



## IN DEFENSE OF TALL TREES

*Identify the valuable and strongest large trees in cities and towns. Then work to keep them.*

BY CHRIS DONNELLY

In the wake of recent storms in Connecticut, residents have criticized tall trees as threats to public safety and the reliability of electricity and cable lines. Yet, tall trees are very much a natural part of the Connecticut landscape.

It is true that trees are large, living organisms and that, when they grow in close proximity to people and structures, they need careful attention and maintenance. However, tall trees also contribute to the quality of life. They provide a wide range of

benefits—from cooling buildings to soothing tempers—not available through other practical means. The growth and retention of healthy, structurally strong, and properly located tall trees should be a priority goal of all municipalities in the state.

My emphasis is deliberately *tall* trees because it's easy to equate a tree with a tree with a tree, and so to accept as a trade-off the safety of short-stature trees for the benefits of tall trees. Although shorter trees such as crabapples, dogwoods, and flowering cherries have their place, they are not able to make the same contributions as do tall trees

such as oaks, elms, maples, and pines.

Tall trees' canopies and leaf surface areas measure larger than do those of smaller trees. Taller trees have more leaves, trap more pollutants, take in more carbon dioxide, transpire more water through the soil, and cast greater shade than smaller trees do.

Tall trees also do all those things that make trees so valuable to us. For the same ground footprint, tall trees deliver more working leaf surface areas. Also, their heights provide greater ability to shade the roofs and upper stories of buildings. Taller trees provide a broader range of habitats and they

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tend to live longer, and so provide their benefits for a much longer time.

The benefits provided by trees in cities, towns, and villages have been well documented. These include financial, social, and health benefits, and many others resulting from the environmental services trees deliver. For instance, in 2007, a team of interns working for Knox, Inc., studied ecosystem benefits of the trees within the City of Hartford.<sup>1</sup> Through this study, it was learned that Hartford's trees remove some 73 tons of air pollutants annually and, through reduction in energy usage, reduce the burning of fossil fuels by some 2,400 barrels of oil per year.

A similar study, conducted by Suzanne Oversvee, a graduate student at the Yale School of Forestry and Environmental Studies, found that the street trees in New Haven produced some \$4 million in environmental

services per year, with energy savings from reduced electrical and natural gas consumption totaling about \$1.7 million.<sup>2</sup>

Because these are local studies, it is possible to look at the data in detail. In New Haven, the larger tall trees, those more than 36 inches in diameter at breast height (dbh), make up about 5 percent of the population of street trees. In Hartford, in which all trees and not just street trees were surveyed, trees with greater than 36 inches dbh make up only about 2 percent of the population. Yet, in Hartford, these 2 percent of the trees produce about 14 percent of the benefits that the trees in the city provide. If trees 24 inches and larger are considered, in Hartford they make up 5 percent of the population and do 40 percent of the work.

The environmental and financial benefits of these trees and their contributions to

green infrastructure are only a part of the importance of these trees. A 2003 study published by Frances Kuo,<sup>3</sup> an associate professor at the University of Illinois at Urbana-Champaign, outlined the benefits of trees to the social ecology. These include stronger ties among neighbors, a greater sense of safety and adjustment, better supervision of children and healthier patterns of children's play, more use of neighborhood common spaces, fewer incivilities, and fewer violent crimes and crimes against property. Most of Dr. Kuo's research in this area was focused on residents in Chicago subsidized housing. In the paper, she comments, "In poor communities, social ties among neighbors are the first line of defense against the ravages of poverty. By contributing to stronger ties among neighbors, trees may enhance residents' resilience in the face of sudden financial setbacks and emergencies." In other words, the simple presence of trees can be a buffer against hard times.

