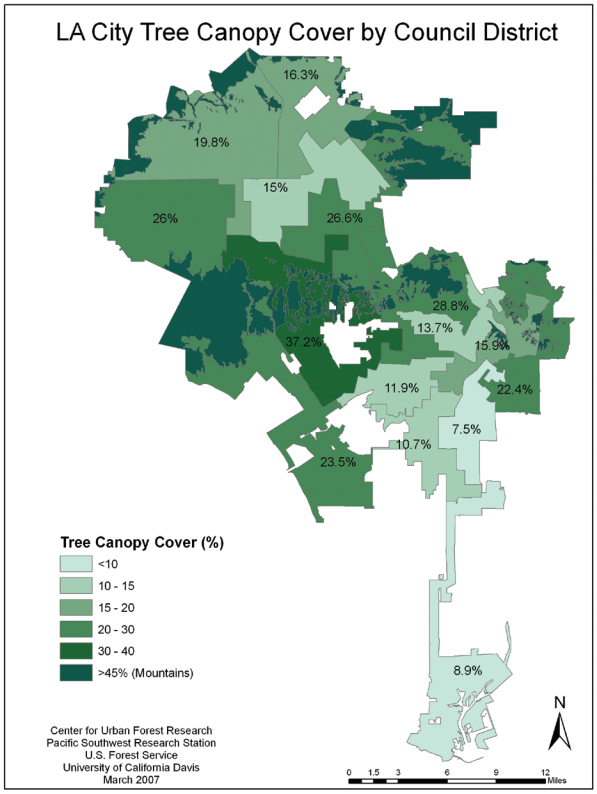
The benefits of one Million Trees in LA

Million Trees LA

Mayor Antonio Villaraigosa of the City of Los Angeles has charted a course for sustainable growth, and the region's community forest is a critical component of that vision. In September 2006, the mayor announced his plan to plant **one million trees** over the next several years. The Million Trees LA initiative draws attention to the importance of urban forests for the **economic, environmental, and social health** of Los Angeles.

For help in carrying out its plans, the city of Los Angeles called upon the Center for Urban Forest Research to answer some questions: How green is LA today? Is there room for a million trees? Where should we plant them? What environmental and other benefits will our trees provide?



How green is Los Angeles today?

To answer the question of how many trees there are in LA today, we turned to technology for help. Using geographic information systems (GIS) and images of the city taken by the Quickbird satellite, we were able to identify areas of trees because trees reflect light in a different way from other materials. We then divided the total acres of tree canopy cover by the diameter of an average urban tree crown. And the results?

Not counting the mountainous areas, the current urban forest covers about 21% of Los Angeles and consists of about 11 million trees. The number of trees in an area is closely related to land use, so the more industrial and commercial parts of the city have the least amount of tree canopy cover (7%), and the low-density residential parts of the city have the most (37%).

Is there room for a million trees?

And where will they go? These weren't easy questions to answer. How do you find and count all the little spaces a tree can fit in a city of almost 500 square miles? With computers, of course.

First, the computer "masked out" areas where there were already trees, buildings, paved surfaces, and bodies of water. In the remaining pervious surfaces (grass and bare soil), the computer tested each potential site for whether a tree would fit, beginning with large trees (50 ft in diameter) wherever possible because they provide the most benefits. After all possible spaces for large trees had been filled, the computer found room for as many medium (30 ft in diameter) and then as many small (15 ft) trees as possible.

Because parking lots are paved, they were "masked out" in the first step, but they can provide valuable opportunities for planting. Potential planting spaces in parking lots were calculated based on a citywide parking lot sample.

