

City of Madison, Wisconsin

Urban Forest

Madison's urban forest is made up of all public and private trees that grow within the city. These trees provide the community many benefits, and these tree benefits are driven by the amount of canopy cover.

Public street trees serve as the basis of Madison's green infrastructure, they form scenic corridors, and create a sense of unity and character throughout the city.

Public street tree population total 96,074 trees.

Every year public street trees provide benefits equal to \$11,735,065.

Each tree provides \$122 in annual benefits.

For every \$1 spent on trees the city receives \$3.35 of benefits in return.

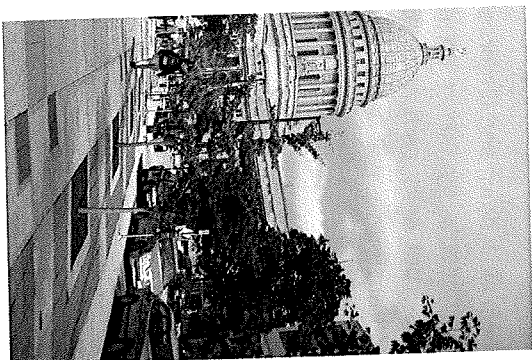
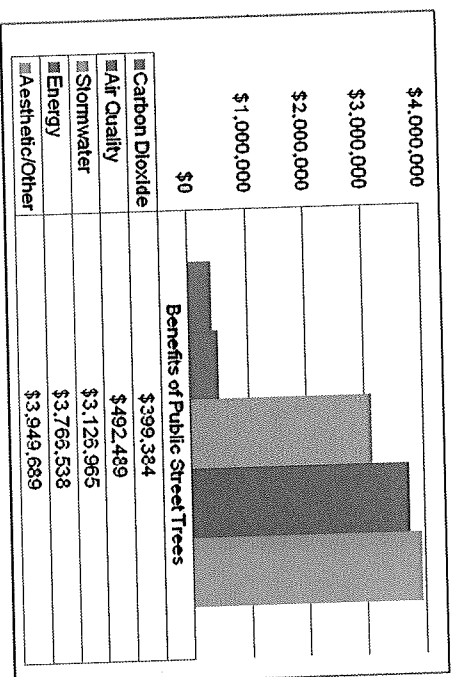


Public Street Tree Benefits

Madison's public street trees provide shade and beauty that contribute to the community's quality of life. They soften the hard appearance of concrete structures, parking lots, and streets. Trees help stabilize soils by controlling wind and water erosion and also help reduce noise levels; cleanse pollutants from the air; produce oxygen and absorb carbon dioxide; and provide habitat for wildlife.

Trees provide significant economic benefits, including increased real estate values and more attractive settings in which to locate commercial businesses. Trees provide shade and act as windbreaks, helping to decrease residential energy consumption.

Madison's public street trees provide **\$11,735,065 of annual benefits** to the community.



There are 11,008 acres of public and private tree canopy, equal to 22.4% of the total land area.

Methods

Using the i-Tree software suite developed by the U.S. Department of Agriculture (USDA) Forest Service, Davey Resource Group completed an i-Tree Canopy assessment of Madison's urban forest with National Agricultural Imagery Program (NAIP) 4-band imagery acquired by the USDA in 2010.

USDA Resource Group entered Madison's computerized street tree inventory data and current maintenance costs into the i-Tree Streets tool to quantify the dollar value of annual environmental and aesthetic



Stormwater

Trees reduce stormwater runoff by capturing and storing rainfall in their canopy and releasing water into the atmosphere. Tree roots and leaf litter create soil conditions that promote the infiltration of rainwater into the soil.

Trees help slow down and temporarily store runoff and reduce pollutants by taking up nutrients and other pollutants from soils and water through their roots. Trees transform pollutants into less harmful substances.

Madison's street trees intercept **115,378,156** gallons of rainfall every year worth **\$3,126,965**. Intercepted rainfall helps to keep Madison's lakes clean.

Intercepted stormwater can fill 17 Olympic-sized pools annually.

Energy

Trees reduce energy usage by lowering local air temperatures when they transpire water and shade surfaces. Urban trees shade buildings in the summer and block winter winds.

Madison's street trees provide energy savings worth **\$3,766,538** every year.

The net cooling effect of a healthy tree is equivalent to 10 room-size air conditioners operating 20 hours a day. Trees placed properly around buildings as windbreaks can save up to 25 percent on winter heating costs.



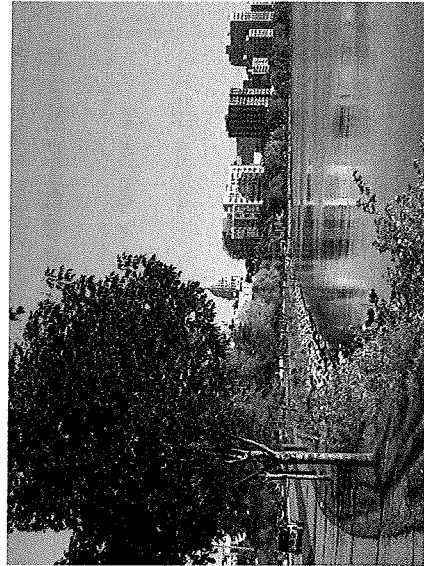
Carbon Dioxide and Air Quality

Trees improve air quality. During photosynthesis, trees remove CO₂ from the atmosphere to form carbohydrates that are used in plant structure/function and return oxygen back to the atmosphere as a by-product. Trees, therefore, act as a carbon sink. Urban forests cleanse the air by intercepting and slowing particulate materials and by absorbing pollutant gases on their leaf surfaces.

Madison's street trees remove **175,136** pounds of pollutants every year worth **\$492,489**.

Madison's street trees sequester **30,819,750** pounds of carbon every year worth **\$399,384**.

Trees act as natural pollution filters; one tree can absorb carbon dioxide at a rate of 48 pounds per year.



Aesthetics and Other Benefits

In addition to increasing property values, research has shown that trees can lead to reduced crime rates, decreased amounts of human stress, and shorter lengths of hospital stays. Tree-lined streets also make our streets safer by reducing traffic speeds and the amount of stress drivers feel which likely reduces road rage. Trees are important for wildlife as well. In Madison trees provide nesting sites for birds and support a wide range of insects which are important food sources for birds and other wildlife.

Madison's street trees provide **\$3,949,689** every year in aesthetic and other benefits.

Landscaping, especially with trees, can increase property values as much as 20 percent.

