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The impact of parks on property values: empirical evidence from the past two decades in the United States

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The notion that parks have a positive impact on proximate property values was recognized in the debates surrounding the pioneering of large urban parks in England in the first half of the nineteenth century, and subsequently in the spread of this movement to the US in the latter half of that century. The empirical basis for these early assertions was rudimentary and naïve. This paper reviews contemporary research using the more advanced analytical procedures now available to social scientists that has examined this issue. The findings confirm the initial rationale and suggest that a positive impact of 20% on property values abutting or fronting a passive park is a reasonable starting point guideline for estimating such a park's impact.

INTRODUCTION

The premise that parks have a positive impact on proximate property values derives from the observation that people frequently are willing to pay a larger amount of money for a home located close to a park, than they are for a comparable home. In effect, this represents a 'capitalization' of park land into increased property values of proximate land owners. The increments of enhanced value attributable to a park were used to fund early parks; just as such increments are used to fund golf courses in community golf developments in contemporary US society. The premise of the proximate principle undergirded the earliest parks in England. It was the central principle in John Nash's development of London's Regent's Park which was commenced in 1812; it was the core rationale for Richard Vaughan Yates' investment in Prince's Park, Liverpool, in 1842; and it provided the rationale for

investment of tax funds in the world's first publicly funded park in Birkenhead in 1847 (Crompton, 2004).

After touring Birkenhead Park in 1850, Frederick Law Olmsted was responsible for transitioning both its picturesque design principles and its proximate principle funding rationale to Central Park in New York City, and from there to urban park systems across the US. Thus, from the earliest days of urban park development in the United States from the 1850s through the 1930s, there was an insistent, almost inviolate conviction among park advocates of the legitimacy of the proximate principle. It was conventional wisdom among them, but it was also espoused by city planners and elected officials.

Olmsted and others undertook studies that appeared to confirm the intuitive validity of the proximate principle. Thus, for example, his studies at Central Park concluded that the annual debt charges incurred

by New York City for acquisition and development of the park were \$834,000 annually; the increase in property tax revenue received by the city as a result of the enhanced value of properties around the park amounted to \$5.24 million annually; so the net annual income accruing to the city from its investment in the park was \$4.4 million (Fox, 1990).

This study and others like it were fairly rudimentary and naïve, reflecting the underdeveloped nature of the statistical tools and research designs available at the time. All property value increases were attributed to the proximity of a park and the potential of other factors were ignored. As new tools evolved, the quality of the studies investigating this issue improved.

During the past couple of decades, there have been three developments that have facilitated the emergence of studies which are much stronger from a science perspective that have addressed the impact of parks on property values. First, the increased sophistication of hedonic analysis and the statistical tools associated with it have enabled the array of other factors that may contribute to changes in property values to be considered. These factors are identified in Figure 1.

The second development was the evolution in the 1980s of Multiple Listing Services in electronic form. In the US, it is standard practice for all real estate agents in a city to report the sales price of each transaction to a central data base that is accessible to all of them with details of the structural and physical attributes of the property. This data base is called the Multiple Listing Service. Now these data are available in electronic form. They can be transposed on to maps that are formulated as part of a city's geographic information system and spatially integrated with the location of parks.

Geographic information systems constitute the third development that has enhanced the quality of the science investigating the impact of parks on property

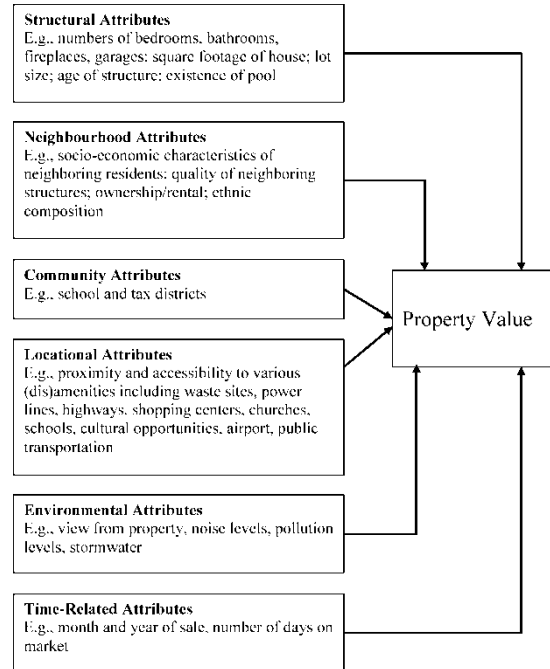


Fig. 1. Factors influencing property value. *Source:* Nicholls (2002)

values. A GIS is a computer-based system that stores and facilitates manipulation of geographic information. GIS enables Multiple Listing Service data to be mapped by individual street addresses. It permits accurate calculation of distances between locations such as a house and a park and can delineate areas within which affected properties are located.

These three developments have facilitated the efficient use of hedonic price modelling. The theoretical foundation of hedonic pricing techniques was laid down by Lancaster (1966) who proposed that utility was derived from the characteristics or attributes of goods. For example, the characteristics of a car from which utility is derived may include engine size, speed and acceleration, fuel economy, number of seats, comfort, luxury, colour, style and status. By estimating the contribution of each characteristic to the purchase decision, its relative

importance can be identified. Thus, the role of the factors shown in Figure 1 in the decision to pay a given price for a home can be identified through the use of regression models.

REVIEW OF 'MODERN' STUDIES

The era of 'modern' studies for the purposes of this review commenced in the 1970s and early 1980s, when the availability and greater capacity of computing stimulated an increased interest in investigating the issue. Early studies in the 1970s were conducted in Philadelphia, and in Boulder, Colorado.

