THE IMPACT OF PARKS AND OPEN SPACE ON PROPERTY VALUES AND THE PROPERTY TAX BASE

by

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CONTENTS

PREFACE

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] A future publication will review the role of park and recreation facilities and services in encouraging businesses and retirees to relocate to a community. These 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.

The first chapter discusses the basic principle that explains how increases in proximate property values around a park can be sufficient to pay for the park's acquisition and development. A discussion of excess condemnation, special assessment districts, and tax-increment financing districts is included since these are all financing mechanisms embracing this principle that have been used by communities to fund park developments.

In Chapters 2 and 3, the empirical evidence that validates the principles described in Chapter 1 is reviewed. The early studies presented in Chapter 2 are likely to be considered "naï ve" today, because they did not use the statistical tools available to more contemporary researchers. Nevertheless, they constitute part of the body of knowledge in this area. They also document the rich historical pedigree and tradition of the principle, and its effectiveness in persuading decision-makers to invest in parks. The later studies reviewed in Chapter 3 tend to use more sophisticated research designs and statistical techniques to control for variables other than park land and open space that may influence property values, which enhances the credibility and acceptance of their findings.

A corollary proposition to the positive impact of parks on property values is that the net cost to a community of maintaining and servicing parks and open space is less than the net cost of maintaining and servicing residential real estate development. This corollary is considered in Chapter 4 which reviews the principles of fiscal impact analysis and summarizes the results from approximately 60 of them. The chapter consistently documents the negative fiscal impacts incurred by a community when open space or potential parkland is usurped for residential development and provides strong evidence of support for the corollary.

The evidence relating to developments proximate to greenway trails is reviewed in Chapter 5. There was some evidence that greenway trails had a positive impact on the saleability and value of proximate property, but the dominant sentiment was ambivalence indicating they had no impact on these issues.

The discussion in Chapter 6 indicates developers incorporate golf courses into property developments because they have found that proximate lot land values in a development increase sufficiently to ensure an enhanced profit margin, even after the substantial costs of acquisition and development of a golf course have been met. The high visibility and success of these golf course developments demonstrates by analogy the probable economic viability of community investments in park land and open space.

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. Unfortunately, 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 impact on proximate property of oceans, lakes or rivers, or changes in the water quality of these bodies, was defined as being outside the scope of this monograph and is not reviewed in it. Nevertheless, it is recognized that results from such studies may be of interest to some readers of this publication. For this reason, a bibliography of them is included in Appendix 2.

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 included in Chapter 4. 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.

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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.

The real estate market consistently demonstrates that many people are willing to pay a larger amount for a 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 an illustrative hypothetical scenario 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.

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, three vehicles are discussed which 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 excess purchase / condemnation, special assessment districts, and tax-increment financing districts.

The proximate principle was first promulgated and empirically verified in the parks field by Frederick Law Olmsted in the context of Central Park in New York City. The documented evidence from Central Park established the proximate principle as conventional wisdom among elected officials and planners as well as park advocates in the late nineteenth and early twentieth centuries. As a result, it

was 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.

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 naive, 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 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 25 studies that investigated this issue were reviewed and in 20 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 empirical evidence to support not only the proximate principle, 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. 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.

Examination of the five studies that did not support the proximate principle suggested that in four of those cases the ambivalent findings may 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 the 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. If the park is large (say over 25 acres), well-maintained, attractive, and its use is mainly passive, then this figure is likely to be low. If it is small and embraces some active use, then this guideline is likely to be high. If it is a heavily used park incorporating such recreation facilities as athletic fields or a swimming pool, then the proximate value increment may be minimal on abutting properties but may reach 10% on properties two or three blocks away.

The diversity of the study contexts also makes it non-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. However, there was convincing evidence that it is likely to have substantial impact up to 500 feet and that in the case of community sized parks it is likely to extend out to 2,000 feet. 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. Nevertheless, in the case of these larger parks there was evidence to suggest impact extended beyond this artificial peripheral boundary, since the catchment area from which users came usually extended beyond it.

It is often argued 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. Because park 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 recent years some communities have commissioned fiscal impact analyses. 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. This is because people who reside in developments require services. In contrast, natural parks and open space require few public services -- no roads, no schools, no sewage, no solid waste disposal, no water, and minimal fire and police protection.

A review of over 60 fiscal impact studies clearly indicated that preserving open space is likely to be a less expensive alternative for communities than residential development. On average, for every $1 million received in revenues from residential developments, the communities had to expend $1.15 million to service them. This suggests that if the area of land on which a development generating $1 million in revenues is located was used as a park instead, then if the park's operation and maintenance costs did not exceed $150,000 the community would financially benefit.

In the 1990s, there was an explosion of interest in developing greenways. 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 most 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, but a consistent pattern emerges from it. There is broad consensus that trails have no negative impact on either the saleability of property (easier or more difficult to sell) or its value. There is a belief among some, typically between 20% and 40% of a sample, that there is a positive impact on saleability and value. However, the dominant sentiment is that the presence of a trail has no impact on these issues.

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 and to accelerate the absorption of real estate, i.e. to sell their lots more quickly.

Contemporary golf courses exemplify the important role of "edge" in maximizing real estate values. Traditional, almost rectangular shaped courses similar to the shape of traditional parks, have been discarded in favor of linear courses which can accommodate much more real estate frontage. Lots and houses throughout a golf-course community bring substantial premiums over comparable lots/units in non-golf developments.

The developers' strategy mirrors that which has been advocated by supporters of public parks and open space for over a century, i.e. parks are an investment not a cost because they generate more property taxes for a city 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.

CHAPTER 1

The Basic Principles

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THE BASIC PRINCIPLES

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 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 per-

suasive 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 previous 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.

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.

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 the additional revenues from property taxes, which then can be used to improve community services without increasing the taxes of existing residents. The conventional wisdom that development 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 Army's 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, 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 developments. This monograph reviews a convincing body of evidence dating back almost 150 years to pioneering work by Frederick Law Olmsted which suggests the conventional wisdom that park amenities offer no economic return is wrong.

The generalizable insights that accrue from multiple studies which have reported positive 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. Further, it has been suggested that better data on economic benefits is a key to promoting public-private development partnerships. For example, improved awareness by private developers about the value of park and open space amenities is likely to give public agencies a stronger negotiating position for securing such amenities when dealing with private proposals.[3]

THE BASIC PRINCIPLE

The premise that parks and open space have a positive impact on 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 further away. Over 30 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).[4]

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. 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 the park or 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 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 shown in Figure 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.

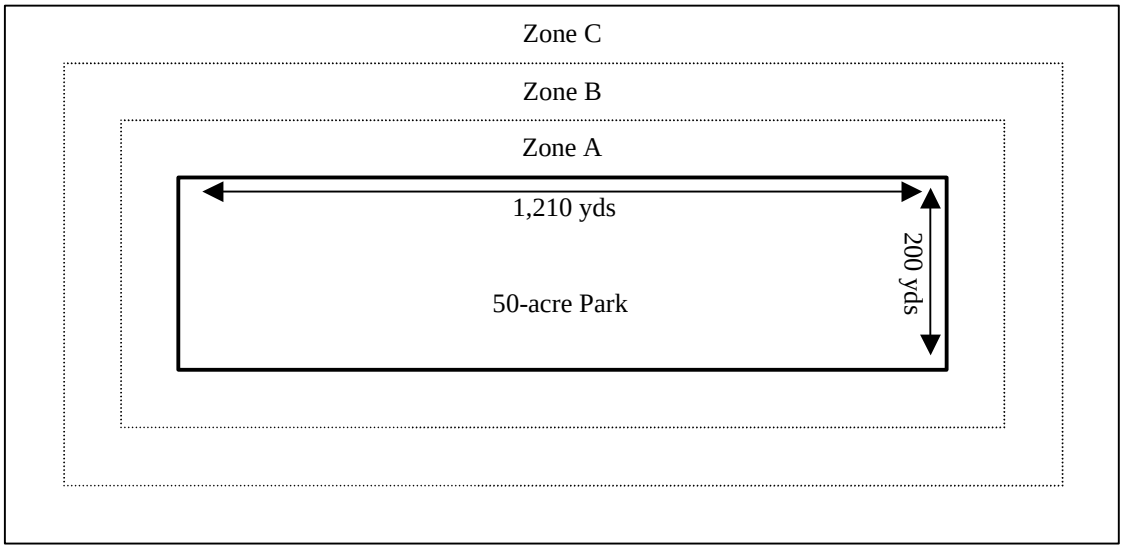

Figure 1-1 Layout of a 50 acre Natural Park and the Proximate Neighborhood Area

A projected annual income stream to service the bond debt was calculated as follows:

- If properties around the park are 2,000sq ft homes on half-acre lots (40 yd x 60 yd) with 40 yd frontages on the park, then there would be 70 lots in Zone A (30 lots along each of the 1,210 yd perimeters and 5 lots along each of the 200 yd perimeters).
- Assume total property taxes payable to city, county, and school district are 2% of the market value of the property.
- Assume the market value of similar properties elsewhere in the jurisdiction beyond the immediate influence of this park is $200,000.
- 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, and that there are also 70 lots in Zones B and C.

Table 1-1 shows that, given the above assumptions, the annual incremental property tax payments in the three zones from the premiums attributable to the presence of the park amount to $98,000. This is sufficient to pay the $90,000 annual bond debt charges.

The flows of this investment cycle are shown in Figure 1-2: (i) the council invests $90,000 a year for 20 years (annual debt charges on a $1 million bond) to construct or renovate a park; (ii) which causes the values of properties proximate to the park to increase; (iii) leading to higher taxes paid by the proximate property owners to the council; (iv) that are sufficient to fully reimburse the $90,000 annual financial investment made by the council.

There are three additional points worth noting which may further strengthen the economic case. First, this illustration assumes no state or federal grants are available to aid in the park's acquisition and development. If they were available to reduce the community's capital outlay, then the incremental property tax

Table 1-1 Property Taxes Pay the Annual Debt for Acquisitions and the Development of the Park

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

income stream would greatly exceed that required to service the debt payments. Second, the incremental property tax income will continue to accrue to the community after the 20-year period during which the debt charges will be repaid, at which time the net return to the community will be substantially enhanced.

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 retirees.[5] However, the proximate capitalization approach does not capture the secondary economic benefits attributable to park provision that accrue from such sources.

Finally, a park of the size shown in Figure 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 3000 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.[6] 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.[7] 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 these users were not represented in the economic benefit capitalization calculations.

