

Urban Forest Tree Benefits

The term urban forest refers to all publicly and privately owned trees within an urban area— including individual trees along streets and in backyards, as well as stands of remnant forest (Nowak et al. 2001). Urban forests are an integral part of community ecosystems, whose numerous elements (such as people, animals, buildings, infrastructure, water, and air) interact to significantly affect the quality of urban life. For the planting cost of \$250 – \$600 a single street tree returns over \$90,000 of direct benefits in the lifetime of the tree:

- **Reduction of traffic speeds.** Urban trees create vertical walls by framing streets thus helping motorists guide their movement and judge speed. Texas A & M research found people slow down while driving through tree lined streets. Speeds of 3 mph to 15 mph were noted.
- **Increased security and reduced crime.** Tree lined streets create a more pleasant walking environment. An increase in pedestrian traffic brings an increase in surveillance of homes and businesses. Apartment buildings with high levels of greenery had 52% fewer crimes than those with few or no trees. Buildings with medium amounts of greenery had 42% fewer crimes. (Kuo 2001)
- **Improved business.** One study found that on average, prices for goods purchased in Seattle were 11 percent higher in landscaped areas than in areas with no trees (Wolf 1998). A tree-scaped street is sometimes a competitive edge needed for success.
- **Less drainage infrastructure.** Trees absorb the first 30% of most precipitation through their leaf system, allowing evaporation back into the atmosphere. This moisture never hits the ground. Up to another 30% is absorbed back into the ground and taken in and held onto by the root structure and then absorbed and transpired back into the air. Storm water runoff and flooding are greatly reduced thus lessening the cost of a towns infrastructure. A typical community urban forest of 10,000 trees will retain approximately 10 million gallons of rainwater per year.
- **Lower air temperatures.** Asphalt and concrete streets are known to increase urban temperatures by 3 – 7 degrees. A properly shaded neighborhood can reduce energy bills for a household by 15 – 35%.The net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day. (*U.S. Department of Agriculture*) Trees influence thermal comfort, energy use and air quality by providing shade, transpiring moisture, and reducing wind speeds. The establishment of 100 million mature trees around residences in the United States is said to save about \$2 billion annually in reduced energy costs (Akbari et al. 1988, 1992; Donovan and Butry 2009).
- **Windbreaks.** Trees properly placed around houses and buildings as windbreaks can save up to 25% on winter heating costs.
- **Added value to adjacent homes, businesses and tax base.** Realtor based estimates of street tree versus non-street tree comparable streets relate a \$15 – \$25,000 increase in home or business value.
- **Longer pavement life.** Studies conducted in a variety of California environments show that the shade from street trees can add 40-60% more life to paved roads. This factor is based on the cooling and heating (expansion/contraction) of asphalt. This is a significant cost reduction to a towns re-paving budget.
- **Individual well-being and public health.** The presence of urban trees and forests can make the urban environment a more aesthetic, pleasant and emotionally satisfying place in which to live, work and spend leisure time (Dwyer et al. 1991; Taylor et al. 2001a, 2001b; Ulrich 1984). Urban trees also provide numerous health benefits; for example, tree shade reduces ultraviolet radiation and its associated health problems (Heisler et al. 1995), and hospital patients with window views of trees have been shown to recover faster and with fewer returns.
- **Noise abatement**—Properly designed planting of trees and shrubs can significantly reduce noise (Anderson et al. 1984). Wide plantings (around 100 ft.) of tall dense trees combined with soft ground surfaces can reduce apparent loudness by 50 percent or more (6 to 10 decibels) (Cook 1978).
- **Air quality**—Trees improve air quality by lowering air temperatures, altering emissions from building energy use and other sources along with removing air pollutants through their leaves. Urban trees in the conterminous United States remove some 784,000 tons of air pollution annually, with a value of \$3.8 billion (Nowak et al. 2006). Philadelphia’s 2.1 million trees currently store approximately 481,000 metric tons of carbon with an estimated value of \$9.8 million. (Nowack 2003)
- **Social Contributions.** Symptoms of Attention Deficit Hyperactivity Disorder (ADHD) in children are relieved after contact with nature. Specifically, ADHD kids are better able to concentrate, complete tasks, and follow directions after playing in natural settings. The greener the setting, the more relief. (Taylor 2001)

Also, Trees help girls succeed. On average, the greener a girl’s view from home, the better she concentrates and the better her self-discipline, enabling her to make more thoughtful choices and do better in school. (Taylor 2002)