A 1972 study in Philadelphia focused on seven sites, at three parks, three schools, and one school-park combination (Lyon, 1972). During the sample years of the study, 1,725 property sales were recorded in the neighbourhoods around the sites. As a percentage of total housing units in each area, the sample size ranged from 12% to 25.5%. In all seven neighbourhoods regression analyses indicated that distance from the site had an impact on property values, enabling the author to conclude, 'there appear to be locational advantages to school and park facilities, and these advantages have been capitalized in the sale price of nearby property' (Lyon, 1972, p. 126).

The Philadelphia study was one of the few to test for a 'net effects' curve which postulates that while there is a positive impact on the value of properties abutting a park, it may be lower than the impact on properties a block or two away which are not subjected to any nuisance created by access and egress. The polynomial equation used to test for this effect was found to be a good fit on one site – a junior high school site with an athletic field – with the maximum impact on property occurring 600 to 800 feet from the site.

Another Philadelphia study in 1974 analysed the impact on sales price of 336

properties in the vicinity of Pennypack Park (Hammer *et al.*, 1974). This 1,294-acre stream-valley park is in northeast Philadelphia. It was surrounded by residential areas developed at a density of approximately ten dwelling units per acre. The area around the park was comprised of 'unimaginative housing, heavy in scale with natural landscaping losing out to concrete and stone' (p. 275). Based on their subjective evaluation of the area, the researchers hypothesized that 'the residents do not consider natural amenity to be very important' so 'public open space would be expected to have a relatively low effect on land values compared to other neighborhoods' (p. 275).

Despite the authors' pessimistic prognosis, regression analysis indicated that the park accounted for 33% of land value at 40 feet. This dropped to 9% at 1,000 feet and 4.2% at 2,500 feet which was the peripheral limit set for the study. From these data, the authors concluded that a net increase in real estate value of almost \$3.4 million (1974 values) was directly attributable to the park.

The most frequently cited study in the literature of this era examined the effect of greenbelts on property values in three different areas of Boulder, Colorado (Correll *et al.*, 1978). A total of 1,382 acres of greenbelt had been purchased adjacent to residential developments in the 10 years prior to the 1978 study. The sample consisted of properties from each area that sold in a selected calendar year which were located within 3,200 feet of the greenbelt ($n = 82$).

Variables in the regression model that were believed likely to influence the sales price of these single family homes were: (i) walking distance in feet to the greenbelt; (ii) age of each house; (iii) number of rooms in each house; (iv) square footage of each house; (v) lot size; (vi) distance to the city centre; and (vii) distance to the nearest major shopping centre. The regression results showed that, other things being

equal, there was a \$4.20 decrease in the price of residential property for every foot one moved away from the greenbelt. This suggested that if other variables were held constant, the average value of properties adjacent to the greenbelt was 32% higher than those located 3,200 walking feet away. These results are shown in Table 1.

One of the three neighbourhoods had been able to take much greater advantage of the open space amenity in its planning than the other two neighbourhoods, so the authors initiated further analyses on it. In this neighbourhood, price decreased \$10.20 for every foot one moved away from the greenbelt. This resulted in:

the aggregate property value for the neighborhood being approximately \$5.4 million greater than it would have been in the absence of greenbelt. This increment resulted in an annual addition of approximately \$500,000 to the potential neighborhood property tax revenue. The purchase price of this greenbelt for the city was approximately \$1.5 million and thus, the potential property tax revenue alone would allow a recovery of initial costs in only three years. (p. 215)

There is an important caveat to these positive results in that 86% of the \$500,000 proximate increment of property tax revenue accrued to taxing entities other than the city, i.e., county, school district and other independent districts. Thus, the incremental return to the city alone was not sufficient to

pay the costs incurred by the city in purchasing the greenbelt. This creates a major policy issue. However, it should not inhibit the purchase of park and open space areas because overall economic benefits accrue to taxpayers whose revenues fund all the governmental entities.

Resolution of this conundrum requires one of two actions. The first requires that a city's elected officials be prepared to accept the inevitable criticism that is likely to occur when it raises taxes to purchase the land. This selfless, 'statesman-like' position is adopted because they recognize that in the long-term the city's taxpayers will benefit when return on the investment is viewed in the broader context of total tax payments to all governmental entities. The alternative strategy is to persuade the other taxing entities to jointly fund purchase of the open space areas, since all will reap proximate tax revenue increments deriving from them.

A study undertaken in Worcester, Massachusetts, in the early 1980s examined the relationship between four parks and the values of all properties sold within a 4,000 foot radius of each park during the preceding 5 years ($n = 170$) (More *et al.*, 1982, 1988; Hagerty *et al.*, 1982). The multiple listing service from which the study's data were derived recorded actual sale price of a house, along with information on other characteristics that might affect the sale price including lot size, number of rooms, age, garage, taxes paid and condition. Distance to the park in feet was added to this set of variables.

The results showed that, on average, a house located 20 feet from a park sold for \$2,675 more than a house located 2,000 feet away. However, 80% of the aggregate increase in value was derived from properties located within 500 feet of the parks. Effects could not be traced beyond 2,000 feet from the parks. Using these data, it was estimated that the aggregate property value increase attributable to these parks was \$3.5 million.

Table 1 Value of the average house related to greenbelt proximity

Walking distance from greenbelt	Average value of house
30	\$54,379
1,000	50,348
1,283	49,172
2,000	46,192
3,200	41,206

The impact of two parks on the values of proximate residential developments in Dayton and in Columbus, Ohio, was reported in 1985 (Kimmel, 1985). The 170-acre Cox Arboretum in Dayton was a wooded open space containing specialized herb, ornamental and other plant gardens. Its impact on an adjacent fairly new sub-division of 300 properties was assessed. The 152-acre Whetstone Park in Columbus, contained ballfields, trails, natural areas and a 13-acre rose garden, and it was adjacent to an older residential area. In both cases, samples of approximately 100 residences were used in the study.

