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Urban Trees: Are They Worth It?

Let's face it, urban trees can cost us some major bucks. With the severe weather this past year I'm sure you or someone you know had a tree come down, possibly even falling on a car or house. Paying for the removal of a tree, and possibly repairing damage done by it is not cheap. Trees can also cause damage to infrastructure-heaving sidewalks, damaging sewer lines and other utilities. Most drop leaves or seeds yearly which require cleanup as well as other maintenance like pruning and watering. Sometimes you may wonder, are they really worth it?

The economic costs for trees are quite easily seen for a homeowner or a city by reviewing their annual budget. One can see what they paid to plant, maintain, and remove a tree, what damage it caused to a sidewalk or building and what it cost to repair it.

The economic benefits of trees may not be as obvious. It may be a little more difficult than looking at your bank account. Unfortunately each tree isn't literally making a cash deposit on a daily basis, but there is an overwhelming amount of research that has found trees are providing a significant economic and social contribution. Here are some of the monetary benefits trees provide:

Trees reduce stormwater.

Urban trees reduce the amount of stormwater a city has to deal with through interception, evapotranspiration, and infiltration. This reduces the amount of infrastructure needed by a city to transport and treat stormwater as well as aides in recharging aquifers and reduces runoff into our lakes and streams. The street trees alone in New York City were found to intercept 890 million gallons of stormwater annually, that's 1,525 gallons per tree on average, with a total value of over \$35 million each year.¹

Trees reduce your utility bills.

Trees can save us a tremendous amount of energy through shading buildings and pavements along with serving as windbreaks. The net cooling effect of a well-placed healthy tree is equivalent to 10 air conditioners operating 20 hours a day.² Evergreens serving as windbreaks in the winter can save 10-50% on heating costs.³ These savings can really add up, street trees alone in Minneapolis save \$6.8 million in energy costs annually!⁴

Trees can extend the life of our streets.

Although trees can cause damage to infrastructure in situations of poor planning, they can also increase the life and decrease maintenance for infrastructure in cases of good planning. One example comes from Modesto, California where they found that paved streets shaded with large-stature trees reduced costs for repaving by 58% or (\$0.66/ft²) compared to unshaded streets over a 30 year period.⁵

Trees increase your home's value.

Properties with or in close proximity to trees are typically worth more money. A study done in east Portland found having one average sized tree for that area in front of a house increased the house's sale price by \$7,130. The tree's benefits spilled over to houses within a 100-foot radius, increasing their combined value by \$12,828.⁶ A similar study done in the Philadelphia neighborhood of New Kensington

showed new tree plantings increased surrounding housing values by approximately 10%, which translated to a \$4 million gain in property value just through tree planting.⁷

Trees fight crime!

A study done of public housing residents in inner-city Chicago found that 25% fewer acts of domestic aggression and violence were reported in areas with nearby trees and natural landscapes than areas without.⁸ A separate study conducted in the same area found that apartment buildings with high levels of vegetation had 52% fewer total crimes reported than those with low levels of vegetation. Proposed reasons for this reduction of crime is the increase in surveillance due to higher outdoor activity and lowered mental fatigue due to exposure to green space.⁹ Considering in Minnesota the taxpayer pays on average \$41,364 per inmate annually¹⁰ this reduction in crime could save the taxpayer a significant amount of money.

Trees keep you healthy.

Increased air quality is another benefit of trees. They clean the air by absorbing carbon dioxide, sulphur dioxide, nitrous oxides and other pollutants.¹¹ Increased air quality means less health risks. Researchers from Columbia University found childhood asthma rates were highest in parts of New York City where tree density was lowest. The rate of asthma fell by 24% for every extra 343 trees/km², a pattern that held true even after taking account of differing sources of pollution, levels of affluence and population density.¹² On the same track, patients recovering from surgery in hospital rooms with window views of a natural scene had shorter postoperative hospital stays, received fewer negative evaluations in nurses' notes, and took fewer painkillers than matched patients in similar rooms with windows facing a brick wall.¹³

Trees are good for business.

Shoppers are willing to travel further to visit a business district with high quality trees and spend more time there once they arrive. They are also willing to spend 9%-12% more for products in well treed business districts than those with no trees. This was found to be true in cities of varying sizes and across the US.¹⁴

Trees are job creators.

It's a politician's dream-in 2002 the environmental horticultural industry was estimated to employ 1,964,339 people, added \$95.1 billion in property value, and contributed \$64.3 billion in labor income.¹⁵
-Support the economy, let's plant some trees!

