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THE FISCAL IMPACTS OF OPEN SPACE CONSERVATION ON A RURAL NEW ENGLAND COMMUNITY

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THE FISCAL IMPACTS OF OPEN SPACE CONSERVATION ON A RURAL NEW ENGLAND COMMUNITY

BY

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INTRODUCTION

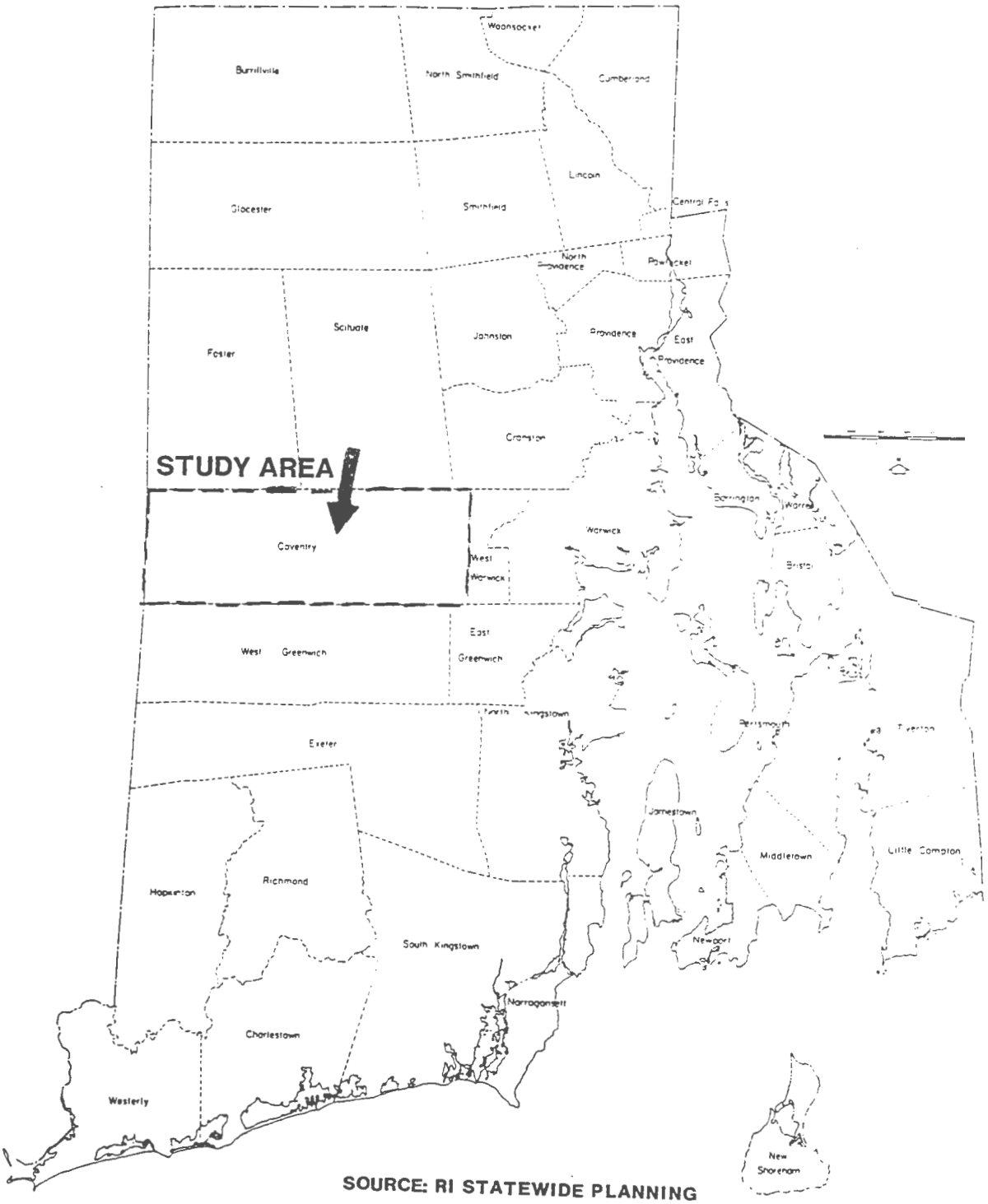
For many years, the New England region has been subject to increased demand for residential and commercial land uses. This demand, combined with the reality of a fixed resource, has resulted in growing conflict between preservation of open space and development in New England communities. As municipal leaders attempt to balance expenditures with revenues, they often question if it is fiscally and economically prudent to invest in protecting open space lands, since they feel it may jeopardize the tax base. Yet, environmental quality, attained in part by the conservation of open space, is often the basis for sustaining the quality of life in these communities. Areas of open space land provide scenic vistas, as well as recreational and environmental qualities. These not only protect natural resources but also increase the value of adjacent properties benefiting fiscal and economic stability of the community as well.

There is a need for quantitative assessment of the impacts of land conservation strategies on a community's economy and tax base. This is particularly important to justify municipal expenditures and land use strategies for conservation of open space under the constraints of dwindling budgets and local opposition. Little fiscal or economic analysis has been undertaken on the conservation

of open space in rural New England communities. Local leaders are in need of a model for evaluating fiscal policy decisions.

The goal of this research is to estimate the fiscal impact of open space preservation on a New England community, thereby providing local decision makers with useful information for justifying open space preservation as a viable use of public funds and land use controls. This research will address two fundamental questions; the first is the fiscal impact of land conservation strategies on a community. Secondly, the research will test the hypothesis that conservation of open space enhances the value of adjacent properties and therefore offsets the monetary costs of conservation within communities.

The primary objective of this research is the application of quantitative assessments of open space conservation to the study area of the Town of Coventry, Rhode Island. Coventry, with an estimated 1988 population of 29,812, is located in the western portion of the State bordering on the State of Connecticut (See Figure 1). It is the largest Town in the State comprising 64.7 square miles of area. The State of Rhode Island has followed the nation in the pattern of population growth over the past decade with the majority of growth occurring in the suburbs and rural areas. This is represented in Table 1 which compares the percent change in Town population with the percent change in County and State population. It can



SOURCE: RI STATEWIDE PLANNING

Figure 1

be noted that over the past decade, Coventry has grown at a significantly higher rate than either the County or the State.

Table 1: Population trends Coventry, Kent County and Rhode Island

Year	Coventry	%Change	Kent	%Change	State	%Change
1960	15,432		112,612		859,488	
1970	22,947	48.7	142,382	26.4	949,732	10.5
1980	29,685	29.4	153,957	8.1	945,761	-0.4

Locally, the Town of Coventry is referred to as two towns: Eastern Coventry with the mill villages of the early 1900's converted to industrial areas and Western Coventry with over 2000 acres of open space owned by both the State and the Audobon Society. The State of Rhode Island and the Audobon Society are the largest public landowners in the Town. The open space included in this area of the Town is also comprised of large private land holders who have committed their land to open space uses. By keeping their land as open space, these landowners are able to qualify for a reduced assessed valuation and taxation under the State's Code 33: Farm, Forest and Open Space. These larger tracts of land range in size from approximately 100 acres to over 300 acres.

Most of the population of this town is concentrated in the eastern section while the western portion of the town is much more sparsely populated; 75% of the Town's population lives in

25% of the area. The specific area to be examined in this study is the western section. In 1980, there were a total of 9492 housing units in the Town with an average family size of 3.03. The current student enrollment within the Town is 6306 according to the "RI public School Indicators", a 1988 publication of the RI Department of Education.

This area was chosen as a study area for the large percentage of preserved open space land and the rural New England character. In built-out urban environments, even though open space preservation is important, additional open space land is in scarce supply. However, in rural areas where open space is more abundant, there is still time to preserve it through successful open space preservation policies and strategies.