The regression analyses indicated that for every additional foot of distance a property was located away from Cox Arboretum and Whetstone Park, the selling price decreased \$3.83 and \$4.87, respectively. The average distance of properties in the study areas were 814 feet and 973 feet from Cox Arboretum and Whetstone Park, respectively, and these properties yielded proximate premiums of \$3,100 and \$4,700. Given the average selling prices of properties in the residential areas were \$58,800 and \$64,000 respectively, the park premium represented 5.1% in the Cox Arboretum subdivision and 7.3% at the Whetstone Park residential area. In neither case was an assessment made of how this average premium varied between properties immediately abutting the parks and those located (say) 2,000 feet away, which presumably were much less impacted by the parks.

An empirical investigation in Salem, Oregon, in 1986 reported that open space in the form of greenbelt at the fringe of the urban area exerted an influence on urban land values that extended inward from the urban boundary about 5,000 feet (Nelson, 1986). The researcher concluded that urban land adjoining farmland zoned exclusively for agriculture was worth \$1,200 per acre more than similar land 1,000 feet away.

Washington County, Wisconsin, is located 40 minutes northwest of Milwaukee and is growing rapidly. The impact of two parks in the county on property values was studied (Sielski, 2002). Jackson Park is a 25-acre park located in the Village of Germantown.

The study was provoked by two common concerns: (i) property owners adjacent to a proposed county park were concerned it would have a negative impact on their property value; and (ii) taking the property off the tax roles would put an undue burden on the rest of the residents.

The study used assessed values and measured the parks' impacts within a half-mile (2,640 feet) radius. It controlled for structural variables. The results for Jackson Park are illustrated in Figure 2. Properties within 200 feet increased by \$113.36 in assessed value for each foot a property was closer to the park. Aggregated incremental assessed valuation attributable to the park was \$1.58 million which generated \$30,128 in annual tax revenues. 19.2% of the assessed value of properties within 200 feet of the park was attributable to the park. For example, if a property located outside the influence of the park was valued at \$120,000, it would have a value of \$143,000 if it were located within 200 feet of Jackson Park.

At Homestead Hollow County Park, assessed value decreased by \$4.96 for each foot of distance from the park up to the half-mile radius. These results were similar to the Boulder greenbelts study reported earlier in the paper. Aggregate value attributable to the parks was \$880,000, generating annual tax revenues of \$18,100.

A county-wide analysis of 6,898 single family residences sold in a 2-year period in Leon County, Florida, reported that homes within 200 feet of the nearest park were worth an extra \$6,015, while the premium for those between 200 feet and 1,320 feet (0.25 mile) was \$1,773 (Cape Ann Economics, 2003). There was some evidence of the impact of a restricted supply since when

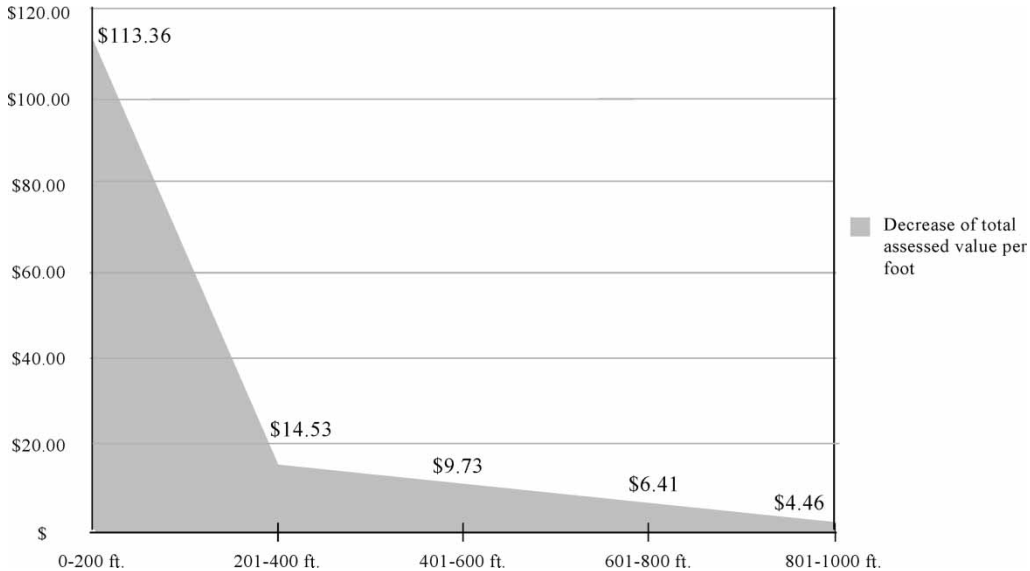


Fig. 2. Decrease of total assessed value per foot (Jackson Park)

the analysis focused on the most densely populated parts of the county (over 2,500 people per square mile, primarily within the city of Tallahassee), the premiums for parcels within 200 feet of a park rose to approximately \$14,000.

In addition to the county-wide analysis, studies were undertaken on the specific impact of two parks. Myers Park in Tallahassee is a 47-acre natural area park. Data from 58 single family home sales in the previous 2 years were used in the analysis, which concluded that those within 200 feet of the park sold for \$24,600 more than they would have brought had they not been close to the park. Since there were 75 properties within this 200-foot zone, the enhanced value attributable to the park was \$1.845 million.

Maclay State Gardens on the fringe of Tallahassee is a Florida State Park embracing rolling hills, a picturesque lake and spectacular and extensive floral gardens featuring both native plants and exotic flora. It includes the 877 acre Lake Overstreet addition which also features a lake and

surrounding woodlands. Over the 2-year period 442 single-family residential properties were sold in the census blocks immediately surrounding the gardens. Regression analyses indicated that properties physically abutting the park had a premium of \$47,000 ($n = 104$), while for those not abutting but within 200 feet the premium was \$21,000 ($n = 70$). These premiums when applied to all properties within the 200-foot zone, added \$6.3 million to the property tax base.

