

Measuring the impact of parks on property values: new research shows that green spaces increase the value of nearby housing

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In light of the declining condition of many state and local budget situations throughout the nation, the need for parks and recreation agencies to prove their worth in order to attain continued funding for their services and facilities is especially crucial. While the many benefits that parks and other open spaces imbue upon community residents are easy to describe, they are typically harder to quantify. Therefore, a need exists for park and recreation professionals to develop means of placing dollar values on the contributions of open spaces to society.

In a previous issue of *Parks & Recreation*, Crompton (2001) outlined what he calls the proximate principle--the increase in value of properties surrounding such open space amenities. In addition, he summarized results of approximately two-dozen early studies into this hypothesis. However, as Crompton noted, some of these studies, ranging in year of publication from the 1870s to the 1980s, exhibited methodological inadequacies and inconsistencies that limit their credibility for current researchers.

Using an economic method known as the hedonic pricing technique, in combination with the spatial analyses made possible by the advent of geographic information system (GIS) technologies, it is now possible to conduct far more detailed and accurate analyses of the impacts of open spaces on surrounding property values. Hedonic pricing is an economic technique that can be used to identify and quantify the various influences on a property's sale price, thereby enabling estimation of the value of residential location adjacent or close to a green space. GIS allows far swifter identification of properties that fit the proximity criterion under consideration, e.g., all homes adjacent to, or within one-half mile of, the green space of interest.

In the last five years, such analyses have been conducted in several cities including Portland, Ore. (Bolitzer & Netusil, 2000; Lutzenhiser & Netusil, 2001), Dallas, Texas (Miller, 2001), Austin and College Station, Texas (Nicholls, 2002), and Indianapolis, Ind. (Lindsey, Man, Payton & Dickson, 2003). Similar analyses have been conducted in international settings, e.g., Joensuu, Finland (Tyrvaainen, 1997) and Castellon, Spain (Morancho, 2003), though only United States examples will be elaborated upon here. These studies have addressed several open space types, three of which--urban parks, greenways and golf courses--gave interesting results (See Table 1).

Urban Parks

Though traditional urban parks have historically attracted the most attention in terms of their property value impacts (Frederick Law Olmsted was one of the earliest proponents of the proximate principle, which he used as economic justification for park development including that of New York's Central Park in the late 19th century), recent studies remain relatively uncommon. In Portland (Bolitzer & Netusil, 2000), 193 public parks ranging in size from 0.2 to 567.8 acres were, as a group, found to have a significant positive impact on the value of properties within a straight-line distance of 1,500 feet.

Between one and three percent of the value of such properties could be attributed to park proximity. Further analysis of 115 of these urban parks (ranging in size from 0.4 to 195.7 acres) found that the greatest premiums (of 2 to 3 percent of value) occurred for homes within 800 feet of a park; beyond 800 feet, there was no significant property value impact. Park size was also found to be significant, the largest premiums being indicated for parks of 148 acres (Lutzenhiser & Netusil, 2001).

In Dallas (Miller, 2001), homes facing one of 14 parks were found to be worth 22 percent more than homes more than one half mile from such an amenity. The Dallas study further suggested that approximately 85 percent of an urban park's positive property value impact occurs within 800 feet of its edge. In Austin (Nicholls, 2002), impacts of parks appeared more mixed. In one instance, no significant relationship, positive or negative, was found between property value and distance to a park-school combination. In the second instance, the relationship varied from no impact to a \$10 decline in value-per-foot from a park or other outdoor recreation

area (depending on the variety of other property value influences also considered, as discussed in the "Research Into Action" section). In both cases, however, the surrounding neighborhoods had easy access to the substantial greenway network (described below) in the area, which might have reduced the impact of these individual parks.

Greenways

"While many studies exist of homeowners' perceptions of the impact of greenway proximity on their home values, many fewer scientific calculations of the actual price premiums exist. In Indianapolis (Lindsey et al, 2003), researchers examined the impacts of location within a one-half mile straight-line distance of 14 greenway corridors on sales prices. They differentiated between three broad categories of these amenities: the Monon Trail, the most heavily used such facility in the city; six other publicly accessible multi-use trails; and seven "conservation corridors" for the most privately owned land which, though designated greenway, does not necessarily provide public access and is not regulated more heavily than any other areas.

