

Part 2

Value of Trees

Why are trees important?

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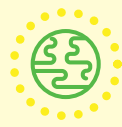
2.0 Introduction

There is now a growing wealth of knowledge and evidence for the wide range of services and value that trees bring to urban environments. Emphasis was once more typically placed on the costs associated with the presence of trees (e.g. leaf removal, ongoing maintenance etc.) However, it is now more commonly known how trees establish a sense of place and provide healthy environments as well as climate change adaptation and mitigation.



Human Benefits

- Improved health, wellbeing and mental health
- Play & Learning
- Shade & Comfort
- Relaxation
- Tourism
- Sense of Place



Environmental Benefits

- Air pollution removal
- Carbon storage
- Urban cooling
- Wind abatement
- Stormwater control
- Healthy soil
- Water filtration



Ecological & Biodiversity Benefits

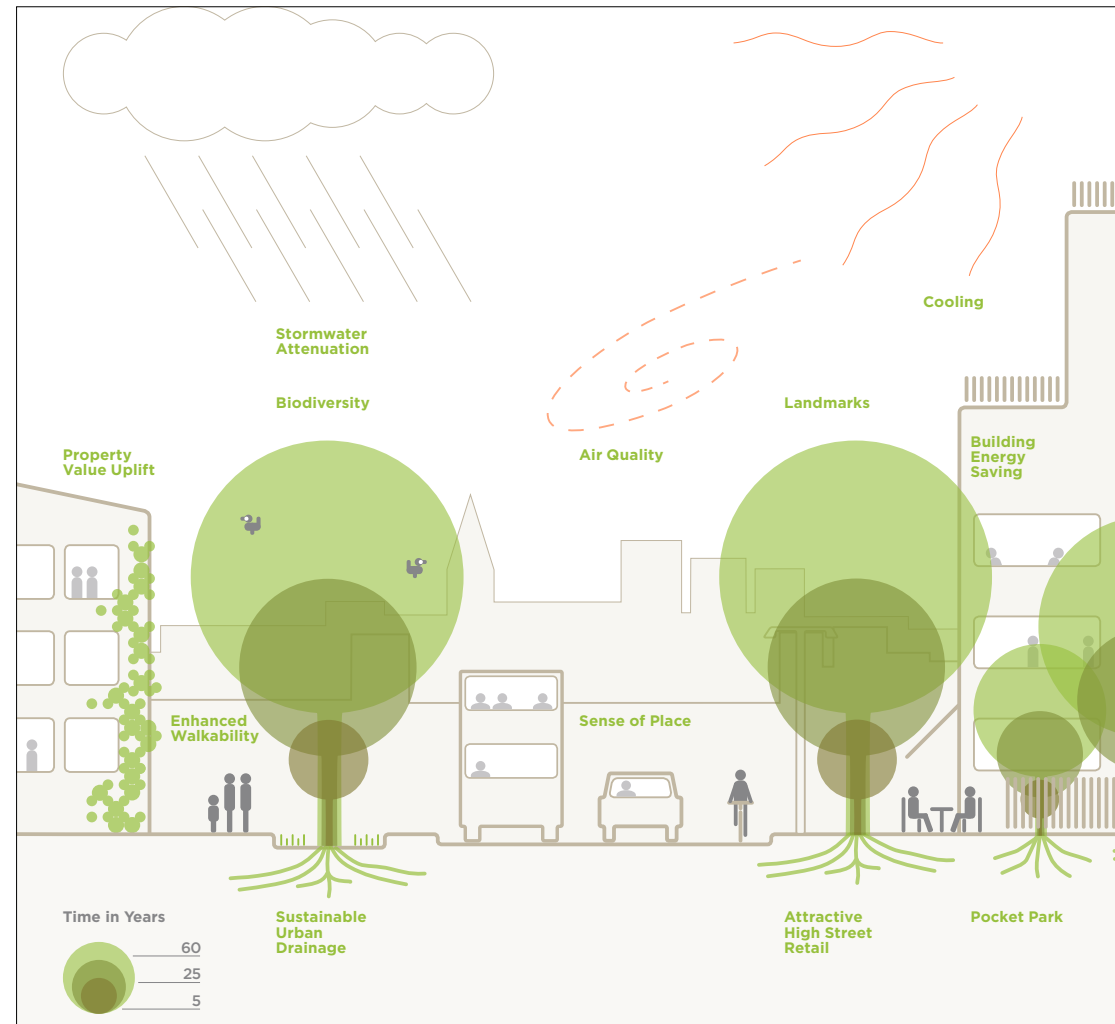
- Improved health of ecosystems
- Pollination
- Buffer for pollution
- Improved species balance & diversity