A study of the impact of 14 neighbourhood parks on suburban areas of the Dallas-Fort Worth metroplex was based on 3,200 residential sales transactions recorded over a 2 $\frac{1}{2}$ year period (Miller, 2001). The parks were all between 2.5 acres and 7.3 acres in size except for two which were 0.5 and 0.3 of an acre. They were 'intermittently maintained' and were selected because of their ordinariness rather than their excellence. The author described them as 'a standard of park quality well within the range of an evenly marginally committed developer. National monuments these are not' (p. 169).

The selected parks were in neighbourhoods of single-family houses. As far as possible, parks near arterial or collector streets, shopping or commercial centres, or abrupt changes in demographic characteristics were excluded from the study to clarify the effect of the park. The comprehensive regression model incorporated 29 variables that could potentially influence sales price. Travel distances using a GIS program were used as the distance variable.

The price effects compared against home values a half-mile from the parks are shown in Figure 3. Homes adjacent to parks received an approximate price premium of 22% relative to properties a half-mile away. Approximately, 75% of the value associated with parks occurred within 600 feet of a park and 85% within 800 feet. This distance approximates a two to three minute walk and delineated the parks' principal areas of influence. The price effects of the parks were insignificant at a distance of approximately 1,300 feet (a quarter mile), the conventional estimate of a 5 minute walk.

This study also found that while large parks add more valuable to residents' property than

small parks, the premium is small relative to that of proximity. All else equal, then, more value will be created by a series of small parks, which permit more total houses in their vicinity, than by a single large park of equivalent area.

Figure 4 demonstrates the outcome if this principle is applied to a 50 acre park illustration. It suggests that the tax base enhancement emanating from six 8.33 acre parks with dimensions of 400 yards \times 100 yards, and non-overlapping impact zones, will be substantially greater in aggregate than the premium generated by the 1210 yards \times 200 yards, 50 acre park. However, such a revenue benefit is likely to be partially offset by higher initial development and construction costs, and more expensive operations costs over time. Nevertheless, the scenario of a set of smaller parks rather than one large park may be appealing to developers because they do not have to incur the additional ongoing maintenance costs whereas governmental entities do.

A large data set to measure the impact of the proximate principle was assembled for the city of Portland, Oregon. It was comprised

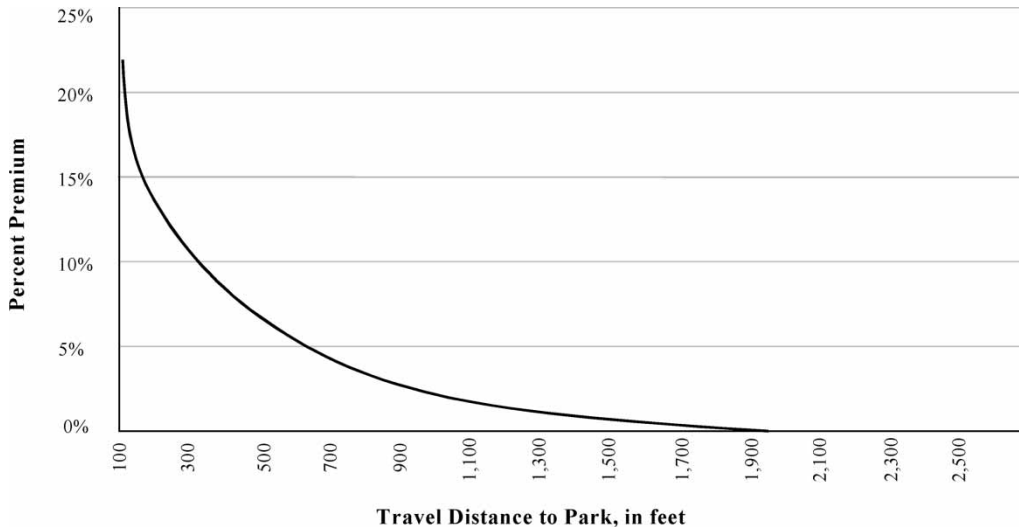


Fig. 3. Impact of proximity to parks (14 neighbourhood parks, Dallas-Fort Worth Metroplex)