She also is quick to point out that the benefits of trees are not just there for the socio-economically disadvantaged. Later on in the paper, she references the community green spaces in middle- and upper-income neighborhoods across the country: "The pattern of neighborhood ties developing from the shared use of these common green spaces exactly mirrors our findings from the poorer

*Opposite page: A pin oak with a trunk 39 inches in diameter shades a two-family house on the corner of Batter Terrace and Derby Avenue in New Haven, providing significant energy savings.*

*Left: A large black oak (61 inches in diameter) dwarfs spectators returning from the 130th Harvard-Yale football game in New Haven's West River neighborhood. Trees like these can be central to the character of a neighborhood.*

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1 See "Hartford's Urban Forest—The Challenge," available on the urban forestry Web page on the Department of Energy & Environmental Protection forestry Web site: [ct.gov/deep/forestry](http://ct.gov/deep/forestry).

2 "Assessment of the Environmental Service Benefits of the City of New Haven's Street Tree Population," by Suzanne Oversvee, Yale School of Forestry and Environmental Studies, Master's Project, Spring 2007, unpublished.

3 "The Role of Arboriculture in a Healthy Social Ecology," by Frances E. Kuo, *Journal of Arboriculture* 29(3): May 2003.



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*A colonnade of well-maintained red oaks line the Memorial Boulevard in Bristol, casting shade and making a strong statement regarding Bristol's veterans.*

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neighborhoods. . . . Moreover, this pattern appears across different community greens with striking consistency.” Trees are a part of the social glue that holds neighborhoods and communities together, wherever those communities are and whatever the circumstances associated with them.

The social value of trees is almost certainly a factor underlying the economic value of trees, as shows in the greater property values in neighborhoods with treed lots and tree-lined streets. But the value of trees does not end there. Many studies have correlated trees with better human health. By encouraging outdoor exercise, trees help with cardiovascular fitness. Although not all studies

support that trees lower the rates of asthma, trees do remove fine particulate matter from the air, and that leads to a variety of health benefits.<sup>4</sup>

U.S. Forest Service researcher Geoffrey Donovan and colleagues outline perhaps the most startling suggestion of trees’ lifesaving benefits in a paper connecting human health and the loss and removal of ash trees killed by an exotic insect, the emerald ash borer. These authors concluded that the widespread death of ash trees from the emerald ash borer led to an increase in deaths from heart and lung illnesses, adding, “These results . . . also provide stronger support for a causal relationship.”<sup>5</sup> The plausible

4 “Modeled PM2.5 Removal by Trees in Ten US Cities and Associated Health Effects,” by David Nowak et al., *Environmental Pollution* 178: 395–402, 2013.

5 “The Relationship Between Trees and Human Health—Evidence from the Spread of the Emerald Ash Borer,” by Geoffrey Donovan et al., *American Journal of Preventive Medicine* 44(2): 139–145, 2013.

mechanisms that the article cites for this result include improved air quality, reduced stress, increased physical activity, more moderate temperatures, and relief during stressful life events.

Other research supports trees' critical values. Trees do matter, and they matter for many reasons. Large trees have a particular importance because of their increased ability to provide these benefits. Because trees are so important to people, well-treed cities and towns should be one of the legacies that each generation seeks to pass down to the next.

How do we do this? We do this by planting trees, of course, but simply planting trees is not enough. We have many large, healthy tall trees now. These trees are already

hard at work. Retaining the trees we already have and committing to their maintenance is only reasonable. We should know where these trees are and differentiate those that are healthiest, are most structurally sound, and otherwise have the greatest potential to contribute within communities, and we should work to keep them.

To gain the benefits of these trees, proximity is important, so it is also important that these trees are well-spread across the community landscape. In some places, because of the density of housing or for other reasons, this means that trees in public places, including along streets, have an additional importance. A tree that is one of the few tall trees in a given vicinity is that much more valuable than if it is one among many other

tall trees nearby. Mapping and other tools can show us where these trees are.

And we do need to plant trees. As we do so, we should seek to plant the right trees where they will be most effective. Besides choosing smaller and more compact trees for certain circumstances, this also means placing a priority on planting trees that will become large, tall trees in areas that can sustain such trees.

This might mean choosing among competing priorities and taking some risks. But, as the articles mentioned suggest, ignoring or undervaluing what it is that trees do has its own risks.

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*Elms under utility wires along Saint Roman Street in New Haven. This is an example of the wrong tree in the wrong place. These trees have no choice but to grow up into the wires, creating long-term maintenance problems for both the City and the utility.*