A significant advantage in choosing the Town of Coventry over other towns was that in 1988 an entire Town reevaluation was completed. Therefore, the data reviewed was current and up-to-date. As a result of the current re-evaluation, the Town's assessment ratio is at 97.5% which means that the property's assessed values are very close to their true market value.

The results of this study will provide information to decision-makers for use in clarifying land conservation strategies within the study area as well as in the State. It should also support and justify the need for open space conservation as a viable use of public funds and land use controls.

The analysis of fiscal impacts to be conducted will weigh the costs of development versus the costs of conservation on a community. It will include a review and discussion of tax revenues generated by residential development, the costs incurred for providing services to taxpayers of the development, as well as acquisition and maintenance costs for open space (if any). In analyzing the windfalls to adjacent property, a multivariate regression analysis will be conducted to answer the question: "What is the value of living next to open space." Knowing if a significant relationship exists between the value of a property and its proximity to preserved open space will allow for agencies to make rational decisions on open space preservation within a community. A comparative approach will be also be applied to the lots in a cluster subdivision to assess the difference in value between these lots as compared with overall changes in value in the study area. This could offer further significance to the importance of preservation of open space as a contributor to property values.

For this research design, open space will be defined as vacant parcels of any size which cannot be developed and are owned by the State of Rhode Island, the Town of Coventry, a land trust, the Audobon Society or other agency such as a homeowner's association for the purpose of preservation.

The following chapters include discussions on the review of the literature (Chapter 2) the methods of quantitatively assessing open space conservation (Chapter 3), the analysis of the findings (Chapter 4) and the conclusions and policy implications (Chapter 5).

C H A P T E R T W O

REVIEW OF THE LITERATURE

The importance of open space can be traced back to biblical times when the Lord gave the Levites six cities to dwell in and pasture lands for the cities around them. The concept of open space preservation can also be traced to this time as evidenced by the following passage from Leviticus 24:34 (Correll et.al. 1978: 1).

> "But the field of the common land belonging to their cities may not be sold; for it is their perpetual possession."

The creation of permanent open space and its conservation has developed from the Old Testament through Plato, Aristotle, Roman city planning (Hellenistic City), Thomas More's Utopia, Robert Owen's Utopian communities and Ebenezer Howard's Garden Cities of Tomorrow. Early settlements in New England were created with a town commons and Ogelthorpes plan of Savannah laid out in 1733 included a generous allocation of open space with parks in alternate squares of grid pattern streets.

In this Country, open space has played a significant role in city planning since the mid 1880's when new public parks were created to lure new real estate development to the outer areas of the city. During this time, parks were used as a marketing tool to expand and strengthen the

city's tax base. Examples include the works of Frederick Law Olmstead and Calvert Vaux in New York City's Central Park, Brooklyn's Prospect Park and Boston's Emerald Necklace. (Fox 1990: 9) New York City's Central Park clearly illustrates the relationship between real estate values and public parks. In 1856, to justify the expenses of property acquisition and construction for the park, Frederick Law Olmstead began tracking the values of real estate in the three wards surrounding the park. Olmstead conducted a simple economic analysis which compared the higher tax revenue from the adjacent property to the interest paid by the city for the cost of the land and its improvement and also considered other variables such as the construction of new avenues. (Fox 1990: 12)

This analysis was also used to justify the creation of a park in Boston. A report from the Metropolitan Park Commissioner stated: "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 new parks, as well as the income from betterments, would ensure them a strong financial support...The experience of other cities had proved that, aside from the benefits accruing from parks as attractions to travelers and as a means for affording aesthetic delight in landscape, there was a tangible effect produced by them to improve the moral and physical welfare of communities." (Fox 1990: 14)

Since Olmstead's time, many other researchers have conducted economic analysis in the form of multiple regression analysis, fiscal impact analysis and comparative approaches to quantify the fiscal and economic impacts of open space preservation. For the most part, previous studies undertaken have focused primarily on urban areas with neighborhood parks. The discussion of prior studies is concentrated on the values which parks with amenities provide to the surrounding dwellings.

James W. Kitchen (1967) tested the hypothesis that land which is adjacent to an urban neighborhood park, because of its unique location, may be of greater value than land which is a greater distance from the park. Hammer, Coughlin, and Horn (1974) also researched this hypothesis.

Weicker and Zerbst (1973) conducted an empirical investigation on five neighborhood parks studying the relationship between the externalities generated by municipal parks and the assessed values of property. These researchers apply the classic multiple regression analysis to urban and neighborhood parks. Their study revealed that there was a decrease in property values across the street from heavily used parks which were developed for active recreation; while, properties facing passive parks were valued higher. Research conducted by More, Stevens, and Allen (1982) provided findings consistent with the Weicker

and Zerbst study. They found that property values were maximized when it was adjacent to parks which emphasized natural open space as opposed to intense development for organized recreation.

Other studies such as the one by Correll, Lillydahl and Singell (1978) apply the classic multiple regression model to greenbelt areas. Their research and analysis finds that greenbelts may have a significant impact on adjacent property values which is important in policy decisions on greenbelt provisions in other suburban communities. Looking at other open space elements, Schroeder (1982) researched the relationship of local public park services to residential property values.

All of the findings from these prior studies lead to similar conclusions -- parks are an important element in community development, bringing both fiscal and social benefits. The results of more of the recent studies support the findings of earlier studies: property values decrease the greater the distance from the open space.

An important research project by Darryl Caputo (1979) investigated the fiscal impacts of residential development versus preserved open space. He devised a method whereby a comparison could be made between the costs and revenues attributed to residential development and the costs associated with purchasing the land and taking it permanently off the tax roles. His conclusion was that open space preservation was a less expensive alternative

for the municipality then residential development. While the preservation of open space in his study area of Clover Hill would have raised the tax rate 0.44 cents from $5.38 to 5.82, a proposed development would have raised the tax rate $1.14 from $5.38 to $6.52.

The studies discussed above including those of Kitchen, (1967); Weicker and Zerbst (1973); Hammer, (1974); Correll, (1978); More et.al. (1982); and Schroeder, (1982) outline methods for comparing other variables which could also affect the value of real estate in order to conclusively prove that the park or open space was the stimulus for the increased property values. These methods, used to quantify fiscal and economic measures of parks in urban areas, will be adapted for use in this research.

This study is a variation on prior research in that it applies the earlier methods to the rural environment and considers the value of land preserved as simply open space in addition to land designated for parks. Since open space implies more than a tree-lined boulevard or a neighborhood park, this research focuses on the need to expand the theme of open space preservation to include land use such as woodlands, wetlands and other sensitive areas that do not support services for organized, active recreation or development.

Since the research will focus on a rural town with a considerable amount of existing open space, it may also

provide some insight into the intrinsic value of open space. Open space can often be taken for granted if it is abundant. This is also a variation from the traditional component in an urban study area where open space is not as prevelant.

A justification of open space conservation is needed for rural New England communities, particularly within the State of Rhode Island, to provide insight into the policy issue of land use planning and to assure continued protection of this finite resource.

C H A P T E R T H R E E

METHODS OF EVALUATING THE FISCAL IMPACTS OF OPEN SPACE CONSERVATION AND RESIDENTIAL DEVELOPMENT

3.1 Fiscal Impact of Residential Development vs. Open Space

The property tax has historically been one of the most important sources of local government revenue. Rhode Island State laws classify property as real property and personal property and further classify personal property as tangible and intangible. It is the real property tax which is of greatest concern to decision makers within a municipal government. This concern is over the conflict between the amount of taxes received by the Town and the cost of services which must be provided to the tax payers. It is important that the taxes received be enough to cover the costs of these services or Towns are faced with the expensive alternative of borrowing funds or cutting back on services. Town government's reliance on property tax can cause serious problems if they find that they cannot support essential public services.