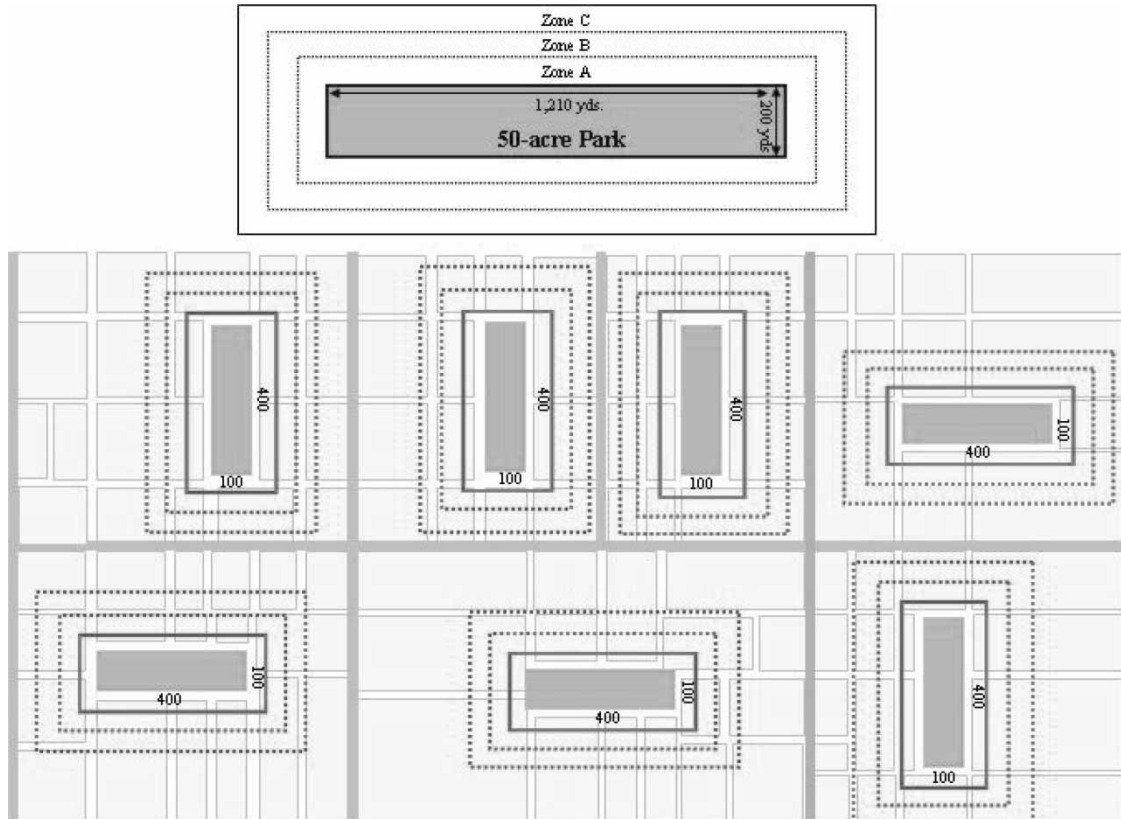


Fig. 4. Implications for proximate premium of distributing 50 acres of parkland among six smaller parks rather than allocating it to a single large park

of 16,636 single family home sales during a three year time period. The mean home sale price was \$66,198 (1990 dollars) and the average size was 1,396 square feet. The impact of parks on property within a 1,500-foot radius was measured. It was estimated that a block was 200 feet, so the 1,500 foot (0.28 mile) radius reflected an average distance of approximately 7.5 blocks.

Results from these analyses were reported in two different papers. In the first paper the 193 public parks were not differentiated by type (Bolitzer and Netusil, 2000). Two statistical models were applied to the data set. The authors concluded that homes within 1,500 feet of a public park increased in

value by \$2,262 (3.5%) or \$845 (1.2%) depending on the model used, compared to property outside the 1,500 foot area. When the impact of different distances within the 1,500 foot radius was evaluated by the two models, the premium values ranged from \$5,023 (7.6%) and \$3,527 (5.3%) for properties within 100 feet of a park, to \$2,109 (3.8%) and \$1,004 (1.5%) for properties that were located 1,301 to 1,500 feet away.

In the second paper using this same data set, the authors classified the public parks into three different categories: urban parks, natural area parks, and specialty parks/facilities (Lutzenhiser and Netusil, 2001). These are defined in Table 2. The results

Table 2 Definition of open space categories

Open space type	Definition
Urban Park	More than 50% of the park is manicured or landscaped and developed for nonnatural resource dependent recreation (e.g., swimming pools, ballfields, sports courts).
Natural area park	More than 50% of the park is preserved in native and/or natural vegetation. Park use is balanced between preservation of natural habitat and natural resource-based recreation (e.g., hiking, wildlife viewing, boating, camping). This definition includes parcels managed for habitat protection only with no public access or improvements).
Specialty park/facility	Primary use at the park and everything in the park is related to the specialty category (e.g., boat ramp facilities).

showed that being within 1,500 feet of a natural area park accounted for \$10,648 (16.1%) of a home's sale price holding all other factors constant. The impacts of urban parks and specialty parks/facilities were \$1,214 (1.8%) and \$5,657 (8.5%), respectively. The relatively low premium for the urban parks may be attributable in part to urban parks often having greater variations in quality.

The impact of distance from each of the three types of area on home values is reported in Table 3. This shows, for example, that a home located 401–600 feet away from a natural area park on average had a \$12,621 premium (19.1%), while the average premium for a house adjacent to an urban park was \$1,926 (2.9%). These data

do suggest there are relative disadvantages to being located next to the facilities, since the largest premiums for the urban park, natural area park and specialty park/facilities were in the 201–400, 401–600, and 401–600 foot distance bands, respectively.

Another technically strong study was reported on the impact of the Barton Creek Greenbelt and Wilderness Park in Austin, Texas (Nicholls and Crompton, 2005). This is a linear 171-acre natural area to the west of downtown that includes 7.5 miles of multi-use trails. The authors examined its impact on three neighbourhoods that bordered this amenity: Barton, Lost Creek and Travis. Single-family home sales over a three year period constituted the data source. The sample sizes of home sales for

Table 3 Variations in proximate values at different distances for each open space type (1990 dollars)

Variable	Urban Park	Natural Park	Specialty Park/facility
Distance ≤ 200	\$1,926	\$11,210	\$7,396
Distance 201–400	2,061	10,216	5,744
Distance 401–600	1,193	12,621	10,283
Distance 601–800	817	11,269	5,661
Distance 801–1,000	943	8,981	4,972
Distance 1,001–1,200	1,691	8,126	4,561
Distance 1,201–1,500	342	9,980	3,839

Number of observations 16,747

the Barton, Lost Creek and Travis neighbourhoods were 224, 240 and 236, respectively.

Results of the study are summarized in Table 4. The table shows that the premium for adjacency to the greenbelt was highest in the Barton neighbourhood and that it represented 20% of the average price of all homes in that neighbourhood. The comparison criterion is important because all the homes impacted by the greenbelt are included in the average price. If the comparison criterion had been with houses beyond the direct impact of the greenbelt (say 1,500 feet or more away), then it is likely that the premiums shown in Table 4 would have been substantially longer.