Economic Benefits

- Increased land and property value
- Energy savings
- Tourism
- Less financial burden on health & emergency services
- Increased productivity & creativity

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Trees in the Townscape (2012). Copyright Trees and Design Action Group.

2.1 Physical & Mental Health & Well Being

At the time of writing, access to trees and green spaces have never been as relevant and important as in the Covid-19 global pandemic. Trees have a positive effect on health through the provision of shade, outdoor recreation amenity and clean air.

Trees reduce stress and give a greater quality of life. Seasonal changes, flowers, colours and aromas can stimulate positive emotions. Studies from over 30 years ago have shown trees to speed up recovery times from illness and reduce needs for medication (Ulrich, Robert 1984).

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Trees reduce exposure to harmful UV rays. The Japanese term *shinrin-yoku* ("forest bathing") emerged in the 1980s as a physiological and psychological exercise. A 2016 report (Ulmer, J.M, et al, 2016) indicated that more neighbourhood tree cover, independent from green space access, was related to better overall health.

2.2 Air Quality - 'Breathing Space'

Everyone deserves to breath clean air and clean air is a human right. According to the World Health Organisation (WHO) air pollution is the greatest environmental health risk, and that nine out of every ten people worldwide do not breath safe air. WHO estimates that around 7 million people die every year from exposure to fine particles in polluted air. There is evidence that urban trees remove large amounts of air pollution and improve urban air quality, particularly in the urban environment (Nowak et al 2006).

'Nine out of ten people worldwide do not breath safe air'

World Health Organisation

2.3 Climate Change

Trees, especially large ones, can store significant amounts of carbon as they grow, temporarily reducing CO₂ into the atmosphere (Nowak et al. 2013).

As trees grow, they accumulate carbon in their woody tissues, reducing the amount of this greenhouse gas emissions.

Cities throughout the world including some in Europe are increasingly experiencing summer heatwaves. Trees work like pumps: through evapotranspiration they breath out into the atmosphere the water they receive, which is a highly effective mechanism for lowering air temperatures.

A naturally growing diverse woodland can store carbon at a far greater capacity than monocultural plantations for production. Increasing tree cover in Fingal will contribute to a reduction in atmospheric carbon.

2.4 Water

In urban areas, the natural hydrological cycle carried out by vegetation is disturbed by the increase in impervious surfaces, which is why urban trees and forests are vitally important. Trees help to reduce localised flooding by intercepting rainfall and maintaining soil permeability. They reduce water run-off in extreme rain events, taking the pressure off the urban drainage system. The canopies themselves retain large volumes of rainwater, delaying the time it takes to hit the ground and cause run-off.

As well as flood relief, trees can also enhance water quality and control soil erosion with their roots.

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2.5 Biodiversity

Trees and their associated ecosystems provide habitats for wildlife – tree and timber with cavities are especially valuable for animals such as bats and birds.

Trees connect habitats by providing green links between parks and open spaces allowing opportunities for wildlife to travel from place to place to access new habitats. Trees provide food for wildlife including nectar for bees and other insects. There is a significant range of pollinator friendly trees which can be maintained and planted to mitigate the current decline in bees and pollinator insects.

2.6 Visual Amenity

Trees bring a sense of place and maturity to new developments, whilst larger species help to create a more human scale to old and existing townscapes.

Trees are also effectively used to screen unsightly structures or views and soften the built environment.

Trees can form an integral part of the design of new schemes whether using existing tree cover or through the planting of new trees as part of the scheme.