A key component in the property supported tax base is the land development pattern of the community. Future development is influenced by the existing land use pattern. It is also important to note that high property taxes tend to lower land prices. This discourages the long-term holding of vacant sites that are not being used

for their "highest and best use". For example, if a new development requires public services that cost more than the new tax revenues it generates this necessitates a general increase in the community's property tax rate. In turn, the net return on most properties and their selling price is reduced. Low property tax rates, on the other hand, make it less costly for owners to hold land idle, tending to reduce the effective supply and raise the cost of land available for development. (Schaenmann and Muller 1974:55) This is an important consideration for Towns seeking growth management strategies.

There is a common misconception that residential development provides tax benefits to a community in the form of increased tax revenues. This may be true for development targeted at an older population with a higher income bracket and no children at home. However, other empirical research has shown that this is not the case for all types of development. In fact just the opposite is true; certain types of residential development places a far greater demand on the Town's services causing an indirect impact on the Town's fiscal stability. Several studies by the American Farmland Trust (Trust) have concluded that residential land development is more expensive for a town's budget. A study of Hebron, Connecticut conducted by the Trust revealed that the ratio of revenues to expenditures for residential development is 1.00 : 1.06. That is for every $1.00 of revenue generated by the residential sector,

$1.06 in expenditures was allocated to this land use. However, the ratio of revenues to expenditures for agricultural land was 1:00 : 0.36 which means that for every $1.00 in revenue generated by this land use only .36 cents in expenditures was earmarked. (American Farmland Trust: 1986)

Open space does not demand municipal services. It costs the community little beyond acquisition expenses but provides many economic benefits. Towns must consider sound fiscal policies that will also ensure environmental objectives by purchasing critical environmental areas, purchasing parklands, or by creating greenbelts that will improve the quality of life for all of the residents.

A fiscal impact analysis is an important tool to compare the costs and revenues associated with land development and also to justify the public expenditure for open space. Since open space does not require the same services as residential development, a likely outcome of an analysis would be that open space is a less expensive alternative to development thereby adding to a Town's fiscal vitality.

Historically, fiscal impact analysis was utilized by planners in the 1930's and 1940's to justify the benefits associated with urban renewal projects. During the 1950's planners relied on fiscal impact analysis to project the demand for new schools in the growing post-war suburbs. In the 1960's, it provided a means to evaluate the economic effects of local Master Plans required by the Department of

Housing and Urban Development. In the early 1970's, local officials began using fiscal impact analysis to evaluate development proposals. However, only recently has it been recognized as a useful tool for long-range planning and growth management. (The Griffith Report 1990:1)

Developers often argue in front of local planning boards that their proposed development will reduce local property taxes as a result of adding rateables to the local tax base, neglecting to mention what it will cost the community to provide services to that development. The fiscal impacts of a development must include an identification of costs as well as benefits. It should examine both the expenditure and revenue impacts associated with residential and non-residential development and attempt to project the net cash flow to the community. The secondary costs of development are often underplayed or overlooked as well. (Caputo 1979:2) A publication of the Nature Conservancy identifies the following as public costs associated with development:

-Educating children;

-Constructing and maintaining public facilities such as water and sewage facilities, solid waste disposal, and parks;

-Providing public services such as fire and police protection, health and welfare services;

-Constructing and maintaining roads, and parking facilities;

-Administering local government.

The Nature Conservancy (Conservancy) argues that development does not often pay its own way; the property tax does not cover what it costs a community to provide essential services. As an example, the Conservancy calculated the tax impact of 350 new homes built in a small rural community of 750 homes and found that the new development would increase taxes by $77.21 per household as a result of an increase in public capital investment for "more classrooms and water, sewage, trash disposal, fire and police stations, recreation as well as increased governmental services". (Caputo 1979:4)

Lyle Fitch, former chief administrator of the city of New York noted "There are cases where it will be financially advantageous to acquire land to preclude its residential development". He developed a formula for determining those instances which is as follows:

$$Ia = CS - (Lat + Lfi)/t;$$ where

Ia is the point at which the municipal costs of servicing development equaled generated tax revenues;

CS represents the costs of providing public services to the household;

La is any decrease in assessment resulting from the acquisition;

t represents the tax rate;

Lf is the cost of acquisition ; and

i represents the interest rate on borrowed money.

Fitch is also quoted as saying, "The township stands to gain by acquiring vacant lots or development rights thereto, rather than allowing them to be developed for residences whenever (1) the costs of supplying public services to the prospective new households exceeds (2) the amount of real estate sacrificed by foregoing private development of the lots, plus (3) interest on the cost to the township of acquiring the lots or development rights thereto". (Caputo 1979:37)

The above discussion does not imply that acquisition of open space won't raise taxes; any municipal expenditure must be covered by taxes. However, the research has concluded that acquisition often will result in a smaller property tax increase than development. In support of this, Charles Little studied an open space acquisition of 1,426 acres in Floyd Harbor, New York. The planners estimated that the land acquisition and preservation of it as open space would increase taxes from $14.33 per $100 valuation to $16.91; however, development would increase taxes to $21.64 per 100, an increase three times greater. (Caputo 1979: 27)

However, it is important to note that a fiscal impact analysis will not provide local decision makers with all of the information they may need when making land use decisions. Fiscal impact focuses on the financial consequences of change; it does not measure environmental, economic or social effects which are also very important considerations in evaluation of land use decisions.

3.1a. Fiscal Impact Analysis: Discussion of the Methods.

Residential Development:

A fiscal impact analysis, as discussed by Burchell, is defined as:

> "A projection of the direct, current, public costs and revenues associated with residential or nonresidential growth to the local jurisdiction(s) in which this growth is taking place."

A fiscal impact analysis projects on the primary costs that will be incurred and the immediate revenues that will be generated. Fiscal impact analysis examines current costs and revenues. It does not treat indirect impacts due to the difficulty in predicting the secondary impacts of growth and the possibility of double counting the primary and secondary impacts. It projects the financial effects of development by considering the costs and revenues if the development were completed today. Fiscal impact analysis is concerned with public (government) costs and revenues and is further concerned with the cost and revenue implications derived from population and/or employment change. Finally, costs are projected to only the local jurisdictions in which the population or employment change is taking place.

For the analysis of residential development versus open space preservation, the Service Standard Method of fiscal impact analysis is used. This method was chosen since it is assumed that residential development demands more services

than does preserved open space. Therefore, a relevant comparison may be made between the two land use categories. The Service Standard Method approach allows costs to be projected separately for each service such as police and schools. One weakness of this approach is that it relies on current costs and staffing patterns to project costs associated with future growth.

The Service Standard Method is an average costing method which uses averages of manpower and capital facility service level data, obtained from the U. S. Census of Governments, for municipalities and school districts of similar size and geographic location. This method determines the total number of additional employees by service function, (i.e. financial administration, general control, police, fire, highways, sewerage, sanitation, water supply, parks and recreation and libraries) that will be required as the result of the development. The existing local operation cost is projected for additional personnel adding local operating outlays (salary, statutory and equipment expenditures) per employee by service function. Projected capital expenditure is obtained through the use of capital-to-operating service ratios derived from Census Information, and applied to the existing total operation costs per employee.

