council in assessing the effectiveness of this plan. They will form the basis of legal defence in the event of an incident and enable the council to substantiate its actions.

The records will also enable a review to assess whether resources are sufficient and being applied to greatest benefit.

The plan will be fully reviewed on a five year basis. If material changes occur in the meantime, such as legal requirements or data analysis suggests reassessment, then reviews in part or whole will take place at the earliest opportunity and no longer than six months. Any review should be based upon duty of care and ensuring that council is doing what is reasonably practicable, in accordance with best practice.

6. DELIVERY PLAN.

To achieve the objectives in a sustainable, timely and economic manner, the operational delivery needs to be carefully considered and controlled. The key actions will include:

6.1 Timescale

The time taken to complete the initial survey and implement this plan is dependant upon available resources. To date four city areas (8 wards) have been completed plus all of the schools, highway and principal park trees, plus some of the larger Housing estates in remaining wards. It has taken three years to get to this position, however, priming investment would mean that the survey could be completed in months and at that time start to deliver cyclical safety assessments and remediation.

6.2 Resources

Inadequate investment has been the Council's reason for failing to meet its obligations in the past, and without the necessary investment now it will continue to fail in this regard.

6.3 Actions and Measures

Action	How	Measures
<ul style="list-style-type: none"> • Publication and advertisement of plan 	Using Council's communication infrastructure to identify and contact asset managers.	Responses from site managers.
<ul style="list-style-type: none"> • Create baseline of current position 	Accurate record of knowledge of tree stock and nature of primary concerns.	Recording of an accurate reference point of current status. Establish April '09.
<ul style="list-style-type: none"> • Assuring professional competency 	Recruitment and continued professional development of specialist arboriculturalists.	Maintain a record of professional training.
<ul style="list-style-type: none"> • Assuring competency of site managers and observers 	Arrange in-house training sessions.	Maintenance of up to date records by the site managers and their service.
<ul style="list-style-type: none"> • Undertake cyclical surveying 	Start at four predetermined loci across Nottingham and systematically inspect every tree in accordance with the plan.	Identification of sites and demonstrate a systematic approach.

<ul style="list-style-type: none"> • Carry out remediation 	<p>Within the prioritisation categories complete remediation as required, contact responsible services and site managers when necessary and structure resource plan.</p>	<p>Maintain accurate records on tree maintenance database, completing all very high and high risk works in appropriate timescales</p>
<ul style="list-style-type: none"> • Positive impact on responsive management 	<p>Use of the data to target resources to places of greatest need and benefit</p>	<p>To achieve a 70:30 split (program: responsive management) in resource application</p>
<ul style="list-style-type: none"> • Maintain records 	<p>Tree Services to manage and maintain records of professional surveys. Site managers to maintain their own records.</p> <p>Must include re-inspection dates.</p>	<p>Periodic review of records and updates reported to scrutiny annually.</p>
<ul style="list-style-type: none"> • Review of inspections 	<p>Tree Services to monitor reports, inspection regimes, remediation priorities and report significant adverse findings to appropriate managers.</p> <p>Site managers to review and report any material changes to the site so that inspections, or risk zones can be modified as appropriate.</p>	<p>Develop and agree service plans, as part of the Urban Forestry Strategy.</p>
<ul style="list-style-type: none"> • Audit the Safety Management Plan 	<p>Review the process.</p>	<p>Cyclical survey of trees at prescribed intervals.</p> <p>Capability to carry out all very high and high priority remediation.</p>

Ongoing reduction in ETW, complaints & budgets for responsive works.

7. OTHER CONSIDERATIONS.

Trees have a wide impact on the community, this wider impact and considerations are an integral part of the Urban Forestry Strategy (in draft). When considering the appropriate response to safety concerns there are a number of other factors which will influence the decision process. Similarly a great many services of the Council, businesses and the community have a role to play in developing a sustainable tree stock. Some of the key considerations are set out below.

7.1 Trees on Neighbouring Land

The Council has a duty of care, not only for trees on its land, but also for those which potentially pose a threat to persons or property visiting Council premises or users of the highway. Within the obligations of the Highway Act 1980 the Council's duty is to identify these trees and instruct remediation. This action would be expected to be carried out in conjunction with DAI, AOI, SOI arboricultural assessments as well as Highway Inspectors other condition surveys.

Responsibility and delegated authority to instruct works to private trees rests within various services throughout the Council. In all circumstances the owner should initially be contacted and advised of the remediation needed to abate a hazard. If they fail to do this then the service with relevant delegated powers should be contacted:

- In the instance of trees affecting the highway refer the matter to Highway Network Management.
- In all other instances initially contact Tree Services for advice.

7.2 Trees and Wildlife

Trees host a wide range of flora and fauna. In the city they are a critical part of a diverse and sustainable environment. Many of the species they are a habitat for, even in the city, are protected by legislation.

Whilst safety is the principle concern, this has to be balanced with these duties, and may affect the type and timing of works. A carefully and appropriately managed treescape is sustainable; and tree safety and condition management does not need to be at the expense of wildlife. Well managed trees will have longer life expectancy and therefore become hosts to larger populations of a greater number and more diverse range of species.

Within the inspection and remediation process, the fulfilment of wildlife obligations is fundamental, and will be a key consideration in the prioritisation, timing and nature of works.

7.3 Protected Trees

Legislation protecting trees and woods has provision for the most urgent works, and exceptional circumstance. The vast majority of work though, will be subject to the processes and procedures of consultation that would apply to routine maintenance.

By regular inspection, work will be identified at an early stage and therefore likely to have a lesser overall impact on the appearance of trees and enable wider consultation

7.4 Protecting Trees during Development

Despite their apparent durability and longevity trees are highly vulnerable to damage by work in their proximity. People are aware of the above ground trunk and branches but forget the roots. It is a common misconception that they have a deep tap root. In fact the vast majority of roots are in the top 600mm of soil, spreading out in a plain that is often broader than the tree is tall.

It is easy to damage roots during construction, not only cutting them, but by compaction of the ground. Damage may occur, whether the construction work is erecting a new building, constructing a road or path, laying underground services, or storing plant and material during the works.

Not only can this damage directly render a tree unstable, and liable to fall over, even the most minor damage can create wounds allowing entry of decay fungi. Indeed this has been associated with the collapse of many trees in the urban environment and some of the most injurious incidents.

Undertaking work without due consideration of the impact it could have, may be deemed negligence and form grounds for litigation. Particularly as codes of practice and British Standards have been published and successfully applied for many years.

When working near trees the designer, engineer, site manager and operatives all have a role to play in their protection. British Standard 5837 ***"Trees in Relation to Construction"*** (2005) and Volume 4: NJUG ***"Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2)"*** (2007) both give safe operating guidance, as well as advise on when and how to seek expert arboricultural advice. If in doubt contact Tree Services for works on Council land or affecting City Council trees; or Planning Services if the work relates to private development.

7.5 Design and Planting

The long term management needs and thereby costs directly correlate to the suitability of a tree to its location. To assist in this and deliver immediate economic savings ***Nottingham's Guide to Right Tree- Right Place*** protocol has been developed as a part of the Council's Urban Forest Strategy.

7.6 Adoption of Trees

During new development and refurbishments trees are often planted. Also mature trees may be handed over to the council as part of Section 106, Planning Obligations.

It is important that these trees form an integral part of the Nottingham landscape, and do not confer an unacceptable liability upon the Council. Tree Services must be consulted as part of the design and planting phases (see 7.5 above), and to agree the suitability of mature trees and ensure that sufficient resources are available for their ongoing maintenance. A specific deliver plan will be formulated as part of the Urban Forestry Strategy

7.7 Recording and Responding to Enquiries

Each year around 2,000 service requests are received by Tree Services. The response time for these depends upon the nature and urgency of the enquiry. All enquiries are recorded, including the outcome of the inspection, and if works are needed. Whether requests for work are carried out depends upon the nature of the request, the Council's obligations, the impact this will have on the tree and community and the available resources. This is set out clearly in the Council's ***Responsible Neighbours Guide***.

Responding to enquiries absorbs much of the available resources. A secondary benefit of an adequately invested safety management plan will be the reduction in the number of these and the ability to have more structured and prompt responses. It should be possible to respond directly to many with the improved records of the asset management, and whenever possible, others should be linked to scheduled professional inspections.

7.8 Integration with Other Works

Frequently trees requiring safety remediation also need other condition works or close to trees which do so. When the risk assessment permits and resources are available works will be scheduled in the most efficient manner to link the operations

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A. APPENDICES

A1. Target Zoning.

Impact of failure	Landmark Trees	Inspection cycle
Moderate to very high	<ul style="list-style-type: none"> Individual trees of high amenity or heritage value, has serious structural faults that cannot be remedied. 	Annual

Constant use.

Impact of Failure	Zoning factors	Target examples	Inspection cycle
Very high	<ul style="list-style-type: none"> Possible multiple people targets Limited control All weather access Vulnerable group congregate (OAP, children) Very high value assets 	<ul style="list-style-type: none"> Principal and distributor roads Other highway around junctions, crossings, signals, bus stops, schools and public buildings, retail zones. Emergency access routes Medical & emergency facilities Car parks adjacent to and serving very high risk areas. Overhead electricity lines (LV & HV) Railway and tram routes City centre zone Shopping precincts Parks: principal entrances, children play areas, event fields, permanent structure with constant use. Schools: entrances, communal routes around facilities and play grounds. Community buildings with constant use “High Risk” trees requiring more regular attention. 	3 yearly

Frequent use

Impact of Failure	Zoning factors	Target examples	Inspection cycle
High	<ul style="list-style-type: none"> Some control realistic Probable individual people targets All weather access, except in most inclement. High value assets Areas where people 	<ul style="list-style-type: none"> All roads, not in very high risk zone Schools: all areas not in very high risk zone Golf courses; tees and greens Car parks adjacent to high risk areas Business areas: entrances and primary uses Overhead and underground services Residential dwelling 	3 yearly

likely to working in vicinity.

- Known informal recreation “hotspots” used for impromptu “gatherings” of school age children
- Park facilities: seating areas, formal paths.
- Woods and open spaces formal paths, and gathering areas
- “Moderate” risk trees requiring more regular attention.

Intermittent use

Impact of Failure	Zoning factors	Target examples	Inspection cycle
Moderate	<ul style="list-style-type: none"> • Probable individual people targets. • Use unlikely to occur during inclement weather • Moderate to high value targets • Primarily recreation use. 	<ul style="list-style-type: none"> • Residential gardens, garages and outbuildings • Parks and woods: informal play areas, recreation grass and gardens, minor paths • Golf courses: fairways and adjacent rough. • Car parks adjacent to moderate/low use areas. 	3 yearly

Occasional use

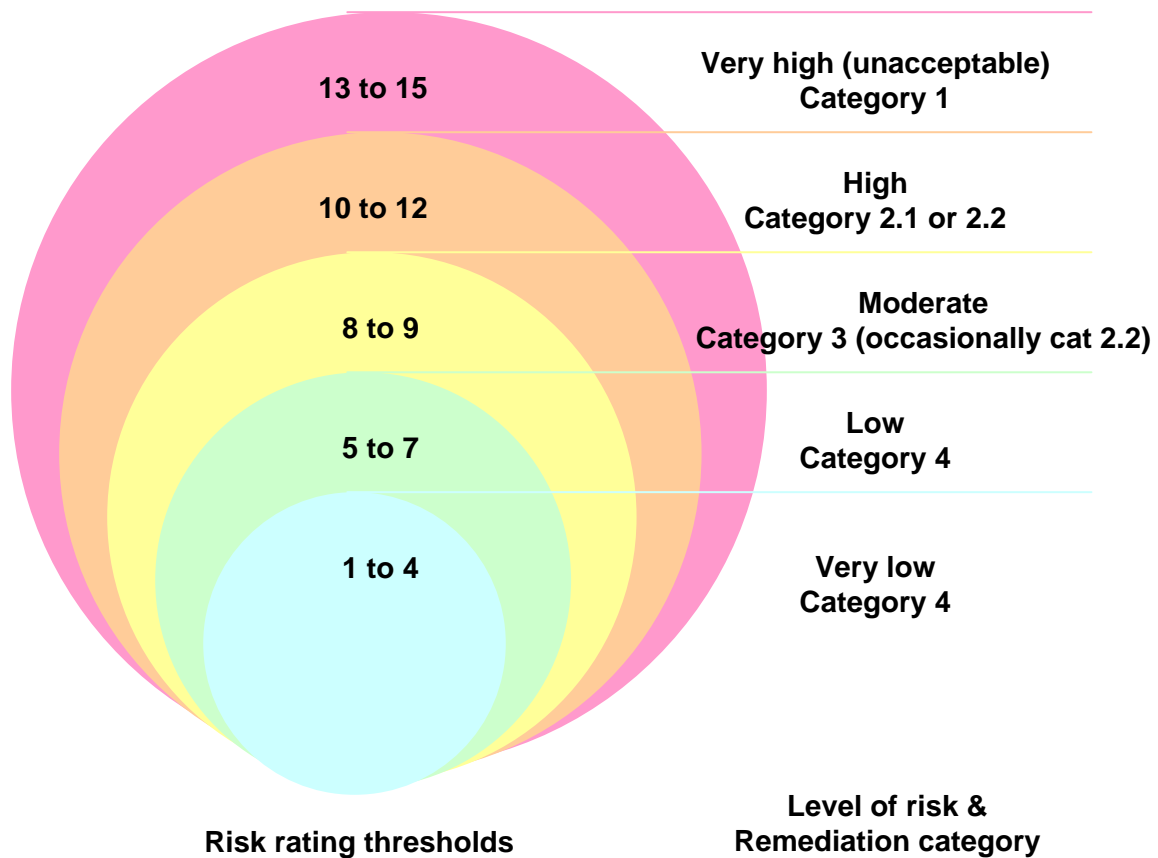
Impact of failure	Zoning factors	Target examples	Inspection cycle
Low	<ul style="list-style-type: none"> • Probable individual people targets. • Infrequent use. • Away from valuable targets. 	<ul style="list-style-type: none"> • Public areas with dispersed recreation eg. Fishing pegs • Golf course roughs • Woods with limited use or access • Low use paths and access ways 	5 yearly

Irregular use

Impact of Failure	Zoning factors	Target examples	Inspection cycle
Negligible	<ul style="list-style-type: none"> • Use of area irregular and very low. • Presence of no or very low risk trees 	<ul style="list-style-type: none"> • Riparian and peripheral areas with limited use or access. • Urban commercial and highly built up sites with no space for trees 	5 yearly review*

* Sooner if changes are known.