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.[8] If a 100 acre park is 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

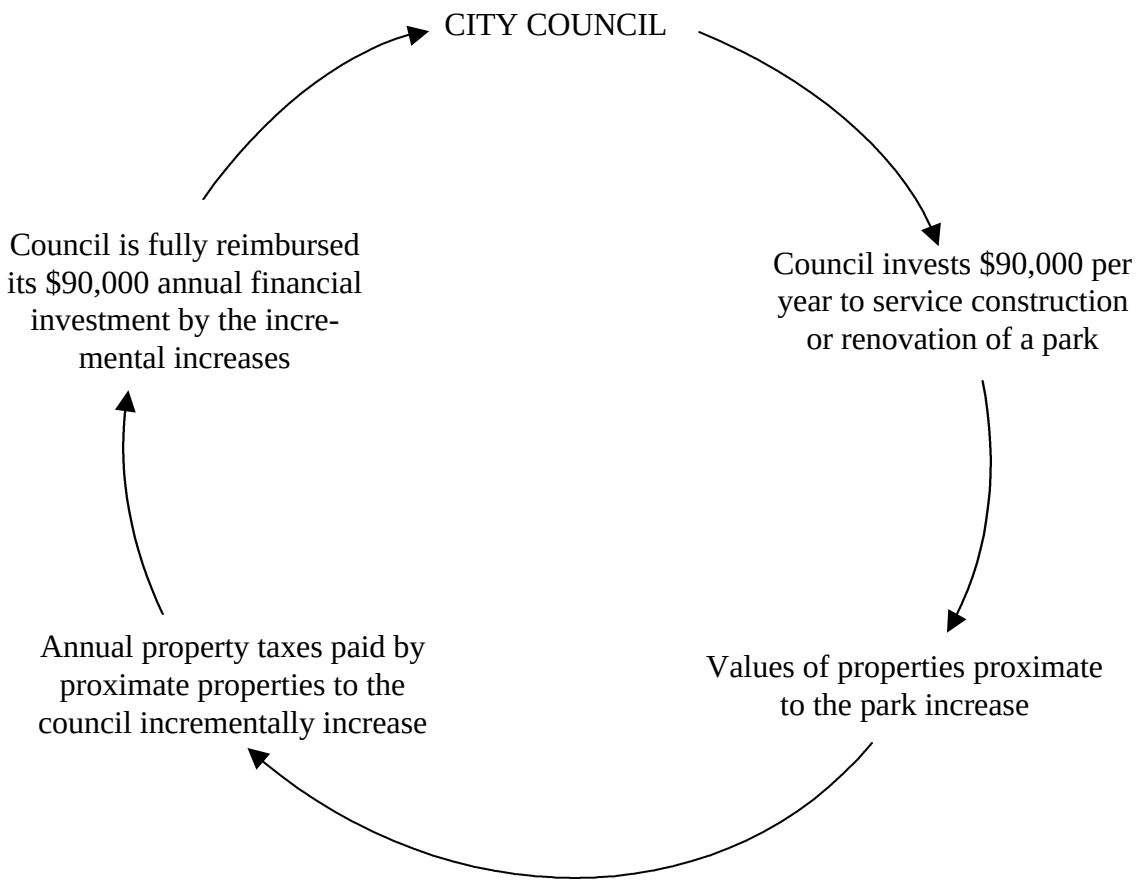

Figure 1-2 The Investment Cycle Associated with a Local Government's Investment in a Park

Figure 1-3. The increased amount of edge means that more property can be sited adjacent to the park and the aggregate enhancement value of the property tax base is likely to be larger. This edge principle has been widely embraced in the design of golf courses which are incorporated into residential real estate developments. These are discussed in Chapter 6.

The research evidence validating and supporting the hypothetical scenario used to illustrate the proximate principle is reviewed in Chapters 2 and 3. 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 more than a 100 year period, in varied settings, by researchers from different disciplines, using a variety of techniques.

POTENTIAL NEGATIVE INFLUENCES OF PARKS ON PROPERTY VALUES

It is important to recognize that some types of parks are more desirable than others as places to live nearby. For example, there is convincing evidence that large flat open spaces

Figure 1-3 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: Charles E. Little (1990) Greenways for America. Baltimore: Johns Hopkins University Press.

which are used primarily for athletic activities and large social gatherings, are much less preferred than natural areas containing woods, hills, ponds or marsh.[9] Further, it must be recognized that there are contexts in which parks exert a negative image 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 then the property value is likely to be diminished.[10]

Adverse impacts may result from nuisances such as: congestion, street parking, litter and vandalism which may accompany 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; or undesirable 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 Mr. Justice Sears wrote:

> 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. The following commentary made some time ago in the context of New York City illustrates that point:

> 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 own 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).[11]

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).[12] 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 Chapter 3.

Two court cases in the 1990s illustrated the continuing contemporary concern about the potential negative impacts of some parks.[13] 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.

In rural contexts, the proximate presence of undeveloped public park or open space is likely to be regarded by many landowners as an asset. However, in some contexts it may be viewed negatively because of trespass concerns. Hence, many proximate landowners in rural areas post and fence their land against trespassing.[14]

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.

Conclusions

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 the park is not well designed, landscaped and maintained. In 1998, the deputy director of the Parks Council, a nonprofit 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).[15]

The second conclusion is summarized in Figure 1-4 which recognizes that both positive and negative impacts on property values are possible. The top half of Figure 1-4a indicates that property value benefit increments associated with proximity and accessibility will decay as distance from the park increases. The lower half of Figure 1-4a suggests 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.[16] Thus, in the negative scenario property in the park's service area but beyond (say) 500 feet is still likely to experience an increase in value, since some benefits of access to the park's amenities accrue to these homeowners but they avoid the nuisance costs inflicted on those who live close to it.

Figure 1-4b illustrates the net effect of a situation 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.

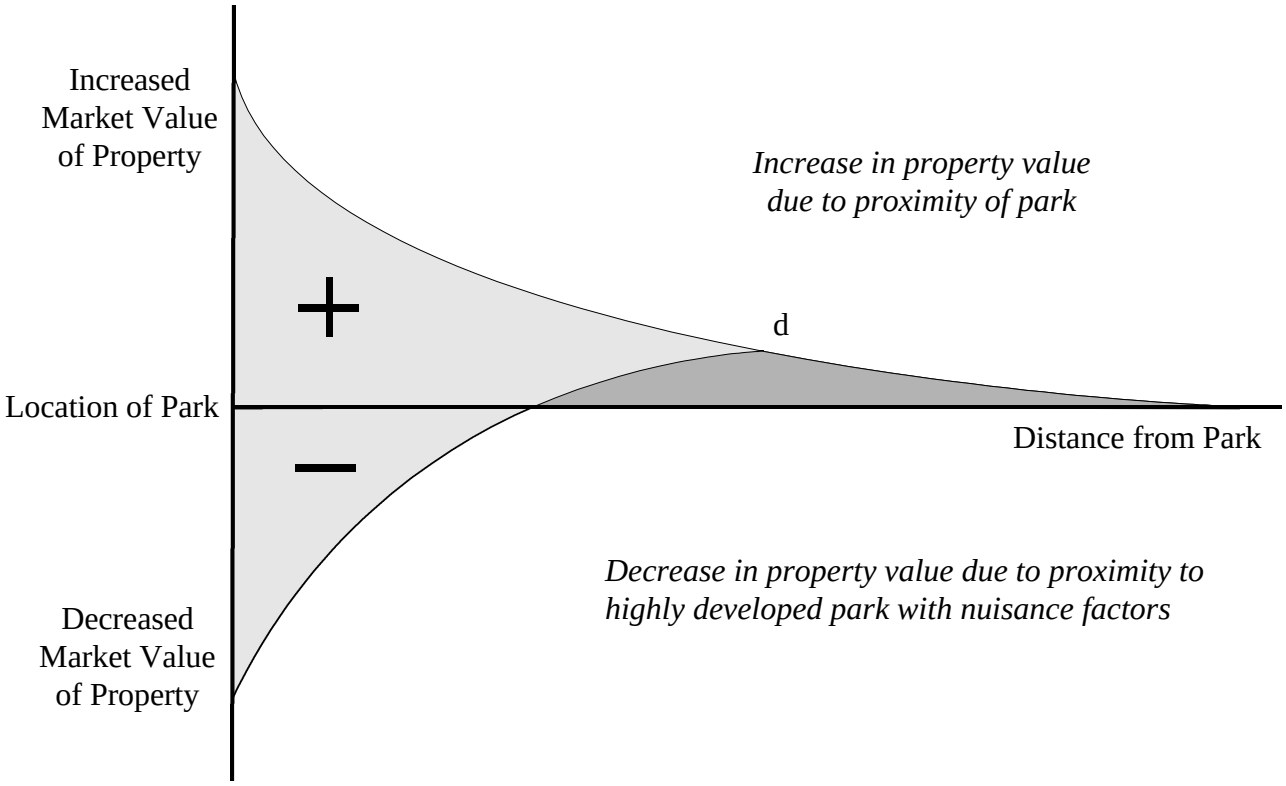

Figure 1-4 (a) The Positive and Negative Impacts of Parks on Residential Property Values

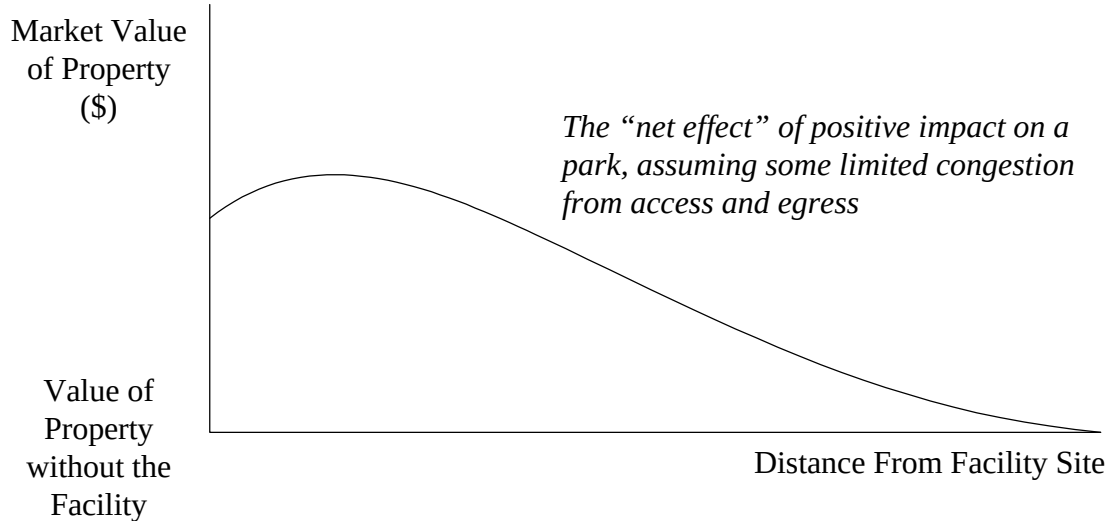

Figure 1-4 (b)

VEHICLES FOR CAPTURING ENHANCED PROPERTY INCREMENTS TO PAY FOR PARK COSTS

Open space can be purchased in fee simple, donated, created through the acquisition of development rights, or preserved by the exercise of the police power function which involves implementing conservancy zoning on open spaces without compensating the affected landowners. In the latter two cases, the land remains in private ownership but it offers most of the amenity value associated with publicly owned land.

Conservancy zoning is likely to be politically controversial. Landowners who are subjected to it will see their land decline in value, while the owners of proximate developable land will received a windfall gain from the open space designation so the value of their land will increase. It has been suggested that some recapture mechanism based on the property tax system should be used to return to owners of open space land some of the value increment that owners of developable land realize from the open space designation.[17] A compensation effort of this nature is likely to lend additional support for establishing and maintaining open space zoning in the long term. Such a mechanism may adapt some of the principles used in the vehicles that have been developed to fund fee simple acquisition that are described in this section.

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, three vehicles have been used which 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 excess condemnation, special assessment districts and tax-increment financing districts.