A fundamental assumption of the Service Standard approach is that, over the long run, average existing service levels for both manpower and capital facilities of

comparable areas can be used to assign costs to future development. Another premise of the technique is that service levels for both manpower and capital facilities vary according to the community's population. A further assumption is that after population size, geographic location also affects public service levels. The basic steps involved in a Service Standard method are as follows:

1. Determine population and student increase resulting from growth;
2. Project number of public employees resulting from growth;
3. Calculate average operating expenses (salary, statutory and material costs) per employee;
4. Project total annual operating costs;
5. Project total annual capital costs;
6. Project total annual public costs;
7. Project total annual public revenues;
8. Calculate the cost-revenue surplus or deficit.

3.1b. Application of the fiscal impact analysis to the study area.

Residential Development:

In applying the fiscal impact analysis discussed above to the Town of Coventry, data regarding the property assessments and tax rates were obtained from the Tax Assessor's Office. Information on total revenue and expenses as well as specific budget line data was obtained from the Town's Adopted Working Budget for 1990-91 as well as the School District Budget. A copy of the relevant information obtained from these budgets is included in Appendix A of this document. It should be noted that the budget allocation for public works would be larger if

fire protection and water services were provided within the Town budget. Fire protection is provided by seven separate Fire and Lighting Districts within the Town. Each of these Fire and Lighting Districts raise their own revenue through separate real and personal property taxes and allocate their own expenses separately from the Town budget. Water services are provided by the Kent County Water Authority and are separate from the Town budget as well.

The Service Standard Method was applied using a hypothetical development which could have occupied 977 acres of land around Carbuncle Pond had it not been purchased by the RI Department of Environmental management Figure 2, located in the back of this document, is an aerial photograph blueprint reproduction of the Carbuncle Pond area. It was selected as an area for study to allow for a comparison between the costs of development and the costs of preservation. Since the property lies in a five-acre zoning district, a multiplier of .15 was used to determine the total subdivision yield. (Emilita 1969: Appendix 3) This multiplier would take into account the amount of land which would be developed with roads, drainage areas and parkland. The calculation determines that 147 house lots could have been developed on the 977 acre parcel. This would add 445 adults to the population using the average household size (3.03) based on the 1980 census information and 104 school age children also using the 1980 census information multiplier of .71 school age children per dwelling unit. A LOTUS spreadsheet

was used to perform steps outlined by Burchell and Listokin in "The Fiscal Impact Handbook". The following is a breakdown of these steps and the application of the method to the Town of Coventry. Tables 2-4 display the information from the LOTUS Spreadsheet analysis. Table 3 contains the computations which correlate to the Steps outlined below.

Step 1 - By using general multipliers for household size and school age children the population growth and increase in students was determined. The general multipliers for the Town of Coventry were obtained from 1980 census information: average household size 3.03 and school age children .71. These figures multiplied by the number of new dwelling units proposed provided the growth projections: 445 adults and 104 school age children.

Step 2 - Using service ratios for communities in the Northeast Region, (obtained from the Fiscal Impact Handbook) the incremental number of public employees resulting from the new development can be predicted.

Step 3 - The Town of Coventry's 1990-91 Annual Budget and the School District Budget was consulted to obtain a current breakdown of the employees and expenses for each service catagory. The total employees for each servcie category were then divided into the total expenses to determine the average operating expenses for each employee. See Table 2 for the display of this information.

Table 2: Operating Expenses per Employee

COSTS PER EMPLOYEE BY SERVICE FUNCTION

PUBLIC SERVICE FUNCTIONS	TOTAL SALARIES	TOTAL STATUTORY	TOTAL MATERIALS	TOTAL OPERATING	TOTAL EMPLOYEES	AVERAGE SALARY	AVERAGE STATUTORY	AVERAGE MATERIAL	AVERAGE OPERATING
MUNICIPAL									
FINANCIAL ADMIN.	388616	35861	3583	428060	15	25907.73	2390.73	238.87	28537.33
GENERAL CONTROL	650099	794990	12726	1457815	102	6373.52	7794.02	124.76	14292.30
PUBLIC SAFETY									
POLICE	2529880	137000	86575	2753455	61	41473.44	2245.90	1419.26	45138.61
GENERAL	482915	102922	20480	606317	29	16652.24	3549.03	706.21	20907.48
PUBLIC WORKS									
HIGHWAY	1142861	259469	864812	2267142	36	31746.14	7207.47	24022.56	62976.17
SANITATION	305270	377992	5512	688774	8	38158.75	47249.00	689.00	86096.75
RECREATION AND CULTURE									
PARKS AND RECREATION	517602	105989	31666	655257	44	11763.68	2408.84	719.68	14892.20
LIBRARIES	254241	18291	48127	320659	5	50848.20	3658.20	9625.40	64131.80
SCHOOL DISTRICT									
PRIMARY AND SECONDARY	12690807	4133941	3368282	20193030	344	36891.88	12017.27	9791.52	58700.67

Table 3: Projected Expenses of Proposed Development

DEVELOPMENT	STEP 1	STEP 1	STEP 2	STEP 2	STEP 3	STEP 4	STEP 5	STEP 5	STEP 6
	445 ADULT POPULATION	FINANCE	0.48	0.2832	28537	8081.678	0	0	8081.678
977 ACRES	104 SCHOOL AGE CHILDREN	GENERAL	0.59	0.3481	14292	4975.045	0	0	4975.045
5-ACRE ZONING		POLICE	2.33	1.3747	145138	199521.2	0.025	4988.030	204509.2
147 SINGLE-		GENERAL	1.88	1.1092	20907	23190.04	0.005	115.9502	23305.99
FAMILY DWELLINGS		HIGHWAYS	1.07	0.6313	62976	39756.74	0.161	6400.836	46157.58
		SANITATION	0.67	0.3953	86096	34033.74	0	0	34033.74
		RECREATION	0.75	0.4425	14892	6589.71	0.055	362.4340	6952.144
		LIBRARY	0.33	0.1947	64131	12486.30	0	0	12486.30
		SCHOOL	85	11.73	58700	688551	0.16	110168.1	798719.1
TOTAL									1139220

Step 4 - The average operating expenses for each worker obtained from Step 3 above is then multiplied by the total number of employees attributable to the growth.

Step 5 - The annual capital costs for each service category was obtained by multiplying the capital-to-operating expenditure ratios by the total annual operating costs. The capital-to-operating expenditures for the Town of Coventry were obtained from the 1972 U.S. Census for the Northeast region.

Step 6 - The annual public costs were then projected by adding the total annual operating expenses to the total annual capital expenses.

Step 7 - Again, utilizing the Town of Coventry's 1990-91 Annual Budget, as well as the School District Budget, information was obtained to project the total annual public revenues as a result of the development. The projected revenue took into account the increase in own-source revenues paid to the municipality as the primary source of revenue generated.

In an interview with Mr. Barry Yeaw, the Town's Financial Director, he stated that there is little, if any, non-educational State Aid expected by the Town for the 1990-91 fiscal year. Recent shortfalls in the State Revenues resulted in the reduction of non-educational state aid to municipalities during the fiscal year ending June 30, 1990. In a recent Providence Journal article it was reported that the DiPrete Administration withheld $23

million dollars in State Aid to communities in 1990. (Providence Journal, November 16, 1990: C3). The state provides operations assistance aid to each municipality and school district in the State, subject to annual appropriation. Mr. Yeaw explained the amount is calculated by a complex formula which is prescribed by the statues and equalized with other municipalities on the basis of assessed valuation. There is, however, a minimum guaranteed state assistance payment. Mr. Yeaw stated that, in preparing this calculation, the Town must submit a three-year forecast to the State which includes population, income, per pupil expenditures, net assessed valuation and projected revenues. It was his opinion that a development or incremental population increase would not directly or immediately impact the amount of non-educational State Aid received and therefore this was not included in the revenue calculations conducted for this fiscal impact analysis. The Town does not receive any other tax revenues from the State nor does it receive any Federal revenues. Therefore, the Town's own-source revenues such as permit and miscellaneous fees, real property and household personnel property taxes for automobiles, fines which could be attributable to the new development (i.e. violation of traffic, and building code ordinances) and interest earnings were the only revenues calculated.

