THE PROXIMATE PRINCIPLE: The Impact of Parks, Open Space and Water Features on Residential Property Values and the Property Tax Base

Book · January 2004

CITATIONS
27

READS
162

1 author:

John Crompton
Texas A&M University
255 PUBLICATIONS **16,727** CITATIONS

SEE PROFILE

THE PROXIMATE PRINCIPLE:
The Impact of Parks, Open Space and Water Features on Residential Property Values and the Property Tax Base

by

John L. Crompton
Distinguished Professor
Texas A&M University

Second edition

Published by the National Recreation and Park Association
22377 Belmont Ridge Road
Ashburn, Virginia 20148
Phone: 703-858-2190

ISBN

CONTENTS

Preface to the Second Edition

Like most second editions, minor revisions have been made in the flow, editing and presentation of the first edition material. The most obvious is a reordering of the chapters. However, complementing these relatively minor amendments, four major additions are incorporated into this edition: (i) an enhanced historical perspective; (ii) inclusion of a chapter on the impact of water features; (iii) an expansion in the number of studies reviewed; and (iv) a method by which local officials can estimate the proximate impact of parks and open spaces in their own communities.

There is an aphorism which says, "People who forget (or are never aware of) their history, forever remain children." Children are required to learn much by trial and error, because they have little experience from which to draw to inform their actions. In contrast, those who are familiar with historical precedent can use it to inform their contemporary actions. The proximate principle was a central feature of justifications for urban parks in the early years of their evolution in the United States. However, in contemporary times it has rarely been part of the political debate. Advocates of parks and open spaces have either been unaware of this history, or have failed to recognize its extraordinary potential power in the political arenas of local governments in the United States.

Hence, the first major change in this second edition is the addition in chapter 2 of an overview of the rich history of the proximate principle. In developing this material I appreciate the assistance of Steve Perkins of Liverpool City Council who has responsibilities for Prince's Park; Martin McCoy, Manager of Birkenhead Park; and Hilary A Taylor Associates who are engaged in planning restoration work at both of these parks.

A second major change is the introduction of a new section, chapter 5, in this edition on the impacts of water-based features on property values. The evidence suggests that the magnitude of their impacts exceeds those associated with exclusively terrestrial park and open space lands. The chapter was contributed

by Dr. Sarah Nicholls whose careful empirical work on the proximate principle in recent years also features prominently in chapters 3 and 6. I am very appreciative of her contributions.

In the four years since the first edition was published, the use of geographic information systems (GIS) by local communities for storing and displaying spatial data has become much more widespread. When this mapping system is linked electronically with home sales transactions data which are available from realtor multiple listing services, they form a basis for hedonic pricing which uses multiple regression techniques to identify the portion of sales price attributable to proximate parks and open space. This has facilitated the emergence of several technically strong scientific studies in recent years. Their inclusion as the third major change in this edition resulted in a substantial expansion of chapter 3. A similar expansion has occurred in the number of cost of community services studies reported in chapter 7. The net effect of the new studies reviewed in chapters 3 and 7 is to confirm and reinforce the economic contributions that parks and open spaces make to enhancing the property tax base and stabilizing residents' property taxes.

The technological advance that has facilitated the introduction of GIS and multiple listing services data means that contemporary empirical studies exclusively use sales transaction information in their analyses, whereas some of the earlier studies relied on the assessed values assigned to properties by tax appraisers. Appraisals are only "best guesses" and thus rarely accurately reflect actual market values. Indeed, tax appraisers frequently systematically undervalue properties in order to avoid having to engage in a large number of negotiation or arbitration procedures with disgruntled residents who believe their property's appraisal is too high. Further, many tax assessors are unfamiliar with the proximate principle so they do not incorporate premiums for it in their appraisal algorithms. Thus, in empirical studies that use assessed values to measure the magnitude of proximate premiums, the data set is likely to be inherently flawed.

There is now sufficient empirical evidence available about the nature and magnitude of the proximate principle to justify tentative generalizations. Thus, the final major change in this edition occurs at the end of the Executive Summary, where a "plug and chug" formulatory approach is offered. This can be used to derive an estimate of the proximate premium in a community. Again, I am appreciative of Sarah Nicholls' assistance in developing this approach, and to Peter Harnik of the Trust for Public Land for encouraging us to produce it.

My Luddite-like insistence on writing on yellow pads with a pen rather than using a keyboard, means that I am reliant on others to transpose my difficult to read scrawl and sketched illustrations into a publishable format that an audience can read. Thus, I am appreciative of the skills and talents of So Yon Lee who transposed all the exhibits that were new to this edition, prepared the page layouts, and organized the material in "printer-ready" form for publication.

Finally, as always, my thanks are extended to Ms. Marguerite Van Dyke who typed most of the manuscript and kept track of the many revisions made to it as the writing progressed. Her professionalism is manifested in the quality of her work, her patience, her tactful editing and guidance, and the unequivocal support and enthusiasm she always offers for my work. All this is accompanied by kindness, unquestionable optimism, and a youthful-like exuberance that belies her years. Marguerite has been my friend and *aide-de-camp* for over a quarter of a century. I have been blessed.

College Station, Texas, October 2004

Preface to the First Edition

There are two ways to measure the economic value of urban parks and open spaces. The first type of measure captures the capitalization worth of parks by measuring their impact on the value of land and property in their immediate catchment zone. The second type of measure is the economic value which residents in the urban area receive from visitors, and from businesses and retirees, whose decisions to come to the area are at least in part predicated on the availability of parks and open space. However, the use of both measures will provide only a *minimum* estimate of the economic value of parks and open space because the measures are not able to capture some dimensions of the benefits these amenities provide to a whole urban area. Such benefits include air cleansing, ground water storage, flood control, elimination of waste, alleviation of environmental stress and pleasing vistas.

This publication focuses on the first type of measure and addresses the economic contributions of parks and open space through their impact on property values. A previous monograph in this series reported the economic contribution made by park and recreation agencies through their role in attracting visitors.[1] Other economic contributions are briefly described in Appendix 1.

The monograph reviews the principles and empirical evidence relating to the economic impact of parks, open spaces, greenways, and golf courses on property values. In the context of this publication, the economic contributions of public park land and open space derive from two premises. First, they often increase the value of proximate properties, and the resultant incremental increase in revenues that governments receive from the higher property taxes is frequently sufficient to pay the acquisition and development costs of the amenities. This view was widely articulated in the early years of the parks field, but in recent decades it appears to have disappeared from the lexicon of advocates. Few park professionals today appear to espouse it, and the author has *never* heard it articulated by an elected official!

The second premise is that public expenditures increase with development, because the costs to a community of servicing residential sub-divisions usually exceed the tax revenues that accrue from them. Thus, the conversion of open space to housing often results in an increased tax burden on existing residents.

Many of the sources used in this monograph were "fugitive" documents. That is, the material had not appeared in scientific journals or other mainstream publication outlets and, thus, was difficult to find and access. Much of this literature has been produced by graduate students for theses or dissertations, land trusts, park advocacy groups, or planners and consultants for the narrow purpose of making or evaluating the case for parks or open space in specific local contexts. The scientific quality of this work varies widely, but the volume of material and the remarkable consistency of findings reporting the positive impact of parks and open space on property values is sufficiently striking that concerns over methodological issues are unlikely to affect the conclusions emanating from this body of literature.

All studies that pertained to the issues discussed in the monograph are reported, irrespective of their conclusions. An effort was made to be comprehensive, rather than selective, and to avoid the review becoming only an advocacy treatise. Thus, results from all studies that were found which do not support the case made by park and open space advocates are included. However, there were relatively few of these. While this suggests strong empirical support for advocates' positions, it is recognized that there may be a lesser probability of research which is not supportive of these positions being reported in the literature. Un-

fortunately, negative findings sometimes are viewed as being unexciting and not as worthy of publication as positive findings.

This publication was commissioned by the National Recreation and Park Association with funding provided by the National Recreation Foundation. It is a component of the National Recreation and Park Association's commitment to documenting the scientific knowledge base pertaining to the contribution made by park and recreation services and amenities to a community's economic development.

The prime motivating force behind this publication was Ms. Terry Hershey, the redoubtable doyenne of the conservation movement in Texas. She heard me discuss these issues over a period of several years and invariably commented: "When are you going to write it all down? This is important information for those of us fighting to protect the critters, open space and parks." Ms. Hershey is a board member of the National Recreation Foundation. When Dean Tice, the executive-director of NRPA proposed to the Recreation Foundation that this monograph be funded, she enthusiastically endorsed the proposal. So, Terry, thanks for all the pushing and support.

The author is grateful for the assistance of Ms. Jennifer Dempsey and Ms. Melissa Adams with American Farmland Trust who provided much of the material on costs of community services. He is also very appreciative of the assistance provided by Ms. Marguerite M. Van Dyke who typed the manuscript drafts of this publication, and Mr. Seokho Lee who prepared the illustrations and formatted the narrative.

References

1. Crompton, John L. (1999). *Measuring the economic impact of visitors to sports tournaments and special events.* Ashburn, Virginia: The National Recreation and Parks Association.

College Station, Texas, April, 2000

The real estate market consistently demonstrates that many people are willing to pay a larger amount for property located close to parks and open space areas than for a home that does not offer this amenity. The higher value of these residences means that their owners pay higher property taxes. In effect, this represents a "capitalization" of park land into increased property values of proximate land owners.

This process of capitalization is termed the "proximate principle." It means that in some instances if the incremental amount of taxes paid by each property which is attributable to the presence of a nearby park is aggregated, it will be sufficient to pay the annual debt charges required to retire the bonds used to acquire and develop the park. In these circumstances, the park is obtained at no long-term cost to the jurisdiction.

In addition to public officials, developers and homeowners have an interest in better understanding the proximate principle. Developers need to apportion the opportunity cost of park and open space lands in their projects to individual lots and to establish these premiums based on the lots' locations. For many people, their home is their principal investment. Thus, data that provide homeowners with information on park proximity premiums have meaningful practical value to them.

Several scenarios are developed to illustrate the proximate principle. They show how, for example, a city council may invest $90,000 a year for 20 years (annual debt charges on a $1 million bond) to construct or renovate a park; which causes the values of properties proximate to the park to increase; leading to higher taxes paid by the proximate property owners to the council that are sufficient to fully reimburse the $90,000 annual investment made by the council.

There are contexts in which the proximate principle may exert a negative impact on property values. Adverse impacts may emerge from nuisances such as congestion, street parking, litter and vandalism, deviant behavior, noise and ballfield lights, and from poorly maintained or blighted, derelict facilities.

In most contexts where parks enhance

property values, the increments of property tax which accrue go into the general fund along with all other property taxes. However, four vehicles are discussed which activate the proximate principle to directly capture the incremental gains and use them to pay for park acquisition and development costs by retaining the increments in a separate account for that purpose. These vehicles are:

(i) Excess purchase or condemnation which involves purchasing more land than is needed for the park project; developing the park, thus appreciating the value of the remaining land; disposing of the remaining land on a commercial basis; and applying the income derived to pay for the original investment in the park.

(ii) Special assessment districts whereby property owners within an area of a community agree to assess themselves an additional tax to pay for a new or renovated park. The tax may be apportioned according to a formula designed to reflect the proportion of benefits that accrue to each property owner, so those whose property abuts the park would pay more than those residing on the fringe of the district.

(iii) Tax increment financing where park renovations result in increases in value of taxable property in the area, and the resultant incremental tax revenues are used to retire the debt used to finance the original renovations.

(iv) Creating new neighborhood and community parks in advance of development. Given their attraction power, they are likely to become a focus for development. Their financing can be retired from the incremental increases in tax revenues from the properties around them and from the exaction fees levied on developers to pay for new parks whose demand has been created by their developments.

The Early Empirical Evidence

The genesis of the proximate principle occurred in the first half of the nineteenth century in England, where it started as a strategy used by private developers to quantumly raise the value of homes in their developments. When the rapidly growing industrial cities in England were urged by central government to create parks, they balked at doing so because they were perceived to be a low priority. When the proximate principle transitioned into the public sector, it repositioned park expenditures as investments rather than costs in the minds of taxpayers and elected officials. This was the financial breakthrough that led to parks becoming a standard component of the British urban infrastructure.

The idea transitioned from the British to the U.S. context through the influence of Frederick Law Olmsted. Olmsted brought the idea of the proximate principle to the U.S. from England; broadcast it widely based on its intuitive appeal; and provided data from his Central Park project, which appeared to empirically confirm it. Thus, in 1868 writing to the future developers of Riverside, Chicago, he cited the "vast increase in value of eligible sites for dwellings near public parks" and over 50 years later in 1919, his son Frederick Law Olmsted, Jr. continued to espouse the mantra: "It has been fully established that…a local park of suitable size, location and character, and of which the proper public maintenance is reasonably assured, adds more to the value of the remaining land in the residential area which it serves than the value of the land withdrawn to create it." Hence, Olmsted's data and advocacy were used to justify major early park investments in many U.S. cities. Other early

empirical studies undertaken in two New Jersey county park systems also endorsed the legitimacy of the proximate principle.

Thus, from the earliest days of urban park development in the United States in the 1850s, through the 1930s, there was an insistent, almost inviolate conviction among park and open space 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. A review of the early studies emphasizes the long history of the proximate principle and its early effectiveness in persuading decision-makers to invest in parks.

In the first third of the twentieth century, developments of parkways and playgrounds were considered to be as central economic, social and political issues, as the development of parks. Hence, studies on their impacts on proximate property were also undertaken. Although these studies showed substantial gains in proximate property values associated with parkway developments, historical perspective suggests that much of the value increase was attributable to more effective and efficient access for traffic and transit, rather than to the parkways' aesthetics. Early conventional wisdom held that playgrounds were likely to depreciate land values in their vicinity, but the evidence from empirical studies in the 1920s suggested this concern was generally unfounded.

These early studies were fairly rudimentary and naïve, reflecting the underdeveloped nature of the statistical tools and research designs available in the first third of the twentieth century. All property value increases were attributed to the proximity of a park and the potential influences of other factors were ignored, such as house age and size; lot size; distance to city center or major shopping center; and access to other amenities such as schools and health care facilities. Although historical perspective suggests the findings reported by these studies may have been exaggerated because of their design failings, they illustrate the rich historical pedigree and tradition of the proximate principle, and its effectiveness in persuading decision-makers to invest in parks.

The Later Empirical Studies

The limitations of the early studies were much better controlled in the later empirical studies which were all undertaken after 1960, except for one pioneering pathfinding study completed in the late 1930s. These later studies were designed to address three key questions. The *first* question asked whether parks and open space contributed to increasing proximate property values. Results from studies that investigated this issue were reviewed and in approximately 30 of them the empirical evidence was supportive.

The support extended beyond urban areas to include properties that were proximate to large state parks, forests and open space in rural areas. The rural studies offered tentative empirical evidence to support not only the proximate principle in some cases, but also to refute the conventional wisdom that creating large state or federal park or forest areas results in a net reduction in the value of an area's tax base.

Six of the supportive studies further investigated whether there were differences in the magnitude of impact among parks with different design features and different types of uses. The findings demonstrated that parks serving primarily active recreation areas were likely to show much smaller proximate value increases than those accommodating only passive use. However, even with the noise, nuisance and congestion emanating from active users, in most cases proximate properties tended to show increases in value when compared to properties outside a park's service zone. Im-

pacts on proximate values were not likely to be positive in those cases where (i) a park was not well maintained; (ii) a park was not easily visible from nearby streets and, thus, provided opportunities for anti-social behavior; and (iii) the privacy of properties backing on to a linear park was compromised by park users.

Examination of the six studies that did not support the proximate principle suggested that in four of those cases the ambivalent findings might be attributed to methodological limitations.

The *second* question that the later empirical studies sought to answer related to the magnitude of the proximate effect. A definitive generalizable answer is not feasible given the substantial variation in both the size, usage and design of park lands in the studies, and disparity in the residential areas around them, which were investigated. 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. Guidelines on how local officials can apply these result to park systems in their communities are given in the section of the monograph immediately following this Executive Summary.

The diversity of the study contexts makes it feasible to offer a generalizable definitive answer to the *third* question addressed by the empirical studies which concerned 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 (typically three blocks away from the park). In the case of community-sized parks (say upwards of 40 acres), it tended to extend out to 1,500-2,000 feet, but even in those cases the premium was small after 500-600 feet. Studies have not 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.

The Evidence Relating to Greenway Trails

In the 1990s, there was an exponential growth in interest in developing greenway trails. The nature of responses to greenway trails is likely to vary according to individuals' value systems and a trail's context. Thus, even narrow greenway corridors in densely developed areas may offer meaningful open space and aesthetic value to some owners. The natural habitat and associated wildlife in a narrow wetland in a greenway corridor, for example, may be more of an amenity for some buyers than living adjacent to a large golf course.

Some potential buyers of a property may have no interest in hike/bike trails or linear recreation activities, so for them there is no positive counterbalance for the potential negative impacts of privacy loss, people flow and noise. For other potential buyers, especially perhaps those with young children, hiking, biking, and linear recreation activities may be a central feature of their lifestyle, so access to trails far outweighs the perceived potential negative outcomes. These dichotomous lifestyles suggest why some are likely to respond positively to trails, while others remain more circumspect.

For the most part, the rationale underlying the proposition that greenway trails may positively influence property values is different from that associated with parks. Unlike parks, any added property value is not likely to come

from the views of nature or open space which a property owner enjoys because in many cases, especially in urban trail contexts, there are no such vistas. Rather, any added value derives from access to the linear trail. It is a trail's functionality or activity potential that is likely to confer added value, not the panorama of attractive open space.

The literature investigating the proximate principle in the context of greenways is sparse and the sample sizes of many studies were small. Nevertheless, the consistent pattern emerging from them and the diversity of milieus in which they were conducted enables a reasonable level of confidence to be placed in generalizations drawn from them. Across the studies there was broad consensus that trails have no negative impact on either the saleability of property (easier or more difficult to sell) or its value. There was a belief among some, typically between 20% and 40% of a sample, that there was a positive impact on saleability and value. However, the dominant sentiment was that the presence of a trail has no impact on these issues.

The Impacts of Water-Based Features on Property Values

The value of a view of water has been proven conclusively. Of the nineteen studies reviewed that included a variable relating explicitly to the view of some water-based feature on property values, only one indicated a significant negative impact while one other listed an insignificant result. The latter finding referred to a view of a small, freshwater pond.

The significant, positive effect of a water view obtained in the remaining studies held across all types of water feature, including ocean, lake, river, and canal. Premiums for a water view in the 1970s were generally in the hundreds or low thousands of dollars. Figures ranged from $573 to $1,340 in a 1977 study. By the late 1980s, premiums of expansive ocean views had reached tens of thousands of dollars. In 1989, figures ranging from $15,000 to nearly $39,000 were reported for a view of San Francisco Bay, though another estimate in 1994 of the value of a view of Lake Michigan was considerably smaller, at $6,700. The most recent estimates of premiums associated with water views have been substantial, nearly $46,000, over $75,000, and $115,000.

When considered as percentages of value added, water views generally produced premiums of between 4% and 12% through the late 1980s. The most recent evidence, however, suggests that the value of such a view is growing in importance relative to the value of a house. Studies since 1997 have listed premiums from 30% to 147% for full ocean views, and over 10% for partial vistas. Lake view premiums of 18% to 56% have been reported. One study found a 115% premium associated with a view of a creek or marsh.

Many analyses have incorporated a variable entitled, "on lake," or "on ocean," to measure impacts of such a position on property values. Such variables do not differentiate between view and recreational access but they have consistently indicated positive impacts on property values. Of the nineteen studies reviewed that utilized this type of variable, fourteen reported significant, positive impacts; three reported insignificant results; and, two, a mixture of positive and negative results. Significant positive impacts were recorded for properties on the ocean, on lakes, and on canals. Insignificant results pertained to properties on a pond, and on a "lake or lagoon," while the largest negative impact (a $49,000, or 12%, decline in values) was attributed to location on a flat, featureless lagoon.

The earliest study of premiums related to waterfront location, conducted in 1964, reported an increase in values of $65.42. By the 1970s, premiums had reached the thousands of

dollars ($809 to $4,040). A 1982 study listed amounts ranging from $7,900 to $10,200. In 1989, increases of $24,000 to $65,5000 were reported. Today, premiums for properties on a waterfront may exceed $100,000.

The decay impact of increasing distance to a lake or ocean on property values is conclusive. Each of the eighteen studies including such a variable confirmed it. Unfortunately, however, few studies have estimated the numerical value of increased proximity.

The Analogous Case of Golf Courses

Almost 1,000 golf courses incorporated as central features of real estate developments were constructed in the U.S. in the 1990s. Developers include golf courses to increase the land values in their projects; to accelerate the absorption of real estate, i.e., to sell their lots more quickly; or to respond to physical planning or ecological conditions.

Contemporary golf courses integrated into real estate developments typically exemplify the important role of "edge" in maximizing proximate residential lot values. The favored designs are linear because they can accommodate much more real estate frontage than traditional circular or rectangular courses.

The magnitude of the premium associated with golf courses appears to be in the 25 to 30 percent range which is substantially higher than the proximate premiums associated with parks and open space, but lower than that accruing from water features. However, the premium is mostly limited to homes abutting the course. Those located two or three blocks away are unlikely to have a view and, unlike a park, frequently they do not have access since casual use for purposes other than golf is often aggressively discouraged.

Although the evidence is sparse, there is general agreement among studies and reports that approximately 70 percent of households residing in golf communities have no members who play golf regularly at the course. These data when aligned with the substantial cost of developing a golf course and the lack of developer interest in operating it, suggest more developers may consider creating a similar premium for their lots by using prime attractive, ambient open space rather than building a golf course.

The developers' use of golf courses in developments mirrors the rationale that public parks and open space has used for over a century and a half, i.e., parks are an investment not a cost because they generate more property taxes for a community than it costs to service the annual debt charges incurred in creating the amenities. The high visibility, large number, and success of these golf course developments demonstrates by analogy to governmental stakeholders and decision-makers the viability of the proximate principle in the context of park land and open space.

The Role of Park and Open Space Lands in Reducing Taxes

It is often argued by developers and elected officials that in addition to acquisition and development costs, and operating and maintenance costs, there is a substantial opportunity cost associated with allocating land for public parks and open space. Because such land is publicly owned, it is exempt from property taxes. Hence, the opportunity cost is the loss of property tax income that jurisdictions would have received if the land had been developed for other purposes.

The conventional wisdom which prevails among many decision-makers and taxpayers is that development is the "highest and best use" of vacant land for increasing municipal revenues. This conventional wisdom is reinforced by developers who claim their projects "pay for themselves and then some." They exhort

that their developments will increase a community's tax base and thereby lower each existing resident's property tax payments.

However, in the past two decades a number of communities have commissioned a type of fiscal impact analysis which has become known as a cost of community services study. Findings from these analyses have challenged conventional wisdom. They have consistently shown that the public costs associated with new residential development exceed the public revenues that accrue from it. The 98 cost of community services studies reviewed showed that for every $1 million received in revenues from residential developments, the median amount the communities had to expend to service them was $1.16 million. There was not a single instance among the 98 communities where taxes from residential development were sufficient to cover the costs of servicing them.

New houses mean more children have to be enrolled and bused to school, additional roads built and maintained, extension of police and fire protection and so on. While supposed benefits of growth are loudly and widely proclaimed by a community's growth coalition, its associated costs are rarely discussed. The results from these studies refute the notion that development of land is invariably its "highest and best use" which sometimes thwarts park and open space initiatives.

The evidence clearly indicates that preserving open space can be a less expensive alternative to development. Hence, a number of communities have elected to purchase park and open space land, rather than allow it to be used for residential development, because this reduces the net tax deficit for their residents which would occur if new homes were built on that land. The conclusion is that a strategy of conserving parks and open space is not contrary to a community's economic health, but rather it is an integral part of it.

ESTIMATING THE MAGNITUDE OF THE PROXIMATE PREMIUM IN A LOCAL COMMUNITY

To undertake hedonic studies that calculate the impact of parks and open spaces on property taxes and the property tax base requires considerable skill in computer mapping and the use of statistical techniques, and it is time consuming. It is likely to be impractical for most park agencies to replicate studies of this nature. Nevertheless, many agencies seek a method of applying a valuation to parks that they can adapt for use in their own communities. An approach is offered here for doing this, but it is emphasized that this approach can only offer a rather crude "best guess." The empirical findings from the studies reviewed in this monograph provide a basis for developing a relatively simple "plug and chug" formulary approach that can be used to derive an estimate of the proximate premium in a community.

The prerequisites for implementing it are that there is electronic access to the assessed values of property assigned by the tax assessor's office and that the community has a GIS mapping system. Without these two tools, estimates of the aggregate value of the proximate premium to the community are unlikely to be feasible.

The following parameters are suggested as reasonable points of departure for deriving these premiums based on the empirical results reported in the monograph.

1. The area of proximate impact of a park should be limited to 500 feet or three blocks. The empirical results suggest this is likely to capture almost all the premium from small neighborhood parks and 75% of the premium from relatively large parks. The remaining 25% is likely to be dissipated over properties between 500 and 2000 feet. Disregarding this will lead to an underestimate of the proximate impact of large parks which may be substantial because while the premiums at these distances are relatively low, the number of properties within these parameters is relatively high. However, adopting this 500-foot parameter substantially simplifies the estimation task.

2. Grade each park in the system on the five-point scale shown in Exhibit A ranging from "unusual excellence" to "dispirited, blighted." The grading can be done either by park staff or by a panel of residents familiar

with each of the sites. This scale is defined primarily by the emotional response of people in a park's area of influence. It recognizes that a park's quality is defined by people's emotional response to it, rather than only by its physical and tangible qualities. In every community there are fine, physically attractive parks that receive little use, either because the infrastructure or/and land uses around it do not encourage use, or because the behavior of existing users discourages others from using it. Such parks should not score highly on this scale and are likely to be assigned to the "average" category.

The two lowest rated categories in Exhibit A are likely to generate negative proximate premiums and so will contribute nothing positive to the tax base. There is no empirical literature to guide estimates of either the magnitude or the impact distance of negative premiums. Thus, no estimate parameters of them are included here. In a system-wide evaluation, these parks should be identified as being opportunities available to the community to enhance its tax base if it invests in them.

3. Based on the results reported in the monograph, the suggested premiums applied to all single family home properties within the 500 foot proximate area for each of the three highest categories shown in Exhibit A are:

Unusual excellence:	15%
Above average:	10%
Average:	5%

After reviewing the monograph, these may appear low to some readers because several of the most recent, technically strong studies reported premiums in the 16%-22% range. However, these were for the first block immediately adjacent to the park and the premiums declined for properties in the second and third blocks. The

Exhibit A Park Quality Scale for Determining Proximate Premiums

Unusual Excellence: A signature park; exceptionally attractive; natural resource based; distinctive landscaping and/or topography; often mentioned in sales advertisements for nearby properties; well maintained; genuine ambiance; engenders a high level of community pride and "passionate attachment."

Above Average: Natural resource based; has charm and dignity; regarded with affection by the local community; pleasant, well maintained.

Average: Rather nondescript; not really "noticed" by the local community; adequately maintained; no distinguishing features.

Below Average: Sterile; absence of landscaping or trees; athletic fields with noise, lights, congestion; intensive use.

Dispirited, Blighted: Dilapidated, decrepit facilities; broken equipment; unkempt, dirty; unofficial depository for trash; noisy; undesirable groups congregate there; rejected and avoided by the community.

proportionate premiums suggested here in stage 3 are averages to be used for all properties within the 500-foot (three block) radius.

4. Any incremental premium associated with greenway trails i.e., trails that are not part of visually appealing park or open space land, would arise from access to the trail rather than from views of the amenity. Results from the limited number of empirical studies available at this point indicate that while trails are unlikely to exert a negative impact on proximate values, there is insufficient evidence to suggest they have a positive impact. The dominant sentiment is that trails have no impact on property values, so no proximate premium is recommended for them here.

5. The technically strong empirical studies in the monograph suggest that the proximate premium associated with a golf course is likely to be around 25%. However, the premium decreases dramatically after one block. The premium is attributable almost exclusively to views and, unlike a park space, homeowners two or three blocks away are unable to use the space unless they play golf so their physical proximity to it has little utility. Thus, for golf courses, it is suggested that the 25% premium be limited to properties that are adjacent to it i.e., a one-block radius.

Steps in Calculating an Estimate of the Impact of Parks on the Property Tax Base

1. Identify all public parks and open spaces, and grade the quality of each on the five point scale shown in Exhibit A.

2. Draw a 3 block or 500 feet travel radius around each of the parks and open spaces, which was classified in the three highest quality categories.

3. Aggregate the assessed value of all single-family homes within each of the three block (500 feet) radii, using data from the local tax assessor's office.

4. Apply the percentage premiums suggested above (15%, 10% or 5%) to the aggregate value calculated in step 3.

5. Aggregate the premiums calculated for each park in step 4. This figure represents an estimate of the overall change in property value attributable to the parks and open spaces examined.

6. Multiply the aggregated premiums calculated in stage 5 by local property tax rates imposed by all taxing entities to estimate the total positive impact of parks on the property tax base.

7. Compare the aggregated premium calculated in stage 6 to:

(i) the annual debt charges incurred in the acquisition and development of those parks and open spaces;

(ii) the annual cost of maintaining those parks and open spaces.

Values that the Proximate Capitalization Measure Fails to Capture

The aggregated proximate premium that these calculations produce offers only a partial indication of their economic value to a community. There are at least three additional sources of economic value attributable to park and open space amenities which are not captured by this capitalization approach.

First, the capitalization of park and open space value into property prices captures the "private" benefits that accrue to proximate homeowners, but it does not capture the "public" benefits that accrue to those outside the proximate influence from such features as wildlife habitat, improved water quality, reduced soil erosion, reduced flooding, et al.

Second, there is evidence to suggest that investment in parks affects the comparative advantage of a community in attracting future businesses and desirable residential relocators such as retirees. However, the proximate capi-

talization approach does not capture the secondary economic impacts attributable to park provision that accrue from such sources.

Third, it was noted in point 1 of the calculation parameters, that relatively large parks rated positively by the scale in Exhibit A are likely to impact property values for distances beyond three blocks, and omission of these premiums may lead to underestimation of proximate impact that could be substantial. In addition, large parks are likely to have value to populations beyond the radius that can be captured by proximate capitalization even if that radius is extended out to 2000 or 3000 feet. This occurs because some users of a large park are likely to come from beyond this radius e.g. two or three miles distance. The benefits accruing to these users cannot be captured in capitalization calculations.

CHAPTER 1

Context of the Issue

CHAPTER 1

CONTEXT OF THE ISSUE

The rationale for this monograph is summarized by the following observation:

> Too many community leaders feel they must choose between economic growth and open space protection. But no such choice is necessary. Open space protection is good for a community's health, stability, beauty, and quality of life. It is also good for the bottom line (p. 3).[1]

Parks and open spaces are equally as productive contributors to a local economy as roads, utilities and other infrastructure elements. The cost of investing in these elements is justified by the economic value that derives from their availability. Unfortunately, many communities which are experiencing growth lack the foresight to set aside land for inclusion in a parks system in the same way as they do for other infrastructure elements. They frequently claim there is a lack of resources for what they regard as a discretionary investment.

Public parks and open spaces traditionally have not been evaluated in economic terms, because there are many other appealing and rational justifications for acquiring and providing them. These may include: (1) enhancement of a community's quality of life, which embraces its livability, "feel", and aesthetic integrity, and the role of parks and open spaces in creating a sense of place or community; (2) ecological and environmental reasons relating to issues such as biological diversity, improving water quality, air cleansing, aquifer recharge and flood control; and (3) scenic vistas and places for engaging in active or passive recreation activities.

Although the primary purpose of acquiring park land or encouraging the preservation of open space may not be financial, financial justification for these actions is nearly always required. The absence of economic measures of value means that the merits of open space cannot be objectively prioritized and ranked against other services whose benefits are measurable. The costs are relatively easy to calculate and the absence of a calculation of economic benefits that offsets them means

there is an inherent imbalance in the information which elected officials and taxpayers have to use to make decisions. An awareness of their economic value is likely to result in more of the outcomes of those decisions being positive.

Although real estate sections of newspapers are replete with advertisements proclaiming the virtues of "leisure living" and stressing proximate recreational and open space amenities, contemporary conventional wisdom among many elected officials and decision makers is that open space and park land is a costly investment from which a community receives no economic return. The social merit of such investment is widely accepted, but social merit amenities frequently are regarded as being of secondary importance when budget priorities are established.

The difficult fiscal environment that prevails in many cities, and the escalation of urban land values, have made the economic justification of park land and open space increasingly necessary in order to rebut the persuasive rhetoric of those who say: "I am in favor of parks and open space but we cannot afford either the capital acquisition and development costs because of more pressing priorities, or the loss of operational revenue that will accrue if the land is removed from the tax rolls." If the flaws in this economic shibboleth are exposed and nullified, then the likelihood of winning the argument for more investments in parks and open space using the traditional justifications noted in the earlier paragraph is enhanced.

The challenge for park advocates is to achieve widespread recognition of the economic contribution of parks and to measure it, so it is adequately represented in the planning, social, and political calculus of community infrastructure decisions. If park and open space advocates are limited when making their case to general statements like, "We know the presence of parks has a beautiful and beneficial effect on our community even though we cannot place a specific value on it," then they are likely to lose contests with developers for land. In contrast to such subjective generalities from conservationists, developers are likely to cite the specific increase in dollar value of the tax base that will accrue if the site is developed.

Government officials frequently seek to enhance the tax bases of their communities by encouraging development. There is a widespread belief that this strategy is the most effective way to raise additional revenues from property taxes, which then can be used to improve community services without increasing the taxes of existing residents. The fallacious conventional wisdom that development *ipso facto* brings prosperity is deeply embedded in the American psyche.

In contrast to the enhanced tax revenues accruing from development, community investments in parks and open spaces often are perceived to offer no financial return to the city. This view was expressed, for example, in an Army Corps of Engineers' environmental impact statement on Ft. Sheridan, Illinois. This base was scheduled for closure and park and recreation advocates wanted to secure assets from the base for recreational use by the local community. The Corps' view was that it had no obligation to consider potential recreation use for land because recreation offers "no support for the local tax base."[2]

The lack of perceived return is exacerbated in the eyes of some elected officials by the costs they perceive to be incurred if parks are created. Three types of costs associated with providing parks are usually identified: (1) acquisition and development costs; (2) operating and maintenance costs; and (3) the opportunity cost of loss of property tax income that jurisdictions would have received if the land had been developed for other purposes. The third cost is cited by people who point out that

because park land is publicly owned, it is exempt from property taxes. In contrast, if it were commercially developed, then it would generate property taxes and, thus, reduce the amount assessed on all other property owners in the jurisdiction to pay for local public services.

Advocates of park and open space provision view this economic conceptualization of parks as flawed. They exhort the adage that much of the value of properties on the tax roll is acquired from amenities that are off the tax roll (parks, schools, roads, etc.), and that the contributions of these amenities to the tax base are likely to be at least as substantial as those forthcoming from residential real estate developers.

If it is recognized that parks and open spaces often add more value than would accrue from the opportunity cost of that land, then it is likely that both developers and government entities will be more supportive of investing in them. This monograph reviews a convincing body of evidence, dating back 150 years to pioneering work by Fredrick Law Olmstead, which suggests the conventional wisdom that park amenities offer no economic return is wrong.

The results of any single study are easily challenged. The cumulative insights gained from multiple studies, however, reduce such skepticism. Their acceptance is increased in situations like this where the studies have been carried out for 150 years, in varied settings, by researchers from different disciplines, using a variety of techniques. The generalizable insights that accrue from the multiple studies discussed in this monograph, which have reported findings relating to the proximate impact of parks on property values, provide data that should facilitate better integration of parks and open space into urban planning and development decisions.

In addition to public officials, developers and homeowners are likely to be interested in the results of empirical studies that have investigated the existence and magnitude of the proximate principle. When park and open space land is incorporated into a development to enhance its amenity value, the developer has to apportion the opportunity cost of that land (that is, the revenue foregone by not building on it) among all the lots based on the extent to which each individual parcel benefits from it:

> Developers and homeowners must know what the final equilibrium distribution of premiums with respect to distance will be before any parcels are sold. Otherwise, prices are likely to be either too low – sacrificing margins – or too high – reducing sales velocity. Either outcome brings large costs, and thereby affects the relative attractiveness of developments utilizing amenities. Financing sources, too, require predictability just as much as they require that specific premiums be achieved. The risk represented by uncertain premiums affects the availability or cost of debt, and by extension the feasibility of new proposals (p12).[3]

If the premium for each parcel is not reliably known before construction of the development commences, then the inclusion of the park and open space land substantially increases the risk of the project. The repercussions of this are that "Lenders require a higher rate of return in compensation for that unknown level of risk, and this raises the cost of debt and reduces the project's feasibility relative to conventional developments (p17).[3] Thus, the availability of data relating to the likely magnitude of the proximate principle is likely to result in more developers including parks and open spaces as amenities in their projects.

Greater awareness by private developers

of the economic value of park and open space

amenities is likely to enhance the likelihood of public-private development partnerships. It is also likely to give public agencies a stronger negotiating position for securing such amenities when dealing with private proposals.[4]

For many people their home is their principal investment. Thus, data that provide homebuyers with information enabling them to make informed decisions about the relative merits of apparently similar properties have substantial practical value. In this context, "A demonstration that park proximity premiums are a resilient characteristic of the market and not just a preference of the individual homeowner transforms what was a costly consumption choice into an investment" (p.19).[3]

THE PROXIMATE PRINCIPLE

Similarly sized, aged and designed homes often have very different values in different neighborhoods. It has been pointed out that investments by public entities in capital projects frequently are a major factor in these valuation differences:

> A new highway interchange, for example, generally increases the value of nearby property because it increases its accessibility. Conversely, a decision to close a school or a neighborhood police station may decrease the value of property in the neighborhood (p. 1).[5]

This monograph is concerned with the impact of public investments in parks, greenways, and open space on property values. It presents empirical findings that researchers have reported on these impacts to provide public policy makers, appraisers, developers and homeowners with information that will inform their decisions.

The premise that parks and open space 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 these types of areas, than they are for a comparable home. Almost 40 years ago, the National Recreation and Park Association in an early edition of its *Outdoor Recreation Space Standards* handbook commented:

> Real estate dealers have always drawn attention to parks and playgrounds near their properties for sale or rent. Many of them know that properly located and planned recreation areas have definite dollars and cents effect on the values of surrounding property. Comprehensive figures have never been brought together but a number of studies and observations show that recreational features contribute to increased valuations for property near parks and playgrounds (p.28). [6]

If this observation is consistently verified by research findings, then elected officials can be assured that owners of the enhanced property are likely to pay higher property taxes to governments because of the increase in the property's appraised value. In effect, this represents a "capitalization" of park land into increased property values for proximate land owners. It adopts the mechanism of market pricing to assess the value of parks. This process of capitalization is termed "the proximate principle." Conceptually, it is argued that the competitive market will bid up the value of property just equal to the capitalized value of the benefits that property owners perceive they receive from the presence of park and open space. Economists refer to this approach as "hedonic pricing." It is a means of inferring the value of a non-market resource (a park) from

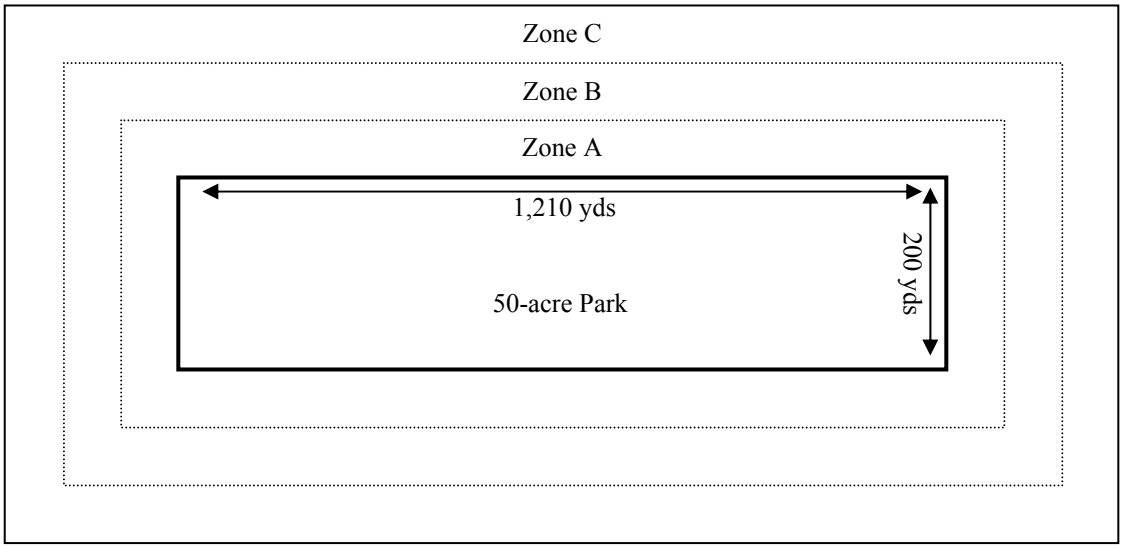


Exhibit 1-1 Layout of a 50 acre Natural Park and the Proximate Neighborhood Area

the prices of goods actually traded in the market place (surrounding residential properties).

In some instances if the incremental amount of taxes paid by each property that is attributable to the presence of the park or open space is aggregated, it will be sufficient to pay the annual debt charges required to retire the bonds used to acquire and develop the park. In these circumstances, the park is obtained at no long term cost to the jurisdiction.

This principle is illustrated by the hypothetical 50 acre park situated in a suburban community shown in Exhibit 1-1. It is a natural, resource–oriented park with some appealing topography and vegetation. The cost of acquiring and developing it (fencing, trails, supplementary planting, some landscaping) is $20,000 an acre, so the total capital cost is $1 million. The annual debt charges for a 20 year general obligation bond on $1 million at 5% are approximately $90,000.

In Exhibit 1-2 annual income streams attributable to the presence of the park that would be available to service the bond debt are developed, based on three different sets of assumptions. The table at the end of Scenario A in Exhibit 1-2 shows the annual incremental property tax payments in the three zones from the premiums attributable to the presence of the park amount to **$98,000** given the assumptions of Scenario A. This is sufficient to pay the **$90,000** annual bond debt charges.

In scenarios B and C, the alternate assumptions result in annual incremental property tax payments in the three zones attributable to the presence of the park of **$196,000** and **$100,800**, respectively. In each case, this is sufficient to pay the $90,000 annual bond debt charges. Clearly, changes in any of the four assumptions listed in the scenarios of Exhibit 1-2 will lead to different outcomes and readers are invited to insert numbers into these assumptions that best reflect the context with which they are concerned.

The alternate scenarios in Exhibit 1-2 also illustrate that the proximate principle may be

Exhibit 1-2 Alternate Scenarios Illustrating how Changes in Context Influence Annual Income Streams available to Service Bond Debt incurred for Acquisition and Development of a Park

Scenario A

1. If properties around the park were 2,000 square feet homes on half acre lots (40 yards x 60 yards) with 40 yard frontages on the park, then there would be 70 lots in Zone A (30 lots along each of the 1,210 yard perimeters and 5 lots along each of the 200 yard perimeters). Assume there are also 70 lots in Zone B and C.
2. Assume total property taxes payable to city, county, and school district are 2% of the market value of the property.
3. Assume the market value of similar properties elsewhere in the jurisdiction beyond the immediate influence of this park is $200,000.
4. Assume the desire to live close to a large natural park creates a willingness to pay a premium of 20% for properties in Zone A; 10% in Zone B; and 5%, in Zone C. (The review of empirical studies in chapters 2 and 3 suggests these values are a reasonable point of departure.)

Zone	Market value of each home	Incremental value attributed to the park	Total property taxes at 2%	Incremental property taxes attributed to the park	Aggregate amount of property tax increments given 70 home sites
Outside the park's influence	$200,000	$0	$4,000	$0	$0
A (20% premium)	$240,000	$40,000	$4,800	$800	$56,000
B (10% premium)	$220,000	$20,000	$4,400	$400	$28,000
C (5% premium)	$210,000	$10,000	$4,200	$200	$14,000
					$98,000

Scenario B

If the context is changed from a suburban community to an urban community, and the properties are townhouses constructed at a density of 8 per acre, then stage 1 of the calculation scenario would be revised as follows:

1. If properties around the park were 2000 square feet townhomes on lots sized 20 yards x 30 yards with the 20 yard frontages on the park, then there would be 140 lots in Zone A (60 lots along each of the 1210 yard perimeters and 10 lots along each of the 200 yard perimeters)

If the remaining assumptions (points 2,3 and 4) are the same, then the aggregate annual incremental revenue attributable to the park will be **$196,000**.

Scenario C

If the park is less attractive than assumed in scenarios A and B, so the premiums in stage 4 are 10% for Zone A, 5% for Zone B and 3% for Zone C, but the remaining assumptions of scenario B are the same, then the aggregate incremental annual revenue attributable to the park will be **$100,800**.

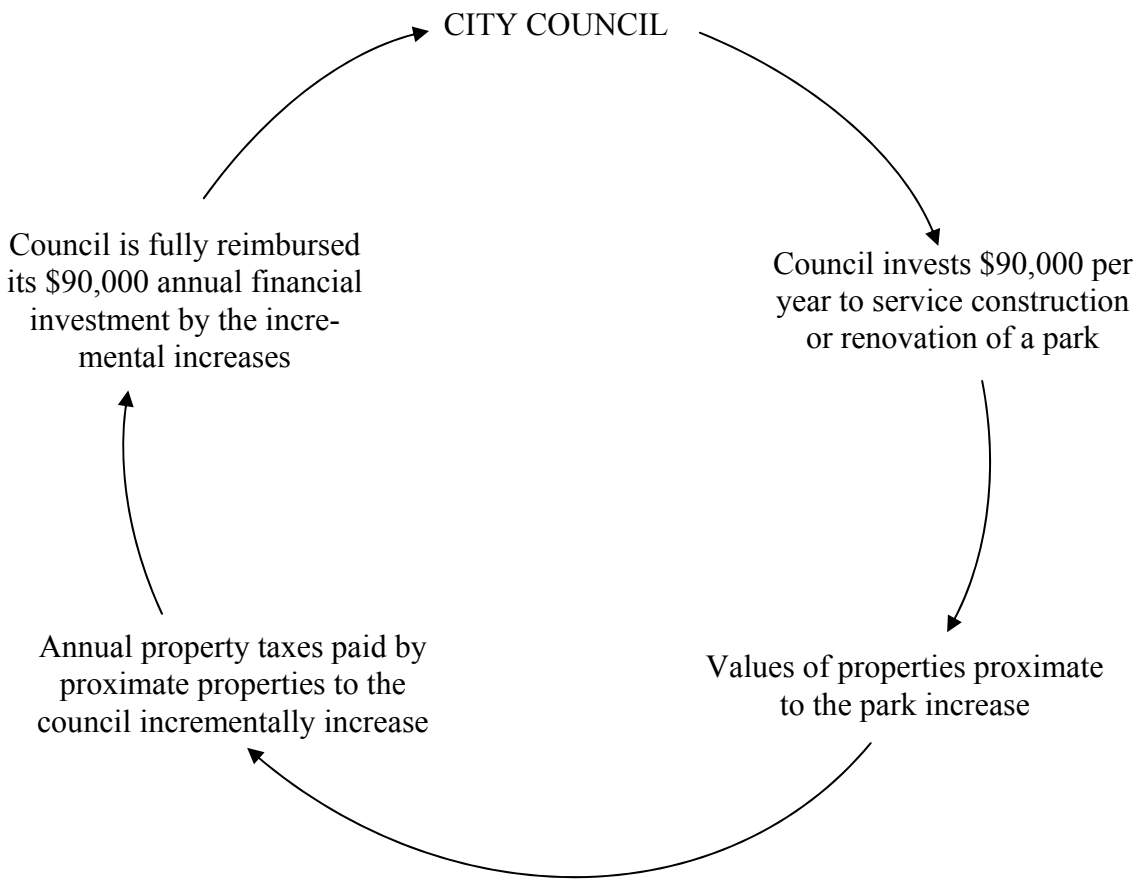


Exhibit 1-3 The Investment Cycle Associated with a Local Government's Investment in a Park

less effective in suburban (Scenario A) than in urban areas (Scenarios B and C). In a garden-style suburban neighborhood, a park would provide continuity and reinforce the image of the neighborhood rather than provide a contrast to its surroundings. However, there will be fewer homes benefiting from proximity to the amenity than in urban areas with denser housing patterns. Thus, if a suburban park is to deliver equivalent proximate impact to the tax base as an urban park, either the premium paid by each home must be substantially higher relative to urban contexts or the cost of land must decrease disproportionably relative to the number of houses around the park. If the park is a private amenity incorporated into a project by a developer to enhance its attractiveness, the same principle applies, *videlicet,* the fewer the number of homes, the higher the premium will have to be to support additional costs associated with construction of the park.[3]

The flows of the proximate principle investment cycle are shown in Exhibit 1-3. Using scenario A in Exhibit 1-2 for illustration purposes.

1) The council invests $90,000 a year for 20 years (annual debt charges on a $1 million

bond) to construct or renovate a park;
2) causing the values of properties proximate to the park to increase;
3) leading to higher taxes paid to the council by the proximate property owners;
4) which are sufficient to fully reimburse the $90,000 annual financial investment made by the council.

There is a caveat to the symmetry of flows shown in Exhibit 1-3. Stage 3 – leading to higher taxes paid to the council by the proximate owners – assumes that the proximate value premiums attributable to the park are recognized by the tax assessor when properties are appraised for tax purposes. In many cases this does not happen because the proximate principle is not built in to the algorithms used by tax assessors. The use of "comparables" to assess annual value rarely consider proximity to the park or open space. Hence, there is often a gap between conceptual outcome of the proximate principle and actual outcome in terms of tax revenues that accrue. This means that many entities forego income because tax assessors have failed to recognize the proximate effect in their appraisals.

A determining factor of the magnitude of a park's impact on the property tax base is the extent of the park's circumference or edge.[7] The rectangular shape in Exhibit 1-1 is likely to yield more incremental revenue, than if the park were square. If a 100 acre park is square or circular in shape, then it has a relatively small circumference. If the 100 acres is distributed more linearly, then the amount of edge increases substantially. The principle is illustrated by the calculations in Exhibit 1-4.

The increased amount of edge means that more property can be sited adjacent to the park and the aggregate enhanced value of the property tax base is likely to be larger. The implications of this for developers and cities in seeking to develop parks for the primary reason of maximizing their impact on the tax base is discussed in chapter 3 (Exhibit 3-6). This edge principle has been widely embraced in the design of golf courses which are incorporated into residential real estate development. These are discussed in Chapter 6.

There are five additional points worth noting which often further strengthen the economic case associated with the proximate principle. First, the illustrative scenarios in Exhibit

Exhibit 1-4 Illustrating the Edge Effect

A circular park that is 100 acres in area will have a radius of 1,177.8 feet. Given that the circumference of a circle is two times pi, times the radius ($2\pi r$), the amount of edge will be 7,396.7 feet.