Excess Purchase / Condemnation

The principle involves purchasing more land than is needed for the park project; disposing of the remainder on a commercial basis; and applying the income derived to pay

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. Some agencies may lack the enabling legislative authority to do this and private developers are likely to strenuously oppose any action of this type. Nevertheless, four early examples in Fort Worth, Lorain, Prescott and Huron-Clinton, and a more contemporary action in Burlington illustrate how it could work:

- In Fort Worth, Texas, the city purchased a tract of land for $12,500. Lots from the tract were sold for a total of $18,750 and a seven acre playing fields park remained the property of the city. Thus, acquisition of land for the park cost the city nothing and $6,250 was available to finance improvements on the park.[18]
- In Lorain, Ohio, a group of public spirited residents purchased a large tract of land, and after reserving 100 acres for a large park, sold the remainder for a sum sufficient to cover the entire cost of the original tract. The park was then deeded to the city.[18]
- In Prescott, Arizona, the city built a golf course on land valued at $25 an acre, then sold adjacent lots to developers for an average of $2,777 per acre. It was anticipated that the development of that land would add over $3 million to the city=s tax base in the next ten years.[19]
- The director of the Huron-Clinton Metropolitan Parks Authority reported the following after a large park was opened contiguous to a fair sized village: "During the period of land acquisition a number of large tracts were acquired en bloc. It was later determined after the park had been opened that some portions should be returned to the tax rolls as being in excess of park needs. This acreage was sold by competitive bids at a considerably higher price than the initial acreage purchase price" (P. 47).[20]
- 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.[21]

The Lorain example illustrated how the principle of excess purchase could be applied in contexts where there was no legal authority for a public agency, or where elected officials were unwilling to face the controversy such an action would generate. Indeed, because statutory hurdles make it difficult for public agencies to engage in such actions, contemporary transactions of this kind tend to be handled by 501(c)(iii) organizations acting on behalf of public agencies. Non-profits, such as the Trust for Public Land or The Nature Conservancy, often purchase tracts from which they convey to a public agency the land it wants for parks or open space. The other parcels are then resold to developers, using profits to finance future conservation transactions.

A variation of the excess purchase principle is emerging in golf residential develop-

ments 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.

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 flood plain 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. An early commentator observed, "Special assessments are apt to arouse less antagonism since, unlike excess condemnation, the amount of the increment taken is limited to the cost of the improvement"[22] (p. 42).

The city of Minneapolis has one of the finest park systems 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 20th 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 state legislature in 1911 provided the enabling legislation to accomplish this:

> In a typical case, a new park costing $3,000,000 would be planned to serve one square mile of the city containing 3000 lots, all within five or 6 blocks of the site. The average assessment in such a case would be $1000 per lot, payable at $50 a year for 20 years, plus 5% interest. Lots nearest the park may have to pay as much as $75 per year while those five blocks away may pay $25 a year.[23]

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. However, it was noted that, "Spreading the assessment costs over the parcels of land in the local district according to proportionate benefits is a matter of considerable technical difficulty. So is the problem of determining the limits of the area benefited" (p. 33)[23]. Initially the assessment to be levied and the park built, 51% of property owners had to sign a petition agreeing to it. Special assessments could be used for renovation as well as acquisition and development. When the city was growing, the process was expedited by developers who offered to donate land if the park board agreed to landscape it, since this enabled them to sell lots at higher prices.

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 cost. The 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 by a majority of seven to one.[10]

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' x 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 $1000 to $3 a lot (p. 181).[24]

Special assessments do not work well in areas where the cost of land is high and the surrounding homes are poor, and this caused Minneapolis to abandon this arrangement 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."[25] Minneapolis scrapped this system and reverted to a citywide charge on each property that was dedicated to park use.

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 services 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. The director of parks and recreation in New York City observed: "It's like upgrading an airline ticket to first-class."[25]

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:

> 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).[26]

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. There are more than 1000 business improvement districts in the United States and Canada. Business improvement districts frequently elect their own boards that 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. An illustration of the effectiveness of business improvement districts is given in Figure 1-5.

Tax-Increment Financing Districts

A majority of states have enabling legisla-

Figure 1-5 Using a Business Improvement District to Resuscitate Bryant Park

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. A business improvement district was formed to maintain the nine-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 business improvement district. 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 $1.2 million of Bryant Park's $2 million annual maintenance bill, while the remainder of the bill is raised in rental and concession fees from restaurants and special events 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. 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."

Source: 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.

tion authorizing tax-increment financing. Although the rules and limitations associated with it differ among the states, the basic concept 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.

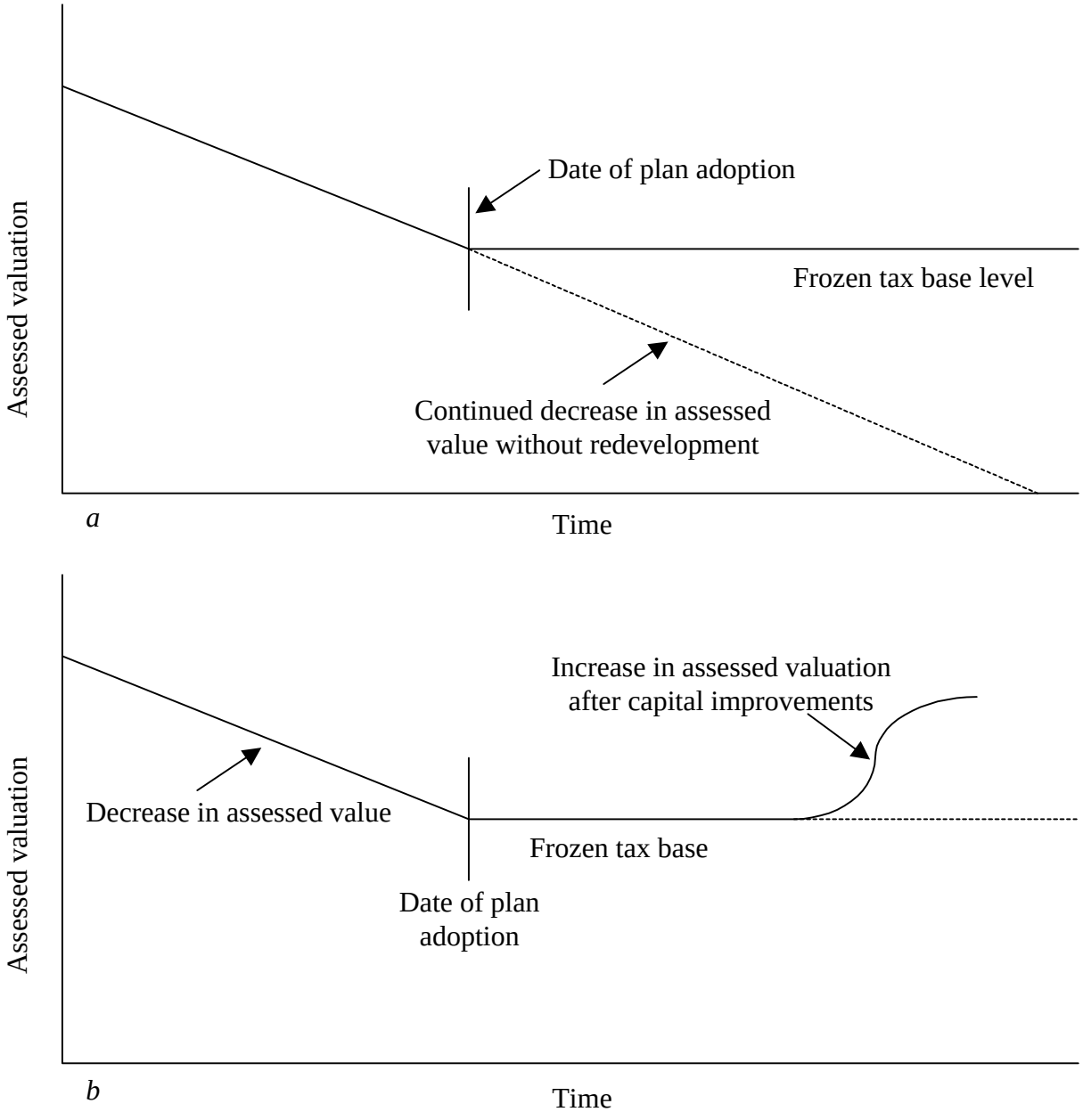

Figure 1-6 Tax Increment Financing *a*, Stage A: Freezing the Tax Base (The Initial Stage); *b*, Stage B: Growth in the Tax Base after Redevelopment

Tax-increment bonds are secured only by projected 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. (Remember that 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 (see Figure 1-6a). 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 debts that the project accumulated (see Figure 1-6b). 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.

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CHAPTER 2

The Early Empirical Studies

THE IMPACT OF PARKS ON PROXIMATE PROPERTY VALUES

THE IMPACT OF PARKWAYS ON PROXIMATE PROPERTY VALUES

THE IMPACT OF PLAYGROUNDS ON PROXIMATE PROPERTY VALUES

CONCLUSIONS

CHAPTER 2

THE EARLY EMPIRICAL STUDIES

THE IMPACT OF PARKS ON PROXIMATE PROPERTY VALUES

Our parks [in Kansas City] have enhanced values and the proof is incontestable, that the construction of our park and boulevard system has been a profitable industry for the taxpayer...Whenever this work has been properly executed and maintained it should be considered an investment and not a tax(p. 31).[1] (Superintendent of Parks, Kansas City, 1912.)

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).[2] (Frederick Law Olmsted, Jr., 1919.)

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).[3] (Henry Hubbard, Professor of Landscape Architecture, Harvard University, 1924.)

These early quotes are representative of the conventional wisdom that prevailed among park professionals, landscape architects and urban planners in the early years of the twentieth century. Given his legendary, inspirational role in the architecture, design and popularization of parks in the United States, it should come as no surprise that this conventional wisdom emerged from the work of Frederick Law Olmsted.

In espousing the proximate principle, Olmsted was adopting the theory of rent that had previously been articulated by Riccardo

who argued:

> Land of superior fertility would earn a rent since it would yield a greater quantity of output for a similar quantity of seed and labor, and this rent would be capitalized into a higher selling price when the land changed ownership. This implies that the change in the fertility of the soil resulting from an irrigation project will be reflected in the change in the market price. Using this technique, several studies were made of irrigation projects. [Others] showed that rent could be earned by land not only through differences in fertility but also because of locational differences; land nearer the market where produce was sold would command a higher rent than land further away, reflecting the saving in travel costs (p. 76).[4]

In the context of parks, Olmsted perceived that savings in travel costs were supplemented, and often likely to be exceeded, by the benefits of a pleasant view and a sense of spaciousness for which people were also prepared to pay a locational premium. This premium was similarly captured in the additional price individuals were willing to pay for property offering easy access to these benefits. When the site for Central Park was acquired, most city residents lived more than three miles to the south.[5] Thus, 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.

Before funding for Central Park was committed, Olmsted 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).[6]

Olmsted consolidated the initial conceptual acceptance of the proximate principle for 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 Figure 2-1.[7] This documentation was widely disseminated and was a powerful weapon in the armory of early public and open space advocates seeking to persuade communities to commit new investments into these amenities.

Figure 2-1 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: Tom Fox (1990) *Urban open space: An investment that pays*. New York, New York: Neighborhood Open Space Coalition, pgs. 9-11.

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.[7] 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.[6]

Attributing all the high increase in the property values in these three wards to the park, as Olmsted (Figure 2-1) 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, 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).[8]

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).[9] 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).[9]

Similar arguments were 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.[7] 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 documented evidence from Central Park had 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, most notably in nearby Brooklyn, in Boston and in Kansas City. 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.[7]

To demonstrate the influence of the Central Park data in Boston, Fox cites an 1890 report,[7] published under the authority of the Metropolitan Park Commissioners which stated:

> 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. (p.7).[10]

In 1900, the Boston Metropolitan 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 (p. 11).[10]

The first county park system in the U.S. was the Essex County Park Commission in New Jersey which was established in 1895. Much of its early justification for park investment was based on the proximate property principle. In 1915, the Commission engaged a consultant to assess the impact on land values of four Newark parks -- Eastside, Westside, Weequahic, and Branch Brook.[3] An extract

Figure 2-2 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	2¼ times
Westside	15 times	3 times	3 times
Weequahic	14 times	7 times	3 times
Branch Brook	5 times	2¼ 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: A 1916 issue of the *Newark Sunday Call* cited in L.H. Weir, *Parks: A manual of municipal and county parks.* New York: A.S. Barnes (1928), p. 12.

from a summary of the report published in the *Newark Sunday Call* is shown in Figure 2-2. 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.[11] 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 Table 2-1.