Analysis showed that location within one-half mile had a significant, positive effect in the case of both the Monon Trail and the conservation corridors (accounting for nearly 15 percent of average sales value in the former location and 2 percent in the latter), but that properties within this distance of the other six public greenways did not experience any significant price premium. When aggregated across all properties within one-half mile, the additional, taxable property value generated by the eight greenbelts equaled \$166.5 million (\$120.4 million for the Monon Trail and \$46.1 million for the seven conservation corridors).

In Austin (Nicholls, 2002), three separate neighborhoods adjoining the Barton Creek Greenbelt were examined. In two of these neighborhoods, statistically significant increases in value occurred for properties directly adjacent to the amenity, with greenbelt adjacency representing between 6 percent and 12 percent of the value of all adjacent homes. Based on these calculations, the total increase in property value attributable to greenbelt adjacency in these two neighborhoods alone was estimated at \$13.64 million, again representing a sizeable addition to the value of property on which taxes can be levied in the city:

In the third Austin neighborhood, however, adjacency to the greenbelt appeared to have no impact on property values. Consideration of the nature of the greenbelt might explain this finding. In the first two areas, the greenbelt consists of gently undulating topography dominated by mature oak trees and open grassy areas, a visually attractive amenity offering obvious recreational opportunities. In the third area, however, the landscape is in many places too steep to navigate and covered by dense scrub vegetation, rendering it less appealing from both a visual and an activity perspective. In such cases, therefore, green space adjacency may have little, if any, positive impact on property price.

Golf Courses

Golf courses appear to have both the most consistent and most substantial positive impact on surrounding property values of any open space type. Early studies suggested that golf course frontage could result in a premium of 5 to 10 percent of value. More recent analyses support these figures, with findings of premiums ranging from 5 to 21 percent, depending on proximity.

In Portland (Bolitzer & Netusil, 2000), the existence of one of the golf courses studied within 1,500 feet of a home added significantly to its value, imbuing a premium equal to approximately 5 percent of the average value of all homes in such a location. Golf course size was also identified as a significant variable; homes within 1,500 feet of a 116-acre golf course, the average size of those analyzed in this study; demonstrated a premium equal to nearly 10 percent of the value of such properties. When a more detailed analysis of property value impact with distance was conducted on a similar series of golf courses in the city (Lutzenhiser & Netusil, 2001), the greatest premium was found for properties within 200 feet of, i.e., adjacent to, the golf course. Such properties sold for a premium equal to 21 percent of the average value of all properties analyzed. By 1,200 to 1,500 feet from the amenity, the premium had declined to nearly 7 percent of value. In College Station (Nicholls, 2002), adjacency to a golf course accounted for 16 to 19 percent of the value of golf front homes.

However, considering the evidence suggesting that only 30 to 40 percent of golf course community residents actually participate in this activity (Dugas, 1997; Pickles, 1999; Nicholls, 2002), there may well be implications for park professionals in terms of the visual quality of open space necessary to generate the greatest returns on investment. Lack of interest in golf itself suggests that residents

are attracted by other factors such as the manicured nature of the green space or the prestige often associated with golf course developments.

Implications

Recent analyses suggest that open spaces may have substantial positive impacts on surrounding property values and hence, the property tax base, providing open space advocates with convincing arguments in favor of open space designation and preservation that can be backed up with actual, dollar impacts. In some cases, the increase in property tax from housing in close proximity to green spaces may equal or even exceed the costs of maintaining them, representing a welcome net gain to a city's coffers.

In no case reviewed by this author to date has an open space been found to have a negative impact on surrounding property values, though evidence does suggest that factors including topography, visual attractiveness, recreational opportunities provided, and the availability of other open spaces in the area, may reduce the positive impact of individual amenities in some cases.

These findings also demonstrate the many approaches to ascertaining real estate values that are available and that may complicate comparison across geographic areas and across various studies. For example, some studies have focused purely on the value added of direct adjacency to a green space amenity, while others have considered the impact of location within a specified distance, often one-half mile. If such a distance is utilized, it is important to differentiate between straight-line measurement (as-the-crow-flies) and the actual distance as measured along the street network (determination of which has been made possible by the network analysis techniques available in most GIS).

