Journal of Park and Recreation Administration *Volume 19, Number 3*
Fall 2001 *pp. 133-154*

Programs That Work

Parks and Open Space: The Highest and Best Use of Public Land?

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ABSTRACT: Parkland advocates frequently find themselves in conflict with residential developers over the appropriate use for a piece of land. Invariably developers argue that their projects will expand the tax base and, thus, reduce existing residents' property taxes. The paper summarizes the results from over 70 empirical studies that suggest that instead of leading to a reduction in property taxes, the consequence of residential development is usually a net increase in the property taxes paid by existing residents. These studies have used cost of community services analyses (COCS) to derive their conclusions. They 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 median net cost of residential development in the over 70 case studies reviewed was 15%. Thus, if the annual tax yield to a community was $1 million from a residential development, the median cost of servicing the development was $1.15 million. In this case, if the operation and maintenance costs associated with using the land as a park or open space were less than $150,000, then it would be a more cost effective use of the land for the community than residential development. Examples are given of communities in which COCS analyses have resulted in decisions to purchase land for open space rather than incur the likely losses from residential development.

A detailed review of the COCS case studies revealed three useful 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. Second, the use of a broad residential development category that was adopted in all of these studies often obscures substantial differences within it. For example, it has been shown that the more sprawling the growth, the higher the cost. Third, education costs are the major contributing source to the residential property deficits.

These findings provide park advocates with a credible entré into the economic development discussion and enable them to position parks as being a key component in a community's economic viability. By showing their relative fiscal strength compared to residential development, advocates can refute the notion that parklands are a drain on local resources. The goal is not to prevent growth, but to encourage a balance between development and open space.

KEYWORDS: park land; open space; cost of community services analysis; fiscal impact analysis; residential development; growth.

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Figure 1
Controversy at City Hall: Open Space or Development

The mayor brought the meeting of the Hometown City Council to order and said

"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."

A woman rose from the audience and stated, "My name is Pauline Smedley, 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.

A voice from the other side of the room said, "My name is Joe Tucker, and I represent the Citizens for a Quality Environment of Hometown. 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 bet interests of the community by acquiring the property."

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

The positions espoused in Figure 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 that 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 on-going 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 (Adams, 1999). 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 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 $2,500 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 (Crain, 1988).

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 (Kelsey, 1992, p.1).

The purpose of this paper 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 that is not usually reflected in market valuations of land, since valuations generally reflect only the short-term benefit of land.

The "New" Municipal Math

Figure 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. 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.

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 acres), 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 20 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 1/2 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.

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: Adapted from the original letter which was reproduced in Charles E. Little (1969). *Challenge of the land*. New York: Pergamon Press.

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 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 (Little, 1969). 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 (Rusch, 1963).

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 (Rusch, 1963).

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 (Little, 1969).

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:

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 (1962, p. 75).

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 (Altshuler & Gómez-Ibáñez, 1993). First, the climate of fiscal austerity, that is characteristic of many jurisdictions, has made local officials more receptive to techniques that 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 (Freedgood, 1992).

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 (Miller, 1992).

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 1.

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 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 2).

Table 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	

Table 2
Municipal Revenues by Land Use Category

Source of Revenues	Residential Revenues	Commercial / Industrial Revenues	Farm / Open space	Total Revenues 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	

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 1 and 2 is shown in Table 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.

Table 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	

A detailed discussion of how the data are collected and analyzed at each of these steps is beyond the scope of this paper. A general description of how to do these studies has been published by the American Farmland Trust, but the methodology is continually being refined, so their initial publication (American Farmland Trust, 1993) should be read in conjunction with the Trust's most recent report on COCS (Adams, 1999).

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 (Black & Curtis, 1993). More sophisticated econometric analyses would use locational equilibrium models that estimate substitution patterns between alternate land uses, rather than assess sector costs independently.

There are three major difficulties inherent in COCS analyses that 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 (Freedgood, 1992).

Second, COCS analyses tend to focus on average costs instead of the marginal, or incremental costs and revenues associated with new development. 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" (Altshuler & Gómez-Ibáñez, 1993, p.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 (Commonwealth Research Group, 1995, p. 9) [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 (Fausold & Lilieholm, 1996, p.6).

Review of Empirical Findings

Table 4 lists the results of over 70 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.

