

# QUICKNOTES

## Planning for Urban Forest Benefits

An urban forest is a collection of all of the trees in a community. It is similar to a traditional forest in that it includes elements of the natural environment like trees, soil, water, and a vast array of wildlife, but it differs in that it also includes elements of the built environment such as people, buildings, and roads. The urban forest provides many important environmental, social, and economic benefits. The services that urban trees provide can make our air more breathable, our homes more valuable, and our neighborhoods safer. Unfortunately, population growth and associated development are causing a significant decline in tree canopy in most U.S. cities. This article will discuss the benefits of the urban forest, as well as what planners can do to maximize the benefits and reduce the costs associated with developing and maintaining the urban forest to improve the quality of life in our cities.

### ENVIRONMENTAL BENEFITS

The urban forest affects air quality in a variety of ways. Not only do trees produce and provide oxygen, but they also absorb gaseous pollutants and filter particulates from the air, which can substantially reduce human ailments related to air quality. Urban trees by virtue of their shade can reduce the amount of electricity needed for air conditioners, which reduces emissions at power plants. Cooler urban air temperatures and fewer emissions result in reduced levels of smog and low-level ozone.

Urban trees also have a positive impact on water quantity and quality. Many cities struggle to handle the huge quantities of stormwater runoff caused by impervious surfaces like parking lots and rooftops. When stormwater runoff exceeds the capacity of treatment systems in cities that have combined sewer overflow systems, untreated sanitary sewage is dumped into water bodies. With the large amount of surface area provided by leaves, trees are particularly good at intercepting rainfall and allowing the water to evaporate from leaf surfaces before reaching the ground. Much of the rain that does enter the ground can be absorbed by tree roots, reducing runoff quantity and ultimately sewage overflow.

### ECONOMIC BENEFITS

Many of the environmental benefits previously discussed are directly linked to economic benefits in the form of cost savings, avoided costs, and added value. For example, shade from trees reduces electricity demand, which directly leads to lower electricity bills for home owners. The cumulative effect of thousands of air conditioners drawing less electricity substantially reduces peak energy demand at generating plants, which in turn could delay or eliminate the need to build additional generators. Similarly, reduced volumes of stormwater can mean avoided costs for engineered stormwater solutions such as underground storage tanks. Finally, a healthy urban forest can help increase a city's tax revenue. Many studies have confirmed the belief that healthy, structurally sound trees can contribute as much as 15 percent to residential real estate value, and other studies have shown that high-quality landscaping near office buildings and retail areas can increase rental and sales revenues in those properties. Quality streetscapes and greenspaces that include healthy trees can attract and keep occupants in neighborhoods, which is particularly important in communities with high vacancy rates.

### SOCIAL BENEFITS

Urban trees also provide a wide range of functions that positively affect physical health and well-being. By improving urban air quality, they reduce the incidence and severity of respiratory disease and asthma attacks. They reduce the number of low-level ozone respiratory ailments and heat-related illnesses by reducing summer urban heat island extremes and slowing the formation of smog. Additionally, access to parks and greenspaces encourages outdoor activity, which can lead to weight loss



Healthy trees improve neighborhoods by adding to property value, providing shade, reducing stormwater runoff, and enhancing human interaction through the creation of calming landscapes (photo credit: R.J. Laverne).



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and reduce health problems associated with obesity. These public health-related social benefits are also linked to economic benefits through avoided health care costs, both for individuals and for the medical insurance industry.

The benefits to physical health are apparent, but there are also mental and emotional well-being benefits. Increasing evidence suggests that access to nature in cities (which can be as simple as a view of trees out of a window) can reduce stress and refresh directed attention and concentration. Research has shown that access to nature can lead to less aggressive behavior in people, a reduction in domestic violence, and lower crime rates. Access to shade, trees, and greenspace encourages people to come out of their houses, fostering communication between residents and establishing a positive social network.

### **COSTS ASSOCIATED WITH THE URBAN FOREST**

The list of benefits provided by urban forests is surprisingly diverse, many of which can be translated into economic impacts. Establishing and maintaining urban forests, however, does not come without costs. First, there are the direct costs of labor and materials to purchase, care for, and eventually remove the trees. There are also environmental costs in the form of emissions from landscape maintenance equipment and water consumption by the trees. Additionally, there are costs to repair sidewalks and curbs displaced by tree roots and for pruning limbs away from power lines. Finally, there are property damage and human injury risks associated with falling branches. All of these costs, however, can be effectively managed through good planning.

### **MAXIMIZING BENEFITS AND REDUCING COSTS THROUGH PLANNING**

Determining the appropriate species of trees to plant and the right place to plant them can significantly reduce tree maintenance costs, greatly extend the useful life of the tree, and maximize the vast range of economic, environmental, and social benefits that urban forests provide. Although communities largely rely on urban foresters and arborists to make these decisions, planners can play an important supportive role.

Planners can work with urban foresters and arborists to document the history of the local urban forest and help seek out private and civic partners to plant and maintain trees. Planners can also support the urban forest through plans and development regulations. They can work to ensure that trees are at the forefront of the community visioning or goal-setting process and can mutually reinforce urban forestry through other planning goals. They can include a green infrastructure element in their comprehensive plan and link it to other plan elements. They can adopt a tree ordinance and ensure that it's incorporated into the development code. Finally, they can include an urban forestry evaluation checklist or guidelines in planned unit development regulations.

### **A MATTER OF QUALITY OF LIFE**

Urban planners continually work to improve the quality of life for community residents—by improving housing, transportation, business opportunities, and increasingly by considering the urban forest. Planning for vibrant urban forests can lead to substantial improvements to the quality of life for people by improving their health, safety, neighborhoods, and even their mental and emotional well-being. Although developing and maintaining the urban forest does not come without costs, the benefits of a mature urban forest far outweigh the costs. By bringing urban forestry ideas to the front of the planning agenda, we can increase the effectiveness of our communities' urban forestry program and ensure that our communities experience all of the benefits the urban forest provides.

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