Assume this park is unpeeled into a long strip of green which is one square acre wide (209 feet) -- in effect, laying one acre next to another in a line. To find the length of the edge of 100 acres in this configuration 209 feet is multiplied by 100 times two, since there are two sides to this strip. The result is 41,800 linear feet, 5.65 times as much edge compared with a circular park of the same number of acres. That is the edge effect.

Source: Little [7]

1-2 assume no state or federal grants are available to aid in the park's construction and development. If they were available to reduce the community's capital outlay, then the revenue stream from the incremental increase in property taxes would greatly exceed that required to service the debt payments.

Second, incremental property tax income will continue to accrue to the community after the 20-year period during which the debt charges are repaid, at which time the net return to the community will be substantially greater.

Third, there is evidence to suggest that investment in parks affects the comparative advantage of a community in attracting future businesses and desirable residential relocators such as affluent retirees.[8] However, the proximate capitalization approach does not capture the secondary economic benefits attributable to park provision that accrue from such sources.

Fourth, while the "private" benefits that accrue to proximate homeowners are reflected in the value of homes, benefits from preserving open spaces that have strong "public good" elements which are received by the whole community, such as reduced soil erosion, wildlife habitat, and improved water quality, will not be captured using this technique.

Finally, a park of the size shown in Exhibit 1-1 is likely to improve the quality of life and, thus, have some economic value to urban residents living beyond Zone C. In all the studies reviewed, the capitalization of benefits ceased at a selected distance, usually somewhere between 500 feet and 2000 feet away from the park perimeter in urban contexts. However, it is unlikely that park users and beneficiaries will be restricted only to those individuals located within such a narrowly defined service area.[9] The underestimation of economic benefit that occurs because some park users live outside a specified perimeter was demonstrated in a study of four parks containing a total of 219 acres in Worcester, Massachusetts.[10] The parks' zones of influence were terminated at 2000 feet because the influence of the parks could not be clearly separated from numerous other elements influencing property values beyond that distance. However, when on-site interviews in the parks were conducted, it was found that between 51% and 75% of the parks' users lived beyond the 2000-foot radius cut-off. The benefits accruing to such users are not represented in economic benefit capitalization calculations.

Factors Influencing Capitalization

Three factors that influence the magnitude of capitalization of parks and open space into home values are (i) the distribution of maintenance costs; (ii) the maturation of the amenities, and (iii) the ratio of supply and demand.

Park maintenance typically is funded by a community's general fund to which all taxpayers contribute. Although all contribute to the maintenance, most benefits accrue to those whose homes are in close proximity to a park.[3] Hence, the proximate homeowners effectively receive a subsidy from other taxpayers which may also contribute to the capitalization premium attributable to their homes.

It may take 30 to 40 years for new 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. Hence, the capitalized premium initially may be relatively small, but if the park is well maintained the premium is likely to increase over time. This is likely to be important to homeowners because over time construction deteriorates; styling of both fixtures and house design becomes dated and out-of-fashion; and so in real monetary terms homes depreciate in value. These losses may be at least partially offset by a premium from the enhanced amenity value of a proximate park.[3]

Like all other goods, the premiums that people are prepared to pay to be proximate to a park or open space is influenced by the available *supply*. If such amenities are relatively abundant, then the premiums will likely be relatively small or non-existent. For example, a study of three regional parks' impact on property values on the county in which they were all located indicated there was no meaningful premium.[11] It was a rural county and land was relatively inexpensive, so there was little incentive to pay a premium to be close to these parks. Conversely, in densely populated urban areas where open space is rare, there may be a large capitalization premium reflecting its scarcity value. Thus, the premium attributable to a park is likely to decline as more parks are added to a neighborhood.

Similarly, if homes in an area have large private yards, then it is likely that premiums will be lower than in areas with little private space because privately owned yard space may act as a partial substitute for public park space. "Residents with extensive yards will have less need of a park within walking distance, because the activities that a neighborhood park provides can be more easily accommodated on their private property" (p. 96).[3] This maxim was confirmed by a comprehensible and technically sound study undertaken in the Dallas-Fort Worth area using data from 3,200 residential sales to measure the impact of neighborhood parks on property values.[3] The sample was split into halves based on lot sizes. The proximity premium at 100 feet for the half containing the smallest lot areas as a percentage of total transaction value was 18.8%, while for the half comprised of the largest lot areas it was 9.6%. Further an increase in park size of one acre was associated with home prices that were 6.7% higher for small parcels, but only 1.65% higher for larger parcels. From a developer's perspective, this suggests that since small lots create a higher premium for proximity to a park, all else equal they should be clustered around the park and larger lots located elsewhere in a development.

Potentially Negative Influences of Parks on Property Values

Some parks and open spaces are more desirable than others as places to live nearby. For example, there is convincing evidence that large flat open spaces which are used primarily for athletic activities and large social gatherings, are much less preferred then natural areas containing woods, hills, ponds or marsh.[13] Because demographics, lifestyles and interests change, some parks and open spaces which were valuable assets are now of the wrong kind in the wrong place at the wrong time. Their value was in another era and no longer fits into the lifestyles and preferences of their proximate populations. In such cases, it is unlikely they will add much if any, proximate value.

There are contexts in which parks exert a negative impact on property values. A useful analogy is with a well-groomed front lawn which is likely to increase the value of a home, but if it is overgrown with weeds and littered with trash then the property value is likely to be diminished. Adverse impacts may result from nuisances such as:

- congestion
- street parking
- litter and vandalism that may occur due to an influx of people coming into a neighborhood to use a park
- noise and ballfield lights intruding into adjacent residences
- poorly maintained, or blighted derelict facilities
- groups congregating in a park engaging in morally offensive activities.

Some of these negatives were articulated in a landmark court case, *City of College Station vs*

Turtle Rock Corp. 666 S.W.2d 318 (TX 1984). The case concerned the legality of a jurisdiction using its police powers to impose exactions for parks on developers. In this intermediate level appellate court decision, the court concluded:

> A required dedication of land for streets and waterworks clearly "bears a substantial relation to the safety and health of the community" while a required dedication for park land does not. In reference to this holding, we note that parks are not necessarily beneficial to a community or neighborhood. Unfortunately, in some neighborhoods, parks serve as gathering places for derelicts and criminals, and are unsafe for use by law abiding citizens. We disagree with Appelant's suggestion that neighborhood parks necessarily benefit the general public.

While most reasonable people would not accept this view as an accurate representation of most parks in most communities, (and subsequently it was rejected by the *Texas Supreme Court 68 S.W. 2nd 802*), unfortunately it does accurately describe the status of some parks especially in some major cities. In a classic exposition on the status of American cities, one author described "Dispirited city vacuums called parks, eaten around with decay, little used, unloved." She went on to give a specific example:

> The city's Skid Row park where the homeless, the unemployed and the people of indigent leisure gather amid the adjacent flophouses, cheap hotels, missions, second-hand clothing stores, reading and writing lobbies, pawnshops, employment agencies, tattoo parlors, burlesque houses and eateries. This park and its users are both seedy…it has hardly worked as an anchor to real estate values or to social stability (p. 120).[14]

Writing in 1920, one commentator stated: "Experience in the east has shown that it is ordinarily impossible to assess special benefits within 200 feet of a playground" because of "the throng of children which it attracts and the attendant noise and stir." However, he went on to note that while the property directly adjacent is not enhanced in value to the same extent as results from a landscape park, "it does diffuse a special benefit throughout the district which it serves"(p. 250)[15] This early observation that properties adjacent to neighborhood parks with playgrounds and lights may decrease in value, while properties located a block or two further away in the parks' service areas increase in value has been consistently verified in subsequent studies. These are reviewed in Chapters 2 and 3.

Two court cases in the 1990s illustrated the continuing contemporary concern about the potential negative impacts of some parks[16] In Fox Mill, Virginia, neighbors sued the Fairfax County Park Authority, challenging the authority's plans to install lights at a youth baseball complex. In Vidor, Texas, an individual donated land adjacent to his house to the city with the understanding that the land would be used for a parking lot. When the city built a youth baseball field on it, he went to court and forced the city to move the baseball field further away from his house.

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. 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.

Some evidence on the negative impact of parks was offered by Hometrack, an English property database company, that investigated the impact of various features on the price of houses. The nature of their data base and the statistical processes used were proprietary, but they reported that living next to a derelict piece of land reduced the value of property in their sample by £20,280 (15%) on average.[17]

Two conclusions emerge from the discussion in this section. First, irrespective of the type of park or the amenities offered, negative impacts will emerge if a park is not well designed, landscaped and maintained. In 1998, the deputy director of the Parks Council, a non-profit advocacy organization in New York City reinforced the point when she observed:

> We have many poor neighborhoods in the South Bronx near parks. But the parks are not helping them. If you put money into a park, chances are that you will improve one portion of the neighborhood. But if the park does not have proper security and maintenance, it becomes a liability for nearby homes (p. 9).[18]

The second conclusion is summarized in Exhibit 1-5 which recognizes that both positive and negative impacts on property values are possible. The exhibit shows four alternate scenarios reflecting the range of impacts that parks and open spaces may exercise on proximate property values:

a) A large, high quality, natural resource based, signature park that is well-

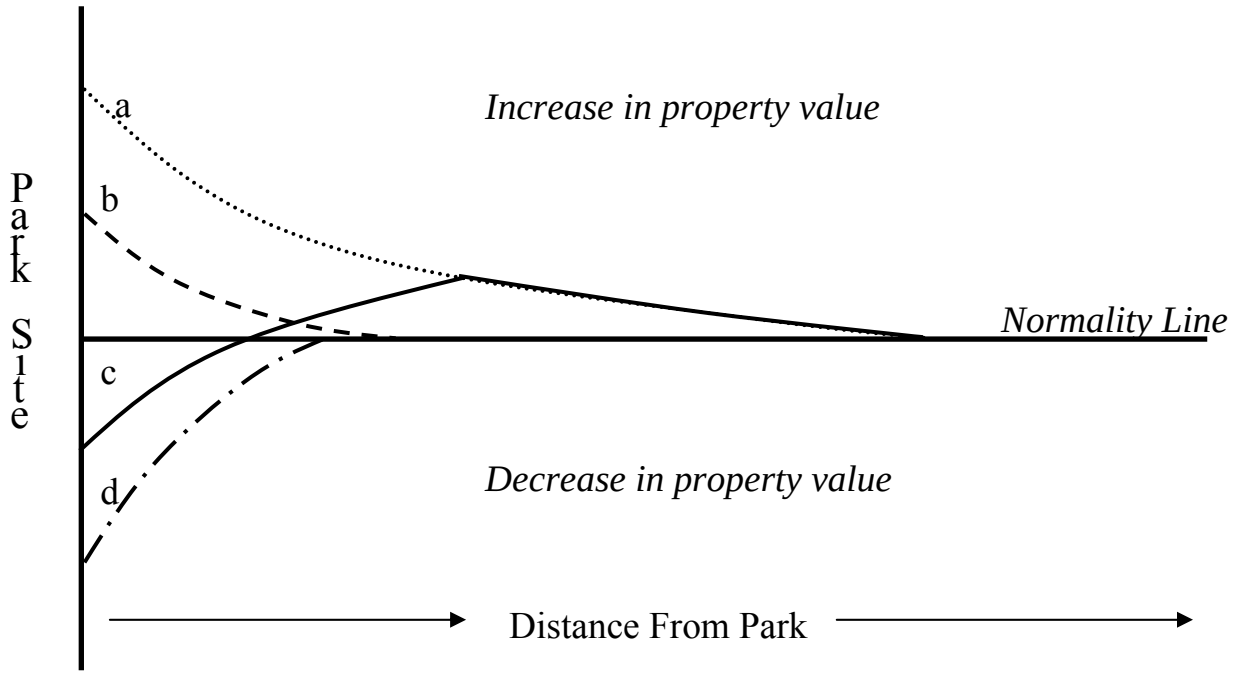


Exhibit 1-5 Alternate Scenarios Reflecting the Range of Impacts that Parks and Open Spaces may exercise on Property values

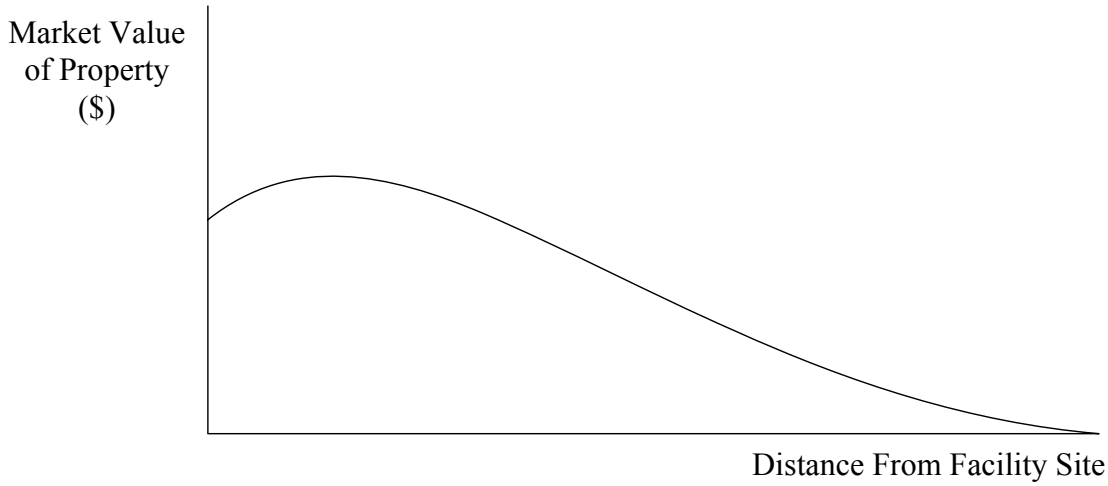


Exhibit 1-6 The "Net Effect" of Positive Impact on a Park, assuming some Limited Congestion from Access and Egress

maintained to which residents are passionately attached. The measurable positive impact on property value may extend out to 2000 feet.

b) A smaller high quality, natural resource based, community level park, with some charm and dignity, that is well-maintained and regarded with affection by the community. The measurable positive impact on property values may extend out 500 feet.

c) A large, intensively used park with athletic facilities, floodlights, noise, congestion at the entrances, and extensive traffic. These factors lead to negative values on properties in close proximity to the park, but benefits accrue to those living away from the immediate nuisance but within easy access, typically two or three blocks away.

d) A dilapidated, dirty, blighted park with decrepit facilities and broken equipment in which undesirable groups congregate. The community rejects it and regards it with disgust. The negative impact does not extend as far as the positive impact of scenario (a) because people avoid it.

In scenarios (a) and (b) property value benefit increments associated with proximity and accessibility decay as distance from the park increases. Scenarios (c) and (d) suggest that any negative values are likely to be limited to properties in close proximity to the park and these will decay more rapidly than positive impacts as distance from the park increases—that is, the positive curve is likely to be flatter than the negative curve.

Exhibit 1-6 illustrates the net effect of the situation in scenario (c) where there is a positive impact on the value of properties abutting the park, but it is lower than that on properties a block or two away which are not subjected to the nuisance costs associated with access and egress to the park.

USING THE PROXIMATE PRINCIPLE TO PAY FOR PARKS AND OPEN SPACES

The proximate principle can be activated to create vehicles that directly capture the incremental gains to property values and use them to pay for park acquisition and development costs by retaining the increments in a separate account for that purpose instead of returning them to the general fund. Four of these vehicles are excess purchase or condemnation, special assessment districts, tax increment financing districts, and creating new parks in advance of development.

Excess Purchase or Condemnation

The excess purchase/condemnation principle involves purchasing more land than is needed for the park project; developing the park, thus appreciating the value of the remaining land; disposing of the remaining land on a commercial basis; and applying the income derived to pay for the original investment. In short, the governmental jurisdiction acts in a role similar to that of a developer. In chapter 2, it is pointed out that this was a strategy adopted by the early urban park developers and was the key to funding the pioneering urban parks in the U.S. Some agencies may lack the enabling legislative authority to do this and private developers are likely to strenuously oppose any action of this type. The following example illustrates how this could work:

- Burlington, Vermont, purchased a 20 acre property that when developed as park land (at the time of purchase it was a tank farm) would complete its waterfront (Lake Champlain) park system, which was seen as a primary catalyst in the city's future economic development. The city also purchased an adjoining 25-acre property that it planned to hold as an 'urban reserve' for which a future generation of Burlington citizens would determine the appropriate development, probably a combination of residential and commercial. This property was purchased with city pension fund money. The idea was that the property would appreciate dramatically in value as the new waterfront park was fully developed (the tank farm had a five year lease). This purchase exemplified a long-term vision of how parks could stimulate surrounding property values and new investment.[19]

Where there is no legal authority for a public agency to use this strategy, or where elected officials are unwilling to face the controversy such an action would generate, nonprofit agencies often fill the void. They can purchase tracts of land that include sections desired by agencies for parks or open space. After conveying these sections, they can resell the remaining land to developers using profits to finance the total transaction.

A variation of the excess purchase principle is emerging in golf residential developments where some developers now donate land to a municipality for a golf course, while retaining the property around it. The land donation is paid for by the increased property value the course creates, while the developer receives a tax write-off for the donation and avoids the costs associated with constructing a course and subsequently owning and managing it.[20]

The excess condemnation principle is sometimes used by River Authorities responsible for flood control and dam projects. Often when they purchase or condemn land for projects, they have to acquire more than they need. For example, if 100 acres of a 150 acre farm is to be flooded, they may have to purchase the full 150 acres because the remaining 50 acre tract which is out of the floodplain is no longer viable for farming. Twenty years

later after the dam is constructed, that 50 acres may be a highly desirable site for second homes, a marina, or other recreational amenities. Its value is likely to be substantially enhanced as a result of the dam project and the River Authority captures that gain when it sells the tract.

Special Assessment Districts

The lively controversy which invariably accompanies excess condemnation led others to suggest that special assessments offered a more feasible method of securing the enhancement increment. The city of Minneapolis has perhaps the finest park system in the country and it was developed primarily through the use of special assessments. When the city was growing rapidly in the first half of the twentieth century, there was a belief that improvements should not be paid for by the city as a whole, but by special assessments levied solely against the properties that benefited. The Elwell law passed by the legislature in 1911 provided the enabling legislation to accomplish this. An example of its application is given in Exhibit 1-7.

This graduated system of park taxes in which the highest taxes were paid by properties closest to the park was practical public recognition of the enhanced value that parks provide. A similar system operated in Kansas City, Missouri, where "park benefit districts" were established and the costs of parks were divided among the lots in the district. George E. Kessler was appointed in 1892 to develop a system of parks in Kansas City but his plans were opposed because of the high costs. The

Exhibit 1-7 An Application of the Elwell Law in Minneapolis

The land for Folwell Park, an area of 26.75 acres, located at Thirty-Sixth Avenue North and Knox, was purchased in 1917 at a cost of $35,420 which was paid off over a 10 year period from 1917-1926. The maximum assessment for a 40-foot lot was $40 and the minimum for the same size lot was $10, and 2300 parcels of land were subjected to the assessment.

The cost of construction and development of the park were also financed over a 10 year period from 1923 to 1932. The capital cost was $147,700. For this the maximum assessment per 40-foot lot was $120, and the minimum assessment was $14. The assessment area was divided into seven zones. The closer a lot was located to the park, the more benefit it was assumed to receive, so the higher was its assessment. The average annual assessments in each zone were:

1st zone	--	Abutting property	----------	$3.00 per front ft.
2nd zone	--	½ to 1½ short block	----------	$2.75 per front ft.
3rd zone	--	1½ to 2½ short block	----------	$2.10 per front ft.
4th zone	--	2½ to 3½ short block	----------	$1.50 per front ft.
5th zone	--	3½ to 4½ short block	----------	$1.00 per front ft.
6th zone	--	4½ to 7½ short block	----------	$ .60 per front ft.
7th zone	--	7½ to 10½ short block	----------	$ .35 per front ft.

Source: Theodore Wirth (1947). *History of the Minneapolis Parks System 1883-1944*, Minneapolis Parks Board, p.248.

Park Board initially considered financing the plan by raising property taxes, but major landowners opposed this. An alternative solution was to establish special park assessment districts, where property values would increase as real estate values adjacent to the improved parks increased. In 1895, this plan passed in a referendum of Kansas City residents by a majority of seven to one.[15]

Similarly, in Denver, Colorado, the city was divided into four park districts where:

> The assessments were graded according to the distance from the park or parkway acquired. In one district they varied from $2.98 for each 25' by 125' lot near the facility to $1.16 for the more remote lots. In another district they ran from $5.09 to $1.25 a lot; in a third from $33 to 50 cents a lot; while in the fourth district covering the central part of the city and containing the civic center where the expenditure for this purpose was almost $3 million, the assessments ran from $1,000 to $3 a lot (p. 181).[21]

Special assessments do not work well in areas where the cost of land is high and the surrounding homes are poor. This is the reason that Minneapolis abandoned the special assessment strategy for financing parks in the 1960s. There was concern that heavy reliance on special assessment districts was creating a two-tier system of parks. The superintendent of the Minneapolis Park and Recreation Board commented: "It totally disenfranchised the folks who couldn't afford parks…The system became so imbalanced between rich and poor that there were uprisings by communities demanding their rights.[22] Hence, Minneapolis scrapped this system and reverted to a citywide charge on each property, dedicating the revenue from that charge for park development.

Nevertheless, there are many contemporary examples where special assessment districts have been used to finance parks that convey benefits only to those in a selected geographical area. In some enabling legislation, special assessment districts are also termed enhancement districts, benefit assessment districts, improvement park districts, special service districts, or business improvement districts. Local governments form them because most property owners within the district's boundaries want a higher level of service than the standard that the city provides. Hence, the property owners agree to assess themselves an additional property or sales tax to pay for this higher level of service. The tax is apportioned according to a formula designed to reflect the proportion of benefits that accrue to each property owner. For example, people whose property is located on the fringe of the district may be assessed less than people whose property abuts the park or facility. The special assessment district tax is identified separately on tax bills.

Where the higher level of service that taxpayers desire refers to acquisition and development of new facilities, rather than to higher standards of operation and maintenance, special assessment bonds may be issued to finance the capital improvements. Because the benefit is confined to a carefully defined area of the community, only those people who will benefit from the improvement bear the cost. A former commissioner for parks and recreation in New York City observed: "It's like upgrading an airline ticket to first-class."[22]

It has been argued that special district funding creates a stronger bonding and emotional connection between the park and residents in the district. An early president of the American Association of Park Superintendents, drawing on his experience as superintendent of parks in Kansas City, stated:

Exhibit 1-8 Using a Business Improvement District to Resuscitate Bryant Park

In less than 15 years Bryant Park went from a textbook example of an urban park gone bad to an urban treasure that plays a strong role in the revitalization of Midtown New York City and especially 42nd street. Bryant Park beside the New York Public Library was a neglected, vandalized facility that by the late 1970s had become a haven for drug dealers in the city of New York and was widely referred to as "Needle Park." A business improvement district was formed to maintain the eight-acre park and make on-going park improvements. The park has been restored with tall shade trees, lush green grass, flower beds, pagodas and a thriving restaurant, and is now considered a model park. At its summer peak, there are 55 employees working in Bryant Park in security, sanitation, gardening, and special events. All of them work for the Bryant Park Restoration Corporation which is a not-for-profit private management company, supported by the Rockefeller Brothers Fund and a cooperative business improvement district of neighboring property owners. On some days, the park attracts more than 4,000 office workers and tourists, and more than 10,000 people attend some special events.

The city paid one-third of the $18 million restoration costs, and foundations, philanthropists, and surrounding businesses financed the rest through the business improvement district. The businesses assess themselves approximately 33 percent of Bryant Park's $2 million annual maintenance bill, while the remainder of the bill is raised in rental and concession fees from restaurants (33%) and special events (33%) held in the park. Businesses recognized that property values and, hence, lease rentals, were closely tied to conditions in the park. Rents in nearby buildings increased dramatically after the park was redesigned and secured. A 2003 analysis of the impact of the renovations on office buildings bordering Bryant Park reported: (i) rents increased at a higher rate than the surrounding submarket; (ii) tenant quality improved in all buildings; (iii) there was reduced downtime between leases; and (iv) the buildings' credit profiles and market values increased. To a primary organizer of the Bryant Park effort, the lesson was clear: "If building owners and the agents help protect urban open space they will be more than paid back for their efforts, both in increased occupancy rates and in increased rent – all because their building has this attractive new front yard."

Sources: Lucia Mouat (1992) Some green in New York's concrete. *The Christian Science Monitor,* July 31, p. 7.
Steve Lerner and William Poole (1999) *The Economic Benefits of Parks and Open spaces*. San Francisco: Trust for Public Land.
Ernest & Young (2003) *Analysis of Secondary Impacts of New York City Parks*, New York City: New Yorkers for Parks

> The advantage of acquiring park lands by special assessment rather than by bond issues is that by adopting the plan of assessments on benefited areas, you at once make the owner of those lands a partner in your work. He says my land is assessed a certain amount for the park improvements in this district, I will see what it means; he takes a keen interest in all of the plans when you assess his lands directly for a definite park improvement - - He has a proprietary feeling in all your plans that may be entirely lacking were those plans being executed under a plan of general taxation (p. 32).[23]

Government agencies usually provide the additional level of service which is paid for by special assessment districts, but in many large cities it has been initiated by business leaders and such areas are termed business improvement districts (BIDs). There are more than 1000 BIDs in the United States and Canada. These districts frequently elect their own boards which take responsibility for the annual budget, hire staff, let contracts, and generally oversee operations. Much of their effort goes

into cleaning up, landscaping, maintaining trees and flowers, and enhancing security. Bryant Park, one of the country's great urban park success stories, is the result of a BID. Exhibit 1-8 briefly describes how the BID worked.

Tax-Increment Financing Districts

A majority of states have enabling legislation authorizing tax-increment financing. Although the rules and limitations associated with it differ among the states, the basic con-

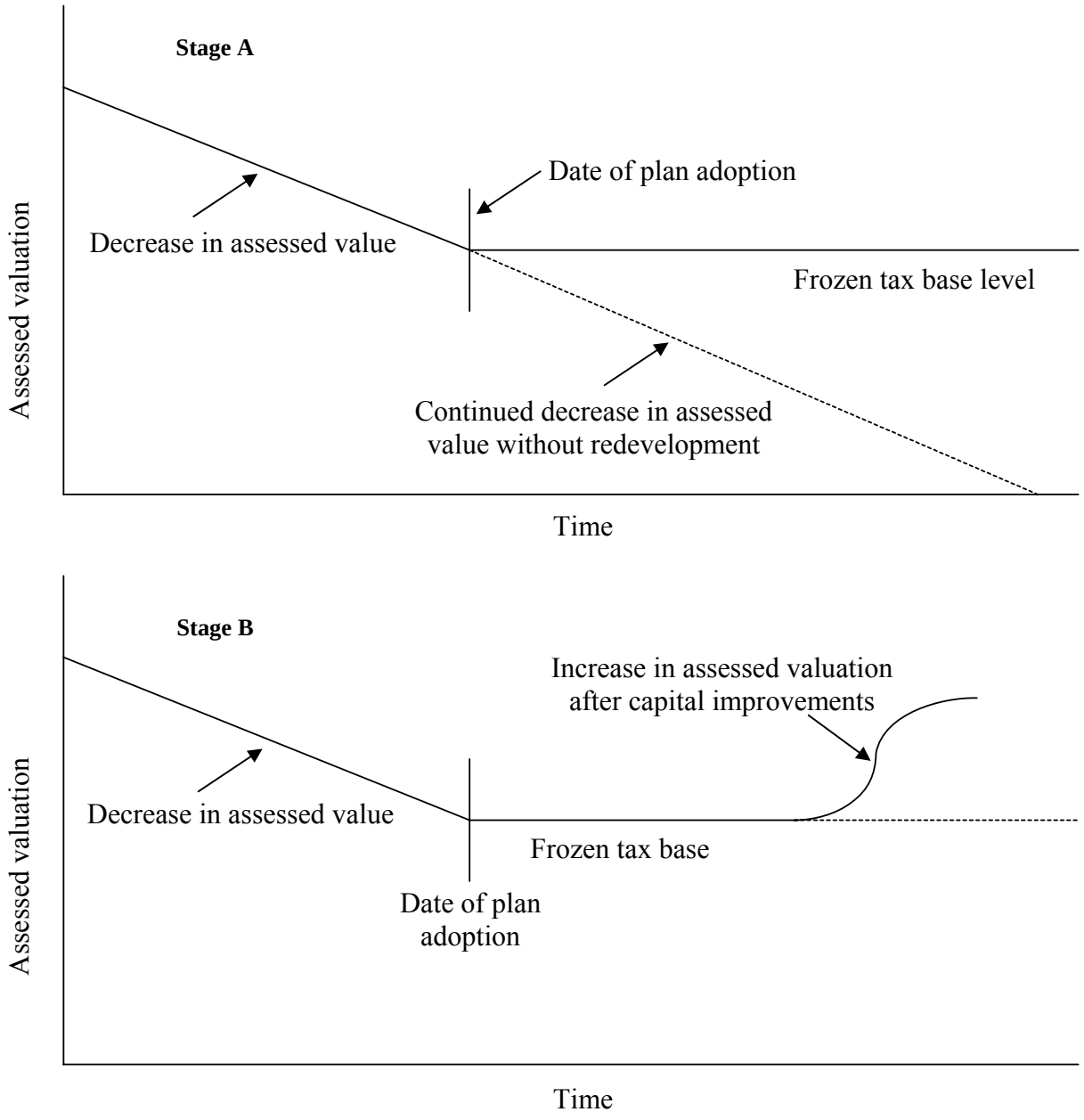


Exhibit 1-9 Tax Increment Financing, Stage A: Freezing the Tax Base (The Initial Stage); Stage B: Growth in the Tax Base after Redevelopment

cept is the same. The first stage is to designate an area as a tax-increment financing district. The local development authority or city then issues tax-increment bonds and uses the proceeds to acquire land, and to develop parks, recreation facilities, infrastructure, or other public improvements on it.

Tax increment bonds are secured only by project increases in revenues from existing and new development in the tax-increment financing district. Repayment is contingent upon increases in the taxable value of the property in the district. From the time that the tax-increment financing district is created, two sets of property tax records are maintained for it. The first set reflects the value of property up to the time that the district is formed, and the second set of records reflect any growth in assessed property value after the enhancements have been made. The second incremental portion of tax revenues is used to pay for the cost of the enhancements.

The distinctive feature of tax-increment financing districts is that they rely on property taxes that the projects within the district directly create. The projects pay for redevelopment costs, not the general taxpayers. The tax base of the property in the designated area is frozen at its current level before redevelopment. All, or some, of the entities that have taxing authority, such as cities, counties, and school districts, agree to this freeze. (Note only the tax *base*, and not the tax *rate* is frozen).

Because rejuvenation of the district is likely to increase the value of their assets, landowners and residents have every reason to support the district's establishment. Jurisdictions, such as school districts, cities, and counties, do not lose revenue by agreeing to freeze assessed property values because without rejuvenation this assessed value would not increase over time.

While state laws vary, all include a provision that enables each of the taxing jurisdictions to continue receiving the share of the taxes that they had collected in the past from the frozen tax base (Exhibit 1-9). Each taxing jurisdiction first applies its tax rate to the frozen value then to a new property value. The revenues accruing from the difference between the two is the tax-revenue increment available that year for repaying capital debt that the project accumulated. These incremental dollars go to the special district that issued the bonds. As assessed value in the district increases above the frozen tax base level, greater increments become available for retiring the district's debts.

Creating New Parks in Advance of Development

A final application of the proximate principle that agencies may wish to consider is a suggestion for using it to rectify a weakness of exaction ordinances. Most communities have passed ordinances that embrace the principle that neighborhood, and in some cases community, parks should be financed by development in the neighborhood or community because development creates the demand for new parks. The ordinances typically require developers to provide land or fees-in-lieu of land. In most cases, communities opt to take the fees-in-lieu because either the amount of land required to be dedicated is too small for practical use as a park, or it is not of the quality desired.

When sufficient fees-in-lieu have been collected, the community seeks to buy a neighborhood or community park with those fees. Unfortunately, by the time sufficient funds have been collected, appropriate land for a neighborhood or community park in the area is frequently not available because it has all been developed. To avoid this situation, an alternative would be for the community to buy parks in advance of development, using the

Exhibit 1-10 Using the Proximate Principle and Certificates of Obligation to Develop New Neighborhood Parks.

Through its revision of the parks dedication ordinance the College Station, Texas, city council established the principal that neighborhood parks should be financed by development in the neighborhood because development creates the demand for new parks.

The ordinance required that developers dedicate an acre of land per 100 single homes (or per 134 multifamily units). The council wanted to make parks neighborhood focal points and to expand their use to include a broader range of intergenerational activities with more passive park areas, so the Parks Board recommended the standard size for neighborhood parks be changed from 5 to 15 acres, to 12 to 15 acres.

The difficulty in meeting that standard was twofold. First, most developments in the city were too small to generate the amount of land to meet the standard. Consequently, the city frequently accepted the alternative dedication of cash in lieu of the land from developers. When sufficient cash accrued from these payments, the city would attempt to purchase adequate land for a neighborhood park. The second problem was that by the time enough money was paid in lieu of land dedication, the land most suited for a neighborhood park of appropriate size had been acquired for development. Invariably, the only land available for a neighborhood park was floodplain or retention pond land that developers could use, but which was also often inferior for use as a neighborhood park.

To illustrate this problem, the College Station Parks Board and the Planning and Zoning Commission provided the council a table showing (below) the composition of the neighborhood parks approved in the previous five years. It revealed that most park areas were comprised mainly of flood plain and detention basin areas, rather than functional park land.

PARKS

	Westfield	Bella Vista	Steeplechase	Shenandoah	Woodland Hills	Edelweiss
Total acres	3.44	7.74	9.09	8.26	13.91	11.01
Floodplain	1.71	0	5.66	0	6.41	0
Detention	0	N/A	1.18	5.68	.95	6.70
Floodplain and Detention	1.71	N/A	6.84	5.68	7.42	6.70
Remaining area	1.73	N/A	2.25	2.58	6.49	4.31

To solve the problem, the board and commission recommended a program in which the city issued Certificates of Obligation to purchase neighborhood park sites of 12 to 15 acres in advance of development. At $10,000 an acre, this would involve a commitment of $120,000 to $150,000 per park. These purchases would be made five to seven years in advance of projected development, using a similar timeframe to that used by the school district. The certificates would be repaid over time from two sources: (1) by the cash in lieu payments that the dedication ordinance required developers to contribute for neighborhood parks; and (2) by the enhanced property taxes the city will obtain from residences in close proximity to these parks as a result of the presence of the parks.

proximate principle of increased value in properties around them and supplementing this with the developers' exaction fees. Exhibit 1-10 describes a proposal considered by the city of College Station, Texas, that embraces this approach.

References

1. Rogers, Will (1999). in the Introduction to *The economic benefits of parks and open space by Steve Lerner and William Poole*. San Francisco: The Trust for Public Land.

2. Dateline (1990). Military base closings. *Dateline NRPA*, September, p. 8.

3. Miller, Andrew R. (2001). *Valuing open space: Land economics and neighborhood parks*. Cambridge, MA: MIT Center for Real Estate.

4. The President's Commission on Americans Outdoors (1987). *Americans outdoors: The legacy, the challenge.* Washington, DC: Island Press.

5. Lindsey, Greg, Seth Payton, Joyce Man, and John Oltensmann (2003). *Public Choices and Property Values: Evidence from Greenways in Indianapolis.* Indiana University/Purdue University, Center for Urban Policy and Environment.

6. National Recreation and Park Association (1966). *Outdoor Recreation Space Standards*. New York, NY: National Recreation and Park Association.

7. Little, Charles E. (1990). *Greenways for America*. Baltimore: Johns Hopkins University Press.

8. Crompton, John L., Lisa L. Love and Thomas A. More (1997). Characteristics of companies that considered recreation/ parks/open space to be important in (re)location decisions. *Journal of Park and Recreation Administration,* 15 (1), 37-58.

9. Lyon, David W. (1972). *The spatial distribution and impact of public facility expenditures*. Berkeley: University of California, Department of City and Regional Planning, Ph.D. dissertation.

10. Allen, P. Geoffrey, Thomas H. Stevens, and Thomas A. More (1985). Measuring the economic value of urban parks: A caution. *Leisure Sciences,* 7 (4), 467-477.

11. Nicholls, Sarah (2002). *Does open space pay? Measuring the impact of green spaces on property values and the property tax base.* College Station, Texas: Texas A&M University, Department of Recreation, Park and Tourism Sciences, Ph.D. Dissertation.

12. Fox, Tom (1990). *Urban open space: An investment that pays*. New York, NY: Neighborhood Open Space Coalition.

13. Kaplan, Rachel and Stephen Kaplan (1990). *The experience of nature*. New York: Cambridge University Press.

14. Jacobs, Jane (1961). *The death and life of great American cities*. New York: Random House.

15. Chandler, H.P. (1920). Financing public parks. *Park International*, November, 250.

16. Berg, Rich (1996). N.I.M.B.Y. suits threaten rec. sports sites. *Athletic Business*, April, 26.

17. Cited in CABE (2003). *Wasted space?* London: Commission for Architecture and the Built Environment.

18. Tibbets, John (1998). *Open space conservation: Investing in your community's economic health*. Cambridge, MA: Lincoln Institute of Land Policy.

19. Cook, Ernest (1994). A Trust for Public Land memorandum to Rand Wentworth, April 7. Cited in Steve Lerner and William Poole (1999). *The economic benefits of parks and open spaces*. San Francisco: Trust for Public Land.

20. Crompton, John L. (1999). *Financing and acquiring park and recreation resources.* Champaign, Illinois: Human Kinetics.

21. Lewis, Nelson P. (1923). *The planning of the modern city*. New York: John Wiley.

22. Martin, Douglas (1994). Trying new ways to save decaying parks. *The New York Times,* November 15, A16.

23. Dunn, W. H. (1912). The effect of park and boulevard improvements on property values. *Proceedings of the Fourteenth Annual Convention of the American Association of Park Superintendents*, 30-34.

CHAPTER 2

The Early Empirical Evidence

CHAPTER 2

THE EARLY EMPIRICAL EVIDENCE

GENESIS OF THE PROXIMATE PRINCIPLE

The genesis of the proximate principle was in England where it emerged first in the private squares of London and subsequently evolved as the funding rationale for the first public parks. One of the features of prestigious neighborhoods in London in the seventeenth and eighteenth centuries was a public park or plaza surrounded on all four sides by elite residences. These areas became known as "squares." These central park squares were intended to be amenities that increased the value of property surrounding them in speculative construction projects that provided housing for the growing upper-class population of London.[1] The squares had both economic and social roles and, thus, were precursors of urban public parks: "They were seen as economic assets to the ground landlords who owned them, by raising the value of surrounding property, and as social assets by the leasehold tenants who had sole access to them" (p. 99).[1]

However, these early squares illustrated that undesirable social behavior or poor maintenance could lead to real estate values being impacted negatively rather than positively:

> Covent Garden failed to develop into the stylish quarter envisioned by its landlord mostly due to the filling of the square with market stalls and the presence of prostitutes and pickpockets in the arcades surrounding it. Even St. James's Square, planned from the outset to house the highest nobility, suffered for many years from the dumping of refuse, periodic crowding by cabs and coaches (and the resulting horse manure), and the presence of unsavory characters at night. Those with well-kept lawns and especially those with trees and shrubs, like Leicester Square and Soho Square, seem to have suffered much less from such abuse, though they still could be subject to the presence of undesirable people at all hours of the day and night. A maintained garden, then, became an asset (p. 97).[1]

This model of laying out residential developments around private park squares was transferred to the United States by William Penn in the seventeenth century when he planned four public squares of eight acres in each of the four quarters of Philadelphia, the most fashionable being Rittenhouse Square.[1]

Regent's Park

The natural evolution from the square was to develop larger park areas than the relatively small squares with surrounding property to generate the revenue to pay for them. The most obvious ancestral genesis of the proximate principle came in the early nineteenth century when Regent's Park in London was transformed from a royal park into a real estate development targeted at the wealthy.[2] The land had originally been claimed by the Crown in the sixteenth century as a hunting preserve, but by the early nineteenth century the forests had been cleared and it was leased as agricultural grazing land.

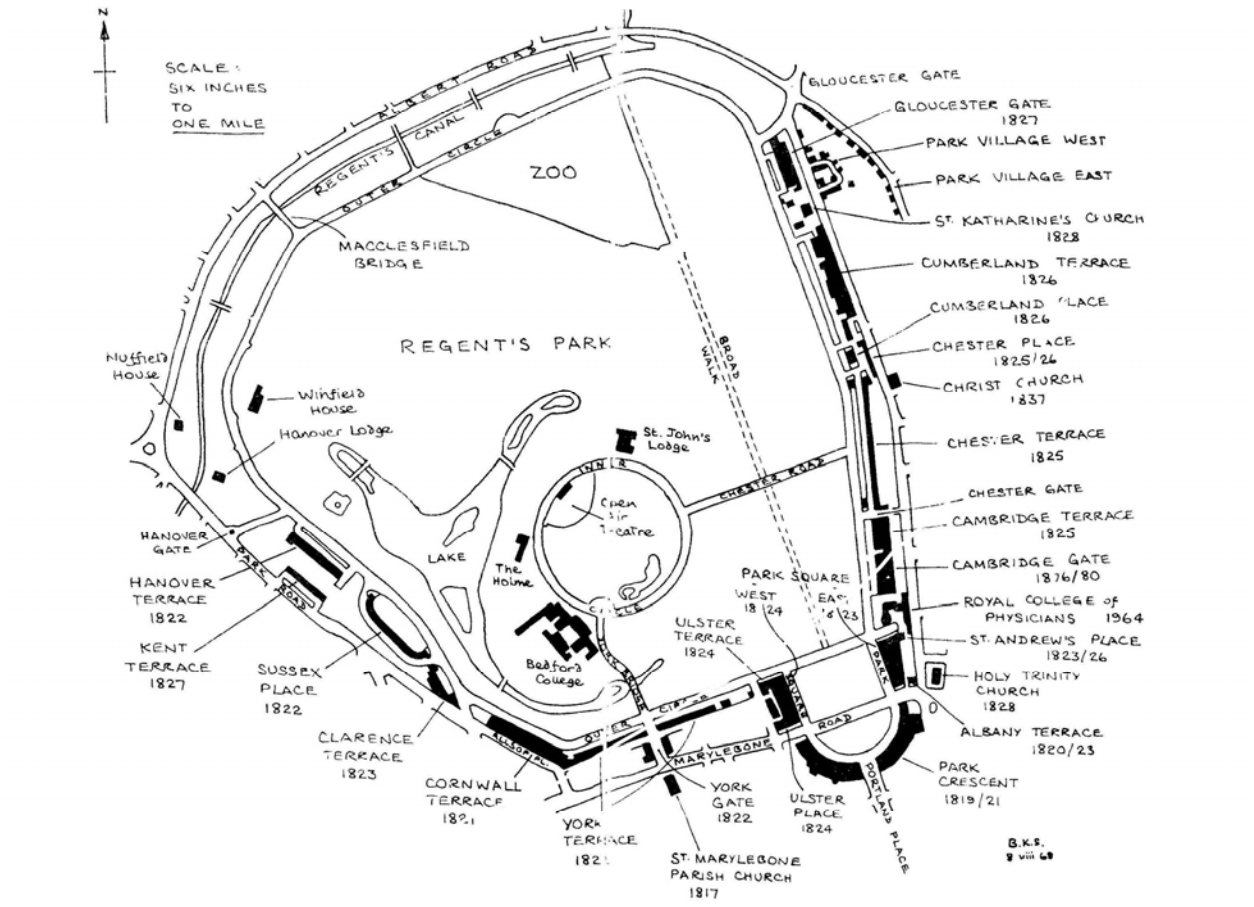
The park venture was initiated in 1811 by the Prince Regent, the title of King George IV before he acceded to the throne, for whom the park was named. At this time the population of London was growing rapidly and had expanded out to Marylebone whose population increased from 63,000 in 1801 to 158,000 in 1851.[3] The Prince realized that considerably more income could be generated if this land was developed for housing than if it remained grazing land. He had a passionate interest in architecture and development, and had bestowed his patronage on John Nash who had long experience with designing country houses and estates both for the Prince and other wealthy landowners. Hence, Nash was charged with transforming the 464 acre site into a residential development which would be the finest in London.

Nash's original plan for the site drew attention to "the fact that wealthy landowners infinitely prefer living near an open space…a park where there were opportunities for riding, driving and walking was an irresistible magnet" (p. 83).[3] Consequently, Nash established as the central principle of his plan: "that the attraction of open Space, free air and scenery of Nature, with the means and invitation of exercise on horseback, on foot and in Carriages, shall be preserved in Marylebone Park, as allurements or motives for the wealthy part of the public to establish themselves (p. 83).[3] In his design for Regent's Park, Nash brought to the urban context the principles of picturesque landscapes that had been developed by Capability Brown in country estates half a century earlier and adapted by Nash's former partner, Humphry Repton.

The park was intended to be an exclusive self-contained residential area, with no means of entrance from the poorer estates around it. It was a radical departure from the gridiron housing estates surrounding it which were the standard development pattern of the day. His plan is shown in Exhibit 2-1. Nash designed classical residential terraces on the periphery of the park which encircled and framed it, and they had magnificent views across the park. It was designed as a "garden city for the aristocracy" so eight villas were placed within it as miniature country houses; others were clustered into two picturesque groupings adjacent to the park. There were 2,500 housing leases from the terraces and by the time it was completed it was widely recognized as the most beautiful estate in London.[3]

Regent's Park was completed in 1826. It was not initially conceived as a public park, but London's population explosion created pressures which led to it being opened to the public in incremental stages commencing in 1835. By 1841 there was substantial public access, so it effectively then evolved into a large public park (although still owned by the

Exhibit 2-1 Regent's Park in 1968. Each Terrace is marked with its Date of Building; the Villas are also shown



Source: Saunders[3]

Crown). The project took 15 years to complete, but it proved to be an extraordinarily successful real estate venture, and the value of the housing was derived in large part from the amenity value of the park.[2]

Prince's Park

During the 1830s, the British government was increasingly concerned about medical and social problems in the densely populated industrial cities. In 1833, a Parliamentary Select Committee on Public Walks was appointed "to consider the best means of securing Open Spaces in the Vicinity of populous Towns, as Public Walks and Places of Exercise calculated to promote the Health and Comfort of the Inhabitants." Their report stressed the health and moral benefits that would accrue from parks, and urged cities to develop them.[4] The re-

sponse from cities was underwhelming and consistent with that which often confronts contemporary park advocates. Liverpool city council's comment in response to the Select Committee's report was typical:

> The council is well disposed to provide a public park and the subject has been discussed, but the value of the land is so great in the vicinity of Liverpool and the council have had so many demands upon it that they do not consider justified in incurring such an expense (p. 3).[4]

Given this mindset, a model had to be introduced which demonstrated that allocating funds for a park would "not incur an expense," but, rather, would yield a return on the investment. Regent's Park provided the model and the next stage in its development occurred in Liverpool.

The success of the Regent's Park venture was noted by Richard Vaughan Yates who was a prominent industrialist, magistrate, and Liverpool city councilor. Yates purchased 97 acres for around £50,000, for a speculative development located about a mile and a half from the city center. He set aside 40 acres for a park – known as Prince's Park in honor of the birth of the Prince of Wales in 1841 – and planned to develop the remainder as exclusive housing in the form of terraces and substantial single villas, following the Regent's Park principle.[5] One historian noted, "This is a form of development which had already appeared at Regent's Park on a much larger scale, and one which was to be increasingly popular both for private and public parks, the extra cost of laying out the internal park usually being covered handsomely by the enhanced value of the now more attractive land on the periphery" (p. 67).[2]

The naming of the park after the Prince of Wales suggests that Yates had aspirations that some of the status connotations of London's royal parks might be conferred upon his Liverpool venture. Yates planned a park to which the general public would have access to the broad central areas, but parts of it, especially the more ornamental gardens around the lake, would be closed to all but the privileged keyholders who would inhabit the new houses built on the periphery[6].

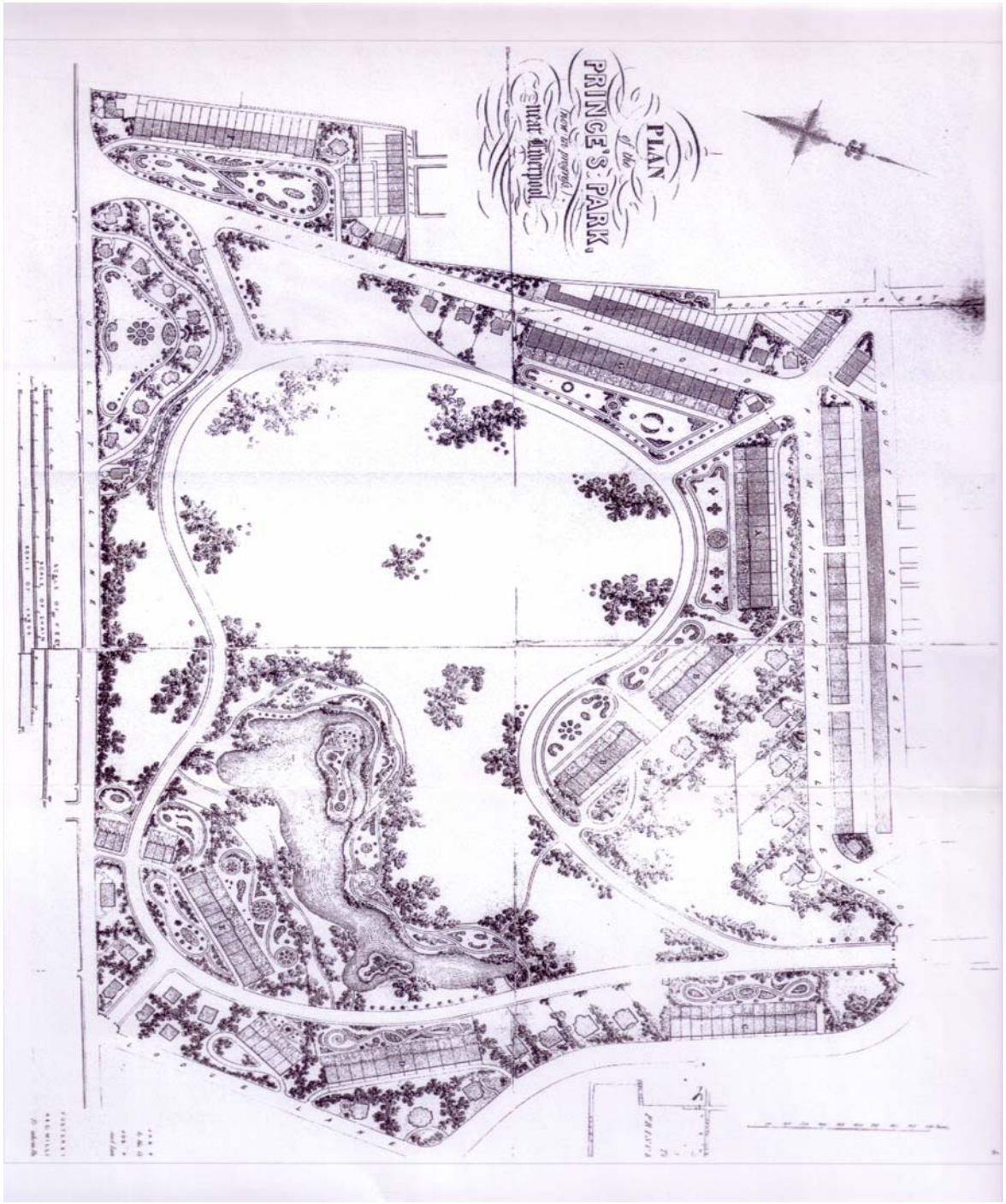
In chapter 6 of this monograph, it is noted that developers of residential communities which are built around golf courses for the most part have no interest in operating a golf course because often they are not financially viable operations and are a distraction to their core businesses of building homes. Hence, frequently they seek to transfer title of the course either to golfers to operate as a non-profit organization or to a specialist golf company. Yates appears to have had similar thoughts for the proposed public area of Prince's Park, inviting the Liverpool city council to purchase and operate it. For 75 years the city refused to take responsibility for it, so it was maintained by a Yates family trust until the city finally agreed to acquire it in 1918 for a bargain sale price of £11,000.[6]

Insights into Yates' plans for financing the park can be gleaned from articles which appeared in the local press[6]. The *Liverpool Mercury* in 1843 reported that Yates was seeking to attract other investors into the project. The article noted that Yates was offering:

> An opportunity of aiding the founder of Prince's Park in the accomplishment of his design. We know not, indeed, that it holds out the inducement of an immense profit…but it seems to often the more substantial, and to prudent men, the more tempting bait of a fair return[7]

It has been noted that, "These were the years

Exhibit 2-2 Paxton's Plan of Prince's Park, Liverpool



Source: Liverpool city council

when the taking of a risk on the chance of making a bumper profit tempted many ambitious men to invest; dramatic gains and losses were the stuff of commercial life" (p.4).[6] The *Liverpool Mercury* article revealed that Yates hoped to raise £50,000 (the amount he had paid for the 97 acres of land).