Table 4
Summary of Cost of Community Services Study Results

State	Town	Residential including farm houses	Combined Commercial & Industrial	Farm/Forest Open Land
Connecticut	Bolton[24]	1 : 1.05	1 : 0.23	1 : 0.50
	Durham[18]	1 : 1.07	1 : 0.27	1 : 0.23
	Farmington[18]	1 : 1.33	1 : 0.32	1 : 0.31
	Hebron[6]	1 : 1.06	1 : 0.47	1 : 0.43
	Litchfield[18]	1 : 1.11	1 : 0.34	1 : 0.34
	Pomfret[18]	1 : 1.06	1 : 0.27	1 : 0.86
Idaho	Canyon County[27]	1 : 1.08	1 : 0.79	1 : 0.54
	Cassia County[27]	1 : 1.19	1 : 0.87	1 : 0.41
Kentucky	Lexington-Fayette County[3]	1 : 1.64	1 : 0.22	1 : 0.93
Maine	Bethel[25]	1 : 1.29	1 : 0.59	1 : 0.06
Maryland	Carroll County[41]	1 : 1.15	1: 0.48	1 : 0.45
	Cecil County[17]	1 : 1.12	1 : 0.28	1 : 0.37
	Frederick County[10]	1 : 1.14	1 : 0.50	1 : 0.53
Massachusetts	Agawam[23]	1 : 1.05	1 : 0.44	1 : 0.31
	Becket[18]	1 : 1.02	1 : 0.83	1 : 0.72
	Deerfield[23]	1 : 1.16	1 : 0.38	1 : 0.29
	Franklin[18]	1 : 1.02	1 : 0.58	1 : 0.40
	Gill[23]	1 : 1.15	1 : 0.43	1 : 0.38
	Leverett[18]	1 : 1.15	1 : 0.29	1 : 0.25

Continued

Table 4 Continued
Summary of Cost of Community Services Study Results

State	Town	Residential including farm houses	Combined Commercial & Industrial	Farm/Forest Open Land
	Southborough[2]	1 : 1.03	1 : 0.26	1 : 0.45
	Westford[18]	1 : 1.15	1 : 0.53	1 : 0.39
	Williamstown[28]	1 : 1.11	1 : 0.34	1 : 0.40
Minnesota	Farmington[45]	1 : 1.02	1 : 0.79	1 : 0.77
	Lake Elmo[45]	1 : 1.07	1 : 0.20	1 : 0.27
	Independence[45]	1 : 1.03	1 : 0.19	1 : 0.47
Montana	Gallatin County[26]	1 : 1.45	1 : 0.16	1 : 0.25
New Hampshire	Deerfield[12]	1 : 1.15	1 : 0.22	1 : 0.35
	Dover[34]	1 : 1.15	1 : 0.63	1 : 0.94
	Exeter[39]	1 : 1.07	1 : 0.40	1 : 0.82
	Fremont[12]	1 : 1.04	1 : 0.94	1 : 0.36
	Stratham[12]	1 : 1.15	1 : 0.19	1 : 0.40
New Jersey	Freehold Township[1]	1 : 1.51	1 : 0.17	1 : 0.33
	Holmdel Township[1]	1 : 1.38	1 : 0.21	1 : 0.66
	Middletown Township[1]	1 : 1.14	1 : 0.34	1 : 0.36
	Upper Freehold Township[1]	1 : 1.18	1 : 0.20	1 : 0.35
	Wall Township[1]	1 : 1.28	1 : 0.30	1 : 0.54
New York	Amenia[15]	1 : 1.23	1 : 0.25	1 : 0.17
	Beekman[20]	1 : 1.12	1 : 0.18	1 : 0.48
	Dix[44]	1 : 1.51	1: 0.27	1 : 0.31
	Farmington[35]	1 : 1.22	1: 0.27	1 : 0.72
	Fishkill[15]	1 : 1.23	1 : 0.31	1 : 0.74
	Hector[44]	1 : 1.30	1 : 0.15	1 : 0.28
	Kinderhook[19]	1 : 1.05	1 : 0.21	1 : 0.17
	Montour[43]	1 : 1.50	1 : 0.28	1 : 0.29
	Northeast[20]	1 : 1.36	1 : 0.29	1 : 0.21
	Reading[44]	1 : 1.88	1 : 0.26	1 : 0.32
	Red Hook[15]	1 : 1.11	1 : 0.20	1 : 0.22
Ohio	Madison Village[9]	1 : 1.67	1 : 0.20	1 : 0.38
	Madison Township[9]	1 : 1.40	1 : 0.25	1 : 0.30
Pennsylvania	Allegheny Township[29]	1 : 1.06	1 : 0.14	1 : 0.13
	Bedminister Township[29]	1 : 1.12	1 : 0.05	1 : 0.04
	Bethel Township[30]	1 : 1.08	1 : 0.17	1: 0.06
	Bingham Township[31]	1 : 1.56	1 : 0.16	1 : 0.15
	Buckingham Township[32]	1 : 1.04	1 : 0.15	1 : 0.08
	Carroll Township[30]	1 : 1.03	1 : 0.06	1 : 0.02
	Maiden Creek Township[33]	1 : 1.28	1 : 0.11	1 : 0.06
	Richmond			

