

# The Large Tree Argument

*The Case for Large-Stature Trees vs. Small-Stature Trees*

Center for Urban Forest Research  
Southern Center for Urban Forestry Research & Information

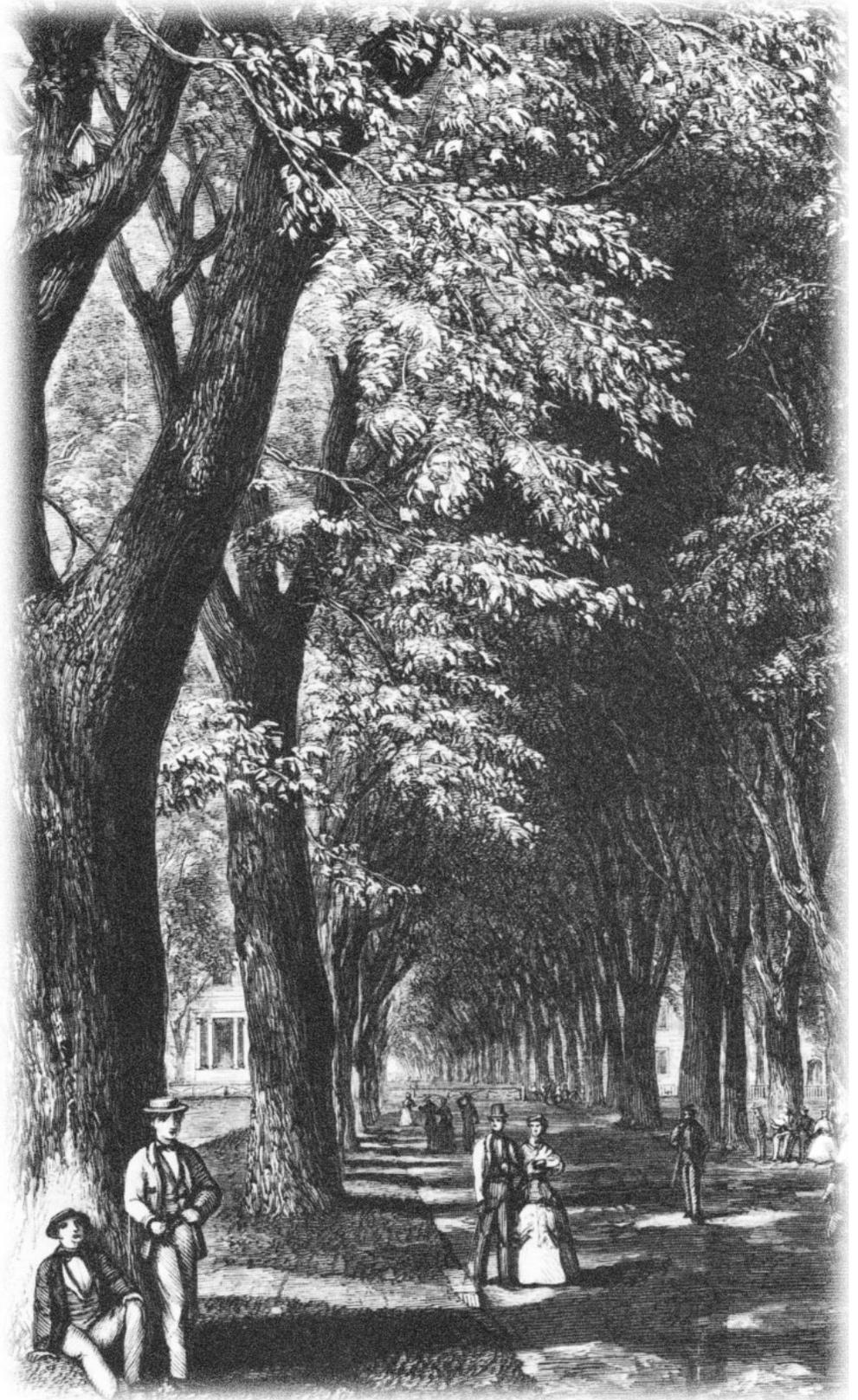




# Why did we like elm trees so much?

Large stately elm trees once graced many communities throughout the US. But now they are gone. Why were entire communities so disappointed when they lost their elm trees to Dutch elm disease several decades ago?

People had a sense that these large trees were important to them, their family, and their community. And this was long before we quantified the benefits of trees. Now we have scientific evidence for what these people knew decades ago.



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### Large trees pay us back

We now know that, dollar for dollar, large-stature trees (see sidebar definition p.6) deliver big savings and other benefits we can't ignore. Small-stature trees like crape myrtle deliver far fewer benefits. In fact, research at The Center for Urban Forest Research shows that their benefits are up to eight times less.

Compared to a small-stature tree, a strategically located large-stature tree has a bigger impact on conserving energy, mitigating an urban heat island, and cooling a parking lot. They do more to reduce stormwater run off; extend the life of streets; improve local air, soil and water quality; reduce atmospheric carbon dioxide; provide wildlife habitat; increase property values; enhance the attractiveness of a community; and promote human health and well being. And when we use large-stature trees, the bottom-line benefits are multiplied. When it comes to trees, size really does matter.