Costs vs. Benefits.

Now that you know some of the benefits of trees, let's see if they outweigh the costs. In the early 90's a study was done in Chicago to determine if benefits from their newly planted trees outweighed planting and maintenance costs over a 30 year period. They determined that there was a *net* benefit of \$38 million over the 30 years or \$402 per tree planted. For every \$1 invested in planting and maintenance costs, they received \$2.83 back in benefits.¹⁶

In 1997-1998 the City of Modesto, California set out to find if the annual \$2.6 million municipal budget spent on urban trees was justified. The results of the study found total annual benefit from Modesto's urban trees to be \$4.95 million, *netting* \$2.3 million or on average \$54.33/tree annually.¹⁷

In Davis, California a study of 24,000 maintained public street trees showed a *net* annual benefit of \$1.2 million, with every \$1 invested returning \$3.80 in benefits. The costs factored in included infrastructure

damage, price of litter/storm clean up, litigation and settlement expenditures, as well as planting, maintenance, and removal costs.¹⁸

Minneapolis receives an annual net benefit of \$15.7 million or \$79/tree from its municipal trees.¹⁹ Trees in New York City provide \$5.60 in benefits for every \$1 spent on tree planting and care.²⁰ Studies done by a variety of researchers across the nation and world continue to tell us that investing in urban trees has significant returns. These returns can be increased greatly through proper planning (site and species selection) as well as using proper planting techniques and continued maintenance.

So, are trees worth it? Well, if you know of any other investments with that great of a return let me know, I wouldn't mind retiring early...

¹ Peper, Paula, E. Gregory McPherson, James Simpson, Shelley Gardner, Kelaine Vargas, Qingfu Xiao. "New York City, New York Municipal Forest Resource Analysis." USDA Forest Service, Pacific Southwest Research Station and Center for Urban Forest Research. (2007). Web. <http://www.fs.fed.us/psw/programs/uesd/uep/products/2/psw_cufr687_NYC_MFRA.pdf>

² University of Washington, College of Forest Resources. Urban Forest Values: Economic Benefits of Trees in Cities. Rep. Center for Human Horticulture, 1998. Web. <<http://www.cfr.washington.edu/research/factSheets/29-UrbEconBen.pdf>>

³ Trees Save Energy. Maryland Department of Natural Resources. Web. <<http://www.dnr.state.md.us/forests/publications/urban5.html>>

⁴ "City of Minneapolis, Minnesota Municipal Tree Resource Analysis." Center for Urban Forest Research, USDA Forest Service, Pacific Southwest Research Station, June 2005. Web. <http://www.fs.fed.us/psw/programs/cufr/products/2/cufr645_minneapolisMFRA.pdf>

⁵ McPherson EG, Muchnick J. 2005. "Effects of street tree shade on asphalt concrete pavement performance." *Journal of Arboriculture* 31:303-310 <http://www.treebenefits.terrasummit.com/Documents/Business/psw_2005_mcpherson001_joa_1105.pdf>

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⁷ Wachter, Susan. *The Determinants of Neighborhood Transformations in Philadelphia Identification and Analysis: The New Kensington Pilot Study*. Rep. Wharton School University of Pennsylvania, 2005. Web. <http://www.kabaffiliates.org/uploadedFiles/KAB_Affiliates.org/Wharton%20Study%20NK%20final.pdf>.

⁸ Kuo, F.E., and W.C. Sullivan. 2001. "Aggression and Violence in the Inner City: Effects of Environment Via Mental Fatigue". *Environment and Behavior* 33.4 (2001): 543-571. Web. <<http://www.outdoorfoundation.org/pdf/AggressionAndViolence.pdf>>

⁹ Kuo, Frances, and William Sullivan. "Environment and Crime in the Inner City: Does Vegetation

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<<http://www.outdoorfoundation.org/pdf/EnvironmentAndCrime.pdf>>

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<http://www.vera.org/sites/default/files/resources/downloads/Price_of_Prisons_updated_version_072512.pdf>

¹¹ McPherson, Gregory, James Simpson, Paula Peper, Shelley Gardner, Kelaine Vargas, Scott Maco, and Qingfu Xiao. "Coastal Plain Community Tree Guide: Benefits, Costs, and Strategic Planting". USDA, Forest Service, Pacific Southwest Research Station. (2006). Web.
<http://www.fs.fed.us/psw/programs/uesd/uep/products/2/cufr_679_gtr201_coastal_tree_guide.pdf>

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