The last column in Table 4 shows the decline in value with each foot of distance away from the greenbelt. These figures are substantially higher than those reported earlier in the paper for the greenbelts in Boulder, Colorado, the two parks in Dayton, and for the parks in Washington County, Wisconsin, although in the first two cases the different values may be attributable to inflation in the two decade time difference between the two studies.

The lack of positive impact in the Lost Creek area was attributed to the different character of the greenway at that point. Homes directly adjacent to the greenway in Lost Creek were located on the edge of deep, thickly vegetated ravines which offered neither recreational access nor attractive views. The vegetation inhibited recreational access and the views were of other properties across the ravines rather

than of the greenspace. In the Travis area where the proximate premium was relatively low, the topography of the land did not allow for non-adjacent properties to enjoy a greenbelt vista, so the premium was primarily a reflection of the value accorded proximate access.

A study conducted in a 1,350 square mile suburban and exurban region in central Maryland used a sample of 55,799 arms-length single transactions of owner-occupied residential properties that occurred in a 5 year time period (Irwin, 2002). It measured the proportions of areas within 400 meters of houses that were in different land uses. The study recognized that open space is heterogeneous and measured the impact on house sales price of different categories of open space. The author reported that in contrast to residential, commercial or industrial uses, open space had a positive impact on a residential property's value. However, the premium for proximity to privately owned open space protected by a perpetual easement was \$4,503 or 2.6%, while that on properties close to government purchased open space was \$2,038 or 1.2%. It was suggested that the privately protected land yielded a higher premium than the publicly owned land because the latter is available to people from outside the local area. They may generate a spillover nuisance cost by reducing privacy and increasing congestion which is not present at privately owned open space.

Table 4 Results from three Austin neighborhoods proximate to the Barton Creek greenbelt and Wilderness Area

Neighborhood	Home sales prices (\$'s)			Adjacency premium (\$'s)	Adjacency premium percentage	Decline in value per foot from the Greenbelt (\$'s)
	High	Low	Mean			
Barton	550,000	105,000	220,000	44,000	20%	13.51
Lost Creek	899,000	179,000	356,000	0	0%	3.97
Travis	392,000	130,000	233,000	16,000	6%	10.61

A similar study was undertaken in Berks County in southeastern Pennsylvania (Ready and Abdalla, 2003). The data base was 8,090 residences sold over a 4 year period in the suburban/exurban areas of the county. Again, the amount of land that was in open space, residential, commercial and industrial use within 400 meters of each house was measured. The authors concluded that within the 400-meter area, open space was the most desirable land use but the premiums on house prices were very small, even lower than those in the Maryland study.

The relatively low premium values reported in these two studies may be a function of three factors: (i) the self-cancelling effect of aggregating open space because both high quality amenity open space and dispirited open space that leads to decreased proximate property values are included in the mean averages; (ii) averaging the proximate premium over 400 meters because most proximate value is likely to be captured within 150 meters and the value decay beyond that distance is substantial so that at 400 meters it is likely to be zero; and (iii) some parts of the study areas were rural with zoning ranging from 1 to 5 acre minimum lot size, so the supply of private open space was relatively plentiful.

In 2003, comprehensive detailed studies of the impact of major renovations in five selected parks in New York City were undertaken (Ernst and Young, 2003). The authors did not use hedonic analysis. Rather, they compared the values of property sales transactions within Park Impacted Areas (PIAs), which consisted of 1–2 blocks immediately adjacent to the parks, with associated Control Areas (CAs) comprising the next 3–4 blocks beyond the PIAs. The CAs were used to hold constant the influence of the other factors that might impact real estate values. The comparisons were made over the time period from 1992 to 2001. All of the five parks selected for the case studies

had benefited from substantial capital investment in renovation during this time period.

The five parks were Prospect (Brooklyn), Crotona (Bronx), Clove Lakes (Staten Island), St. Albans (Queens), and Serrano (Bronx). The graphs in Figure 5 compare the sales prices per square foot for single family homes and multi-family units (where these were present) over the 1992–2001 period. The sample sizes (n) of sales transactions from which the value data are derived are shown underneath each graph. The results show that the positive impacts of renovation at the first two parks were substantial; for the other three parks the results showed moderate enhancement of property values.

Olmsted and Vaux considered Prospect Park to be their masterpiece. In the 1992–2001 period, \$103 million worth of capital renovation was undertaken in the 526 acre park, restoring it to its status as a first-class, signature park. The PIA and CA zones selected for comparison were in the Park Slope neighbourhood. In the most recent 4 year period, single family homes sold for between 32% and 153% more per square foot in the PIA than in the CA (Figure 5a). The same trend was apparent in the comparison of multi-unit properties but the difference was not as dramatic, ranging from 20% to 84% over the most recent four years (Figure 5b). In the case of multi-unit properties, the prices were similar before the renovations commenced and as more improvements were made the value gap between the PIA and CA zones became more accentuated. However, the per square foot values of both the PIA and CA properties increased markedly. Some of this may be attributable to inflation and the vibrant economy at that time, but it is likely that some of the CA added value also is attributable to the renovations since being 3–6 blocks away from the park suggests the park exercises some proximate impact.