### Don't forget the established "Old Guard"

We can't forget the already-established trees. These older trees provide immediate benefits. The investment that community leaders made 30, 40, 50 years ago is producing dividends today. Dr. McPherson, Director of the Center for Urban Forest Research, points out that "since up-front costs to establish these large-stature trees have already been made, keeping these trees healthy and functional is one of the best investments communities can make."

### What do you lose if you don't plant large trees?

Municipal tree programs are dependent on tax-payer supported funding. Therefore, communities must ask themselves, are large-statured trees worth the price to plant and care for? Our research has shown that benefits of large-statured trees far outweigh the costs of caring for them, sometimes as much as eight to one. The big question communities need to ask is: can we afford not to invest in our trees? Are we willing to forego all of these benefits? Or, would we rather make a

commitment to provide the best possible care and management of our tree resource and sustain these benefits for future generations.

### Costs vs benefits

In most areas of the country, communities can care for their largest trees for as little as \$13 per year, per tree. And, each tree returns an average of \$65 in energy savings, cleaner air, better managed stormwater, extended life of streets, and higher property values. Even at maturity, small-stature trees do not come close to providing the same magnitude of benefits.

**WHAT LARGE TREES MEAN**

-  **More shade** = **more energy savings**
-  **Cleaner air** = **better health and fewer hospital visits**
-  **More stormwater management** = **lower costs for stormwater controls**
-  **More shaded streets** = **longer time between resurfacing**



## A hypothetical example

A few years ago, the community of Greentree was faced with a budget crisis and decided to save money by downsizing its community forest—planting a majority of small-stature trees like crape myrtle in favor of large-stature trees like ash and even replacing large trees with smaller ones (see below). It made choice X. Unfortunately, this is not an uncommon story in communities today. But the real question is, what did they give up in return, and was downsizing a wise choice?

**Table 1: Large trees vs small trees**

The city of Greentree chose planting scenario X. By year 20 it was already a \$60,000 annual mistake (see discussion above).

	CHOICE X			CHOICE Y	
	Avg. Ann. Benefit Avg. Ann. Cost	# Trees	Total Benefit Total Cost	# Trees	Total Benefit Total Cost
<b>Large Trees</b>	\$65.18 \$13.72	259	\$16,882.00 \$3,553.00	1,693	\$110,350.00 \$23,228.00
<b>Medium Trees</b>	\$36.04 \$6.87	753	\$27,138.00 \$5,173.00	753	\$27,138.00 \$5,173.00
<b>Small Trees</b>	\$17.96 \$6.23	1,693	\$30,406.00 \$10,547.00	259	\$4,652.00 \$1,614.00
<b>Total Trees</b>		<b>2,705</b>		<b>2,705</b>	
<b>Total Benefits</b>			<b>\$74,426.00</b>		<b>\$142,140.00</b>
<b>Total Costs</b>			<b>\$19,273</b>		<b>\$30,015.00</b>
<b>Annual Net Value to Community</b>			<b>\$55,153.00</b>		<b>\$112,125.00</b>

Note: Each "tree" represents 259 trees planted.

In this case, the city decided that planting 1693 small-stature trees and only 259 large-stature trees would be a good budget-cutting strategy. Over the short term this may save the city a little money. But over the long term they will have decidedly fewer benefits and a decreased quality of life. City elected officials failed to consider what the city would be giving up over the life of those trees.

Will people want to live, work, recreate, do business, and shop in this community? And will the new trees provide all of the benefits that the residents seek—energy conservation, clean air, clean water, attractive surroundings, and enhanced real estate values. The answer is a resounding NO! The growth of these trees was modeled by The Center for Urban Forest Research over 40 years. By year 20, the decision-makers had

already made nearly a \$60,000 dollar annual mistake.

Choice Y is clearly the way to go to maximize their return on budget dollars. The model shows that once the trees are mature the community will receive an annual return on investment of nearly \$60,000 over choice X. Plus, the community will look quite different in the future and be a healthier and safer place to live.

## Is it possible to recreate the past ?

We may never have the arching canopies we once had with the stately elms of a few decades ago. But, we can still achieve large, extensive and functional canopies and reap all the benefits. It will take planting large-stature trees in as many appropriate places as possible while creating the best possible site that maximizes space and allows for adequate exchange of gases and water. And yes, it is possible!

### Editors Note

*We recognize that on some restricted sites small-stature trees may be the best choice. However, let's not succumb to the limited space argument so easily. We need to continue to fight for more space for trees in every new project and every retrofit. The bigger the tree, the bigger the benefits and, ultimately, the better our quality of life.*

### The Future Without Large Trees

Cities that are using small-stature trees to reduce costs may achieve some short-term savings, but over the long term, they have destined themselves to a future with fewer and fewer benefits as large-statured trees are replaced with smaller ones.

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