> To expend…in the purchase of land and the erection of houses in the park. The rents, after payment of the annual expenses, will be divided among the proprietors…There is every probability of the scheme proving completely successful[7]

In 1843, it was announced in a newspaper advertisement that: "Several of the principal Gentry of Liverpool have already purchased Villa lots, and many have expressed a wish to rent houses, whilst others are prepared to build in Terraces for their own habitation or as an investment" (p.4)[6]

Yates hired Joseph Paxton to design and construct Prince's Park which was accomplished in 1842 and 1843. Paxton was the leading botanist-gardener in the country. By this time, he had been in charge of the gardens of Chatsworth, one of Britain's finest stately homes, for over 20 years. His patron at Chatsworth, the Duke of Devonshire, was passionate about botany and used his extraordinary wealth to indulge his passion, sending expeditions around the globe to bring back to Chatsworth the most exciting and interesting plants. In this environment, Paxton's talents and fame flourished, and Chatsworth's gardens were the most famous in the country. Thus, securing Paxton's services for this venture "was a marketing coup for Yates. For Paxton, it represented his first essay in municipal design, setting a pattern that would be developed and extended in all his future projects" (p. 115).[5]

There was a linkage with Regent's Park. James Pennethorne, who was a protégé of Nash and had worked with him on Regent's Park, assisted Paxton in the design of Prince's Park. His experience in establishing the intimate relationship between the parkland and surrounding dwellings at Regent's Park, presumably was valuable in designing Prince's Park.[6]

Paxton's design is shown in Exhibit 2-2. A broad curving perimeter drive, flanked by a separate narrower footpath, linked the four road entrances. The design separated the park into two principal areas. The major area was wide open, undulating grass parkland, planted with informal groups and single trees which was to be the public access area. This contrasted with the more private, intensive garden area which featured an irregular, sinuous lake designed to create the impression of a long winding river with its own island linked by a bridge which was to be for the exclusive use of residents. The housing around the formal park faced into it and ornamental bedding fronted it linking the houses directly with the park.

The land plots sold more slowly that Yates expected, and most of the terraces shown on the plan were never built.[5] Nevertheless, the project was an important advancement of the proximate principle because, "Prince's Park was a forerunner of later Victorian Parks, with its principle of exclusive housing built around the edges of the park on individual plots sold for profit" (p. 118)[5]

To this point in time, the proximate principle had been implemented only in the context of private land developments. The London Squares, Regent's Park and Prince's Park used the park as an attraction to raise the price of surrounding residential property in the owner's development- -in this sense, golf courses constructed as the central feature in some real estate developments (which are discussed in Chapter 6) are their contemporary progeny.

Birkenhead Park

The next stage in the proximate principle's evolution was to apply it in the public domain whereby public entities benefited from its implementation rather than private developers. This transition took place in Birkenhead.

In the 1840s the city of Liverpool was experiencing annual growth of 5000-10,000 people. Across the River Mersey from Liverpool was located the village of Birkenhead which in 1820 had a population of 100. The inauguration of a steam-powered ferry linking the two communities meant that Birkenhead became an obvious site for absorbing some of Liverpool's population growth. Consequently, in 1833, an Act of Parliament was passed establishing the Birkenhead Improvement Commission to develop a new and competitive port to Liverpool. In 1843, a second Birkenhead Improvement Act was passed empowering the Commissioners to establish a park.[8]

Given this authorization, the Commissioners purchased a 225 acre site of unattractive, swampy low-lying land. The land was purchased cheaply because of its poor quality for £70,230 which was approximately ls 3d per square yard.[9] Even this price was inflated because when the Improvement Commission officially purchased the land in 1843, it was owned by several of the commissioners who had used their inside information to quietly buy from the original owner and secure a personal profit for themselves when it was resold to the commission.[5] Thus, the town "benefited from that peculiarly Victorian blend of enterprise and liberalism which was the acceptable face of the industrial revolution" (p. 48).[10]

In this way, Birkenhead Park became the first urban park in the world to be publicly funded and to be freely accessible to all members of the public at all times. It was intended to be "The People's Garden." It "brought the ideal of a huge rural landscape right into the center of the city as a founding principle of its development" (p. 136). [5] The commissioners designated 125 acres of it for use as a public park in perpetuity, while the remaining 100 acres was to be sold for house plots, to the new captains of industry from Liverpool following the precedents of Regent's Park and nearby Prince's Park. They were familiar with Paxton's work at Prince's Park and hired him to design and construct it. Paxton proclaimed it was "not a very good situation for a park as the land is generally poor"[9] but, nevertheless, accepted the project.

Paxton started work in 1842, the park was completed in 1846, and the official opening was in 1847. In many ways, it reflected the design of Regent's and Prince's Parks, but a major difference was that access to the houses was from public roads outside the park; rather than from the carriage road inside the park which was the access featured at Regent's and Prince's Parks. He "was determined that the park should not be, nor appear to be, the property of the houses which surrounded it" (p. 78).[8] It was a public park and that required that it be designed to encourage all to have access.

Nevertheless, Exhibit 2-3 illustrates that it was designed so the public funds would be recovered by the sale of adjacent residential building lots:

> Birkenhead Park was a self-financing venture employing the simple device of surrounding the park with plots for single houses and terraces, and selling them at an enhanced value because of their relationship with the park. The profit from this paid for the park (p. 50).[10]

The design featured islands in lakes and small hills which were derived from the lakes' excavations, winding paths, picturesque meadows, open glades, and wooded areas designed for

Exhibit 2-3 Birkenhead Park Lot Sale Plan, 1850

Source: Metropolitan Borough of Wirral

strolling and quiet reflection, with residential properties on terraces surround the park. Commentators raved about the magnificent park when it was completed. For example, the *Edinburgh Journal* called it "one of the greatest wonders of the age" (p. 135)[5].

The cost of excavation, construction and planning in Birkenhead Park amounted to nearly £70,000, a thousand men being employed on the work for upwards of two years.[2] Hence, when the land cost is included, the total cost was approximately £140,000.

It has been reported that the residential lots that were sold between 1843 and 1845 were priced at 11s 4d per square yard.[2] Exhibit 2-4 shows the price that was being asked for lots that were still on offer in 1850. The prices are somewhat lower, probably reflecting that the first lots to be sold were the most desirable, but also that the area's economy suffered through an unstable period in the mid and late 1840s. The locations of the lots listed in Exhibit 2-4 are shown on Exhibit 2-3. The total number of lots on Exhibit 2-3 appears to be 43. If this is correct, then the 20 unsold lots listed in Exhibit 2-4 would represent fewer than half of the total.

Exhibit 2-4 Lots Available for Sale at Birkenhead Park in 1850

REFERENCE.

	Quantities in each Lot	Quantities in Subdivided Lots of more saleable Sizes	Price per yard
LOT 3 Contains	9,640 Sq.Yds.	A 4,419	10s.
		B 5,221	"
" 6 "	21,969 "	A 2,461	7s.
		B 2,461	"
		C 7,435	"
		D 5,942	"
		E 3,670	"
" 7 "	6,362 "	A 3,506	7s.6d.
		B 2,856	"
" 8 "	4,740 "	A 2,533	8s.
		B 2,207	"
" 9 "	7,121 "	A 3,796	6s.
		B 3,325	"
" 10 "	5,510 "	A 2,434	6s.6d.
		B 3,076	"
" 11 "	3,083 "	3,083	5s.6d.
" 16 "	6,086 "	6,086	6s.
" 22 "	21,620 "	A 6,640	9s.
		B 7,604	"
		C 7,376	"
" 24 "	21,987 "	A 6,844	9s.
		B 8,375	"
		C 6,768	"
" 27 "	12,860 "	A 2,942	8s.
LOT 27 Contains	12,860 Sq.Yds.	B 6,228	8s.
		C 3,690	"
29 "	10,238 "	A 2,959	6s.6d.
		B 3,527	"
		C 3,752	"
30 "	4,798 "	A 3,103	6s.6d.
		B 1,695	"
31 "	7,566 "	7,566	6s.
32 "	11,532 "	A 1,565	8s.
		B 4,751	"
		C 5,216	"
35 "	29,146 "	A 6,674	7s.6d.
		B 7,768	"
		C 8,181	"
		D 6,523	
36 "	8,932 "	A 5,057	9s.
		B 3,875	"
39 "	9,773 "	A 4,351	10s.
		B 5,422	"
40 "	15,517 "	A 8,276	10s.
		B 7,241	"
41 "	10,875 "	A 6,312	9s.
		B 4,563	"
TOTAL	229,355	229,355	

Source: Metropolitan Borough of Wirral

Exhibit 2-5 Projected Revenue from Lots available for sale at Birkenhead Park in 1850

Lot #	Total sq yds	Price in shillings*	Total revenue (£'s)
3	9,640	10s	4,820
6	21,969	7s	7,689
7	6,362	7s 6d	2,386
8	4,740	8s	1,896
9	7,121	6s	2,136
10	5,510	6s 6d	1,791
11	3,083	5s 6d	848
16	6,086	6s	1,826
22	21,620	9s	9,729
24	21,987	9s	9,894
27	12,860	8s	5,144
29	10,238	6s 6d	3,327
30	4,798	6s 6d	1,559
31	7,566	6s	2,270
32	11,532	8s	4,613
35	29,146	7s 6d	10,930
36	8,932	9s	4,019
39	9,773	10s	4,886
40	15,517	10s	7,758
41	10,875	9s	4,894
Totals: 20	**229,355**		**92,415**

* English currency at that time was expressed in pounds (£), shillings (s) and pence (d). There were 20 shillings in a pound and 12 pence in a shilling.

Exhibit 2-5 indicates that the income forthcoming from the lots available in 1850 if they were all sold at the prices being asked would have been £92,415 at an average price of a little over 8 shillings a square yard. The aggregate square yardage of the 23 lots which apparently had been sold by 1850 is unknown. If it is assumed to be (say) 240,000 square yards, extrapolating from column 2 in Exhibit 2-5, and the reported average price of 11s 4d per square yard is applied to it, then it would have generated £135,996. Based on these calculations, the projected income would have totaled £228,000, which would have far exceeded the park's cost of £140,000.* In addition to paying for the capital cost of the park, this real estate would have provided a consistent income stream in property taxes to pay for the park's maintenance and future development.[8]

* According to the Bank of England, the value of £1 on 1851 when converted to 2002 equates approximately to £53.3. thus, in contemporary values, the park's total cost approximated £7.5 million or $13.4 million (using the current exchange rate of 1.8); revenues would convert to £12.2 million or $21.9 million; so surplus revenues would be £4.7 million or $8.5 million.

The period of political and economic instability which occurred while the park was being completed meant that the demand for high-end houses dissipated. Thus, many of the lots were not sold and some were eventually reabsorbed as extensions to the park. Nevertheless, Birkenhead Park vividly illustrated the potential of the proximate principle as a financial *raison d'être* for public parks in urban areas.

Given his legendary, inspirational role in the design, landscape architecture and popularization of parks in the United States, it should come as no surprise that the agent for transitioning the proximate principle from England to the United States was Frederick Law Olmsted. Birkenhead Park received wide publicity, visitors came to see it from far and wide, and Olmsted was one of them. After seeing it in 1850, he wrote of:

> a perfection that I had never dreamed of. I cannot undertake to describe the effect of so much taste and skill as had evidently been employed…And all this magnificent pleasure-ground is entirely, unreservedly, and forever the people's own…But you are inquiring who paid for it. The honest owners- -the most wise and worthy people of Birkenhead- -in the same way that New-Yorkers pay for 'the Tombs,' and the Hospital, and the cleaning (as they amusingly say) of their streets (p. 72).[2]

He was inspired by Paxton's design and incorporated many of the features and principles he observed there into the design that he and Calvert Vaux prepared for New York City's Central Park, although the latter was on a much larger scale. Indeed, he returned to Birkenhead Park in 1853, and again in 1859 after work had started on Central Park in 1858 to obtain "full particulars of its construction, maintenance and management" (p. 183).[2] Most importantly, Olmsted took notice of the financial arrangement that undergirded its viability- -the proximate principle.

IMPLEMENTING THE PROXIMATE PRINCIPLE AT CENTRAL PARK

Central Park was the first deliberately planned urban park in the United States. The success of Central Park was evident from its subsequent emulation. The beginning of the public parks movement in the United States can be traced to it. The site was a squalid messy landscape of squatters, pigsties, trash, slaughter houses, goats, mud and swampland with a pervasive obnoxious odor. When the site for Central Park was selected, most city residents lived more than three miles to the south,[11] so one of the four objectives of Central Park was that it should be a strategic public investment that would encourage real-estate development in the surrounding blocks. (Indeed, Olmsted resisted pressures to make Central Park an up-market estate with limited access by the public similar to the original conceptualization of the pioneering Regent's Park in London).

Before funding for Central Park was committed, Olmstead, using his Birkenhead Park knowledge, explained how the proximate principle would result in the park being self-financing and his argument convinced key decision-makers. Thus, the New York City Comptroller, writing in 1856 shortly after the city acquired title to the land for Central Park, said, "the increase in taxes by reason of the enhancement of values attributable to the park would afford more than sufficient means for the interest incurred for its purchase and improvement without any increase in the general rate of taxation" (p. 12).[12]

Olmsted consolidated the initial conceptual acceptance of the proximate principle at

Central Park by subsequently providing empirical verification of it. He was responsible for the earliest documentation of the relationship between public parks and real estate values. A summary of his data is given in Exhibit 2-6.[13] These data received enhanced credibility in 1884 when a pamphlet signed by many eminent bankers and businessmen confirmed its general conclusions.[2]

Exhibit 2-6 Frederick Law Olmsted's Documentation of the Impact of Central Park on the Property Tax Base of the Three Proximate Wards

The earliest documented relationship between public parks and real estate values was developed by Frederick Law Olmsted at New York City's Central Park. The data were an important element in stimulating creation of the entire New York City park system, and they supported the evolution of the public park movement in many other American cities in the late 19th century.

Olmsted was aware that many in the City of New York were skeptical of spending so much money on land acquisition and park construction. To justify the expenses in 1856, Olmsted began tracking the value of real estate in the three wards surrounding the park, comparing the higher tax revenue from this adjacent property to the debt charges the city was paying on the bonds used to acquire the land and build the park. The results of his tracking and the conclusions he derived from it are shown below:

Ward	**1856**	**1857**	**1858**	**1859**	**1860**	**1861**
Twelfth	$8,149,360	$8,134,013	$8,476,890	$10,062,725	$11,857,114	$12,454,375
Nineteenth	8,041,183	8,558,624	10,971,775	12,621,894	16,830,472	16,986,152
Twenty-second	10,239,022	10,489,454	11,563,506	13,261,025	14,775,440	17,666,866
Total	$26,429,565	$27,182,091	$31,012,171	$35,954,644	$43,463,026	$47,107,393

Ward	**1862**	**1863**	**1864**	**1865**	**1866**	**1867**
Twelfth	$13,100,385	$14,134,825	$15,493,575	$18,134,805	$18,381,650	$24,940,737
Nineteenth	17,903,137	19,003,452	20,462,607	23,070,890	37,636,050	46,249,340
Twenty-second	18,041,857	18,281,222	18,756,276	19,824,265	24,052,715	30,915,240
Total	$49,045,379	$51,419,499	$54,712,458	$61,029,960	$80,070,415	$102,105,317

Ward	**1868**	**1869**	**1870**	**1871**	**1872**	**1873**
Twelfth	$28,143,005	$42,648,865	$48,869,700	$50,362,925	$54,568,885	$62,457,680
Nineteenth	53,608,040	59,608,040	71,319,633	77,771,930	91,283,545	110,519,305
Twenty-second	36,175,185	47,663,245	53,146,920	57,666,340	60,185,820	63,104,530
Total	$117,926,230	$150,224,743	$173,336,040	$185,801,195	$206,038,250	$236,081,515

Assessed value in 1873	$236,081,515.00
Assessed value in 1856	26,429,565.00
Showing an increased valuation of	$209,651,950.00

The total expenditure for construction, from May 1st, 1857 to January 1st, 1874, is		$8,873,671.50
The cost of land of the Park to the city is		5,028,844.10
The cost of the Park to the city is		$13,902,515.06
The rate of tax for the year 1873 is 2.50, yielding on the increase of valuation as above stated, increase of tax amounting to $5,241,298.75.		
Total increase of tax in three wards		$5,241,298.75
The annual interest on the cost of land and improvement of the Park, up to this time, at six percent	$834,150.94	
Deduct one percent, on $399,300 of stock, issued at five percent	3,933.00	
		830,157.94
Excess of increase of tax, in three wards, over interest on cost of land and improvements		$4,411,140.81

When it was only half complete, Central Park began to generate revenue. Olmsted documented a $55,880 net return in annual tax from the park in 1864. By the end of 1873, Central Park had cost the City of New York $13.9 million. Land acquisition had cost $5.0 million, and capital improvements to the property came to $8.9 million. In his 1875 report to the Board of Commissioners, Olmsted presented the total cost for Central Park and the increase in tax revenue from the surrounding properties. His chart displayed the values of property in the wards adjacent to the park, which he then compared to the average increases in property value in the city's other wards during the same period.

Olmsted suggested that without Central Park, the property values in the three wards surrounding the park would have appreciated at the same rate as property in other city wards, which was 100%. At that rate the properties in the Twelfth, Nineteenth and Twenty-Second Wards would have been worth $53 million in 1873—but their appraised value was $236 million. Olmsted proposed that the tremendous increase in property value and tax revenue, was directly attributable to Central Park. In 1873 alone, income from property tax in the three wards, minus the interest on the cost of the land and its improvements, was $4.4 million.

Source: Fox[13]

By the 1890s, the homes of many of America's richest families including the Astors, Vanderbilts and Rockefellers were located on Fifth Avenue from 46th street to 72nd street.[13] Soon after Central Park was completed, the New York Parks Commission was able to assert that before the park was developed, the three wards adjacent to the park paid one dollar in every thirteen the city received in taxes; but after its development they paid one-third of the entire expenses of the city, even though acquiring the land for Central Park removed 10,000 lots from the city's tax roll.[12]

Attributing all the high increase in the property values in these three wards to the park, as Olmsted (Exhibit 2-6) and the New York Parks Commission claimed, was probably inappropriate and an exaggeration of the park's influence. It is likely that natural growth in the city's population which caused a northerly movement of people would have created increased property values in these wards without the park. Indeed, the average values in other parts of the city increased approximately

100% during this time period. However, as Olmsted pointed out in his 1875 report to the Board of Commissioners[13], if this average rate of increase had been applied to the three wards contiguous to Central Park then their property value would have been about $53 million; whereas it was actually $236 million. Thus, even when this is considered, the park's influence remained considerable. A commentator writing in 1923 noted:

> The assumption that this increase was entirely due to the acquisition and development of this park would be unwarranted. As property changes from acreage to city lots the percentage of increase in value is greater than during any other period of development. Much of this advance in value may be speculative, but that there is a real increase due to the land having become marketable cannot be questioned. During the period covered by the increase in taxable values about Central Park, the great northward movement in population and improvement began, and there would undoubtedly have been a marked advance in value even if Central Park had not been bought and improved; but it is unreasonable to suppose that it would have been so great. If we cut the figures in two and conclude that values within these three wards were quadrupled as a result of this improvement, it is likely that we would not be far wrong (p. 177).[14]

The Ripple Effect of the Central Park Data

The highly publicized financial success of Central Park generated calls for the scenario to be replicated elsewhere in the New York City area. For example, in a letter to the *New York Times* in 1882, a correspondent noted that Central Park "has not only paid, but it has been a most profitable investment, and regarded in the light of a real estate transaction alone, it has been a great success"(p. 3).[15] He went on to observe that "those who want a reduction in the tax rate and those who favor the movement for its effect on real estate" were now "certain" to support development of future parks. As a result of the Central Park success, the letter writer advocated a proposal to acquire and develop two new 2,000 acre parks on the periphery of the city before its expanding population reached those areas. He argued:

> Four or five millions of dollars at the utmost will be sufficient and, as experience has proved, the City will not only be reimbursed for the outlay, but will receive in the increased tax income collected on the enhanced value of land contiguous to the proposed parks much more than will be required for maintenance and other accounts, leaving, as in the case of Central Park, a handsome profit on the investment (p. 3).[15]

The enormous influence of Olmsted and the vast reach of the firm that carried his name for almost 100 years ensured that the documented evidence from Central Park established the proximity principle as conventional wisdom among planners and park advocates, and resulted in it being used to justify major park investments in many other communities.

In Brooklyn it was a prime factor in stimulating development of the 526 acre Prospect Park, which Olmsted and his partner Calvert Vaux also designed and built. One of the main purposes of the plan was to stimulate new real estate development.[14] At Prospect Park, Olmsted and Vaux sought to purchase the adjoining land to recoup the park's costs by selling lots using the Birkenhead Park model, but legal

difficulties prevented them from doing this.[2]

The proximate principle became a cliché accepted by all and was rarely challenged. It was used in many other locales, as local governments realized that large public parks encouraged new residential development on the periphery of a city which they believed expanded and strengthened the tax base.[13] Land on the fringes was inexpensive and there was general acceptance of the principle that the increased tax revenue fully reimbursed the initial investment required to acquire and develop the land. The pervasiveness of the proximate principle in the collective psyche of elected officials, park managers, landscape architects and planners in communities in the late nineteenth and early decades of the twentieth century is illustrated by the quotations and descriptions assembled in Exhibit 2-7.

Exhibit 2-7 Illustrations of the Pervasiveness of the Proximate Principle

- The Olmsted and Vaux 1868 Brooklyn report noted that Prospect Park had increased nearby property more than four times in value.[16]

- The 1874 report of the Boston Park Commission included a table demonstrating how "land adjacent to parks" had risen far beyond the "average increase" in New York and other cities.[16]

- In 1890 the Boston Metropolitan Park Commissioners reported:

  "The citizens of Boston had examples before them, in the parks of neighboring American cities, which assured them that, while the cost of necessary open spaces would be great, the returns in taxes from the enhanced value of real estate in the vicinity of the new parks, as well as the income from betterments, would ensure them a strong financial support."[17]

- In 1900 the Boston Park Commissioners reported:

  "Franklin Park has cost for land and construction, to the present time, $3,800,000, while the cost of maintenance for the year 1899 amounted to $36,700. The increase in valuation of lands in the vicinity of the park, which were assessed for betterment, was $1,230,000 between 1883 and 1890.[17]

- In Madison, Wisconsin, a citizens committee appointed to investigate and report upon the amount of increase in the city's assessed value of property attributable to parks concluded:

  "In our judgment, from ten to fifteen per cent of the increase in the value of taxable property in the city of Madison during the period mentioned is attributable to the establishment of parks, drives, playgrounds, and open spaces in and around the city of Madison, by and through the activities of the city, its citizens and the Park and Pleasure Drive Association."

  When translated into dollar terms, the committee concluded that the increased tax revenue the city received from the presence of its parks "are meeting all the expenses of their maintenance, and all interest charges on the investment, and, in addition, are paying into the city treasury at least $10,000 to be expended by the city for other municipal purposes."[18]

- The Hartford Park Commission, Connecticut, reported: "A careful examination shows that the parks constructed during the last ten years have increased the ground list by a sum equal to that expended by the city in their purchase and development, and have gone far toward making up that which has been taken from the tax list. This increase will continue for years."[18]

- The Park Superintendent of Keney Park in Hartford reported: "If the influence of Keney Park is considered to exist only one thousand feet from its borders, then the value of the lands abutting it is probably four times the value they were sixteen years ago."[18]

- In San Francisco, the *Real Estate Circular* was the monthly magazine of the real estate fraternity. Initially, it had opposed the investment of city resources into developing Golden Gate Park, referring to it pejoratively as "our Great Sand Park," but it gradually changed its position as it watched the developing park lift property values. By July 1868, the *Circular* was reporting with approval Olmsted's data relating to Central Park, and in 1873 informed its readers that Central Park "Before it was half finished…had paid for itself in the enhancement, ten times over, of real-estate values," and began advocating more rapid improvement and investment in the "Great Sand Park."[19]

- The Superintendent of Parks in Kansas City in 1912 stated:

  "Any wide awake city can establish its park system without one cent of general indebtedness to the city. In other words, the enhancement in values of benefited lands will be more than sufficient to pay the cost of the acquisition and improvement of the park system. This will impress you as being a too optimistic view, yet in our own city it is a fact recognized and not disputed with reference to boulevards, and to a somewhat lesser degree with reference to parks and parkways…In Kansas City, at least, the effect of park and boulevard improvements has been the enhancement of land values far in excess of the whole cost of the acquisitions and improvements of their park system…Wherever this work has been properly executed and maintained, it should be considered an investment and not a tax."[18]

- At the first meeting of the city of Minneapolis Park Commission in 1883, the commissioners were presented with Olmsted's data from Central Park and urged to invest quickly and extensively in park land while it was relatively inexpensive. Writing in 1946, the long time director of that system stated unequivocally: "The real estate values promoted through the establishment of all of our parks and playgrounds, and, in later years, the playground and recreational system, have returned to the city's commonwealth not only the entire costs involved, but a handsome interest as well" (p. 26).[20]

- Henry Hubbard, Professor of Landscape Architecture at Harvard University observed in 1924, "After the park is established the land abutting it is increased in value, which value comes back to the city in increased taxes: and in addition to this localized increase in values on account of the visible and obvious advantages which accrue to the abutting property, there will also be a general rise in value because the park has raised the tone of the city as a whole" (p. 12).[21]

- William Stinchcomb was the "father" of the impressive system developed by the Cleveland Metropolitan Park District in Ohio, serving as its director from 1915 to 1954. In the early years of his tenure he consistently espoused the proximate principle in his effective advocacy for park funds. For example, in 1920, he told a reporter:

"The $200,000 we can get from the levy will enable us to buy. Then the adjacent land will rise in value and this will be reflected in the tax duplicate and hence yield more taxes. Thus, in a sort of circle, the improvement pays for itself."[22]

Additional Evidence from New Jersey

The first county park system in the U.S. was the Essex County Park Commission in New Jersey which was established in 1895. Olmsted was hired to plan it and, although his plan was never fully realized, he did design two major county parks within the Newark city limits: 360 acre Branch Brook Park, which is famous for its four-mile park loop roadway, romantic lake and streams and large meadow area; and Weequahic Park which also features a lake and large meadow area. Much of the early justification for park investment in Essex County was based on the proximate principle. Thus, in 1915, the Park Commission engaged a consultant to assess the impact on land values of four Newark park – Eastside, Westside, Weequahic, and Branch Brook.[21] An extract from a summary of the report published in the *Newark Sunday Call* is shown in Exhibit 2-8. The results showed that over a 12 year period, the increased taxes paid to the county by adjacent property owners, which were attributable to the four parks, were sufficient to pay all debt charges and almost all of the maintenance costs.

Similar results were reported in a study undertaken by a firm of accountants for the neighboring Union County Park System in New Jersey in 1928.[23] The study focused on property adjacent to Warinanco Park in both the City of Elizabeth and the Borough of Roselle, for the years 1922 and 1927. For comparative purposes, the study reported assessed values of the City of Elizabeth; the tenth ward of that city in which the park was located; and of the balance of the taxing district of Roselle, for the same years. Results of the study are summarized in Exhibit 2-9.

The consultants reported that the increase in assessed values in the Elizabeth tenth ward outside the area adjoining the park in this period was 64.1%. If the area adjoining the park had increased in value at that rate since 1922, then its assessed value would have been only $450,000, giving a total for 1927 of $1.15 million instead of the $3.77 million shown in Exhibit 2-9. The difference of $2.62 million they believed was attributable directly to the influence of the park.

A similar situation was evident on the Roselle side of the park where the rate of increase for the Borough property beyond the park area was 34.5%. If this rate were applied to the park area property, then the increase in assessment values from 1922 to 1927 would have been $370,000 giving a total of only $1.44 million instead of the actual total of $2.65 million shown in Exhibit 2-7. Again, the difference of $1.21 million was attributed by the consultants to the influence of the park.

A subsequent update of this study reviewed the 17 year period from 1922 to 1939.[24] It reported that there was a 632% increase in assessed valuations on properties adjacent to Warinanco Park during this period. This was nearly 14 times the average increase of 46% for the entire city during the same period of years. The property in Elizabeth adjacent to the park which was assessed at $703,000 in 1922, rose to $5.1 million in 1939.

A similar, though less spectacular, increase was shown on lands adjacent to the park in Roselle where valuations on land adjacent to the park increased by 257%.

THE IMPACT OF PARKWAYS ON PROXIMATE PROPERTY VALUES

In the first third of the twentieth century, developments of parkways and playgrounds were considered to be as central economic, social, and political issues, as the development of parks. Hence, the remaining discussion in this chapter separately reviews the results of studies that investigated how each of these two land uses impacted proximate property values.

Parkways were first introduced by Olmsted and Vaux in their design of Prospect Park

Exhibit 2-8 The Impact of Four Newark Parks on Adjacent Property Values

The property immediately adjoining the four parks named was assessed in 1905 for $4 million and in 1916 for $29.2 million, an increase of $25.1 million, or 606 per cent. Property in these same taxing districts, perhaps not wholly outside the 'park influence,' was assessed in 1905 at 36.6 million, and in 1916 at $111.5 million, a gain of $74.9 million or 204 per cent. Thus, while the property adjoining the park increased more than six times in value, property in the remainder of the same taxing districts about doubled in value. The following table shows the dramatic increases in adjacent properties associated with each of the four park sites:

RATE OF INCREASE IN PROPERTY VALUES

Park	Property adjacent to parks	Rest of same taxing district	Adjacent taxing districts
Eastside	9 times	2¼ times	2½ times
Westside	15 times	3 times	3 times
Weequahic	14 times	7 times	3 times
Branch Brook	5 times	2½ times	$3^{2/3}$ times (part adjoins park)

If the increase in valuations adjoining these parks has been the same as in other property in the same taxing districts, and no more, it would have been $8.4 million, leaving an increase as a result of the parks of $16.6 million. The fortunate owners of this property have been enriched by this large sum beyond what they would have been had the parks not been established.

But this was not all. The cost of these four parks was $4.2 million. The increase is enough to pay for them four times. The cost of all the parks in the county was $6.9 million -- say $7 million. The increased value of adjoining property alone, beyond what it would have been if the parks had not been constructed, was sufficient to pay for all the parks in the county 2.4 times. The Commission stated that "the increased revenue to the county was sufficient to pay the interest and sinking fund charges on the bonds issued for park construction, and meet almost the entire cost of the annual maintenance."

Source: The *Newark Sunday Call* cited in Weir[21]

Exhibit 2-9 The Influence of Warinanco Park on Adjacent Land Values in the City of Elizabeth and the Borough of Roselle 1922-1927

	City of Elizabeth	Tenth Ward in Elizabeth	Adjacent to Park on Elizabeth side	Borough of Roselle	Adjacent to Park in Roselle
1922 Assessed Value*	83.90	16.10	0.703	7.10	1.07
1927 Assessed Value*	125.13	29.05	3.770	11.57	2.65
% Increase	49.1%	80.4%	436.1%	62.8%	147.0%

* Values are in $ millions.
Source: *The Playground* [21]

in Brooklyn. In their earliest form they were conceptualized as broad, tree-lined boulevards that characterized the major approaches to a park and were intended to extend the park out to surrounding farmlands.[13] A parkway was conceptualized as a limited-access highway located through a park, which combined recreational areas with the movement of passenger vehicles.[25]

The idea was subsequently adopted by many other cities, most notably Boston and Kansas City. The main difference between parkways and highways was that "highways place a greater emphasis upon convenience and directness, while the emphasis in parkways is upon agreeableness and pleasure, so that movement becomes in itself a form of recreation. Parkways thus having the motive of recreation are conceived more generously in the matter of space and width" (p. 119).[26]

In contemporary society, the distinction between a highway and a parkway in an urban setting has essentially disappeared since the dominant goal of all main urban arteries today is the efficient movement of traffic, and not their aesthetic appeal. However, in the first third of the twentieth century, development and maintenance of parkways was a major responsibility of many urban park departments and their positive impact on proximate land values was a primary justification for their construction. For example, George E. Kessler, who master-minded the early evolution of the excellent Kansas City park system, made the following observations regarding boulevards (which in his context was a synonym for parkways) in a report to his Board of Park Commissioners in 1910:

> Conservative real estate men [in Kansas City] estimated the present value of the ground frontage on the Kansas City boulevards, less building improvements. They compared this valuation with that of ground fronting on adjacent streets which were not boulevards. They found that the difference in favor of the boulevard real estate was a quarter of a million dollars more than the entire cost to taxpayers of all the parks and boulevards embraced in the system...Real estate

> men discovered years ago that frontage on boulevards easily doubles the market value of lots on streets two or more blocks distant.[27]

Writing much later in 1937, two landscape architects from Harvard reaffirmed that this view was still the prevailing conventional wisdom (the italics are theirs):

> In most cases where public money has been spent for parkways the assumption has been definitely made that the proposed parkways will show a *provable* financial profit to the city. It has been believed that the establishment of parkways causes a rise in real estate values throughout the city, or in parts of the city, to such a degree that increased proceeds from taxation may equitably be collected, sufficient to meet both the interest charges entailed by the original expenditure and the sinking-fund requirements for discharging the debt (p. 6).[26]

The prevailing mind-set was that these recreational parkways were analogous to linear parks and, thus, a similar premium attributable to their aesthetic appeal would be present.

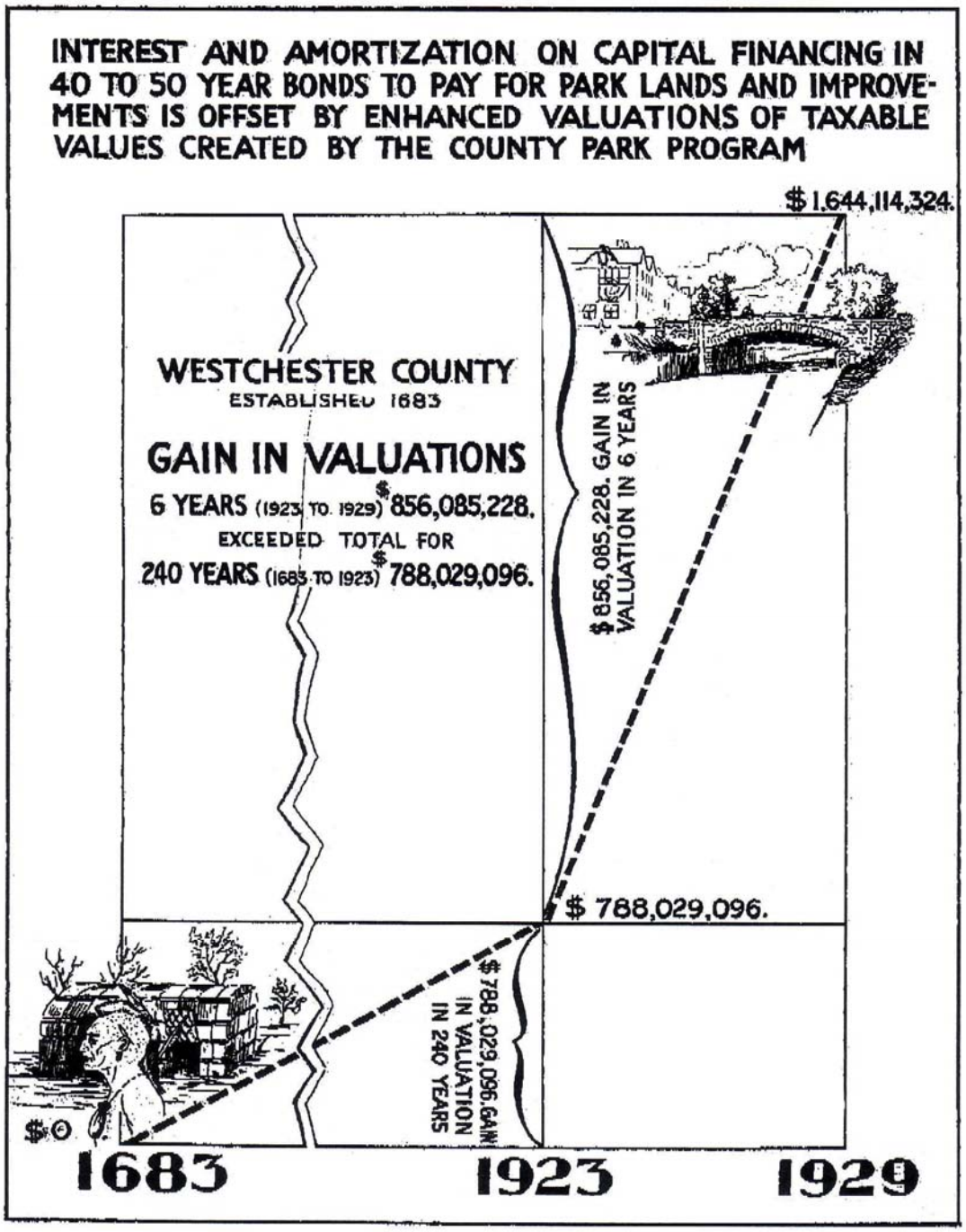
Given the prominence of parkways in the urban landscape, these same two Harvard professors, undertook an empirical study of their impacts on land values.[26] Sample sections of three parkways were selected for investigation in Kansas City, Missouri; Boston, Massachusetts; and Westchester County, New York. The methodology used was to compare the value of land before the creation of a parkway with the value of the land near the parkway after it had been in existence for some years. Land values were measured in dollars per square foot based on assessed valuations of the property. The authors drew three general conclusions from their project:

- The increase in land values close to a parkway was greater than that of land unaffected by the parkway.
- Some benefits of parkways were spread generally across the whole city.
- "From all our study we have come to a firm conviction that parkways, properly designed in their relation to all the needs of a considerable population, will be worth their expense and that their value will be reflected in the taxable values of property so that, in truth, the community *as a business* will be better off financially on account of the parkway because it will ultimately be receiving annually in added taxes more than the annual charge to the community for creating and maintaining the parkway" (p. 128).[26]

Some park commissions made extravagant claims for the influence of parkways. For example, Westchester County, New York, whose parkway system was probably the most comprehensive in the country in the late 1920s, included Exhibit 2-10 in its 1929 annual report. It showed the valuation of taxable land improvements increased by over 100% from 1923 when the park commission was formed to 1929. The commissioners grandiosely claimed that the "Enhanced valuations of taxable values [were] created by the county park system." This was reinforced by an assessed valuation study in the 1930s completed by the commissioners' real estate department which concluded, "The lands adjacent to the Bronx River Parkway have enjoyed an increase of 1178% as contrasted with a 393% increase for the outside area." And the park commission proudly noted that the entire cost of the Bronx River Parkway had been returned "to the County and the various municipalities, through the collec-

tion of

Exhibit 2-10 Extract from the Westchester County Park Commission Annual Report, 1929



almost $23,000,000.00 more in tax receipts from this affected area than would have been collected, had its increase been the same as for the outside area."[28]

However, the Harvard professors in their study observed the "great rise in land value in Westchester County, although it was doubtless increased and hastened by the parkways, would have taken place to a considerable extent if there had been no parkways" (p.127).[26] They pointed to the pressure on land caused by the large population growth of New York City in this period, the growth in automobile use, and the introduction of improved rail services as key factors in stimulating the growth.

Increases in parkways' proximate land values were clear, but there were two reasons why it was naïve to attribute the increase to the design of the parkways. First, as the authors noted in the case of Westchester County, there were invariably numerous confounding variables which also contributed to the increases and they commented, "It is quite impossible to segregate accurately...the effect due to the parkway with the effects due to many other causes" (p. 32).[26]

A second factor was the changing role of the automobile in the first third of the century. When Olmsted and Vaux and Kessler originally developed the parkway idea, the automobile was a recreational vehicle for the wealthy, but by the early 1930s, it had become a transit vehicle for the middle classes. The parkways "furnished channels for quick accessibility" (p. 61)[26] because they were "insulated" arteries along which crossings of highways and railroads were eliminated. In essence, they were an early form of freeway which sought to integrate aesthetic beauty with the need to expedite vehicle movement. Thus, much of the enhanced value of proximate lands was likely to stem from the enhanced accessibility the parkways offered as traffic and transit arteries to these properties, rather than from their aesthetic appeal.

THE IMPACT OF PLAYGROUNDS ON PROXIMATE PROPERTY VALUES

In most communities today, the distinction between parks and playgrounds has disappeared. Typically, playground equipment is one of multiple features incorporated into the design of parks. Playgrounds as independent entities are confined primarily to inner city neighborhoods where they are vestiges of a previous planning era. However, in the first third of the twentieth century, independent playgrounds were a common feature in the urban landscape. These entities were defined as, "spaces wholly designed for play, and having little or no park-like qualities" (p. 324).[29]

In 1926, the Metropolitan Conference of City and State Park Authorities in New York observed: "We have no evidence that neighborhood playgrounds cause that direct and measurable increase in land values which has been proven in the case of major park and parkway extensions" (p. 376).[30] The conventional wisdom of that era on the likely impact of playgrounds was mixed. One commentator observed:

> Some of the opinions that have been expressed as to the effects of playgrounds on land values point out that playgrounds not having a park-like effect decrease land values; that because of the noise and dust caused by a large number of children on the playground the "bordering-on" property value would be decreased; that playgrounds are undesirable in the "better class" residential districts (p. 376).[30]

There was anecdotal evidence to support this view, such as this report from 1926:

> A delegation of citizens from the Tompkins Square neighborhood waited on the Park Commissioner demanding that the playground be taken out--not because their children did not attend, but because of the great clouds of dust that were raised on windy days because of the dry weather and the bad surface of the playground. This action certainly indicated an unpleasant state of affairs, which would not make the houses surrounding the playground a desirable place to live in (p. 324).[31]

At the same time another observer, who was a professor of landscape architecture at Harvard University, while acknowledging this viewpoint was prevalent, concluded: "But whenever a playground is necessary, it cannot be denied that its presence raises the value of the whole neighborhood" (p. 376).[30]

In response to these antithetical views and to the lack of empirical evidence relating to playgrounds, two major studies were undertaken in the late 1920s. The first investigation was in New York City and it focused on seven playgrounds in Manhattan and two in Brooklyn.[29] Changes in the assessed value of land were compared between 1904 and 1926: (i) directly bordering on a playground; (ii) adjacent to a playground, which was operationally defined as streets located one, two or three blocks away from it; (iii) in the Section in which each playground was located. Sections were large areas, (eight in Manhattan) for which total assessed valuations were given yearly; and (iv) on the whole Borough. Data for the study were derived from land value maps and tax reports prepared by the Department of Taxes and Assessments. The results are shown in Exhibit 2-11.

The data in Exhibit 2-11 show that in only three of the nine locations did the bordering land increase at a greater rate than the adjacent land. The increase in the adjacent land was in seven of nine cases greater than the increased assessed values in the section and in eight of nine cases greater than in the borough. Also at six of the playgrounds, the bordering values increased more than those in the section and borough. These findings suggested that the optimum location was not abutting a playground, but was within one, two, or three blocks of it. However, abutting such a facility created larger increases in land values than being outside the service range of a playground.

Other conclusions drawn from this study included:

- In no case was there a decrease in the value of bordering lots in the time period from two years before the land for the playground was acquired by the city to the year 1926. The author noted, "It is quite evident that the acquisition or opening of these playgrounds had no detrimental effect on the land values around them, but rather, as shown in many cases, an immediate upward effect" (p. 325).[29]
- The more "park-like" the playground, the more positive the impact on property values.
- Large sites increased the value of residential property to a greater extent than small sites.
- The location of business and industry near a playground minimized the effect a playground had upon proximate property values. Conversely, the effect was greatest in an exclusively residential neighborhood.

These findings were generally confirmed in a second study reported a year later which focused on nine playgrounds in Brooklyn, New York, and four playgrounds in Orange, New Jersey.[30] Orange was included because it offered a different kind of environment, "a city

Exhibit 2-11 Increase in Land Values at Nine Playgrounds Between 1904 and 1926

Name	Location	Date of acquisition	Character of neighborhood at time of acquisition	Area in acres	Percentage increases in assessed values of land				
					Period of years	Bordering on playground	Adjacent to playground	Tax section	Borough
MANHATTAN Chelsea	27th Street and 10th Avenue	1906	Residential, with scattered retail stores and industry	3.1	1904 to 1926	24	53	38	27
West 59th St.	West 59th Street between 10th and 11th Avenues	1906	Residential and industrial	0.5	1904 to 1926	99	75	32	27
St. Gabriel's	35th Street and 2d Avenue	1906	Residential and mixed industrial	2.9	1904 to 1926	25	33	38	27
Yorkville	101st Street between 2nd and 3rd Avenues	1906	Residential	0.9	1904 to 1926	52	42	9	27
John Jay	East 76th Street to East 78th Street and East River	1906	Residential	3.0	1904 to 1926	98	103	45	27
Carmansville	152nd Street and Amsterdam Avenue	1906	Residential	0.1	1904 to 1926	92	94	51	27
St. Catherine	East 67th Street between 1st and 2nd Avenues	1914	Residential	1.4	1914 to 1926	11	13	39	19
BROOKLYN Betsy Head Memorial	Livonia, Dumont and Hopkinson Avenues	1912	Open, near detached residential area	10.5	1911 to 1926	163	118	89	55
Graves-end	18th Avenue and 55th Street	1917	Scattered detached residences	6.9	1915 to 1926	123	125	91	57

Sources: (i) Charles J. Storey (1927). Increase of land values around playgrounds. *The Playground* September: 324-326.
(ii) Thomas Adams, Harold M. Lewis, Theodore T. McCrosky (1974). *Population, Land Values and Government. Regional Survey, Volume II.*. New York: Arno Press p. 178.

of houses and very few factories" (p. 378). Two criteria were used to select playgrounds for inclusion in the study. First, all were staffed with a supervisor and were equipped. Second, none were selected where the "bordering on" or "adjacent to" property values were influenced by other public property, such as schools or parks. The selected playgrounds differed in size (12 of the 13 ranged from 0.5 acres to 8.5 acres), type of district in which they were located, and proximate land uses. Some were in "very poor, highly congested tenement and industrial sections, while others were in the high class resi-

dential districts of one or two family detached

Exhibit 2-12 Land Value Increases Associated with Playgrounds Located in Different "Classes" of Residential Districts, 1909-1929.

"HIGH CLASS" DISTRICT

Three playgrounds were located in high class residential districts, "in which it was very desirable to live, consisting of one and two family detached houses with well kept lawns and yards, and also better types of apartment houses." The increase in land values in percentages for the different playgrounds were:

Name of Playground	"Bordering On" Per Cent	"Adjacent To" Per Cent
McKinley	158.0	162.0
Central	170.8	95.8
East 14th St. and Ave. "S"	102.0	88.0

"MEDIUM CLASS" DISTRICT

This type of residential district was characterized by "the better type of tenement houses and fairly desirable one and two-family houses." Four playgrounds were in these types of areas:

Name of Playground	"Bordering On" Per Cent	"Adjacent To" Per Cent
New Lots	68.0	103.0
McLaughlin	72.7	58.99
Metcalf	60.5	40.5
Ropes	53.0	53.8

"POORER CLASS' DISTRICT

Six playgrounds were in "the district of poorer class tenement houses located in a business and industrial area." The percentage increase in land values associated with these playgrounds were:

Name of Playground	"Bordering On" Per Cent	"Adjacent To" Per Cent
City	72.4	87.3
McKibben	20.6	42.4
Colgate	27.2	4.6
McCarren	9.0	51.8
Lindsay	0.0	6.8
Greenpoint	0.0	0.0

Source: Feldman[29]

houses with well kept lawns" (p. 378). Thus, the playgrounds were classified as being located in one of three categories of district: high class, medium class, and poorer class. Again, data were derived from land value maps published annually by the cities of New York and Orange for the 1909-1929 period. The results are summarized in Exhibit 2-12.

The increase in land values of property surrounding playgrounds was greatest in the "high class" residential districts. As the residential desirability of a district decreased, the extent of increase in land value diminished, until in some of the "poorer class" districts no change at all occurred in land values in the 1909-1929 period.

In the high and medium class districts the "bordering on" increases were greater than the "adjacent to" increases, but this pattern was reversed among the poorer class districts. This appeared to reflect a predominance of residential property in the high and medium class districts and a predominance of industrial property in the poorer class districts.

The findings indicating increases more favorable to residential "bordering on" properties, contrasted with those in the earlier study. Another contrasting finding was that in this study, size of playground did not affect the relative increase in land values. However, the findings of the earlier study were confirmed since in 12 of the 13 cases there was no decline in land value following the opening of the playground.