Continued

Table 4 Continued
Summary of Cost of Community Services Study Results

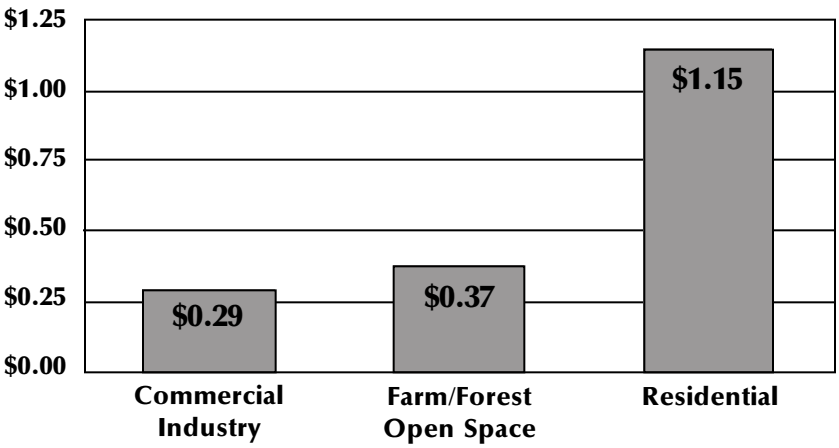
State	Town	Residential including farm houses	Combined Commercial & Industrial	Farm/Forest Open Land
	Township[33]	1 : 1.24	1 : 0.09	1 : 0.04
	Stewardson Township[31]	1 : 2.11	1 : 0.23	1 : 0.31
	Straban Township[30]	1 : 1.10	1 : 0.16	1 : 0.06
	Sweden Township[31]	1 : 1.38	1 : 0.07	1 : 0.08
Rhode Island	Hopkinton[18]	1 : 1.08	1 : 0.31	1 : 0.31
	Little Compton[18]	1 : 1.05	1 : 0.56	1 : 0.37
	West Greenwich[18]	1 : 1.46	1 : 0.40	1 : 0.46
Utah	Cache County[46]	1 : 1.27	1 : 0.25	1 : 0.57
	Sevier County[46]	1 : 1.11	1 : 0.31	1 : 0.99
	Utah County[46]	1 : 1.23	1 : 0.26	1 : 0.82
Virginia	Clarke County[49]	1 : 1.26	1 : 0.21	1 : 0.15
	Culpepper County[36]	1 : 1.25	1 : 0.19	1 : 0.19
	Northampton County[4]	1 : 1.13	1 : 0.97	1 : 0.23
Washington	Skagit County[11]	1 : 1.25	1 : 0.30	1 : 0.51
Wisconsin	Dunn[48]	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.

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.

A summary of the results reported in Table 4 is provided in Figure 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 to provide them with public services was only $370,000 and $290,000, respectively. 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.

Figure 3
The Median Cost, per Dollar Revenue Raised, to Provide Public Services to Different Land Uses (n=71 Communities)



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

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, 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 accompany new residential development. Such communities have no commercial / industrial base to mitigate the costs of servicing new residential developments, making substantial tax increases to existing residents almost inevitable.

Second, the use of a broad residential development category that 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 (Freedgood, 1992). 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 (Thomas, 1991). 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) (American Farmland Trust, 1986). This reflects the increased costs associ-

Figure 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 consultants who derived these data concluded that the costs of excessive development outweighed its possible benefits, and that the town's economy would benefit if more land was put into conservation rather than construction.

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

ated 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 (Black & Curtis, 1993).

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 maintaining and operating the land as a park or as open space be greater than the net costs associated with servicing a residential development that may be constructed on that site?"

Figure 5 uses a 50-acre park site that could be used either for residential development or as a natural park, and the data summarized in Figure 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.

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

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On a 50-acre site, assume a density of three homes per acre, a market value of $200,000 per home, and a property tax rate (school district, city, county et al.) of $2\frac{1}{2}\%$ of market value. 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 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 this 50-acre site is used by the community as a natural park rather than as residential development, then if the operation and maintenance cost is lower than $112,500 per year, it is a less expensive option to service than the housing development on the same site.

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 for open space rather than incurring the losses likely to accrue from residential development. Examples of this are described in Figures 6 and 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 (Bryan, n.d.).

Figure 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, NJ.

Figure 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 southeast 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 that 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. Breakeven 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 in creases.
- 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 that 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" (Bucknall, 1989, p.9). 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 (1995), 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. 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 article 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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