



# City Trees and Property Values

KATHLEEN L. WOLF



**U**rban nature in all its forms—urban forests, parks, greenbelts—provides a range of benefits and services to society, most of which are not readily bought and sold. Economists calculate the use value of nature and ecosystems when tangible goods can be exchanged at market prices, such as timber or fisheries products. Non-use values set up a more complex economic puzzle. How do you estimate values for the many indirect, intangible services and functions that urban nature provides, such as beauty, ecosystem services and psychological benefits?

The issue of valuation has become paramount in today's society. What is not counted does not count in the public arena. When markets do not exist for a resource in question then efforts are made to derive monetary value. Natural settings, ranging from wildland to urban, offer many beneficial life-support functions. Nonmarket valuation

techniques arose from the desire to represent the natural environment in the decision-making calculus within communities.

## Valuation and decisions

Land ownership and improvements can be expensive in urban areas. If the values of intangibles are not represented, hard costs become powerful disincentives to invest in natural capital. Without some indicator of economic value, there is little financial incentive to consider urban nature in land-use decisions, market transactions and capital investment budgets.

In the public sector, local leaders often make decisions about natural resources based on cost-benefit analysis. Any public investment or policy proposal that incurs public costs or affects private development brings forward advocates with evidence on how much market value will be gained



or lost. Those who favor conserving or creating nonproductive nature are often at a disadvantage—as they cannot readily express the monetary gains or losses arising from environmental changes.

The challenge is that city trees and open space are public goods. Consumption of a public good by one individual does not reduce the amount of the good available for consumption by others. Another key property of public goods is that they are nonexcludable. Any number of people who walk under a splendid street tree will enjoy its shade and beauty immediately or over the course of several decades—irrespective of who pays for the planting and maintenance of the tree. It is nearly impossible to exclude any nonpaying individuals from consuming the good.

Government authorities have often invested in public goods that members of society accept as providing value, such

as education or emergency response systems. Having some way to estimate the value of nature's services helps local governments to weigh costs against returns from development or prioritize payments for green versus gray infrastructure.

Nonmarket valuation is helpful in the private sector as well. The pursuit of profit is based on estimates of costs and revenues. Nonmarket valuations offer the developer and land manager information to estimate return on investment for land development projects. For instance, there may be extra costs associated with taking greater care to protect trees during site preparation, but those costs may be offset by higher purchase prices for the building lots.

**Hedonic pricing method**

Although the value of nature to property owners and communities is rarely known in precise dollars, its existence can be detected indirectly. Methods for nonmarket valuation

include travel cost method, deferred and replacement costs analysis, and contingent valuation method.

Hedonic pricing is a revealed willingness-to-pay technique. It attempts to capture the proportion of property prices that are derived from the non-use value of trees and other natural elements. It is a partial measure of value, obtained from indirect inferences about spending and prices.

Hedonic pricing studies have been done since the 1960s. Most use least squares regression analysis as the primary statistical tool. Property prices or assessments are regressed against sets of control variables: environmental attributes of the house or property, other neighborhood variables (such as the quality of local schools) and structural characteristics of the house (such as number of bedrooms). One can then estimate how a change in a natural feature—such as yard trees or proximity to a nearby park—is



**ChairMD**

Where the broken chairs go...

Toll-free: 877-FIX-CHAIR  
or visit [ChairMD.com](http://ChairMD.com)

**Booth #2355**

**We are the chair repair people!**

Visit us at IFMA World Market Place.



**Herman Miller**

**Steelcase**

- All of our technicians are factory trained by industry leaders.
- We use only authentic manufacturer's parts.

- We repair any **Herman Miller** or **Steelcase** chair.
- 95% of our customers get their chairs fixed for **FREE!**



related to a change in property value, holding other characteristics of the property constant. The advantage of this method over others is its use of actual market transactions versus hypothetical questionnaires or indirect assessments.

Urban areas are ideal for the application of hedonic pricing because there is usually a wealth of data available on house and property sales. Geographic databases enable analysis of value increments based on proximity to natural features such as parks. Hedonic values can be capitalized by local governments as increased property tax assessments or as excise taxes paid on property sales. The calculated value across all properties influenced by a natural feature can be aggregated, and the case may be made that the sum is adequate to pay for annual debt and maintenance of the feature, such as street trees or greenspace.

**Review of valuations**

This overview of hedonic studies focuses on properties in urban settings

**Yard and street trees**

Studies about trees and residential property values have evaluated a range of urban forest and landscape conditions on single-family homes. Although there have been a few exceptions, homes with trees are generally preferred to comparable homes without trees, with the trend across studies being a price increase of about seven percent. The following are results from a selection of studies:

Price increase	Condition
2%	mature yard trees (greater than 9-inch dbh)
3-5%	trees in front yard landscaping
6-9%	good tree cover in a neighborhood
10-15%	mature trees in high-income neighborhoods

Price effect is variable and depends on how tree presence is defined. In addition, the socioeconomic condition of a residential area makes a difference. For instance, greater increments of value are seen for tree planting and landscape improvements in lower-quality neighborhoods.