A limitation of this second study was that, unlike the first project, it did not offer any basis for comparison in land values in the area beyond the immediate influence zone of the playgrounds. The author concluded that his data demonstrated, "The general opinion that playgrounds are a detriment to land values in a "high class" residential district is not true" (p. 380). However, without comparisons to other areas in high class districts that were outside the influence of the playgrounds' zones this conclusion is challengeable, since there was no basis for assessing whether land values would have increased by an even greater percentage if the playgrounds had not been there.

CONCLUSIONS

The genesis of the proximate principle occurred in the first half of the nineteenth century in England where it started as a strategy used by private developers to quantumly raise the value of homes in their developments. When the rapidly growing English industrial cities were urged by central government to create parks, they balked at doing so because they were perceived to be a low priority. When the proximate principle transitioned into the public sector, it repositioned park expenditures as investments rather than costs in the minds of taxpayers and elected officials. This was the financial break-through that led to them becoming a standard component of the British urban infrastructure.

The idea transitioned from the British to the U.S. context through the influence of Frederick Law Olmsted. Olmsted brought the idea of the proximate principle to the U.S. from England; broadcast it widely based on its intuitive appeal; and provided data from his Central Park project which appeared to confirm it. Thus, in 1868 writing to the future developers of Riverside, Chicago, he cited the "vast increase in value of eligible sites for dwellings near public parks"[32] and over 50 years later in 1919 his son Frederick Law Olmsted, Jr. continued to espouse the mantra: "It has been fully established that…a local park of suitable size, location and character, and of which the proper public maintenance is reasonably assured, adds more to the value of the remaining land in the residential area which it serves than the value of the land withdrawn to create it" (p. 14).[33]

Thus, throughout the time period of the studies reviewed here- -from the earliest days of urban park development in the United States in the 1850s, through the 1930s--there was an insistent, almost inviolate conviction among park and open space advocates of the legitimacy of the proximate principle. It was conventional wisdom among them but it was also espoused by elected officials. This review of the early studies emphasizes the long history of the proximate principle and its early effectiveness in persuading decision-makers to invest in parks.

The relatively small number of early studies relating to the impact of parks on property values was supplemented by many subsequent studies in later years. These reflected the continued central role of urban parks in communities throughout the century. In contrast, the role of parkways and stand-alone playgrounds diminished considerably in later years, which explains the subsequent absence of studies measuring their impact.

Although substantial gains in proximate property values were associated with parkway developments, there was no convincing evidence to indicate this was attributable to their park-like qualities. It was not possible to untangle the myriad influences accounting for the increases. However, historical perspective suggests that much of the value increase was attributable to more effective and efficient access for traffic and transit, rather than to the parkways' aesthetics.

It had been claimed that playgrounds were likely to depreciate land values in their vicinity, but the empirical evidence suggested this concern was generally unfounded, especially in proximate rather than abutting properties. The cases investigated indicated that, for the most part, playgrounds caused no retardation in the natural rise of land values. In residential neighborhoods, playgrounds tended to increase the value of proximate property at a greater rate than in neighborhoods where business and industry were present. These conclusions were based on the results from only two studies. However, both studies were carefully executed and were comprehensive, involving 22 different sites in three different communities, and they reached similar conclusions. These characteristics suggested that a reasonable level of confidence could be placed in the generalizability of their findings.

In many ways, these rudimentary early studies were naïve, reflecting the underdeveloped nature of the statistical tools and research designs in the early years of the field. They were limited to simple calculations of increased tax receipts accruing from properties in proximity to parks, parkways and playgrounds. However, this ignored the necessity of unraveling the complicated plexus of factors that may influence property values in addition to parks. It was noted in 1937 that these "are not merely additive, but react on each other and may react in opposite directions in different cases" (p. 124).[26]

In subsequent eras, substantial improvements were made in methods used for quantifying the impact of parks and open space on real estate values. Hedonic analysis using statistical techniques especially regression analysis, and econometric models, made it possible to identify the relative influence on property values of factors other than parks, such as house size, type, and location, and the relative impact of other amenities such as schools, shopping centers, and the central business district. The emergence of these analytical tools defined the end of the era of "early" empirical studies rather than any specific date, but this tended to occur in the late 1930s.

References

1. Lawrence, Henry W. (1993). The greening of the squares of London: Transfor-

mation of urban landscapes and ideals. *Annals of the Association of American Geographers* 83(1),90-118.

2. Chadwick, George F. (1966). *The park and the town: Public landscape in the 19th and 20th centuries*. New York: Praeger.

3. Saunders, Ann (1969). *Regent's Park: A study of the development of the area from 1086 to the present day*. New York: Augustus M. Kelley.

4. Thornton, Clifford E. (1984). *The people's garden: A history of Birkenhead Park.* Wirral, England: Williamson Art Gallery & Museum.

5. Colquhoun, Kate (2003). *A thing in disguise: The visionary life of Joseph Paxton.* London: Fourth Estate.

6. Hilary Taylor Landscape Associates Lid (2004). *Prince's Park, Liverpool, restoration and management plan. Volume 1 survey and analysis* Liverpool City Council.

7. *The Liverpool Mercury* (1843) October 20.

8. Tate, Alan (2001). *Great city parks*. New York: Spon

9. Chadwick, George F. (1961). *The works of Sir Joseph Paxton*. London: The Architectural Press.

10. Smith, Allan (1983). Paxton's park. *Architects Journal* 179, (51/52), 48-51.

11. Garvin, Alexander (1999). A parks agenda for the 21st century. *The Millennium vision.* A Supplement to Parks and Recreation, October:27-37.

12. Metropolitan Conference of City and State Park Authorities (1926). *Parks as investments.* New York City. Cited in L.H.Weir (1928) *Parks: A manual of municipal and county parks.* New York: A.S. Barnes.

13. Fox, Tom (1990). *Urban open space: An investment that pays*. New York, New York: The Neighborhood Open Space Coalition.

14. Lewis, Nelson P. (1923). *The planning of the modern city*. New York: John Wiley.

15. More parks for New York (1882, January 9). Unsigned letter to the editor. *New York Times*, p.3, col.6.

16. Wilson, William H. (1989). *The city beautiful movement*. Baltimore: The Johns Hopkins University Press.

17. Board of Paris Exposition Managers (1900). *A history and description of the Boston Metropolitan Parks.* Boston: Wright & Potter Printing Co.

18. Nolen, John (1913). *Some examples of the influence of public parks in increasing city land values*. Landscape Architecture 3(4), 166-175.

19. Deichanty, Randolph S. (1992). *San Francisco Parks and Playgrounds 1839-1900: the history of a public good in one North American City*. Cambridge, MA: Harvard University Department of History, Ph.D. Dissertation.

20. Wirth, Theodore (1946). *History of the Minneapolis park system*. Minneapolis: Minneapolis Park Commission.

21. Weir, L.H. (1928). *Parks: A manual of municipal and county parks*. New York: A.S. Barnes.

22. Miller, Carol P. (1992). *Cleveland Metroparks past and present*. Cleveland, Ohio: Cleveland Metroparks.

23. Editorial (1928). County parks increase property values. *The Playground,* March: 633-634.

24. Little, Charles (1969). *Challenge of the Land*. New York: Pergamon

25. Rowe, Peter G. (1991). *Making a middle landscape*. Cambridge, MA: The MIT Press.

26. Nolen, John and Henry V. Hubbard (1937). *Parkways and land values*. Cambridge, MA: Harvard University Press.

27. Kessler, George E. (1910). *Report of Board of Park Commissioners of Kansas City, MO*: April 18th.

28. Weigold, Marilyn E. (1980). *Pioneering in parks and parkways: Westchester County New York, 1895-1945*. Chicago, Illinois: Public Works Historical Society.

29. Storey, Charles J. (1927). The increase of land values around playgrounds. *The playground*, September, 324-326.

30. Feldman, Jacob W. (1929). The effects of playgrounds on land values of the "bordering on" and "adjacent to" properties to the playgrounds in Brooklyn, New York and Orange, New Jersey. *Playground and Recreation,* September, 375-384.

31. Adams, Thomas, Harold M. Lewis and Theodore T. McCrosky (1974). *Population, land values and government.* Regional survey, Volume II, New York: Arno Press.

32. Miller, Andrew R. (2001). *Valuing open space: Land economics and neighborhood parks.* Cambridge, MA: Massachusetts Institute of Technology Center for Real Estate.

33. Olmsted, Frederick Law, Jr. (1919). Planned residential subdivisions. *Proceedings of the Eleventh National Conference on City Planning*. Harvard University Press: 14-15.

CHAPTER 3

The Later Empirical Studies

CHAPTER 3

THE LATER EMPIRICAL STUDIES

The high profile of the proximate principle in the collective public psyche waned from the 1930s onwards. There were occasional references to it in the 1940s and 1950s. For example, in their *Home Builders' Manual for Land Development*, the National Association of Home Builders noted, "In the vicinity of park and recreation areas enhanced values of building sites up to 15% to 20%, with a high level of sustained value over the years, are not uncommon experiences" (p. 85).[1] However, such references were conspicuously scarce. The proximate principle virtually disappeared from mainstream discussions of parks. There appear to have been two reasons for this.

The first reason was an evolution in local government spending patterns and priorities. In the early days of municipal governments, these entities spent money only on a limited set of core services such as sewers, roads, police and schools: "As local governments assumed responsibilities for an ever-widening array of social welfare functions, the park proportion of the budget declined automatically. Further, parks were once loaded with social tasks now performed by other reform institutions: juvenile courts, public housing, urban planning, pollution control" (p. 176).[2] Other commentators observed:

> After World War II and with the rise of the suburbs, cities refocused their planning and left parks in a spiraling 50-year decline. Many of the ideas regarding the role parks play in city planning and community socialization were lost. More importantly, ideas about measuring park access, assuring equity, and meeting the needs of changing users languished with the erosion of budgets for city parks (p. 5).[3]

The reduction in park budgets caused by this "crowding out" resulted in an inexorable decline in expenditures on the maintenance and renovation of parks. In many communities, parks were allowed to decay. Many of them became dispirited vacuums of dilapidated open space characterized by vandalized equipment

and vegetation, rubble, and trash, that were inhabited primarily by people engaging in socially deviant behavior. It could no longer be argued unequivocally that parks were community assets when it was visually evident that some of them were obvious liabilities. The existence of such parks made the proximate principle a source of declining property values in many urban areas and essentially erased it from the collective psyche as a rationale for public parks. The following perception written in the 1970s was representative of how many viewed parks:

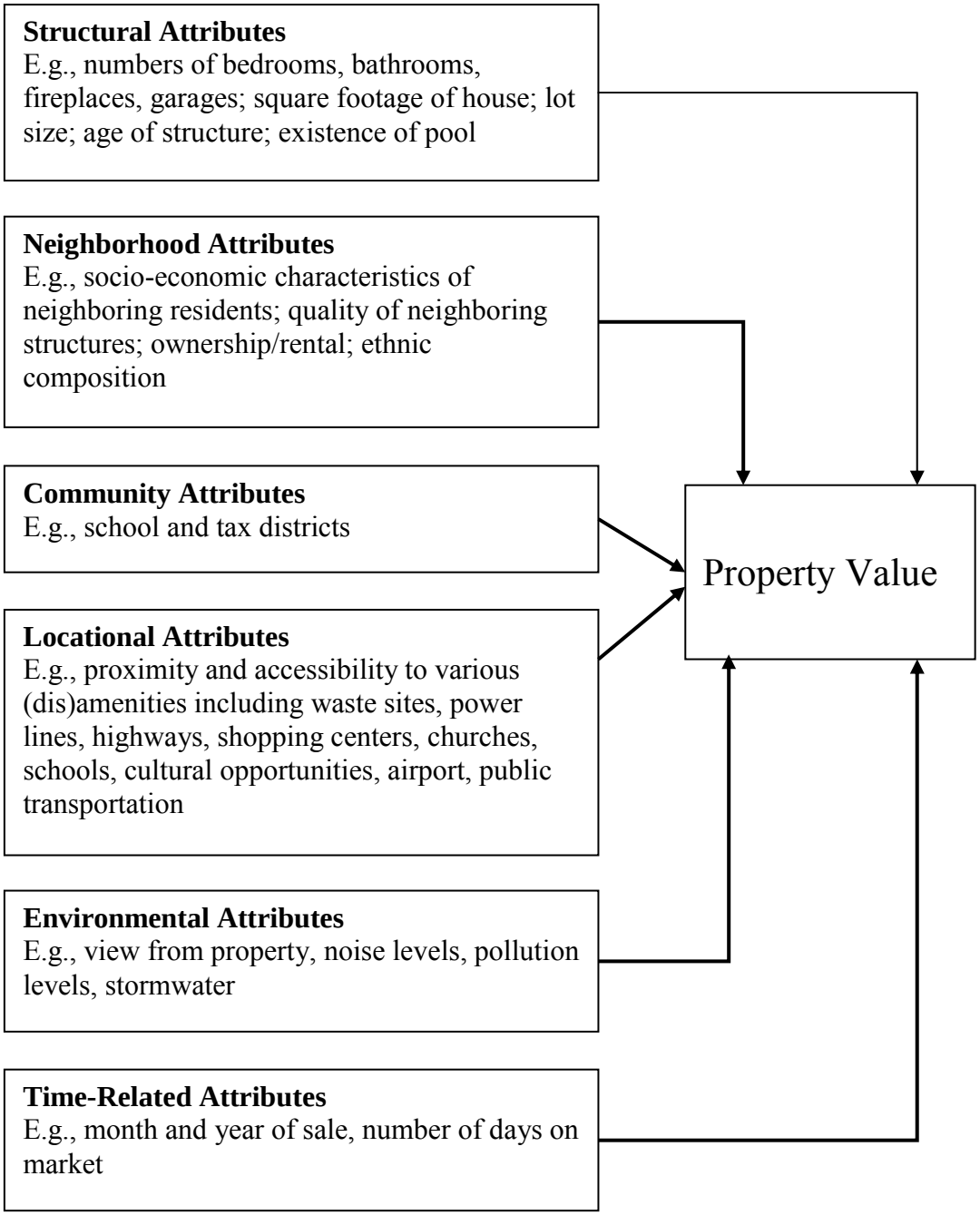
> In many congested neighborhoods with almost no available park space, the few parks to be found often lie all but unused by local residents. In recent years community groups have marched to City Hall as often to oppose proposed park construction as they have to appeal for it. For many people a park is no longer an amenity: It represents a threat to their safety and a liability to the value of their property. In a quarter of a century, a long-established philosophy has been overturned. The image of a greensward decorated with a monument to a national hero or a playground filled with happy children has been replaced by visions of acres of weeds interrupted by vandalized statues, or playgrounds barren of any usable equipment occupied by the social dregs of the community.
>
> From the most prosperous to the most squalid neighborhood, the cry is the same: The parks are not properly maintained and are often inhabited by undesirables. Even in the high-population-density areas, the few parks remain unused while children play amidst parked and moving cars and adults lounge on building stoops (p. 29).[4]

A second reason for the waning of the proximate principle was an awareness of the naiveté of the early studies on which its empirical verification was based. These had ascribed all increases in proximate property values to the existence of a park. They disregarded the array of other factors that may have contributed to such increases. Exhibit 3-1 identifies six sets of factors that may influence property values:

(i) Structural or physical attributes related both to the land and the building(s) constructed upon it;
(ii) Neighborhood attributes impacting upon property values refer to factors in the immediate area, but beyond the property itself;
(iii) Community attributes are those which extend beyond the neighborhood, but within the political jurisdictions in which the property is located;
(iv) Locational characteristics relate to the proximity of, or accessibility to, specific facilities or land uses, whether these are desirable or undesirable;
(v) Environmental attributes impacting upon property values include levels of noise and pollution, and the existence of views;
(vi) Time-related attributes are the macro-economic conditions at the time of a property sale.[5]

The realization that property value at a given point in time results from its relationship to multiple attributes within each of these six broad groups of influences, eroded confidence in the findings of the simplistic studies which had been used to verify the proximate principle. Clearly, more sophisticated analytical techniques were needed.

Exhibit 3-1 Factors influencing Property Value



Source: Nicholls[5]

The first study of the proximate principle to adopt a more sophisticated analytical approach was reported in 1939[6] and used regression analysis as its primary statistical tool. This enabled the impact of parks on property values to be isolated from other influences on it. Typically, either the market price or the assessed valuation of properties was regressed against a measure of distance and a set of "control variables" which measured the contributions of other potential influences on a property's value as well as parks and open space.

However, relatively few studies were reported on the proximate principle until the 1970s which was coincident with the increased capability of computing that made feasible more complex analyses containing a greater number of control variables. As that capability has accelerated, it has stimulated an increase in the number of studies reported and enhanced their level of sophistication. These enhancements in recent years have emanated from the ability to use GIS maps, to integrate house sales data into them from multiple listing services, and to undertake analyses with spatial statistics. Thus, the increase in the number of credible studies is at least partially the result of advances in technology.

However, the resurrection of the proximate principle is also attributable to a change in prevailing philosophy. In the late 1980s and early 1990s, the benefit approach to the delivery of park and recreation services came to prominence. It reminded elected officials, park managers and park advocates that the focus of public investments should be on benefit outcomes and that it was collective or "public" benefits, not "private" benefits, which were most important. Public benefits are those that accrue to most people in a community, whereas private benefits accrue only to those individuals who use a park fairly frequently.

A consequence of the tax revolt of the late 1970s and early 1980s was an emphasis on a pay for service approach in order to raise revenue to compensate for reduced tax funding. Thus, the focus was on private benefits and on creating user satisfaction. This served only to marginalize the parks field further, because those who did not use parks had difficulty understanding why they should support them with tax resources. For example, one large regional park agency reported that the average property owner in the region paid $80 a year in property taxes to the district, but only visited the parks five times a year. [7] There was a realization that to regain public support, park advocates had to demonstrate that there are benefits which accrue to infrequent users and to non-users. The proximate principle is potentially one of these. Hence, the renewed interest in it.

This chapter is divided into three main sections. The first section chronologically reviews studies reporting results in urban and suburban areas. The key questions these studies addressed were:

(i) Did parks and open space contribute to increasing property values when other potential influences on those values were also taken into account.
(ii) How large was the proximate effect?
(iii) Over what distance does the effect extend?

Two subsections of the synthesis of urban/suburban studies address (i) the influence of different park designs, types and use characteristics on proximate premiums; and (ii) studies that related to the proximate principle but for various reasons were not considered to be "mainstream."

Findings emerging from studies of parks and open spaces in urban and suburban areas may not be generalizable to rural areas because of differences in context, scale or mission. For this reason, results from studies undertaken in those contexts are reviewed separately. In the

final section of the chapter, studies are reviewed in which the findings did not endorse the proximate principle.

RESULTS FROM URBAN AND SUBURBAN STUDIES

The shift from the rudimentary early empirical studies to stronger methodological approaches was initiated by Herrick in 1939.[6] His primary purpose was "to show the possibilities of a simple method of analysis applied to available data" (p. 96).[8] It was 25 years before others emulated his approach which highlighted the pioneering nature of the study. Pioneers of new methods by definition expose themselves to criticism. Contemporary colleagues identified what they believed to be significant weaknesses in the mathematical models he developed, but at the same time they acknowledged, "Mr. Herrick's paper is an interesting first approach" (p. 56).[9]

He was the first to use statistical techniques to try and isolate the specific contribution of parks to property value increases vis-à-vis other factors. It was an attempt to rectify the fundamental weakness inherent in the early studies of ascribing all increases to the existence of a park and disregarding the array of other factors that may have contributed to the increases. Herrick used regression analysis to identify the impact of park acreage and population density on real estate value in Washington, D.C. for the 1911-1937 period. He suggested his analyses "made it possible to compute the probable future average real estate and land values for the city of Washington with any assumed percentage of parks and density of population, and so to determine whether the probable increase in values justified the expenditure necessary to procure any proposed park lands" (p. 91).[6]

The analyses addressed average conditions over the whole city, not the impact of particular parks on specifically defined proximate areas. The results indicated that total taxes collected during the 27 year period on the incremental values created by parks were $69 million. Total expenditures for parks and recreation by the city during the same period was $45 million, "leaving a balance of $24 million, which we might say was contributed by the park system to the maintenance of other municipal services" (p. 92).[6]

In the context of a single year, it was calculated that in 1937 the increase in real estate values attributable to the parks of Washington, D.C. was $339 million. The tax rate was $1.50 per $100 valuation, so the taxes collected on these incremental values exceeded $5 million. In that year, operating and maintenance expenses for Washington's parks were $2 million, so based on these data the parks yielded a net income to the city of $3 million.

Herrick concluded that his analyses suggested: "Most cities could afford to have twenty to thirty percent of their areas in parks. The ten percent rule, which has been suggested, is much too low" (p. 92).[6] However, the dramatic findings and conclusions of this study have to be tempered by the reservations expressed by contemporary critics about the application of the regression analysis.[9] In the long term, the study's main contribution was its pioneering illustration of the potential role of statistical tools for investigating this issue.

In 1961 the lack of convincing scientific evidence to support the proximate principle caused William Penn Mott Jr., who at that time was superintendent of parks for the city of Oakland, to write a letter to the Caro Foundation in San Francisco stating the "need for concrete evidence to indicate that parks are good business and that the purchase of park lands for future use is good business for a city" (p. 3).[10] As a result of that letter, the Caro Foundation sponsored a study focused on two parks in Oakland.[10] The samples were relatively

Exhibit 3-2 The Impact of Two Parks in Oakland on the Assessed Values of Properties in the Surrounding Neighborhoods

Name of park	Properties fronting the park	Properties one block from the park	Properties two blocks from the park
Clinton Park	$3,416	$2,300	$2,355
San Antonio Park	$1,489	$940	$932
Control Area*	$876	$932	$1,195

* In the control area, the first zone fronted on to other houses rather than a park, so these values were not subject to the influence of a park.

small, but they confirmed the positive impact of park on the assessed values of proximate properties. The results are summarized in Exhibit 3-2.

Clinton Park was in a relatively affluent area, while the San Antonio Park neighborhood property values were substantially lower. In both locations, the mean assessed values (which were supplied by the Tax Collector's Office) of properties fronting the park were dramatically higher than those of properties located one or two blocks away from the parks.

A third neighborhood relatively close to the San Antonio Park was used as a control area. It mirrored the San Antonio neighborhood in size, type of dwelling units, ethnic composition, median family income, and education level, but was not subject to the influence of a park. Thus, its first zone fronted on to other houses rather than a park. Its aggregate assessed values were substantially lower than those of the San Antonio neighborhood, but almost all the difference was attributed to properties on the block that immediately fronted the San Antonio Park.

The wider availability and greater capacity of computing in the 1970s and 1980s stimulated an increase in the number of empirical studies investigating the issue. A 1972 study in Philadelphia focused on seven sites, at three parks, three schools, and one school-park combination.[11] During the sample years of the study, 1,725 property sales were recorded in the neighborhoods 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 neighborhoods 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" (p. 126).[11]

The Philadelphia study was one of the few to test for a "net effects" curve (Exhibit 1-6) 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 analyzed the impact on sales price of 336 properties in the vicinity of Pennypack Park.[12] This 1,294 acre stream-valley park is in north-east Philadelphia and was surrounded by residential

Exhibit 3-3 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

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 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.[13] 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 center; and (vii) distance to the nearest major shopping center. 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 Exhibit 3-3.

One of the three neighborhoods had been able to take much greater advantage of the open space amenity in its planning than the other two neighborhoods, so the authors initiated further analyses on it. In this neighborhood, 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).[13]

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 be prepared to accept the inevitable criticism that is likely to occur when it raises taxes to purchase the land, knowing that its taxpayers indeed 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 five years (n = 170).[14, 15, 16] 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 effect 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.

The impact of two parks on the values of proximate residential developments in Dayton and in Columbus, Ohio, was reported in 1985.[17] 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 subdivision 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, 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 proper-

ties 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.[18] 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.[19] 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 Exhibit 3-4. 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

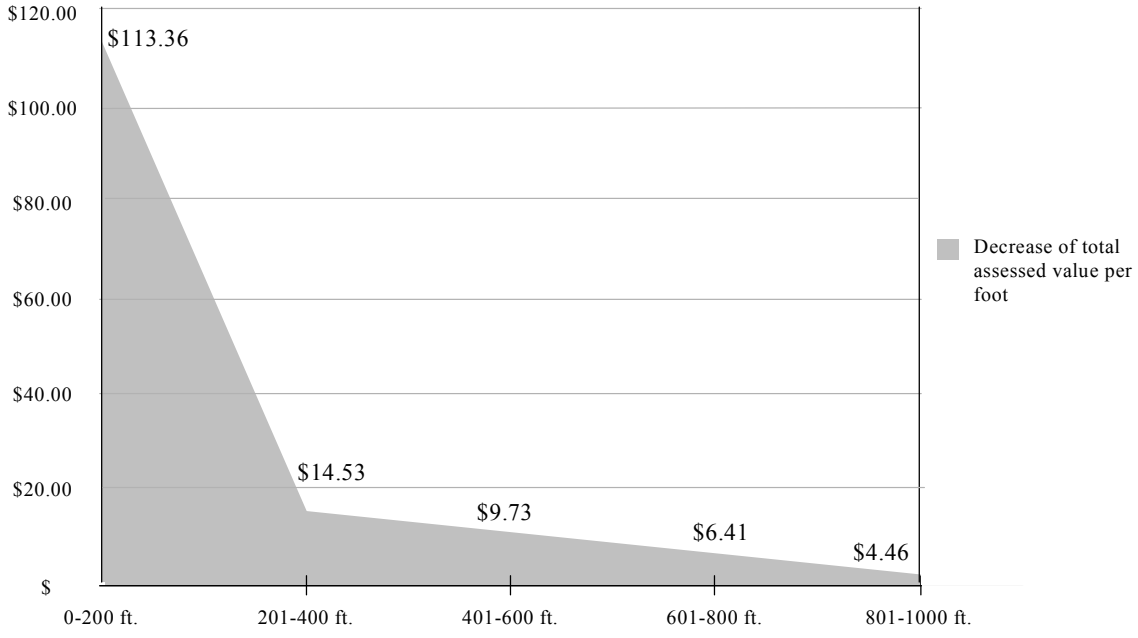


Exhibit 3-4 Decrease of Total Assessed Value per Foot (Jackson Park)

radius. These results were similar to the Boulder greenbelts study reported earlier in the chapter. 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 two 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.[20] There was some evidence of the impact of a restricted supply since when 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 two 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 two 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 neighborhood parks on suburban areas of the Dallas-Fort Worth metroplex was based on 3,200 residential sales transactions recorded over a 2 ½ year period.[21] 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 neighborhoods of single-family houses. As far as possible, parks near arterial or collector streets, shopping or commercial centers, 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 Exhibit 3-5. 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 reinforced the value of the edge factor discussed in chapter 1. It 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.

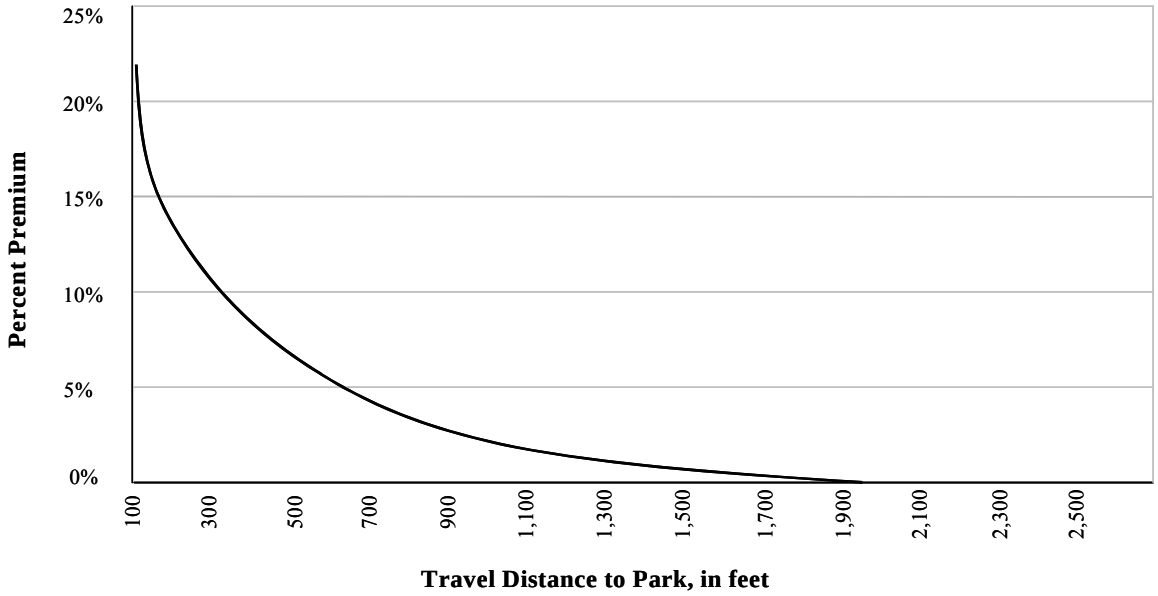


Exhibit 3-5 Impact of Proximity to Parks (14 Neighborhood Parks, Dallas-Fort Worth Metroplex)

Exhibit 3-6 demonstrates the outcome if this principle is applied to the 50 acre park illustration shown in Exhibit 1-1. Exhibit 3-6 suggests that the tax base enhancement emanating from six 8.33 acre parks with dimensions of 202 yards x 33 yards, and non-overlapping impact zones, will be substantially greater in aggregate than the premium generated by the 1210 yard x 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. The scenario of a set of smaller parks rather than one large park may be more appealing to developers who do not have to incur the additional ongoing maintenance costs than to governmental entities who do.

A large data set to measure the impact of the proximate principle was assembled for the city of Portland, Oregon. It was comprised 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.[22] 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

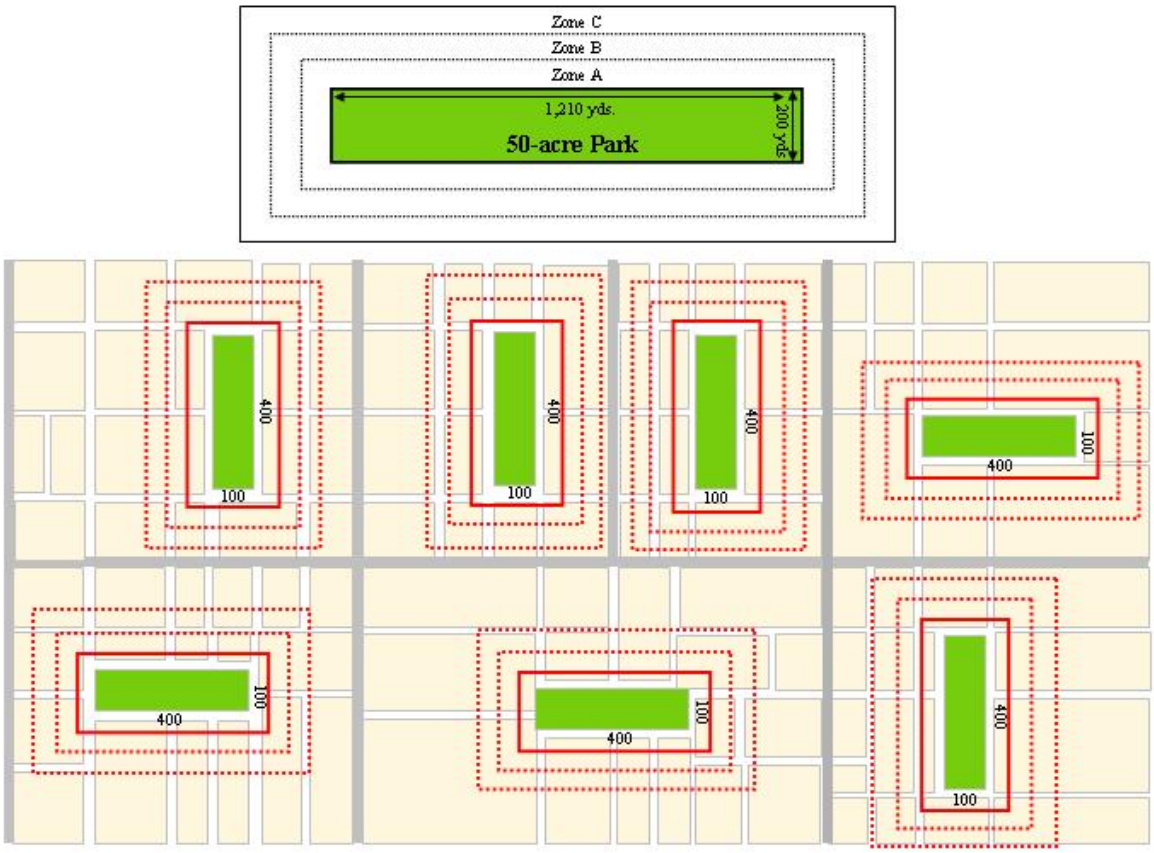


Exhibit 3-6 Implications for Proximate Premiums of distributing 50 acres of Parkland among Six Smaller Parks rather than allocating it to a Single Large Park

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.[23] These are defined in Exhibit 3-7. The results 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 Exhibit 3-8. 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

Exhibit 3-7 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).

Exhibit 3-8 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			

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.[24] 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 neighborhoods 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 the Barton, Lost Creek and Travis neighborhoods were 224, 240 and 236, respectively.

Results of the study are summarized in Exhibit 3-9. The table shows that the premium for adjacency to the greenbelt was highest in the Barton neighborhood and that it represented 20% of *the average price of all homes in that neighborhood*. 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 Exhibit 3-9 would have been substantially longer.

The last column in Exhibit 3-9 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 chapter 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 five year time period.[25] 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 mimpact on house sales price of different cate-

Exhibit 3-9 Results from Three Austin Neighborhoods Proximate to the Barton Creek Greenbelt and Wilderness Park

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

gories 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.

A similar study was undertaken in Berks County in southeastern Pennsylvania.[26] The data base was 8,090 residences sold over a four 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 five selected parks in New York City were undertaken.[27] 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.

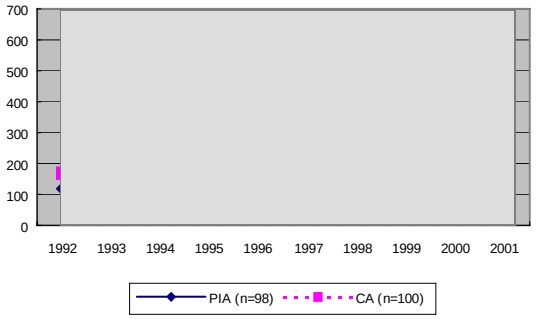
The five parks were Prospect (Brooklyn), Crotona (Bronx), Clove Lakes (Staten Island), St. Albans (Queens), and Serrano (Bronx). The graphs in Exhibit 3-10 compare the sales prices per square foot for single family homes and multi-family units (where these were present) over the 1992-2001 period. The 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 neighborhood. In the most recent four year period, single family homes sold for between 32% and 153% more per square foot in the PIA than in the CA (Exhibit 3-10(a)). The same trend was apparent

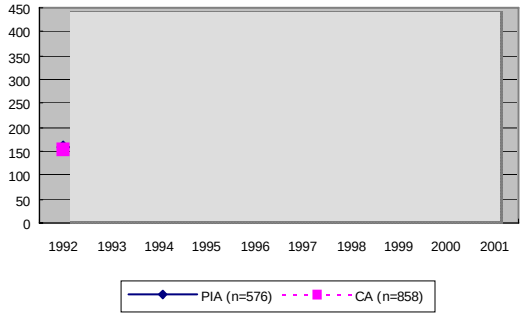
Exhibit 3-10 Comparison of the Sales Price per square foot of properties within the Impact Areas (PIA) of Five Parks with those of their control areas (CA)

Prospect Park (526 acres), $103 million, 1993 – 2001

(a) Single Family Homes

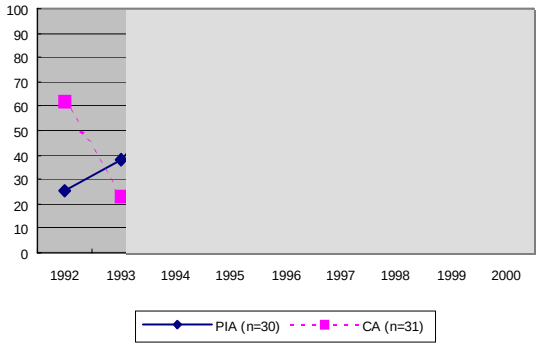


(b) Multi-unit Dwellings

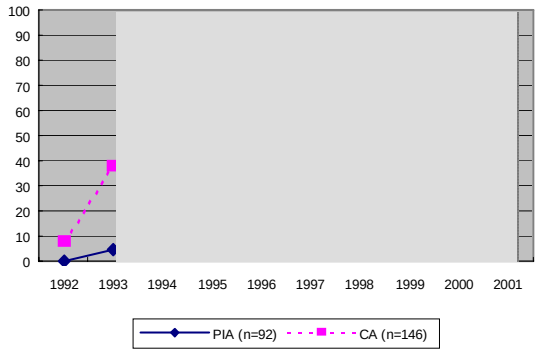


Crotona Park (128 acres), $12 million, 1993 - 2001

(c) Single Family Homes

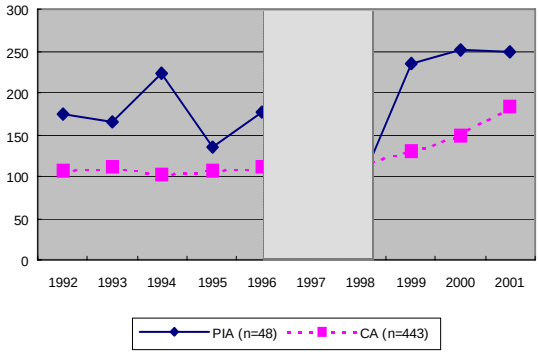


(d) Multi-unit Dwellings



Clove Lakes (198 acres), $5.6 million, 1993 - 1996

(e) Single Family Homes



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 (Exhibit 10(b)). 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.

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 neighborhood in the South Bronx, characterized by burned-out vacant buildings, drug dealers and crime. Efforts were made to upgrade the neighborhood, 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. Exhibit 3-10(c) 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 (Exhibit 3-10(d)). 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. Exhibit 3-10(e) shows that in the last three 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.

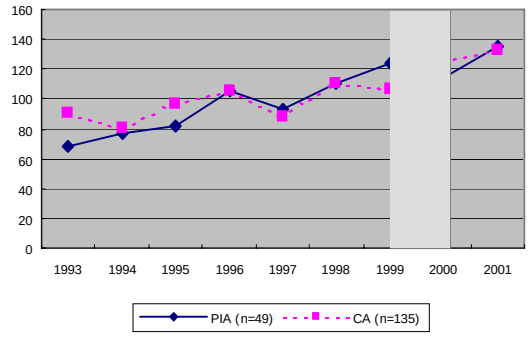
St. Albans Park (11 acres) was renovated in 1999 and 2000 at a cost of $1.7 million. Two PIAs were used to measure the proximate impact of the park. Data from its east side, summarized in Exhibit 3-10(f), show no substantial difference between the sales value of properties in the two areas. The second 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 (Exhibit 3-10(g)). 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 Exhibits 3-10(h) and (i) reflect these unattractive qualities in that the

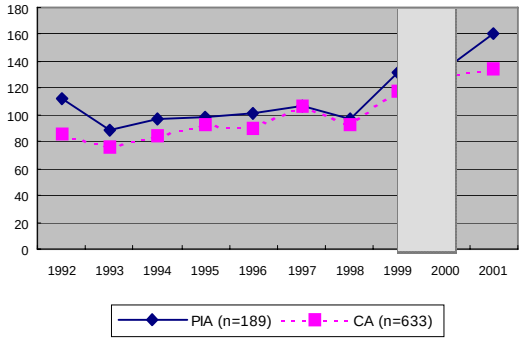
Exhibit 3-10 (continued)

St. Albans Park (11 acres), $1.7 million, 1999 - 2000

(f) East: Single Family Homes

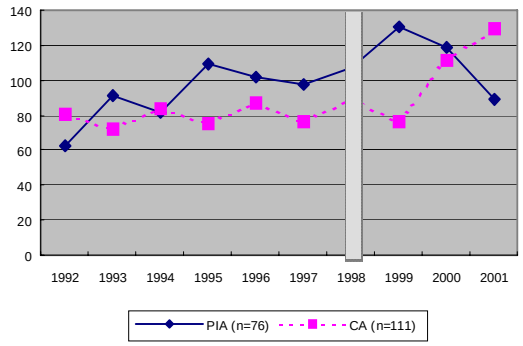


(g) Northwest: Single Family Homes

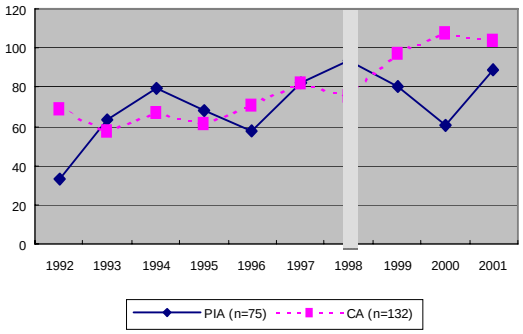


Serrano Park (2½ acres), $450,000, 1998

(h) Single Family Homes



(i) Multi-unit Dwellings



facility appears to have no proximate impact on property values.

In addition to the proximate value data reported in Exhibit 3-10, 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).

The Influence of Different Park Design and Use Characteristics

While the above studies consistently reported that parks and open space had a substantial positive impact on proximate property values, other studies have refined this conclusion by identifying differences in the magnitude of this impact based on a park's attributes. These differences pertained to (i) whether a park was designed to service active recreation users or to offer users a more passive, contem-

Exhibit 3-11 The Impact of Different Types of Parks on Residential Property Values

	Active Recreation Areas	Combined Active and Passive Recreation Areas	Passive Recreation Areas
% change in adjoining lots relative to average value of their census tracts	+10%	+33%	+70%
% change in residential blocks surrounding the parks relative to the average value of their census tracts	+7%	+14%	+63%

plative experience; and (ii) whether a park was easily visible from adjacent streets or was sufficiently obscured from public view that it encouraged anti-social behavior.

Results from an early study undertaken in the city of Spokane, Washington, are shown in Exhibit 3-11.[28] This was a relatively naïve study devoid of sophisticated statistical controls, but it was the first to identify a continuum of effect between active and passive parks. Parks were classified into the three categories of active, combined active and passive. The values of residential properties adjacent to or surrounding parks were positively impacted regardless of the type of park, and magnitude of the impact declined with distance from the parks. However, there were substantial differences in impact along the active/passive continuum with active parks exercising the least positive impact and passive parks the most positive impact.

A more detailed study with better controls pertaining to this issue was undertaken in Dallas and reported in 1967.[29] Ten parks were selected for study. The impact on properties within 500 feet of each park was compared with that on properties which were beyond 500 feet but still within the park's service area and zone of influence. In half of the parks the main feature was a playground, while the other five parks were larger and featured community playing fields.

The data in Exhibit 3-12 show that properties within 500 feet of a playground park were of lesser value than other properties beyond 500 feet but within the park's service area. However, the inner area values were higher than those of properties that were outside the playground parks' service areas. In contrast, properties around the larger playing field parks were of higher value than properties that were more distant in the service area. The authors of the study stated:

> In conclusion, it appears that the community playfield park, because of its large size, generally acts to increase property values of properties immediately adjacent to it while the playground generally decreases the values of similar properties (p. 74).[29]

The authors attributed the reasons for the adverse impact on nearby property of the playground parks not only to noise and the flow of additional people into the area, but to their quality. For example, in the Preston Hollow neighborhood, the park's adverse impact was relatively strong (20%). In this area property values were high, $9,039 within 500 feet compared to $11,207 in the rest of the service area (Exhibit 3-12). The authors offered the following explanation for the adverse effect:

> The detrimental character of the park appears to lie in its appearance relative to the rest of the neighborhood. Probably if the appearance were improved, by plantings or some form of redesign, the adverse effect would be diminished.
> It seemed to be true in all cases, that the aesthetically pleasing park (one which had an attractive design, was well maintained, and highly landscaped) caused an increase in property values or properties around the park, relative to other properties...The parks which were well shaded, well designed and were of pleasing appearance had a positive impact, while those which were poorly designed had an adverse effect upon property values (p. 74).[29]

Added dimensions to these findings were

Exhibit 3-12 A Comparison of Mean Assessed Values of Properties Within 500 feet and Beyond 500 feet of 10 Parks in Dallas, Texas

	Properties Within 500 Feet		Properties Over 500 Feet		Ratio:
	Mean Assessed Value ($)	Number of Properties	Mean Assessed Value ($)	Number of Properties	Under 500 / Over 500
Playground Parks					
Casa View	3,637.00	128	3,778.00	485	.90
Beckley Heights	3,390.00	141	4,197.00	760	.81
Hattie Rankin Moore	1,372.00	179	1,528.00	301	.90
Sleepy Hollow	2,683.00	39	2,556.00	55	1.05
Preston Hollow	9,039.00	154	11,207.00	516	.81
Playfield Parks					
Harry Stone	5,058.00	195	5,040.00	707	1.00
Pleasant Oaks	6,980.00	171	5,879.00	505	1.19
Beckley-Saner	3,436.00	250	2,742.00	494	1.25
Martin Weiss	3,335.00	262	3,258.00	741	1.02
Exline	2,382.00	113	2,254.00	594	1.06

Source: Hendon, Kitchen and Pringle 1967

reported in a 1973 study which employed sophisticated statistical controls.[30] These authors were the first to use ordinary least squares multiple regression analysis to measure proximate impact. Their study focused on five parks in Columbus, Ohio: Audubon, Kenlawn and Linden parks were on the north side of the city, while Hauntz and Westgate were on the west side. All were located in neighborhoods comprised predominately of single family homes. However, the spatial relationships between the parks and adjacent residential properties differed in two ways. First, at Hauntz, Linden and Westgate, houses faced the park with a street between them; while at Audubon and Kenlawn, houses backed on to the parks separated from them only by a fence. Second, most houses had a view of open space, trees, grass, etc., but those around Linden Park and part of Audubon Park looked out on intensively used recreation facilities.

Prices of properties which had been sold in the previous five years that were immediately adjacent to these neighborhood parks constituted the dependent variable. The regression analysis controlled for house age, number of rooms, year of sale and lot size.

The study differentiated between property (i) facing a park across a street; (ii) backing on to a park; and (iii) facing a heavy recreation use area or park building. The first category was comprised of properties facing Westgate and Hauntz Parks. These homes sold for approximately 7% more than identical properties located away from the park.

In contrast, there was no proximate premium associated with homes in the second category around Audubon and Kenlawn which backed on to the parks, since they sold for a similar price to those beyond the parks' view zones. Further investigation seeking an explanation of this finding revealed that the city's parks department received frequent complaints from neighborhood residents of drinking and other disturbing activities at night in Kenlawn and Audubon Parks. Kenlawn Park was almost completely surrounded by private residences, so it was almost invisible from the street. Therefore, it was an excellent gathering place for people who wanted to be undisturbed whether for legal or illegal purposes. Audubon Park contained a heavily-used baseball diamond, which meant that homeowners had strangers very close to their backyard for substantial time periods. This lack of privacy may have accounted for the lack of positive impact on property values.

Properties around Linden Park fell into the third category since the park consisted mainly of heavily used recreation facilities, such as baseball diamonds and a children's playground, rather than of passive open vistas. These homes sold for approximately 8% less than identical properties away from the park.

The authors conjectured that the adverse impact on single family residences backing on to a park or exposed to intensive use recreation facilities would be unlikely to occur if the adjacent residences were high-rise apartments rather than single family homes. They reasoned:

> Whether the [high-rise] building faces or backs on to a park, the apartment resident has about the same view of the park, and has the same amount of privacy. Also this view will typically encompass more of the park than the area immediately adjacent to the building; it will probably include both recreational facilities and scenery. We therefore do not believe that our results for Audubon, Kenlawn and Linden Parks are likely to be valid for parks surrounded by apartment buildings; we would expect positive externalities in all three cases (p. 102).[30]

Another study reported in 1973 sought to identify the differential effects of four kinds of open space on property values: (1) public open space with recreational facilities (e.g. playgrounds, athletic fields); (2) public open space without recreational facilities (e.g. parks, arboretums, cemeteries); (3) private open space (e.g. large estates); and (4) institutional open space (e.g. colleges, private schools, country clubs).[31] The analysis was undertaken in a large area of northwest Philadelphia. The study compared the value of properties in census blocks that adjoined one of these open space categories with other census blocks. A total of 1.955 census blocks were included in the analysis and they contained 300,000 inhabitants.

The regression analysis included a large number of other variables that could influence property values, and it identified separately the park impacts on blocks comprised mainly of homeowners and those where renters predominated. Among both of these groups, access to public open space without recreation facilities was important. Accessibility to private and institutional open space impacted homeowner blocks but not rental blocks, while there was a positive relationship with open space containing recreation facilities and rental blocks but not homeowner blocks.

Exhibit 3-13 summarizes the implications of the study's findings relating to public open space with no recreation facilities. Based on the average number of dwelling units per acre and the average housing unit value given in the table footnote, the incremental value attributable to three hypothetical different sized open space parks was computed using the analysis results. Computations were made for both individual dwelling units and for their aggregation in the four distance zones.

The percentage increment attributable to the park, increases markedly with the size of the park. Thus, in the case of a 25 acre park, increments range from an average of 9.9% within 1,000 feet of the park, down to 0.17% in the 5,000 to 10,000 feet radius. Despite the low percentage increment in the outer bands, their aggregate incremental contribution to the tax

Exhibit 3-13 Effect on Property Value of Public Open Space with No Recreation Facilities*

Distance to Residence (feet)	TOTAL Size of Park			PER DWELLING UNIT Size of Park		
	1-Acre Park	5-Acre Park	25-Acre Park	1-Acre Park	5-Acre Park	25-Acre Park
0-1,000	$51,904	$205,788	$498,513	$83.31	$349.98	$1,207.05
1,000-2,500	43,057	215,258	1,076,290	12.97	64.86	324.28
2,500-5,000	37,148	185,740	928,699	3.13	15.67	78.34
5,000-10,000	39,246	196,258	981,292	0.83	4.14	20.69
	$171,355	$803,044	$3,484,794			

* Assuming 8.8 dwelling units per acre, and base value of average housing unit is $12,185.

base is substantial because the larger radi and greater width of the outer distance bands means that they embrace a quantumly greater number of properties than the closer bands.

One of these authors also was involved with the Pennypack Park study in Philadelphia in 1974, the results from which were discussed earlier in the chapter.[12] The overall findings in that study strongly supported the proximate principle, but there was one exception in that an anomalous negative impact occurred on properties which backed directly on to the park. The authors attributed this to:

> abutting owners feeling vulnerable from park users, who may cross over their land and cause annoyance to the owners or even physical damage to their properties. In an attitude survey carried out concurrently with this study, 21% of respondents rated the park poor or bad from the point of view of safety from crime, and an additional 45% rated it only fair (p. 277).[12]

Finally, results from the study of four parks in Worcester, Massachusetts discussed earlier strongly supported the proximate principle.[14] However, the authors reported that parks with natural landscapes created the highest values in adjacent property, while property next to active recreation facilities had slightly lower values which were attributed to noise and pedestrian traffic. However, these negative influences quickly dissipated, since property values one block away from the active parks showed a positive proximate increment.