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 Table 2-1. 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 Table 2-1. 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.[12] 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 adja-

Table 2-1 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: County parks increase property values. *The Playground* March 1928: 633-634.

cent to the park in Roselle where valuations on land adjacent to the park increased by 257%.

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.

THE IMPACT OF PARKWAYS ON PROXIMATE PROPERTY VALUES

Parkways were first introduced by Olmsted and Vaux in their design of Prospect Park in Brooklyn. They were broad, tree-lined boulevards that characterized the major approaches to the park and were intended to extend the park out to surrounding farmlands.[7] The idea was subsequently adopted by many other cities. 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).[13]

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 boulevard easily doubles the market value of lots on streets two or more blocks distant.[14]

Writing much later in 1937, Nolan and Hubbard reaffirmed that this view was still the prevailing conventional wisdom:

> 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).[13]

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, Nolan and Hubbard, who were Harvard University professors, undertook an empirical study of their impacts on land values.[13] 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).[13]

Some park commissions made extravagant claims for the influence of parkways. For example, in Westchester County, New York, the valuation of taxable land improvements increased 125% from $800 million in 1923 to $1,800 million in 1931. The County Park Commissioners were quick to claim a large proportion of this growth was attributable to their parkways. Nolan and Hubbard, however, 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). 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 naive 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).

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).[13] 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).[15]

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).[16] 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).[16]

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).[15]

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).[16]

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.[15] Changes were compared between 1904 and 1926 in the assessed value of land: (1) directly bordering on a playground; (2) adjacent to a playground, which was operationally defined as streets located one, two or three blocks away from it; (3) 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 (4) 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 Table 2-2.

The data in Table 2-2 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

Table 2-2 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.

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).[15]

- 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.[16] Orange was included because it offered a different kind of environment, "a city 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 residential districts of one or two family detached houses with well kept lawns" (p. 378). Thus, the playgrounds were classified as being located in one of three categories of district: high class, middle 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 Figure 2-3.

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

In the higher and middle 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 higher and middle 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 in 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.

Figure 2-3 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: Jacob W. Feldman (1929) The effects of playgrounds on land values. *Playground and Recreation* September: 375-384.

CONCLUSIONS

Throughout the time period of the studies reviewed here- -from the earliest days of urban park development 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 and 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 of 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 early studies were naive, 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.[7] However, this ignored the necessity of unraveling the complicated plexus of factors that may influence property values in addition to parks. It was noted that these "are not merely additive, but react on each other and may react in opposite directions in different cases" (p. 124).[13]

In subsequent eras, substantial improvements were made in methods used for quantifying the impact of parks and open space on real estate values. Statistical techniques, such as regression analysis, and econometric approaches made it possible to identify the relative influence on property values of factors other than parks such as house size, type, and location relative to 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 1930s.

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CHAPTER 3

The Later Empirical Studies

RESULTS FROM URBAN STUDIES

The Influence of Different Park Design and Use Characteristics

FINDINGS FROM NON URBAN STUDIES

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

FINDINGS NOT SUPPORTIVE OF THE PROXIMATE PRINCIPLE

CONCLUSIONS

CHAPTER 3

THE LATER EMPIRICAL STUDIES

The chapter is divided into three main sections. The first section chronologically reviews studies reporting results in urban areas. With the exception of a pioneering, pathfinding study completed in the late 1930s, these studies were all undertaken after 1960. The growth in their number after this time was coincident with the increasing capability of computing. Almost all of the later studies used least squares regression analysis as their primary statistical tool. Typically, property prices or assessed valuations were regressed against a measure of distance and a set of "control variables" which measured the contributions of other potential influences on property value as well as parks and open space. The increased sophistication of computing made feasible more complex analyses containing a greater number of control variables. The key questions these analyses 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?

A sub-section reviews studies that did not treat parks and open spaces as being homogeneous, but which recognized there are qualitative differences among them that are likely to result in different impacts on proximate property values.

Findings emerging from studies of parks and open spaces in urban areas may not be generalizable to state and national level parks because of differences in context, scale or mission. For this reason, results from studies undertaken in those contexts are reviewed separately in the chapter's second main section. However, results from water based parks are not reviewed here because they add a level of complexity to the discussion that was deemed to be outside the scope of this monograph. Readers interested in these studies are referred to the bibliography included in Appendix 2. In the final section of the chapter, studies are reviewed whose findings did not endorse the proximate principle.

RESULTS FROM THE URBAN STUDIES

The shift from the rudimentary early empirical studies to stronger methodological approaches was initiated by Herrick in 1939.[1] His primary purpose was "to show the possibilities of a simple method of analysis applied to available data" (p. 96).[2] 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. 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).[3]

He was the first to use statistical techniques to try and isolate the unique 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, such as differences in the size, age and quality of residences erected on lots; lot size; proximity to a Central Business District, schools, or shopping centers; and access to other facilities and amenities which generate real estate value. Herrick used regression analysis to identify the impact of park acreage and population density on real estate value in Washington, DC 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 justifies the expenditure necessary to procure any proposed park lands" (p. 91).[1]

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).[1]

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 DC 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 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).[1] However, the dramatic findings and conclusions of this study have to be tempered by the reservations expressed by critics about the application of the regression analysis.[3] In the long term, the study's main contribution was its pioneering illustration of the role of statistical tools in investigating this issue.

Although no additional work evaluating the proximate principle was reported after Herrick's study for 25 years, the principle retained its status as the prevailing conventional wisdom through the 1940s and 50s. 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).[4] However, in 1961 the

lack of convincing scientific evidence to support such anecdotal and experiential conclusions 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)[5]

As a result of that letter, the Caro Foundation sponsored a study focused on two parks in Oakland.[5] The samples were relatively small, but they confirmed the positive impact of parks on the assessed values of proximate properties. The results are summarized in Table 3-1.

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 all the difference was attributed to properties on the block that immediately fronted the San Antonio Park.

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).[4]

The wider availability and greater capacity of computing in the 1970s and 1980s stimu-

Table 3-1 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.

lated an increase in the number of empirical studies investigating the issue. A 1972 study in Philadelphia focused on 7 sites, at three parks, three schools, and one school-park combination.[6] 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).[6]

The Philadelphia study was one of the few to test for a "net effects" curve (Figure 1-4b) 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.[7] This 1,294 acre stream-valley park is in north-east Philadelphia and was surrounded by residential areas developed at a density of approximately ten dwelling units per acre. The area around the park was comprised of "unimaginative housing, heavy in scale with natural landscaping losing out to concrete and stone" (p.275). Based on their subjective evaluation of the area, the researchers hypothesized that "the residents do not consider natural amenity to be very important" so "public open space would be expected to have a relatively low effect on land values compared to other neighborhoods" (p. 275).

Despite the authors' pessimistic prognosis, regression analysis indicated that the park accounted for 33% of land value at 40 feet. This dropped to 9% at 1,000 feet and 4.2% at 2.500 feet which was the peripheral limit set for the study. From these data, the authors concluded that a net increase in real estate value of $3.3 million was directly attributable to the park.

The most frequently cited study in this literature examined the effect of greenbelts on property values in three different areas of Boulder, Colorado.[8] 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 Table 3-2.

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:

Table 3-2 Value of the Average House and Greenbelt Proximity

Walking Distance from Greenbelt	Average Value of House
30	$54,379
1,000	50,348
1,283	49,172
2,000	46,192
3,200	41,206

> the 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)[8]

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 a city to 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).[9] 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 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.[10] The 170 acre Cox Arboretum in Dayton was a wooded open space containing specialized herb, ornamental and other plant gardens. Its impact on an adjacent fairly new sub-division of 300 properties was assessed. The 152 acre Whetstone Park in Columbus, contained ball-fields, 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 5.13% in the Cox Arboretum subdivision and 7.35% at the Whetstone Park residential area. In neither case was an assessment made of how this average premium varied between properties immediately abutting the parks and those located (say) 2,000 feet away, which presumably were much less impacted by the parks.

An empirical investigation in Salem, Oregon, in 1986 reported that open space in the form of greenbelt at the fringe of the urban area exerted an influence on urban land values that extended inward from the urban boundary about 5,000 feet.[11] 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.

The Influence of Different Park Design and Use Characteristics

While the above studies consistently re-

Table 3-3 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%

ported 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, contemplative 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 Table 3-3.[12] This was a relatively naive 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, 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

Table 3-4 A Comparison of Mean Assessed Values of Properties Within 500 feet and Beyond 500 feet of 10 Parks in Dallas, Texas

Type of Park	Properties Within 500 Feet		Properties Over 500 Feet		Ratio: Under 500 / Over 500
	Mean Assessed Value ($)	Number of Properties	Mean Assessed Value ($)	Number of Properties	
Playground Parks					
Casa View	3,637.00	128	3,778.00	485	.96
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.

pertaining to this issue was undertaken in Dallas and reported in 1967.[13] 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 Table 3-4 show that properties within 500 feet of a playground park were of lesser value than other properties beyond 500 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).

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 (Table 3-4). 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 of 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).

Added dimensions to these findings were reported in a 1974 study which employed sophisticated statistical controls.[14] It 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 (1) 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).[14]

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 recreation 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).[15] 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 on which 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.

Table 3-5 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 is computed using the analysis results. Computations are 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 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.[7] The overall findings 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).

Finally, results from the study of four parks in Worcester, Massachusetts discussed earlier strongly supported the proximate principle.[9] However, the authors also reported that

Table 3-5 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.

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. Following the models described in Figure 1-4, these negative influences quickly dissipated and 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 curves shown in Figure 1-4. Properties that face or directly abut parks which 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 substantially, and negative amounts are unlikely to be present, on properties located beyond the first block adjacent to the park. In contrast, the value of 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.

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.

FINDINGS FROM NON-URBAN STUDIES

Most studies measuring impact of the proximate principle have been undertaken in urban 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 likely that the proximate principle will apply, at least in some cases, even though such an impact may be perceived as incidental to the mission of these parks.

An indication of the impact of a major new outdoor recreation facility on property values in rural areas was given in a study assessing the effect of the Pearl River Reservoir, near Jackson, Mississippi on the area's suburban farm land.[16] The prices of recorded land sales in the proximity of the reservoir project were compared with the sale prices of similar farm land at a comparable distance from Jackson on the other side of the city away from the reservoir's influence. The study's time period was from 1950 to 1963. This time span included the period leading up to final voter approval for the project in 1958 and the subsequent initiation of its construction.

Figure 3-1 shows the impact on the land 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.