A2. Methodology of Risk Assessment Quantification.



Risk Rating Thresholds

Risk Rating Ranges	Level of Risk	Remediation Response
13 – 15	Very high (unacceptable)	Cat 1
10 – 12	High	Cat 2.1 & 2.2
8 – 9	Moderate	Cat 3 (occasionally 2.2)
5 – 7	Low	Cat 4
1 – 4	Very low	Cat 4

Remediation Response.

Cat 1: immediate call out.	Prioritised usually within 48 hours, with a maximum response time up to 7 days.
Cat 2.1: scheduled work.	Prioritised into work programs with a maximum response of 6 months
Cat 2.2: scheduled work.	Prioritised into work programs with a maximum response time of 12 months.
Cat 3: scheduled work.	When resources permit, or review condition at next inspection.
Cat 4: scheduled work.	Review condition at next inspection.

Quantification of Risk

$$\text{Risk Rating} = \text{Impact of Failure} + \text{Size of Defect} + \text{Likelihood of Failure}$$

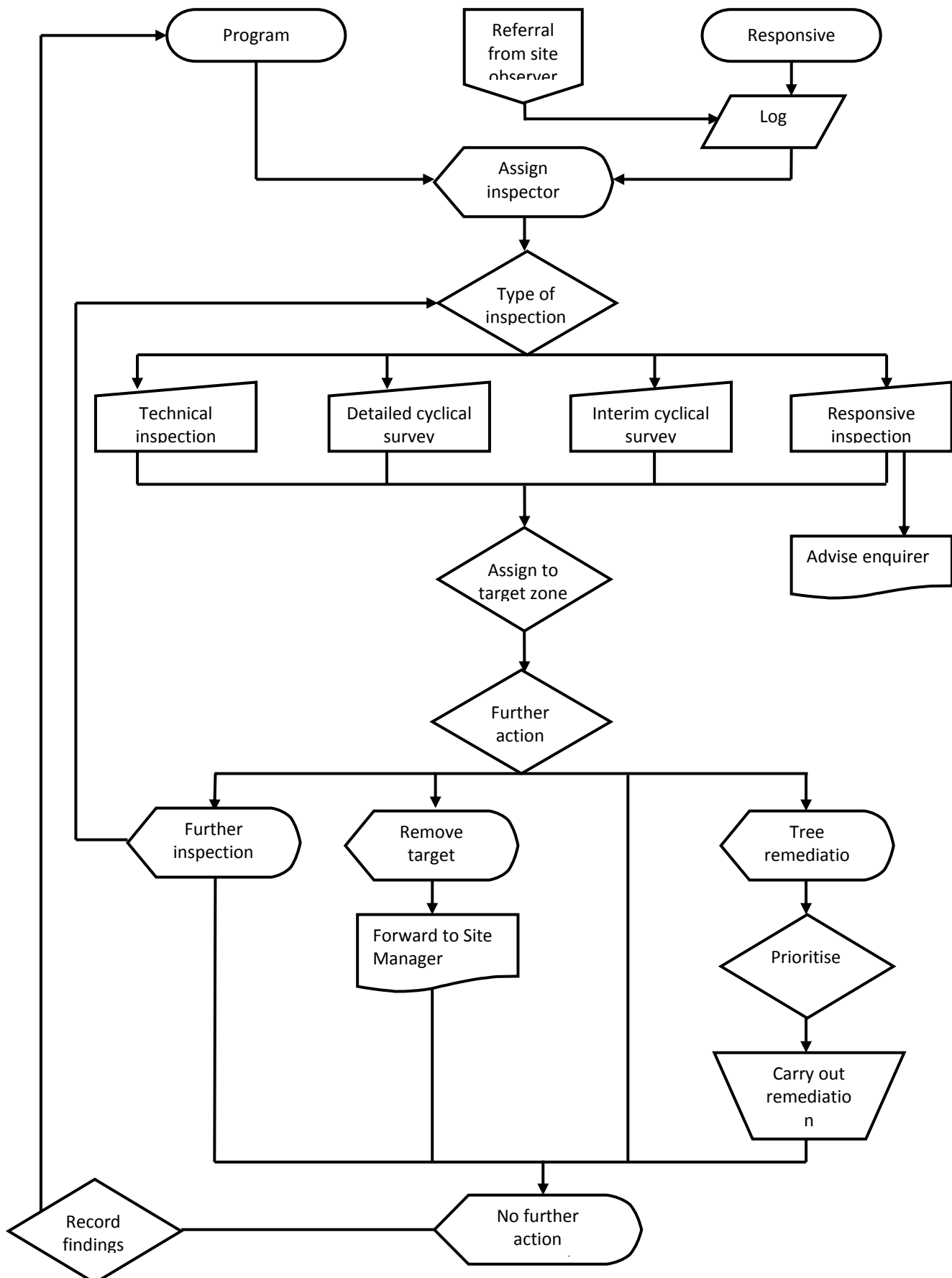
Risk Management Factors

Impact of Failure	Score	Target Zone	Colour
Very high	5	Constant	Red
High	4	Frequent	Amber
Medium	3	Intermittent	Yellow
Low	2	Occasional	Green
Negligible	1	Irregular use	Blue

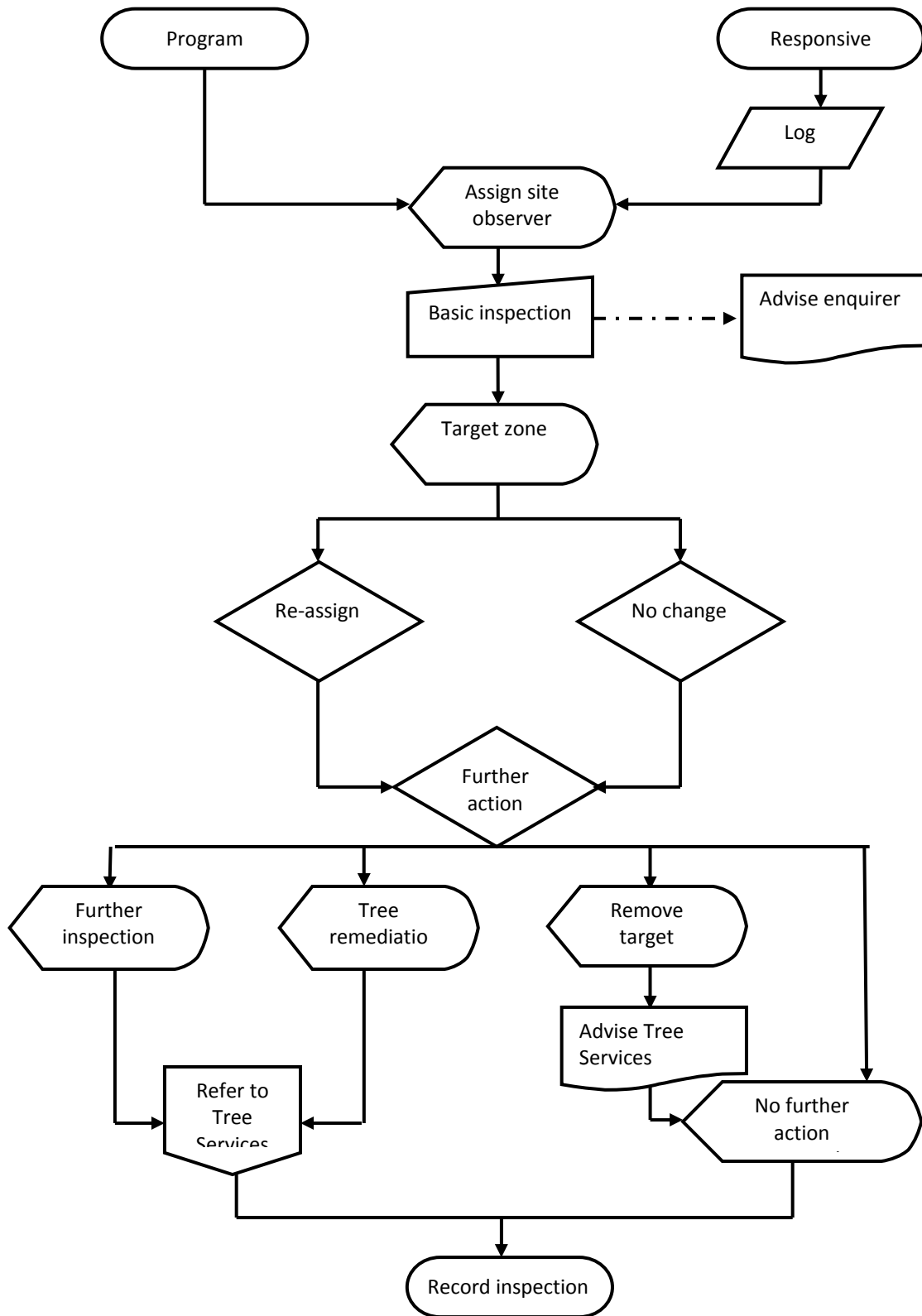
Size of Defect	Score	cm diameter
Very large	5	61 +
Large	4	41 – 60
Medium	3	26 – 40
Small	2	11 – 25
Very small	1	Up to 10
None	0	---

Likelihood of Failure	Score
Very high	5
High	4
Medium	3
Low	2
Very low	1
None	0

A3.1. Professional Tree Inspection and Survey Process (simplified)



A3.2. Site Observer Inspection and Survey Process (simplified)



A4. Glossary of Terms and Abbreviations.

A4.1 Definition of Terms

Competent Person: Any person with specific practical and theoretical knowledge as well as experience of a particular task or job. A competent person must know what the limits of their knowledge are and when to seek help or advise.

Council (the): Nottingham City Council, its departments and parts.

Hazard: Anything that can cause harm such as a falling tree or limb, or an action and its resultant defect, such as root severance)

Highway tree: Any tree, or part, which has the potential to fall onto or affect public roads and their associated, paths and cycleways, irrespective of ownership.

Inspection: Checking trees to establish whether condition standards are met and to specify, when necessary, actions to restore trees to accepted standards.

Remediation: Actions or processes to lessen risk. This could be actions to the tree, or to remove a target.

Risk: The chance, high or low, that persons or property will be harmed by the hazard.

Risk zone: Areas of the city considered to have similar risk.

Site Observer: Suitably skilled person nominated by site manager to undertake site risk assessment.

Survey: A program of tree inspections, maybe undertaken as a one-off or cyclically.

Target: Person or property which may be harmed if a tree or part thereof fails.

A4.2 Abbreviations

AOI: Arboriculturalist Observational Inspection

ALARP: As low as reasonably practicable

DAI: Detailed Arboriculturalist Inspection

DOE: Department of the Environment

HSE: Health and Safety Executive

SOI: Site Observer Inspection

MEWP: Mobile Elevated Work Platform

MHSWR: Management of Health and Safety at Work Regulations, 1999

NJUG: National Joint Utility Group

NPTC: National Proficiency Test Council

SIM: Sector Information Minute

The Act: Health and Safety at Work etc Act, 1974

A5: SUMMARY OF AIMS AND PRINCIPLES.

The aims and principles of Nottingham’s Urban Forest Strategy are summarised into its vision:

“CREATE AN URBAN FOREST THAT IS DESIGNED AND MANAGED SUSTAINABLY, FOR THE BENEFITS OF NOTTINGHAM’S COMMUNITIES.”

To achieve the vision two aims have evolved, to create Nottingham’s urban forest, each with its own guiding principles:

- **AIM 1: TO DESIGN A SUSTAINABLE URBAN FOREST**
- **AIM 2: TO MANAGE A SUSTAINABLE URBAN FOREST.**

Decision making involves many factors, which sometimes can appear contradictory. These are set out below as the principles which will guide the decision making that will enable the city to achieve its vision and target.

- **PRINCIPLE 1: ENSURE THAT THE TREE AND WOOD POPULATIONS ARE PROTECTED, ENHANCED AND, WHERE APPROPRIATE EXPANDED**
- **PRINCIPLE 2: MAINTAIN TREES AND WOODS IN ACCORDANCE WITH LANDOWNERS OBLIGATIONS, WITH PARTICULAR ATTENTION FOR THE SAFETY OF PEOPLE AND PROPERTY**
- **PRINCIPLE 3: MANAGE TREES AND WOODS IN A MANNER WHICH BENEFITS LOCAL COMMUNITIES, WHILST ENSURING PROBLEMS ARE PROMPTLY AND APPROPRIATELY DEALT WITH.**
- **PRINCIPLE 4: ENCOURAGE NEW AND REPLACEMENT TREE AND WOOD PLANTING, USING APPROPRIATE TREE SPECIES**
- **PRINCIPLE 5: THE REMOVAL OF TREES AND WOODS SHALL BE RESISTED, UNLESS THERE ARE SOUND ARBORICULTURAL OR OTHER REASONS TO INDICATE OTHERWISE.**
- **PRINCIPLE 6: MANAGE ITS WOODS IN A FULLY SUSTAINABLE MANNER.**
- **PRINCIPLE 7: ALL TREE AND WOODLAND MANAGEMENT DECISIONS WILL TAKE APPROPRIATE ACCOUNT OF CLIMATE CHANGE, AND NATURAL ENVIRONMENT PROTECTION**
- **PRINCIPLE 8: PROVIDE A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION TO INDUSTRY AND PEER BEST PRACTICE STANDARDS AND ACT AS AN EXAMPLE FOR OTHERS TO FOLLOW.**
- **PRINCIPLE 9: RESPOND TO TREE WORK APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
- **PRINCIPLE 10: RESPOND TO PLANNING APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
- **PRINCIPLE 11: APPLY RESOURCES IN A CONSIDERED MANNER TO ENSURE GREATEST COMMUNITY BENEFIT AND TO MEET ITS OBLIGATIONS**
- **PRINCIPLE 12: ENCOURAGE AND ENABLE GREATER AWARENESS AND BETTER UNDERSTANDING OF TREE AND WOOD MANAGEMENT, IN ORDER THAT COMMUNITY CONSULTATION AND INVOLVEMENT IS ENCOURAGED.**

**Urban
Forest
Strategy**

Responsible Neighbours' Guide

**Annex 2
October 2012**



**Nottingham
City Council**

CONTENTS

Introduction.....	3
Benefits of Trees in the City	
Trees and Consultation.....	7
Public Safety.....	10
Unfounded tree fears	
Obstruction of the Highway	
Obstruction of Public Lighting and Signs	
Root Damage and subsidence.....	12
Subsidence	
Drain Blockage	
Topping and Lopping.....	13
Trees Obstructing Views, Daylight and Media Reception.....	14
Trees obstructing views	
Daylight loss	
Reception for television, satellite, and other telecommunications equipment	
Trees and Nature.....	15
Pollen, petals, fruit, seeds and leaves	
Birds and other wildlife	
Honeydew	
Grey squirrels	
Solar Panels and Trees.....	17
Vehicle Cross-overs and Trees.....	19
Appendix 1 Summary of Urban Forest Strategy Aims and principles.....	21

1. INTRODUCTION.

This **Responsible Neighbours' Guide** forms an integral part of the Council's **Urban Forest Strategy** and shall be applied in accordance with the strategy's aims and principles. The vision for Nottingham's urban forest is:

“Create an urban forest that is designed and sustainably managed for the benefits of Nottingham's communities.”

