

# Benefits of trees

## The value of trees in our urban landscape

The value of trees in the urban environment is widely accepted. Trees are not only beautiful in themselves, collectively they add beauty to our urban landscapes, soften the harsh lines of buildings or compliment architecture, screen unsightly views, provide privacy and a sense of security, while contributing to the landscape character and provide a sense of place (USDA, 2003). Trees perform important functions that help maintain the sustainability of our cities and contribute to the community's health and serenity. Trees clean the air by absorbing air pollutants and releasing oxygen, they can sequester carbon dioxide. They reduce stormwater runoff and erosion; they ameliorate climate; they can save energy; they create wildlife habitat; they can strengthen community, including its economy (USDA, 2003).

Some trees are recognised historical landmarks by virtue of their age or their relation to a significant historical event. There has been research that demonstrates that trees can have a profound impact on our emotional and physical well-being.

The benefits of trees can be grouped into social, environmental, and economic.

## Social benefits

Trees and other landscape plantings provide the community with a fundamental reminder of nature being an important component of people's lives. In an urban environment trees provide a critical link to the natural world from which we have evolved and helps restore the mind and spirit.

Humans respond to nature, we like trees around us because they make life more pleasant. The understanding of the role that trees play in our urban environment has led to an increase in the veneration of trees and they can evoke strong passions, particularly when their removal is being debated. People can become personally attached to trees consequently a loss of trees within a community can have significant psychological effect on residents (USDA, 2003).

Other social and communal benefits:

- Hospital patients have been shown to recover from surgery more quickly when their hospital room offered a view of trees.
- Trees and green space improve human mental health. Office workers with views of natural elements experienced less job pressure and greater job satisfaction, which leads to greater productivity and lower absenteeism.
- Trees have a positive effect on people experiencing stress and anxiety and the presence of trees has a calming effect on children suffering from Attention Deficit Disorder (ADD) (Taylor, Kuo, Sullivan, 2003).
- Appropriate vegetation cover; without dense shrubs and screen planting, can lead to reduced crime rates (Kuo, 2003).
- Trees in open space encourages people out of their homes where they interact more with others, which creates stronger social relationships.
- Children are more likely to be found playing in green spaces and their play is also more creative (Kuo, 2003).
- People in greener settings feel safer and experience fewer anti-social behaviour, including vandalism and graffiti (Kuo, 2003).
- Because of their potential for long life, trees frequently are planted as living memorials. They can remind us of loved ones or significant historical or cultural events.

### Environmental benefits

Trees alter the environment in which we live by moderating climate, improving air quality, conserving water, and providing habitat for wildlife (ISA, 2007).

- Trees modify local climate, primarily by lowering air temperature and increasing humidity. Trees shade buildings and hard surfaces reducing re-radiated energy and the 'heat island' effect. This reduces reliance on air conditioning. The evaporation of water from trees also has a cooling effect. Trees are nature's air conditioners - one tree is equivalent to 5 room air conditioners running 20 hours/day. The larger the tree, the greater the cooling effect.
- Strategic planting of deciduous trees to the north and west of buildings can reduce reliance on heating and cooling systems.
- Trees improve air quality by removing a number of pollutants from the atmosphere; particulates from the combustion of fossil fuels, sulphur dioxide, nitrogen oxides, ozone and smog can all be reduced by the presence of trees. Amount of contaminants removed will vary between areas and amount of tree cover. It should be noted that trees could emit volatile organic compounds that can contribute to the formation of ozone and carbon monoxide.
- Wind speed and direction can be affected by trees. The more compact the foliage on the tree or group of trees, the greater the influence of the windbreak.
- Trees can influence the flow of water in several ways. The downward fall of rain, and hail is initially absorbed or deflected by trees, reducing the force. This allows greater capture of rainfall into the soil reducing runoff and erosion. Water is also allowed to percolate through the natural mulch layer created beneath the canopies of trees.
- Global warming and climate change as a result of human-induced increases in greenhouse gases including carbon dioxide, is arguably the biggest threat facing the world's population. Trees remove carbon dioxide from the atmosphere and store (sequester) it as carbon in the plant material and in the surrounding soil. Global warming may be combated by removing CO<sub>2</sub> from the atmosphere and temporarily (for the tree's life) storing the carbon, however forests, and particularly urban forests, can only offset a relatively small proportion of total greenhouse gas emissions, and so we must also reduce other emissions at the same time. Trees can have a more significant impact through the effects they can create when strategically planted near buildings leading to a reduction in energy use.
- Trees, and in particular native vegetation, benefit biodiversity (diversity of ecosystems, species and genes within species). Diversity of trees and shrubs in the urban landscape return it to a more natural, less artificial environment. Birds and other wildlife are attracted to the area. The natural cycles of plant growth, reproduction, and decomposition are again present, both above and below ground (ISA, 2007).

### Economic Benefits

Individual trees and shrubs have value, but the variability of species, size, condition, and function makes determining their economic value difficult. The economic benefits of trees can be both direct and indirect.

- Direct economic benefits are usually associated with energy costs. Well-placed shade trees can reduce energy consumption in a home by as much as 30 percent.
- The indirect economic benefits of trees are based on the cumulative effect of individual savings and reliance on external energy sources. These benefits are available to the community or region. Lowered electricity requirements result in fewer new facilities to meet peak demands, and reduced amounts of fossil fuel burned.
- Studies have shown that trees in the metropolitan area contribute between 13 and 20 percent of the value of the property. Houses located in tree-lined avenues have higher property values than those without street trees. Well treed suburbs are more appealing to newcomers.

- Research has established a number of benefits in terms of consumer experiences of business districts with trees (Wolf, 1998, Wolf, 1999 and Wolf, 2003). Consumers reported a willingness to pay more for parking in landscaped car parks and on average reported a willingness to pay an average of about 11% more for goods in a landscaped business district than a non-landscaped district, with this figure being as high as 50% for convenience goods.

### Trees Require an Investment

Trees provide numerous benefits but also incur some costs. The biggest cost of trees and shrubs occurs when they are purchased and planted. Initial care will invariably include some watering. Leaf, branch, and whole tree removal and disposal can be expensive. To function well in the landscape, trees require maintenance (ISA, 2007).

The greatest benefit is derived from healthy, structurally sound trees planted in locations that support their development. Planting the right tree in the right place will maximise benefit while minimising the costs (Harris, Clark, & Matheny, 2004).

The long-term goal of urban forest management is sustainability; the maintenance of ecological, social and economic functions and benefits over time. The environmental function of the urban forest largely depends on the amount of canopy cover; therefore a healthy tree resource is imperative (Harris, Clark, & Matheny, 2004).

### References

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