An empirical analysis of determinants of land values in the Airondack Forest Preserve in New York State was reported in 1978.[17] The Preserve is a region within which privately-

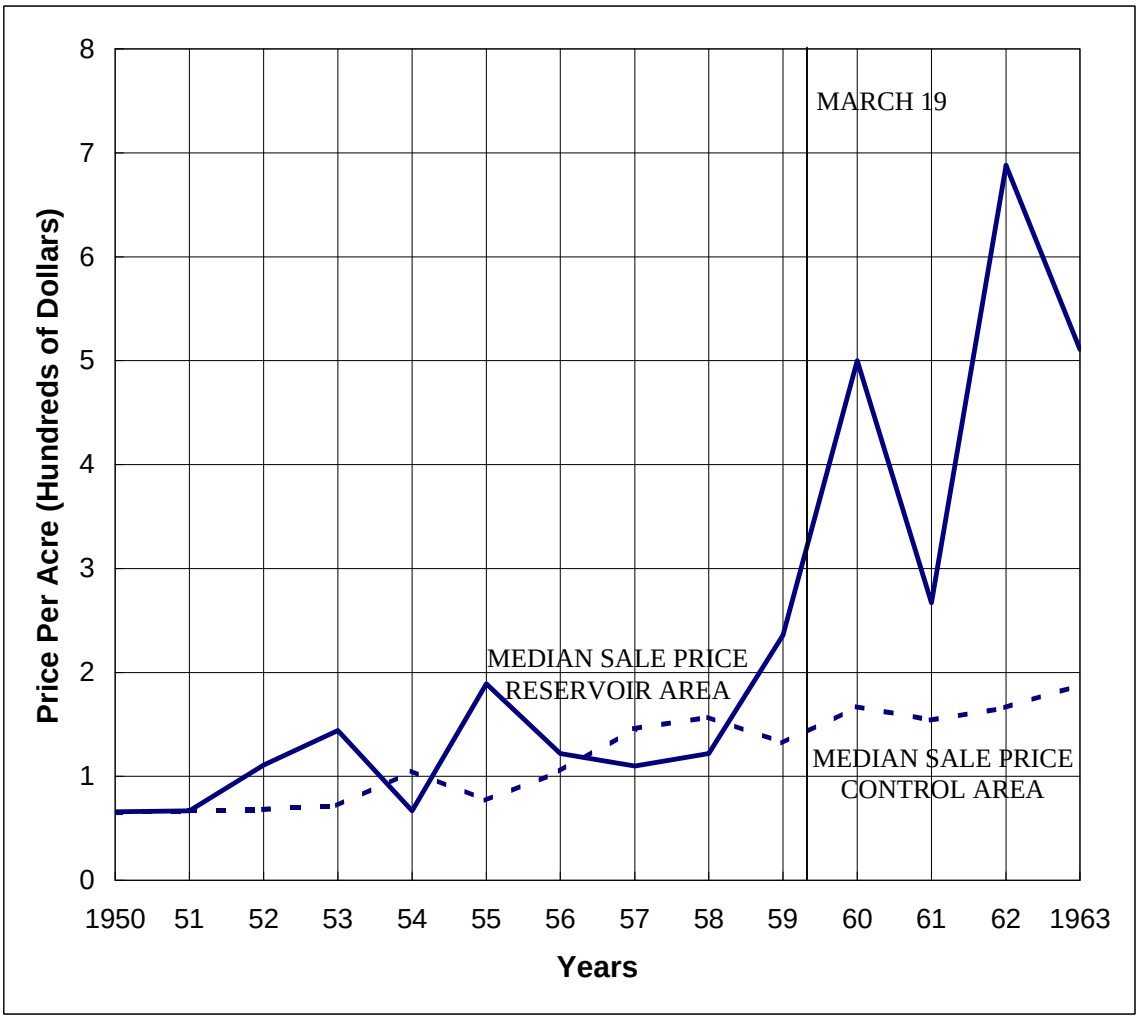

Figure 3-1 Comparison of the Median Per Acre Sale Price in the Pearl River Reservoir and Control Areas 1950-1963.

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 which 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.[18] 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. Table 3-6 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.[19] 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 County and 6% in Carroll County, but it depressed home values by at least 7% in Howard County.

Generally, findings from the non-urban studies mirror those from the urban studies in supporting the proximate principle. Despite the

Table 3-6 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

concerns of rural landowners relating to adjacent public lands facilitating access to trespassers,[20] 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 2000 in a minority report submitted to the US House of Representatives by nine members of the House Resources Committee who disapproved of the Committee's support for the Conservation and Reinvestment Act (CARA) which would provide 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 example, 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 park land acquisitions made in Pennsylvania by the U.S. Corps of Engineers or Pennsylvania State Parks.[21] 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 park land 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).

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 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.[22] The authors used multiple regression analysis to test the hypothesis that 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. The hypothesis was rejected because 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).

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).

These detailed findings were consistent with those reported by the National Park Service on the impact of two of its facilities.[23] 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

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.[24]

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.[25] 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 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 Forth Worth.[26] 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 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 Table 3-7. 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 1986. Community parks of 25 acres or more were selected through a systematic process based on a number of pre-established criteria.[27] 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.

Table 3-7 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

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 increase 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 Figure 1-4b. 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.[28] 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 procedures may have contributed to the findings of no relationship,[29] but the author rejected this criticism.[30]

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 and 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 control 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 25 studies that investigated this

issue were reviewed and in 20 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 empirical evidence to support not only the proximate principle, 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. 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.

Examination of the five studies that did not support the proximate principle suggested that in four of those cases the ambivalent findings may be attributable to methodological limitations.

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. However, some point of departure based on the findings reported here is needed for decision-makers in communities that 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. If the park is large (say over 25 acres), well-maintained, attractive, and its use is mainly passive, then this figure is likely to be low. If it is small and embraces some active use, then this guideline is likely to be high. If it is a heavily used park incorporating such recreation facilities as athletic fields or a swimming pool, then the proximate value increment may be minimal on abutting properties but may reach 10% on properties two or three blocks away.

The diversity of the study contexts also makes it nonfeasible to offer a generalizable definitive answer to the final question posed in the introduction concerned with the distance over which the proximate impact of park land and open space extends. However, there appeared to be wide agreement that it had substantial impact up to 500 feet and that in the case of community sized parks it extended out to 2,000 feet. 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. Nevertheless, in the case of these larger parks there was evidence to suggest impact beyond this artificial peripheral boundary, since the catchment area from which users came extended beyond it.

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CHAPTER 4

The Relative Service Cost Efficiencies of Parks and Open Space:
Findings from Cost of Community Services Analyses

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THE NEW MUNICIPAL MATH

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CHAPTER 4

THE RELATIVE SERVICE COST EFFICIENCIES OF PARKS AND OPEN SPACE: Findings from Cost of Community Services Analyses

INTRODUCTION

The positions espoused in Figure 4-1 by the two sides debating the relative economic merits of using land for development or for park land and open space, are echoed in communities across the country. 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 projects will increase the municipal tax base and thereby lower each individual's property tax payments.

This myth resides deep in the American psyche and frequently has thwarted the conservation efforts of park and open space advocates. However, the reduction in financial aid from intergovernmental transfers and the ongoing resistance of residents to tax increases has caused some elected officials to scrutinize this conventional wisdom more carefully. This has led to investment in fiscal impact analyses and cost of community services (COCS) analyses.

Fiscal impact analyses are concerned with the future fiscal impacts on a community of a specific proposed development, while cost of community services analyses relate to the current fiscal situation in an entire community. COCS studies do not predict the future impact of decisions, which is the goal of traditional fiscal impact analysis. Rather, they assess current conditions based on existing budgets and real dollars. In this way, they provide hindsight from past land use decisions.[1] The findings from these two types of analyses have challenged the historical view that more development generates more net revenue for municipalities.

COCS analyses consistently report 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

Figure 4-1 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

ayor. "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: Adapted from Darryl F. Caputo (1979) *Open space pays: The socioenvironomics of open space preservation.* Morristown, New Jersey: New Jersey Conservation Foundation

pays its way is being discarded. The emerging prevailing view is that few developments generate sufficient tax payments to pay their way.

The people who reside in developments require services. Natural parks and open space require few public services -- no roads, no schools, no sewage, no solid waste disposal, no water, and minimal fire and police protection. This difference in cost of service provision was documented in the city of Boulder, Colorado where it was found that the city's costs of servicing non-open space areas exceeded $2500 per acre, whereas the costs associated with open space in the city were only $75 per acre -- less than 3% the cost of non-open space.[2]

The way in which land is used in a community affects 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).[3]

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 park and open space land is less costly for public agencies to maintain and operate than residential property. This is a long-term benefit of preserving open space which is not usually reflected in market valuations of land, since valuations generally reflect only the short-term benefit of land.

THE NEW MUNICIPAL MATH

In 1956, Mr. 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 in Figure 4-2. It has been suggested that this letter was a benchmark representing the genesis of a "new municipal math" recognizing that the public costs needed to service a development usually exceed the tax income accruing from it.[4] 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 resulted 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.[5]
- 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.[5]
- 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.[4]

Figure 4-2 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.

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).[6]

These early observations have been confirmed in recent years by many of the findings reported in the increasingly sophisticated fiscal impact and COCS analyses that have been undertaken by numerous governmental entities.

The ascendancy of this viewpoint has been reinforced by two other factors.[7] First, the climate of fiscal austerity, that is characteristic of many jurisdictions, has made local officials more receptive to 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.

COST OF COMMUNITY SERVICES ANALYSIS PROCEDURES

COCS analysis determines the overall fiscal contribution of current land uses to a community. It assesses the costs incurred by, and

the revenues accruing to, a given public jurisdiction from different types of land use in a given time period, usually a year. 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. COCS and fiscal impact studies have been used as planning tools for over 50 years, but from the perspective of park and open space advocates 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.[8]

To address these issues, the American Farmland Trust in the mid-1980s developed a relatively inexpensive procedure for assessing the costs and revenues of community services associated with different land uses which included open space. The broad categories of land that are used in evaluations sponsored by the American Farmland Trust are: residential development, commercial/industrial development, and farmland/forestland/open space. The five stages involved in undertaking these analyses are described in the following paragraphs.[9]

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 Table 4-1.

Table 4-1 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	

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 lands, vacant land of more than (say) two acres, and residentially zoned land not built upon. Table 4-1 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" (Table 4-2).

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 Tables 4-1 and 4-2 is shown in Table 4-3. 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.

A detailed discussion of how the data are collected and analyzed at each of these steps is

Table 4-2 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	

Table 4-3 A Comparison of Revenues and Expenditures

Source of Revenues	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	

beyond the scope of this publication. A general description of how to do these studies was provided by the American Farmland Trust in 1993.[10] The methodology is continually being refined, so this initial publication should be read in conjunction with the Trust's most recent report on COCS.[1]

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.

A limitation of COCS analyses is that often they do not recognize the interconnectedness of some land uses. For example, the net impact of commercial / industrial land use is invariably shown to be positive in COCS studies, but this ignores any net deficit cost that may be incurred from providing services to additional residences needed to house employees associated with it. Alternatively, a residential development that shows a fiscal deficit, provides customers for businesses in the area. This is likely to increase business sales, which may enhance the underlying value of their property and result in an increase in property taxes from that source.[11]

There are three major difficulties inherent in COCS analyses which suggest that their results should be viewed with caution. First, the validity of COCS analyses 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 report extract illustrates the types of challenges involved:

> Of all expenditures, those in Public Works were the toughest to assign. This was especially true of highways. If information was available on the types of vehicles using roads, the frequency of trips and the intensity of travel, these were used. The toll of heavy equipment might be allocated

> to Commercial or Industrial sectors. Tractors and milk-truck road use were charged to Farm and Open Land. Garbage disposal was treated the same way. Dump permits were evaluated and records searched to determine which sectors received public-waste removal services.[8]

Second, COCS analyses tend to focus on average costs instead of the marginal, or incremental costs and revenues associated with new development.[7] 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, for example, "Service expansion may be unusually costly in areas that already are built-up, that are remote, or that have difficult topography. It may be less expensive than average in areas that have excess service capacity or favorable topography" (p.7).[7] Third, the broad allocation of costs among only three or four land-uses produces generalized results that may be misleading:

> For example, elderly housing does not require educational services from the town to the same extent as single-family dwellings normally do. Thus, a retirement community (or a summer community) should have different expense/cost ratios than does a bedroom community. Some classifications are more difficult to make than others. A single-family residence on a lot that exactly meets the minimum zoning requirements is easily classified as residential, but the allocation becomes more difficult if the house is surrounded by 25 acres of land. Even though there is sufficient excess acreage to classify it as an open space parcel, the property is legally a residential parcel (p. 9).[12] [It would be considered residential in the American Farmland Trust studies]

It has been suggested that the greatest benefit of COCS and fiscal impact analyses:

> may be in prompting a reassessment of the 'conventional wisdom' about the economic consequences of development and conservation. Fiscal impact analysis will not by itself answer the question of whether a particular parcel of land should be preserved as open space or developed. However, it can help frame the discussion and lead to more informed decisions by policymakers, conservationists and the public(p.6).[13]

REVIEW OF EMPIRICAL FINDINGS

Table 4-4 lists the results of studies that have used the American Farmland Trust's approach to COCS. The studies were undertaken by 26 different research teams in 18 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.