To achieve this, the city has set the target of increasing the urban forests canopy cover from its current level of 14% to 18% by 2030. To delivery this 12 principles (core policies) have been adopted. The Responsible Neighbours Guide is part of the Council's response to Principle 3 in particular, though all 12 are relevant in any consultation of decision making:

“Manage trees and woods in a manner which benefits local communities, whilst ensuring problems are promptly and appropriately dealt with.”

The aims and principles of the Urban forest strategy are shown in appendix 1. More details can be found in the Strategy, available on the Council's website.

Nottingham is a city of over 305,000 residents (for the Greater Nottingham area that figure is over 675,000) and the Council is responsible for an estimated 110,000 individual trees and over 150 hectares of woods in the City. This brings people into close proximity to trees in the urban area on a regular basis, so there is a need to ensure that the environment is managed appropriately and sustainably.

Each year the Council receives approximately 2,000 enquiries regarding its trees, this Guide has been written to clarify the responses the Council will make to a range of enquires commonly made by citizens. The Guide helps to provide a consistent response to citizens and inform them of the usual response that can be expected to typical tree related enquiries.

People often live in close proximity to trees, particularly in urban areas. These trees are either their own or their neighbours'; quite commonly belong to the Council. Trees can cause inconvenience to citizens when they grow near dwellings, and a dilemma may occur when the tree makes an important contribution to the local environment but also causes inconvenience to those living nearby.

It is not possible to anticipate every situation therefore it is important that these aims and principles of the Urban Forest Strategy will be the guiding principles of all future decisions. It is recognised that the implementation of the UFS will lead to the formulation of a new routine maintenance programme. It is anticipated that the majority of all routine service requests will be dealt with as part of this maintenance programme.

However it should be noted that whilst we intend to use the UFS as our guiding principle there will always be some circumstances that require individual assessment and therefore the principles should not be considered absolutely prescriptive.

The common elements that will be considered in reaching the Council's decision will include the law, industry good practice, common practice amongst our local authority peers, and affordability. This Guide will be applied when responding to enquiries complaints and requests for service and in the formulation of routine maintenance programmes.

Individual principles and policy should not be considered in isolation, but all relevant ones should be taken into account when reaching a decision which most closely matches the overarching vision.

Benefits of Trees in the City

Trees have long been held a valued place in the urban environment, though, as greater pressure is being exerted on using urban land, space available to trees is becoming more limited. Early planting in the city would have been to improve the visual landscape, disguise some of the uglier parts of a busy industrious city. The city's forebears recognised the restorative value of trees, and their benefits to people's well-being. Since then research has been able to substantiate, the observations of these early visionaries, as well as many other, important benefits of trees in a modern urban environment.

The urban forest helps to define the character of Nottingham just as much as the architecture and fabric of particular communities will, for example the London planes in the Boulevards, the Park Estate and Mapperley Park. Now recognised for their breadth of benefits, trees in the urban environment continue to be relevant and an important component of a sustainable city. Though it is also recognised that care and maintenance is needed if trees are to fulfil their role without becoming a nuisance to neighbours, or a potential hazard

Trees and People

- Beautiful in their own right, providing colour and form to the landscape, also helping to mark the change of seasons.
- Create more pleasant environments, which have positive effects on people's behaviour, bringing about stronger and more stable communities
- For recreation, the urban forest, offers benefits to children, allowing creativity of mind, encourages exploration and adventure, promotes physical activity, builds resilience and enhances experiential learning.

Health Benefits of Trees

- Positive effects on people's wellbeing and can encourage hospital patient recoveries, reducing the amount of time spent in hospital.
- Tree and woods are now promoted as "nature's health service". The restorative effects are greatest for those who actively interact in the natural environment, but even just viewing trees and nature through window can have psychological benefits.

- The canopy formed by trees has indirect human health benefits, their shade during hot summer days to a reduce heat related illnesses.

Trees and Noise

- Often it is not possible to provide effective barriers to noise, in these instances trees may be able to provide a visual screen between the source of noise and hearer. Whilst the sound reduction is negligible the lack of direct view creates the impression of greater noise reduction.

Trees and Urban Regeneration

- Trees help improve the environmental performance of buildings – increasing tree cover in a well planned development can lower heating and cooling costs by 20%
- Tree canopies and root systems play a key role in mitigating flood levels during extreme events and have the ability to lower storm water flows into the existing drainage infrastructure and so reducing the risk of damage
- Tourism and city marketing can be boosted by a good quality urban forest as recognised by “Green Flag” awards. Green Flag urban parks can be marketed as city attractions and will provide attractive settings for various events and activities which will boost the local economy.
- Tree planting in streets has been shown to directly enhance and improve the neighbourhood aesthetics and may increase property values by 7 – 15%

Effects of Climate Change

Climate change is now recognised as one of the most serious challenges facing us today and its potential impacts for trees and forests are well documented. The UK climate change scenarios indicate average annual temperature increases could be 4.5°C by 2080. However, these scenarios do not take urban surfaces into account, which have the potential to further increase these predicted temperatures due to the urban heat island effect.

- the urban forest helps to mitigate the Urban Heat Island effect by; transpiration (helping to reduce day and night-time temperatures in cities, especially during summer), canopy shade (canopies provide shade for buildings, streets and footpaths and reflection (leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day).
- During photosynthesis trees convert carbon dioxide and water into sugar and oxygen and then sequester (store) the carbon, making a significant contribution toward absorbing carbon from the atmosphere, and emit the oxygen we all breath.
- The urban forest helps urban areas adapt to the impact of climatic change regardless of whether they are in parks, private gardens or street trees, but the space, size, quality and vegetation type and proportion of coverage all influence the level of impact. Open space within towns and cities, rather than as a green belt, might be more effective in helping adaptation.
- Atmospheric particulates (emissions from industry and vehicles have been linked to increased incidences of illness in people (eg asthma and allergies). Trees have an important role in combating (mitigating) these effects. Some are absorbed and used as

part of the trees growth processes, other, larger particulates are filtered from the atmosphere by attaching themselves to leaves. The closer trees (and greater their canopy) are to the sources of pollution the greater their contribution and benefits

Trees and Storm Water

Urbanization changes many attributes of the land that is developed and built upon. One of these is a reduction in the permeability of surfaces leading to changes in patterns of runoff and increased loads of pollutants entering water courses.

- Tree canopies and root systems reduce storm water flows and nutrient loads that might otherwise end up in our waterways. Broad canopies intercept and mitigate the impact of heavy rainfalls and healthy, fibrous, tree roots help reduce the nitrogen, phosphorus and heavy metal content in storm water

Trees and the Natural Environment

- A healthy and sustainable urban forest will increase biodiversity in the city, becoming a home or roost to a wide range of species; even endangered animals and other biological species of high conservation value.
- All trees support a range of other wildlife which either feeds directly on the tree itself, or indirectly on something else which is feeding on the tree, even the smallest sapling

More detail of the benefits from the urban forest, and the Council's approach to managing it for the benefits of Nottingham's citizens and visitors can be found in the Urban Forest Strategy available at the council's website. To provide these benefits, trees need space above and below ground to grow, and to be properly cared for. The Council has a cyclical program of tree inspection, resulting in the scheduling of essential maintenance works. All work is assessed on the risk of injury posed by the tree, the available resources and prioritised accordingly.

2. TREES AND CONSULTATION

Trees can evoke positive as well as negative responses from people. They are a valued part of the local landscape, giving the impression of permanence, however, to maintain them in good condition, or when there is no practical alternative, they require removal. It is not always obvious to the lay person why work is being carried out so a process to consult and advise on sensitive works, will help to allay local concerns and inform citizens.

Consultation in regard to tree work and tree management generally will take one of two forms:

- **Consulting**

Active engagement with citizens and community organisations to make sure their opinions, comments and objections are fully considered, and the appropriate changes made prior to implementation.

- **Advising**

Informing citizens and community organisations of the intended works and the rationale. This will take place using the Council's Consultation hub good practice guidance.

With a tree population of over an estimated 110,000 trees and a continual, all year round program of tree maintenance it is not viable for the Council to advise in every instance. In the Urban Forest Strategy, Principle 12 states the Council will:

“Encourage and enable greater awareness and better understanding of tree and wood management, in order that community consultation and involvement is encouraged.”

And includes amongst its priorities:

- **The Council will seek to consult and involve local communities in new planting proposals.**

New planting is at the heart of the success of the Urban Forest Strategy, in particular achieving a sustainable urban forest and the target of increasing the canopy cover across the city. New planting is distinct from replacement planting – it creates new tree features where there were none for several years.

Replacement planting is sustaining the existing urban forest, replacing trees which have had to be removed because they were no longer suitable in the city. Replacing a tree is not always possible quickly after removal, and it is not always practical at precisely the same position. Therefore replacing a tree is deemed to be planting:

- In the vicinity (eg same or neighbouring street or same open space).
- Fulfilling the replacement ratio 2:1 (two for each one removed).
- Within five years of the removal of the previous tree.

When replacing street trees the immediately adjacent properties will be advised of the planting. In all instances replacement planting will continue as part of the work program.

- **The Council will publicise its programme for planned tree works on its website and inform community organisations and ward councillors in advance of the works; setting out the type of work to be undertaken and why it is required. The Council will also notify the Highways**

Authority in advance of carrying out any tree works or excavations within the highway or footway.

The Council has routine tree inspections program, both to discharge its duty of care and to be a good neighbour, trying to identify the occasional problems that may arise from trees and proactively resolve them. It is often at the start of a program that the impact of carrying out work arouses most comment that arises from that. The inspections assess the condition of all the trees in an area and are the most efficient and economical way of managing the trees stock. The works are prioritised to match available resources, with health and safety the highest priority.

The condition inspection has two aspects to resolve:

1. Foreseeable dangers.
2. Possible nuisance and inconvenience the tree may cause to citizens and property.

In the instances where the work is carried out for health and safety, to protect property or the city's infrastructure, or to resolve the nuisances set out elsewhere in this guide the council will advise the community by contacting ward Councillors and posting the work program on its website.

Urgent health and safety work will continue to be carried out as soon as is practicable. The Council maintains a record of why such work is carried out and will advise retrospectively to any enquiry.

When the work identified spreads beyond this, changing the method of pruning and permanently changing the appearance of the trees consultation with the community will take place.

As well as the cyclical maintenance program, the Council follows up requests and complaints from citizens to assess individual or small groups of trees. Normally the enquirer will be the citizen living or working in closest proximity to the tree(s) and therefore discussion and response to the citizen will be deemed to be the consultation.

- **Where practical the Council will place a notice on any tree which is scheduled to be removed ten working days in advance of tree removal and will inform residents adjacent to the tree by letter, unless:**
 - **The tree has become dangerous and needs to be removed as a matter of urgency;**
 - **The tree is obviously dead;**
 - **The tree is part of a wider management scheme that has been publicised elsewhere or**
 - **placing of a notice is impractical.**

Trees are only removed as a last resort, and even then the Council will seek to replace them.

Whenever practicable a site notice, normally completed on site at the time of the inspection, will be attached to the tree, and advise neighbours of the reason the tree needs to be removed and giving an indication when the removal will take place.

If a removal and replacement program is scheduled the consultation with the local community will take place before the program starts.

3. PUBLIC SAFETY

Annex 1 Tree Safety Management Plan to the **Urban Forest Strategy** shows how the Council's duty of care to manage the tree stock is discharged, either as a consequence of a routine cyclical survey or as a response to a specific request for a tree inspection.

Unfounded tree fears

There are a number of popularly held, but none the less unfounded, fears concerning trees including for example:

the tree is swaying in the wind, or
the tree is too big.

The tree is swaying in the wind

Tree branches and stems have adapted a natural response to the effect of wind: to flex and bend. If the branches and stem were to remain rigid the branch union with the stem would be put under extraordinary pressure and would be likely to snap.

The Council will check that the swaying is the normal response to wind, however the unfounded fear that "the tree is swaying in the wind" **will not** result in any pruning or removal.

The tree is too big

Trees will grow as tall and as wide as the local conditions will allow, this is not always as tall as suggested in the guide books. The size of the tree's canopy should not be a cause for concern on its own.

Factors influencing tree growth include:

the soil conditions, including its chemical composition, the availability of water and oxygen in the soil that may be exploited by the tree's roots, the security of the tree's "anchor" in the ground
the available soil volume to develop a healthy root system
the local climate – not too hot or too cold, the right amount of rainfall at the right time of year,
the available sunlight
exposure – which may be quite extreme in an urban setting
local pollution

The unfounded fear that "the tree is too big" **will not** result in any pruning work because such action will create long-term problems, will leave the tree looking unsightly and anyway is unlikely to have the desired effect.