**Tree retention in development**

Many communities have codes or ordinances that regulate tree preservation on residential development sites. Site developers may argue that tree protection costs are prohibitive. Understanding potential market values in different forest conditions is an important step in understanding the economics of forest protection. Market price studies of treed versus untreed lots show this range:

Price increase	Condition
18%	building lots with substantial mature tree cover
22%	tree-covered undeveloped acreage
19-35%	lots bordering suburban wooded preserves
37%	open land that is two-thirds wooded

How do you estimate values for the many indirect, intangible services and functions that urban nature provides, such as beauty, ecosystem services and psychological benefits?

Generally, trees and forest cover in development growth areas add value to parcels. One study found that development costs were 5.5 percent greater for lots where trees were conserved. Given increased lot





and home valuations, builders have reported that they were able to recover the extra costs of preserving trees in a higher sales price for a house and that homes on wooded lots sell sooner than homes on unwooded lots.

### Variability and limitations

Decades of research findings indicate that property values are consistently higher with the presence of trees. There are a few studies that show modest or no results, but even fewer show any negative price effect for city trees. In studies where distance effects can be measured, properties closest to naturalistic parks and greenspace have greatest value.

Despite these general patterns, there is great variability in hedonic analysis valuations. Why would that be? First, the statistical models may omit property characteristics that can bias estimates of amenity value. Such omissions may be due to inadequate research design, or the data for a key characteristic simply may not be available at a reasonable effort.

From a statistical standpoint it is assumed that there is an additive influence of city trees on property prices. Yet a causal relationship is rarely so simple, and all possible environmental inputs are difficult to capture, nor are they independent of each other.

These difficulties raise more philosophical questions. Is it really possible to calculate a price that communicates all the services and benefits that trees provide? There are some very practical limitations of hedonic analysis.

Trees and forests provide diverse environmental services such as air and water quality improvements, flood control and wildlife habitat. Such benefits extend beyond the boundaries of a single parcel or may be invisible to buyers and so may not be adequately captured in hedonic analysis. Urban forest analysis tools (such as STRATUM, UFORE and cityGreen) address the economics of distributed services, and some include hedonic analysis as one input in a broader economic model. Yet local decision makers may not understand the nuances of resource economics and may assume

that property values represent the sole economic contribution of trees. The true and full value of city trees and forests will usually be greater than the value estimated by hedonic analysis alone.

Finally, in communicating about trees in terms of price, there is the risk of reducing the meaning of trees to purely economic terms. Hedonic calculations may be an awkward and incomplete way to describe the range of values that people place on

having quality trees and forests in their communities. For most people, there are matters of meaning and principle that are beyond economic calculations of nature. Keen observers of nature have noted the beauty and restorative qualities of trees for centuries. Recent studies of the human dimensions of urban forests are just starting to reveal the breadth and depth of benefits from the human experience of nature. Talking about trees in terms of a narrow estimation of

**YOUR SOLUTION FOR ASSET PRESERVATION AND OCCUPANT WELLNESS**

**Common Sense Carpet Care®**

Whittaker's comprehensive "planned" approach extends carpet life cycles, creates consistent appearance levels and promotes a healthier work environment. SmartCare® meets the warranty requirements for all leading carpet mills, and its safe chemistry is approved by the Carpet & Rug Institute.

- » Interim maintenance extends the life cycle of carpet investments
- » Low-moisture cleaning will not disrupt daily operations
- » SmartCare® Carpet System meets the requirements for USGBC - LEED EB
- » Crystal Dry® Extra is Green Seal™ Certified
- » Simple and effective spotting system

**whittaker**  
Healthy Carpets. Healthy Buildings.™

Factory Direct 800.422.7686 | Visit [www.whittakersystem.com/fmj](http://www.whittakersystem.com/fmj) to learn more.





value may limit public debate about the importance of trees in communities.

Hedonic pricing and other nonmarket valuations are important contributions to local decision making. Yet those who use and report such studies must understand that the valuation process is fraught with uncertainty and assumptions. The point of using any valuation analysis is not so much to think exclusively in money or market terms but to frame choices and make clear the trade-offs between alternative outcomes. How do the costs and benefits of investments in natural capital compare to

investments in other urban services such as law enforcement or education? Is the trade-off worthwhile? These are the types of questions for which even preliminary valuation can provide useful information. Quantifying the value that society assigns to trees and greenspaces, hedonic analysis can inform

public discussions about urban forest investment and stewardship. **FMJ**

---

"City Trees and Property Values" is a reprint from the August 2007 issue of *Arbortst News*, published by the International Society of Arboriculture.



Kathleen Wolf is a research social scientist at the University of Washington, Seattle. Her work focuses on the human dimensions of urban forests and ecosystems, including community development. Information about Wolf's research program can be found at [www.cfr.washington.edu/research.envmind](http://www.cfr.washington.edu/research.envmind).

*Photo: University of Washington, Mary Levin*