The interest earnings for the Town were included since this is the largest single category of miscellaneous revenues: interest on investments. As population

increases, general revenues increase and more tax money is available for investment. The increase of investment on earnings atributable to growth was calculated as ratio based on the current proportion of interest on earnings and total assessed valuation of all properties in the Town. Table 4 displays the projected revenues for the Town as a result of the development.

Step 8 - The cost/revenue deficit was then calculated by comparing the projected total revenue attributable from the new development to the projected total costs.

3.1c. Findings

Residential Development:

The findings of the fiscal impact analysis reveal that the residential development would indeed cost the Town more from providing services than it would receive from the development. The proposed costs associated with the development total $1,139,216 while the proposed revenues associated with the growth would total only $367,118. This results in a fiscal tax loss to the Town of over $700,000. It is apparent that while preserved open space would not bring in any revenues to the Town, in turn, it would not require the services which residential development would demand. It is also likely to increase the value of the adjacent properties indirectly bringing added revenue to the Town.

Table 4: Projected Revenues from Proposed Development Alternative (Step 7)

MUNICIPAL	DOLLARS
1. Own Source Revenues	
A. Property Taxes	$105,132
B. Automotive Taxes	1,229
C. Interest Earnings	9,492
D. Fees	4,998
E. Fines	60
Total Own Source Revenues	$120,911
SCHOOL DISTRICT	
1. Own Source Revenues	
A. Property Taxes	$243,360
B. Automotive Taxes	2,847
Total Own Source Revenues	$246,207
Grand Total Revenues	$367,118

(It is noted that the Automotive Taxes were based on the assumption that there would be one automobile per dwelling with a value of $2,000. The Fees and Fines were calculated based on the assumption that the current amount received per dwelling and per capita would be the same for the new development. Interest Earnings were projected by computing the ratio of the current proportion of interest on earning and applying that figure to the proposed growth. However, as the population increases, and general revenues increase and there is more money available to invest. Therefore, the first step in this calculation involved adding the assessed value of the proposed development, minus the value of the assessment on the existing vacant land, to the current total assessment.)

3.1d. Fiscal Impact Analysis: Discussion of the Method: Open Space Acquisition:

To assess the tax impact of open space preservation, a formula devised by Darryl F. Caputo in his study "Open Space Pays" (1979) is utilized. This procedure is followed to calculate and compare the tax impacts of removing property from the tax rolls to preserve it as open space and the tax impacts of a residential development. To perform this method the following data, obtained from the Town of Coventry Tax Assessor's Office, was utilized:

1. Assessed value of property;
2. Town equalization ratio;
3. Town's total assessed net valuation taxable;
4. Town's assessed property tax rate;
5. Amount of acquisition cost to be raised locally in the first year;
6. Town's total property tax levied;

The procedure, which is relatively simple involves calculating the impact of lost revenue on the tax rate and then calculating the impact of the town's payment for acquisition on the tax rate. (A copy of this method is contained in Appendix B of this document.) A comparison is then made between the tax rate impact from the land preservation and the tax rate impact which would be

attributed to the growth which could occur if the property was developed rather than acquired for open space.

3.1e. Application of the fiscal impact analysis to the Study Area.

Open Space Acquisition:

In conducting the method discussed earlier outlined by Darryl F. Caputo, information from the Town's Tax Assessor was utilized to assess the tax impact of open space preservation versus the tax impact of development. Appendix C contains a copy of the data and information utilized from the Office of the Tax Assessor. For the purpose of comparison, the 977 acre land area described earlier was used as the basis for the assumptions surrounding this procedure. This acreage was actually purchased between 1986 and 1987 by the Rhode Island Department of Environmental Management for one million one hundred sixty one thousand three hundred sixty dollars ($1,161,360) and preserved as open space.

The calculations were based on the assumption that the State had not purchased this area and that the Town would have had to purchase it in order to guarantee its preservation. It was also assumed that the parcel would have had a total assessed value of $586,200 had it not been taken off the tax rolls since it would have met the criteria for the State's Farm, Forest, and Open Space tax program. This program allows the Town to assess the value

of open space lands at six hundred dollars ($600) per acre. Based on the purchase price of over one million dollars, another assumption was that the amount of acquisition cost to be raised locally for the first year totalled five hundred thousand dollars ($500,000).

Using the simple calculation method outlined by Caputo, the tax impact of residential development could be determined. Again, the 977 acre parcel with 145 house lots was selected as the development to be analyzed. The basic assumptions relating to the development were that the dwelling units would have three (3) bedrooms per unit (which is the average in the Town) and that the market value of each unit would be $124,820 (which was the average market value of residential units in the Town for 1988). The proposed market value of the total units was then multiplied by the assessment ratio of 97.5 to determine the assessed value.

The calculations breakdown the analysis into the impact on the school tax and the impact on the non-educational tax rate. The tax rate for the town of Coventry is $14.32 which is broken down into $10.00 for the school budget and $4.32 for the non-educational municipal budget. The annual per pupil expenditure is currently at $5,042. Expenditures for education historically receive the largest percentage of the tax revenues and are therefore viewed as the largest potential liability associated with growth. Figure 3, reprinted from the Town of Coventry's 1990-91 Budget,