A clear and foreseeable threat

If the Council believes that there is a clear and foreseeable threat to the personal safety of residents or visitors, or of harm to property, which is directly related to the condition of a Council-managed tree, then the appropriate action will be taken to minimise that threat.

Threats that are an indirect consequence of the tree (e.g. slippery leaves on the pavement in autumn) will only be dealt with in extraordinary circumstances and when no other options are available.

Obstruction of the highway

The Council will seek to ensure that adequate overhead clearance of the highway for the type of traffic using that highway is maintained at all times. Complaints about low branches over the highway will be considered and acted upon.

Obstruction of public lighting and signs

The Council will endeavour to ensure that trees under their management do not obscure road signs or prevent street lamps from illuminating the highway.

The purpose of street lamps is to illuminate the public highway and where adequate illumination of the highway is present the Council **will not** normally take action to improve the levels of illumination of private property.

4. ROOT DAMAGE AND SUBSIDENCE.

Annex 3 Nottingham’s Response to Tree Root Claims to the **Urban Forest Strategy** sets out how the Council will manage its trees to lessen the risk of subsidence-related damage to properties, and how it will respond in the event of such occurrences being reported to it.

Cases of alleged root damage will be considered on an individual basis. A balance will be struck between the nuisance experienced by individuals and the benefits offered by the tree to the wider community.

Subsidence

The Council is responsible for an estimated 110,000 individual trees and over 150 hectares of woods in the City, and every year there will be a very small number of potential claims for subsidence damage resulting from tree root encroachment.

Where it is alleged that building movement due to the shrinkage of clay soils has occurred then the Council will require that an adequate assessment, including cyclical monitoring, is undertaken to demonstrate that a Council-managed tree is involved – such evidence must be submitted in support of any request for action.

Requests for action based on an unquantified possibility of damage occurring at an unspecified point in the future will not be considered.

Tree related subsidence damage is a complex issue and each case will need to be considered on an individual basis, in accordance with **Nottingham’s Response to Tree Root Claims**.

Drain blockage

Roots of any plant (be it a tree or a shrub) will only grow where conditions are suitable, and the conditions required include an adequate supply of water and oxygen in the soil pores. Roots cannot cross the barrier of unsuitable growing conditions in search of better conditions.

It is not uncommon to see a mass of roots surrounding a pipe, providing that pipe is in good condition they are not able to break into it, but they may exploit an existing fault provided that the conditions are suitable; they may not tolerate certain pollutants or levels of pollution for example.

The removal of one particular tree will not prevent the roots of other vegetation from exploiting the same opportunity. The appropriate way to deal with root blockage of drains is to ensure that the drains are watertight.

Action **will not** be considered in response to complaints that Council-managed trees are blocking drains.

5. TOPPING AND LOPPING

Topping is not cost-effective tree management and does not provide a solution to perceived problems. The on-going maintenance of the tree will cost the owner more, in money and in time, than the alternative of using more appropriate and sympathetic crown management techniques.

Topping often removes a large proportion of a tree's crown and leaf area in one operation and will seriously weaken the tree by reducing its ability to produce chemical defences, for example by hindering the production of energy through photosynthesis. A tree with insufficient stored energy reserves may die as a consequence. Moreover, the pruning wounds seldom heal, and so the tree's inner tissues are exposed to the risk of disease and insect pests.

Another concern is that post-topping, to compensate for the loss of leaf area, trees will often respond by putting out a profusion of dense, upright shoots from the cut wound surface. This new growth sprouts from latent buds located just below the bark and concentrated around the wounds. These shoots are only weakly attached to the wood from which they have emerged and so they are very prone to breaking off, particularly in high winds. Topping may therefore create a hazardous situation at a significant height, and serious injury or damage to property may occur as a consequence of branch union failure; rather than reducing the perceived danger of a tree that is too tall, topping is likely to make a tree a greater risk.

Topping also destroys the natural form and grace of a tree for ever; a topped tree appears disfigured and mutilated, especially when it is without leaves during the winter. The tree will not recover its natural habit and gains something of the appearance of a porcupine!

Another concern is that a topped tree, should it survive, will often quickly grow back to its original height with a denser crown faster than a properly pruned tree. In other words, topping, in the long term, is unlikely to have the desired effect of reducing the size of a tree. Moreover, the tree is likely to need pruning again when, within a few years, it regains or surpasses its old size, or its new branches break or become a hazard.

For these reasons the Council will not carry out lopping and topping of its trees. Where it is acknowledged that work is required to the tree the Council's arboriculturalists will advise accordingly.

6. TREES OBSTRUCTING VIEWS, DAYLIGHT AND MEDIA RECEPTION.

Trees obstructing views

Whilst the occupant of a property may wish to have a more expansive view across neighbouring land, there is no legal right to a view, and it should be remembered that trees and other vegetation are frequently planted as a screen, to obscure nearby properties, increasing privacy and providing a more naturalistic environment.

The Council **will not** take action to create or maintain a view.

Daylight loss

Action will normally only be considered where the separation between the tree trunk and the window of the nearest habitable room (dining room, lounge, kitchen, study or bedroom but specifically excluding WCs, bathrooms, utility rooms, landings and hallways) is less than 6m for trees with a height of over 12m, or less than half the height of the tree for smaller trees, or where the separation between the edge of the canopy and window is less than 2m. The work prescribed will maintain the tree's overall form and shape and normally be limited to selective reduction of branch tips and some crown lifting.

Where a situation falls within these guidelines cases will be prioritised according to proximity and account will also be taken of the orientation of the affected window and available resources.

Reception for television, satellite and other telecommunication equipment.

A TV licence is a permit to operate a television receiver, it does not guarantee any reception; there is no legal right to reception. In many cases it will be possible to resolve issues of poor television reception that may involve trees by adopting an engineering solution.

In general providers of terrestrial and satellite equipment cannot expect the Council to prune trees to improve or gain reception. The Council will only consider requests to prune trees to improve reception when all the following criteria have been met:

- efforts to find an engineering solution to the problem have been exhausted and unsuccessful, and
- the tree work required is consistent with good arboricultural practice and will not unduly affect the amenity or health of the tree, and
- the tree work required can be executed within current financial constraints.

7. TREES AND NATURE

Trees can arouse strong emotions. Some people will be fiercely protective of them, perhaps because of the tree's size, historical or aesthetic value. Other people will hold equally strong feelings, but of animosity and a determination to see the tree removed or at least reduced in size. The reasons for this animosity might include the spectre of damage to property, loss of light and the shedding of branches, leaves and fruit.

Pollen, petals, fruits, seeds and leaves.

Trees will naturally shed pollen, petals, fruits, seeds and leaves which will drop to the ground, or be carried freely on the wind – their movement is outside the control of the Council. The clearing of leaves from gutters and pathways and weeding of self-set seeds are considered to be normal, routine, seasonal maintenance which property owners are expected to carry out.

The Council **will not** consider action to alleviate the problems that may be associated with shed pollen, petals, fruits, seeds and leaves.

Birds and other wildlife.

Trees provide a habitat for many animals and other plants, as a source of food, or by providing shelter to nest or roost.

If you are troubled by bird-droppings from a Council-managed tree then pruning will not provide a solution, as the birds will continue to sit on the remaining branches.

The Council **will not** consider tree removal as a way of alleviating the problems associated with bird nesting or roosting.

Honeydew.

Honeydew is not produced by the tree, it is a sticky deposit of almost pure sugar solution excreted by aphids and other plant sucking insects. Aphid populations can increase very rapidly with the result that a large deposit of honeydew may create a sticky residue beneath affected trees and plants.

The Council **will not** consider pruning as a way of alleviating the problems associated with aphid and honeydew problems. The cleaning of affected surfaces should be considered to be routine maintenance.

Grey squirrels.

To the arboricultural professional grey squirrels are destructive, opportunistic rodents (with incisors that continually grow and must be kept in check by gnawing) that are very well adapted to exploit both urban and suburban habitats; they can range for up to 10 hectares. To the general public they are both enchanting and endearing.

In the wild grey squirrels strip the bark of thin barked trees like the limes, sycamore and Norway maple damaging the trees, and eat fruit, nuts and seeds. They will bury the seeds from trees such as oak, beech chestnut and walnut and then dig them up again: often the seed's growth point will have been destroyed before it is buried. In urban and suburban areas they will continue to damage trees but also dig up and eat bulbs, buried seeds, and damage soft fruit crops (and their protective cages), raid bird feeders and scavenge from wheelie bins and other sources of food waste.

Squirrels are good climbers and can access buildings by scaling walls, aided by such things as loose cabling, outbuildings, boundary fences etc. Squirrels will take up residence in houses, garages and sheds: the hazard they pose is that they may gnaw through electrical wiring, lead or plastic pipe, roof timbers or felt, a number of house fires have been attributed to their activities. A sufficiently wide gap between a tree's canopy and an "at risk" building may dissuade grey squirrels from jumping onto the building, and then entering. Tree removal may displace grey squirrels from one site, forcing them to take refuge elsewhere, and so will not provide a sustainable solution.

The Council **will** prune trees to provide a clearance of 2 to 3m from buildings, but **will not** consider tree removal as a way of alleviating the problems associated with grey squirrels.

The Council's position regarding squirrels on green space or within trees is that they are considered to be in their natural environment, and therefore, we cannot deal with squirrels or their habitat if they are outside. The Council will deal with squirrels within buildings and provide advice on excluding squirrels, sealing access points and generally proofing the building to prevent the squirrels getting back in.

If you require further information and advice regarding the proofing of your property against squirrels please contact the Pest Control Team.

8. SOLAR PANELS AND TREES

Context

The use of solar power to generate electricity, at a significantly reduced environmental cost when compared with traditional forms of electricity generation such as fossil-fuel power stations, has been recognised as a useful tool to help combat the impact of climate change.

Incentives, such as the Feed-in-Tariff, have been used by government to encourage the installation of solar panels as a low carbon energy source for one of two outputs, electricity generation and the provision of hot water. The number of solar panels has, in consequence, proliferated.

The obstruction of solar panels

Prior to the installation of the panel the provider's survey will have noted anything that may obstruct direct sunlight from reaching the panel's surface, such as neighbouring buildings, chimneys or trees. Above a certain threshold for future obstruction or light loss the provider will need to carefully consider the decision over whether and where to site the panel. It is therefore an implicit assumption for the Council that the positioning and installation of the panel, often on roofs, will have ensured that the panel will be able to operate at a high level of efficiency over a long period: the panel will be optimally positioned so that it can receive as much sunlight as possible throughout the day and its operational life.

Therefore, provided that the pre-installation survey has been competent the likelihood that a Council-managed tree will obstruct the panel should not arise.

Solar panels and tree work

Action will not normally be taken by the Council to improve solar access to a panel on these grounds:

a pre-requisite for the installation of the panel would be an assessment that the panel was unlikely to be obstructed by Council-managed trees throughout its operational life, whilst the solar panel provides low carbon electricity and so is broadly environmentally beneficial the tree provides a range of amenity and environmental benefits too, and the solar panel will benefit the householder with the generation of low cost energy whilst the management of the Council's tree stock is at the tax payer's expense and for wide community benefit.

A request from a citizen or Councillor to remove or prune a Council-managed tree that is apparently obstructing a solar panel will only result in action after a site visit by the Tree Officer or another responsible officer, who has confirmed that action is acceptable, advisable and appropriate, no one action will be regarded as precedent.

The cost of the inspection and any action that is taken will be charged to the householder.

Justification

The use of solar panels to generate low carbon electricity is recognised as a good thing, reducing the environmental costs associated with traditional forms of electricity generation, and so is broadly welcomed.

However, to remove part or all of a Council-managed community tree, which provides a broad range of benefits to a large group of people, in favour of low carbon energy production at low cost for an individual household, is not considered to be environmentally beneficial, overall.

9. VEHICLE CROSS-OVERS AND TREES

A request for a cross over may result in one of the following outcomes:

Cross-over can be constructed without any impact upon trees

Cross-over may be constructed but will require remedial tree works (root or branch pruning)

Cross-over may be constructed but will require the removal and replacement of a tree or trees


Cross-over can not be constructed because of adverse impact upon important trees

In order to ease access to the front garden from the road the highway engineers will require that the kerbs be dropped for an appropriate distance, at the householder's expense, and that the kerb and footway be made good. This will require the engineers to make allowances for any underground services (such as connections to the house from the main electricity, gas, telephone or water supply, or sewers running from the house to the main drains) which may need to be buried deeper or protected in some other way from possible damage that may be caused by vehicle movements.

Trees may complicate the picture, not because of their crowns, but because their roots, growing beneath the pavement, need to be kept alive in order to absorb enough oxygen and water from the soil to sustain the foliage, and develop a strong root system to keep the tree secure and upright.

Tree issues can generally be satisfactorily overcome, and only in a very few cases the presence of a tree will prevent a crossover from going ahead.

In some cases the location of the crossover will not pose any threat to a tree's roots and the Council will not object to the crossover. In other cases the presence of a tree will be accommodated by perhaps shifting the crossover slightly or alternatively by root pruning and compensatory crown pruning. In certain cases the Council may allow a tree to be removed to allow a crossover to be constructed, having taken the advice of its arboriculturalists, and in a very few cases the presence of a tree will prevent a crossover from going ahead. The applicant will be required to pay the full cost of any tree or root pruning works which may be deemed necessary by the Council.

City Council Size Category	Trunk Diameter (at 1.2 m above ground)	Protective Distance (radius from edge of trunk)
Very small  Very large	Young, staked, tree	1 m
	Up to 18 cm, no stake	2 m
	19 – 35 cm	4 m
	36 – 50 cm	5 m
	51 – 60 cm	6 m
	61 – 75 cm	8 m
	75 cm +	10 m

The Council has developed guidance to indicate how near to the trunk of a tree the closest excavation required for the crossover may be, without adversely affecting the tree. Note: this includes all the preparatory works, not just the edge of the finished crossover. If the proposed

crossover is closer than the Protective Distance prescribed in the table then applicant must refer to the Council's arboriculturalists for advice.