The empirical literature reviewed in this section offers convincing evidence to support the proximate value curve shown in Exhibit 1-5, alternate scenario (c). Properties that face or directly abut parks that primarily serve active recreation users are likely at best to show only a small positive value increment attributable to the park. This is attributable to the noise, nuisance and congestion emanating from the influx and egress of traffic and people. However, values are likely to rise, and negative amounts are unlikely to be present, on properties located beyond the first block adjacent to the park. In contrast, the value or properties close to parks offering users a passive experience generally follow a classic distance decay curve with those closest to the park exhibiting the highest increments of value (Exhibit 1-5, alternate scenarios (a) and (b)).

There is some evidence in these studies that parks in which there is anti-social behavior may create a negative impact on properties facing or abutting them. The probability of this type of behavior increases if parks are not easily visible from nearby streets. Again, however, any negative impact is likely to dissipate beyond the first block.

Related Empirical Findings

In concluding this review of urban and suburban studies there are four other relatively recent studies that have reported on the proximate principle but which for various reasons are not "mainstream." Nevertheless, they do provide evidence that appears to reinforce the legitimacy of the principle and they are included for that reason.

The impact of squares or gardens on property in the formative years of cities was briefly reviewed at the beginning of chapter 2. In 1994 a study was reported that used modern statistical techniques with data drawn from row houses located in the South End of Boston that were built and sold between 1850 and 1872.[32] The data set was created from the City of Boston, Office of Deeds, and consisted of 131 houses. The mean purchase price of these homes in 1850 dollars was $10,552. The regression model contained 26 variables repre-

senting lot and house size, architectural features and location relative to a Federal or Victorian Park which were in the area. Because the development took more than 20 years to complete two styles of parks were included. There were two large block square parks, Franklin and Blackstone Squares, that were a heritage from the Federalist planning of the district; and Victorian era planned parks which were elongated, curvilinear parks placed amid tree-lined side streets. The study concluded that market price increased approximately $4,894 (a 46% premium) if the house was located on a Federal park and $1,147 (11% premium) if it was located on a (smaller) Victorian park.

In 2003, a study was reported in St. Louis of the impact of community gardens on property values between 1990 and 2000.[33] There were 53 community gardens in the sample; their sphere of impact was assumed to be 0.3 of a mile; and the rents of properties within the sphere of influence were compared with the rents of properties located outside the 0.3 radius, but within the rest of the same census tract. Census data were used and changes in the property rents between 1990 and 2000 were compared.

In 50% of the 53 cases, the immediate garden area rents increased more than in the tracts as a whole. In two cases the garden areas increased by less than $10 a month, but in the other 48 cases the increase was more than $10 a month. Exhibit 3-14 shows that in St. Louis as a whole overall mean rents fell $4 between 1990 and 2000 and in the tracts surrounding those in which the gardens were located there was no change in rents, but rents within the garden areas saw a mean increase of $113 and a median increase of $91. Thus, the value of properties around the gardens increased, while elsewhere in the neighborhood they remained constant and in the city overall they declined.

An unusually inclusive measure of green space was used by the authors of a 2002 study which was based on 259 single family homes sold in an 18 month period in the Vermont corridor, an older region in central Los Angeles.[34, 35] The median sale price of the houses was $237,500 and their median size was almost 1,600 square feet. Aerial photographs were used to measure "areas of green cover" which embraced the street and private tree canopy, parks and private lawns, landscaped areas, and other types of green cover such as sports fields and cemeteries.

The statistical models indicated that an 11 percent increase in the amount of green space

Exhibit 3-14 Median Gross Rent Change between 1990 and 2000

	Garden Areas	Tracts	Citywide
Mean Increase in Median Gross Rents	$113	$0	-$4
Median Increase in Median Gross Rents	$91	$3	N/A
Range	-$81 - $531	-$71 - $103	N/A

within a radius of 200 to 500 feet of a house led to an approximate 1.5 percent increase in the expected sales price of the house or an additional $3,440 in the median price. The authors illustrated a potential implication of this result (although they disregarded the time value of money):

> An 11 percent increase in the green space is equivalent to approximately 1/3 acre or about the size of a small park. Given the cost of vacant lots in the area, a small park parcel would cost roughly $200,000 to purchase. However, having the green space would increase the expected sale price by 1.5 percent for approximately 300 houses in the vicinity of the park. Additional property tax revenues from this increased value are about $13,000 per year. As a result the small park cost could be paid from the increased tax revenues in about 15 years with no new taxes (p. 37).[34]

A study of variables impacting property values in an urban watershed located in New Haven County, Connecticut measured the percentage land classified as open space around each of over 4,000 houses sold over a two year period within a 1 mile and a 1/4 mile radius.[36] The authors concluded that an increase in the percent of open space within both radi resulted in a significant increase in the value of property, but that as the percentage increased the magnitude of the property value increase declined.

FINDINGS FROM NON URBAN STUDIES

Most studies measuring impact of the proximate principle have been undertaken in urban or suburban settings. Their findings may not be useful for those whose focus is at the state or national level. For this reason, studies that have been undertaken in those contexts are discussed in this separate section of the chapter.

State and national parks typically are not established and operated primarily to provide benefits to local residents. Their mandate is much broader so their economic contributions are likely to arise from visitor expenditures in the area, rather than be captured in proximate real estate values. Nevertheless, it seems possible that the proximate principle may apply, at least in some cases, even though such an impact may be perceived as incidental to the mission of these parks.

An empirical analysis of determinants of land values in the Adirondack Forest Preserve in New York State was reported in 1978.[37] The Preserve is a region within which privately-owned land and state-owned land are interspersed. Of its 6 million acres, 42% are owned publicly and one purpose of this study was to test whether the state-owned land that will remain undeveloped impacted the price of privately-owned land that was adjacent to it. The data consisted of the sale prices of 284 vacant land parcels during a three year period which did not contain buildings and were not waterfront properties. The regression analysis indicated that being adjacent to state land had a large positive impact on price. The price of such parcels was about $20 per acre higher than similar parcels that were not adjacent to state land. Given that the mean price for all sites in the sample was $114 per acre, this represented a 17.5% incremental increase in value.

A 1983 study of the impact of six New York state parks on surrounding property values reported that in four cases there was no impact.[38] The authors suggested two reasons which may explain these findings. First, the areas lacked intense development and were

characterized by predominantly mixed rural land uses so proximate open space had little additional appeal. Second, in areas that were developed around these four parks the lots were large, incorporating backyard pools and other amenities which effectively discounted or nullified the importance of recreational opportunities offered by a nearby state park when the houses were sold.

At the remaining two parks, the analyses showed there was an impact. At Watkins Glen State Park for each 100 feet closer to the park a residence was located, its selling price increased by $50, while at Keewaydin State Park the increase was $72 per 100 feet. The authors used Keewaydin State Park to illustrate the magnitudes of these incremental increases on properties in the three local communities of Town of Alexandria Bay, Village of Alexandria Bay and Town of Orleans where the increments represented 4%, 16% and 16% of the tax base, respectively. Exhibit 3-15 shows the impact of these incremental increases on the tax revenues accruing to the three communities (in 1983 dollars).

A Maryland study reported in 1993 that the preservation of a significant tract of forest land accounted for at least 10% of the value of a house within one mile of the site in Baltimore County: at least 8% in Carroll County; and at least 4% in Howard County.[39] When the radius was reduced to a quarter mile, open space farm land accounted for a minimum of 15% of the value of a house in Baltimore

Exhibit 3-15 The Influence of Keewaydin State Park on the Property Tax Base and the Property Tax Revenue of Three Local Communities*

	Town of Alexandria Bay	Village of Alexandria Bay	Town of Orleans
Average sale price of properties	$44,272	$41,257	$40,296
Number of properties	557	600	476
Average enhanced assessed value of each property attributable to Keewaydin State Park	$1,703	$6,780	$6,302
Total enhanced assessed value	$948,482	$4,067,820	$2,999,638
Taxes paid attributable to incremental park values (town, village, fire/light district, school district, etc)	$117,981	$633,237	$70,911

* 1983 dollar values
Source: Brown, Tommy L. and Nancy A Connelly (1983). State parks and residential property values in New York. Ithaca, New York: Cornell University, Department of Natural Resources

County and 6% in Carroll County, but it depressed home values by at least 7% in Howard County.

A more recent study used a sample of 524 sales transactions in Bastrop County, Texas, over a four year period to assess the impact of three large state/regional parks, Bastrop State Park, Lake Bastrop Regional Park and McKinney Roughs Regional Park on home values.[5] Bastrop County is relatively rural, located approximately 20 minutes from the periphery of the city of Austin. Sales prices ranged from $17,000 to $350,000 with a mean of $117,000.

The results showed that for each mile of distance from the boundary of McKinney Roughs, sales prices were reduced by $724 (0.6%), while from Lake Bastrop and Bastrop State Parks the decays were $62 and $182, respectively. However, these proximate values were not significant premiums so it was concluded these three large natural areas in Bastrop County had no substantial impacts on surrounding properties.

The rural nature of the county and the abundance of easily accessible natural parkland offered by these three sites, probably account for the lack of a substantive proximate premium. This interpretation is reinforced by the empirical conclusions drawn from an hedonic analysis of properties in the Patuxon Watershed in Maryland which used assessed values of residences within a 30-mile radius of Washington, DC.[40] It concluded, "The effect on price of many features of the landscape is different depending on whether the parcel is in a highly developed area, a suburban area, or a relatively rural area" (p. 263).

Generally, findings from the non-urban studies mirror those from the urban studies in supporting the proximate principle. Despite the concerns of rural landowners relating to adjacent public lands facilitating access to trespassers,[41] these findings suggest that properties proximate to public park, forest or open-space land are likely to receive positive increments of value.

The Impact of Large Federal or State Park or Open Space Areas on the Local Tax Base

The conventional wisdom among many elected officials, especially in rural areas, is that public acquisition of land for outdoor recreation adversely effects the revenue generating capacity of local jurisdictions. The belief is that since publicly owned land is exempt from taxation, its removal from the tax rolls increases the burden on other taxpayers, and in some instances may lead to the demise of communities. This position was articulated in a minority report submitted to the US House of Representatives by nine members of the House Resources Committee in 2000 who disapproved of the Committee's support for the proposed Conservation and Reinvestment Act (CARA) which would have provided federal money for the acquisition and development of new outdoor recreation facilities. The minority report attacked the private property impacts of the bill stating:

> As the government or a non-profit buys land in a small community, people are forced out of their homes. There is less business to keep a retail store running, a smaller congregation to keep a church's doors open, and less reasons to justify keeping a school or post office in the area. After a point, government land acquisition causes a community to lose critical mass, and it ceases to be a community.

As the statement notes "at some point" this scenario may emerge, but it represents an extreme position. It may be applicable, for ex-

ample, in Nevada where over 85% of the state is in public ownership. It would be absurd to suggest that the absence of this huge proportion of land from the tax rolls had no adverse impact on local tax bases. However, such cases are extreme and the more common context in which controversy on this issue arises is the acquisition and development of new state park sites. In these situations, the scenario postulated by the minority report is improbable.

The cumulative research findings of the studies reported in this chapter to this point suggest that developing outdoor recreation amenities is likely to lead to a rise in proximate property values which will generate more revenue than is lost by removing the land from the tax base. Two empirical studies were identified which specifically addressed this controversial issue. In both cases, the findings offered support for the proximate principle and did not support the conventional wisdom.

A 1971 study reported the impact of 15 parkland acquisitions made in Pennsylvania by the U.S. Corps of Engineers or Pennsylvania State Parks.[42] The aggregate property values of the township in which each park was located were compared with the values of the rest of the county which were not subject to the park's immediate influence. Data were derived from assessed values. The values for both areas were tracked for an 11-year period, starting five years before acquisition of parkland began. It was assumed that the control sites, comprised of the rest of the county, gave a good approximation of the land values that would have prevailed if the park sites had not been acquired.

In 12 of the 15 park sites, the total value of each township's taxable real estate was higher the year after acquisition began than it was in the previous year. At the other three sites, township land values recovered in the second, fourth and fifth years. The author concluded that these results indicated the increase in the value of land remaining on the tax rolls more than offset the loss of taxable land caused by acquisition, so the revenue base of school districts and other local government entities was not adversely affected.

To facilitate comparison between the park sites and the control areas, a dollar value index was developed which established the market value in the year the land was acquired at 100. In the five years before acquisition commenced the value index of land on average across the 15 park site townships was 84, while the value in the rest of the counties was 90. For the five years after acquisition the average values for the park townships and control areas were 115 and 108, respectively. Thus, as a group, the 15 park townships moved from 6% below the control areas' values before acquisition, to 7% above them after acquisition. The study's author concluded, "It seems likely that public acquisition of recreational land in amounts up to 60,000 acres does not reduce the real property tax base" (p. 26).[42]

Results of this study suggested that the proximate principle is likely to apply to state and federal parks, even though much of the evidence reviewed in this monograph refers to parks under the control of local governments. However, in addition to proximate principle benefits, federal and state lands often bring additional revenue benefits to local governments because in some cases they receive payments in lieu of taxes (PILT) from the federal and state governments.

The compensatory impacts of such payments on local government revenues were believed to explain the findings reported in a 1970 study.[43] The authors used multiple regression analysis to test if state or federal land ownership in a forested three county area of north-western Pennsylvania adversely affected the fiscal capacity of local government through removal of part of the property tax base. It was found that neither higher tax rates on private

lands, nor reduced levels of per capita local government expenditures (i.e. counties, townships and school district) were associated with large amounts of public land, indicating that local governments were not placed at an economic disadvantage by public land programs. Indeed, the data "appeared to indicate the reverse" (p. 370).[43]

In the three counties comprising the study area, the proportions of state and federal land were 51%, 48% and 17%. The consequences of the loss of local tax base were recognized by the Federal government and the Pennsylvania state government which both provided payments in lieu of taxes on these lands to local jurisdictions. The authors believed these payments explained their results, concluding that "the payments in lieu of taxes effectively substitute for foregone tax revenues" (p. 370).[43]

These detailed findings were consistent with those reported by the National Park Service on the impact of two of its facilities.[44] In Dare County, North Carolina, near Cape Hatteras National Seashore Area, the National Park Service reported that total assessed valuation within the county more than doubled soon after the area was opened. At the same time, tax rates were reduced from $1.00 to 80 cents per $100. Similar conclusions were reported after the expansion of Grand Teton National Park in Teton County, Wyoming.

Findings not Supportive of the Proximate Principle in Urban/Suburban Contexts

Five studies were located which reported findings that did not unequivocally support the proximate principle. A 1966 study used multiple regression to evaluate the relative influence of a combination of 14 independent variables on urban growth patterns, including distance to a playground or recreation area. However, this was not one of the four variables that had a significant influence on land values.[45]

Two studies undertaken in the late 1960s that were directed by the same researcher reported mixed results in that they offered only partial support for the proximate principle. The first site was a two and a half block area of housing (which equated to a depth of five lots) around a 10 acre park in Lubbock, Texas.[46] The area was characterized as being "homogeneous" and this was used as justification for not measuring the influence of other potential influencing variables. There were 550 properties within this zone of influence of the park, and assessed valuation data were available for 480 of them. Correlation analysis was used to test for a relationship between distance from the park and (i) assessed value of the property; (ii) sale price of properties that had been sold in the previous five years; and (iii) assessed value of the land. There was a significant correlation only with the last of these three measures, and it was a fairly small correlation (-.17).

The second study focused on three parks in the city of Fort Worth.[47] They were: (i) Eastover Park, which was 13.5 acres surrounded by low to middle income residential property primarily occupied by African-Americans; (ii) Marine Park, which was 12 acres with a surrounding population and characterized as low to middle income and predominantly white; and (iii) Rosemont Park, a community park of 30 acres bordering a large boulevard. Results are summarized in Exhibit 3-16. In Marine and Rosemont Parks, the mean values of properties within 500 feet of the parks were of significantly greater value than properties more distant from the park. However, this support for the proximate principle was partially offset by the findings at Eastover Park where the direction of the significant relationship was the antithesis of that which was anticipated.

Findings from a large scale study involving 18 park sites in 13 municipalities in Westchester County, New York were reported in

Exhibit 3-16 Comparison of Mean Value of Properties within 500 Feet and Over 500 Feet at Three Fort Worth Parks

	Mean value over 500 feet	Number of Properties	Mean value 500 feet and under	Number of Properties	Difference significant at .01
Rosemont Park	$5,729	184	$6,562	59	Yes
Marine Park	4,565	162	5,571	48	Yes
Eastover Park	7,358	165	6,419	29	Yes

1986. Community parks of 25 acres or more were selected through a systematic process based on a number of pre-established criteria.[48] The neighborhoods around the selected parks were characterized as being relatively homogeneous. The 18 sites generated approximately 2,500 individual house price/park relationship quantifiable data points.

The impact of the park on three zones (termed tiers) was evaluated. Residential properties in Tier 1 were immediately adjacent to a park. Tier 2 comprised the next two rows of residential properties directly behind Tier 1. Tier 3 consisted of the two rows of residential home plots lying behind Tier 2, that is, four and five rows from the park. Tiers 2 and 3 were perceived to be "control areas."

It was anticipated that the findings would endorse the proximate principle, but the regression analyses showed no difference in value between those properties adjacent to a community park and similar properties located in the other two tiers. The study's design may account for the unexpected result because it was different from the design used in most of the other studies reviewed. Given that fairly large community parks (at least 25 acres in size) were used in the study, the lack of a relationship may have reflected the proximity of all three tiers to the park. It seems possible that the adjacent properties of Tier 1 may have experienced a nuisance factor which depressed any incremental value increased to the level of that accruing to properties located 2-5 blocks away in Tiers 2 and 3. This would be consistent with the principle explaining the "net effect" in Exhibit 1-6. There was no measure of how well the prices of properties in these three tiers compared to those a greater distance away. Thus, it seems reasonable to postulate that if a control area had been established 6-10 blocks away from the parks, instead of 2-5 blocks away, then a distance decay impact on residential properties may have emerged.

Methodological limitations may also have accounted for the findings of a 1982 study which failed to validate the proximate principle.[49] Using 566 randomly selected residential properties located in several communities in Du Page County, Illinois, the study's objectives were to test for a significant relationship between the value of residential property and (i) per capita expenditures for parks and recreation in those communities; and (ii) the acreage of land per 1,000 population. The regression analysis indicated no evidence of a relationship in either case. It was subsequently suggested that inappropriate statistical proce-

dures may have contributed to the findings of no relationship,[50] but the author rejected this criticism.[51]

Both of the variables used in this study are inadequate surrogates for capturing the value of parks in residential property values. The failure of any other researchers working in this area to adopt these operationalizations is suggestive of their fundamental weakness. Per capita expenditure is an input measure not an output measure, whereas the proximate principle relates to quantity and quality of output in the form of parks and open space. It is the tangible output assets which influence the sale price of proximate properties, not dollar inputs.

Both per capita expenditures and acres per 1,000 population are gross aggregate measures which do not relate proximity of residence to a park. Any evaluation of the effect of the proximate principle must by definition include a measure of distance decay between park and residence, and this is absent when these gross measures are used.

In conclusion, one of the five studies reviewed in this section reported mixed results, but in two of the three parks which were investigated in it the proximate principle was supported. In three of the remaining studies, failure to verify the proximate principle may be attributed to unorthodox and flawed measurement measures that were used. These involved failure to control for other influencing variables, an inappropriate control area against which proximate value increments could be measured, and measures which failed to embrace the central element of distance decay.

Conclusions

Three key questions were posed in the introduction to the chapter. The first question asked whether parks and open space contributed to increasing proximate property values. Results from 30 studies conducted in urban/suburban areas reported in this chapter (and an additional 12 "naive" studies reported in chapter 2) that investigated this issue were reviewed, and with only five exceptions all the empirical evidence was supportive.

The support extended beyond urban/suburban areas since an additional eight studies that investigated properties which were proximate to large state parks, forests and open space in rural areas offered similar empirical evidence to support the proximate principle. Evidence from some of these studies also refuted the conventional wisdom that creating large state or federal park or forest areas invariably results in a net reduction in the value of an area's tax base.

Six of the supportive studies further investigated whether there were differences in the magnitude of impact among parks with different design features and different types of uses. The findings demonstrated that parks serving primarily active recreation areas were likely to show much smaller proximate value increases than those accommodating only passive use.

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 park and recreation 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 nonusers of parks who are the primarily beneficiaries of passive facilities rarely offer a counterorganized lobbying force.

However, even with the noise, nuisance and congestion emanating from active users, in most cases proximate properties located two or

three blocks from such parks tended to show increases in value when compared to properties outside a park's service zone. Impacts on proximate values were not likely to be positive in those cases where (i) a park was not well maintained; (ii) a park was not easily visible from nearby streets and, thus, provided opportunities for anti-social behavior; and (iii) the privacy of properties backing on to a linear park was compromised by park users.

The second question posed in the introduction related to the magnitude of the proximate effect. A definitive generalizable answer is not feasible given the substantial variation in both the size, usage and design of park lands in the studies, and the disparity in the residential areas around them, which were investigated, but an attempt to offer guidelines on this issue is included in the Executive Summary at the beginning of this monograph.

The diversity of the study contexts makes it feasible to offer a generalizable answer to the third issue posed in the introduction which was to identify 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.

There is 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 (p. 101).[21]

References

1. Little, Charles E. (1969). *Challenge of the land*. New York: Pergamon.

2. Cranz, Galen (1982). *The politics of park design*. Cambridge, Massachusetts: The MIT Press.

3. Harnik, Peter and Katherine L. Rowe (2002). *The excellent city park system: What makes it great, and how to get there.* San Francisco, California: Trust for Public Land

4. Simon, Donald E. (1976). A prospect for parks. *The public Interest*, 44 (Summer), 27-39.

5. Nicholls, Sarah (2002). *Does open space pay? Measuring the impacts of green spaces on property values and the property tax base.* College Station, Texas A&M University, Department of Recreation, Park and Tourism Sciences, Ph.D.

dissertation.

6. Herrick, Charles (1939). The effects of parks upon land real estate values. *The Planners Journal,* 5 (4), 89-94.
7. King, John (2000). Economist puts a price on what is priceless. *San Francisco Chronicle*, November 18.
8. Herrick, Charles (1940). The effects of parks upon land and real estate values: Concluding discussion. *The Planners Journal,* 6 (4), 94-98.
9. Ackerman, Frederick L. and Ernest P. Goodrich (1940). The effects of parks upon land and real estate values: Discussion. *The Planners Journal,* 6 (2), 53-56.
10. Wonder, Robert L. (1965). *An analysis of the assessed valuation of private properties in proximity to public parks.* San Francisco: Caro Foundation. Unpublished paper.
11. Lyon, David W. (1972). *The spatial distribution and impact of public facility expenditures*. Berkeley, California: University of California, Department of City and Regional Planning. Ph.D. dissertation.
12. Hammer, Thomas R, Robert E. Coughlin, and Edward T. Horn, IV (1974). Research report: The effect of a large park on real estate value. *Journal of the American Institute of Planners,* 40 (July), 274-277.
13. Correll, Mark R., Jane H. Lillydahl, and Larry D. Singell (1978). The effect of greenbelts on residential property values: Some findings on the political economy of open space. *Land Economics,* 54 (2), 207-217.
14. More, Thomas A., Thomas H. Stevens, and P. Geoffrey Allen (1982). The economics of urban parks: A benefit/cost analysis. *Parks and Recreation,* August, 31-33.
15. More, Thomas A., Thomas H. Stevens, and P. Geoffrey Allen (1988). Valuation of urban parks. *Landscape and Urban Planning,* 15, 139-152.
16. Hagerty, John, Thomas H. Stevens, P. Geoffrey Allen, and Thomas A. More (1982). Benefits from open space and recreational parks: A case study. *Journal of the Northeastern Agricultural Economics Council,* 11 (1), 13-20.
17. Kimmel, Margaret M. (1985). *Parks and property values: An empirical study in Dayton and Columbus, Ohio*. Oxford, Ohio: Miami University, Institute of Environmental Sciences, M.S. thesis.
18. Nelson, Arthur C. (1986). Using land markets to evaluate urban containment programs. *American Planning Association Journal,* Spring, 156-171.
19. Sielski, Debora M. (2002). *The impact of parks on residential property values: An analysis of two parks within Washington County, Wisconsin*. Milwaukee: University of Wisconsin, Master of Urban Planning Program.
20. Cape Ann Economics (2003). *Land values and open space – Leon County*. San Francisco: Trust for Public Land.
21. Miller, Andrew R. (2001). *Valuing open space: Land economics and neighborhood parks.* Cambridge, Massachusetts: MIT Center for Real Estate.

22. Bolitzer, B. and N.R. Netusil (2000). The impact of open spaces on property values in Portland, Oregon. *Journal of Environmental Management*, 59, 185-193.

23. Lutzenhiser, Margot and N.R. Netusil (2001). The effect of open spaces on a home's sale price. *Contemporary Economic Policy*, 19(3), 291-298.

24. Nicholls, Sarah and John L. Crompton (2005 in press). The impact of greenways on property values: Evidence from Austin, Texas. *Journal of Leisure Research*.

25. Irwin, Elena G. (2002). The effects of open space on residential property values. *Land Economics* 78(4), 465-480.

26. Ready, Richard & Charles Abdalla (2003). *The impact of open space and potential local disamenities on residential property values in Berks County, Pennsylvania.* State College, Pennsylvania: Deparment of Agricultural Economics and Rural Sociology, The Pennsylvania State University.

27. Ernest & Young (2003). *Analysis of secondary economic impacts of New York City parks.* New York City: New Yorkers for Parks.

28. Sainsbury, James C. (1964). *The impact of urban parks on surrounding residential areas: A case study*. Seattle: University of Washington, M.S. thesis.

29. Hendon, William S., James W. Kitchen, and Bruce Pringle (1967). *The sociological and economic impact of urban parks in Dallas, Texas.* Lubbock, Texas: Texas Tech University Press.

30. Weicher, John C. and Robert H. Zerbst (1973). The externalities of neighborhood parks: An empirical investigation. *Land Economics,* May, 99-105.

31. Coughlin, Robert E. and Tatsuhiko Kawashima (1973). *Property values and open space in Northwest Philadelphia: An empirical analysis.* Philadelphia: University of Pennsylvania, Regional Science Research Institute, Discussion Paper #4.

32. Moorhouse, John C. and Margaret Smith (1994). The market for residential architecture: 19th century row houses on Boston's South End. *Journal of Urban Economics*, 35, 267-277.

33. Travel, Mark (2003). *Whitmire Community Garden study*. University of Missouri, St. Louis: Public Policy Research Center.

34. Conway, Dolores (2002). The effects of green space on housing prices. *Marshall Magazine*, Spring, 32-37.

35. Princetl, Stephanie, Jennifer Wolch, John Wilson and Travis Longcore (2003). *Toward a sustainable Los Angeles: A "nature services" approach*. Los Angeles: University of Southern California, Center for Sustainable Cities.

36. Acharya, Gayatri and Lynn Lewis Bennett (2001). Valuing open space and land use patterns in urban watersheds. *Journal of Economics and Sociology*, 37(2), 165-177.

37. Vrooman, David H. (1978). An empirical analysis of determinants of land values in the Adirondack Park. *American Journal of Economics and Sociology,* 37 (2), 165-177.

38. Brown, Tommy L. and Nancy A. Con-

nelly (1983). *State parks and residential property values in New York.* Ithaca, New York: Cornell University, Department of Natural Resources, Unpublished paper.

39. Curtis, Rita E. (1993). *Valuing open space in Maryland: An hedonic analysis*. College Park: University of Maryland, M.S. thesis.

40. Geoghegan, Jacqueline, Lisa A. Wainger and Nancy e. Bockstael (1997). Spatial landscape indices in a hedonic framework: an ecological economics analysis using GIS. *Ecological Economics*, 251-264.

41. Gartner, William C., Daniel E. Chappelle and T. C. Girard (1996). The influence of natural resource characteristics on property value: A case study. *Journal of Travel Research,* 25 (1), 64-71.

42. Epp, Donald J. (1971). The effect of public land acquisition for outdoor recreation on the real estate tax base. *Journal of Leisure Research,* 3 (1), 17-27.

43. Barron, James C. and J. Dean Jansma (1970). Impact of public land programs on local government finances. *American Journal of Agricultural Economics,* 52, 365-371.

44. Division of Recreation Resource Planing, National Park Service (1961). *The economics of establishing National Parks.* Washington, DC: U.S. Government Printing Office.

45. Weiss, Shirley H., Thomas G. Donnelly, and Edward J. Kaiser (1966). Land value and land development influences factors: An analytic approach for establishing policy alternatives. *Land Economics,* 42, 230-233.

46. Kitchen, James W. and William S. Herndon (1967). Land values adjacent to an urban neighborhood park. *Land Economics,* 43, 357-360.

47. Hendon, William S. (1972). The park as a determinant of property values. *The Real Estate Appraiser,* September/October, 73-79.

48. Yoegel, John Allen (1986). *An inquiry into the impact of park land location upon single family residential property values in middle and upper income communities in Westchester County, New York.* New York: New York University, Department of Public Administration, Ph.D. dissertation.

49. Schroeder, Timothy D. (1982). The relationship of local park and recreation services to residential property values. *Journal of Leisure Research,* 14 (3), 223-234.

50. Arthur, Louise M. (1983). Comments on an article, "The Relationship of local park and recreation services to residential property values." *Journal of Leisure Research*, 15 (3), 245-246.

51. Schroeder, Timothy D. (1983). Use of multiple regression in recreation research: A discussion of several issues. *Journal of Leisure Research,* 15 (3), 247-250.

CHAPTER 4

The Evidence Relating to Greenway Trails

REVIEW OF EMPIRICAL FINDINGS

SUMMARY

CHAPTER 4

THE EVIDENCE RELATING TO GREENWAY TRAILS

In the 1990s, there was an explosion of interest in developing greenways. A greenway is any "linear open space established along either a natural corridor such as a river front, stream valley or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, a scenic road, or other route" (p. 1).[1] It can be as elaborate as a lengthy, paved hiking-biking-riding route, or as simple, natural and ecologically important as a stretch of stream bank left wild.

Greenways are not new. The concept grew out of the work of Frederick Law Olmsted, who coined the word parkway in 1865 and was the designer of some of the nation's first linear parks. It evolved from the development of the Appalachian Trail in the 1920s, the urban parkways of the 1920s and 1930s, and the British concept of greenbelt areas around neighborhoods and communities. The term greenway is derived from taking a syllable from the words greenbelt and parkway.[1] The term first appeared in the 1950s, but it was brought into common use and given national prominence in 1987 by the President's Commission on Americans Outdoors which reported that there was a clamor for outdoor recreational facilities closer to home.[2] Their response was a vision of a system of recreational corridors: "fingers of green that reach out from and around and through communities all across America" (p. 142). They called for a "prairie fire of local action" (p. 73) to implement the vision and recommended that "communities establish Greenways, corridors of private and public recreation lands and waters, to provide people with access to open spaces close to where they live, and to link together the rural and urban spaces in the American landscape" (p. 142). The fire was ignited, a groundswell of public support emerged, and greenways have since been developed on public land or on easements across private property in hundreds of communities across the country.

Greenways have multiple purposes, but from a recreation perspective they have two major functions: (1) to link and facilitate hike and bike access between residential areas and parks; and (2) to provide opportunities for the

linear forms of outdoor recreation (e.g. hiking, jogging, bicycling, inline skating, horseback riding, cross-country skiing, and ordinary walking) in which many North Americans engage today. These recreational roles require the development of trails along the greenways.

It is possible to conceptualize greenways whose width at one extreme may be measured in miles, while at the other extreme their width may be measured in single-digit feet. In the former case, the impact of greenways on proximate properties may resemble that of large park or open space areas, and greenway trails (the pathways within a greenway corridor on which human linear use is concentrated) will occupy only a minuscule area of the corridor. In these instances, the impact of greenways on proximate property values may resemble that of large parks and open spaces which was discussed in the previous two chapters.

The rationale underlying the proposition that greenway trails may positively influence property values is conceptually different from that associated with parks in those instances where the greenway is not a wide swath but rather a narrow corridor of which the greenway trail occupies a substantial portion. Narrow corridors do not provide the extended tranquil views which underlie increases in proximate property values associated with extensive green areas, so enhanced property value associated with greenways of this nature is likely to come from access to the linear trail, rather than from views of nature or open space. It is the trail's functionality or activity potential that is likely to confer most added value, in lieu of the panorama of attractive open space.

The suggestion that access to narrow trails of this nature enhances property values is nearly always controversial when the issue is debated in communities. Much depends on perceptions of who the users of trails are likely to be. For example, if it is perceived that the trail may facilitate the movement of economically disadvantaged residents through a relatively affluent neighborhood, then the trail may be supported by the former but resisted by some people in the latter area who fear a decrease in their property value.

Exhibit 4-1 Controversy over Heritage Trail

The county commissioners held a hearing to take up the question of converting a rail right-of-way into a trail. When they arrived at the meeting, supporters of the trail were surprised to find the auditorium packed with right-of-way neighbors emotionally claiming that a recreation trail would bring "criminal elements" from Dubuque into their rural communities. Many had assumed they owned a reversionary interest in the right-of-way, although their deeds showed otherwise. Moreover, since there had been a history of trespassers and vandals abusing railroad property, the abutting owners and their allies assumed that a trail would compound the problem. Many of the trail neighbors simply wanted some measure of control over the use of the railbed land. Others, more fearful, vowed they would burn the bridges before they would allow the Heritage Trail to be built. They were referring to the wooden trestles that crossed and recrossed the Little Makoqueta River, which the rail-trail followed along part of the proposed twenty-six mile route. All that was needed to scotch the plan, the extremists figured, was a few crucial missing links, since it would be beyond the means of the project to build new bridges. And then the land would be theirs.

Source: Charles E. Little (1990) Greenways for America. Baltimore: John Hopkins University Press.

Exhibit 4-1 refers to the Heritage Trail which is featured later in this chapter. It is a typical illustration of the controversies that often erupt when rails-to-trails projects are suggested. In some instances the opposition is too strong to surmount, but after five years of persistent struggle, Heritage Trail was completed and the evidence presented later in the chapter in Exhibit 4-6 indicates that the concerns of opponents were groundless.

Rather than increasing property values, some argue that in these narrow corridor contexts, greenway trails will cause property values to decline because they encourage a flow of non-local people to pass through neighborhoods. The concern is that this will result in a loss of privacy, trespass, litter, noise, increased crime and vandalism, and other problems. Reactions to the widely acclaimed trail around the Inner Harbor area in Baltimore illustrate this point. Town houses on the old wharfs were constructed with large windows so occupants could enjoy the harbor views. Some of these occupants resent people walking on the trail in front of their properties, interrupting their privacy and their views.

However, the concern that there will be negative repercussions associated with a trail does not appear to be supported by the limited empirical literature on this issue, which suggests that while there may be negative aspects to living close to greenways, they are not as serious as many landowners anticipated they would be before they were constructed, and that trails are often better neighbors than landowners expect them to be.[3] Controversy of this nature and concern about the effect of greenway trails on property values was the stimulus for commissioning most of the studies reviewed in this chapter.

The findings reviewed here relate to the perceived impact of greenway trails rather than greenways per se on proximate property values. Although a greenway trail can take multiple forms, the term generally refers to a high standard paved trail that accommodates multiple uses,[4] and this description generally portrays the character of trails reviewed here. For the most part, the trails were located in relatively narrow corridors.

Only two of the eleven studies reported in this chapter,[3,5] appeared in scientific journals. The remaining nine are from consultants' reports, agency in-house studies, or student theses. Thus, it is likely that there are limitations in design, sampling, data collection and analytical techniques, which mean the studies may not meet acceptance standards of social science research. Nevertheless, if some consistent findings emerge across the eleven different studies that are reviewed, then they may offer some useful insights to decision-makers in the absence of any other information to guide them.

Studies discussed in chapters 2 and 3 which measured the impact of parks and open space on property values, invariably measured incremental shifts in property transaction prices or assessed valuations. However, in the case of greenway trails, relatively little research of this nature has been reported. Instead of examining trends in market transactions or assessments, nine of the eleven studies that are reviewed in this chapter used attitude and opinion surveys of homeowners, residents, developers, and realtors. It was assumed that these attitudes and opinions reflected residents' or homeowners' personal experiences, and the professional expertise of developers and realtors. These survey studies are less definitive and convincing than studies that examine trends in market transactions. Nevertheless, until this latter type of research is undertaken, such survey results represent the best available evidence.

REVIEW OF EMPIRICAL FINDINGS

Exhibit 4-2 Adjacent Residents' Perceptions of Trail Impacts on Two Trails in the East Bay Regional Park District on their Property Value (n=410)

Impact of Trail on Property Value	LaFayette-Moraga Trail	Alameda Creek Trail
Increased Value	36%	18%
No Affect	48%	72%
Decreased Value	7%	4%
No Response	9%	6%

The earliest trail impact study was undertaken in 1978 by the East Bay Regional Park District in the San Francisco Bay area.[6] The owners of 410 residences were surveyed. They were located in areas adjacent to either the Lafayette-Moraga or the Alameda Creek trails. The former was developed from an abandoned rail line while the latter was part of a flood control project. Results are shown in Exhibit 4-2. Only 7% and 4%, respectively, of homeowners on the two trails believed their property values had been lowered as a result of the trail's presence.

Almost a decade went by before another trail study was undertaken in 1987 in Seattle to evaluate the effect of the 12 mile Burke-Gilman Trail on property values and crime in residences near and adjacent to the trail.[7] The trail is 8-10 feet wide, asphalt paved, and follows an abandoned railroad right-of-way. It passes primarily through residential neighborhoods, but also through an industrial area, several neighborhood commercial areas, and the University of Washington. It links six parks, and in 1987 was used by 5,000 people a day, of whom 80% were bicyclists.

The trail was opened in 1979, and it was assumed after eight years' experience with it that stakeholders would have formed fairly clear opinions as to its effect on property. Two groups of stakeholders were surveyed by telephone: residents living adjacent (n = 110), and within one block of the trail (n = 159); and real estate agents (n = 75) who bought and sold homes in neighborhoods near the trail.

Results of the residents' survey are summarized in Exhibit 4-3. Three groups of residents were surveyed: owners of single-family homes adjacent to the trail; owners of single-family homes within one block of the trail; and owners of condominiums adjacent to the trail. They were asked two questions: (1) If you were to sell your home today, do you think being near the Burke-Gilman Trail would make the home easier to sell, the home more difficult to sell or have no effect on selling the home? And (2) If you were to sell your home today, do you think being near the Burke-Gilman trail would make the home sell for more, make the home sell for less, or have no effect on the selling price of the home? Similar questions were subsequently used by most of the other reported studies reviewed in this chapter that addressed this issue.

The data in Exhibit 4-3 show that relatively few residents perceived the trail to have a negative influence on their property. More of those living a block away from the trail and condominium owners viewed it as a positive influence on their property than did single-family homeowners who were adjacent to the trail. However, the dominant feature of these results is the large proportion who perceived the trail to have either a neutral impact or ex-

Exhibit 4-3 Results of a Survey of Homeowners on the Burke-Gilman Trail

Type of Homeowner	Impact on Home Saleability				Impact on House Price			
	Positive	Neutral	Negative	No Response	Positive	Neutral	Negative	No Response
Single family home owners adjacent to the trail (n=110)	44%	27%	9%	20%	22%	40%	8%	30%
Single family home owners within one block of the trail (n=159)	52	24	9	15	30	48	7	16
Condominium owners adjacent to the trail (n=100)	52	36	1	11	21	51	2	26

Exhibit 4-4 Real Estate Agents' Views of the Impact of the Burke-Gilman Trail on Residential Property (n=75)

Type of Homeowner	Impact on home saleability			Impact on house price		
	Positive	Neutral	Negative	Positive	Neutral	Negative
Adjacent to the trail	43%	26%	31%	33%	42%	25%
Within 2 blocks of the trail	75	25	0	43	57	0

pressed no opinion. On perceptions of the trail's impact on house prices, approximately two-thirds of respondents were in one of these two neutral categories.

A larger proportion of real estate agents than residents perceived a negative impact on residences adjacent to the trail, but they were still outnumbered by those who saw the trail as having a positive impact on both house price and on home saleability (Exhibit 4-4). None of the 75 agents surveyed perceived the trail to have a negative impact on properties located within two blocks of the trail but not adjacent to it. Indeed, their average view was that these properties sold for an average of 6% more because of the trail.

Not a single resident who was surveyed felt that the trail should be closed, and almost two-thirds of residents believed the trail enhanced the quality of life in the neighborhood.

Exhibit 4-5 Adjacent Residents' Perceptions of the Impacts of Two Trails on Their Property Value (n=74)

Impact of Trail on Property Value	Root River Trail	Luce Line Trail
Increased Value	14%	58%
No Effect	62%	32%
Decreased Value	14%	9%
No Response	10%	1%

The authors of the report concluded:

> In summary, this study indicates that concerns about decreased property values, increased crime, and a lower quality of life due to the construction of multi-use trails are unfounded. In fact, the opposite is true. The study indicates that multi-use trails are an amenity that helps sell homes, increase property values and improve the quality of life (p. 3).

Exhibit 4-5 shows results of a study which reported adjacent residents' attitudes to the Root River and the Luce Line trails in 1988 in Minnesota.[8] Both these trails were converted from abandoned railroad rights-of-way. The sample was relatively small (n = 74) but only 11% of the sample believed the trails lowered their property values. The survey also reported that landowner concerns prior to trail development were greater than the subsequent problems that they actually experienced.

In 1992, the National Park Service commissioned a study of the impacts of three trails which were formed from rail right-of-ways.[9] They were (1) the 26 mile Heritage Trail in Iowa from Dubuque to Dyersville which was rural; (2) the Tallahassee to St. Marks Historic Railroad State Trail in Florida which runs for 16 miles through a mix of settings, primarily rural but including the town of Woodville and several areas of single family home development; and (3) the 7 mile Lafayette-Moraga Trail which featured in the earlier 1978 East Bay study (Exhibit 4-2), and passes through heavily developed, relatively affluent suburban areas.

Similarly sized samples were drawn of property owners who lived adjacent to each trail and those who resided within quarter of a mile but not adjacent to it. Response rates to the eight-page self-administered mail questionnaire ranged from a high of 75% on the Heritage Trail to a low of 58% on the St. Marks Trail with an overall response rate of 66%. In addition, telephone interviews with 25 realtors and appraisers were undertaken in two of the three trail areas, while 17 were interviewed in the less developed Heritage Trail area.

The property owners' responses shown in Exhibit 4-6 indicated that there was relatively little difference in the trails' perceived impacts on property values between those living adjacent and those residing nearby. At the generally rural Heritage and St. Marks trails, between 73% and 90% of respondents reported that the trails had no impact on their property values. Along the suburban Lafayette/Moraga Trail, a much larger proportion perceived there

Exhibit 4-6 Adjacent and Nearby Owners' Opinions about How the Presence of a Trail Affects the Resale Value of Their Property (n=74)

	Heritage		St. Marks		Lafayette/Moraga		Combined	
	Adjacent (n=51)	Nearby (n=49)	Adjacent (n=107)	Nearby (n=92)	Adjacent (n=172)	Nearby (n=142)	Adjacent (n=330)	Nearby (n=283)
Lower Value	14%	2%	11%	2%	3%	1%	7%	2%
Increased Value	14	8	16	21	53	47	35	31
No Effect	73	90	74	77	44	52	58	67

Exhibit 4-7 Realtors Perceptions about the Effect of Three Trails on Their Property

Type of Impact	Heritage (n=17)			St. Marks (n=25)			LaFayette/Moraga (n=25)		
	Positive	Neutral	Negative	Positive	Neutral	Negative	Positive	Neutral	Negative
Impact on saleability of homes adjacent to the trail	6%	94%	0%	20%	80%	0%	20%	48%	32%
Impact on saleability of homes nearby	12	88	0	24	76	0	56	44	0
Impact on resale value of homes adjacent to the trail	12	82	6	20	80	0	24	52	24
Impact on resale value of homes nearby	12	88	0	20	80	0	48	52	0

to be an effect and most thought it was positive. Overall, only 7% of adjacent homeowners and 2% of nearby Lafayette/Moraga residents thought the trails lowered the value of their property.

Realtors and appraisers both believed the trails would have little effect on property values (increases or decreases in value) or saleability (home sells faster or slower). Again, there was more perception of impact on the suburban Lafayette/Moraga Trail and, in contrast to property owners, a greater proportion felt it was negative than believed it was positive (Exhibit 4-7). Buyers' concern about possible loss of privacy was given most frequently as the reason for the effect.

The Brush Creek Trail in Santa Rosa, California, is a 1.25 mile, 10 feet wide asphalt hike and bike trail. It had been operating for 9 years when 75 of the 85 homeowners whose properties were adjacent to it were interviewed in 1992.[10] The dominant response to the saleability and value questions was "no effect" (49% and 69%, respectively), while 29% and

20%, respectively, reported a "slight" positive effect. Only 17% of the sample perceived the trail to have a negative impact on saleability and 8% on value.

In 1994, the Maryland Greenways Commission funded an analysis of the impact of the Northern Central Rail Trail.[11] Surveys distributed to property owners and trail users, yielded returns of 465 (26.7% response rate) and 199 (16.2% response rate), respectively. Out of this total of 664 respondents, 545 responded to a question asking how much value the trail added to property within walking distance of it. The authors noted that some properties were negatively influenced at peak times when parking areas became full and users parked on nearby private properties. This may have contributed to 7% of respondents believing the trail lowered nearby property values, and a further 30% believing it had no impact on values.

The 63% (n = 341) who felt it had a positive effect, "guesstimated" that it added on average $2,459 to the value of a typical residence. However, this guesstimate could not be confirmed in an analysis of actual market transactions in the area, because too few property exchanges had occurred in the vicinity of the trail since it had been developed for an identifiable pattern to emerge. As was the case in some of the previous studies discussed in this chapter, respondents believed that properties within 1,000 feet of the trail, but not abutting it, generally experienced the greatest positive impacts on value.

When the property owner respondents (n = 442) were asked if they believed their house's proximity to the trail would be a positive selling point, 68% answered affirmatively. This belief was endorsed by developers and brokers who were also interviewed as part of the study.

They perceived the trail's main benefit to be increased saleability of listings. One appraiser noted how frequently brokers advertised the proximity of a property to the trail and commented, "they wouldn't advertise the proximity of the trail if it didn't help sell property."

Three trails in the metro-Denver area were selected to study the impact of urban trails on adjacent and nearby property values in a 1994 study sponsored by the Conservation Fund and The Colorado State Trails Program.[12] They were: (1) a 1.5 mile section of the Highline Canal Trail, which is paved and is the most highly used trail in metro-Denver; (2) the Weir Gulch Trail, which is a small paved footpath that has evolved into a connector path between neighborhood parks; and (3) a section of the asphalt Willow Creek Trail, which connects community parks and open space and is also used primarily by neighborhood residents. Since all the trails were more than ten years old, it was assumed that whatever effect they had on property values would have occurred.

Following the precedent of several of the previous studies, data were collected by telephone surveys from (1) 26 residents who owned or rented property adjacent to the trail; (2) 143 residents within one block of the trail; and (3) 11 real estate agents who did business in metro-Denver. The results are summarized in Exhibit 4-8. The overall pattern of the data clearly indicate that an insignificant number of respondents perceived the trails to have a negative impact on the saleability or selling price of the property. The results from the residents adjacent to a trail and the realtors' sample should be considered tentative because of the very small sample sizes which means that changes in a very few cases cause the percentages to change dramatically. However, the general pattern among both homeowner groups was to favor a neutral impact, while realtors favored a positive impact.

A mail survey undertaken in 1995 of 145 households located in close proximity to three greenways in Cary, which is a rapidly growing city in the Research Triangle region of North

Exhibit 4-8 Residents' and Realtors' Perceptions of the Impact of Three Trails on Residential Property

Types of Homeowner	Impact on Home Saleability				Impact on House Price			
	Positive	Neutral	Negative	No Response	Positive	Neutral	Negative	No Response
Properties adjacent to a trail (n=26)	46%	38%	8%	8%	35%	46%	4%	15%
Properties within a block of the trail (n=143)	33	50	5	12	33	50	5	12
Realtors (n=11)								
- Adjacent to the trail	73	18	9	0	55	36	0	9
- Within 1 block of the trail	64	36	0	0	9	91	0	0

Carolina, yielded responses from 109 (75%) of them.[13] The lengths of the three greenways were 0.8 mile, 2.5 miles, and 0.79 miles. The surveyed residences typically were single family homes, and some residents in one of the three areas had vociferously opposed development of the greenway. Although respondents reported that the public use of greenways caused some problems for adjacent residents in the form of trespassing, noise, roaming pets, and loss of privacy, the occurrence of these problems was generally not perceived to negatively impact property values since 55% believed that the greenways enhanced the resale value of their property. Only 3% reported decreases as a result of the greenway near their home, while the remaining 42% perceived the greenway to have no effect on their property value.

In 1997, the Green Bay-Brown County Planning Commission in Wisconsin investigated the impact of Brown County's Mountain-Bay Trail on property values.[14] The study focused on the Highridge Estates subdivision in the Village of Howard. The initial phase of the subdivision had been developed and a new addition was currently under development. The study is particularly significant because, unlike all previous studies, it used actual property values rather than residents' perceptions. A comparison of the lots within the original Highridge Estates subdivision indicated that those lots located immediately adjacent to the trail sold for an average of $34,200, while the remaining lots (of similar size and character) sold for an average of $31,400, a difference of $2,800 or 9 percent. In addition to selling for more, the lots along the trail also sold faster. According to representatives of the realty companies involved in the development, the lots adjacent to the trail sold immediately, while the lots further away did not sell as fast.

Recognizing what had happened, the realty companies decided to restructure the pricing of future lots located along the Mountain-Bay Trail. Thus, in the addition of Highridge

Exhibit 4-9 Respondents' Estimates of the Impact of a Greenway on their Home

Percentage impact on value	Sample Total (n=59)	Live on greenbelt (n=39)	Do not live on greenbelt (n=20)
20% increase	17 (29%)	15 (38%)	2 (10%)
15% increase	19 (32%)	10 (26%)	9 (45%)
10% increase	1 (2%)	1 (2%)	0 (0%)
5% increase	19 (32%)	11 (28%)	8 (40%)
5% decrease	2 (3%)	2 (6%)	0 (0%)
10% decrease	1 (2%)	0 (0%)	1 (5%)

Estates, the average lot located along the trail was priced at $44,900, compared to $35,700 for slightly larger lots not located along the trail, a difference of $9,200 or 26 percent.