Town of Coventry Expenditure History

Schools vs. Municipal

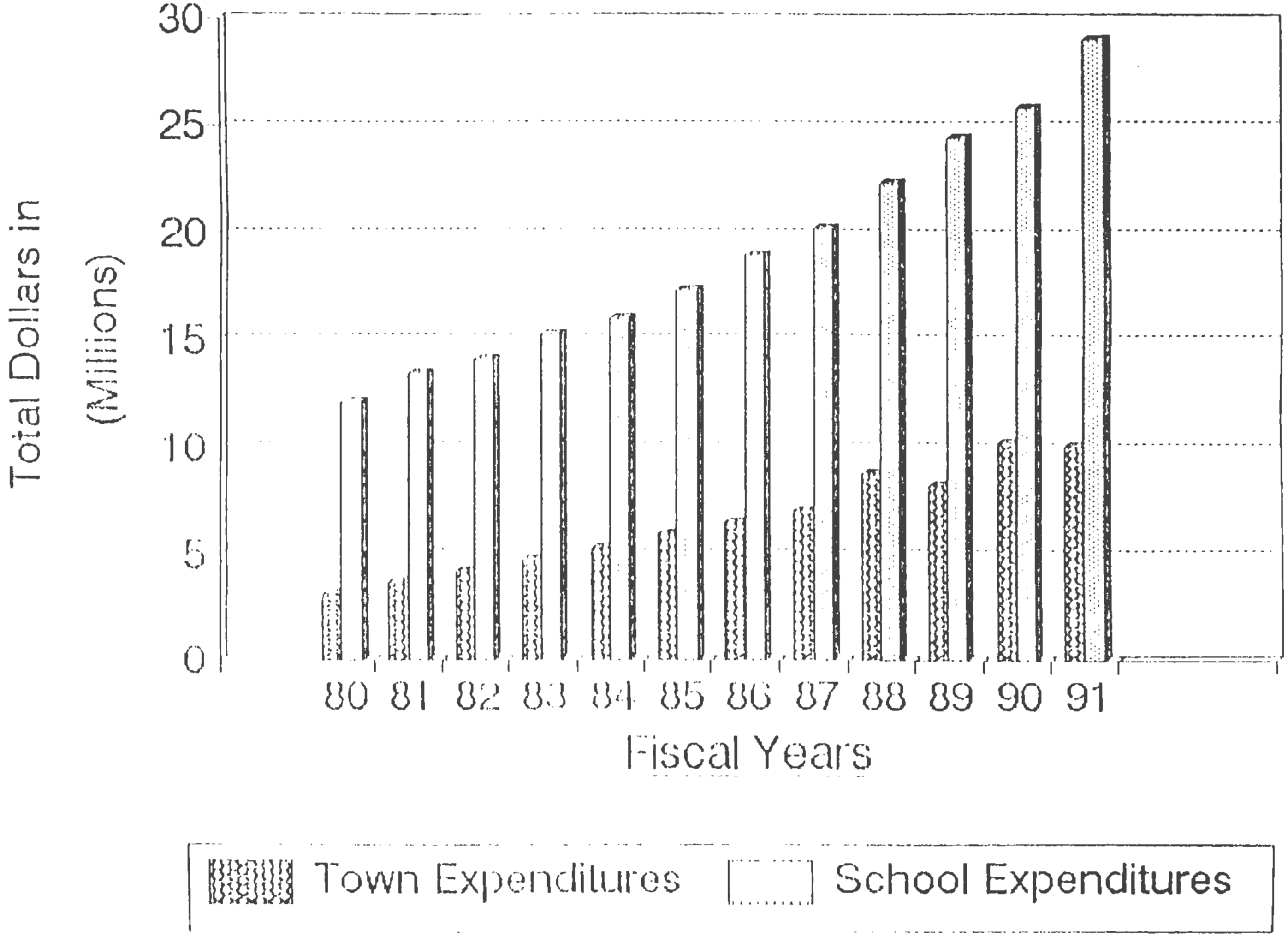


Figure 3

portrays the trends of school expenditure as compared to the municipal expenditure for the total tax dollar.

3.1f. Findings

Open Space Acquisition:

The findings of Caputo's method are contained in Appendix D of this document. They reveal that the increase in the Town's total tax rate from this development is .42/1000 while the increase in the tax rate from open space preservation is .33/1000. While this difference seems small, it should be noted that this is based on a five-acre zoning district which greatly reduces the number of building lots that could be developed. Other areas in Town, where the zoning is less restrictive would see a greater impact. As can be seen by the computations in Appendix D, of the .42/1000 increase as a result of the new growth, .24/1000 is as a result of the increase in school age children on the school district while .18/1000 is as a result of the non-educational expenses.

This supports the discussion earlier that while open space preservation does not reduce the tax rate, it results in a smaller increase in the tax rate than residential development. The increase in the tax rate as a result of the development would result in over a fifty dollar difference to taxpayers with an average residential home

for the year. The impact from the purchase of the open space however would result in only a forty dollars tax increase. While this may seem insignificant, additional development would continue to cost the Town money and add to the tax impact. The savings from the purchase of the open space would equal the purchase price over time.

It is also important to note in this case that the State actually purchased the open space which meant that the municipality did not have to spend its tax dollars and instead that money could be put to other uses and services for the Town residents. Therefore, the Town saved the tax rate increase which would have resulted from either residential development or the land acquisition if done with Town funds.

Summary

In summary, with the costs of providing services to such a development greatly exceeding the amount of projected revenues there would have been an annual loss to the Town of Coventry if the land was developed. Since the preserved open space does not require an increase in the Town services which the development would have, the Town saves money. In this case, since no Town funds were directly used in the purchase, the Town has even saved the money which would have been needed for preservation

The case for open space preservation based on the cost

versus revenue concept is not new. In a study by Charles Little, done in 1968, the acquisition of 80 acres in Gloster, New Jersey compared to a potential development of 160 homes which the zoning would have allowed was studied. With annual costs for the development projected at $156,000 and annual revenues determined to be only $100,900 a year there would have been an annual loss of $56,000 to be made up by increasing the communities tax rate. Based on an acquisition cost of $500,000, it was determined that the annual deficit of $56,000 to the community if the land were developed would equal the purchase price in ten years.

It is important to note, however, that in many areas, there is a legimate need for housing and often the need must be met even if rising tax rates result. However, there are areas better suited for housing and other areas better suited for open space. The purpose of this section is to inform local government decision makers of the tax implication of housing and open space in the hopes that more fully informed decisions will result. (Caputo 1979:2)

3.2. Windfalls to Property Adjacent to Preserved Open Space

Studies by Frederick Law Olmstead and George E. Kessler projected that their new parks and parkways would increase real estate value. They supported their projections with empirical research which was based on simple calculations of the increased tax revenues from the property surrounding the park areas. As statistical techniques became more sophisticated, multiple regression analysis was applied to add variables such as house types, house size and location to the calculation. By introducing these variables, which are not related to the open space, their influence on the adjacent property values could be determined. This would further support the projections that the parks and open space variables would be the catalysts for the increase in property values. (Fox 1990:2)

In 1974, Hammer, Coughlin and Horn examined how a 1,294 acre park "Pennypack Park" affected nearby real estate. A multiple regression analysis was used, to try to hold constant such variables as type of house, year of sale, and location. To measure, as precisely as possible, the value from Pennypack Park the study also considered such variables as whether or not a house was next to a retail area, major highway, or other large open space. The results of this research supported the findings of previous studies; the property value decreases the farther away it is from open space.

In 1973, a study of five parks in Columbus, Ohio by Weicker and Zerbst, found a decrease in the value of property across the street from heavily used parks developed for active recreation such as baseball and swimming. At the time of the study, these lots sold for an average of 7% less than property further away. However, property facing "passive" recreational areas sold for 7-23% more than property a block away from these areas. These findings of Weicker and Zerbst are interesting to note; particularly in terms of the expanded definition of "open space" which this research project emphasizes. Open space should include areas for passive recreation, however, this type of open space often receives the lowest priority in terms of municipal acquisition.

Further research on the subject by More and Allen in 1982 came to the same conclusion as that of Weicker and Zerbst. It appeared that there was a tendency for the property value benefit to be maximized by parks which emphasize natural open space as opposed to intense development for organized recreation. In fact, they report, it may well be that on-site recreation benefits are not compatible; as the level of use rises, the property value declines. (More and Allen 1982: 33)

3.2a. Multiple Regression Analysis: Discussion of the Method

A multiple regression analysis is any statistical analysis involving more than two independent variables to determine their influence on a dependent variable. (Grosof 1985: 271) This method is often used by social researchers to determine the relationship between variables. Two variables, "x" and "y", may be related to each other exactly or inexactly. The simplest relationship between an independent variable (i.e. the cause), labelled "x" and a dependent variable (i.e. the effect), labelled "y" is a straight line, expressed in the formula:

$$Y = a + bx,$$

where the values of the coefficients, a and b, determine respectively the precise height and steepness of the line.