The Council may allow root pruning to be carried out to remove particular roots from within the area of excavation to allow a crossover to proceed in exceptional circumstances where this does not affect the health or stability of the tree. All works in the vicinity of root must conform to the guidance of NJUG 4, namely

- 1 roots, whilst exposed, should be wrapped in dry, clean hessian sacking to prevent desiccation and to protect from rapid temperature changes,
- 2 roots smaller than 25 mm diameter (i.e. narrower than a thumb) may be pruned back, preferably to a side branch, using a sharp proprietary cutting tool such as secateurs or handsaws,
- 3 roots larger than 25 mm diameter (i.e. wider than a thumb) may only be severed following consultation with the Council's arboriculturalist, as they may be essential to the tree's health and stability,
- 4 prior to backfilling, any hessian wrapping should be removed and retained roots should be surrounded with sharp sand (builders' sand should not be used because of its high salt content which is toxic to tree roots), or other loose granular fill, before soil or other material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

For each tree that has to be removed, to make way for the crossover, the Council will require that the applicant pay for their replacement with two container grown trees, of at least 12 – 14 cm girth, the species and location of the planting to be specified by the Council's arboriculturalist.

Further guidance is contained in:

British Standard 5837 2005: Trees in relation to construction – Recommendations
British Standards Institution
September 2005

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees, Volume 4 issue 2
National Joint Utilities Group Limited
November 2007

APPENDIX 1: SUMMARY OF URBAN FOREST STRATEGY AIMS AND PRINCIPLES.

The aims and principles of Nottingham's Urban Forest Strategy are summarised into its vision:

“CREATE AN URBAN FOREST THAT IS DESIGNED AND MANAGED SUSTAINABLY, FOR THE BENEFITS OF NOTTINGHAM’S COMMUNITIES.”

To achieve the vision two aims have evolved, to create Nottingham's urban forest, each with its own guiding principles:

- **AIM 1: TO DESIGN A SUSTAINABLE URBAN FOREST**
- **AIM 2: TO MANAGE A SUSTAINABLE URBAN FOREST.**

Decision making involves many factors, which sometimes can appear contradictory. These are set out below as the principles which will guide the decision making that will enable the city to achieve its vision and target.

- **PRINCIPLE 1: ENSURE THAT THE TREE AND WOOD POPULATIONS ARE PROTECTED, ENHANCED AND, WHERE APPROPRIATE EXPANDED**
- **PRINCIPLE 2: MAINTAIN TREES AND WOODS IN ACCORDANCE WITH LANDOWNERS OBLIGATIONS, WITH PARTICULAR ATTENTION FOR THE SAFETY OF PEOPLE AND PROPERTY**
- **PRINCIPLE 3: MANAGE TREES AND WOODS IN A MANNER WHICH BENEFITS LOCAL COMMUNITIES, WHILST ENSURING PROBLEMS ARE PROMPTLY AND APPROPRIATELY DEALT WITH.**
- **PRINCIPLE 4: ENCOURAGE NEW AND REPLACEMENT TREE AND WOOD PLANTING, USING APPROPRIATE TREE SPECIES**
- **PRINCIPLE 5: THE REMOVAL OF TREES AND WOODS SHALL BE RESISTED, UNLESS THERE ARE SOUND ARBORICULTURAL OR OTHER REASONS TO INDICATE OTHERWISE.**
- **PRINCIPLE 6: MANAGE ITS WOODS IN A FULLY SUSTAINABLE MANNER.**
- **PRINCIPLE 7: ALL TREE AND WOODLAND MANAGEMENT DECISIONS WILL TAKE APPROPRIATE ACCOUNT OF CLIMATE CHANGE, AND NATURAL ENVIRONMENT PROTECTION**
- **PRINCIPLE 8: PROVIDE A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION TO INDUSTRY AND PEER BEST PRACTICE STANDARDS AND ACT AS AN EXAMPLE FOR OTHERS TO FOLLOW.**
- **PRINCIPLE 9: RESPOND TO TREE WORK APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
- **PRINCIPLE 10: RESPOND TO PLANNING APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
- **PRINCIPLE 11: APPLY RESOURCES IN A CONSIDERED MANNER TO ENSURE GREATEST COMMUNITY BENEFIT AND TO MEET ITS OBLIGATIONS**
- **PRINCIPLE 12: ENCOURAGE AND ENABLE GREATER AWARENESS AND BETTER UNDERSTANDING OF TREE AND WOOD MANAGEMENT, IN ORDER THAT COMMUNITY CONSULTATION AND INVOLVEMENT IS ENCOURAGED.**

**Urban
Forest
Strategy**

**Nottingham's Response to
Tree Root Claims**

**Annex 3
October 2012**



**Nottingham
City Council**

INTRODUCTION.

This **Nottingham's Response to Tree Root Claims** guide to selecting and planting trees forms an integral part of the Council's **Urban Forest Strategy**, and shall be applied in accordance with the strategy's aims and principles. The vision for Nottingham's urban forest is:

“Create an urban forest that is designed and sustainably managed for the benefits of Nottingham's communities.”

To achieve this, the city has set the target of increasing the urban forests canopy cover from its current level of 14% to 18% by 2030. To delivery this 12 principles (core policies) have been adopted. Nottingham's Response to Tree Root Claims is part of the Council's response to Principle 2 in particular, though all 12 are relevant in any consultation and decision making:

“Maintain trees and woods in accordance with landowners' obligations, with particular attention for the safety of people and property.”

The aims and principles of the Urban Forest Strategy are shown in appendix 1. More details can be found in the Strategy, available on the Council's website.

First published in 1992 the London Tree Officer Association “A Risk Limitation Strategy for Tree Root Claims” was developed to provide a consistent and efficient response to claims. This was developed in collaboration with a broad range of partners, including arboricultural consultants, and representative of the insurance and structural engineer industries. This has since been updated and is currently published as 3rd Edition 2008, a copy of which is also available on the Council's website.

The Risk Limitation Strategy recommends that:

- Local authorities instigate a regime of cyclical pruning of council tree stock in areas predisposed to building movement where this is appropriate.
- Local authorities provide dedicated resources for dealing with subsidence generated claims directed at council owned trees.
- Local authorities instigate a regime of selective removal and replacement of street tree stock in areas predisposed to building movement where this is appropriate.
- Local authorities challenge unwarranted claims based on poorly investigated or inaccurate evidence.

It should be emphasised that many trees and buildings co-exist quite happily. In Nottingham the volume of tree root claims is relatively small compared to other cities, but each claim can be stressful to the claimant if their home is damaged and they do not fully understand what is happening to assist in finding the right resolution. The Risk Limitation Strategy sets out a

consistent approach to handling claims and explains what evidence is needed and what can be done to resolve the claim.

All claims regarding trees in the Council's ownership are handled by the Council's Claims Section, Nottingham City Council, Loxley House, Station Street, Nottingham, NG2 3NG. It is the claimant's responsibility to substantiate their claim, providing the evidence, the Council will consult with appropriate colleagues and professionals in consideration of the claim.

Cases of alleged root damage will be considered on an individual basis. A balance will be struck between the nuisance experienced by individuals and the benefits offered by the tree to the wider community.

Subsidence

The Council is responsible for an estimated 110,000 individual trees and over 150 hectares of woods in the City, and every year there will be a very small number of potential claims for subsidence damage resulting from tree root encroachment.

Where it is alleged that building movement due to the shrinkage of clay soils has occurred then the Council will require that an adequate assessment, including cyclical monitoring, is undertaken to demonstrate that a Council-managed tree is involved – such evidence must be submitted in support of any request for action.

Requests for action based on an unquantified possibility of damage occurring at an unspecified point in the future will not be considered.

Tree related subsidence damage is a complex issue and each case will need to be considered on an individual basis, in accordance with [Nottingham's Response to Subsidence Claims](#).

Drain blockage

Roots of any plant (be it a tree or a shrub) will only grow where conditions are suitable, and the conditions required include an adequate supply of water and oxygen in the soil pores. Roots cannot cross the barrier of unsuitable growing conditions in search of better conditions.

It is not uncommon to see a mass of roots surrounding a pipe, providing that pipe is in good condition they are not able to break into it, but they may exploit an existing fault provided that the conditions are suitable; they may not tolerate certain pollutants or levels of pollution for example.

The removal of one particular tree will not prevent the roots of other vegetation from exploiting the same opportunity. The appropriate way to deal with root blockage of drains is to ensure that the drains are watertight.

Action **will not** be considered in response to complaints that Council-managed trees are blocking drains.

Trees are described as “*dynamic, self-optimising structures*”, that is their size, form and shape is continually changing and adapting to the environment in which they grow. The, often massive, structure of a mature tree above ground, consisting of its trunk, branches, twigs, and foliage (leaves, flowers and fruit), uses and stores solar energy and gases from the atmosphere. Below ground the, far less obvious, extensive roots are equally efficient in absorbing the water and minerals. Together the above and below ground parts of the tree combine to produce the materials and compounds needed to sustain a healthy long lived organism.

Trees absorb carbon dioxide, and emit oxygen. A mature tree in one growing season emits as much oxygen as ten people inhale in a year.

The benefits and values of trees in the urban environment mostly relate to that which can be seen above ground. However, it is the ability of roots to function in the urban soil, which is often hostile to tree growth, but crucial to growing and maintaining healthy trees. It is the roots system which is frequently ignored and damaged by people's activities (such as excavation, construction and compaction), though it is also the roots, rather than the aerial parts of the tree that play biggest part in damaging adjacent infrastructure (lifting pavements or subsidence).

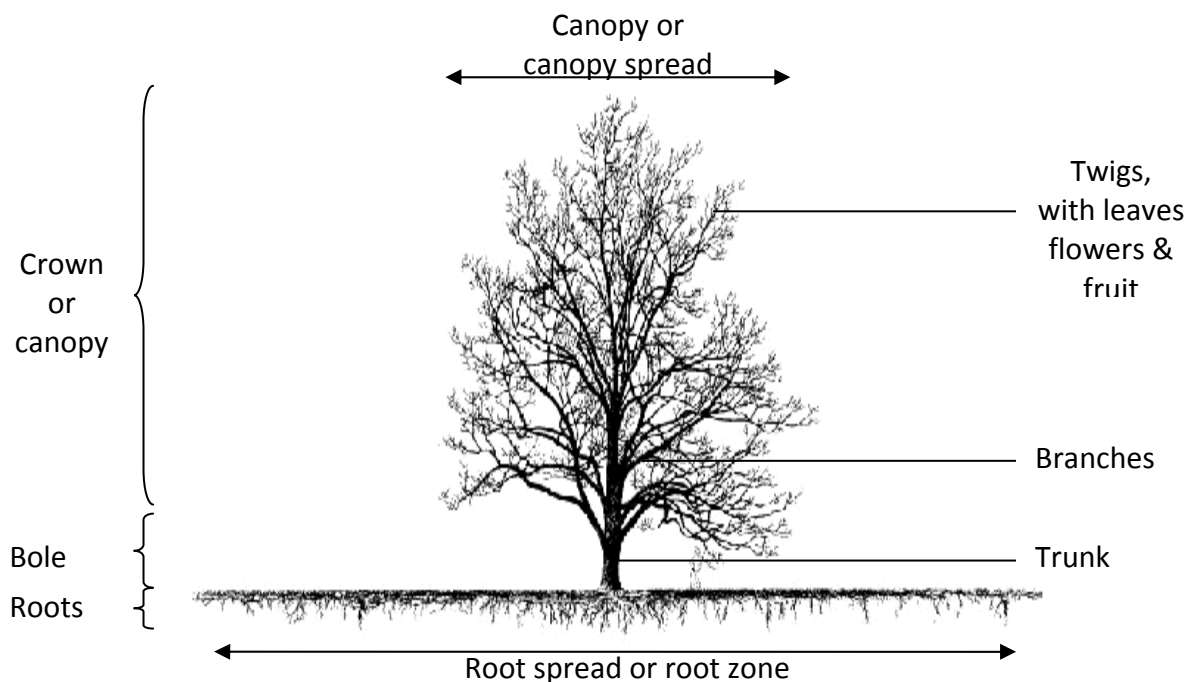


Diagram 1: Parts of the Tree

Despite their appearance of solidity and longevity, trees are easily damaged, and require all of its parts, both above and below ground to survive. For most trees under normal conditions, the root-shoot ratio is approximately 1:5; the top is 5 times heavier than the roots. If it were not for the weight of the trunk and structural branches, though, the top and roots would weigh about the same and of equal importance to the tree. The above diagram gives an indication of how a tree grows, the roots will spread out in a broad horizontal plane, just below the soil surface (they need

oxygen to survive so grow above the permanent ground water table, with the vast majority – 90%+ in the top 600mm of the soil).

Benefits of Trees in the City

Trees have long been held a valued place in the urban environment, though, as greater pressure is being exerted on using urban land, space available to trees is becoming more limited. Early planting in the city would have been to improve the visual landscape, disguise some of the uglier parts of a busy industrious city. The city's forebears recognised the restorative value of trees, and their benefits to people's well-being. Since then research has been able to substantiate, the observations of these early visionaries, as well as many other, important benefits of trees in a modern urban environment.

The urban forest helps to define the character of Nottingham just as much as the architecture and fabric of particular communities will, for example the London planes in the Boulevards, the Park Estate and Mapperley Park. Now recognised for their breadth of benefits, trees in the urban environment continue to be relevant and an important component of a sustainable city. Though it is also recognised that care and maintenance is needed if trees are to fulfil their role without becoming a nuisance to neighbours, or a potential hazard

Trees and People

- Beautiful in their own right, providing colour and form to the landscape, also helping to mark the change of seasons.
- Create more pleasant environments, which have positive effects on people's behaviour, bringing about stronger and more stable communities
- For recreation, the urban forest, offers benefits to children, allowing creativity of mind, encourages exploration and adventure, promotes physical activity, builds resilience and enhances experiential learning.

Health Benefits of Trees

- Positive effects on people's wellbeing and can encourage hospital patient recoveries, reducing the amount of time spent in hospital.
- Tree and woods are now promoted as "nature's health service". The restorative effects are greatest for those who actively interact in the natural environment, but even just viewing trees and nature through window can have psychological benefits.
- The canopy formed by trees has indirect human health benefits, their shade during hot summer days to a reduce heat related illnesses.