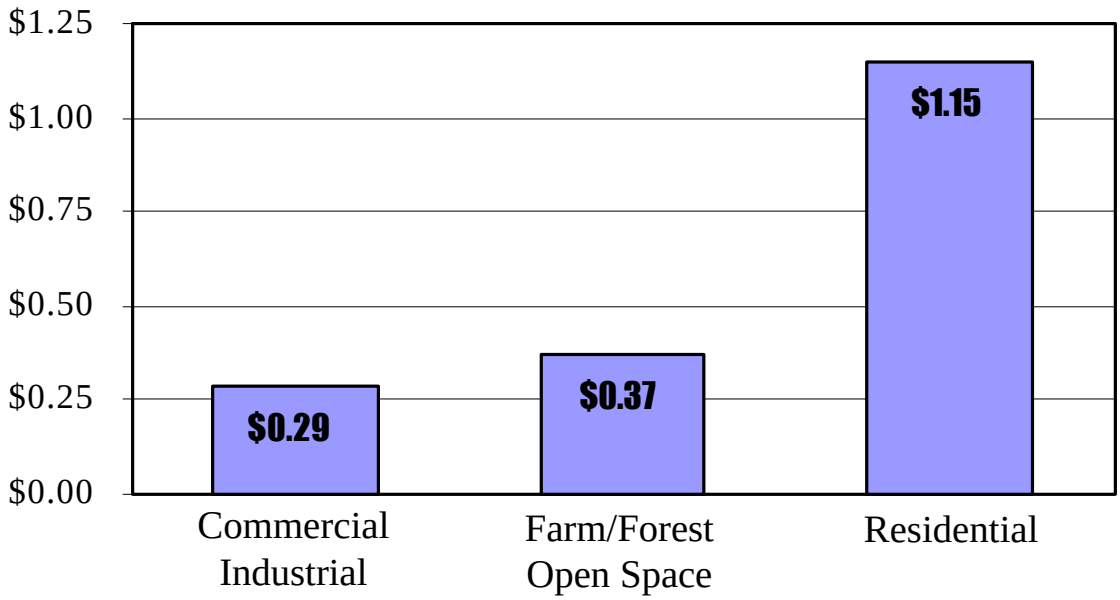
Given the diversity of locations and research teams involved, the results are remarkably consistent. They confirm the results reported by more elaborate conventional fiscal impact studies, which consistently document the net deficit of most residential development and recommend attracting commercial 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 use. These elements traditionally have been omitted from fiscal impact analyses.

Table 4-4 Summary of Cost of Community Services Study Results

State	Town	Residential including farm houses	Combined Commercial & Industrial	Farm/Forest Open Land
Connecticut	Bolton[14]	1 : 1.05	1 : 0.23	1 : 0.50
	Durham[12]	1 : 1.07	1 : 0.27	1 : 0.23
	Farmington[12]	1 : 1.33	1 : 0.32	1 : 0.31
	Hebron[15]	1 : 1.06	1 : 0.47	1 : 0.43
	Litchfield[12]	1 : 1.11	1 : 0.34	1 : 0.34
	Pomfret[12]	1 : 1.06	1 : 0.27	1 : 0.86
Idaho	Canyon County[16]	1 : 1.08	1 : 0.79	1 : 0.54
	Cassia County[16]	1 : 1.19	1 : 0.87	1 : 0.41
Kentucky	Lexington-Fayette County[1]	1 : 1.64	1 : 0.22	1 : 0.93
Maine	Bethel[17]	1 : 1.29	1 : 0.59	1 : 0.06
Maryland	Carroll County[18]	1 : 1.15	1: 0.48	1 : 0.45
	Cecil County[19]	1 : 1.12	1 : 0.28	1 : 0.37
	Frederick County[20]	1 : 1.14	1 : 0.50	1 : 0.53
Massachusetts	Agawam[8]	1 : 1.05	1 : 0.44	1 : 0.31
	Becket[12]	1 : 1.02	1 : 0.83	1 : 0.72
	Deerfield[8]	1 : 1.16	1 : 0.38	1 : 0.29
	Franklin[12]	1 : 1.02	1 : 0.58	1 : 0.40
	Gill[8]	1 : 1.15	1 : 0.43	1 : 0.38
	Leverett[12]	1 : 1.15	1 : 0.29	1 : 0.25
	Southborough[21]	1 : 1.03	1 : 0.26	1 : 0.45
	Westford[12]	1 : 1.15	1 : 0.53	1 : 0.39
	Williamstown[22]	1 : 1.11	1 : 0.34	1 : 0.40
Minnesota	Farmington[23]	1 : 1.02	1 : 0.79	1 : 0.77
	Lake Elmo[23]	1 : 1.07	1 : 0.20	1 : 0.27
	Independence[23]	1 : 1.03	1 : 0.19	1 : 0.47
Montana	Gallatin County[24]	1 : 1.45	1 : 0.16	1 : 0.25
New Hampshire	Deerfield[25]	1 : 1.15	1 : 0.22	1 : 0.35
	Dover[26]	1 : 1.15	1 : 0.63	1 : 0.94
	Exeter[27]	1 : 1.07	1 : 0.40	1 : 0.82
	Fremont[25]	1 : 1.04	1 : 0.94	1 : 0.36
	Stratham[25]	1 : 1.15	1 : 0.19	1 : 0.40
New Jersey	Freehold Township[28]	1 : 1.51	1 : 0.17	1 : 0.33
	Holmdel Township[28]	1 : 1.38	1 : 0.21	1 : 0.66

	Middletown Township[28]	1 : 1.14	1 : 0.34	1 : 0.36
	Upper Freehold Township[28]	1 : 1.18	1 : 0.20	1 : 0.35
	Wall Township[28]	1 : 1.28	1 : 0.30	1 : 0.54
New York	Amenia[29]	1 : 1.23	1 : 0.25	1 : 0.17
	Beekman[30]	1 : 1.12	1 : 0.18	1 : 0.48
	Dix[31]	1 : 1.51	1: 0.27	1 : 0.31
	Farmington[32]	1 : 1.22	1: 0.27	1 : 0.72
	Fishkill[29]	1 : 1.23	1 : 0.31	1 : 0.74
	Hector[31]	1 : 1.30	1 : 0.15	1 : 0.28
	Kinderhook[33]	1 : 1.05	1 : 0.21	1 : 0.17
	Montour[34]	1 : 1.50	1 : 0.28	1 : 0.29
	Northeast[30]	1 : 1.36	1 : 0.29	1 : 0.21
	Reading[34]	1 : 1.88	1 : 0.26	1 : 0.32
	Red Hook[29]	1 : 1.11	1 : 0.20	1 : 0.22
Ohio	Madison Village[35]	1 : 1.67	1 : 0.20	1 : 0.38
	Madison Township[35]	1 : 1.40	1 : 0.25	1 : 0.30
Pennsylvania	Allegheny Township[36]	1 : 1.06	1 : 0.14	1 : 0.13
	Bedminister Township[36]	1 : 1.12	1 : 0.05	1 : 0.04
	Bethel Township[3]	1 : 1.08	1 : 0.17	1: 0.06
	Bingham Township[37]	1 : 1.56	1 : 0.16	1 : 0.15
	Buckingham Township[38]	1 : 1.04	1 : 0.15	1 : 0.08
	Carroll Township[3]	1 : 1.03	1 : 0.06	1 : 0.02
	Maiden Creek Township[39]	1 : 1.28	1 : 0.11	1 : 0.06
	Richmond Township[39]	1 : 1.24	1 : 0.09	1 : 0.04
	Stewardson Township[37]	1 : 2.11	1 : 0.23	1 : 0.31
	Straban Township[3]	1 : 1.10	1 : 0.16	1 : 0.06
	Sweden Township[37]	1 : 1.38	1 : 0.07	1 : 0.08
Rhode Island	Hopkinton[12]	1 : 1.08	1 : 0.31	1 : 0.31
	Little Compton[12]	1 : 1.05	1 : 0.56	1 : 0.37
	West Greenwich[12]	1 : 1.46	1 : 0.40	1 : 0.46
Utah	Cache County[40]	1 : 1.27	1 : 0.25	1 : 0.57
	Sevier County[40]	1 : 1.11	1 : 0.31	1 : 0.99
	Utah County[40]	1 : 1.23	1 : 0.26	1 : 0.82
Virginia	Clarke County[41]	1 : 1.26	1 : 0.21	1 : 0.15
	Culpepper County[42]	1 : 1.25	1 : 0.19	1 : 0.19
	Northampton County[43]	1 : 1.13	1 : 0.97	1 : 0.23
Washington	Skagit County[44]	1 : 1.25	1 : 0.30	1 : 0.51
Wisconsin	Dunn[45]	1 : 1.06	1 : 0.29	1 : 0.18

Source: American Farmland Trust. Farmland Information Center, Technical Assistance Division, Northampton, MA 01060. Web:www.farmlandinfo.org. March 2000.



Source: American Farmland Trust, Farmland Information Center, Technical Assistance Division, Northampton, MA.

Figure 4-3 The Median Cost, per Dollar Revenue Raised, to Provide Public Services to Different Land Uses (n=58 Communities)

A summary of the results reported in Table 4-4 is provided in Figure 4-3. 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 $370,000 and $290,000, 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 $1,150,000. 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.

A more detailed review of the COCS and fiscal impact case studies revealed three useful additional insights. First, communities with larger and rapidly growing populations appeared to experience greater net deficits on their residential land than did communities with smaller, more stable populations. This is exemplified in Figure 4-4 which describes the consequences of rapid growth in the 1980s on the island of Nantucket, Massachusetts.

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 ac-

Figure 4-4 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.

Source: Adapted from Nantucket Land Council Inc. (1989). *Balancing today's development and tomorrow's taxes.* Nantucket, MA: Nantucket Land Council.

company 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.

Second, the use of a broad residential development category which was adopted in all of these studies, often obscures substantial differences within it. Thus, many studies have shown that the more sprawling the growth, the higher the cost.[8] 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.[46] Similarly, in a study of Loudoin County, Virginia, which is the fastest growing county in the Washington, D.C. 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).[47] 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.

While sprawl often contributes to net deficits so, on the other hand, do lower-rent apartments and larger (four and five bedroom) housing units tend to result in a net fiscal deficit. This occurs because the dominant cost centers of local governments are education and social service expenditures. Together these two cost centers on average account for approximately 50% of local government expenditures.[11]

Building on this observation, a third insight was the major role of education in accounting for the residential property deficits. The impact on school costs is especially pernicious because in many states the subsidy that a local school district receives from the state declines as assessed valuations in the district increase. This means that the deficit fiscal impact of residential property is accentuated, because by increasing the tax base it triggers reduction in the revenue that school districts receive from the state.