With a multiple regression, more than one independent variable can be incorporated into the equation. This is useful for two reasons. First, it offers a fuller explanation of the dependent variable, since few effects are products of a single cause. Second, the effect of a particular independent variable is made more certain, for the possibility of causality from other independent variables is removed. The general multiple regression equation is written as follows where the dependent variable

is seen as a linear function of more than one independent variable:

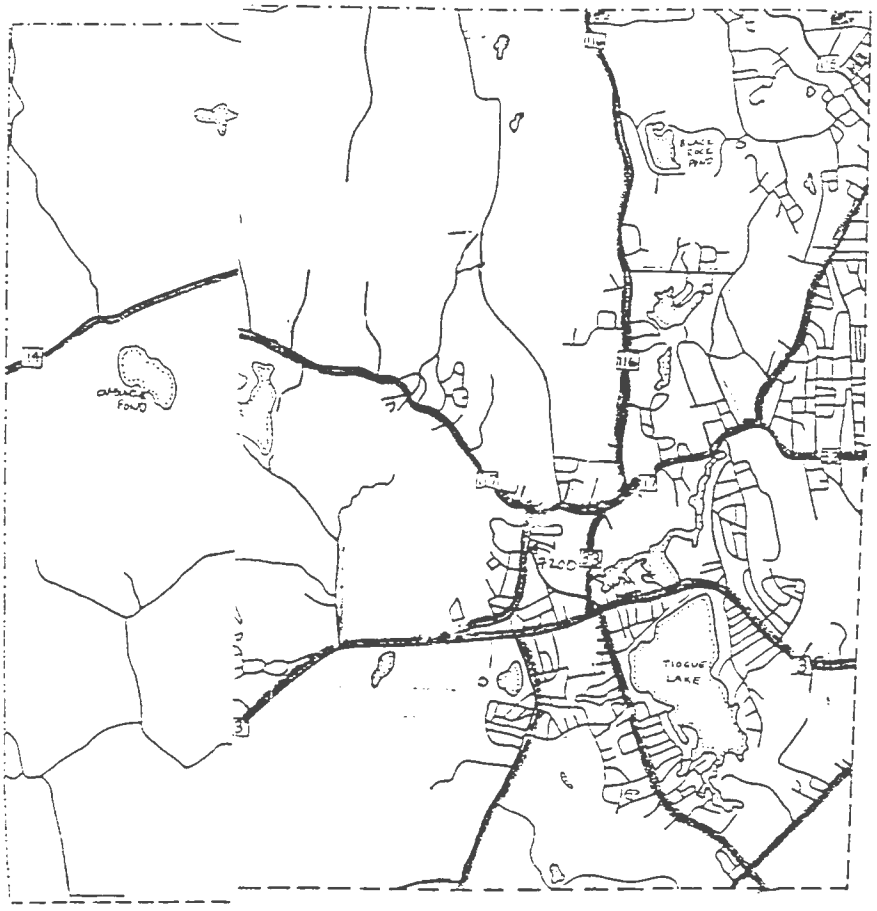
$$y = a_o + b_{1x1} + b_2x_2 + \ldots\ldots b_nx_n + e$$

Note: the subscript identifies the independent variables.

3.2b. Application of the method to the study area.

The multiple regression analysis discussed above was used to answer the question "What is the value of living next to open space?" The hypothesis tested for the case study community was "When proximity to open space, housing age, house size, number of bedrooms, acreage and type of house is controlled for, property values decline with distance from open space".

To examine the effect of preserved open space on property values, an area of woodland, known as Parker Woodland, totalling 329 acres purchased by the Audobon Society in 1981 was selected as the preserved open space. Figure 4, located in the back of this document, is an aerial reproduction indicating a portion of the Audobon Society land. The map of Coventry in Figure 5 indicates this area in relation to the rest of the Town. This open space area was selected for its size and its acquisition date. It was assumed, given the purchase date, that there would have been a number of housing units sold since that time for use as the data set.



MAP BY A. BELL

N

0 1mile

COVENTRY

FIGURE 5

First, the Assessor's Plat Maps were analyzed for those areas which would be within 1 1/2 miles of the open space area. Once the plats were established, the Assessor's Field Cards for each plat were reviewed. Information was obtained for each single-family residential property which was sold in the open market since 1981, the year the open space was purchased. All transfers of property between relatives and all other transfers which did not take place in an open market situation were not included in the sample. The sample size consisted of 85 residential properties that met this qualification.

Data was then collected for eight (8) variables as follows: the distance from the open space, the assessed value, the sales price of the property, the year the dwelling was built, the number of bedrooms, the square footage of the living area, the total lot size (in acres), type of house (i.e. cape cod, colonial, raised ranch, etc.) and the type of construction (i.e. shingle, siding, etc.). A computer printout of this data is contained in Appendix E of this document. It was noted that all of the dwellings with a small exception had shingled construction. Therefore, because this variable was not significantly different among the sample, it was not utilized for the analysis. The property sales price was determined by the value of the transfer tax stamps affixed to the deed of sale. This information was readily available since the

the Tax Assessor's Office included this data on the field card for each property. Due to the large number of raised ranch dwelling units, this variable was "dummy coded" to indicate those units which were raised ranch (Type = 1) and all others (Type = 0). The raised ranch housing types were coded one (1) due to the popularity of this style within the community study area. The selection of the variables was based on the availability of the data and a review of the literature. In the selection of the variables, the primary objective was to develop a model for testing the hypothesis which would account for a large amount of the variation in property. The types of variables which the literature indicated would do this were selected. (Schroeder 1982: 227)

The data were collected from the Tax Assessor's Field Cards for all of the variables except the distance from the open space. This variable was calculated from measurements on the Tax Assessor's Plat Maps. The housing units sampled were plotted on the map and their distance from the open space noted. For this measurement, a straight line distance was utilized.

The data were analyzed through the use of the multiple regression statistical technique with a new variable (NASSESED) as the dependent variable. Since the properties sampled sold in different years, there was a time series constraint which would distort the market price variable. A solution to this is to bring all of the market price

variables up to constant dollar amount. Given that the Town's assessment ratio is 97.5%, it is very close to the market value of the properties recently sold. Therefore, the assessment value was divided by .975 and used as the market price variable. As can be seen by the normality plot displayed in Figure 6 this variable was normally distributed (a majority of the "+" signs are covered) therefore no additional calculation was made to this variable.

The independent variables measured and their variable names are as follows:

DISOS	The distance from the open space
BEDROOMS	The number of bedrooms in the dwelling unit
AGE	The age of the dwelling unit
HOUSE	The square footage of the housing unit
TYPE	A dummy variable coded "1" for a raised ranch and "0" for all other house types
ACRES	The total lot acreage

The dependent variable measured was:

NASSESED	The assessed value divided by .975

Two forms of regression were used in the analysis a linear form and a squared form. The linear form is represented in the following equation:

$$NASSESED = b_{DISOS} + b_{BEDROOMS} + b_{AGE} + b_{HOUSE} + b_{TYPE} + b_{ACRES}$$

UNIVARIATE PROCEDURE

Variable=NASSESED

```
                         Normal Probability Plot
 475000+                                                              *
       |
       |
 325000+
       |                                                   +++*+*+++++
       |                                            +++++**+++***
 175000+                                   ***************
       |    * **************++
       |  +++++++++
  25000++*+++*
        +----+----+----+----+----+----+----+----+----+----+
             -2        -1        0         +1        +2
```

Figure 6

Several diagnostic tests were performed with the independent variables to "fit the model". Each variable was measured against the residual variable to determine if a quadratic term was needed. In this analysis, the variables for DISOS and BEDROOMS needed a quadratic term. Their plots were not scattered but rather had an apparent trend. Therefore, new variables were created for these variables by squaring them.

This is represented by the following formula:

$$NASSESED = b_{DISOS}^2 + b_{BEDROOMS}^2 + b_{AGE} + b_{HOUSE} + b_{TYPE} + b_{ACRES}$$

To increase the significance level of the findings, a "beta weight" statement was added to the analysis. This option produces a set of standardized regression coefficients. These coefficients labeled "Standardized Estimate" are the estimates obtained if all of the variables in the model were standardized to zero mean. Therefore, the measurements are not affected by the scales of measurement of each of the various independent variables. For example, in this case, there are variables measured as dollars, square feet and years which could not be easily compared without a standardized estimate since the values are relevant to the unit of measurement for each.