When all the small, medium, and large planting spaces were finally counted, we found room in Los Angeles for **2.5 million trees!**

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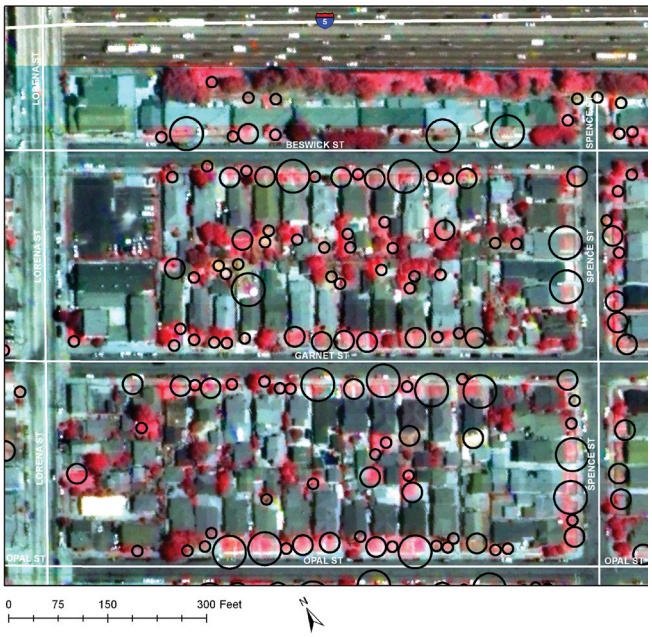

Potential tree planting sites in an LA neighborhood

Of course, although the computer can distinguish grass from roads, it can't tell a grassy backyard that would be perfect for a tree from the grassy area of a baseball field where a tree would be less welcome. So although there are technically 2.5 million spaces for trees, in reality we estimated that about half of those are practical for planting. That still leaves plenty of room for LA's one million trees.

What benefits will one million trees provide?

Trees are a solution to many of Los Angeles's most pressing environmental problems.

- The leaves of trees intercept rainfall, reducing stormwater runoff, protecting water quality, and lowering costs for water treatment. Over 35 years, one million new trees will capture 14–21 billion gallons of stormwater!
- By capturing carbon dioxide from the air and turning it into leaves, branches, and roots, trees fight global warming. One million new trees will reduce carbon dioxide in the air by about one million tons!
- Trees intercept and absorb air pollutants, including those that cause smog. One million new trees will reduce air pollution by up to 10,000 tons!
- By shading buildings and lowering temperatures, trees reduce our energy needs, which reduces the production of pollutants and carbon dioxide at the power plant, all while saving us money. One million trees will save about 1 million MWh of electricity!

Trees also provide other benefits that are less easily calculated: by lowering parking lot temperatures, they reduce smog-forming emissions from parked cars; patients in hospitals with views of trees heal more quickly and require less medication; shade lowers the threat of skin cancer from UV rays; views of nature have been shown to reduce stress; commercial areas with many trees encourage shoppers to stay longer and spend more; and trees increase residential property values.

Using research and models developed at the Center for Urban Forest Research, we estimated the value, over a 35-year period, from one million trees in Los Angeles as **$1.3 to 2.0 billion!** Average annual benefits are $49 to 60 per tree planted.

Estimated Urban Forest Benefits	
Aesthetic/other	$1.1–1.6 billion
Energy savings	$75–117 million
Air quality improvement	$53–83 million
Carbon dioxide reduction	$5.1–8.5 million
Stormwater interception	$97–153 million
Total benefits	**$1.3–2.0 billion**

Range based on different mortality rates

Planting for the future

Choosing species wisely and planting trees in the best locations relative to buildings and other infrastructure will increase the benefits that the one million trees will provide. We recommend that the City of Los Angeles develop a tool that will make the data from this study accessible to tree planters and help them choose the best tree and the best spot for it.

Parking lots offer challenging, but extremely valuable, planting opportunities. Trees in parking lots can substantially improve air quality, reduce stormwater runoff, cool urban heat islands, and improve community attractiveness. We recommend establishing new technical, financial, and community partnerships aimed at developing support for a major parking lot greening effort in Los Angeles that could serve as a model for cities around the world.

Los Angeles is a vibrant city that will continue to grow in the decades ahead. A healthy urban forest will serve the residents of Los Angeles well by helping transform the city known for its concrete-lined river and endless freeways into a more beautiful, healthy, and sustainable place to live.

For more information on this and other urban forestry projects, visit: http://www.fs.fed.us/psw/programs/cufr/