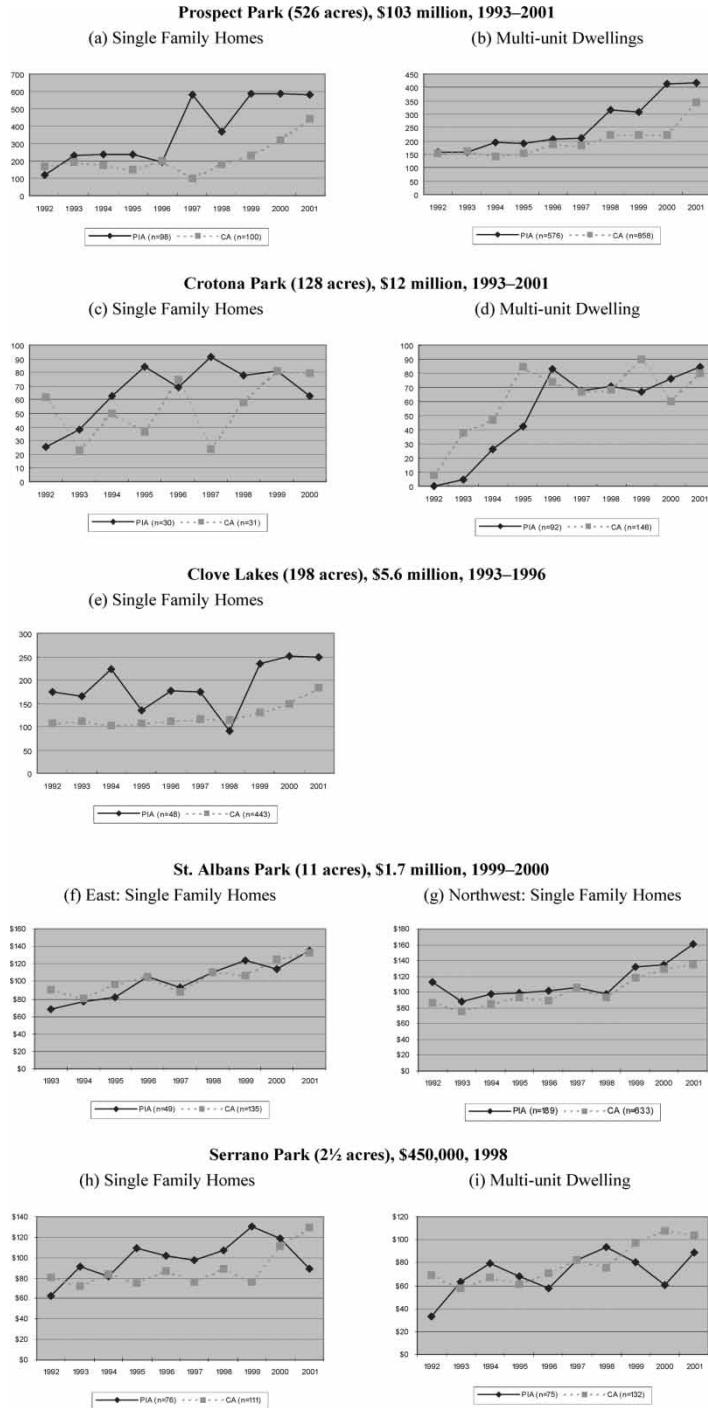


Fig. 5. Comparison of the sales price per square foot of properties within the impact area (PIA) of five parks with those of their controls areas (CA)

Renovation of Crotona Park took place from 1993 to 2001 at a cost of \$12 million. During the 1970s and 1980s, the 128 acre park was situated within a decaying urban neighbourhood in the South Bronx, characterized by burned-out vacant buildings, drug dealers and crime. Efforts were made to upgrade the neighbourhood, but investment in the park only came later. However, in a few years it was transformed from a place to be ignored and avoided, to an attractive asset. Figure 5c shows that values in the PIA for the most part are higher for single family homes than in the CA, but the relatively small number of sales transactions means there is some volatility in the graph. Among multi-unit dwellings, the CA values were substantially higher than those in the PIA in the early years reflecting the blighted status of the park, but in the later years the situation was reversed (Figure 5d). There was a trend showing an increase in PIA values after the renovation work commenced in 1995.

Clove Lakes Park is a 198 acre natural area surrounded almost exclusively by single family homes. Between 1993 and 1996, \$5.6 million was invested in renovating it. Since that time, it has become a weekend destination for Staten Island's residents as well as a staple of the community. Single family house prices in the PIA were higher than those in the CA before the renovation and that trend subsequently continued. Figure 5e shows that in the last 3 years of the study's time period, the value gap ranged from 36% to 80%. Although the gap has generally not widened, the values of properties in both the PIA and CA increased markedly, as they did in Prospect Park; again suggesting the CA experienced some positive proximate increment. The variability of the PIA sales price across years may be attributable to the relatively small sample size.

St. Albans Park (11 acres) was renovated in 1999 and 2000 at a cost of \$1.7 million. Two PIAs were used to measure the proximate

impact of the park. Data from its east side, summarized in Figure 5f, show no substantial difference between the sales value of properties in the two areas. The second PIA was on the park's northwest side. This is a more extensive residential area so the sample size was larger. The PIA values historically were slightly higher than the CA values, but this gap increased dramatically to 19% in 2001 after the improvements were completed (Figure 5g). Since the renovation took place in 1999 and 2000, if there is impact on the market price of properties, it was likely to become more obvious in the period beyond the timeframe of the study. Again, both the PIA and CA values increased substantially from the time the renovations commenced in 1999.

Serrano Park is a 2.5 acre playground and park located in the Castle Hill section of the Bronx in a densely populated area. Although \$650,000 was invested in 1998 to renovate its structures, it remains aesthetically unappealing since the majority of it is 'a vast concrete field'. It is heavily used, so there is noise and congestion. The graph in Figure 5h and 5i reflect these unattractive qualities in that the facility appears to have no proximate impact on property values.

In addition to the proximate value data reported in Figure 5, the authors empirically addressed other impacts in their case studies. Thus, they were able to conclude: 'Single family turnover rate was generally lower near well improved parks as compared to adjoining ones. Quality parks serve to stabilize local communities and are a catalyst for the redevelopment of adjacent real estate' (p. 10).