Alternatively, it is possible to calculate the change in property value with each unit of distance (straight-line or network) from a green space, with a decline in value with distance indicating a positive effect. Nevertheless, whichever type of measurement is chosen, the combination of hedonic pricing techniques with GIS capabilities represents a significant opportunity for parks and recreation agencies to place dollar values, verifiable using rigorous scientific techniques, on the economic contributions of their amenities to local communities.

Table 1. Impacts of Open Spaces on Surrounding Property Values: Results of Recent Analyses

Authors	Study Site	Open Space Type	Property Value Impact
Bolitzer & Netusil (2000)	Portland, Oregon	Public parks (193)	Location within 1,500 feet accounted for 1-3% of value
		Golf courses (8)	Location within 1,500 feet accounted for 5% of value
Lutzenhiser & Netusil (2001)	Portland, Oregon	Urban parks (115)	Location within 1,500 feet accounted for an average of 2% of value, ranging from 3% for properties within 200 feet to 0% at 1,201-1,500 feet
		Golf courses (8)	Location within 1,500 feet accounted for an

			average of 13% of value, ranging from 21% for properties within 200 feet to 7% at 1,201-1,500 feet
Miller (2001)	Dallas, Texas	Urban parks (14)	Homes facing a park valued at 22% more than those one-half mile or more away
Nicholls (2002)	Austin, Texas	Barton Creek Greenbelt	Neighborhood 1: adjacency had a significant, positive effect, accounting for 12% of average sales price Neighborhood 2: adjacency had a significant, positive effect, accounting for 6% of average sales price Neighborhood 3: no significant effect
		Urban parks (2)	Park 1: no significant relationship between property value and distance to park Park 2: relationship between property value and distance to park varied from no significant impact to \$10 decline per foot
	College Station, Texas	Golf course (1)	Location adjacent-to golf course accounted for 16-19% of average sales price
Lindsey, Man, Payton & Dickson	Indianapolis, Indiana	Monon Trail (converted rail-trail)	Location within one-half mile had a significant, positive effect,

(2003)

accounting for 15% of average sales price

Other greenways throughout city (6) No significant effect

Conservation corridors (7) Location within one-half mile had a significant, positive effect, accounting for 2% of average sales price

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- RESEARCH INTO ACTION: CALCULATE THE PROPERTY VALUE IMPACTS OF YOUR PARK(S)**
- Estimation of the property value impacts of your local park or park system will first require access to a variety of types of data that may, or may not, be readily available. At a minimum, these include:
- * recent sales prices or assessed values of the properties in the area, obtainable from your local Board of Realtors/Multiple Listing Service (BoR/MLS) or the local tax appraisal office;
 - * information about the characteristics of these properties (house and lot size, numbers of bedrooms, bathrooms and garages, existence of a swimming pool, etc.), also obtainable from the local BoR/MLS or tax appraisal office; and,
 - * maps that illustrate the locations of these properties relative to the open spaces of interest and from which adjacency, view, and/or

distance can be measured.

This data can then be entered for hedonic analysis using a statistical package such as SPSS from SPSS Inc. Implementation of this multiple regression-based technique enables the value of a home to be broken down into its many constituent elements, and the contribution of each to be calculated relative to overall value. In this way, the most significant factors, from a statistical standpoint, can be identified. Influences on home values are typically grouped into at least five major categories: structural characteristics (physical attributes of the home and lot); neighborhood/community characteristics (e.g., school district, local property tax, rate); environmental characteristics (e.g., noise and pollution levels, existence of a view); locational characteristics (proximity to various amenities including schools, shopping and parks); and, time of sale (year and month of sale, days on the market, etc.).

Partially in response to the large volume of data required to conduct such analysis, as well as its potential complexities, the Trust for Public Land (TPL) is currently organizing an effort to develop simpler means of calculating the property value impacts of open spaces (as one part of a broader study aimed at enabling parks departments to calculate their total dollar contributions to all aspects of communities and community life).

To obtain more detailed information and advice on how to calculate the property value impacts of your park (system), or to discuss the possibility of including your city as a study site in the TPL study described above, please contact the author at Michigan State University (nich0210@msu.edu), John L. Crompton, Distinguished Professor at Texas A&M University (j-crompton@tamu.edu), or Peter Harnik with the TPL (harnik@earthlink.net)

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