Parks and Open Space Implications

The data from these empirical 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 the city from publicly owned land 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 still yield some tax revenue to the community.

Residential development is the most 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

Figure 4-5 An Illustrative Comparison of the Net Cost of Serving a Residential Development and a Natural Park Area

On the 50-acre site (Figure 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 15% higher than the property taxes received (Figure 4-3). Thus, the annual net loss to the community for servicing this residential development is $112,500 ([(115 ÷ 100) x $750,000] - $750,000).

If the operation and maintenance cost of the 50-acre natural park is lower than $112,500 per year, then it is a less expensive option to service than the housing development on the same site.

site?" Evidence in the previous three chapters of this monograph suggests that the purchase cost 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.

Figure 4-5 uses the 50 acre natural park site described in Chapter 1 (Figure 1-1) and the data summarized in Figure 4-3, 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 $112,500, 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, 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.

These kinds of analyses have caused some communities to consider purchasing land rather than incurring the losses likely to accrue from development. Examples of this are described in Figures 4-6 and 4-7. Another example occurred in Wayland, Massachusetts where 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.[48]

Figure 4-6 Fiscal Analysis of the Relative Impact for Alternative Land Uses of a 720 Acre Farm in Mansfield Township, New Jersey

When a 720 acre farm property became available for sale, the Mansfield Township's 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 of services for a residential development would continue forever.

Source: Adapted from Association of New Jersey Environmental Commissions (1996). *Open space is a good investment: The financial argument for open space preservation.* Menham, New Jersey.

Figure 4-7 The Pittsford Solution

In 1998, the American Planning Association recognized the innovative conservation action taken by the Town of Pittsford, New York, located seven miles south-east of Rochester, 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 groups 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 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 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. The average cost to a homeowner of the purchases was approximately $50 per year. 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 about $5,000 over the life of the bonds issued to purchase the development rights which were acquired at an average price of $9,000 per acre.

Source: John J. Behan (1999) Pittsford's Greenprint Initiative *Planners' Casebook* Spring/Summer. Published by the American Institute of Certified Planners

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 land use" (p.9)[29] 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.

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 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 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.

Burchell and Listokin, who have been doing fiscal impact analyses for over two decades and have published the most influential materials during this time period, developed a hierarchy of the fiscal impacts of different land uses.[49] It ranged from research office parks at the top (highest net fiscal surplus) to mobile homes at the bottom (highest net fiscal deficit). In this hierarchy, they placed open space and undeveloped or unimproved land in the middle, just above the break-even line for municipal budgets.

The intent in this chapter is not to suggest that one type of development is a superior land use to another, because some combination of all three land uses (residential, commercial/industrial, and open space) is needed in viable communities. 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.

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CHAPTER 5

The Evidence Relating to Greenway Trails

REVIEW OF EMPIRICAL FINDINGS

DISCUSSION

CHAPTER 5

THE EVIDENCE RELATING TO GREENWAY TRAILS

In the 1990s, there was an explosion of interest in developing greenways. Greenways are corridors managed for recreation, transportation and conservation purposes. They 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 1921, the urban parkways of the 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.

The commission 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 ground swell 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 en-

gage today. These recreation roles require the development of trails along the greenways. The studies reviewed in this chapter address the impact of these greenway trails on property values.

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 would not come from the views of nature or open space which a property owner enjoys because in most 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 confers added value, not the panorama of attractive open space.

The suggestion that trail access enhances property values is nearly always controversial. 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.

Figure 5-1 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. Rather than increasing property values, many argue that greenway trails will cause them to decline because they encourage a flow of nonlocal 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. Thus, Mayor Sharon Sayles-Belton, the long-term mayor of Minneapolis, who has been a staunch advocate of trails, observed "It has been my experience that after a trail has been put in, the residents abutting it seek to curtail its public use."[3]

Reactions to the widely acclaimed trail around the Inner Harbor area in Baltimore illustrate this point. Town houses on the old

Figure 5-1 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.

wharfs were constructed with large windows so occupants could enjoy the harbor views. These occupants resent people walking on the trail in front of their properties, interrupting their privacy and their views. Controversy of this nature was the stimulus for commissioning all of the studies reviewed in this chapter.

It was anticipated that the research designs of studies commissioned to address this controversy would take one of two forms:

(1) Identify an existing greenway trail running through an area and compare property assessments (available at the assessor's office) before and after the greenway was established to see if there were any differences; or
(2) Identify a control area similar in essential respects to a greenway trail neighborhood but without the trail, and compare the differences in assessed value of comparable properties in the two areas.

These were the approaches commonly used in the studies reviewed in Chapters 3 and 4. However, in the case of trails, research of this nature has not been reported. Instead of examining trends in market transactions, eight of the nine studies reviewed here 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 which 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

The earliest trail impact study was undertaken in 1978 by the East Bay Regional Park District in the San Francisco Bay area.[4] 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 Table 5-1. Only 7% and 4% 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.[5] The trail is 8-10 feet wide and follows an abandoned railroad right-of-way. It passes primarily through residential neighborhoods, but also through an industrial area, several neighbor-

Table 5-1 Adjacent Residents' Perceptions of Trail Impacts 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%

hood commercial areas, and the University of Washington. It links six parks and is used by 5,000 people a day, of whom 80% are bicyclists.

The trail was opened in 1979 and it was assumed after 8 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, and within one block of the trail; and real estate agents who bought and sold homes in neighborhoods near the trail.

Results of the residents' survey are summarized in Table 5-2. 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) did the presence of the trail make it easier, more difficult or have no effect on the saleability of their home; and (2) did the trail increase or decrease the selling price of the property. These two questions were subsequently used by most of the other reported studies reviewed in this chapter that addressed this issue.

The data in Table 5-2 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 expressed 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 (Table 5-3). None of the 75 agents surveyed perceived the trail to have a negative impact on properties located

Table 5-2 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

Table 5-3 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

within two blocks of the trail but not adjacent to it. Indeed, their consensus 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. 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).

Table 5-4 shows results of a study which reported adjacent residents' attitudes to the Root River and the Luce Line trails in 1988 in Minnesota.[6] 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.[7] 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 (Table 5-1), and passes through heavily developed, relatively affluent suburban areas.

Similarly sized samples were drawn of property owners who lived adjacent to the trail and those who resided within quarter of a mile but not adjacent to it. In addition, a survey of 25 realtors and appraisers was 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

Table 5-4 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%

table 5-5 indicate 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 urban Lafayette/Moraga Trail, a much larger proportion perceived there to be an effect and most thought it was positive. In total, only 7% of adjacent homeowners and 2% of nearby residents thought the trails lowered the value of their property.

Overall, realtors and appraisers 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 urban Lafayette/Moraga Trail and, in contrast to property owners, a greater proportion felt it was negative than believed it was positive. Buyers' concerns 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.[8] 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

Table 5-5 Adjacent and Nearby Owners' Opinions about How the Presence of a Trail Affects the Resale Value of Their Property

	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

Table 5-6 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

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.[9] Only 7% of the local brokers, appraisers, developers and tax assessors who were surveyed believed that the trail lowered nearby property values. The 63% 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 insufficient 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 many 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.

Three trails in the metro-Denver area were selected in a 1995 study sponsored by the Conservation Fund and The Colorado State Trails Program.[10] They were: (1) a 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 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 previous studies, data were collected by telephone surveys from: (1) 26 residents who owned or rented property adjacent to the trail; (2) 143 residents living within one block of the trail; and (3) 11 real estate agents who did business in metro-Denver. The results are summarized in Table 5-7. 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

Table 5-7 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

small sample sizes which means that changes in only a 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 Carolina, yielded responses from 109 (75%) of them.[11] The surveyed residences typically were single family homes, and residents in one of the three areas had vociferously opposed development of their 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 not perceived to negatively impact property values since 55% believed that the greenways enhanced the resale value of their property. Only 3% reported it decreased 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.[12] The study focused on the Highridge Estates subdivision in the Village of Howard. The initial phase of the subdivision was developed and a new addition was currently under development. This study was particularly significant because unlike 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 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.

DISCUSSION

The sample sizes in many of these studies were small, but 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.

It appears that for most people who reside adjacent or close to trails, the advantages of hike and bike access to other amenities and the opportunities for linear outdoor recreation activities that trails provide, are countered by the increased flow of people and reduced privacy that trails bring to a neighborhood. This suggests that the challenge for trail advocates is to design trails to alleviate these concerns. The issue was encapsulated in the following statement:

> 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. III-15).[7]

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.

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 resi-

dents 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.

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CHAPTER 6

The Analogous Case of Golf Courses

THE ANALOGY WITH PARKS

PLANNING AND DESIGN STRATEDGIES

Alternative Configurations

The Windows Principle

THE BOTTOM LINE

CHAPTER 6

THE ANALOGOUS CASE OF GOLF COURSES

There are 16,000 golf courses in the United States and approximately 2,000 of them are part of a residential development. However, the trend to incorporate them as central features of real estate developments accentuated in the 1990s when almost 1,000 such courses were constructed, accounting for nearly 50% of all new courses in that decade. The acreage required to make these developments viable varies. The minimum size is about 400 acres (half golf and half residential), but many consider this ratio to be marginal. Larger projects of 800-1500 acres allow the 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.

While the overall U.S. real estate industry grew at an annual rate of 2%-3% in the 1990s, the annual growth rate of developments which incorporated golf courses approached 10%, making it one of the hottest sectors in real estate. Demographic and economic indicators suggest this trend will continue. The highest golf participation rates are in the 50-59 age cohort. The baby boomers are now entering this age cohort. They are empty nesters; in their peak earning years; close to retirement; and have the economic security of strong private pension funds boosted by the unprecedented increases in the stock market in the late 1990s.

Some developments have an array of other recreation amenities along with the golf courses, such as nature trails, jogging and biking trails, day care centers, fishing lakes, swimming pools and recreation centers.

THE ANALOGY WITH PARKS

There are two reasons why developers include golf courses and other amenities in their projects: (1) to increase the land values in their development; and (2) 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, speeds up overall absorption by 20-30 percent which

translates into higher profitability for the developer. The developers are not philanthropists! They incorporate these recreational features because they generate more revenues for the developer than it costs to create them.

The appeal of golf course communities is not confined to golfers. Indeed, only approximately one-third of those who purchase houses in these developments play golf regularly.[1] For the majority of home buyers, the appeal is the open space and park-like ambiance that golf courses provide. A typical response from residents is, "It's like living in the country here, but with access to the city."[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."[2] 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.

The developers' strategy mirrors that which has been advocated by supporters of public parks and open space for over a century, i.e. parks and selected recreation features are an investment not a cost because they generate more property taxes for a city 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 that commercial developers implicitly recognize that recreation amenities and park-like open spaces enhance the surrounding land values sufficiently to offset their costs of acquisition and development.

The linkage between golf courses and parks has been accentuated in recent years by newer courses accepting greater responsibility for protecting the natural environment. There has been growing acknowledgment of the damage golf courses can inflict by denigrating wetlands and other types of sensitive areas and using pesticides, and a recognition that they should be part of the solution to environmental problems, rather than creating them. 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. In short, golf courses are becoming more park-like.