Trees and Noise

- Often it is not possible to provide effective barriers to noise, in these instances trees may be able to provide a visual screen between the source of noise and hearer. Whilst the sound reduction is negligible the lack of direct view creates the impression of greater noise reduction.

Trees and Urban Regeneration

- Trees help improve the environmental performance of buildings – increasing tree cover in a well planned development can lower heating and cooling costs by 20%
- Tree canopies and root systems play a key role in mitigating flood levels during extreme events and have the ability to lower storm water flows into the existing drainage infrastructure and so reducing the risk of damage
- Tourism and city marketing can be boosted by a good quality urban forest as recognised by “Green Flag” awards. Green Flag urban parks can be marketed as city attractions and will provide attractive settings for various events and activities which will boost the local economy.
- Tree planting in streets has been shown to directly enhance and improve the neighbourhood aesthetics and may increase property values by 7 – 15%

Effects of Climate Change

Climate change is now recognised as one of the most serious challenges facing us today and its potential impacts for trees and forests are well documented. The UK climate change scenarios indicate average annual temperature increases could be 4.5°C by 2080. However, these scenarios do not take urban surfaces into account, which have the potential to further increase these predicted temperatures due to the urban heat island effect.

- the urban forest helps to mitigate the Urban Heat Island effect by; transpiration (helping to reduce day and night-time temperatures in cities, especially during summer), canopy shade (canopies provide shade for buildings, streets and footpaths and reflection (leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day).
- During photosynthesis trees convert carbon dioxide and water into sugar and oxygen and then sequester (store) the carbon, making a significant contribution toward absorbing carbon from the atmosphere, and emit the oxygen we all breath.
- The urban forest helps urban areas adapt to the impact of climatic change regardless of whether they are in parks, private gardens or street trees, but the space, size, quality and vegetation type and proportion of coverage all influence the level of impact. Open space within towns and cities, rather than as a green belt, might be more effective in helping adaptation.
- Atmospheric particulates (emissions from industry and vehicles have been linked to increased incidences of illness in people (eg asthma and allergies). Trees have an important role in combatting (mitigating) these effects. Some are absorbed and used as part of the trees growth processes, other, larger particulates are filtered from the atmosphere by attaching

themselves to leaves. The closer trees (and greater their canopy) are to the sources of pollution the greater their contribution and benefits

Trees and Storm Water

Urbanization changes many attributes of the land that is developed and built upon. One of these is a reduction in the permeability of surfaces leading to changes in patterns of runoff and increased loads of pollutants entering water courses.

- Tree canopies and root systems reduce storm water flows and nutrient loads that might otherwise end up in our waterways. Broad canopies intercept and mitigate the impact of heavy rainfalls and healthy, fibrous, tree roots help reduce the nitrogen, phosphorus and heavy metal content in storm water

Trees and the Natural Environment

- A healthy and sustainable urban forest will increase biodiversity in the city, becoming a home or roost to a wide range of species; even endangered animals and other biological species of high conservation value.
- All trees support a range of other wildlife which either feeds directly on the tree itself, or indirectly on something else which is feeding on the tree, even the smallest sapling

More detail of the benefits from the urban forest, and the Council's approach to managing it for the benefits of Nottingham's citizens and visitors can be found in the Urban Forest Strategy available at the council's website. To provide these benefits, trees need space above and below ground to grow, and to be properly cared for. The Council has a cyclical program of tree inspection, resulting in the scheduling of essential maintenance works. All work is assessed on the risk of injury posed by the tree, the available resources and prioritised accordingly.

APPENDIX 1: SUMMARY OF URBAN FOREST STRATEGY AIMS AND PRINCIPLES.

The aims and principles of Nottingham's Urban Forest Strategy are summarised into its vision:

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To achieve the vision two aims have evolved, to create Nottingham's urban forest, each with its own guiding principles:

- **AIM 1: TO DESIGN A SUSTAINABLE URBAN FOREST**
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Decision making involves many factors, which sometimes can appear contradictory. These are set out below as the principles which will guide the decision making that will enable the city to achieve its vision and target.

- **PRINCIPLE 1: ENSURE THAT THE TREE AND WOOD POPULATIONS ARE PROTECTED, ENHANCED AND, WHERE APPROPRIATE EXPANDED**
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**Urban
Forest
Strategy**

**Nottingham's Guide to
Right Tree – Right Place**

**Annex 4
October 2012**



INTRODUCTION.

Nottingham's Guide to Right Tree – Right Place guide to selecting and planting trees forms an integral part of the Council's **Urban Forest Strategy**, and shall be applied in accordance with the strategy's aims and policies. The vision for Nottingham's urban forest is:

“Create an urban forest that is designed and sustainably managed for the benefits of Nottingham's communities.”

To achieve this, the city has set the target of increasing the urban forests canopy cover from its current level of 14% to 18% by 2030. To delivery this 12 principles (core policies) have been adopted. **Nottingham's Guide to Right Tree – Right Place** guide is part of the Council's response to Principle 3 in particular, though all 12 are relevant in any consultation and decision making:

“Encourage new and replacement tree and wood planting, using appropriate tree species.”

The aims and principles of the Urban Forest Strategy are shown in appendix 1. More details can be found in the Strategy, available on the Council's website.

This guide briefly sets out the key factors that will influence the selection, positioning and care of new trees. At the moment there is a new British Standard (draft title: ***BS8545 From Nursery to Independence in the Landscape***) in development. It is anticipated that this will be incorporated into this guide complementing and expanding upon and updating the advice.

Nottingham is a city of over 300,000 residents (for the Greater Nottingham area that figure is over 675,000) and the Council is responsible for an estimated 110,000 individual trees and over 150 hectares of woods in the City. This brings people into close proximity to trees in the urban area on a regular basis, so there is a need to ensure that the environment is managed appropriately and sustainably.

Trees are described as *“dynamic, self-optimising structures”*, that is their size, form and shape is continually changing and adapting to the environment in which they grow. The, often massive, structure of a mature tree above ground, consisting of its trunk, branches, twigs, and foliage (leaves, flowers and fruit), uses and stores solar energy and gases from the atmosphere. Below ground the, far less obvious, extensive roots are equally efficient in absorbing the water and minerals. Together the above and below ground parts of the tree combine to produce the materials and compounds needed to sustain a healthy long lived organism.

Trees absorb carbon dioxide, and emit oxygen. A mature tree in one growing season emits as much oxygen as ten people inhale in a year.

The benefits and values of trees in the urban environment mostly relate to that which can be seen above ground. However, it is the ability of roots to function in the urban soil, which is often hostile to tree growth, but crucial to growing and maintaining healthy trees. It is the roots system which is frequently ignored and damaged by peoples activities (such as excavation, construction

and compaction), though it is also the roots, rather than the aerial parts of the tree that play biggest part in damaging adjacent infrastructure (lifting pavements or subsidence).

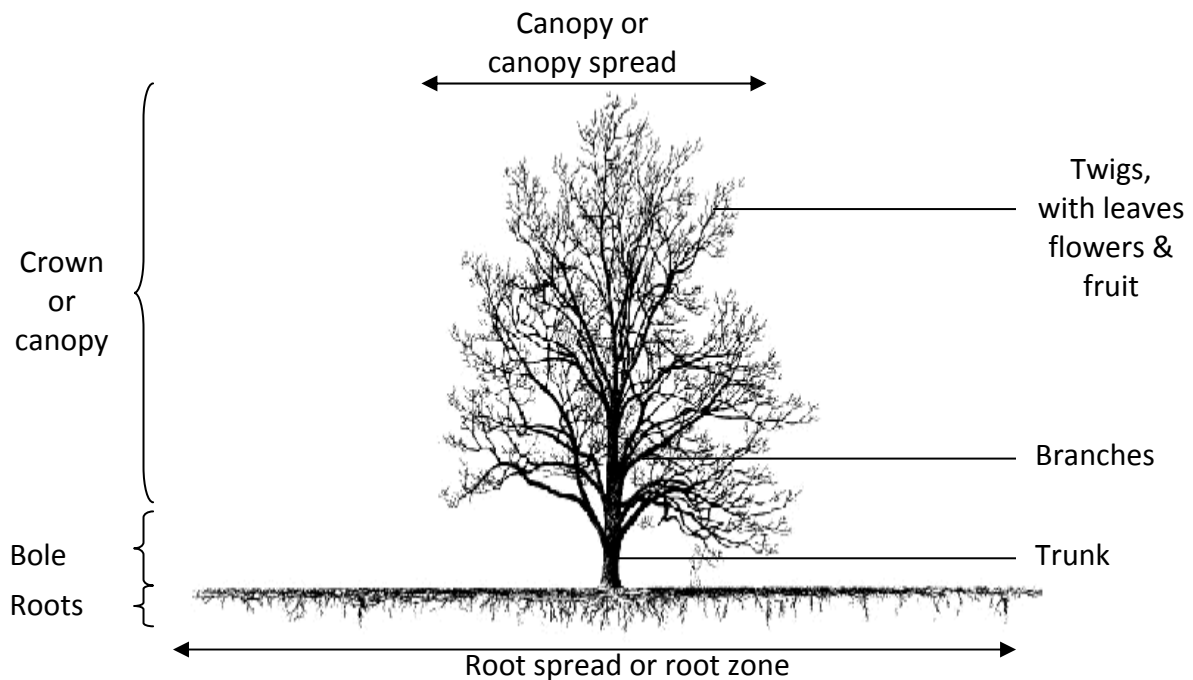


Diagram 1: Parts of the Tree

Despite their appearance of solidity and longevity, trees are easily damaged, and require all of its parts, both above and below ground to survive. For most trees under normal conditions, the root-shoot ratio is approximately 1:5; the top is 5 times heavier than the roots. If it were not for the weight of the trunk and structural branches, though, the top and roots would weigh about the same and of equal importance to the tree. The above diagram gives an indication of how a tree grows, the roots will spread out in a broad horizontal plane, just below the soil surface (they need oxygen to survive so grow above the permanent ground water table, with the vast majority in the top 600mm of the soil).

Benefits of Trees in the City

Trees have long been held a valued place in the urban environment, though, as greater pressure is being exerted on using urban land, space available to trees is becoming more limited. Early planting in the city would have been to improve the visual landscape, disguise some of the uglier parts of a busy industrious city. The city's forebears recognised the restorative value of trees, and their benefits to people's well-being. Since then research has been able to substantiate, the observations of these early visionaries, as well as many other, important benefits of trees in a modern urban environment.

The urban forest helps to define the character of Nottingham just as much as the architecture and fabric of particular communities will, for example the London planes in the Boulevards, the Park Estate and Mapperley Park. Now recognised for their breadth of benefits, trees in the urban environment continue to be relevant and an important component of a sustainable city. Though it

is also recognised that care and maintenance is needed if trees are to fulfil their role without becoming a nuisance to neighbours, or a potential hazard

Trees and People

- Beautiful in their own right, providing colour and form to the landscape, also helping to mark the change of seasons.
- Create more pleasant environments, which have positive effects on people's behaviour, bringing about stronger and more stable communities
- For recreation, the urban forest, offers benefits to children, allowing creativity of mind, encourages exploration and adventure, promotes physical activity, builds resilience and enhances experiential learning.

Health Benefits of Trees

- Positive effects on people's wellbeing and can encourage hospital patient recoveries, reducing the amount of time spent in hospital.
- Tree and woods are now promoted as "nature's health service". The restorative effects are greatest for those who actively interact in the natural environment, but even just viewing trees and nature through window can have psychological benefits.
- The canopy formed by trees has indirect human health benefits, their shade during hot summer days to a reduce heat related illnesses.

Trees and Noise

- Often it is not possible to provide effective barriers to noise, in these instances trees may be able to provide a visual screen between the source of noise and hearer. Whilst the sound reduction is negligible the lack of direct view creates the impression of greater noise reduction.

Trees and Urban Regeneration

- Trees help improve the environmental performance of buildings – increasing tree cover in a well planned development can lower heating and cooling costs by 20%
- Tree canopies and root systems play a key role in mitigating flood levels during extreme events and have the ability to lower storm water flows into the existing drainage infrastructure and so reducing the risk of damage
- Tourism and city marketing can be boosted by a good quality urban forest as recognised by "Green Flag" awards. Green Flag urban parks can be marketed as city attractions and will provide attractive settings for various events and activities which will boost the local economy.
- Tree planting in streets has been shown to directly enhance and improve the neighbourhood aesthetics and may increase property values by 7 – 15%

Effects of Climate Change

Climate change is now recognised as one of the most serious challenges facing us today and its potential impacts for trees and forests are well documented. The UK climate change scenarios indicate average annual temperature increases could be 4.5°C by 2080. However, these scenarios do not take urban surfaces into account, which have the potential to further increase these predicted temperatures due to the urban heat island effect.

- The urban forest helps to mitigate the Urban Heat Island effect by; transpiration (helping to reduce day and night-time temperatures in cities, especially during summer), canopy shade (canopies provide shade for buildings, streets and footpaths and reflection (leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day).
- During photosynthesis trees convert carbon dioxide and water into sugar and oxygen and then sequester (store) the carbon, making a significant contribution toward absorbing carbon from the atmosphere, and emit the oxygen we all breath.
- The urban forest helps urban areas adapt to the impact of climatic change regardless of whether they are in parks, private gardens or street trees, but the space, size, quality and vegetation type and proportion of coverage all influence the level of impact. Open space within towns and cities, rather than as a green belt, might be more effective in helping adaptation.
- Atmospheric particulates (emissions from industry and vehicles have been linked to increased incidences of illness in people (eg asthma and allergies). Trees have an important role in combatting (mitigating) these effects. Some are absorbed and used as part of the trees growth processes, other, larger particulates are filtered from the atmosphere by attaching themselves to leaves. The closer trees (and greater their canopy) are to the sources of pollution the greater their contribution and benefits.

Trees and Storm Water

Urbanization changes many attributes of the land that is developed and built upon. One of these is a reduction in the permeability of surfaces leading to changes in patterns of runoff and increased loads of pollutants entering water courses.

- Tree canopies and root systems reduce storm water flows and nutrient loads that might otherwise end up in our waterways. Broad canopies intercept and mitigate the impact of heavy rainfalls and healthy, fibrous, tree roots help reduce the nitrogen, phosphorus and heavy metal content in storm water.