For developers considering greenway trails in their projects, the trade-off often is whether the trail creates more value than would be forthcoming if the land were incorporated into private backyards. Greenway Parks in Dallas is a long-established subdivision. In some sections of it the lots incorporate a greenway easement, while in other sections the extra open space was allocated as backyard space instead. A survey of residents in each section showed both groups perceived that the greenbelt trail easement added value to their properties (Exhibit 4-9). Only 3 out of the 59 residents felt that the trail had a negative impact on their home value, while over 60% indicated they thought the greenbelt raised their home values by at least 15%. However, in contrast, an analysis of 33 property transactions in the subdivision found that homeowners paid only an additional $3 for each foot of effective greenway depth when making their home purchase, while they paid $384 for each additional foot of depth in private backyard space.

The Indianapolis Greenways System is comprised of 14 corridors consisting of 11 stream corridors, a canal connector, and two abandoned rail rights-of-way. These are designated on a plan, but most of the land in the corridors is privately owned and does not contain publicly accessible trails. In contrast to all of the previous studies discussed in this chapter, a 1999 study used a database consisting of residential property transactions that occurred within one-half mile of publicly accessible trails in the greenway corridors,[5] rather than relying on people's opinions and attitudes.

The study had two foci. The first was the Monan Trail, which is the flagship of the system. It is the most heavily used trail and when completed will extend north more than 10 miles from the center of the city. It is 10-15 feet wide, asphalt, and sited on an abandoned rail right-of-way. The anecdotal evidence reported in Exhibit 4-10 suggested it had a marked positive impact on proximate property values. The second focus was on publicly accessible trails in the other corridors.

The hedonic model results indicated a premium of 14 percent ($13,056) of the price of an average property was attributable to the

Exhibit 4-10 Anecdotal Evidence of the Impact of the Monan Trail

"Since Indianapolis does not have any mountains or oceans, the Monan has become an important natural feature" said the developer of 148 condominiums adjacent to the trail. "If developers find any property along the trail, they'll purchase and develop it." He said he paid 50 percent more for the 12-acre site than he'd have paid if the property had not been on the trail. Likewise, condos close to the trail would be priced 10 percent to 15 percent more than similar homes farther away. "It's hard to quantify demand for the trail," he said, "but we know it's very high." Another developer said, "I can't give you an exact dollar value, but it's easier to sell homes on the Monan."

Source: Gargi Chakrabarty (2002). Monan affecting realty prices. *The Indianapolis Star*, October 28.

"Commercial property sells at $70 to $120 per square foot. Being along the trails adds $2 - $3 per square foot. Multiply those few dollars by a few thousand square feet, and it's a tidy premium. J.K. Wall (2002). Trail spurs business. *The Indianapolis Star*, October 28.

Monan Trail. When this premium was applied to all 8,862 households in the half-mile Monan Trail zone, the total incremental increase in property values was $115.7 million.

These results generally corroborated the findings of an earlier study of the perceptions of neighbors of the Monan Trail.[16] When asked whether the Monan Trail "increased," had "no effect," or "lowered" the resale value of their property, nearly two-thirds (65.9 percent) of those who responded said they believed that the trail increased value while nearly 29 percent responded "no effect." Approximately 50 percent said that the effect on resale value was less than five percent, while almost 29 percent said the effect was between five and ten percent, and about 20 percent thought the impact on value was greater than 10 percent.

Homes within the half-mile catchment area of the other publicly accessible rails, however, had a moderate negative effect of $1,025 on property values. If this negative premium was applied to all the 28,326 households in the zones of the other trail corridors, the aggregate effect would be a loss of $29 million. Hence, the study provided contrasting results. Those sections of all the greenways that had no public accessible open space but were essentially "conservation corridors" had a proximate premium of $5,317 which was slightly higher than the premium for greenway segments with trails which was $4,384.[17]

The authors concluded that "some greenways, but not all, have positive impacts on property values." The mixed results may be a function of the half-mile distance that was used. Most value accrues within 3 blocks or 600 feet, and it seems improbable that homes in the outer areas of the 2,640 foot zone would experience any substantive proximate premium from trails.

SUMMARY

In the 1990s, there was exponential growth in interest in developing greenway trails. The nature of responses to greenway trails is likely to vary according to individuals' value systems and a trail's context. Thus, even narrow greenway corridors in densely developed areas may offer meaningful open space and aesthetic value to some owners. The natu-

ral habitat and associated wildlife in a narrow wetland in a greenway corridor, for example, is likely to be more of an amenity to some buyers than living adjacent to a large golf course.

Some potential buyers of a property may have no interest in hike/bike trails or linear recreation activities, so for them there is no positive counterbalance for the potential negative impacts of privacy loss, people flow and noise. For other potential buyers, especially perhaps those with young children, hiking, biking, and linear recreation activities may be a central feature of their lifestyle, so access to trails far outweighs the perceived potential negative outcomes. These dichotomous lifestyles suggest why some are likely to respond positively to trails, while others remain more circumspect.

Although the sample sizes of many of the reviewed studies were small, the consistent pattern emerging from them and the diversity of milieus in which they were conducted, enables a reasonable level of confidence to be placed in generalizations drawn from them. Across the studies there was broad consensus that trails have no negative impact on either the saleability of property (easier or more difficult to sell) or its value. There was a belief among some, typically between 20% and 40% of a sample, that there was a positive impact on saleability and value. However, the dominant prevailing sentiment was that the presence of a trail had no impact on these issues.

The challenge for managers is to design trails to alleviate concerns about loss of privacy. The issue was encapsulated in the following statement from one of the studies reviewed:

> A home with a trail running very close behind it with no fencing or screening could be affected adversely, while an identical home with private trail access across a well screened yard might be much more desirable as a result. Several professionals discussed the impact of the trails as a "mixed bag," where the benefits of convenient trail access and living near undeveloped open space had to be weighed against some loss of privacy for adjacent properties. They felt the relative importance of these positive and negative impacts depended on the situation of each particular property and the feelings of each potential buyer (p.111-15).[9]

Greenway trails take multiple forms[4,18] and at this time there is little understanding of what aspects of a greenway cause impacts on property values. The discussion in chapter 3 showed that both design and use characteristics were likely to have a substantial differential effect on the impact of parks on property values, but there has been no empirical verification of this in the context of greenway trails.

Most people intuitively accept that proximity to a park or golf course often has a positive impact on property, but this acceptance does not extend to trails where any added value accrues from access rather than vista. Thus, it seems likely that there will be an expanded number of trail impact studies commissioned in the coming years reflecting the growth in greenways development, because some residents will invariably be concerned about their potential for negative impacts on existing neighborhoods. Commissioning these studies is a necessary defensive strategy that greenway advocates have to support if they are to alleviate the legitimate concerns of neighborhood opponents.

References

1. Little, Charles E. (1990). *Greenways for America*. Baltimore: Johns Hopkins Uni-

versity Press.

2. The President's Commission on Americans Outdoors (1987). *Americans outdoors: The legacy, the challenge.* Washington, DC: Island Press.

3. Moore, Roger L., Alan R. Graefe, & Richard J. Gitelson. (1994). Living near greenways: Neighboring landowners' experiences with and attitudes toward railtrails. *Journal of Park and Recreation Administration* 12(1), 79-93.

4. Moore, Roger L., & D.T. Ross (1998). Trails and recreational greenways: Corridors of benefits. *Park & Recreation* 33(1), 68-79.

5. Lindsey, Greg, Joyce Man, Seth Payton & Kelly Dickson (2004). Property value, recreation values and urban greenways. Journal of Park and Recreation administration, 22(3),

6. East Bay Regional Park District (1978). *A trails study: Neighbor and user viewpoints*. Oakland, California: EBRPD.

7. Puncochar, B. & P. Lagerway (1987). *Evaluation of the Burke-Gilman Trail's effect on property values and crime*. Seattle, Washington: Engineering Department.

8. Mazour, Leonard P. (1988). *Converted railroad trails: The Impact on adjacent property.* Manhattan, Kansas: Kansas State University, M.S. Thesis.

9. Moore, Roger L., Alan R. Graefe, Richard J. Gitelson, and Elizabeth Porter (1992). *The impacts of rail-trails: A study of the users and property owners from three trails.* Washington, DC: Rivers, Trails and Conservation Assistance Program, National Park Service.

10. Murphy, Michelle Miller (1992). *The impact of the Brush Creek Trail on property values and crime*. Sonoma State University: Environmental Studies and Planning Dept.

11. PKF Consulting (1994). *Analysis of economic impacts of the Northern Central Rail Trail.* Annapolis, Maryland: Maryland Greenways Commission, Maryland Department of Natural Resources.

12. Alexander, Leslee T. (1995). *The effects of greenways on property values and public safety*. Denver, Colorado: Colorado State Parks, State Trails Program and The Conservation Fund.

13. Tedder, Lauren Allisen (1995). *Do greenways make good neighbors? Evidence from a survey of adjacent residents in Cary, North Carolina*. Chapel Hill, NC: Center for Urban and Regional Studies, University of North Carolina.

14. Green Bay-Brown County Planning Commission (1997). *Recreation trails, crime, and property values: Brown County's Mountain Trail and the proposed Fox River Trail*. Green Bay, WI: Green Bay-Brown County Planning Commission.

15. Peiser, Richard B & Gregory M. Schwann (1993). The private value of public open space within subdivisions. *Journal of Architectural and Planning Research* 10(2), 91-104.

16. Eppley Institue for Parks & Public Lands (2001). *Monan Trail, Indianapolis, Indiana Trails Study*. Bloomington, Indianan: Eppley Institute for Parks and Public

Lands.

17. Lindsey, Greg, Seth Payton, Joyce Man, & John Oltensmann (2003). *Public choices and property values: Evidence from greenways in Indianapolis*. Indiana University: Center for Urban Policy and The Environment.

18. Shafer, C. Scott, David Scott & Jennifer Mixon. (2000). A greenway classification system: Defining the function and character of greenways in urban areas. *Journal of Park and Recreation Administration* 18(2), 88-106.

CHAPTER 5

The Impacts of Water-Based Features on Property Values

RURAL/RECREATIONAL LAKES AND RESERVOIRS

RESORT-BASED COASTAL SHORELINES

URBAN AND RESIDENTIAL WATERFRONTS

WATER QUALITY

WETLANDS

CONCLUSIONS

CHAPTER 5

THE IMPACTS OF WATER-BASED FEATURES ON PROPERTY VALUES

*BY SARAH NICHOLLS**

In this chapter, research findings relating to the impacts of proximity to, and views of, various types of water-based features on property values are discussed. Findings related to the effects of views of and access to rural and recreational lakes and reservoirs, resort-based coastal shorelines, and urban and residential waterfronts; changes in water quality; and, the effects of proximity to wetlands, are reported. In each section, the findings are reported in chronological order. Generally, the most reliable and valid studies are likely to be most recent (i.e., those reported near the end of each section) since more rigorous analytical tools were available to the authors in later years.

RURAL/RECREATIONAL LAKES AND RESERVOIRS

One of the earliest studies of the impacts of water resource development projects on surrounding property values investigated the effect of reservoirs in the Tennessee Valley.[1, 2] The authors compared the sale prices of properties around existing reservoirs to those of similar properties in an area where no reservoir existed. As anticipated, they found a significant positive relationship between lakefront location, distance to lake, and property value. When they applied the figures to the site of a proposed new reservoir, the predicted increase in land values due to the reservoir's location amounted to $1.96 million (1960 dollars).

The authors noted that not all recreational benefits likely to be produced by such a water development would be reflected in these land value increases, however. This is because they fail to include benefits obtained by users who do not own property in the area. The proportion of benefits not measured by land values would therefore depend upon the amount of

* Sarah Nicholls is an Assistant Professor in the Departments of Community, Agriculture, Recreation & Resource Studies, and Geography, at Michigan State University.

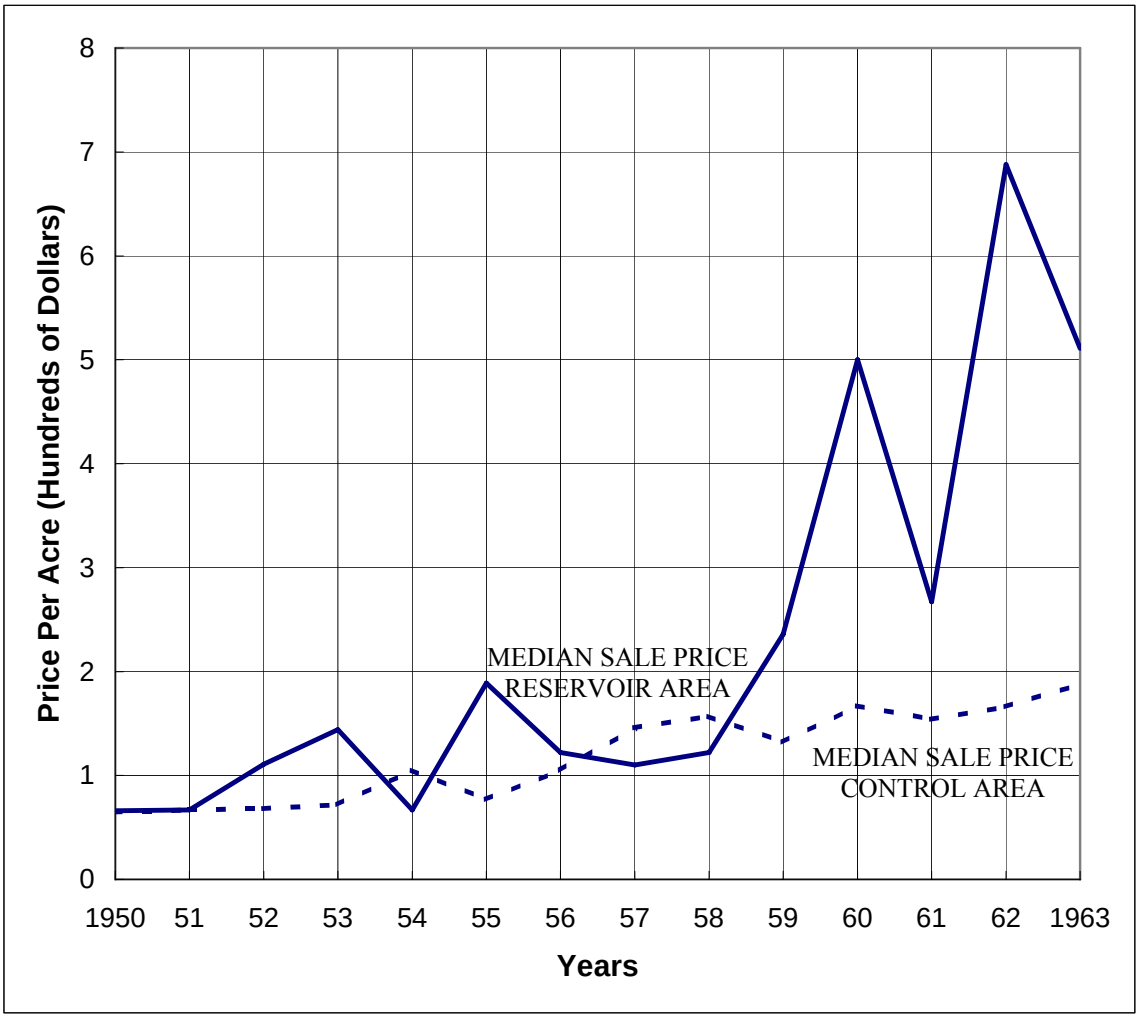


Exhibit 5-1 Comparison of the Median Per Acre Sale Price in the Pearl River Reservoir and Control Areas 1950-1963.

public access to the waterfront; these could be calculated by identifying willingness to pay in areas where fees were charged for entrance, but would still leave unmeasured benefits obtained by those who might enter without paying a charge or simply drive past to admire the view.

The influence on land prices of the Pearl River Reservoir near Jackson, Mississippi was calculated by comparing sales prices of properties around the reservoir with those in a control area.[3] In addition, values were examined pre and post the announcement of the construction of the project. Differences between the two areas and time periods were then attributed to the speculative influence of the reservoir in terms of future benefits expected to flow from it.

Exhibit 5-1 shows the impact on land value of the 1958 official approval by voters that confirmed the project would proceed. The trend line of the median per acre sale price of properties in the control area did not change after this announcement. In contrast, the sale

prices of reservoir impacted properties increased dramatically after 1958. The average yearly increase in the reservoir area from 1950 to 1958 was 9% per year. In 1959, the annual increase was 116%, or 107% above normal! Increases of similar magnitude occurred in subsequent years.

The disadvantage of the method used in the two studies reported above, that of comparing values in the area in which the project is located with those in a control area, is the requirement that the two regions be similar with respect to all conditions other than the facility. This is unlikely, so to attribute the entire difference between values in the control and experimental areas to the development may be optimistic.

A subsequent study in 1968 measuring the impact of a 2,250-acre water-based state park in Pennsylvania suggested an alternative approach.[4] By comparing the values of the same set of properties before and after the creation of the park, it was possible to control for variations between areas and more convincingly assess the impact of the development itself. The authors concluded that the water-based recreation facilities significantly and positively influenced rural property values. In addition, they discovered that the structure of the rural land market had been affected, in terms of the typical size of properties transferred (sales of smaller parcels of land without any buildings increased particularly sharply) and land use patterns (a definite shift from agricultural to residential use was noted).

Properties on 2,131 tracts of land surrounding 60 artificial lakes in the state of Wisconsin were investigated in the late 1960s with the purpose of determining how lakeshore property values varied with lake attributes.[5, 6] The characteristics investigated included swampiness, topography, lake water quality, lake size, and water level fluctuations. As might be expected, swampy land was found to be less valuable and less likely to be improved than land with better drainage. Topography made a "moderate but consistent" contribution to property values; lakes whose banks were either steeper or gentler than average tended to experience lower land values. However, while there were fewer improvements on land around lakes with steep shores, those structures that had been erected tended to be of higher value than average.

Water quality was also found to be an influential factor on property values, with cleaner lakes commanding higher prices than polluted ones. Size of lake was, however, insignificant; there was no consistent increase in property value with each additional acre of lake surface. Somewhat unexpectedly, lake level fluctuation was found to be insignificant, i.e., properties on lakes with high levels of fluctuation were found to be no less valuable than those on stable-level lakes. The authors suggested that fluctuations experienced in the study area during the study period were not large enough to have had any negative influence.

The impact of ownership on property values was also investigated to see whether land on lakes with a high proportion of privately owned property was more valuable than land on lakes around which some land was publicly owned. In general, the authors found that property was more valuable in areas without public lands nearby. However, some of the most valuable properties were located on lakes near public parklands, indicating the desirability of residing close to a natural, protected area.

A 1969 study in Colorado compared land values over time at three reservoir and two control areas (the effects of two of the three reservoirs were combined into a single impact area).[7] Control areas were chosen to be as similar in topography and economic use to impact areas as possible, to minimize variations

other than their proximity to a reservoir.

The total increase in property values around the three reservoirs, beyond the net rate of increase observed in the control areas, amounted to more than $8 million over the period under consideration (1946 to 1968). This net increase took into consideration the loss of thousands of acres from the tax rolls due to flooding of land to create the reservoirs. Within the reservoir areas, shoreline plots were generally assessed at double the value of non-shoreline plots. The greatest positive impacts were found on parcels of particularly desirable topography, and those with basic public facilities such as roads and utilities. At one of the reservoir sites, suburban tracts close to the reservoir, combined with all other lakeshore properties, accounted for just 6% of the area's total acreage, but 86% of its land value and 83% of the value of improvements. At the combined two reservoir site, 19% of the acreage accounted for 84% of the value of land in the area. Reservoirs were, therefore, concluded to have a significant net positive impact on the economy in terms of property values.

A survey approach was used in a 1973 study which asked lakefront residents of the Kissimmee River Basin, Florida, their perceptions of the impact of lakefront location on the value of their property.[8] A series of questions probed residents with regards both to the price at which they would sell their property, and the price they would be willing to pay to obtain it.

Four scenarios were considered: sale or purchase (i) today, i.e., under prevailing water level conditions; (ii) if the lake were permanently lowered by three feet; and (iii) if the lake were subject to fluctuations of up to three feet one or two months a year. Only a selling price was obtained under the fourth scenario, permanent drainage of the lake, since pilot surveys suggested that most interviewees would not purchase property without lake frontage, i.e., their answer would have been "zero." The average results are listed in Exhibit 5-2. In all cases, stated selling prices exceeded buying prices, by $3,400 to $4,700, or 20% to 22%. Some of this discrepancy may be accounted for by the nature of the question with regards to selling price, specifically, that interviewees were being asked to estimate the "personal value", including sentimental or attachment value, of a property that they were unlikely to be willing to sell.

Comparing the average stated selling price were the lake to be drained permanently with current average buying and selling prices indicated that the presence of the lake contributed

Exhibit 5-2 Average Lakefront Property Values as Perceived by Lakefront Residents, Kissimmee River Basin, Florida, 1970

Scenario: Average selling/buying price……	Average Selling Price ($)	Average Buying Price ($)
…… today	27,370	22,710
…… if the lake were permanently drained	14,250	-
…… if the lake were permanently lowered three feet	19,140	15,710
…… if the lake were subject to fluctuations	20,650	17,000

Source: Conner, Reynolds, and Gibbs, 1973, p.22.

to between 37% (buying price) and 48% (selling price) of property values. The value of the entire basin to all 800 lakefront residents' properties was estimated at $7 million. Permanent lowering of the level of the lake would reduce values by approximately 30%, while they would fall 20-25% were the lake to become subject to regular fluctuations. Perceived contribution of the lake to property values was, therefore, substantial.

The authors complemented their survey with a multiple regression analysis of 316 sales of vacant residential lots, 197 of which had neither lake nor canal frontage, 83 of which were on a lake, 30 on a canal, and six on both.[9] Both lake and canal frontage created positive and significant influences on land values. Lake frontage added 64.3% to the value of vacant lots, while canal frontage added 31.0%. For lots with lake and canal frontage, 69.2% was added to the value.

The resident survey had indicated that lake frontage contributed about 48% of the selling price of a property. The discrepancy between the two estimates (the value added estimate for lakes according to the regression analysis was 64%) was attributed to the survey requesting residents to value their entire property (land plus structural improvements), whereas the regression analysis related only to land values.

A 1978 investigation of the effects of reservoir development on rural residential property values in Oregon indicated that properties surrounding the reservoir were, on average, 15% more expensive than non-reservoir properties.[10] On a per acre basis, the reservoir premium amounted to 29%. Homes and other improvements in the vicinity of the reservoir also tended to be larger and in better condition than were homes in the control area.

Little work appears to have been completed on the impacts of lakes and reservoirs on property values since the late 1970s. A 1982 study reported a 0.14% decrease in per square foot land prices with every 1% increase in distance from the shores of Lake Michigan.[11] Sales prices of 294 recreational properties located within one mile of the lake in the states of Michigan and Indiana were analyzed. Distance to the lake accounted for 19% of all variation in land prices.

The most recent study appears to be the examination of the effects of two Lower Colorado River Authority-managed lakes in central Texas on sales values, as reported in 1995.[12] A hedonic, multiple regression-based approach revealed that the premium paid for waterfront property on the two lakes analyzed (Lakes Austin and Travis) was $80,000-$100,000. However, this premium declined rapidly with distance. On Lake Austin, $49,000 to $91,000 of the waterfront premium was lost at locations only 150 feet from the shore, while $60,000 to $89,000 was lost at the same distance from the shore of Lake Travis. In both cases, the positive impact of proximity declined more gently thereafter, reaching a rate of decline of $7.60-7.80 per foot of distance from the shoreline at 1,000 feet and leveling off beyond 2,000 feet. This latter finding was consistent with that reported by others[13] that the contributions of lakes to property values approach zero between 2,000 and 4,000 feet.

Properties located on a bluff overlooking a lake sold for approximately 10% less than did similar waterside properties with direct access to the water. This does not, however, imply that direct access makes up one-tenth of the waterfront premium, since losses in accessibility must be balanced against gains in view, both of the lake and surrounding countryside, as the authors pointed out. Property prices were found to decline between $3,000 and $8,000 for sales at times of low lake levels, defined as levels six feet below normal, though this decrease in value declined with distance from the waterfront. When the authors calculated the aggregate market value increases due

to the recreational and view benefits provided around each of the lakes, they totaled $65.9 million around Lake Austin and $49.2 million around Lake Travis.

RESORT-BASED COASTAL SHORELINES

A 1989 study used regression analysis to measure the capitalization of proximity to coastal recreation sites into property values.[14] The author reported that these values ranged from $2,311 to $70,404. When these values were annualized over a 50-year period, using the average mortgage rate of the study period as the household's private discount rate, household benefits for the properties in the dataset ranged from $300 to $9,152 per annum. Per capita benefits ranged from $86 to $2,615 per annum.

The same, South Kingstown, Rhode Island, data set was used to compare the economic value of beach recreation to the costs of beach nourishment.[15] The value of beach recreation enjoyed by local users of average income and at the average distance from the beach, equaled nearly $20,100. Multiplying the $20,100 average household consumer surplus by the number of households (1,440) yielded a community-wide proximate value of nearly $29 million. This amount exceeded the one-year advance-fill cost estimates of beach nourishment under various erosion scenarios ($204,000-$639,000) considerably. Note that the proximate value figures include neither benefits obtained by non-local users, nor those accruing to beach-dependent businesses. Beach nourishment therefore seemed to be an economically viable option in the context of this case study.

An investigation of the characteristics affecting market values of undeveloped residential beach lots at the Lands End Development on Emerald Isle, North Carolina, was undertaken in 1992 by using sales values of 115 lots and regressing them against nine variables including distance to the beach, ocean view, beach frontage, and location on a pond.[16] In the multiple regression all variables were of the expected sign. Distance to the beach, ocean view, and beach frontage were all significant.

An estimation of the contribution of beach width (as a measure of beach quality) to sales values of residential properties in the resort towns of Garden City and Surfside Beach, South Carolina, was reported in 1994.[17] The authors hypothesized that increasing width would inflate prices due to the recreational and storm protection benefits it provided to property owners. Beach width was found to have a significant positive impact on house prices, with a 10% increase in width producing a 2.6% increase in house values. As anticipated, this impact varied with distance. While a 10% increase in width increased the average price of an average oceanfront property by $4,431, the same width increase produced only a $2,017 rise in the average value of an average house located one-half mile from the beach.

In a subsequent extension of this analysis,[18] it was reported that oceanfront location had a greater positive impact on vacant lots than on built lots, which reflected similar findings reported previously in this chapter with respect to lakefront properties.[9] There were, however, diminishing returns to the value of increasing beach width. An increase from 119 to 120 feet raised values by $371 and $501, for built and vacant lots, respectively, while an increase from 79 to 80 feet raised these values by $558 and $754, respectively.

An hedonic analysis reported in 1997 of 397 single family summer homes sold between 1984 and 1994 on Point Roberts, Washington, indicated that, relative to a property with no view of the ocean, ocean frontage added 147.2% to a home's value, a full ocean view (but without direct ocean frontage) added

Exhibit 5-3 Ocean View Premium (percent) Associated with an Ocean View in Bellingham, Washington

Type of View	Distance from Waterfront			
	0.1 mile	0.5 mile	1 mile	2 mile
Full	68.31%	55.63%	44.72%	30.63%
Superior partial	56.21%	41.78%	29.59%	14.16%
Good partial	37.03%	32.28%	28.01%	22.23%
Poor partial	25.64%	18.61%	12.45%	4.30%

32.0%, and a partial ocean view added 10.3%.[19] In a subsequent study reported a year later, the same authors calculated the value of different qualities of ocean view with distance from the water in Bellingham, Washington.[20] Results are summarized in Exhibit 5-3. For all ocean view quality levels, view value varied inversely and significantly with distance from the waterfront.

URBAN AND RESIDENTIAL WATERFRONTS

The previous two sections have addressed property values around lakes and reservoirs in predominantly rural areas, and in resort-type, coastal towns. In this section the property value impacts of water-based features or developments in urban areas are discussed.

A 1974 study assessed the impact of the construction of an artificial lake on residential property values in Toronto, Canada.[21] The authors compared results from a multiple regression analysis with those from resident surveys. Distance from the lake accounted for only 0.8% of the variation, suggesting that it had virtually no impact on property values. Resident surveys yielded essentially the same result. Eighty-five percent of residents surveyed considered their area a good or excellent place to live, but only 12% regarded the parkland associated with the reservoir as an advantage or benefit (most of the 12% resided contiguous to the park). Seventy-one percent of answers indicated that the reservoir had not affected residential property values.

The authors of a 1977 shoreline study around three lakes in Seattle using the hedonic approach[22] found a view of shoreline to have a significant, positive effect on sales prices of single-family homes. The premium payable for shoreline proximity declined significantly with distance from the shore, and with decreasing width of the shoreline setback (amount of open space around the water's edge). For example, a property close to a 200-foot wide setback sold for $850 more than a similar property close to a 100-foot wide setback. A 300-foot wide setback was expected to command a premium of $1,350 over a setback of 100 feet. Where no setback existed, three-quarters of the value attributable to location in close proximity to the waterfront was lost within 300 feet.

Sales values of condominium units in Knollsbrook Village, Stoughton, and Farrar Pond, Lincoln, both in eastern Massachusetts, were compared in 1978 on the basis of whether or not the unit had a water view.[23] Results of the analyses are listed in Exhibit 5-4. A premium, varying from approximately 5% to 12%, for condominiums with a view of water consistently emerged. However, when ex-

Exhibit 5-4 Comparison of Condominium Sales Prices in Eastern Massachusetts With and Without a Water View

Site	Unit Model	Year	Water View	No water View	Difference
Knollsbrook Village	A	1973	41,700	39,500	2,200 (5.6%)
		1974	45,400	41,700	3,700 (8.9%)
	B	1973	33,800	31,500	2,300 (7.3%)
		1973	36,800	34,900	1,900 (5.4%)
	C	1974	40,800	36,500	4,300 (11.7%)
Farrar Pond	Bedford	1975	67,700	62,500	5,200 (8.3%)
		1976	69,900	64,450	5,450 (8.5%)
	Cambridge	1975	78,000	74,167	3,833 (5.1%)
		1976	81,500	76,500	5,000 (6.5%)

pressed in percentage terms, this premium appeared greater for lower-priced structures than for higher-priced units, suggesting the possibility that a standard differential for a water view exists. This finding is intuitive – a view accrues to the position of a housing unit, not its size, so as the value of the structure increases, the proportionate value of the view is likely to decline.

A number of studies have analyzed the impact of views of and/or access to the Great Lakes on urban property values. A 1980 analysis found that properties located within five miles of Lake Michigan in Chicago, Illinois, sold for a premium of $2,219 compared to properties beyond that distance.[24] None of the properties sampled had a view of the lake, thus, this added value was attributed to recreational opportunities provided by proximity to the lake and to positive local weather effects. Another Chicago study reported in 1980 that apartment rents declined 8.5% with every mile of distance from Lake Michigan, while a view of the lake resulted in a 7% premium.[25]

A 1994 analysis of the impact of Lake Michigan on residential property prices in Chicago assessed the effect of coastal setback (both its existence and width) on values.[26] Values of 547 properties within two miles of Lake Michigan between 1982 and 1984 formed the data base. Two different methods were used in the analysis. They showed that the difference between comparable properties on the coast compared to two miles from it was $24,336 using one method and $13,386 using the other. The author also showed that increasing setback width from 100 feet to 200 feet resulted in an increase in value of $2,064, or $1,938, depending on which method was used. The effect of lake view was approximately $6,700 in both models. In conclusion, both the existence and setback width of Lake Michigan were found to have a significant effect on property values in Chicago.

A similar study reported in 2001 also analyzed the impact of Great Lakes' views on residential property values, in this case a view of Lake Erie in Cuyahoga County, Ohio.[27] The

authors used hedonic techniques to quantify the value of a "clear view" of the lake based on 541 properties with such a view and 631 without a lake vista. On average, homes with a lake view sold for $115,000 more than similar homes with no view. Lake view represented an average of 56% of the value of homes with this attribute.

WATER QUALITY

Another consideration in the impact of water-based features on property values, beyond distance to or view of them, or width of shoreline setback, is water quality. An assessment of the impact on property values of water resource quality changes along the Willamette River, Clackamas County, Oregon, between 1960 and 1970 used sales and assessed values of 98 single-family homes located within 4,000 feet of the shoreline to estimate the influence of the substantial improvements in water quality that had occurred during the study period.[28] As expected, property prices had risen during this time, and the level of increase attributable to water quality improvement declined significantly with distance of the property from the water. Increases of 25%, 17%, 11%, and 5% in value, attributable specifically to water quality improvements, were found for residences at distances of 100, 500, 1,000, and 2,000 feet, respectively, from the water's edge.

The influence of water pollution levels on sales values of 686 and 751 New York properties surrounding Lake Erie and Chautauqua Lake, respectively, between 1950 and 1973 was investigated in 1976.[29] The overall increase in property values between 1950 and 1973 was 254% around Lake Erie and 286% around Chautauqua. However, these averages masked substantial differences between the three sub-regions of each area. Around Lake Erie, increases in value were 188% on the waterfront, 326% waterside, and 256% in non-lake areas. Around Chautauqua, waterfront properties increased 406%, waterside 255%, and non-lake 248%. At Chautauqua Lake, waterfront properties registered the greatest increases in value, but at Lake Erie the greatest positive impact was found for properties removed from the water. The authors attributed these discrepancies to negative effects of pollution and shoreline erosion experienced on Lake Erie. Their conclusions addressed the policy implications of pollution abatement programs on the lake, especially with respect to cost-benefit analysis of such programs and the need to incorporate potential property value and, hence, property tax revenue, increases in such calculations.

A 1979 study determined the effect of water quality on rural, non-farm residential property values along 23 streams (twelve clean and thirteen polluted) in Pennsylvania.[30] The sample consisted of 212 owner occupied residences within 700 feet of one of the streams, sold between 1969 and 1976. The analysis indicated that a one-point increase in pH increased mean sales values by $654, or 5.95%.

Water quality was also found to have a significant influence on recreational properties on St. Albans Bay, Vermont.[31] The investigators discovered that poor water quality in the bay depressed adjacent property values by an average of $4,500, or 20%, compared to similar properties on a larger but cleaner lake nearby. The aggregate estimate of loss to property owners on the bay amounted to $2 million. The authors noted that restoration of water quality would improve not only area property values, but also wildlife habitat, recreational opportunities, and aesthetics.

The effect of water quality on property values adjacent to San Francisco Bay, California, was established by comparing two stretches of the bay with markedly different water qualities.[32] It revealed that residents

placed a statistically significant value on better water quality, though proximity to water of any quality had a significant, positive effect. Thus, while waterfront location was worth $65,000, or 20% of value, in the cleaner Tiburon area, it was valued at $24,000, or 9%, in Foster City, where water quality was poorer. These findings contradict other studies which have discovered decreases in value due to poor water quality. In this case, poorer quality only reduced the level of premium relative to cleaner water.

Water quality, in this case measured by water clarity, was also found to significantly affect property prices around 34 lakes in Maine.[33] Based on an hedonic analysis of 543 lakefront properties sold between 1990 and 1994, it was established that an improvement in water clarity of one meter resulted in an increase in sales value of $11 to $200 per front foot (average lake frontage per property ranged from 82 feet to 191 feet among the 34 lakes). The authors noted that increased community awareness of positive impacts of improved water quality on property values might be an incentive to residents to help prevent pollution and protect lake resources.

The impact of discovery of groundwater contamination on residential property values in Wichita, Kansas, was investigated in 1997.[34] Values were expected by the author to fall due to the legal and financial liabilities of property owners with respect to clean-up, as well as uncertainty in the housing market caused by the stigma of contamination. Sales of 1,392 properties, in the contaminated area and in two control areas, in the twelve months preceding and following the discovery of contamination, formed the basis for the analyses. No significant difference in prices pre and post discovery of contamination was found; neither values of properties nor average length of time taken to sell them were negatively affected by the discovery.

The effect of drinking water quality on house prices was the focus of an analysis of 800 bungalow sales in the Charlesbourg region of Quebec City.[35] Water quality was measured by number and duration of "boil-before-use" warnings issued to households in the 1990-1991 period. A decline in value of $92 per day of warning was identified.

The property market was segmented (into halves and then thirds) in order to test the hypothesis that implicit prices of environmental attributes such as water quality vary according to the education and wealth of property owners, and this hypothesis was supported. The decline in property value per day of water quality warnings was $177 for the upper half portion of the residential market, and $298 for the upper third. Thus, the higher the price of the property, the sharper the decline in market value due to poor drinking water quality. The average decrease in property values due to the effect of drinking water quality problems over the study period was 0.5% for upper-half properties, and 1% for upper third. However, losses amounted from 5.2% to as high as 10.3% for upper-third properties that were subjected to extended periods (seven to thirty-four days) of poor water quality warnings.

The authors concluded that water-related health hazards were shown in this case study to exert a measurable, detrimental impact on property values. They recommended that the public investment needed to address these problems should be considered given the recurrent property tax revenue losses likely to occur if no future action were taken.

The most recent evidence of the effects of water quality on residential property values was provided by an analysis of sales and residual land (sales minus assessed values of any structures on the property) values of 1,183 waterfront properties on Chesapeake Bay, Maryland, reported in 2000.[36] Water quality was measured by fecal coliform counts. High fecal

coliform levels cause unpleasant odors, unsightly waters, and can be hazardous to human health. The average effect on predicted values of a waterfront property of a 100-count change in fecal coliform ranged from $5,114 to $9,824. The authors illustrated potential benefits of water quality improvement in a small region of their study site: a $230,000 increase in property values over just 41 parcels.

WETLANDS

The value of proximity to wetlands in Ramsey County, Minnesota, was demonstrated in two studies reported in 1993 and 1996. Of interest was the balance between benefits, including open space provision and opportunities to view wildlife, and nuisances such as insects and odors. Four types of wetland were analyzed (open water, scrub-shrub, emergent vegetation, and forested), each of which varies in appearance and suitability for wildlife habitat. In the first study (1993), the impact of distance to both each type and the closest type of wetland was investigated,[37] while in the second (1996) only properties within 1,000 meters of a wetland were considered.[38] This stipulation lowered the number of assessed values of single-family residences in the sample from 105,568 to 32,417.

The first study clearly indicated homeowners' preferences for proximity to open water or scrub-shrub wetlands over forested or emergent vegetation. However, while the results were statistically significant, the magnitude of premiums that residents were willing to pay were not large in relation to the overall cost of the housing package. In the second study, the cost of living an additional ten meters closer to a wetland was estimated to be $145 for scrub-shrub, $136 for emergent vegetation, $99 for open water, and -$145 for forested. Comparing the two sets of results, peoples' preferences for scrub-shrub and open water wetlands, and dislike of the forested type, were consistent. The influence of emergent vegetation wetlands proved less clear. The authors concluded that their results indicated homeowners do place varying values on living close to different types of wetland.

Contrasting results were reported in a 2000 study which found that while distance to the nearest wetland and wetland size did significantly influence surrounding property values, wetland type was not a consistently influential factor.[39] Two analyses of 14,485 sales values of properties in Portland, Oregon, were carried out. The first, which was concerned with the influence of the characteristics (size, proximity, and type) of the nearest wetland to each sample property on its sale value, revealed that increasing the size of the nearest wetland by one acre increased sales value by $24.39, while reducing distance to it by 1,000 feet increased value by $436.17.

The second model measured distance to the nearest wetland of each type (open water, scrub-shrub, emergent vegetation, and forested) and shape (areal or linear). Influence varied in magnitude, with areal open water wetlands having the greatest positive impact on property values and linear open water wetlands having a significant, negative effect. Thus, influence of type was inconsistent between the two models. However, the authors reasoned that the second model was the less plausible of the two, and concluded that type was probably insignificant in this study area. It should be noted that all three of these studies captured only private values placed on wetlands by nearby residents. Like all studies of proximate impact on property values, they do not reflect additional, public values of wetlands which are likely to be considerable and felt widely throughout a community (water quality improvements, biodiversity, ground water recharge and discharge, recreation, etc).

CONCLUSIONS

The value of a view of water has been proven conclusively. Of the nineteen studies that included a variable relating explicitly to view of some water-based feature on property values, only one indicated a significant negative impact while one other listed an insignificant result. The latter finding referred to a view of a small, freshwater pond.

The significant, positive effect of a water view obtained in the remaining studies held across all types of water feature, including ocean, lakes, rivers, and canals. Premiums for a water view in the 1970s were generally in the hundreds or low thousands of dollars. Figures ranged from $573 to $1,340 in a 1977 study.[22] By the late 1980s, premiums of expansive ocean views had reached into tens of thousands of dollars. In 1989 figures ranging from $15,000 to nearly $39,000 were reported for a view of San Francisco Bay,[32] though another estimate in 1994 of the value of a view of Lake Michigan was considerably smaller, at $6,700.[26] The most recent estimates of premiums associated with water views have been substantial, nearly $46,000,[38] over $75,000,[17] and $115,000.[27]

When considered as percentages of value added, water views generally produced premiums of between 4% and 12% through the late 1980s. The most recent evidence, however, suggests that the value of such a view is growing in importance relative to the value of a house. Studies since 1997 have listed premiums from 30% to 147% for full ocean views, and over 10% for partial vistas. Lake view premiums of 18% to 56% have been reported. One study found a 115% premium associated with a view of a creek or marsh.

Many analyses have incorporated a variable entitled, "on lake," or "on ocean," to measure impacts of such a position on property values. Such variables do not differentiate between view and recreational access but, like more detailed view specifications, they have consistently indicated positive impacts on property values. Of the nineteen studies reviewed that utilized this type of variable, fourteen reported significant, positive impacts; three reported insignificant results; and, two, a mixture of positive and negative results. Significant positive impacts were recorded for properties on the ocean, on lakes, and on canals. Insignificant results pertained to properties on a pond, and on a "lake or lagoon," while the largest negative impact (a $49,000, or 12%, decline in values) was attributed to location on a flat, featureless lagoon.

The earliest study of premiums related to waterfront location, conducted in 1964, reported an increase in values of $65.42.[1] By the 1970s, premiums had reached the thousands of dollars ($809 to $4,040).[9] A 1982 study listed amounts ranging from $7,900 to $10,200.[11] In 1989, increases of $24,000 to $65,500 were reported.[32] Today, premiums for properties located on a waterfront may exceed $100,000. In percentage terms, premiums associated with waterfront location have varied from 9% to 147%, with figures exceeding 50% not being uncommon. An increase in the proportion of value added which occurred with water views does not appear to have occurred through time, however, though relatively few studies were available over which to identify trends across the period.

The decay impact of increasing distance to a lake or ocean on property values is most conclusive. Each of the eighteen studies including such a variable confirmed this. Unfortunately, however, few studies have estimated the numerical value of increasing proximity. Thus, while a decline in values of $87 with each mile from eleven TVA reservoirs were reported in 1964,[1] and a decrease of over $292 with each mile from a water-based state park in Pennsyl-

vania in 1968,[4] the only recent estimations are of reductions in values of $7.60 to $7.80 per foot at 1,000 feet, becoming insignificant at 2,000 feet, around two lakes in Austin, Texas,[12] and of $188 per meter from a lake in Ramsey County, Minnesota.[38]

The effects of lake size, lake level fluctuations, lake or ocean setback, and water frontage, have also all been analyzed. Lake size has been found to have both positive and insignificant impacts on property values, while lake level fluctuations appear to be either insignificant or negative. Setback width has consistently been found to be a significant positive influence on property values, as has length of water frontage. Presence of a dock was found to have a significant, positive impact on property values in the one study that included this variable.

The studies reviewed have demonstrated that recreational and aesthetic factors can be a major source of land value increase around water-based features such as lakes and on the coast. As demand for the packages of amenities offered by waterside properties increases, prices of, and premiums for, these properties are likely to rise even higher. The tendency of the proportion of value added by a water view to increase through the time period of the studies reviewed reflects the inelasticity in water view amenity supply.

References

1. Knetsch, J.L. (1964). The influence of reservoir projects on land values. *Journal of Farm Economics, 46*, 231-243.

2. Knetsch, J.L. and Parrott, C.J. (1964). Estimating the influence of large reservoirs on land values. *The Appraisal Journal, 32*, 537-546.

3. Mann, W.M., and Mann, J.K. (1968). Analysis of the influence of the Pearl River reservoir on land prices in the area. *The Appraisal Journal,* January, 42-52.

4. Schutjer, W.A., and Hallberg, M.C. (1968). Impact of water recreational development on rural property values. *American Journal of Agricultural Economics, 50*, 572-583.

5. David, E.L. (1968) Lakeshore property values: A guide to public investment in recreation. *WaterResources Research*, *4*(4), 697-707.

6. David, E.L., and Lord, W.B. (1968). Determinants of property value on artificial lakes. *Department of Agricultural Economics Bulletin No. 54.* Madison: University of Wisconsin.

7. Milliken, J.G., and Mew, H.E. (1969). *Economic and social impact of recreation at reclamation reservoirs: An exploratory study of selected Colorado reservoir areas.* Denver, CO: Industrial Economics Division, Denver Research Institute, University of Denver.

8. Conner, J.R., Reynolds, J.E., and Gibbs, K.C. (1973). Activities, characteristics, and opinions of lakefront residents: Kissimmee River Basin, Florida. *Agricultural Experiment Stations Bulletin 755*. Gainesville: Institute of Food and Agricultural Sciences, University of Florida.

9. Conner, J.R., Gibbs, K.C., and Reynolds, J.E. (1973). The effects of water frontage on recreational property values. *Journal of Leisure Research*, *5*(2), 26-38.

10. Boodt, W.A. (1978). *Effects of reservoir recreation development upon rural residential property values*. Doctoral thesis, Oregon State University, Corvallis, OR.

11. Grimes, O.F. (1982). The influence of urban centers on recreational land use. In D.B Diamond and G.S. Tolley (Eds.), *The Economics of Urban Amenities* (pp.143-164). New York, NY: Academic Press.

12. Lansford, N.H., and Jones, L.L. (1995). Effects of LCRA lakes on riparian property Values: Recreational and aesthetic components of lakeside housing in the Colorado River Basin. *Technical Report No. 170*. College Station: Texas Water Resources Institute, Texas A&M University.

13. Dornbush & Barrager (1973) cited in Lansford and Jones op.cit.

14. Edwards, S.F. (1989). On estimating household demand for outdoor recreation from property values: An exploration. *Northeastern Journal of Agricultural and Resource Economics, 18*, 140-148.

15. Edwards, S.F., and Gable, F.J. (1991). Estimating the value of beach recreation from property values: An exploration with comparisons to nourishment costs. *Ocean and Shoreline Management, 15*, 37-55.

16. Wertheim, P., Jividen, J., Chatterjee, D., and Capen, M. (1992). Characteristics that affect the market value of beach lot property. *The Real Estate Appraiser,* August, 59-64.

17. Rinehart, J.R., and Pompe, J.J. (1994). Adjusting the market value of coastal property for beach quality. *The Appraisal Journal, 62*, 604-608.

18. Pompe, J.J., and Rinehart, J.R. (1995). Beach quality and the enhancement of recreational property values. *Journal of Leisure Research*, *27*(2), 143-154.

19. Benson, E.D., Hansen, J.L., Schwartz, A.L., and Smersh, G.T. (1997). The influence of Canadian investment on U.S. residential property values. *Journal of Real Estate Research, 13*(3), 231-249.

20. Benson, E.D., Hansen, J.L., Schwartz, A.L., and Smersh, G.T. (1998). Pricing residential amenities: The value of a view. *Journal of Real Estate Research, 16*(1), 55-73.

21. Day, J.C., and Gilpin, J.R. (1974). The impact of man-made lakes on residential property values: A case study and methodological exploration. *Water Resources Research, 10*(1), 37-43.

22. Brown, G.M., and Pollakowski, H.O. (1977). Economic valuation of shoreline. *The Review of Economics and Statistics, 59*(3), 272-278.

23. Plattner, R.H., and Campbell, T.J. (1978). A study of the effect of water view on site value. *The Appraisal Journal, 46*, 20-26.

24. Diamond, D. (1980). The relationship between amenities and urban land prices. *Land Economics, 56,* 21-31.

25. Pollard, R. (1980). Topographic amenities, building height, and the supply of

urban housing. *Regional Science and Urban Economics, 10*, 181-199.

26. Smith, B.H. (1994). Coastal setback and the impact of water amenities. *Geographical Analysis, 26*(4), 364-369.

27. Seiler, M.J., Bond, M.T., and Seiler, V.L. (2001). The impact of world class Great Lakes water views on residential property values. *The Appraisal Journal, 69*, 287-295.

28. Barrager, S.M. (1974). The impact of water resource quality changes on surrounding property values. *Water Resources Bulletin, 10*(4), 759-765.

29. Fisher, W., Starter, N. and Fisher, A. (1976). Environmental impact on property values along New York's Lake Erie coastline. *Journal of Great Lakes Research, 2*(1), 78-88.

30. Epp. D.J. and Al-Ani, K.S. (1979). The effect of water quality on rural non-farm residential property values. *American Journal of Agricultural Economics, 61*(3), 529-534.

31. Young, C.E., and Teti, F.A. (1984). The influence of water quality on the value of recreational properties adjacent to St. Albans Bay, Vermont. *ERS Staff Report No. AGES 831116.* Washington, DC: Natural Resource Economics Division, Economic Research Service, U.S. Department of Agriculture.

32. Kirshner, D. and Moore, D. (1989). The effect of San Francisco water quality on adjacent property values. *Journal of Environmental Management, 29*, 263-274.

33. Michael, H.J., Boyle, K.J. and Bouchard, R. (1996). Water quality affects property prices: A case study of selected Maine lakes. *Maine Agricultural and Forest Experiment Station Miscellaneous Report No. 398*. Orono, ME: Maine Agricultural and Forest Experiment Station, University of Maine.

34. Dotzour, M. (1997). Groundwater contamination and residential property values. *The Appraisal Journal, 65*, 279-284.

35. Des Rosiers, F., Bolduc, A. and Thériault, M. (1999). Environment and value: Does drinking water quality affect house prices? *Journal of Property Investment and Finance, 17*(5), 444-463.

36. Leggett, C.G. and Bockstael, N.E. (2000). Evidence of the effects of water quality on residential land prices. *Journal of Environmental Economics and Management, 39*, 121-144.

37. Doss, C.R., and Taff, S.J. (1993). The relationship of property values and wetland proximity in Ramsey County, Minnesota. *Economic Report 93-4*. St. Paul, MN: Department of Agricultural and Applied Economics, University of Minnesota.

38. Doss, C.R., and Taff, S.J. (1996). The influence of wetland type and wetland proximity on residential property values. *Journal of Agricultural and Resource Economics,* 21(1), 120-129.

39. Mahan, B.L., Polasky, S. and Adams, R.M. (2000). Valuing urban wetlands: A property price approach. *Land Economics, 76*(1), 100-113.

CHAPTER 6

The Analogous Case of Golf Courses

CHAPTER 6

THE ANALOGOUS CASE OF GOLF COURSES

CONTEXT

The growth in popularity of golf in the United States is shown in Exhibit 6-1.[1] The number of golfers per course peaked in 1990 and has fallen 14 percent since that peak. Similarly, the number of rounds played per course has decreased to its lowest point in the 34 year period shown in Exhibit 6-1 and has fallen by over 17 percent. Thus, the competition among courses to attract golfers has intensified.