CONCLUDING COMMENTS

The evidence that has emerged from relatively sophisticated analyses in the past two decades, essentially endorses the legitimacy of the proximate principle which was demonstrated in the early English urban

parks and later disseminated in the US by Olmsted in the nineteenth century. The evidence from these studies unequivocally supports the contention that parks and open space contributes to increasing proximate property values.

It is not possible to discern a generalizable answer with regards to the magnitude of the proximate effect, given the substantial variation in the size, usage and design of park lands in the studies, and disparities in the residential areas around them. However, some point of departure based on the findings reported here is needed for decision-makers in communities who try to adapt these results to their local context. To meet this need, it is suggested that a positive impact of 20% on property values abutting or fronting a passive park area is a reasonable starting point guideline.

The diversity of the study contexts makes it feasible to offer a tentative generalizable answer regarding the distance over which the proximate impact of park land and open space extends. There was consensus among the studies that it has substantial impact up to 500–600 feet. In the case of community sized parks it tended to extend out to 1,500–2,000 feet, but after 500–600 feet the premium was small. Few studies tried to identify impacts beyond that distance because of the compounding complexity created by other potentially influencing variables, which increases as distance from a park increases. However, especially in the case of larger parks, it is likely there are additional economic benefits not captured by capitalization into increased property values beyond this peripheral boundary, since the catchment area from which users come frequently extends beyond it.

This type of work is useful in that it provides a measure of the value of parks, whereas elected officials tend to think only of their cost. However, the focus is myopic since the value of parks to a community involves many factors other than proximity

such as level of maintenance, maturation level of the park, ratio of supply and demand and type of use.

Level of maintenance relates to quality. A useful analogy is with a well-groomed front garden which is likely to increase the value of a home, whereas if it is overgrown with weeds and littered with trash then the property value is likely to be diminished. Adverse impacts also may emanate from nuisances such as congestion, street parking, litter and vandalism, noise and ballfield lights intruding into adjacent residences, poorly maintained facilities, or anti-social behaviours.

Maturation level recognizes that it may take 30 to 40 years for new or renovated parks to mature. In the beginning trees are small and spindly, plantings are scattered and immature, shade is scarce, and the landscaping often is not aesthetically pleasing. Thus, the premium in the early years is likely to be less than in later years.

Like all other goods, the premiums that people are prepared to pay to be proximate to a park or open space are influenced by the available supply. If such amenities are relatively abundant, then the premiums will likely be relatively small or non-existent (Nicholls, 2002). Similarly, if houses in an area have large private gardens, then it is likely that premiums will be lower than in areas with little private space because privately owned space may act as a partial substitute for public park space (Miller, 2001).

Parks serving primarily active recreation users are likely to show much smaller proximate value increases, than those accommodating only passive use (Sainsbury, 1964; Hendon *et al.*, 1967; More *et al.*, 1982). The superiority of passive parks in enhancing the tax base presents local governments with a conundrum because frequently they are under considerable pressure to give priority to creating facilities for active recreational use. This is often the more attractive option to conventional leisure services

agency thinking in that it responds to an overt and highly visible user need, accommodates a relatively large number of participants and generates revenues. Organized recreational sports groups are especially effective in politically lobbying for facilities. In contrast, users of passive parks, occasional users, and non-users of parks who are the primary beneficiaries of passive facilities rarely offer a counterorganized lobbying force.

Finally, it should be noted that appreciation of property values is not always perceived by homeowners to be positive. Its corollary is that their property taxes are higher. Some residents who have lived in a location for a long time and have no interest in selling their property, may see no personal benefits accruing to them from development or major renovation of a nearby park. Nevertheless, they are required to pay higher taxes because the appraised value of their property has increased.

In a broader context than a local neighbourhood, it should be noted that these types of analysis fail to capture the 'public' benefits of parks beyond those that accrue to proximate properties through the 'capitalization' captured by hedonic techniques. These public benefits include such factors as reduced soil erosion, water supply protection, wildlife habitat etc., and secondary benefits that may be attributed to parks' role in attracting visitors, businesses or retirees to a community.

A further limitation of the studies reported to this point is that they are confined to single family homes and do not address the impact of parks on proximate retail or other commercial properties. These properties often constitute the major elements around downtown parks. The lack of good empirical work in this context is attributable to three factors. First, hedonic analysis requires a threshold number of property sales to have occurred around a park to generate the market data needed to undertake

the analyses. Business property tends to turn-over less frequently than residential property so this threshold is rarely available. Second, business properties often are not entered into the Multiple Listing Service data bases used for the analyses. Third, changes in annual rents, rather than property sales, could be used, but this information tends to be proprietary and not accessible to researchers.

There is a growing recognition among developers of the legitimacy of the proximate principle and of its utility for developers. Thus, in a careful, comprehensive and technically strong study that was commissioned by a developer the author concluded:

Parks have traditionally been considered a cost center in neighborhood planning, an amenity that must be provided by local government or required of private developers by statute in order to be feasible. This research in contrast, suggests that providing parks in new neighborhoods offers clear financial benefits to developers, that those benefits are predictable using objective research methods, and that they can be captured through careful design and development practice. (Miller, 2001, p. 101)

Despite its limitations, the empirical findings reviewed in this paper are important because they provide park advocates with legitimate monetary indicators of value. Such indicators appear to be central in the decision-making paradigms used by many senior bureaucrats, and to be demanded by elected officials anxious to demonstrate 'accountability' for public expenditures.

In contemporary times, the power of the proximate principle appears to have been overlooked by park advocates since it has rarely been part of the political debate. The evidence reported here suggests that the principle should be resurrected. There are encouraging signs that this is occurring. For example, the city of Houston recently announced the construction of a 13 acre

downtown park to be completed by 2007 for \$40 million. Mayor Bill White stated, 'Much of the city's investment will be recouped over time by increased tax revenues from the enhanced value of property around the park that the park will create'.

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