Trees and the Natural Environment

- A healthy and sustainable urban forest will increase biodiversity in the city, becoming a home or roost to a wide range of species; even endangered animals and other biological species of high conservation value.
- All trees support a range of other wildlife which either feeds directly on the tree itself, or indirectly on something else which is feeding on the tree, even the smallest sapling

More detail of the benefits from the urban forest, and the Council's approach to managing it for the benefits of Nottingham's citizens and visitors can be found in the Urban Forest Strategy

available at the council's website. To provide these benefits, trees need space above and below ground to grow, and to be properly cared for. The Council has a cyclical program of tree inspection, resulting in the scheduling of essential maintenance works. All work is assessed on the risk of injury posed by the tree, the available resources and prioritised accordingly.

RIGHT TREE - RIGHT PLACE

Framework for the selection, planting and establishment of a sustainable urban forest.

Landscape Impact

Trees are the largest growing natural feature in the city, and therefore can make striking impact on the feel and appearance of an area.

- Consider the existing use of the space and would the presence of trees be positive.
- Establish the landscape type and what constraints this will place of species selection.
- Establish existing habitats and ensure that tree and woods would be complimentary to or adding value to this.
- Establish the history of tree cover and whether new trees or wood would be appropriate.

Site Constraint

Space in the city is at a premium, and therefore often has a multitude of uses. Trees need to justify their place and ensure that they can co-exist with other parts of the infrastructure with minimal disruption.

- Use the design phase of a development and planting scheme to provide space for trees to grow – both above and below ground.
- Maintain local distinctiveness.
- Consider the presence of underground and overhead services.
- Meet the statutory safety requirements of access for pedestrians and vehicles.
- Assess impact on adjoining properties to ensure future potential problems can be minimised, particularly subsidence.
- Prioritise sites where there is greatest public benefit.

Species Consideration

Each location has its own unique feature, character, and constraints. This means they are not suitable for every species of tree, but with around 300 species growing in the UK there should be at least one suitable for each site.

- Select species known to thrive on the soil, particularly the soil's type, compaction, nutrients and available water.
- Sufficient space for the tree at its ultimate size, unless, the tree is intended for controlling management such as coppicing or pollarding.
- Select species of maximum suitable size for space.
- Consider use of natural regeneration where appropriate.
- Where appropriate use native species.

-
- Ensure a diverse tree population is sustained.
 - Consider the species tolerance to disease, and wind damage

Community Consideration

The city is home and work place to its citizens and visitors. To provide a sustainable urban forest it is essential the trees fit into their communities.

- Consider potential impact on neighbours.
- Select trees which will maximise the many benefits trees provide to communities.
- Consult with local community when introducing new large scale planting.

APPENDIX 1: SUMMARY OF URBAN FOREST STRATEGY AIMS AND PRINCIPLES.

The aims and principles of Nottingham's Urban Forest Strategy are summarised into its vision:

“CREATE AN URBAN FOREST THAT IS DESIGNED AND MANAGED SUSTAINABLY, FOR THE BENEFITS OF NOTTINGHAM'S COMMUNITIES.”

To achieve the vision two aims have evolved, to create Nottingham's urban forest, each with its own guiding principles:

- **AIM 1: TO DESIGN A SUSTAINABLE URBAN FOREST**
- **AIM 2: TO MANAGE A SUSTAINABLE URBAN FOREST.**

Decision making involves many factors, which sometimes can appear contradictory. These are set out below as the principles which will guide the decision making that will enable the city to achieve its vision and target.

- **PRINCIPLE 1: ENSURE THAT THE TREE AND WOOD POPULATIONS ARE PROTECTED, ENHANCED AND, WHERE APPROPRIATE EXPANDED**
- **PRINCIPLE 2: MAINTAIN TREES AND WOODS IN ACCORDANCE WITH LANDOWNERS OBLIGATIONS, WITH PARTICULAR ATTENTION FOR THE SAFETY OF PEOPLE AND PROPERTY**
- **PRINCIPLE 3: MANAGE TREES AND WOODS IN A MANNER WHICH BENEFITS LOCAL COMMUNITIES, WHILST ENSURING PROBLEMS ARE PROMPTLY AND APPROPRIATELY DEALT WITH.**
- **PRINCIPLE 4: ENCOURAGE NEW AND REPLACEMENT TREE AND WOOD PLANTING, USING APPROPRIATE TREE SPECIES**
- **PRINCIPLE 5: THE REMOVAL OF TREES AND WOODS SHALL BE RESISTED, UNLESS THERE ARE SOUND ARBORICULTURAL OR OTHER REASONS TO INDICATE OTHERWISE.**
- **PRINCIPLE 6: MANAGE ITS WOODS IN A FULLY SUSTAINABLE MANNER.**
- **PRINCIPLE 7: ALL TREE AND WOODLAND MANAGEMENT DECISIONS WILL TAKE APPROPRIATE ACCOUNT OF CLIMATE CHANGE, AND NATURAL ENVIRONMENT PROTECTION**
- **PRINCIPLE 8: PROVIDE A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION TO INDUSTRY AND PEER BEST PRACTICE STANDARDS AND ACT AS AN EXAMPLE FOR OTHERS TO FOLLOW.**
- **PRINCIPLE 9: RESPOND TO TREE WORK APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
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- **PRINCIPLE 12: ENCOURAGE AND ENABLE GREATER AWARENESS AND BETTER UNDERSTANDING OF TREE AND WOOD MANAGEMENT, IN ORDER THAT COMMUNITY CONSULTATION AND INVOLVEMENT IS ENCOURAGED.**

THE PRIORITIES OF **PRINCIPLE 4**:

- The Council will ensure that the location, species selection and planting specification of all new tree planting by the Council is approved by an arboriculturalist prior to implementation.
- The Council will develop a programme of tree planting using appropriate species and specification
- The Council will develop tree planting and establishment specification to be applied to all new trees planted on land in its stewardship
- The council will secure new tree planting on or near development sites, through the planning process, and mitigate agreed losses through replacement planting.
- When a tree is removed land in the Council's stewardship two replacements shall be planted, preferably at the same location. If this is not possible the replacements will be planted at a suitable nearby site.
- When planting trees, selection will be based on the principles of "Nottingham's Guide to **Right Tree, Right Place**" (Annex 4). Where space permits, there will be a presumption in favour of large shade-producing forest-scale trees with maximum opportunities for mitigating the effects of climate change
- New planting will take into account climate change implications
- The location and species for new tree planting will be selected to minimise the risk of tree-related subsidence, and other structural damage.
- The Council will develop a programme for the replacement of street trees which have been removed, including those in the past but not replaced
- Where highways schemes are programmed, the Council will develop supporting tree planting programmes for the routes.
- To place a priority on the replacement of ageing street tree populations, particularly where these adjoin major traffic routes, planting large growing trees where appropriate.
- The Council will establish an annual dedicated tree planting budget
- During the design phase of new construction and development ensure sufficient space is allowed for trees and their continued healthy growth to maturity.
- When trees are removed to facilitate construction and development replacements at agreed minimum ratio of 1:1 shall be planted. In the case of trees on Council owned and managed land the ratio shall be a minimum of 2:1 (i.e. two new trees for each one removed).
- Maintain a diverse mix of tree species (no single species, or closely related species shall be more than 10% of the total urban forest)
- Preference to be given to planting native species of local provenance, when the opportunity arises when applying Right Tree – Right Place criteria.

**Urban
Forest
Strategy**

**Supplementary Planning Guidance
Trees on Development Sites**

Annex 5
May 2001
Updated October 2012



**Nottingham
City Council**

INTRODUCTION.

Trees make an important contribution to our environment. Trees absorb carbon dioxide, and emit oxygen. A mature tree in one growing season emits as much oxygen as ten people inhale in a year. Trees and the urban forest benefit the city in numerous ways, including:

- creating a more pleasant environment in which to live and work
- providing positive health and well-being benefits
- screening and softening of hard landscapes
- assisting in urban regeneration
- mitigating the impact of climate change and helping adaptation
- intercepting and slowing storm water runoff
- providing habitat and connectivity for wildlife.

These are summarised in appendix 2 and explained in more detail in the Council's **Urban Forest Strategy**.

The National Planning Policy Framework (2012) identifies natural environment as one of three dimensions to sustainable development that must be supported by the planning system, and makes clear that local planning authorities should plan for the enhancement and management of networks of green infrastructure. Recognising the importance of the urban forest the Council developed this **Supplementary Planning Guidance – Trees on Development Sites**, an integral part of the Urban Forest Strategy to be applied in accordance with the strategy's aims and principles.

The vision for Nottingham's urban forest is:

“Create an urban forest that is designed and sustainably managed for the benefits of Nottingham's communities.”

To achieve this, the city has set the target of increasing the urban forests canopy cover from its current level of 14% to 18% by 2030. Delivery is guided by the Urban Forest Strategy's 12 principles (core policies). The Supplementary Planning Guidance is part of the Council's response to Principle 10 in particular, though all 12 are relevant in any consultation and decision making:

“Respond to planning applications in a manner which ensures a sustainable and high quality tree and wood population is retained.”

The aims and principles of the Urban forest strategy are set out in appendix 1. More details can be found in the Strategy, available on the Council's website.

The retention of mature, healthy trees on a new development can greatly enhance the appearance of the development, providing instant maturity and embedding green infrastructure. Trees are, however, delicate organisms which are extremely vulnerable to damage during construction works. It is essential that suitable precautions are taken to

provide adequate space for trees and to protect trees from damage on development sites.

The, often massive structure of a mature tree above ground, consisting of its trunk, branches, twigs, and foliage (leaves, flowers and fruit), uses and stores solar energy and gases from the atmosphere. Below ground the, far less obvious, extensive roots are equally efficient in absorbing the water and minerals. Together the above and below ground parts of the tree combine to produce the materials and compounds needed to sustain a healthy long lived organism. This Supplementary Planning Guidance sets out ways in which developers and the Council can work together to achieve this.

The benefits and values of trees in the urban environment mostly relate to that which can be seen above ground. However, it is the ability of roots to function in the urban soil, often hostile to tree growth, that is crucial to growing and maintaining healthy trees. It is the roots system which is frequently ignored and damaged by peoples activities (such as excavation, construction and compaction), though it is also the roots, rather than the aerial parts of the tree that play biggest part in damaging adjacent infrastructure (lifting pavements or subsidence).

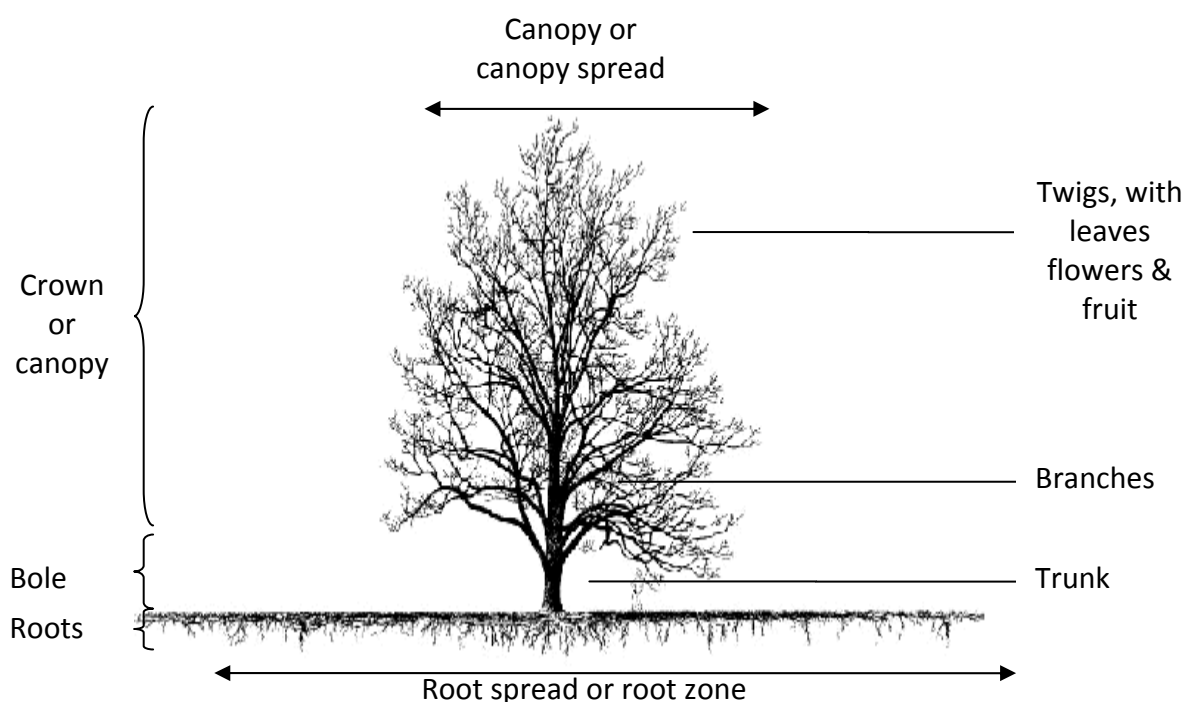


Diagram 1: Parts of the Tree

Despite their appearance of solidity and longevity, trees are easily damaged, and require all parts, both above and below ground to survive. For most trees under normal conditions, the root-shoot ratio is approximately 1:5; the top is 5 times heavier than the roots. If it were not for the weight of the trunk and structural branches, though, the top and roots would weigh about the same and of equal importance to the tree. The above diagram gives an indication of how a tree grows, the roots will spread out in a broad horizontal plane, just below the soil surface (they need oxygen to survive so grow above the permanent ground water table, with the vast majority in the top 600mm of the soil).

1. THE LEGAL AND POLICY FRAMEWORK

The Town and Country Planning Act 1990 makes it a duty of the Local Planning Authority to ensure in granting planning permission that adequate provision is made for the protection and planting of trees, both through the use of planning conditions and of Tree Preservation Orders.

Additionally, the Nottingham Local Plan 2005, which is the current adopted Local Plan for the City of Nottingham, includes a number of policies that relate to trees. The most important of these is policy NE5 which states that the Council will seek to protect existing trees and secure the planting of new trees.