The incorporation of golf courses into real estate developments started in earnest in the 1950s, with the widely acclaimed Hilton Head development in South Carolina, and has con-

Exhibit 6-1 The Growth of U.S. Golf

	1970	1980	1990	1995	2000	2003
Golfers (millions)	11.2	15.1	23.0	23.7	25.4	27.4
Rounds Played (millions)	266	358	421	431	518	495
Golf Courses	7,516	9,852	11,178	12,571	14,268	14,827
Golfers Per Course	1,490	1,533	2,058	1,830	1,780	1,847
Rounds Per Course	35,370	36,345	40,340	34,290	36,300	33,378

sistently grown in popularity in each subsequent decade. In the 1980s approximately 35 percent of new golf courses were incorporated into a real estate development and despite the increased competition for golfers this increased to 46 percent in the 1990s which represented almost 1000 courses.[2]

The magnitude of investment to construct a course varies widely according to topography, soil conditions, irrigation needs, drainage requirements, landscaping, the quality of course features such as greens, bunkers and water features, and the costs of labor and materials in the area. However, it is substantial. Design and construction of an 18-hole course is likely to cost between $3 million and $8 million, but in addition the investment includes the opportunity cost of the land. That is, the 150-200 acres which is allocated for the course cannot be sold for building lots. If the average density of the development is three lots per acre, this means that the developer foregoes the revenue from 450-600 lots which at (say) $40,000 each amounts to between $18 million and $24 million. Thus, the total investment to the developer may well be in the range of $20-$30 million. However, some of the opportunity cost is reduced if some of the course is constructed on land considered undevelopable or too costly to adapt for residential development. Further, the course may serve other purposes such as accommodating storm water run-off, or protecting wetlands or other environmentally sensitive areas. These are costs a developer would incur irrespective of whether a golf course was constructed and, hence, do not constitute opportunity costs.

The magnitude of this investment means that the minimum size of the real estate development for a course to be viable is about 400 acres, but this is likely to be marginal and reflect very exclusive and expensive homes. Typically, such developments are 800 acres or larger because such projects allow developers to spread the cost of the golf course over a larger number of residential units. However, the disadvantage of larger projects is that the interest costs of the money borrowed to undertake the development escalate, as they have to be carried for a longer period of time.

THE ANALOGY WITH PARKS

The strategy of constructing golf courses to enhance lot value reflects the thinking of the English pioneers of urban parks--Regent's Park, Prince's Park and Birkenhead Park--which were described in chapter 2. Like those parks, the premiums accruing from the surrounding residential lots pay for the investment in the amenity and generate a higher profit for the development company than it believes would occur if a golf course was not included in the project.

It was noted earlier that this strategy has become relatively prolific in the past two or three decades, but there were pioneering developments in the early 1890s in Florida and North Carolina that deliberately linked golf and real estate with the intent of enhancing value. In both cases the Frederick Law Olmsted firm which championed the linkage with parks in the U.S. (chapter 2) was involved. The firm designed the Mountain Lake Estates, a community that linked winter homes with golf, in Lake Wales, Florida,[2] and America's first golf course village at Pinehurst in North Carolina.[3]

There are three reasons why developers include golf courses and other amenities in their projects: (i) to increase the land values in their development; (ii) to respond to physical planning or ecological conditions, either voluntarily or imposed by regulation, which require a real estate development to accommodate storm water run-off, integrate wetlands or other environmentally sensitive areas, mitigate a site by enhancing bio-diversity through creat-

ing native habitat areas, or buffer disparate uses; and (iii)

to accelerate the absorption of real estate, i.e. to sell their lots more quickly. It has been estimated that the broadening of market appeal and the enhanced image and ambiance that a golf course creates, typically speeds up overall absorption by 20-30% which translates into higher profitability for the developer.[2]

The enhanced land value derives from two sources. The first is image: "Golf is a way to dress up the real estate…The golf course tends to elevate the image of the community and people are attracted to image" (p. 1b).[4] Golf has connotations of affluence and prestige, and some people may seek to enhance their self-esteem or social standing by buying into a development with this type of image. The second source of enhanced value is the visual and physical access to attractive open space that causes individuals to pay a premium price for their homes. Both of these sources are consistent with the reasons for the enhanced value of land around natural parks and open space.

ALTERNATE GOLF COURSE CONFIGURATIONS

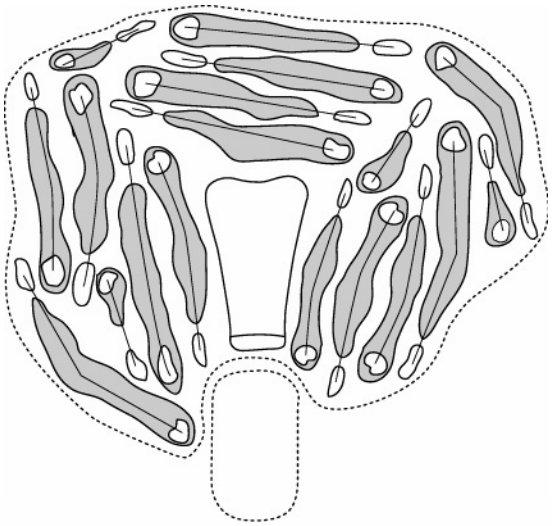
Five basic golf course configurations are recognized: core; double fairway, continuous; double fairway, returning nines; single fairway, continuous; and single fairway, returning nines.[5] These are shown in Exhibit 6-2. Their potential for maximizing the value of adjacent real estate varies and Exhibit 6-2 reinforces the important role of "edge" in maximizing real estate frontage potential which was discussed in chapter 1.

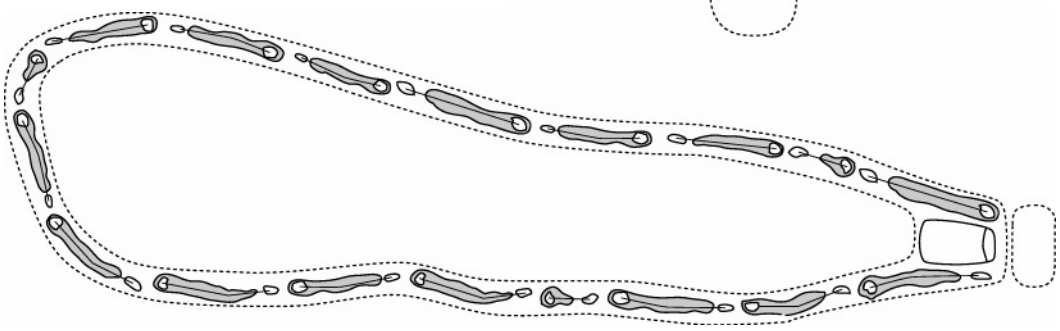
The almost rectangular shape of the core golf course is similar to the shape of traditional parks and has relatively little edge. The single fairway configurations have most edge and can accommodate the most real estate frontage. However, the houses on opposite sides of the course are relatively close together and likely to be in each other's viewlines. In contrast, the core course has least potential for extensive real estate frontage, but the views are likely to be uninterrupted and not likely to include other homes. For this reason, the premium associated with the core course frontage is likely to be greater than that accruing from the single or double fairway options. One authority on residential golf course developments observed:

> Early in the evolution of golf course communities, the courses typically were stretched out so that both sides of each fairway were lined with housing. The trend today is toward a high-quality golfing experience and a larger sense of community open space, which has led to the development of more "core" golf courses. In this configuration, fairways parallel one another, and sometimes only the perimeter of the course provides frontage on the course for housing (p. 85).[2]

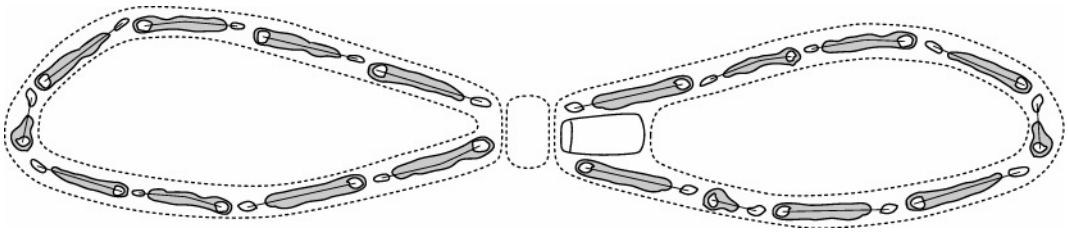
Notwithstanding this perspective, the challenge in generating the magnitude of premium needed (discussed in Exhibit 6-4) means that while there may be more core courses emerging, the preferred option in most real estate developments remains the single fairway returning nines configuration. This yields almost the maximum frontage for real estate, but offers greater flexibility and efficiency in operation over the single fairway continuous configuration by providing two starting holes. Thus, more players can begin a game, and the entire course can be brought into play in two hours, compared to four hours in a continuous layout with only one starting hole.[5] Further, this layout allows for the option of playing only nine holes.

The Core Golf Course. In a core course, the holes are clustered together, either in a continuous sequence, leaving the clubhouse at number one and returning to it at number 18, or in two returning nines, with each nine-hole sequence beginning and ending near the clubhouse. Because it consumes the least amount of land, the core course is usually the least expensive to build. However, the only sites it provides for real estate development lie at its perimeter, and the length of lot frontage is ±10,000 feet.

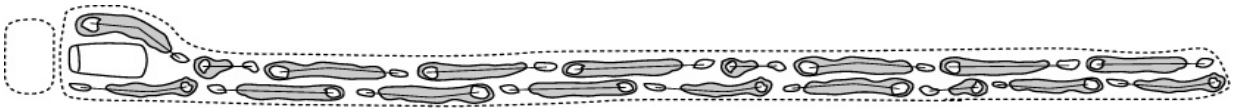




The Single Fairway, Continuous is a single, open loop starting from the clubhouse and returning to the clubhouse. It consumes the greatest amount of land and offers the greatest amount of fairway frontage for development sites. It can be designed to wind its way through fairly difficult terrain. Length of available lot frontage is ±47,000 feet.



The Single Fairway, Returning Nines configuration consists of two loops of returning nines, with the clubhouse in the center. Most flexible for play, slightly less frontage due to the concentration of tees and greens for holes 1, 9, 10, and 18. Length of available lot frontage is ±44,000 feet.



The Double Fairway, Continuous configuration consists of a continuous single loop of adjacent, parallel fairways. It offers about 40% less frontage for development sites than a single-fairway course and can result in a boring course design. But the greater distance it provides from building sites on the opposite side of the fairway create a greater sense of spaciousness than does a single fairway lined by development. Length of available lot frontage is ±25,000 feet.

The Double Fairway, Returning Nines is characterized by two circuits of nine holes each, which both start and finish at the clubhouse, and both have adjacent parallel fairways. Length of available lot frontage is ±24,000feet.

Exhibit 6-2 The Five Basic Golf Course Configurations

Source: Muirhead and Rando[5]

THE BOTTOM LINE

To justify the magnitude of investment associated with a golf course, there has to be substantial enhanced value of a development's lots. Five studies have been reported which have investigated how much value is added by a golf course. The first provided summary data from a survey of master-planned golf communities across the United States.[6] Details of the survey remained proprietary information; only averages were reported and these invariably obscure variations among courses. They are reported in Exhibit 6-3.

Exhibit 6-3 indicates that every lot and home location site within a golf-course community had a premium over comparable lots and units in non-golf developments. Prime sites fronting on greens or enjoying water views or fairway and open-space vistas commanded twice the average fairway-frontage premium. Nonfrontage property offering views of the golf course and partial vistas also commanded a substantial premium. Even interior sites located within the gates of a golf-course community commanded a slight premium.

A more recent survey of 11 golf course communities in the Coastal Carolinas and Georgia provided more detail (Exhibit 6-4).[2] It shows the premiums associated with lakes /lagoons, fairways, fairway/lagoons, marsh, water front, and deep water, when compared with interior lots in the developments. All of these projects were high-end, prestigious, resort-type developments. They suggest: (i) premiums across all these features are substantial; and (ii) water features generally generate the highest premiums.

In Exhibit 6-5 the real estate income premiums accruing from a core course development are compared with those from a single fairways returning nines layout. The analysis assumes that 75 percent of the frontage in both cases is usable for real estate development. (Based on the parameters shown in Exhibit 6-2, this means the available frontages for the

Exhibit 6-3 Average Golf Real Estate Premiums from a Survey of Values in Master-Planned Communities

	Lot Value	Housing Value
Base Homesite[1]	$50,000	$180,000
Golf-Course Community		
Interior Homesite	$52,000	$185,000
Golf-View Homesite	60,000	200,000
Fairway Frontage	75,000	225,000
Prime Golf Frontage[2]	100,000	260,000

[1] An interior lot in a master-planned community without golf.
[2] Homesites fronting on greens, lakes, and other particularly desirable features of a golf course.
Source: Economics Research Associates cited in J. Richard McElyea, Austin G. Anderson, and Gene P. Krekorian (1991) Golf's Real Estate Value. *Urban Land,* February, 14-19.

Exhibit 6-4 Real Estate Premiums by Amenity Orientation, Coastal Carolinas and Georgia (2000)

		Developer / Resale Homesite Prices						
Course/Community	Average Size	Interior	Lake/ Lagoon	Fairway	Fairway / Lagoon	Marsh	Waterfront	Deep Water
Amelia Island, Amelia Island, FL	1 / 4 to 1 / 2 acre	$120,000	$310,000	$400,000	$500,000	$850,000	$2,000,000	N/A
Bald Head Island, Southport, NC	1 / 4 to 1 / 2 acre	$72,000-175,000	N/A	$80,000-230,000	N/A	$250,000-700,000	$200,000-1,200,000	N/A
Belfair Plantation, Bluffton, SC	1 /2 acre	$149,000-300,000	$275,000-400,000	$375,000-525,000	$450,000-700,000	$850,000-1,200,000	N/A	N/A
Bray's Island, Sheldon , SC	1 acre	$295,000	N/A	$350,000	$400,000	$470,000	$595,000	$950,000
Indigo Run, Hilton Head, SC	1 / 2 acre	$115,000	$135,000	$175,000	$190,000	$500,000	N/A	$800,000
Colleton River, Bluffton, SC	1 / 2 to 1 acre	$275,000	$310,000-477,000	$356,000-363,000	$360,000-640,000	$542,000-845,000	$930,000-1,800,000	$2,100,000
Marsh Creek, Jacksonville, FL	1 / 2 to 1 acre	$50,000	$82,000	$100,000	N/A	$250,000	N/A	N/A
Osprey Cove, St. Mary's, GA	1 / 4 to 1 acre	$46,000	$55,000-60,000	$65,000-82,000	$85,000	$180,000 / acre	N/A	N/A
Glen Kernan, Jacksonville, FL	3 / 4 to 1 acre	$200,000	N/A	$220,000	N/A	N/A	$375,000	N/A
Marsh Landing, Jacksonville, FL	1 / 3 to 1 / 2 acre	N/A	$150,000	$330,000	$330,000	$250,000	$850,000	$1,000,000
Plantation at Ponte Vedra, Jacksonville, FL	1 / 3 to 1 / 2 acre	$100,000	$120,000	$150,000	$200,000	$250,000	N/A	N/A

Source: Mulvihill et al.[2]

core and single fairways layouts are 7,500 and 33,000, feet respectively). Exhibit 6-3 indicated that the premiums for golf-view homesites on the fairway were $25,000. Thus, in Exhibit 6-5, it has been assumed that the premiums for detached houses, townhouses, and garden apartments are $25,000, $20,000 and $15,000, respectively.

The premium incomes reported in Exhibit 6-4 are in 1990 dollars and would be higher if the dollar values were transposed to a contemporary time period. Further, the incomes are conservative because they do not include the premiums associated with golf-view homesites or interior homesites (Exhibit 6-3). Neither do they show the loan cost savings that accrue to the developer from selling the real estate more quickly as a result of the golf course. Nevertheless, the analysis in Exhibit 6-5 suggests that the individual lot premiums for detached houses, townhouses, and garden apartments of developments with a core style course would have to be, respectively, 4.4, 4.4, and 3.4 times as great as those of a single fairway returning nines course to generate the same level of profitability to the developer- -assuming the development costs of both were the same.

A third study was published in 1995 and examined prices of properties on and around three private golf courses in Rancho Bernardo, a suburb of San Diego located 32 miles from the San Diego Central business district.[7] The sample comprised of 717 single family home sales transactions of which 216 properties abutted a golf course and the remaining 501 were in the same area. A matched-pair design was used in an attempt to equalize all locational factors other than position relative to the golf course. The results indicated that homes abutting a course sold for 7.6 percent more than similar homes in the same area which amounted to a premium of $12,914.[7] These premiums are substantially lower than the conventional wisdom and those reported in the first two studies, but the authors offered no explanation for this.

Exhibit 6-5 Income Advantages of the Single Fairway Returning Nines Course Compared to a Core Course

Types of Development	Core Course 7,500 feet available frontage		Single fairway returning nines with 33,000 feet available frontage		Differential Premium Bonus
	Possible Number of Units	Premium Income	Possible Number of Units	Premium Income	
Detached houses (100 feet lots)	75	$1,875,000	330	$8,250,000	$6,375,000
Townhouses (38 feet width)	197	$3,940,000	868	$17,360,000	$13,420,000
Three story garden apartment (40 units of frontage per 1000 feet)	300	$4,500,000	1,320	$19,800,000	$15,300,000

Much higher premiums were reported in a 2001 study reporting results of 457 single family home sales within 1,500 feet of one of the eight golf courses in the city of Portland, Oregon.[8] The courses ranged in size from an executive course of 26 acres to an extended course of 232 acres, with a mean size of 169 acres. The premiums were evaluated at different distances from the courses and the results (shown in 1990 dollars) are reported in Exhibit 6-6.

The rapid fall in value which occurs in the 201-600 feet zone is consistent with the conventional wisdom that those interior properties which do not abut the course and, hence, have no view of it are unlikely to yield much premium. However, the subsequent increase in the 601-1000 feet zone is not obviously explicable and no explanation for it was offered by the authors.

This study investigated the impact of parks (reported in chapter 3) as well as golf courses and did not differentiate the mean value of the homes in the two analyses. If the mean value across the whole sample, which the authors cited as $66,198, was representative of the golf course impacted properties, then the premium on homes within 200 feet of a course would be 21%. The golf course premium was higher than that associated with the other three types of open space the authors analyzed, i.e., natural area parks, urban parks, and specialty parks. Although the Portland study was technically strong, whenever the impact of multiple courses is aggregated there is some likelihood of a self-canceling effect because the influence of both high quality and low quality courses is included in the mean averages.

The final empirical study in the published literature emerged in 2005. It focused on a 1,348 acre master planned community in Texas that was centered around an 18 hole golf course.[9] The sample comprised the sales transactions of 305 properties over a five year period. Their mean sales price was $237,000. The analysis compared the sales prices of properties fronting on the golf course with those located elsewhere in the subdivision. This meant that other attributes of the subdivision, which may generate a premium independent of the golf course such as prestige, image, security, school quality, etc. were controlled. The average premium of properties abutting the golf course ranged from $61,000 to $73,000, which represented between 26% and 31% of the average sales price of all the sample's homes in the area.

THE CASE FOR A SHIFT FROM GOLF COURSES TO PARK SPACES

The Texas study reported in the previous paragraph had a second dimension. In addition to calculating the premiums attributable to the golf course, a survey of all 707 homeowners in

Exhibit 6-6 The Mean Value of Premiums at Different Distances from City of Portland Golf Courses

Distance (feet)	<200	201-400	401-600	601-800	801-1000	1001-1200	1201 - 1500
Premium	$13,916	$7,851	$2,814	$8,842	$8,898	$4,391	$4,366

the subdivision was undertaken, to which 466 (66%) responded.[10] It found that 51 percent of respondents reported nobody in their household played golf on the sub-division's course. An additional 20 percent of households had an individual who played less than once a month. These results suggest that for this 70% of households, the substantial premium some of them paid for their home was not attributable to the golfing opportunity.

These data are consistent with anecdotal estimates that have been made by others who have cited the proportion of households living in golf communities who played the game at 20-30%,[2] 30-40%,[4] 30%,[12] 20%[13] and 10%[14]. The most comprehensive publication in recent years offering guidelines for golf course development in residential communities observed, "Many buyers in golf communities are not golfers; rather they appreciate the aesthetic qualities of the course, the permanent open space, and the preserved exclusivity of the community" (p. 6).[2] Elsewhere in the publication the authors report:

> Exit interviews with homebuyers in a cross-section of large master-planned golf communities have shown that golf, while important, ranks well behind less capital-intensive features such as open space and trails in defining the community (p. 26)[2]

Residents who front on to a golf course benefit from the viewscape and in that respect it resembles a well-maintained manicured park. However, those located two or three blocks away are unlikely to have a view and, unlike a park, frequently they do not have access unless they actually play golf. A golf course is not community open space. Casual public access to golf courses for such purposes as walking, jogging, sitting or daydreaming is usually aggressively discouraged.

Developers generally have no interest in operating a golf course because it is a distraction to their core business of creating subdivisions and selling lots. Frequently, they seek to transfer title of the course either to golfers to operate as a non-profit organization or to a specialist golf company. However, many residential golf courses today are not viable operating entities and an increasing number of developers find they are required to continue to accept responsibility for operating and subsidizing them because no other entity will accept them.[15]

The phenomenon of non-golfers being the predominant homeowners in golf developments suggests that developers may avoid this ongoing financial liability and may create a similar premium for their lots by creating attractive open space rather than building a golf course, without alienating a majority of their potential market. Such a strategy appears likely to result in substantial cost savings to the developer. However, there is a caveat to this conclusion in that golf courses are used by a narrow demographic range of people, during particular times, in a highly structured way.[16] These characteristics may contribute part of the premium that abutting homeowners are willing to pay and, should be replicated as far as possible if open space replaces the golf course.

There has been growing acknowledgement of the damage golf courses can inflict by changing existing open space ecology; denigrating wetlands, sensitive aquifers or habitat; or from run-off of pesticides, herbicides and fertilizers. Indeed, in some parts of the country, the permitting of golf facilities has become a long and difficult process, in large part because of environmental issues.[17] To this end, the U.S. Golf Association has linked with the Audubon Society in an effort to enhance wildlife habitat through improved resource management practices on golf courses, so golf

courses are being encouraged to be more park-like. From both a societal and a developer's perspective, if a similar premium for residential developments can be acquired from attractive open space as from golf courses, then these negative consequences could be totally avoided.

If open space is used instead of a golf course to create premiums on the lot prices, then, like the golf course, it should be the first and foremost element to be planned in the subdivision. Such initial identification of key open space involves "delineating both 'Primary Conservation Areas' (such as unbuildable wetlands, waterbodies, floodplains, and steep slopes) and 'Secondary Conservation Areas' (including mature woodlands, upland buffers around wetlands and waterbodies, prime farmland, natural meadows, critical wildlife habitat, and sites of historic, cultural, or archaeological significance)" (p. 6).[18] This approach has the added advantage of it being viable on smaller sites on which a golf course would not be viable. This line of thinking led one author to conclude:

> The following general recommendation may be stated: Let us build many more "golf course developments," but for the most part without the golf courses themselves—substituting community greens for putting greens, and greenways for fairways (p. 7).[18]

References

1. National Golf Foundation (2004). *The growth of U.S. golf.* Jupiter, Florida: National Golf Foundation.

2. Mulvihill, David A. et al. (2001). *Golf course development in residential communities.* Washington, DC: ULI-The Urban Land Institute.

3. Hellman, Douglas J. (1998). Paradigm shift. *Landscape Architect and Specifier News,* November, 34-36.

4. Dugas, Christine (1997). Golf drives housing trend. *USA Today*, November 18, p. 1B.

5. Muirhead, Desmond and Guy L. Rando. (1994). *Golf course development and real estate*. Washington DC: The Urban Land Institute.

6. McElyea, J. Richard, Austin G. Anderson and Gene P. Krekorian (1991). Golf's real estate value. *Urban Land,* February, 14-19.

7. Do, A. Quang and Gary Grudnitski (1995). Golf courses and residential house prices: An empirical examination. *Journal of Real Estate Finance and Economics* 10, 261-270.

8. Lutzenhiser, Margot and Noelwah R. Netusil (2001). The effect of open spaces on a home's sale price. *Contemporary Economic Policy* 19(3), 291-298.

9. Nicholls Sarah and John L. Crompton (2005). The impact of a golf course on residential property values. *Journal of Sport Management* (forthcoming).

10. Nicholls, Sarah and John L. Crompton (2005). Why do people choose to live in golf course communities? *Journal of Park and Recreation Administration* (forthcoming).

11. Solano, V. A. (1991). You can't just putter around in golf course development. *Real Estate Today* 24(9), 54-57.

12. Pickles, H. (1999). When you're never late for tee. *The Daily Telegraph*, October 16.

13. Beldon, Tom (1993). A front yard on the front nine. *The Philadelphia Inquirer,* September 26.

14. Firth, W. R. (1990). Can golf and housing get along? *Urban Land,* February, 16-19.

15. Sargent, Peter (2003). Tee time. *Sports Management,* June, 36-37.

16. Miller, Andrew R. (2001). V*aluing open space: Land economics and neighborhood parks*. Cambridge, Massachusetts: Massachusetts Institute of Technology Center for Real Estate.

17. Howland, Libby (1994). The business of golf. *Urban Land*, August, 45-50, 75.

18. Arendt, Randall G. (1996). *Conservation design for subdivisions: A practical guide to creating greenspace networks*. Washington, DC: Island Press.

CHAPTER 7

The Role of Park and Open Space Lands in Reducing Taxes

Exhibit 7-1 Controversy at City Hall: Open Space or Development

The gavel came down upon the desk with a loud, resonating thump, which immediately brought silence to the small but crowded room. As the din of voices faded into a whisper and ceased altogether the municipal clerk announced, "The meeting of the Hometown City Council will now come to order."

Hesitantly, because he could sense that the meeting would be long and tiresome, the mayor rose to address his fellow councilmen and the anxious crowd. "The purpose of tonight's meeting is to discuss the possible acquisition by this community of property known as the Scenic View Farm.

"As most of you know, this property consists of about 200 acres and includes open fields, woods, a stream and an overlook from which the whole community can be viewed. I realized that the potential acquisition is controversial; therefore, all those who desire to speak will be given an opportunity to be heard."

Immediately a hand rose in the audience. At a gesture from the mayor, a woman rose and stated, "My name is Pauline Smedley. I live on Anderson Road and I am representing the Hometown Citizens Taxpayers Association. We are opposed to the acquisition of the Scenic View Farm, and feel that its acquisition with public funds would not be in the best interest of the community's residents.

"Already our property taxes are unbearable. This acquisition would result in a tax increase since the property would be removed from the tax rolls. On the other hand, if the tract were developed, more homes would produce more tax revenues, which would result in keeping our tax rate from increasing. This community, in all good conscience, cannot afford to allow potential taxable property from being constructed. We hope that the council will, in the best interests of the community, vote not to acquire the property." As she sat down members of the taxpayers association applauded loudly.

"Your Honor," a voice from the other side of the room called out. "I'd like to present an opposing viewpoint." "Please proceed," responded the mayor. "My name is Joe Tucker," the second speaker said. "I represent the Citizens for a Quality Environment of Hometown, and we fully support the Scenic View Farm acquisition. In our rapidly growing community, the few remaining open spaces should be preserved, not only for scenic and environmental reasons, which are important, but also because it's good business.

"It's not true that more development is the answer to our rising tax rate; in fact, it is often the cause of it. If the farm were to be developed, it would cost the community more to provide services to the development than the community would receive in tax revenues. This deficit would have to be made up by increasing the tax rate.

"Open space, however, doesn't demand municipal services. It costs the community little beyond acquisition expenses but provides many economic benefits. In fact, the projected deficit created by the cost of servicing the development exceeding the taxes received from it, would be adequate in seven years to pay for the farm's acquisition as open space. Open space keeps our taxes low and we urge the council to act in the best interests of the community by acquiring the property."

Having heard diametrically opposed arguments, the council postponed making its decision until its members had sufficient information to fully evaluate the economic aspects of the proposed acquisition.

Source: Caputo[2]

Previou
reported em
ingly suppo
ever, in urb
tively short
whether to i
se, but rath
likely to yie
were to be u

The cor
among man
that develop
of vacant la
nues. This c
by develope
for themsel
that their pr
tax base an
property tax

accepted that a park may pay for itself from the extra property tax increments emanating from surrounding property, developers are likely to point out that much larger property tax revenues would accrue if the space was built-out

the American psyche. There is a distinction between sustainable development and growth. *Sustainable development* is carefully planned and results in public investments that lead to increases in quality of life. *Growth* refers to

expanded community size with minimum restraints or guidance which requires a community to incur net costs merely to retain the quality of life standard it had before the growth occurred.

The momentum for growth emanates from two sources.[3] First, from well-intentioned residents who genuinely wish to better the community and who believe the myth that growth leads to reduced taxation. Second, those who will directly profit from growth such as landowners, real estate developers, mortgage bankers, realtors, construction contractors, cement and sand and gravel companies, building suppliers, and architects and landscape architects. This latter coalition tends to be wealthy, organized and politically influential in most communities, and their agenda is to improve the profitability of local land development by:

- increasing the intensity of land use (rezoning or annexing land, for example);
- reducing the cost of development (reducing regulations, fees, and delays);
- diverting public resources to support local land development (new roads, sewers, and other facilities); and
- stimulating the demand for new development (economic development programs, tax incentives, and other subsidies).[4]

Together these economic and political forces create an urban growth machine[3] whose momentum is difficult to slow. The counter message that growth results in increased costs to local taxpayers is alien to the long-established belief system and, hence, confusing to most residents and local officials:

> For years they have been assured by growth boosters that the solution to a community's economic problems is to increase the tax base. The next big expansion project, say growth advocates, will produce enough tax revenue to fix local problems without raising taxes. Most of us accept these assertions. The claim that we can grow our way out of growth problems seems so reasonable that most of us don't think much about it. After all, we've always been told that growth is the basis of prosperity (p. 2).[5]

While the benefits of growth are widely proclaimed by the growth coalition, its associated costs are rarely discussed. It is easier for those who gain from economic development to mobilize political support for developing projects by focusing only on benefits. Thus, existing taxpayers unwittingly subsidize a community's expansion and communities are conditioned to believe that they must grow to prosper. Most residents are astonished to learn that stopping expansion and investing only in projects that improve quality of life is likely to be less expensive than accommodating and encouraging growth. It has been observed that:

> If a private company had a business plan that looked only at revenues and ignored costs, it would quickly be out of business. Why should the public tolerate such one-sided accounting by local governments? We make tremendous expenditures of public resources to support growth, yet fail to account for these costs in terms of the impact on existing residents and taxpayers (p. 14).[4]

The consequences of rapid growth are illustrated by the situation which the island of Nantucket, Massachusetts, abruptly recognized in the late 1980s which is described in Exhibit 7-3.

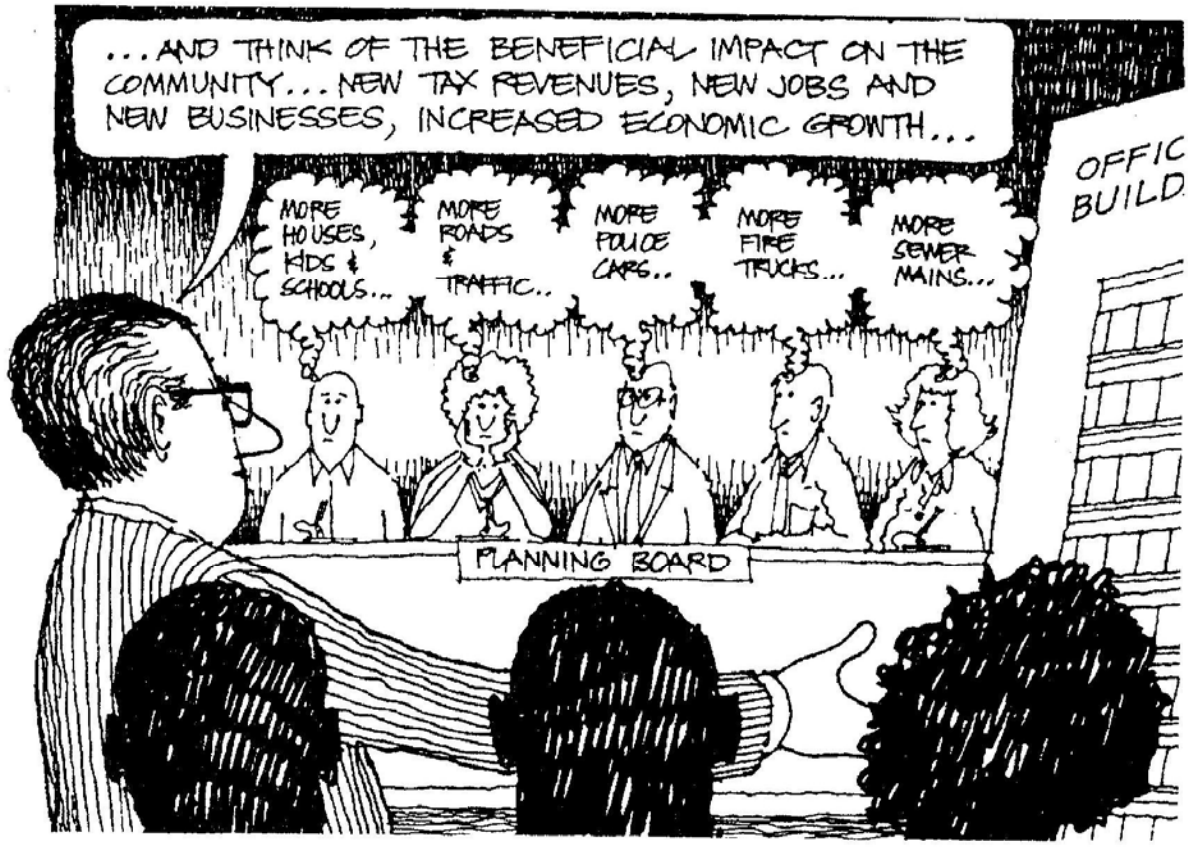


Exhibit 7-2 Fordor[4], p.79

Source: Roger Lewis, The Regional Planning Partnership

Bedroom communities, which are characterized as places from which people commute to work to commercial/industrial establishments located elsewhere, are particularly vulnerable to the taxation increases likely to accompany new residential development. Such communities have no commercial/industrial base to mitigate the costs of servicing new residential developments, making substantial tax increases to existing residents almost inevitable.

Local government generally allocates the costs of new facilities, infrastructure and service expansions on an average basis rather than on an incremental basis. This means that the new costs are spread among all taxpayers rather than charged only to those who create the costs. For example, if a city expands by 10 percent, it is likely that there will be additional capital and operating costs for school facilities, sewers, storm drainage, transportation, roads, water, fire and police protection, park and recreation facilities, libraries, general government offices, electricity, gas and solid waste disposal.[4] However, the new residents pay only 10% of these costs, while the remaining 90% will be paid by existing residents who were sufficiently serviced by the existing infrastructure. Since in most communities the tax income accruing to the community from the new homes is likely to be less than the cost of these additional services, the existing community

Exhibit 7-3 The Fiscal Impact of Development on Nantucket

The island of Nantucket in Massachusetts experienced a building boom in the1980s which caused the town's operating budget to explode, going up more than 26 percent a year. As a result, property taxes more than doubled between 1982 and 1988. Yet town revenues could not keep up with the expenditure growth, because the average cost of servicing a new dwelling unit ($2,925) exceeded the taxes paid by that additional unit ($2,656). Simply stated, new dwellings did not carry their own weight on the tax rolls.

Rapid growth forced the town to borrow money. Nantucket's debt by 1988 was six times what it was in 1982. Each year the town paid $6.5 million on this debt. In fact the biggest item in the town budget was this annual debt payment. By 1988, the town spent more to service its loans than for education.

Furthermore, this situation was expected to worsen, if rapid development continued. By 1988, the town had scheduled more loans and was seeking voter approval for financing an additional $40 million worth of capital projects during the next five years. This increased indebtedness would double the annual debt service costs.

Excessive development was escalating taxes while overburdening town services. Nantucket's taxpayers could not afford to stay on this course. The study which derived these data was commissioned from RKG Associates of Durham, NH and Boston, MA. Their detailed analysis of Nantucket's economy spelled out why the island's growth had to be managed. According to the study's findings, the costs of excessive development outweighed its possible benefits. For example, new construction did not compensate the town for the cost of maintaining its municipal infrastructure. Therefore, the current taxpayers subsidized housing development. The RKG Associates report helped dispel the myth that the town's economy would suffer if more land was put into conservation rather than construction. It showed that an acre of land put into conservation benefited the current taxpayer more than an acre with a new house on it, because the town spent more to provide municipal services to a new dwelling than the tax revenues received from that unit. In the end the excessive development of the 1980s was detrimental to the quality of life; to the natural resources of the island; and to the fiscal well-being of the residents.

effectively subsidizes the developers and the new residents.

The net costs of growth are accentuated with sprawl which technically is defined as occurring when land is being consumed at a faster rate than population growth. For example, in Wright County, Minnesota, the net annual deficit between taxes paid and the cost of services required was found to be $490 for developed home lots larger than one acre, and $114 for quarter acre lots.[7] Similarly, in a study of Loudoin County, Virginia, which is the fastest growing county in the Washington, DC area, it was found that public costs were approximately three times higher ($2,200) per dwelling where the density was one unit per five acres, than where the density was 4-5 units per acre ($700 per dwelling).[8] This reflects the increased costs associated with such services as school buses, emergency service response times, road provision and repairs, garbage pick-up, and utilities when homes are spread out.

However, the net deficit associated with growth is largely independent of density.[4] Public costs for services such as schools remain

high irrespective of the quality of planning, so while sprawl is likely to accentuate the cost deficit, a lack of sprawl is unlikely to remove it.

The most expensive growth cost that confronts communities is schools. The national

Exhibit 7-4 The School Costs projected to be incurred if 100 acres of Open Land was transformed to Residential Development: Example of the Souderton Area School District, Montgomery County, Pennsylvania

Costs in the following example were based on the district's reported annual cost to educate a public school student. The average number of school age children per home was based on the number expected in the growth area of the district. The shift in costs shows what would occur if a 100 acre farm was transformed into residential development. Much of the undeveloped land is zoned for homes at 0.5 homes per acre.

Three alternate options are shown.: (i) development of the 100 acre farm; (ii) purchasing the development rights of the farm; and (iii) purchasing the 100 acre property for open space.

Development of the "100-Acre Farm" – Costs to the Community

	100	Acreage of the Farm
x	0.50	Homes per Acre
	50	New Homes
	50	New Homes
x	0.8265	School-age Children Per Home
	41	School-age Children in the Subdivision
	$8,888	Public School Costs Per Student
	$364,408	Public School Costs For the 50 New Homes Per Year
	50	New Homes
	$2,787	Average School Tax Revenues Per Home
	$139,350	Public School Revenues for the 50 Homes Per Year

$139,350 (Revenues) - $364,408 (costs) = -$225,058 (shortfall) Per Year

Preservation of the "100-Acre Farm" – Purchase the Conservation Easement

	100	Acres of Conservation Easement Purchase
x	$11,666	Average Cost Per Acre – Easement Purchase
	1,666,600	Purchase Price of the Easement

$1,166,600 / $225,058 (shortfall) = 5.2 Year Break Even Period

Preservation of the "100-Acre Farm" – Purchase of Land

	100	Acres Purchased
x	$16,108	Average Cost Per Acre – Fee Simple Purchase
	$1,610,800	Purchase Price of the Farm

$1,610,800 / $225,058 (shortfall) = 7.2 Year Break Even Period

Source: Montgomery County Lands Trust[9]

average number of public school-age children for a three-bedroom house is 0.67. Thus, there will be an average of two school-age children for every three houses (3 x .67 = 2), so 750 new residences are likely to require one new school for the 500 students who move in. If the total cost of land and construction for such a new school is $14 million, then the cost per house is $18,667. (Note, this is not the cost per child!).[4] In most jurisdictions, this cost will be shared by the whole community and not be charged directly to the new homeowners or their developers.

Exhibit 7-4 offers an example of the schooling cost that would be incurred by a community in Pennsylvania if a 100-acre farm was transformed into residential development. It shows that the pay-back periods for purchasing the development rights or for purchase of the land for open space/park purposes were 5.2 and 7.2 years, respectively. The pay-back periods are relatively short, but the schooling costs would continue as long as the homes exist and would likely increase each year.[9] Thus, communities can choose to pay for these ever-increasing school costs, or they can elect to spend the money, in part, to preserve selected areas as open space or park land.

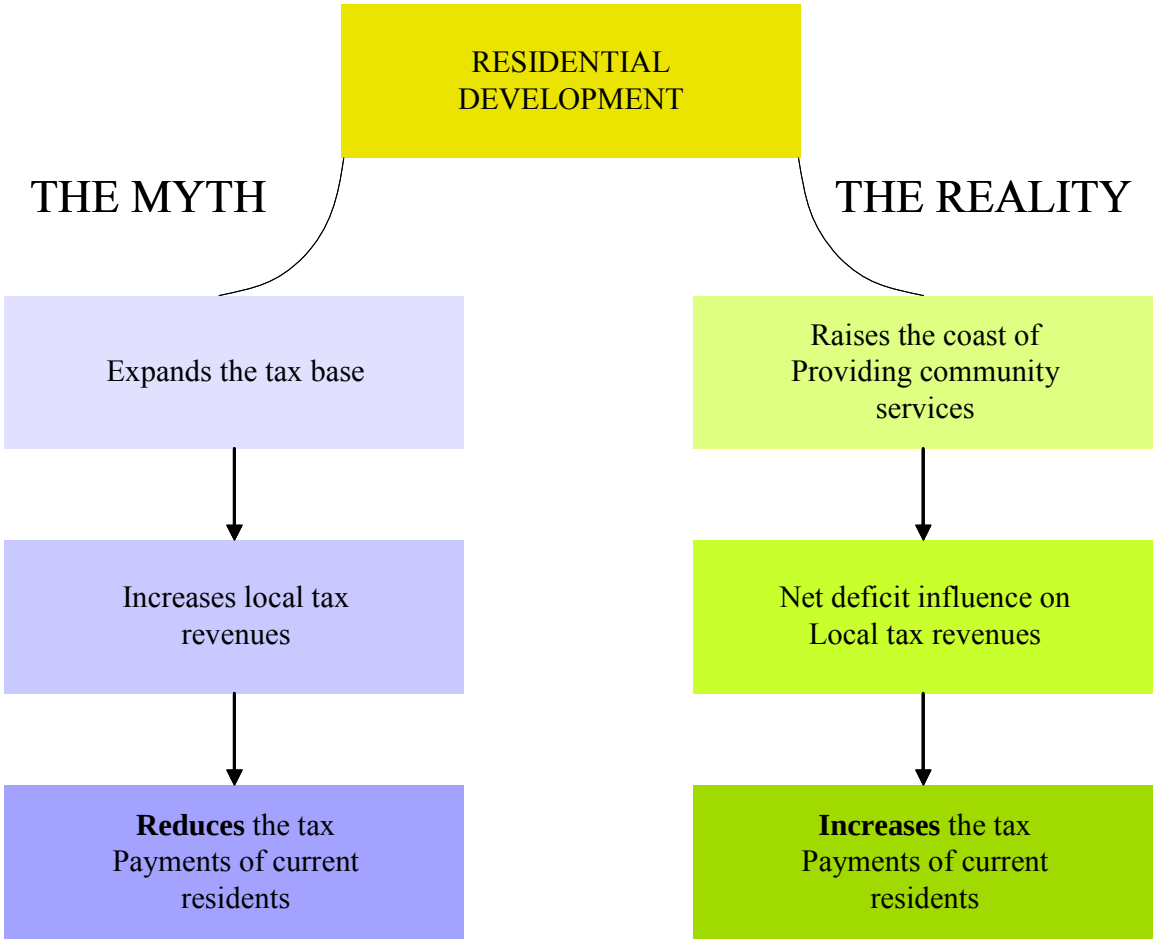
The city of Naperville is a suburb of Chicago with a population of 150,000. Exhibit 7-5 reports how the city made a conscious choice to increase the available park and open space land in order to reduce the schooling costs associated with new development within its boundaries.

Exhibit 7-6 summarizes the differences between the myth of residential development and the reality. Although the assumption that expansion will lead to a net gain in local taxes is fiscally irresponsible, this myth has frequently thwarted the conservation efforts of park and open space advocates. The purpose of this chapter is to expose the development myth by reviewing the substantial number of empirical findings that have been reported on this issue. The general thesis examined here is that saving land is often synonymous for local governments with saving money, because the net cost (revenues minus expenses) of maintaining and operating park and open space land is likely to be lower than the net cost to a community associated with residential development. This is a long-term benefit of preserving open space which is frequently overlooked in

Exhibit 7-5 Using Open Space to Reduce Taxes

The city of Naperville was almost built out. The remaining undeveloped area was in the southwest of the city. The city's planners reported that if this was developed as projected in the existing master plan, then it would generate an additional 7,711 population and of these 1,820 would be of school age. Within this undeveloped zone, the city master plan showed that 125 acres would be parkland or open space.

The city was concerned about the cost of servicing this new population, especially the costs associated with providing schools for them. Accordingly, it revised the master plan, expanding the open space acreage to 205 acres. The revised plan projected the school-aged population would be 1,104, a reduction of 716 from the original plan. This meant the residents of Naperville would save the costs of building, staffing and operating one new school. This cost was much greater than the tax that would have accrued from the additional residences which would have been built in the original plan. The cost of acquiring and maintaining the additional parkland was projected to be much lower than the ongoing net deficit associated with building and operating the additional school.



policy decisions because market valuations generally reflect only the short-term benefit of land.

public costs needed to service a development usually exceed the tax income accruing from it.

Exhibit 7-6 A Generalized Summary of the Myth and the Reality Associated with Residential Development

EMERGENCE OF A NEW MUNICIPAL MATH

In 1956, Roland B. Greeley, who was a member of the faculty of City and Regional Planning at the Massachusetts Institute of Technology and a private planning consultant, wrote a letter to the Lexington, Massachusetts *Minute Man.* The letter is reproduced as Exhibit 7-7. It has been suggested that this letter was a benchmark representing the genesis of a "new municipal math" recognizing that the [10] Evidence in that era from other case studies provided momentum for the new municipal math movement:

- The village of Mamaroneck, New York, reported that building a large post-war garden apartment block on vacant land re-

Exhibit 7-7 The Genesis of the "New" Municipal Math: Mr. Roland Greeley's Letter to the Editor

April 19, 1956

To the Editor:

There seems to be widespread concern about Lexington's rate of growth. I submit below the crude outlines of a process for restraining such growth I wish the Planning Board would consider seriously. Perhaps they already have; or perhaps they will wish to appoint a special committee to study the matter.

Most people come to Lexington because they like, among other things, its "rural atmosphere," its open lands and freedom from urban character. Most people who are now here are concerned about the rate at which that openness is disappearing. Such controls as 30,000 sq. ft. zoning obviously will not preserve the openness which we cherish.

Suppose the Town should decide to buy up, within the next few years, something like 2,000 acres of undeveloped land in the Town (the total area of the Town is about 10,000), selecting the areas which are least accessible, least easy to service, least desirable for residence. What would be the result?

First, it would cost money—possibly a million dollars. However, unless the Town was forced to pay exorbitant prices for the land, the total cost, spread over a twenty year period, should not exceed $75,000 per year, including the loss of tax income from the raw land.

Second, we would derive significant financial savings. Judging from post-war experiences, each new home pays on the order of $400 per year in taxes. If we assume that such homes average only 1-1 ½ school children per family, then the cost of schooling alone is equal to, or exceeds, the taxes paid during the first 15 or 20 years of the dwelling's existence. Thus the costs of school construction, sewers, drainage, street maintenance, and even some health and welfare expenses must all be met by the Town as a whole rather than by taxes on the individual properties concerned. Thus the net cost of servicing these new homes, if they are built, would add up to far more than the $75,000 per year which the Town might have to spend to avoid this cost.

Third, we would lose out to the extent of denying ourselves the addition of many new friends and neighbors such as those who have recently come to Town; and we might open ourselves up the criticism of being "snobbish" or selfish. On the other hand, in the long run there may be two factors which will offset these arguments. The open spaces may, in their way, become just as great assets in the total Metropolitan area as such large open spaces as Middlesex Falls, Blue Hills and Breakheart Reservations are already proving to be. And the existence of such open spaces may, in the future, make it appear desirable to allow some residential areas in the Town to develop at somewhat higher densities, and thus more efficiently. If this proves to be the case, we could eventually absorb the same amount of additional growth, but at a slower rate and in a more economical and desirable pattern. If not, then we will be fortunate enough to have acted before it was too late.

Fourth, we would be guaranteeing the future existence of real open spaces throughout the Town - -open spaces which need not be maintained (except for fire protection), but which would count significantly as far as amenity, appearance, and casual use are concerned; and which would count significantly, I believe, in maintaining sound property values in nearby residential areas. If a generation hence, we find such land not to be an asset in public ownership, the chances are overwhelming that it could be disposed of at a profit. Personally I doubt if we would be willing to dispose of it at any price in the future.

If I interpret citizen attitudes correctly, a procedure of buying up open space reserves would obtain for nearly all of us the very pattern of development in the Town which we want most. And at the same time, for an initial expenditure of a million dollars (the cost of one school), we would have a very good chance of making a net profit (through reduction in Town expenses) of at least a quarter million dollars a year.