2.7 Economic Benefits

Research (Morales 1980) shows that the presence of trees can increase the value of residential and commercial properties by between 5 – 18%. The presence of trees in retail areas positively affects people's behaviour by attracting consumers to an area. Trees provide shade, shelter in wind and a regulation of local air temperature thus reducing energy and heating costs. Planting areas of woodland into amenity grassland can reduce the cost of maintenance by at least 60% (Trees or Turf, Woodland Trust 2011). Trees provide ecosystem services, they remove air-borne pollutants, store carbon, divert storm water runoff away from local sewer systems each year. The Council plans to carry out research in to the extent this occurs in the county and to put a value as to the avoided treatment costs annually. Studies have proven that production in the workplace is higher in environments with tree cover. Research in the US comparing the costs and benefits of trees, have shown a positive return ranging from 1.7 to 2.4 depending on the context. Urban trees are not only essential to quality of life, they also offer good value for money.

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The urban forest has an impact on a town's image and the business climate it provides to attract inward investment.

Studies have proven trees to have financial benefits as opposed to a cost liability for local authorities such as their contribution to SuDS(Sustainable Urban Drainage).

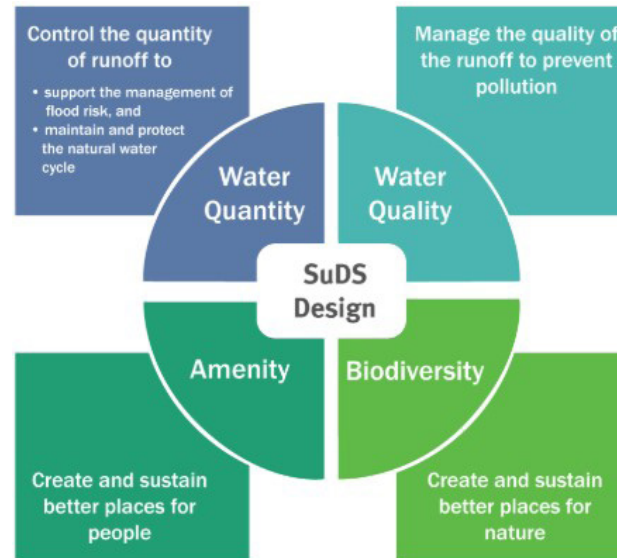


Image depicting the four pillars in successful SuDS design. The SuDS Manual, CIRIA, 2015.

A single mature tree, if planted under the Principle of right tree, right place can arguably be defined as a successful SuDS element in its own right, due to its invaluable benefits which fit under the four main pillars illustrated on the left.

2.8 Crime and Public Safety

There is evidence to suggest that in urban areas, the presence of trees can deter crime and anti-social behaviour. Fewer crimes were reported in locations with greater amounts of vegetation, (Kuo and Sullivan 2001b). Donovan and Prestemon (2012) also reported a decreased incidence of crime when street trees were present, suggesting that the presence of trees was perceived as indicating a more cared for environment. Similarly, Burden (2006) has suggested that trees improve security due to better use of these spaces and hence increased surveillance.

Roadside trees have been shown to have a marked impact on road safety, properly placed trees have been shown to reduce roadside accidents and incidents of road rage. Roads lined with trees affect speed perception, resulting in considerably lower speeds than on adjacent open roads (Burden 2006). Roadside trees also create a safer environment for pedestrians by providing a visual and physical barrier between pedestrians and road users.

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2.9 Conclusion

Depending on the tree species in question, it takes between 15 and 40 years for a tree to grow a sufficiently large canopy to deliver meaningful aesthetic, air pollution removal, rainwater management and other benefits, size matters. Trees are the only part of urban infrastructure that can appreciate while the rest generally depreciates in value.

Urban trees have a finite useful life expectancy, with this regard the Council will seek to retain, protect and care for as many of these trees as reasonably practicable to maximise this, further details will follow in the policy and management sections of this strategy. The above benefits highlighted are non-exhaustive and interconnected, for example, the health benefits associated with contact to nature will in turn provide economic benefits with reduced costs to our healthcare system.

Extensive studies along with modern technology and software such as itree can now provide hard numbers in terms of putting a figure on the environmental services that trees provide. Consideration in planning, design and provision of future trees can maximise these benefits for many years to come.