Additionally, policy BE5 states that the council will seek to ensure that an appropriate scheme of landscaping, incorporating or complementing established features within the site or vicinity.

The Local Plan is further supported by Ambitious For Wildlife Biodiversity Statement (2011), The Urban Forest Strategy (2012) and Breathing Space Open Space Strategy (2011).

This Supplementary Planning Guidance is intended to offer additional guidance to developers as to how these policies will be applied by the City Council and what will be required of developers seeking planning permission for developments that may affect trees.

2. HOW TREES ARE DAMAGED

2.1. Damage to roots

Potentially the biggest threat to a tree on a development site is through damage to the roots and this type of damage is all the more worrying as it can take several years to become evident. Tree roots generally consist of a mass of rapidly subdividing fibrous (feeding) roots, with a few larger structural (supportive) roots. The roots are likely to extend to at least the edge of the canopy and the vast majority of them will be found in the top 600mm of soil.

The smaller, fibrous roots provide moisture to the tree and are vital for tree health. These roots require oxygen in order to survive, which they find in the tiny pockets that exist throughout the upper layers of aerated soil. Compaction of the soil, whether by passing construction traffic and machinery over it or by increasing soil levels, will remove much of the oxygen from the soil and is likely to kill fibrous roots.

Any changes in level within the canopy area of a tree can have a seriously damaging effect on the tree's future health.

Cutting of larger roots will not only kill the fibrous roots connected to them but can affect the stability of the tree and may result in the tree having to be removed on safety grounds. This can happen during excavation for footings, service trenches or for regrading.

2.2. Impact Damage

Trees on development sites can often be damaged directly by physical impact with construction machinery. Being reversed into by delivery vehicles or having digger buckets entangled in the branches are amongst the most common problems.

Any damage to tree bark can create an environment in which fungi are able to infect the tree and cause decay.

2.3. Poisoning

Many of the materials used on development sites are toxic to trees and must not be allowed to come into contact with either the tree itself or the ground. Such materials include cement, bitumen, diesel and hydraulic fluid. Safe storage of such materials is not just important for the protection of trees but may also be a legal obligation under other legislation.

3. WHAT YOU NEED TO DO.

3.1. The Design Process

The best way to ensure appropriate trees are retained in a healthy state is to make sure the design process takes account of the need of trees. The first step is to commission land and tree surveys.

3.1.1. Land Survey

First of all a detailed land survey should be undertaken plotting the site as it is at present, with levels being taken through out the site. This survey should include the location of all the trees on the site, any trees whose canopy overhangs the site or would do if it had not been pruned, or any tree within a distance from the site boundary of less than half its own height. It is important that the location of trees is accurately plotted (to within 1m).

3.1.2. Tree Survey

A competent arboriculturist or suitable other professional with experience in the protection of trees on development sites should carry out the tree survey in accordance with BS 5837: 2012 Trees in relation to design, demolition and construction: Recommendations. It is desirable to retain category A and category B trees. For householder applications it will be sufficient to submit stem diameter measurements for plotted trees.

3.1.3. Design Considerations

Once the tree survey has been completed it will be clear which trees should be retained on the site and which may be removed. Having established which trees will be retained the design team is in a position to account for the needs of trees - in the design.

The following points will need to be considered

Position of Buildings

- Substantial excavation must take place outside the protected zone of trees, bearing in mind that some space will be necessary for working.
- It is advisable to keep buildings at least 1m from the edge of the canopy of mature trees to avoid direct damage to the building from tree branches. For younger trees greater allowance should be made for future growth.

Greater distances may be required if the tree is near a window of a habitable room, especially on the south side.

- When building near trees it is important to consider the design of the foundations to avoid possible subsidence problems in future. This will depend on the type and size of tree and the nature of the soils. Guidelines can be found in NHBC Chapter 4.2

Levels

- Level changes within the protected zone of a tree should be limited in scope and informed by arboricultural advice.
- Changes in levels close to a protected zone may require retaining walls.

Access

- The location of roads, driveways and access points should avoid the root protection zone (RPA) of the tree as far as possible.
- Whilst it may be possible to construct surfaces for light traffic within the RPA this will have to be done without excavation and where necessary to an adoptable standard.

Services

- The location of service ducts, drainage runs and septic tanks etc should be clear of trees' protected zones.
- Where possible, keep all services together and avoid surrounding a tree with trenches.
- If running a service duct underneath a tree canopy is unavoidable it must be hand dug, retaining roots above 25mm in diameter, or thrust bored.
- Service runs must be shown on submitted plans, in relation to position and canopy spread of trees to be retained.

3.2. Submitting your plans

In order to process your application the Council will require the following additional plans and documents:

- A layout plan with trees to be removed clearly marked in red and those to be retained marked in green.
- A tree survey in accordance with BS5837 (2012) ***Trees in relation to design, demolition and construction – Recommendations.***

The Council will then require an arboricultural method statement (AMS) in accordance with BS5837 by pre-commencement condition. This will comprise some of the following:

- A plan showing the location of protective fencing around the retained trees together with the following details:
 - The location of all service trenches, drainage runs, septic tanks and other buried apparatus.
 - The location of materials storage areas and construction traffic access points. Storage areas should not come within 5m of any tree trunk or main stem.
 - Existing and proposed levels within the protected zones of trees.
- A method statement clearly indicating how the protection of trees on the site is to be ensured. This should include at least the following:
 - When the protective fencing will be put in place. This should be prior to any work, whether demolition, excavation or construction, taking place and the fencing should stay in place until all work is completed.
 - Design of protective fencing. BS5837:2012 gives useful guidelines but the council will consider the merits of alternative suggestions. Fencing must be both sturdy and not readily moved.
 - Statement to the effect that no operations will take place within the protective fencing. Notices should be attached to the fencing at regular intervals to this effect.
 - Statement to the effect that all materials will be stored in the designated storage area.

- Statements about the location relative to trees of any fires to be lit on site - no flames should be allowed within 5m of any foliage.
- Details of the means of constructing any hard surfaces that come within the canopy of a tree.
- Details of the method of excavation of any service trenches, drainage runs etc that come under the canopy of a tree. NJUG Vol 4 gives useful guidance but the council will consider the merits of alternative suggestions.
- On more sensitive sites the Council may ask you to arrange for supervision and regular inspection of tree protection measures to be undertaken by a competent arboriculturist.
- If this is the case you should include details of your arrangements for arboricultural supervision.

It will usually be possible to combine some of the information required onto the same plans.

3.3. On Site

On site you should do exactly as you have said you will do in your Method Statement and accompanying plans

Where the tree survey has identified the need for tree surgery this should be included in the AMS along with other required pruning in the submitted AMS and will usually be carried out prior to any development works commencing.

Development plans rarely stay the same throughout the whole development process - problems come to light which require slight changes to the original plans.

Where this happens you must contact the City Council to gain their agreement before continuing with work.

4. CHECKLIST

Before you submit your scheme please make sure it:

- Includes a tree survey
- Includes details of which trees are to be retained and which to be removed
- Includes details of existing and proposed levels near trees
- Includes details of all existing and proposed hard surfacing within a tree's protected zone
- Includes details of the location of any proposed or existing underground service runs
- Avoids locating any temporary or permanent features which might injure trees within the protected zone

5. FURTHER INFORMATION

BS3998:2010 *Recommendations for Tree work* British Standards Institute

BS5837:2012 *Trees in relation to design, demolition and construction - Recommendations* British Standards Institute

NJUG Vol 4 *Guidelines for the planning, installation and maintenance of utility services in proximity to trees* National Joint Utilities Group, November 2007

NHBC Chapter 4.2 *Buildings near trees* National House Building Council

Nottingham Local Plan Development Department, Nottingham City Council
Nottingham City Council (2005)

Urban Forest Strategy Department of Leisure and Culture, Nottingham City Council
Nottingham City Council (2012, consultation draft)

Ambitious for Wildlife: Biodiversity Statement Department of Leisure and Culture
Nottingham City Council (2011)

Breathing Space Open Space Strategy Department of Leisure and Culture
Nottingham City Council (2011)

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Health Benefits of Trees

- Positive effects on people's wellbeing and can encourage hospital patient recoveries, reducing the amount of time spent in hospital.
- Tree and woods are now promoted as "nature's health service". The restorative effects are greatest for those who actively interact in the natural environment, but even just viewing trees and nature through window can have psychological benefits.
- The canopy formed by trees has indirect human health benefits, their shade during hot summer days to a reduce heat related illnesses.

Trees and Noise

- Often it is not possible to provide effective barriers to noise, in these instances trees may be able to provide a visual screen between the source of noise and hearer. Whilst the sound reduction is negligible the lack of direct view creates the impression of greater noise reduction.

Trees and Urban Regeneration

- Trees help improve the environmental performance of buildings – increasing tree cover in a well planned development can lower heating and cooling costs by 20%
- Tree canopies and root systems play a key role in mitigating flood levels during extreme events and have the ability to lower storm water flows into the existing drainage infrastructure and so reducing the risk of damage
- Tourism and city marketing can be boosted by a good quality urban forest as recognised by “Green Flag” awards. Green Flag urban parks can be marketed as city attractions and will provide attractive settings for various events and activities which will boost the local economy.
- Tree planting in streets has been shown to directly enhance and improve the neighbourhood aesthetics and may increase property values by 7 – 15%

Effects of Climate Change

Climate change is now recognised as one of the most serious challenges facing us today and its potential impacts for trees and forests are well documented. The UK climate change scenarios indicate average annual temperature increases could be 4.5°C by 2080. However, these scenarios do not take urban surfaces into account, which have the potential to further increase these predicted temperatures due to the urban heat island effect.

- The urban forest helps to mitigate the Urban Heat Island effect by; transpiration (helping to reduce day and night-time temperatures in cities, especially during summer), canopy shade (canopies provide shade for buildings, streets and footpaths and reflection (leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day).
- During photosynthesis trees convert carbon dioxide and water into sugar and oxygen and then sequester (store) the carbon, making a significant contribution toward absorbing carbon from the atmosphere, and emit the oxygen we all breath.
- The urban forest helps urban areas adapt to the impact of climatic change regardless of whether they are in parks, private gardens or street trees, but the space, size, quality and vegetation type and proportion of coverage all influence

the level of impact. Open space within towns and cities, rather than as a green belt, might be more effective in helping adaptation.

- Atmospheric particulates (emissions from industry and vehicles have been linked to increased incidences of illness in people (eg asthma and allergies). Trees have an important role in combatting (mitigating) these effects. Some are absorbed and used as part of the trees growth processes, other, larger particulates are filtered from the atmosphere by attaching themselves to leaves. The closer trees (and greater their canopy) are to the sources of pollution the greater their contribution and benefits

Trees and Storm Water

Urbanization changes many attributes of the land that is developed and built upon. One of these is a reduction in the permeability of surfaces leading to changes in patterns of runoff and increased loads of pollutants entering water courses.

- Tree canopies and root systems reduce storm water flows and nutrient loads that might otherwise end up in our waterways. Broad canopies intercept and mitigate the impact of heavy rainfalls and healthy, fibrous, tree roots help reduce the nitrogen, phosphorus and heavy metal content in storm water

Trees and the Natural Environment

- A healthy and sustainable urban forest will increase biodiversity in the city, becoming a home or roost to a wide range of species; even endangered animals and other biological species of high conservation value.
- All trees support a range of other wildlife which either feeds directly on the tree itself, or indirectly on something else which is feeding on the tree, even the smallest sapling

More detail of the benefits from the urban forest, and the Council's approach to managing it for the benefits of Nottingham's citizens and visitors can be found in the **Urban Forest Strategy** available at the Council's website. To provide these benefits, trees need space above and below ground to grow, and to be properly cared for.

Urban Forest Strategy City and Ward Action Plans Template

Annex 6

October 2012



CITY AND WARD ACTION PLANS – TEMPLATE

City Action Plan – develop and adopt within six months of adoption of UFS **Ward Action Plans - develop and adopt within three years of adoption of UFS**

Introduction

- Link to UFS, particularly the vision and target
- “The Tree”
- “Trees in Urban Environment”
- Physical geography:
 - local topography, aspect altitude.
 - Geology including soil types
 - Climate
- Social geography
 - Land use types (included potted history explaining how got to current)
 - Prominent grey infrastructure (buildings, roads, residential estates, industries)
 - Human population density
- Situational analysis (resources, time available to deliver plan, so additional need can be identified)

The Urban Forest

- Description of the trees and woods
 - Notable local feature
 - Special benefits
 - Canopy cover 2007 & 2012
 - Urban forest demographics (age, species mix, condition)
- Private/Council split
 - Number TPO’s, Conservation Areas
 - Council tree numbers by land-owner
- Social interaction
 - Recognition of community schemes (tree planting, partnership management)
 - Identify key local challenges (subsidence, common complaints)
- Conclusion
 - Synthesise data to identify local priorities.

Delivery Plan

- Link City wide and Ward targets (ensure ward targets consistent with vision, aims and principles of UFS)
- Identify necessary resources and lead & contributory partners
- Set review dates
 - City Action Plan – annual reporting and five year review
 - Ward Action Plan three year reporting and six year review

EXAMPLE CITY TARGETS

Target	12/01	To replace all trees which are removed for whatever reason	
UFS Links		Purpose	To meet the Council's climate change and sustainable community duties, by ensuring that more trees are planted, than removed
Aims	1,2		
Principles	1,3,4,6,7,8,10,11,12	Resources	£19,500 pa 15% of FTE Additional budget required (£15k pa)
Commence	2012		
Achieve by	2015		
Measure of achievement		Sustainable program adopted where more trees are planted and established than removed year on year.	

Target	12/02	To Protect trees and woods as per statutory framework	
UFS Links		Purpose	To protect the most important trees and woods to maintain the City's character and distinctiveness.
Aims	2		
Principles	1,8,9,10	Resources	£15,000 pa 50% FTE
Commence	ongoing		
Achieve by	2015		
Measure of achievement		Maintaining a sustainable TPO and Conservation Area tree and wood protection and work application program.	

Ward targets would be in same form, focussed and prioritised locally to achieve city targets.