A majestic silver maple tree in front of 91-32 71st Avenue in Forest Hills, Queens.

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Maybe Only God Can Make a Tree, but Only People Can Put a Price on It

By DAVID K. RANDALL

It seems like a Zen koan: how much is a New York City tree worth? Since New York's first park was created in 1733, the various incarnations of the modern Parks and Recreation Department have tried to quantify a resource that at best is viewed as inherently valuable, like sunshine, or at worst is chopped down.

"Trees are great for a variety of reasons, but how do you explain that to the Office of Management and Budget?" Adrian Benepe, the parks commissioner, has said.

Now, for the first time, the Parks Department can actually translate the value of the city's trees into real dollars and cents. And as expected, it's a big number.

Step 1 was a tree census, a two-year process that sent more than 1,000 volunteers to count every tree on every street in the city. The census results were then fed into a computer program that spit out a dollar value for each of the 592,130 trees counted, a figure that does not include the roughly 4.5 million trees in parks and on private land.

The program, called Stratum, was developed by researchers at the [University of California](#) at Davis and the [United States Forest Service](#). It takes into account several factors, including a tree's impact on local property values, its contribution to cleaning the air by absorbing carbon dioxide, and how much its shade helps reduce energy consumption.

Factoring in the costs associated with planting and upkeep, New York City's street trees provide an annual benefit of about $122 million, according to the Parks Department. The study concludes that New York receives $5.60 in benefits for every dollar spent on trees.

Trees in lower-density areas, typically in Queens and on Staten Island, are generally more valuable than those in Manhattan and high-density areas of Brooklyn and the Bronx because they provide the greatest environmental benefits, according to Fiona Watt, chief of forestry and horticulture for the city.

"Trees in front of single-family homes will provide greater shade, and it's intuitive that a large tree in front of a home seems to resonate more than the same tree in front of a huge apartment building," she said.

Trees with large leaves, like London plane trees or maple trees, are more valuable because they provide more shade and consume more carbon dioxide.

The information on the economics of the city's trees gives the Parks Department concrete evidence when it comes to budget discussions, Mr. Benepe said. "We plan on using these values as a baseline to say that this is what we have now, and argue for additional funds to plant more trees," he said.

The tree census found that Queens has about 40 percent of the city's street trees, followed by Brooklyn, with about 25 percent; Staten Island, with about 16 percent; the Bronx, with about 10 percent; and Manhattan, with roughly 8 percent.

The city has made planting more trees as a small way to improve air quality part of a broad plan developed by Mayor [Michael R. Bloomberg](#) to make the city a better place to live by 2030. Mr. Benepe called it "a happy coincidence" that the tree census puts a dollar value on a tree's environmental benefits at the same time that the city is trying to reduce its carbon dioxide emissions.

The first step in determining a tree's environmental value is measuring the rate at which different tree species absorb pollutants. This is being done at a monitoring station at the University of California that simulates New York's City's climate, said Dr. Greg McPherson, the lead designer of the program and the director of the Forest Service's Center for Urban Forest Research.

Dollar values are assigned through an equation that compares carbon dioxide emissions from power plants with the amount of carbon dioxide that a tree species takes in, he said. Power plant smokestack emissions are used because they are easily traceable in the atmosphere, Dr. McPherson said.

The computer model determines a tree's environmental value based on how much carbon it absorbs that would have to be eliminated from the air through some other means, and how much less carbon is emitted by power-generating plants because of a reduced demand for energy resulting from a tree's shade.

To calculate the dollar effect of a tree on property values, the city used a 1988 study in Athens, Ga., that found that homes with a tree in front sell for almost 1 percent more than similar homes without trees.

The city took the median value of a single-family home sold in 2005 as a constant and based each tree's contribution on its size, location and species. A large tree in front of a single-family home would have the highest value, while a small tree in front of an apartment building would have the lowest value.

Dr. McPherson said he developed his computer program over the last 25 years by incorporating several studies that showed the economic benefits of trees.

"I hope this model provides ammunition for people on the front lines who have to battle for budgets to maintain their trees and expand their urban forests," he said.