Sincerely,

Roland B. Greeley

Source: Reproduced in Charles E. Little (1969) *Challenge of the land*. New York: Pergamon Press.

sulted in higher taxes for property owners. The development paid $42,415 in school taxes in 1960. However, based on Board of Education figures, it cost $107,800 to educate the children living in the apartments. The existing taxpayers paid the difference.[11]

- In the town of Yorktown, Westchester County, New York, it was found that each dwelling paid $100 less in real estate taxes than it received in municipal services. The staff calculated that the acquisition of a public park, including the loss of tax revenue from the vacant land, the purchase cost and the maintenance cost, would result in a 15 percent lower annual cost to the Town than if the land were developed with houses.[11]
- When Robert Moses, as Commissioner of Parks for New York, announced his intention to purchase 1,426 acres in Lloyd Harbor, New York for a new state park, many residents complained about the land going off the tax rolls and persuaded the village to hire consultants to assess the fiscal impact. They reported that loss of this land from the tax roll would increase taxes by 20% from $14.33 to $16.91 per hundred dollars assessed valuation. However, if the land were to be used for residential development, which was the most likely alternative scenario, they concluded the tax rate would go up to $21.64, an increase nearly three times greater.[10]

In their 1960s Plan for the Valleys, the respected Wallace/McHarg planning firm called for the preservation of 3,000 acres of meadowland in their planning area of the Green Spring and Washington Valleys outside Baltimore. They stated:

> It has been calculated that uncontrolled growth develops approximately $33.5 million (in land value) by 1980, and Optimum Land Use residential development produces $40.5 million in the same period. The additional $7 million resulting from concentration would be adequate to pay in excess of $2,300 per acre for title to the 3,000 acres exempted from development [which was higher than the prevailing market price at that time] (p.86).[10]

A review of these types of findings led to this theme being subsequently endorsed and reiterated by the Outdoor Recreation Resources Review Commission in its landmark report in the early 1960s:

> The use most often competing for potential park land or open space is residential development, and governments often lose money on such development - - that is, it costs more to provide schools, streets, and other services than is returned in new taxes. Thus, in many instances, placing the land in recreation use may prevent a drain on the community's finances while engineering a long-term rise in surrounding property values (p. 75).[12]

In the 1970s more studies showing similar results emerged:

- A 1970 study for the city of Palo Alto, California, indicated that it was substantially cheaper for that city to acquire at full market value its foothill open space than to allow it to become an "addition" to the tax base.[3]
- In Santa Fe, New Mexico, a 1973 study from the city's planning department concluded: "The primary conclusion of the study is that new subdivisions do not pay

> their own way as far as the public economy is concerned. The deficit incurred by residential units is not unique to Santa Fe. There are few communities where residential developments actually cover all the costs for services provided them." [4]

Thus, by 1973, a national taskforce reporting on the use of land was able to observe:

> Citizens seem to be expressing the belief that large size reflects not only lesser quality but also higher costs… Immediate economic gains from job creation, land purchases, and the construction of new facilities are being set against the public costs of schools, roads, water treatment plants, sewers, and the services new residents required.[13]

However, there were two limitations to this growing body of literature. First, investing in these studies if they were done thoroughly was expensive. They were time-consuming and took substantial expertise to complete. Second, the authors of each study developed their own methodology and the lack of widely accepted standardized procedure inhibited their comparability and generalizability beyond the jurisdictional context in which they were undertaken.

EVOLUTION OF COST OF COMMUNITY SERVICES STUDIES

The standardized procedures emerged in the late 1970s and 1980s with the evolvement of increasingly sophisticated fiscal analysis techniques (sometimes called cost-revenue analysis) which have since been used by many local governments to analyze their taxation sources and expenditures. Adoption of these techniques has been accentuated by two factors. First, the climate of fiscal austerity, exacerbated by the cutbacks in federal and state aid to local communities that have occurred since the late 1970s. This meant that local governments had to pay a larger share of local capital projects, and the on-going resistance of residents to tax increases made local officials more receptive to using analysis techniques which may protect them against new spending and tax pressures. Second, the rise of antigrowth sentiment in a growing number of communities has enhanced the political plausibility of techniques that encourage growth control. These factors are gradually shifting the burdens of fiscal proof from the opponents to the advocates of growth.

A number of techniques have evolved for measuring fiscal impacts of alternate decisions. Traditional fiscal impact analyses project the net cash flow of new development to local government. These may pertain to specific development proposals or to area wide alternate development scenarios. For example, they may compare the fiscal impacts of high and low housing densities on a given parcel of land, or assess the impact of a particular development such as an office complex or residential subdivision. From the perspective of those concerned with parks and open space, they had two critical limitations. First, they typically did not include parks and open space. Apparently, it was assumed that undeveloped land had no substantial economic value. Second, they were expensive, costing over $50,000 to commission which made them non-feasible in many small communities.[14]

In contrast to this traditional approach to fiscal analysis, the studies reviewed in the following sections of this chapter do not predict the future impact of decisions. Rather they are cost of community services (COCS) analyses which assess current conditions based on existing budgets and real dollars. COCS studies are one of many techniques of fiscal impact analy-

sis that are available. They are a case study approach used to assign a given community's public service costs and revenues to current land uses to ascertain the level of surplus or deficit associated with each land use. Three land use categories are generally used: residential, commercial / industrial, and farm / forest/ open space. Tying the origin and dispersion of taxes to land uses in this way recognizes that the way in which land is used in a community affects both the level of taxes paid by residents and their quality of life:

> It affects the size of the local government, the types of services it offers, the type of equipment it must purchase, and the taxes and tax rates it must levy. It also affects the number of students in the local school district, the size and number of school buildings, the number of teachers, and the taxes and tax rates the school district levies…Identifying the impacts of different land uses helps identify what types of land development and uses should be encouraged in a municipality, and what types should be treated cautiously (p.1).[15]

In contrast to traditional analysis, COCS studies look back rather than forward in time, so they provide hindsight from past land use decisions. Hence, a premise underlying the commissioning of these analyses is that the past can serve as a prologue for guiding future land use decisions when decision makers review the effects of past actions.

The value of COCS studies to those concerned with parks and open space is that they are a relatively inexpensive and reliable tool, using a widely accepted methodology for comparing the costs and revenues associated with these land uses with those of residential commercial/industrial land uses. As such, the information they generate can inform policy decisions because they invariably dispel the myth that parks and open space generate less net economic gain to a community than residential development.

Cost of Community Services Study Methodology

COCS analysis was developed by the American Farmland Trust in the mid-1980s and the methodology has been continually refined by agricultural and natural resource economists, and planners since that time. A detailed discussion of how the data are collected and analyzed at each step in the process is beyond the scope of this monograph, and the reader is referred to an American Farmland Trust publication where details are provided.[16] However, an overview of the five stages in undertaking these analyses is provided in the following paragraphs.[17]

Stage 1. Ascertain the service categories used in the community's budget for the year of interest. Typical of the service categories into which a municipality's expenditures are grouped are: (1) education; (2) general government; (3) public safety; (4) public works; (5) social services, including health/welfare and recreation/parks/culture; and (6) water/sanitation. An example of how the $31.5 million budget of a municipality in Massachusetts was allocated among these categories is shown in Exhibit 7-8.

Stage 2. Allocate total municipal expenditures to the selected land use categories. This is the most difficult stage in the procedure and is likely to require extensive discussion with municipal officials. Careful definition of the use categories is essential. For example, open space may be defined to include forests, fields, agricultural lands, parks, recreational land, vacant land of more than (say) two acres, and residentially zoned land not built upon. Ex-

Exhibit 7-8 Municipal Expenditures by Land Use Category

Service Area	Residential Expenditures	Commercial / Industrial Expenditures	Farm / Open space Expenditures	Total Expenditures
Education	12,899,906	0	0	12,899,906
General Gov't	5,326,710	787,284	53,619	6,167,613
Public Safety	3,535,520	851,292	37,108	4,423,920
Public Works	3,970,837	249,364	16,148	4,236,349
Social Services	839,015	0	0	839,015
Water/Sanitation	2,350,762	611,421	5,975	2,968,158
Total ($)	28,922,750	2,499,361	112,850	31,534,961
Total (%)	91.7	7.9	0.4	

Exhibit 7-9 Municipal Revenues by Land Use Category

Source of Revenues	Residential Revenues	Commercial / Industrial Revenues	Farm / Open space Revenues	Total Revenues
Property Taxes	12,843,014	4,098,870	294,746	17,236,630
State Aid	8,972,932	409,676	29,656	9,412,264
Local Receipts	2,272,262	520,197	19,905	2,812,364
Other Sources	3,385,273	978,769	31,260	4,395,302
Total ($)	27,473,481	6,007,512	375,567	33,856,560
Total (%)	81.2	17.7	1.1	

Exhibit 7-10 A Comparison of Revenues and Expenditures

	Residential	Commercial / Industrial	Farm / Open space	Total
Revenues	27,473,481	6,007,512	375,567	33,856,560
Expenditures	28,922,750	2,499,361	112,850	31,534,961
Balance	-1,449,269	3,508,151	262,717	2,321,599
Ratios ($Revenues:$Costs)	1:1.05	1:0.42	1:0.30	

hibit 7-8 shows that in this community, almost 92% of total expenditures were attributable to residential land.

Stage 3. Categorize municipal revenues by sources. The categories most commonly used are property taxes, sales taxes, local receipts, state aid and federal aid. In the Massachusetts community used here to illustrate the fiscal impact analysis procedure, the sales taxes and federal aid categories were subsumed under the heading "other sources" (Exhibit 7-9).

Stage 4. Allocate municipal revenues to the land use categories. Property tax allocations can be derived from the tax assessor's records. In many communities, much of the state aid is associated with schools and is formula based on number of pupils, so it is attributable to residential development. Much of the local receipts revenue will be derived from recreation fees and similar activities attributable to residential development, while sales taxes derive primarily from commercial land uses.

Stage 5. Compare revenues to expenditures for each land use category. A comparison of the data in Exhibits 7-8 and 7-9 is shown in Exhibit 7-10. The data in this example show a deficit in the residential category of approximately 5%, so for every $1 of income residential development yields, it costs the municipality $1.05 to service it. In contrast, every $1 of revenue accruing from the open space category, requires only 30 cents in cost of service.

The approach gives a snapshot of the fiscal implications of land use based on current costs and revenues. The procedure is designed to supply enough information for people to recognize the potential positive fiscal impact of parks and open space. One outcome that sometimes emerges from these relatively simple studies is recognition of a need to commission more expensive studies that offer greater sophistication and embrace fiscal impact projections of future built-out scenarios in a community.

Review of Empirical Findings

Exhibit 7-11 lists the results of 98 studies that have used the American Farmland Trust's approach to COCS.[16] The studies were undertaken by over 50 different research teams in 21 different states. The main commonality among the studies is that most of the selected communities were relatively small and incorporated farmland in their tax base.

For every dollar of revenue generated, farm/forest/open space lands cost communities from $.02 in Carroll Township, Pennsylvania, to $.99 in Servier County, Utah. Similarly, for every revenue dollar generated by commercial / industrial development, service costs ranged from $.05 in Bedminster Township, Pennsylvania, to $1.04 in Perry, Wisconsin. In the residential sector for each tax dollar received the range in cost of services was from $1.01 in Groton, New Hampshire, to $2.11 in Stewardson Township, Pennsylvania. Among the 96 studies, there was not a single instance where taxes from residential development were sufficient to cover the costs of servicing this type of development in a community, clearly demonstrating that residential development is expensive and relies on other land uses to balance local governments' expenditures.[16]

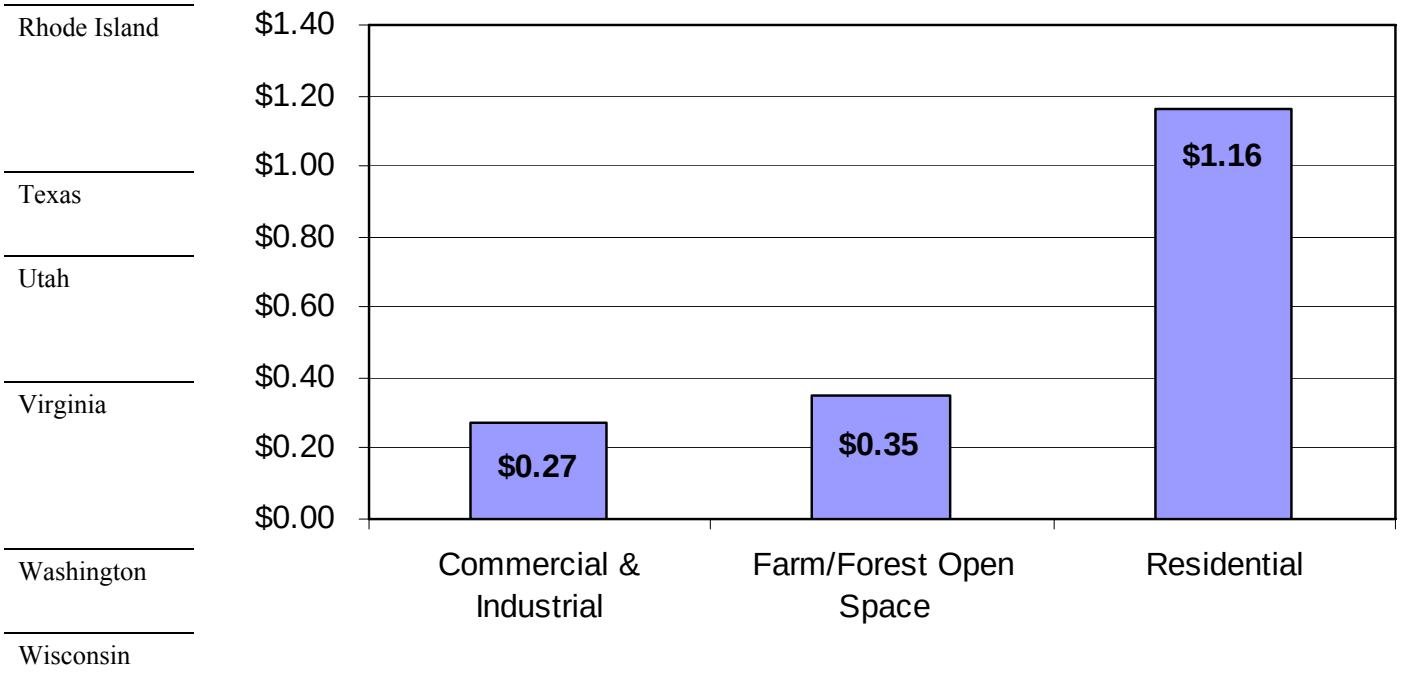
Given the diversity of locations and research teams involved, the results are remarkably consistent. They confirm the results reported by more elaborate conventional fiscal impact studies, which consistently document the net deficit of most residential development and recommend attracting commercial and industrial development to offset these deficits. However, they offer the additional dimension of demonstrating the relatively positive fiscal impact of farm and forestland, open space and park land, when compared to residential land

Exhibit 7-11 Summary of Cost of Community Services Study Results

State	Town	Residential	Commercial & Industrial	Farm, Forest & Open Land
Colorado	Custer County[18]	1 : 1.16	1 : 0.71	1 : 0.54
	Saguache County[19]	1 : 1.17	1 : 0.53	1 : 0.35
Connecticut	Bolton[20]	1: 1.05	1 : 0.23	1 : 0.50
	Durham[21]	1: 1.07	1 : 0.27	1 : 0.23
	Farmington[21]	1: 1.33	1 : 0.32	1 : 0.31
	Hebron[22]	1 : 1.06	1 : 0.47	1 : 0.43
	Litchfield[21]	1 : 1.11	1 : 0.34	1 : 0.34
	Pomfret[21]	1 : 1.06	1 : 0.27	1 : 0.86
Georgia	Carroll County[23]	1 : 1.29	1 : 0.37	1 : 0.55
Idaho	Canyon County[24]	1 : 1.08	1 : 0.79	1 : 0.54
	Cassia County[24]	1 : 1.19	1 : 0.87	1 : 0.41
Kentucky	Lexington-Fayette[25]	1 : 1.64	1 : 0.22	1 : 0.93
Main	Bethel[26]	1 : 1.29	1 : 0.59	1 : 0.06
Maryland	Carroll County[27]	1 : 1.15	1 : 0.48	1 : 0.45
	Cecil County[28]	1 : 1.17	1 : 0.34	1 : 0.66
	Cecil County[29]	1 : 1.12	1 : 0.28	1 : 0.37
	Frederick County[30]	1 : 1.14	1 : 0.50	1 : 0.53
	Kent County[31]	1 : 1.05	1 : 0.64	1 : 0.42
	Wicomico County[31]	1 : 1.21	1 : 0.33	1 : 0.96
Massachusetts	Agawam[14]	1 : 1.05	1 : 0.44	1 : 0.31
	Becket[21]	1 : 1.02	1 : 0.83	1 : 0.72
	Deerfield[14]	1 : 1.16	1 : 0.38	1 : 0.29
	Franklin[21]	1 : 1.02	1 : 0.58	1 : 0.40
	Gill[14]	1 : 1.15	1 : 0.43	1 : 0.38
	Leverett[21]	1 : 1.15	1 : 0.29	1 : 0.25
	Middleboro[33]	1 : 1.08	1 : 0.47	1 : 0.70
	Southborough[34]	1 : 1.03	1 : 0.26	1 : 0.45
	Westford[21]	1 : 1.15	1 : 0.53	1 : 0.39
	Williamstown[35]	1 : 1.11	1 : 0.34	1 : 0.40
Michigan	Calhoun County			
	Marshall Township[36]	1 : 1.47	1 : 0.20	1 : 0.27
	Newton Township[36]	1 : 1.20	1 : 0.25	1 : 0.24
	Scio Township[37]	1 : 1.40	1 : 0.28	1 : 0.62
Minnesota	Farmington[38]	1 : 1.02	1 : 0.79	1 : 0.77

	Lake Elmo[38]	1 : 1.07	1 : 0.20	1 : 0.27
	Independence[38]	1 : 1.03	1 : 0.19	1 : 0.47
Montana	Carbon County[39]	1 : 1.60	1 : 0.21	1 : 0.34
	Gallatin County[40]	1 : 1.45	1 : 0.16	1 : 0.25
	Flathead County[41]	1 : 1.23	1 : 0.26	1 : 0.34
New Hampshire	Deerfield[42]	1 : 1.15	1 : 0.22	1 : 0.35
	Dover[43]	1 : 1.15	1 : 0.63	1 : 0.94
	Exeter[44]	1 : 1.15	1 : 0.40	1 : 0.82
	Fremont[42]	1 : 1.04	1 : 0.94	1 : 0.36
	Groton[45]	1 : 1.01	1 : 0.12	1 : 0.88
	Stratham[42]	1 : 1.15	1 : 0.19	1 : 0.40
	Lyme[46]	1 : 1.05	1 : 0.28	1 : 0.23
New Jersey	Freehold Township[47]	1 : 1.51	1 : 0.17	1 : 0.33
	Holmdel Township[47]	1 : 1.38	1 : 0.21	1 : 0.66
	Middletown Township[47]	1 : 1.14	1 : 0.34	1 : 0.36
	Upper Freehold Township[47]	1 : 1.18	1 : 0.20	1 : 0.35
	Wall Township[47]	1 : 1.28	1 : 0.30	1 : 0.54
New York	Amenia[48]	1 : 1.23	1 : 0.25	1 : 0.17
	Beekman[49]	1 : 1.12	1 : 0.18	1 : 0.48
	Dix[50]	1 : 1.51	1 : 0.27	1 : 0.31
	Farmington[51]	1 : 1.22	1 : 0.27	1 : 0.72
	Fishkill[48]	1 : 1.23	1 : 0.31	1 : 0.74
	Hector[50]	1 : 1.30	1 : 0.15	1 : 0.28
	Kinderhook[52]	1 : 1.05	1 : 0.21	1 : 0.17
	Montour[53]	1 : 1.50	1 : 0.28	1 : 0.29
	Northeast[49]	1 : 1.36	1 : 0.29	1 : 0.21
	Reading[53]	1 : 1.88	1 : 0.26	1 : 0.32
	Red Hook[48]	1 : 1.11	1 : 0.20	1 : 0.22
Ohio	Madison Village[54]	1 : 1.67	1 : 0.20	1 : 0.38
	Madison Township[54]	1 : 1.40	1 : 0.25	1 : 0.30
	Shalersville Township[55]	1 : 1.58	1 : 0.17	1 : 0.31
Pennsylvania	Allegheny Township[56]	1 : 1.06	1 : 0.14	1 : 0.13
	Bedminster Township[56]	1 : 1.12	1 : 0.05	1 : 0.04
	Bethel Township[15]	1 : 1.08	1 : 0.17	1 : 0.06
	Bingham Township[57]	1 : 1.56	1 : 0.16	1 : 0.15
	Buckingham Township[58]	1 : 1.04	1 : 0.15	1 : 0.08
	Carroll Township[15]	1 : 1.03	1 : 0.06	1 : 0.02
	Hopewell Township[59]	1 : 1.27	1 : 0.32	1 : 0.59
	Maiden Creek Township[59]	1 : 1.28	1 : 0.11	1 : 0.06
	Richmond Township[59]	1 : 1.24	1 : 0.09	1 : 0.04

Exhibit 7-12 The Median Cost to Provide Public Services to Different Land Uses per Dollar Revenue Raise (n=98 Communities)



Source: Freedgood[16]

Westport 1 : 1.11 1 : 0.31 1 : 0.13

Source: American Farmland Trust's Farmland Information Center

use. These elements traditionally have been omitted from fiscal impact analyses.

A summary of the results reported in Exhibit 7-11 is provided in Exhibit 7-12.[16] It shows the median cost per dollar of revenue raised to provide public services to each of the three different land uses. Thus, for every $1 million in tax revenues these communities received from farm/forest/open space uses and from industrial/commercial uses, the median amount they had to expend was only $350,000 and $270,000, respectively, to provide them with public services. In contrast, for every $1 million received in revenues from residential developments, the median amount the communities had to expend to service them was $1,160,000. The results of these studies indicate that favoring residential development at the expense of open land does not alleviate the financial problems of communities. Indeed, it is likely to exacerbate them.

Limitations of COCS Analyses

There are five limitations or difficult challenges associated with COCS analyses. First, they do not recognize the interconnectedness of land uses. For example, the net impact of commercial/industrial land use is invariably shown to be positive in COCS studies. However, except in areas of high unemployment, residential development is an almost unavoid-

able consequence of new employment opportunities. If local skills are not available to fill the jobs created by new businesses, then new residential development is likely to occur to accommodate the new workforce which would result in additional net costs associated with providing services to these residences.

A second limitation is that COCS studies do not incorporate non-market costs that accrue when open space is converted to residential development. Such costs may include traffic congestion, pollution, soil erosion, removal of wildlife habitat, and reduced protection from flooding and adverse impacts on water quality.

Third, the accuracy of COCS studies depends on the validity of their methodology and assumptions. It is difficult to "unbundle" or disaggregate costs and revenues so they are accurately allocated to the selected expenditure categories, because municipal records do not allocate revenues and expenditures by land-use. Different allocation decisions may lead to substantially different outcomes. The following observation illustrates the types of challenges involved:

> Local road and highway costs are one of the hardest things to allocate by land use. There are so many users of each road that it is very challenging to determine what percentage originates from commercial/industrial, residential, or farm/forest/open space lands (p.33).[16]

To ensure a study's findings have credibility in a community, it is important that key elected officials, department managers and financial/budget officials are involved in the process, so they can offer their insights and experience on these critical allocation decisions.[16]

Fourth, COCS analyses tend to focus on average costs instead of the marginal, or incremental costs and revenues associated with new development.[72] Economists point out that marginal costs and revenues are the more relevant measure and that they may differ widely from average costs and revenues. Thus, they recognize that the extent to which new residential development will increase cost of services depends on the level and surplus capacity of existing services.

A final limitation of COCS studies is that the broad allocation of costs among only three categories of land use provides generalized results that obscure important nuances within the categories. For example, demographics of new residents will influence the costs and revenues they produce. Thus, working class families with children will tend to pay lower taxes and make heavier use of public services than childless young professionals, and a retirement or summer community is likely to make little use of educational and other services compared to homes with younger families who permanently reside in the community.

IMPLICATIONS FOR PARKS AND OPEN SPACE

The data from the COCS studies, group publicly owned parks and open space with privately owned agricultural land, forest land and vacant lots. However, the revenue implications associated with this non-developed land are quite different in the public and private sectors. Revenues accruing to a community from publicly owned lands are likely to be minimal – limited to net receipts from admission fees, concessions, grazing rights, or lease income from tenant farmers. In contrast, even if the private lands are protected by conservation easements and taxed at their use or productive value rather than appraised value so property taxes are low, they will yield some tax revenue to the community.

Residential development is the most

Exhibit 7-13 An Illustrative Comparison of the Net Cost of Serving a Residential Development and a Natural Park Area

On the 50-acre site (Exhibit 1-1), assume a density of three homes per acre and a property tax rate (school district, city, county et al.) of 2½ % of market value on these $200,000 homes. Thus, annual property tax revenue equals $750,000 (50 x 3 x $5,000).

Assume that the cost of servicing these residences is 16% higher than the property taxes received (Exhibit 7-12). Thus, the annual net loss to the community for servicing this residential development is $120,000 ([(116 ÷ 100) x $750,000] - $750,000).

If the operation and maintenance cost of the 50-acre natural park is lower than $120,000 per year, then it is a less expensive option to service than the housing development on the same site.

common alternate use proposed for potential park and open space lands. Thus, because only nominal revenue is likely to accrue from public park and open space lands, the key fiscal impact issue becomes, "Will the net costs of purchasing, maintaining and operating the land as a park or as open space be greater than the net costs associated with servicing a residential development that may be constructed on that site?" Evidence in previous chapters of this monograph suggests that the purchase cost of a park is likely to be paid for by increases in proximate property values. Hence, the fiscal impact comparison involves only the park or open space land's maintenance and operating expenses.

Exhibit 7-13 uses the 50-acre natural park site described in Chapter 1 (Exhibit 1-1) and the data summarized in Exhibit 7-12, to illustrate how to undertake the comparative fiscal impact analysis. In the context provided, the illustration suggests that if the annual cost of maintaining and operating the natural park is less than $120,000, then it is likely to be less of a financial burden to the community than if the 50 acre site is developed for houses.

Further, it was noted earlier that investment in parks and open space does not incur the externality costs that accompany residential development – traffic, congestion, noise, crime, pollution, infrastructure deterioration, and changes in community character. The COCS methodology does not include quantification of the costs of these externalities, but presumably they add to the appeal of using land for open space rather than developing it.

In Exhibit 7-5 an example was given of a city which planned to increase its purchase of park and open space lands in order to eliminate the need to fund an additional school. Exhibit 7-14 offers a set of examples of communities that have adopted similar strategies of acquiring open space in order to reduce their residents' tax bills. The Pittsford Solution which is described in Exhibit 7-15 has received widespread national attention and visibility as a result of its dissemination by the American Planning Association which has recommended it as a model for other communities.

CONCLUSIONS

It has been suggested that, "Communities striving to reduce the tax burdens on citizens may not fully appreciate the increase in the scope and level of services that will have to be provided to different categories of the land use" (p. 9)[48] The costs and benefits of parks

and open space have largely been ignored by fiscal impact studies in the past. The results reported here provide evidence of the need to include parks and open space in the fiscal and economic discourse.

COCS analyses have consistently reported that over a wide range of residential densities, and especially in rapidly growing communities, the public costs associated with residential development exceed the public revenues that accrue from it. The traditional belief that development pays its way is being discarded. The emerging prevailing view is that few developments generate sufficient tax payments to pay their way. Further, an analysis of property taxes in Massachusetts concluded: (i) tax bills were lowest in towns with the most open space per capita; (ii) towns where open space made up a larger proportion of the tax base had lower taxes, on average, than most developed towns; and (iii) towns with the most permanently protected land had lower tax rates on average.[76]

The procedures used in these studies were intended by the American Farmland Trust to "simplify" the complex and expensive process involved in undertaking traditional fiscal impact analyses. The trade-off in using the simpler procedures is some reduction in level of accuracy. However, the consistency of the results, and the magnitude of differences between residential and open space use, is so striking that debate over nuances in the methodology is rendered redundant. The evidence clearly indicates that preserving open space can

Exhibit 7-14 Examples of Communities that have Purchased Open Space to Reduce the Tax Burden, which would have Resulted from Residential Development

- Huntsville, Alabama, is the eastern gateway to Wheeler National Wildlife Refuge, a 35,000-acre preserve along the Tennessee River. Huntsville's eastern limits are flanked by Monte Sano Mountain, the city's most visible landmark. In 1988, a developer acquired a large tract on the western slope of the mountain and proposed to convert it to high-priced homes. An analysis by a local conservation organization, the Huntsville Land Trust, determined that it would cost the city about $5 million to install roads, sewers, and other infrastructure for the development, and another $1.4 million a year to service it. On the other hand, the city could acquire the entire parcel for $3 million, with annual maintenance costs of only about $40,000. Once the voters discovered the true cost of the development, they approved a sales-tax increase to buy the property and dedicate it as a park.[1]
- Visitors to Lake Michigan's eastern shore often combine a trip to Sleeping Bear Dunes National Lakeshore with a visit to nearby Old Mission Peninsula, where cherry orchards and vineyards dot a narrow finger of land that juts 16 miles into Grand Traverse Bay. Concerned with their town's rapid growth, voters in 1994 approved a property-tax increase to purchase conservation easements on farms, preventing them from ever being developed. Support for the tax hike was based on estimates that a surging population would lead to higher municipal expenses and, eventually, higher taxes. In other words, a slight increase in property taxes today could avert a larger increase tomorrow. Over the next 15 years, the tax increase was projected to raise $2.6 million, which was enough to buy development rights on nearly one-fourth of the peninsula's farms.[1]
- Yarmouth, Maine, a community on the state's rugged Atlantic Coast, chartered a citizens' committee to examine the pros and cons of developing a parcel of land outside the town. The committee found that (i) if the property were developed, service costs would be $140,000 a year greater than the tax revenue the project would generate, and (ii) the city could purchase the entire property for $76,000 a year over a 20-year period. As a result, residents overwhelmingly approved a referendum to issue $1.5 million in bonds for open-space acquisition.[1]
- In Wayland, Massachusetts, it was found that development of 1,250 acres of open space would cost taxpayers $328,350 a year more than they would receive in added tax revenues from new homes. This represented a $7.75 increase in the tax rate. On the other hand, purchasing the property would only add $4.25 to the tax rate.[73]
- When a 720-acre farm property became available for sale in Mansfield Township, New Jersey, the zoning ordinance would have permitted 300 units of small, clustered housing to be developed on the site. The average cost per household to the school district, assuming one student per home, was $5,568. The average residential property tax, excluding county taxes, was $2,172. Given these data, the Township concluded:

  > The annual cost to the school district would be approximately $1,670,400 ($5,568 x 300 children).The anticipated revenue would be approximately $651,600 ($2,172 x 300 homes). The annual deficit for the school district budget would be $1,018,800 ($1,670,400-$651,600).

The cost of purchasing the development rights of the 720-acre farm was $10.4 million. The public investment for the development rights could be offset in less than 15 years by avoiding the higher costs associated with development of the farm. From then on the town would receive only the positive revenue flow from the farmland, and attain the statewide and municipal goal of farmland preservation. In contrast, the cost for a residential development would continue forever.[74]

Exhibit 7-15 The Pittsford Solution[15]

In 1998, the American Planning Association recognized the innovative conservation action taken by the Town of Pittsford, New York, which is a 24 square mile suburb of Rochester located seven mile south-east of the city, by awarding the town its annual Current Topic Award. Land development in Pittsford was consuming important agricultural landscapes, scenic vistas, and other natural and cultural resources. A comprehensive planning process, involving more than 100 public meetings, workshops, and focus group sessions, resulted in a community consensus that they wanted to preserve these central features of the town's character. The outcome was development of a precedent-setting plan for permanently protecting its greenspaces that the American Planning Association considered to be "exemplary."

A key element in their decision process was the results of a fiscal impact analysis which predicted future tax rates based upon the costs and revenues associated with alternate future land-use patterns. The fiscal impact analysis revealed the following:

- If the town did nothing, the typical household would pay increased taxes of several hundred dollars per year to support growth.
- The break-even value of a new home was more than $300,000. Break-even occurs when the tax revenue gained from the addition of a house equals the cost of community services attributable to a new home.
- Increased commercial development could decrease future tax increases.
- The break-even cost for the town to purchase development rights on farms and other open space resources in the path of development was about $10,000 per acre. The break-even cost occurs when the cost of financing a bond to purchase the development rights for an acre equals the net additional cost to the community of developing an acre for residential use.

The fiscal impact analysis demonstrated that it would be less expensive to implement a revised land-use plan than to follow the current zoning policies. The revised plan included purchase of conservation easements on important farmland and open space resources, coupled with a policy of creating several enhanced economic development sites for commercial and light industrial business expansion.

The fiscal impact analysis showed that protection of open space, including purchase of development rights, would cost taxpayers less per year for support of community services than full build-out of the town. This finding did not mean that there should be no further development. It meant that a fiscal balance could be achieved through a strategy that promoted a variety of housing types, recognized the need for the development of economic land uses, and preserved open space. Using the fiscal model as a planning tool, the targets for land preservation and development were tested, modified, and refined.

The plan protected more than 2,000 acres, which represented about two-thirds of the remaining undeveloped land in the town. Three mechanisms were used:

- Purchase of development rights on 1,200 acres
- Incentive zoning (transfer of development rights) on 200-plus acres
- Mandatory clustering protecting 600-plus acres.

The purchase of development rights program protecting 1,200 acres was directed at seven farms. Landowners supported the plan because they were compensated for the loss of their development rights. The average cost to a homeowner of the purchases was $45 per year for 20 years. In contrast, the fiscal impacts analysis estimated that homeowners would face an average tax increase of $250 per year if the development rights program was *not* implemented and a projected 1,000 plus new homes were built on this land. Avoiding these tax costs saved the average homeowner over $4,000 over the life of the bonds issued to purchase the development rights which were acquired at an average price of $5,600 per acre.

Source: John J. Behan (1999) Pittsford's Greenprint Initiative *Planners' Casebook* Spring/Summer. Published by the American Institute of Certified Planners

be a less expensive alternative to development. The conclusion is that a strategy of conserving parks and open space is not contrary to a community's economic health, but rather is an integral part of it.

These types of findings provide park advocates with a credible entré into the economic development discussion and enable them to position parks as being a meaningful component of economic development. By showing their relative fiscal strength compared to residential development, advocates can refute the notion that parklands are a drain on local resources. The results challenge the assumption that development of land is its "highest and best use," which often thwarts park and open space advocates.

The intent in this chapter is not to argue for parks and open space rather than housing because that does not solve a problem, it only shifts it elsewhere. There is a moral issue here. People have to live somewhere, so there cannot be a national moratorium on residential development. Rather, the intent is to point out that using land for parks and open space is relevant to discussions concerned with enhancing a community's fiscal health. The goal is not to prevent growth, but to encourage a balance between development and open space which tends to get lost without these types of analyses. These types of studies moderate the dialog by giving parks and open space a higher profile in the economic development debate. They also may provide support evidence for a bond initiative if they demonstrate that open space investment may result in a net saving to the community.

References

1. Howe, Jim, Ed McMahon, and Luther Papst (1997). *Balancing nature and commerce in gateway communities*. Washington, DC: Island Press.

2. Caputo, Darryl F. (1979). *Open space pays: The socioenvironomics of open space preservation.* Morristown, New Jersey: New Jersey Conservation Foundation.

3. Molotch, Harvey (1976). The city as a growth machine: Toward a political economy of place. *American Journal of Sociology* 82(2), 309-330.

4. Fordor, Eben (1999). *Better not bigger.* British Columbia, Canada: New Society Publishers.

5. Kinsley, Michael J. and L. Hunter Lovins (1995). *Paying for growth, prospering from development.* Snowmass, Colorado: Rocky Mountain Institute.

6. Nantucket Land Council Inc. (1989). *Balancing today's development and tomorrow's taxes.* Nantucket, MA: Nantucket Land Council.

7. Thomas, Holly L. (1991). *The economic benefits of land conservation.* Duchess County, New York: Department of Planning and Development, Technical Memo.

8. American Farmland Trust (1986). *Density related public costs*. Northampton, Massachusetts: American Farmland Trust.

9. Montgomery County Lands Trust (2003). *Saving land saves money*. Lederach, Pennsylvania: Montgomery County Lands Trust.

10. Little, Charles E. (1969). *Challenge of the land.* New York: Pergamon Press.

11. Rusch, Ruth (1963). Here's proof that open space can hold down taxes. Park *Maintenance,* February 24-27.

12. Outdoor Recreation Resources Review Commission (1962). *Outdoor recreation for America.* Washington, DC: Superintendent of Documents.

13. Reilly, William K (1973). *The use of land; a citizens policy guide to urban growth.* New York: Crowell.

14. Freedgood, Julia (1992). *Does farmland protection pay? The cost of community services in three Massachusetts towns*. Northampton, Massachusetts: American Farmland Trust.

15. Kelsey, Timothy W. (1992). *The fiscal impacts of different land uses:* The Pennsylvania experience. State College, Pennsylvania: Cooperative Extension Service.

16. Freedgood, Julia (2002). *Cost of community services studies: Making the case for conservation.* Northhampton, Massachusetts: American Farmland Trust.

17. Miller, Stephen (1992). *The economic benefits of open space*. Islesboro, Maine: The Islesboro Islands Trust.

18. Haggerty, Mark (2000). *The cost of community services in Custer County, Colorado.* Study sponsored by San Isabel Foundation, Custer Heritage Committee, Sonoran Institute and American Farmland Trust.

19. Dirt, Inc. (2001). *A revenue cost analysis of community service provisions in Saguach County, Colorado*. Northampton, Massachusetts: American Farm Land Trust.

20. Geisler, K. (1999). *Cost of community services study: Bolton, Connecticut*. Unpublished paper. Keene, New Hampshire: Antioch New England Graduate School.

21. Commonwealth Research Group Inc. (1995). *Cost of community services in southern New England.* Chepachet, Rhode Island: Southern New England Forest Consortium Inc.

22. American Farmland Trust (1986). *The Cost of community services in Hebron, Connecticut.* Northampton, Massachusetts: American Farmland Trust.

23. Dorfman, Jeffrey H. and Dawn A. Black (2002). *Service costs and revenue streams of different land uses in Carrol County, Georgia: The economic costs of development for local governments*: Carrol County: Farmland and Rural Preservation Partnership.

24. Hartmans, M. and N. Meyer (1997). *Financing services for residential, commercial, and agricultural parcels: The cases of Canyon and Cassia Counties*. Idaho Agricultural Extension Series No. 96-13.

25. Adams, Melissa (1999). *The cost of community services in Lexington-Fayette County, Kentucky.* Northampton, Massachusetts: American Farmland Trust.

26. Good, T.F. (1994). *The cost of community services in Bethel, Maine.* Keene, New Hampshire: Antioch New England Graduate School.

27. Pyne, S.V.R., J.K. Topper and K.L.

Grabill (1994). *Fiscal impacts of residential, commercial/industrial, and agricultural land uses in Carroll County, Maryland.* Carroll County: Department of Management and Budget.

28. American Farmland Trust (2001). *The cost of community services in Middleborough, Massachusetts.* Northampton, Massachusetts: American Farmland Trust.

29. Cecil County Office of Economic Development (1994). *Fiscal impacts of residential, commercial/industrial and agricultural land uses in Cecil County, Maryland.*

30. American Farmland Trust (1997). *The cost of community services in Frederick County, Maryland.* Northampton, Massachusetts: American Farmland Trust.

31. American Farmland Trust (2002). *Kent County, Maryland, cost of community services study.* Northampton, Massachusetts: American Farmland Trust.

32. American Farmland Trust (2001). *Wicomico County, Maryland, cost of community services*. Northampton, Massachusetts: American Farmland Trust.

33. American Farmland Trust (2001). *The cost of community services in Middleborough, Massachusetts.* Northampton, Massachusetts: American Farmland Trust.

34. Adams, M. and T. Hines (1997). *Assessing land-use costs: A cost of community services study in Southborough, Massachusetts.* Northampton, Massachusetts: American Farmland Trust.

35. Hazler, Kristin, John Kinabrew and William Sullivan (1992). *The cost of community services in Williamstown, Massachusetts.* Williamstown, MA: Williams College, Department of Environmental Planning.

36. American Farmland Trust (2001). *Calhoun County, cost of community services.* Northampton, Massachusetts: American Farmland Trust.

37. University of Michigan (1994). Cited in Freedgood ref. 16.

38. Senf, David (1994). *Farmland and the tax bill: The cost of community services in three Minnesota towns.* Northampton, Massachusetts: American Farmland Trust.

39. Prinzing, Kristen (1999). *Cost of providing community services in Carbon County, Montana.* Montana: Carbon County Commissioners.

40. Haggerty, M. (1996). *Fiscal impacts of alternative development patterns: Broadwater and Gallatin Counties.* Montana Policy Review, Fall: 19-31.

41. Citizens for a Better Flathead (1999). *The fiscal impact of different landuses on community government and school districts in Flathead County, Montana, for the fiscal year 1997.* Flathead County: Citizens for a Better Flathead.

42. Auger, P.A. (1994). *Does open space pay?* Durham, NH: University of New Hampshire Cooperative Extension.

43. Kingsley et al. (1993). Cited by American

Farmland Trust, Technical Assistance Division on website:www.farmlandinfo.org. March 2000.

44. Niebling, C.R. (1997). *Town of Exeter, New Hampshire cost of community services study.* Concord, NH: Innovative Natural Resource Solutions.

45. Taylor, Dorothy T. (2001). *1997 Cost of community services study: Groton, New Hampshire.* Concord, New Hampshire: New Hampshire Wildlife Federation.

46. Richard, Constance (2000). *1998 cost of community services study: Town of Lyme, New Hampshire.* The statewide program of action to conserve our environment.

47. Adams, M. and J. Freedgood (1998). *The cost of community services in Monmouth County, New Jersey*. Northampton, Massachusetts: American Farmland Trust.

48. Bucknall, Christopher P. (1989). *The real cost of development*. Poughkeepsie, NY: Scenic Hudson Inc.

49. Cornell Cooperative Extension of Dutchess County and American Farmland Trust (1989). *Cost of community services study: Towns of Beekman and Northeast Dutchess County, New York*, Milbrook, NY.

50. Schuyler County League of Women Voters (1993). *Fiscal impact of residential, commercial, and agricultural land use in the towns of Hector and Dix*. Schuyler County, New York: League of Women Voters.

51. Kinsman, Connie, Loyd Garrison and Jane Sloan (1991). *Farmington cost of community services study.* Milbrook, New York: Cornell Cooperative Extension Service and American Farmland Trust.

52. Concerned Citizens of Kinderhook (1996). Cited by American Farmland Trust, Technical Assistance Division on website, www.farmlandinfo.org March 2000.

53. Schuyler County League of Women Voters (1992). *Fiscal impact of residential, commercial and agricultural land use in the towns of Montour and Reading*. Schuyler County, New York: League of Women Voters.

54. American Farmland Trust (1994). *The cost of community services in Madison Village and Township, Lake County, Ohio.* Northampton, Massachusetts: American Farmland Trust.

55. Portage County Regional Planning Commission (1997). *Containing urban sprawl in Portage County, Ohio: Project report to the George Gund Foundation* Portage County: Shalersville Township, Ohio.

56. Kelsey, Timothy W. (1987). *The fiscal implications of alternative land uses.* State College, Pennsylvania: The Pennsylvania State Cooperative Extension.

57. Kelsey, Timothy W. (1994). *The fiscal implications of alternative land uses.* State College, Pennsylvania: The Pennsylvania State Cooperative Extension.

58. Kelsey, Timothy W. (1996). *The fiscal implications of alternative land uses*. State College, Pennsylvania: The Pennsylvania State Cooperative Extension.

59. South Central Assembly for Effective Governance (2002). *Cost of community services. Shrewbury township, York County, Pennsylvania* Shrewsbury Township: South Central Assembly for Effective Governance.

60. Johnston (1997). Cited in Freedgood ref. 16.

61. American Farmland Trust (2002). *The cost of community services in Bandera County, Texas.* Northampton, Massachusetts: American Farmland Trust.

62. Bowden, Margaret A. (2000). *The cost of community services in Hays County, Texas.* Austin: University of Texas, M.S. in Department of Community and Regional Planning.

63. Snyder, D.L. and G. Ferguson (1994). *Cost of community services study: Cache, Servier, and Utah Counties.* Logan, Utah: Utah State University, Economics Department.

64. Hutchinson, John D. (1993). *Land use and community costs: A study of the relative costs and revenues of different land uses in Augusta County, Virginia.* Augusta County: Valley Conservation Council.

65. Vance, Tamara (1994). *Fiscal impacts of major land uses in Clarke County*. Piedmont, Virginia: Piedmont Environmental Council.

66. Larson, Arthur B. and Tamara A. Vance (1988). *Fiscal impacts of residential development in Culpepper County, Virginia.* Piedmont, Virginia: Piedmont Environmental Council.

67. Adams, Melissa (1999). *The cost of community services in Northampton County, Virginia.* Northampton, Massachusetts: American Farmland Trust.

68. American Farmland Trust (2002).

69. American Farmland Trust (1999). *The cost of community services in Skagit County, Washington*. Northampton, Massachusetts: American Farmland Trust.

70. Town of Dunn (1994). *Cost of community services in Dunn, Wisconsin*. Dunn, WI: City Planning Department.

71. Edward, Mary, Douglas Jackson-Smith, Steve Ventura and Jill Bukovac (1999). *The cost of community services for Three Dane County Towns: Dunn, Perry and Westport.* Research Report #1, Madison, University of Wisconsin, Wisconsin Land Use Research Program.

72. Altshuler, Alan A. and José A. Gómez-Ibánez (1993). *Regulation for revenue: The political economy of land use exactions.* Washington, DC: The Brookings Institution.

73. Bryan, Todd A. (n.d.) *Developments and taxes: Facts versus fiction.* Mendham, NJ: Association of New Jersey Environmental Commissions.

74. Association of New Jersey Environmental Commissions (1996). *Open space is a good investment: The financial argument for open space preservation*. Menham, New Jersey.

75. Behan, John J. (1999). Pittsford's Greenprint Initiative. *Planners' Casebook*.

Spring/Summer. American Institute of Certified Planners.

76. Brighton, Deb (1999). Community choices: *Thinking through land conservation, development and property taxes in Massachusetts*. Boston: Trust for Public Land.

APPENDIX 1

THE THREE COLLECTIVE PUBLIC BENEFITS THAT MAY ACCRUE FROM PARK AND RECREATION SERVICES[1]

The provision of park and recreation opportunities for their own sake still lacks political clout. They have to be shown to solve community problems before politicians see them as being worthy of funding. Many taxpayers are not frequent users of park and recreation services and, thus, have difficulty understanding why they should support them. The prevailing sentiment is often: If only some segments of our community use park and recreation services, then why should the rest of us have to pay for them? To gain the support of non-users, an agency has to provide a convincing answer to the question "What is in it for them?" Broader community support is likely to be dependent on building awareness not only of the on-site benefits that accrue to users, but also of the off-site benefits that accrue to non-users in communities.

There is increased recognition that while benefit driven programs may lead to higher levels of satisfaction among participants and attract increased numbers, such individual "private" benefits have relatively little impact on resource allocation decisions made by elected officials. These benefits are described as individual or "private" because they accrue only to program participants and do not extend to the majority of the population who are only occasional users or non-users. Providing resources to a parks and recreation department so a minority of residents can have enjoyable experiences is likely to be a low priority when measured against the critical economic, health, safety and welfare issues with which most legislative bodies are confronted.

To justify the allocation of additional resources, elected officials have to be convinced that park and recreation agencies deliver collective "public" benefits. These are defined as benefits that accrue to most people in a community, even though they do not participate in

1. An expanded discussion of these benefits can be found in Chapter 5 of a book: John L. Crompton (1999) *Financing and Acquiring Park and Recreation Resources*, Champaign, Illinois: Human Kinetics.

an agency's programs or use its facilities. There are just three of these public benefits: **economic development; alleviating social problems; and environmental stewardship.** However, even these three categories of public benefits receive funding support only when they are regarded as being high priority in a community. Hence, the task of a park and recreation agency is to identify which of these public benefits is most prominent on a jurisdiction's political agenda, and to demonstrate the agency's potential contribution to fulfilling that agenda.

Economic Development

Economic development is viewed as a means of enlarging the tax base. The enlargement provides more tax revenues that governments can use either to improve the community's infrastructure, facilities, and services or to reduce the level of taxes that existing residents pay. It is seen also as a source of jobs and income that enables residents to improve their quality of life. In some communities, park and recreation agencies play a major role in economic development. That role may take the form of:

(i) **Attracting Tourists**: The major factor considered by tourists when they make a decision which communities to visit on a pleasure trip, is the attractions that are available. In most cities, those attractions are dominated by facilities and services operated by park and recreation agencies and their non-profit partners (parks, beaches, events, festivals, athletic tournaments, museums, historical sites, cultural performances, etc.). Without such attractions, there is no tourism.

(ii) **Attracting Businesses:** The viability of businesses in the highly recruited high-technology, research and development, company headquarters, and services sectors, in many cases is dependent on their ability to attract and retain highly educated professional employees. The deciding factor of where these individual choose to live is often the quality of life in the geographic vicinity of the business. No matter how quality of life is defined, park and recreation opportunities are likely to be a major component of it.

(iii) **Attracting Retirees**. A new clean growth industry in America today is the growing number of relatively affluent, active retirees. Their decisions as to where to locate with their substantial retirement incomes is primarily governed by two factors: climate and recreational opportunities.

(iv) **Enhancing Real Estate Values**. People are prepared to pay more to live close to natural park areas. The enhanced value of these properties results in their owners paying higher property taxes to governments. If the incremental amount of taxes paid by each property that is attributable to the park is aggregated, it is often sufficient to pay the annual debt charges required to retire the bonds used to acquire and develop the park.

Alleviating Social Problems

(i) **Preventing Youth Crime**. The use of park and recreation programs to alleviate youth crime was a primary political stimulant for much of the early recreation provision in major cities at the beginning of the 20th century. There is strong evidence demonstrating the success of these programs when they are structured to provide: social support from adult leaders; leadership opportunities for youth; intensive and individualized attention to participants; a sense of group belonging; youth input into program decisions; and opportunities for community service. The return on investment of such programs is substantial when it is re-

lated to the costs of incarceration.

(ii) **Healthy Lifestyles**. There is growing recognition that the key to curtailing health care costs lies in prevention of illness so it does not have to be treated by the expensive medical system. Park and recreation services contribute to this end not only by facilitating improvements in physical fitness through exercise, but also by facilitating positive emotional, intellectual and social experiences. People with high levels of wellness have a proclivity to act during their free time, rather than merely be acted on.

(iii) **Environmental Stress.** Environmental stress may involve both psychological emotions, such as frustrations, anger, fear and coping responses, and associated physiological responses that use energy and contribute to fatigue. It is experienced daily by many who live or commute in urban or blighted areas. Parks in urban settings have a restorative effect that releases the tensions of modern life. Evidence demonstrating the therapeutic value of natural settings has emerged in both physiological and psychological studies. The cost of environmental stress in terms of work days lost and medical care is likely to be substantially greater than the cost of providing and maintaining parks, urban forestry programs, and oases of flowers and shrubs.

(iv) **Unemployment and Underemployment**. Basic psychological needs that many people derive from their work are difficult to acquire when unemployed or working in low-level service jobs such as cashiers, janitors and cleaners which are the major growth positions in the economy. Such needs may include self-esteem, prestige accruing from peer group recognition, ego satisfaction of achievement, a desire to be successful, excitement and self-worth. For the growing number of people in low level jobs, these needs will be obtained in their familial or leisure milieus, or they will not be obtained at all.

Environmental Stewardship

(i) **Historical Preservation**. Without a cultural history, people are rootless. Preserving historical remnants offers lingering evidence to remind people of what they once were, who they are, what they are and where they are. It feeds their sense of history.

(ii) **The Natural Environment.** People turn to the natural environment, preserved by humans as a park, wilderness, or wildlife refuge, for something they cannot get in a built environment. The quality of human life depends on an ecological sustainable and aesthetically pleasing physical environment. The surge of interest in conserving open spaces from people motivated by ecological and aesthetic concerns, is matched by a similar surge from those concerned that the inexorable rise in demands for outdoor recreation is not being matched by a commensurate expansion of the supply base.