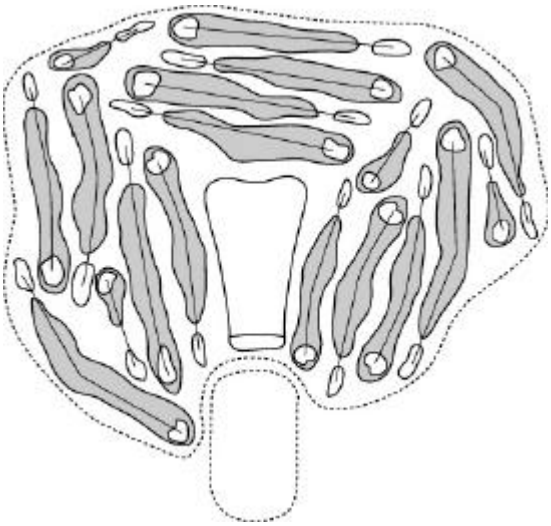
PLANNING AND DESIGN STRATEGIES

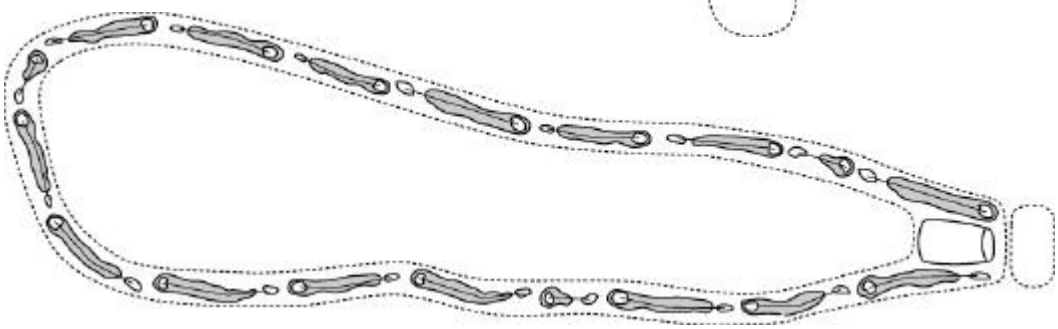
Planning and design strategies used by developers to enhance the value of property around golf courses are reviewed here because they may be adapted by public agencies engaged in planning and designing parks to maximize real estate values if that is an agency goal.

Alternative Configurations

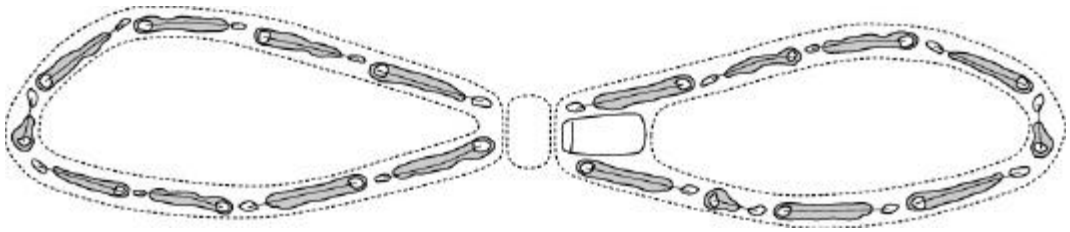
Five basic golf course configurations are recognized: core; double fairway, continuous; double fairway, returning nines; single fairway, continuous; and single fairway, returning nines. These are shown in Figure 6-1.[3] Their potential for maximizing the value of adjacent real estate varies and Figure 6-1 reinforces the important role of "edge" in maximizing real estate frontage potential.

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.

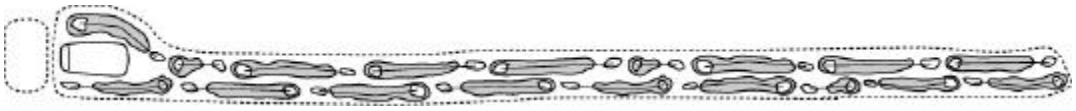




The Single Fairway, Continuous is a single, open loop starting from the clubhouse and returning to the clubhouse. It consumes the greatest amount of land and offers the greatest amount of fairway frontage for development sites. It can be designed to wind its way through fairly difficult terrain. Length 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.

Figure 6-1 The Five Basic Golf Course Configurations

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 others' viewlines. In contrast, the core course has least potential for 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.

The preferred option in most real estate developments is 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.[3] Further, this layout allows for the option of playing only nine holes.

The "Windows" Principle[4]

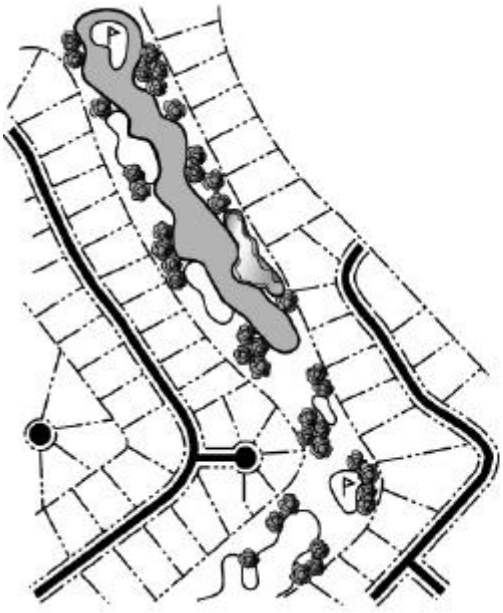
Creating "windows" is a design strategy used to maximize real estate values in golf course developments. It is a principle that cities may encourage developers to adopt in the vicinity of parks to maximize economic return to both the developer and to the city in the form of increased property taxes.

In traditional golf course developments, lots were placed around the entire perimeter of the course, which locked it off from internal areas of the project. This isolates the internal lots and diminishes their desirability and value. "Windows" are openings in the perimeter of the golf course that, much like a window in the side of a building, provide direct views of the

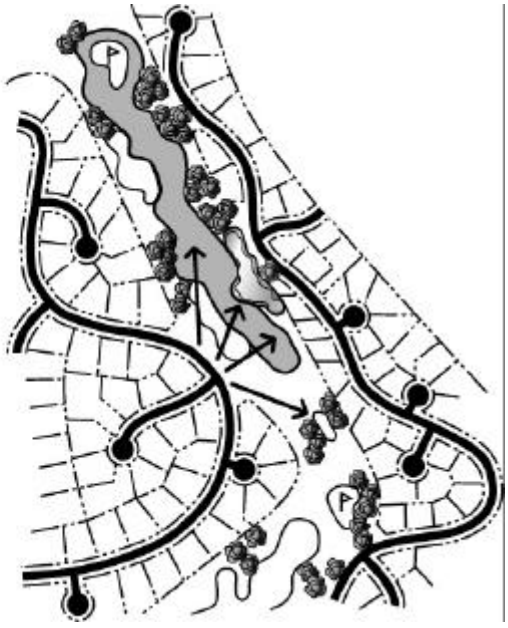
golf course. They are created by leaving open spaces at key points along the perimeter of the course. Making the golf course visible from interior lots increases the value of portions of the development that are located at a distance from the course.

Figure 6-2 contrasts the impact of creating windows with the traditional lot pattern. Windows are created by locating local interior roads and cul-de-sacs from the window into the interior lots, giving most of the lots on a cul-de-sac views of, and secondary frontage (i.e. across the road) on, the golf course. At the very least, all homeowners have a view of the course as they drive down the cul-de-sac past the window. The effect is to make it feel that the golf course belongs to the whole community and contributes an ambiance that benefits everybody.

Sometimes a developer may have to give up a few frontage lots to create a window. But obtaining premium prices for a larger portion of the interior lots, more than offsets this loss. Roadway windows frequently can be placed at points along the course where it would be difficult to fit in perimeter lots - - at drainage ways, at the outside edges of dogleg golf holes, and at unusually shaped parcel boundaries. Such placements minimize the amount of frontage given up for the window and often lead to greater efficiency in developing lots elsewhere on the site.



TRADITIONAL LOT PATTERN
In the typical layout of golf course communities, interior lots can be walled off from the golf course.



WINDOWS
Creating windows with views of the course and developing roads through them gives residents the feel of truly living in a golf community.

Figure 6-2

THE BOTTOM LINE

The magnitude of investment in creating a golf 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 and the cost of constructing an 18-hole course may range from $2 million to $8 million. If all the acreage in a project is suitable for development into lots and no floodplain land is involved, then a developer forfeits the revenue that would be forthcoming from the sale of lots on the 150 acres of land needed for the course. If one-acre lots were sold at $40,000 each, then the loss to the developer of the 150 acres would be $6 million. If the developer paid another $4 million to construct the course on this land, then the total cost would be $10 million.

A larger set of amenities beyond a golf course results in commensurate increases in cost. For example, Del Webb Corporation developed a 5,800 acre master planned subdivision in Phoenix known as Anthem.[5] The recreation amenity package cost the corporation $77 million. It included two golf courses, a rock climbing wall, a children's railroad, a skating rink, a roller hockey rink, a 4 acre fishing lake, a water park, 30 acres of soccer and softball fields, and an array of parks.

To justify investment on this scale, there has to be substantial enhanced value of a development's real estate. How much value does a golf course add? Generalizations or averages obscure substantial variations among courses, but results from a study of master-planned golf communities across the United States yielded the averages shown in Table 6-1.[1]

Lots and houses throughout a golf-course community bring premiums over comparable lots/units in nongolf developments (Table 6-1). Prime sites fronting on greens or enjoying water views or fairway and open-space vistas can command twice the average fairway-frontage premium. Nonfrontage property offering views of the golf course and partial vistas also commands a substantial premium. Even interior sites located within the gates of a golf-course community command a slight premium.[1] Although it is difficult to generalize about the

Table 6-1 Golf Real Estate Premiums

	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.

magnitude of premiums, in percentage terms golf's enhancement of land values tends to decrease as the base land values rise.

When the averages shown in Table 6-1 are applied to the course configurations shown in Figure 6-1, the difficulty of recouping the costs of a golf course using a core or a double fairway configuration becomes apparent. In Table 6-2 the real estate income accruing from a double fairways returning nines course is compared with that from a single fairways returning nines lay-out. The analysis assumes that 75% of the frontage in both cases in usable for real estate development, and that the premiums for properties with golf course frontages average $25,000 for detached homes, $20,000 for town homes, and $15,000 for garden apartments.

The estimates in Table 6-2 show that the single fairway returning nines yields substantially more income, irrespective of what type of housing is developed. The income estimates in Table 6-2 are conservative because they do not include the premiums associated with golf-view homesites or interior homesites (Table 6-1). They also do not 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, these estimates do illustrate why the single fairway returning nines configuration is preferred in golf course developments.

To reduce costs while retaining the real estate premium, some developers have donated the land for a golf course to a city. For example, in response to its request for proposals, Lee County in Florida received offers from six developers willing to donate 150 acres for a golf course, some of whom also offered to contribute $100,000 for the planning and design of the course.[6] In these cases, the municipality develops the course and operates it. When the costs of land acquisition are excluded, the course revenues often are sufficient to cover

Table 6-2 Income Advantages of the Single Fairway Returning Nines Course

Types of Development	Double fairway returning nines with 18,000 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)	180	$4,500,000	330	$8,250,000	$3,750,000
Townhouses (38 feet width)	424	$9,480,000	868	$17,360,000	$7,880,000
Three story garden apartment (40 units of frontage per 1000 feet)	720	$10,800,000	1,320	$19,800,000	$9,000,000

operational costs and annual debt charges associated with the construction costs. In addition, the city receives increased property taxes from the homes whose values have been enhanced by their proximity to the course. Indeed, in some instances, it may be feasible to form a tax increment financing district and use the property tax premiums to pay the annual construction debt service costs.

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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.

APPENDIX 2

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