3.2c. Findings.

The results of the linear multiple regression analysis is outlined in Table 5. From this analysis it was determined that the distance from open space was directly related to the selling price variable. However, there is a positive relationship, that is for every percent increase in the distance from the open space, the price of a dwelling unit increases by eleven dollars.

In explaining significance, the p-value (Prob>|T|) column is reviewed. For this case, the significance probability is closest to zero for the square footage of the dwelling unit with a value of 0.0006. This indicates that there is a greater relationship between this variable and the market value of a dwelling unit than among the other variables. This is further revealed in the standardized estimate for house square footage which reads that for every percentage increase in the square footage of the dwelling unit, the market value increases by thirty-eight dollars.

Table 6 presents the analysis which was performed after the DISOS and BEDROOMS variables were squared. As can been seen by this table, there is little variation in the results with only a few points difference in the measurement of the variables. The most significant variable in explaining the market value is the square footage of the dwelling unit in this analysis as well.

Table 5: Linear Multiple Regression Analysis

Dependent Variable: NASSESED

ANALYSIS OF VARIANCE

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	58576199851	9762699975.2	4.122	0.0012
Error	76	180020406006	2368690750.0		
C Total	82	238596696848			

Root MSE	48669.19714	R-square	0.2455
Dep Mean	164820.52518	Adj R-sq	0.1859
C.V.	29.52860		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for HO: Parameter	Prob >|T|
Intercep	1	53022	30923.100069	1.715	0.0905
Disos	1	2.279437	2.13470187	1.068	0.2890
Bedrooms	1	4744.628512	5302.1623923	0.895	0.3737
Age	1	316.464381	228.38367628	1.386	0.1699
House	1	80.896437	22.64530044	3.572	0.0006
Type	1	-15066	11639.791359	-1.294	0.1995
Acres	1	-39.949459	264.34244661	-0.151	0.8803

Variable	DF	Standardized Estimate
Intercep	1	0.00000000
Disos	1	0.10984877
Bedrooms	1	0.09366629
Age	1	0.14505057
House	1	0.36148599
Type	1	-0.13592746
Acres	1	-0.01556148

Table 6: Multiple Regression Analysis: Squared Variables

Dependent Variable: NASSESED

ANALYSIS OF VARIANCE

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	58359212362	9726535393.7	4.101	0.0013
Error	76	180237484486	2371545848.5		
C Total	82	238596696848			

Root MSE	48698.51998	R-square	0.2446
Dep Mean	164820.52518	Adj R-sq	0.1850
C.V.	29.54639		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for HO: Parameter	Prob >|T|
Intercep	1	63671	27377.312158	2.326	0.0227
NDisos	1	0.000233	0.00022709	1.026	0.3083
NBrooms	1	675.028356	678.96164179	0.994	0.3233
Age	1	324.827507	227.67684667	1.427	0.1578
House	1	81.777866	22.63220565	3.613	0.0005
Type	1	-15770	11567.511173	-1.363	0.1768
Acres	1	-50.973690	263.39619649	-0.194	0.8471

Variable	DF	Standardized Estimate
Intercep	1	0.00000000
NDisos	1	0.10414796
NBrooms	1	0.10190646
Age	1	0.14888379
House	1	0.36542466
Type	1	-0.14228168
Acres	1	-0.01985574

It is noted that in both analyses, there is a relationship between the age of the dwelling unit and the market value that is not consistent with previous studies. Based on the results of the study by Weicker and Zerbst it is expected that the market value should tend to decline with the age of the house, but this is not the case in this research. Several different tests and other computations were conducted on the variables in an effort to obtain results consistent with Weicker and Zerbst's research. However, none of these proved to affect this value or make it significantly different from the result reported. It was assumed, therefore, that in this community an older home is considered more valuable. Many homebuyers are realizing the value of older homes, particularly historic dwellings. In this study, several of the homes used in the data set were over 50 years old.

Summary

The results of the multiple regression analysis did not prove the hypothesis that when location to open space, housing age, size, type, number of bedrooms, and lot acreage are controlled for, permanent open space increases the value of the adjacent property. Several explanations are offered for the finding that did not prove the hypothesis tested.

This study was conducted on land in Western Coventry where most of the surrounding area consists of large wooded lots. Therefore, the value, which other more urbanized areas would place on protected open space, is not prevalent in this case. With large lot zoning (two-acre and five-acre zoning) in place throughout most of this area as well, it is assumed that this further reduces the value placed on the protected land. The large lot zoning may provide certain values to the lot owner who feels as though he has his own "protected open space" in his backyard.

Other plausible explanations for this phenomenon were offered by a local realtor, Mr. John E. Peacock in an interview. It was his opinion that many people have become accustomed to the more urban environment. They associate certain negative values about the large wooded areas in the western portion of town. He gave for example, the abundance of wildlife in these areas which some homeowners see as a nuisance. He also explained that there were many open space lands in western Coventry which consisted of wetlands or swampy low areas. Development adjacent to these areas often involves costly septic and drainage systems which would tend to lower the value of the house lots.

The real estate market may also affect the results of this study. The market values may be a result of "buyer ignorance". In this case, a survey may provide more information on the amount of value placed on the proximity to the preserved open space. (Abelson 1979:192).

3.3 Open Space Preservation Techniques and Their Influence on Adjacent Property Values

To quote Robert Yaro, the former director of the Center for Rural Massachusetts, "Many New England towns think they have already protected their open spaces by adopting one-acre or two-acre zoning...what the Towns don't seem to be able to see in advance is that these zoning laws actually require them to suburbanize, because a town that has one house on each acre is a town that has open space but no openness." This is evident even more so in large lot zoning such as five-acre lot size. Land's consumptive requirements for large building lots, extensive road frontage, deep set-backs for structures and wide, paved roads with vertical, curbing have effectively prohibited development designed along more "neo-traditional" lines. At the same time, little or no requirement is made for the preservation of open space; some form of development is envisioned for all land in this process. Measures originally intended to preserve rural character and slow growth have merely dispersed development, while consuming a proportionally larger amount of farm, forest, and recreational land in this process. (Lacy 1990:2)

Recently, many planners and municipal officials are looking at the cluster development as a "neo-traditional" approach to the subdivision process. Mr. Randall Arendt, a researcher at the Center for Rural Massachusetts, has made several presentations throughout Rhode Island promoting the

benefits of cluster developments. The cluster development allows the same number of homes which would be constructed under a conventional development plan (typically single family detached) grouped more closely together on down-sized house lots, with the remaining area of the parcel left as permanently preserved open space. This undeveloped land, often 50% or more of the original parcel, is then either managed by the homeowner's association, deeded to the municipality, land trust, or retained by the original owner who has surrendered all of the development rights. In all cases, the homeowners have traded a larger house lot for the assurance that the adjacent open land will never be developed for commercial, residential, or industrial purposes.

The Town of Coventry permits such a cluster development under Article 13: Residential Cluster Development of the Town Zoning Ordinance. According to Section 1301, the tract of land proposed for a residential cluster development (RCD) shall have the minimal capacity for six dwelling units computed in accordance with Section 1302. Section 1302 requires that land unsuitable for development shall first be deducted from the tract proposed for development with the remainder divided by the minimum lot size for the applicable zoning district.

Among several concerns expressed by those in the real estate and development professions is that, because of smaller house lot size, cluster housing, even with

protected open space will not necessarily appeal to the average American home-buyer as an investment. Quite correctly, they associate the marketability of a newly constructed home with its resale value or market appreciation in the future. (Lacy 1990:3) A comparative approach looking at the appreciation rates for an older clustered housing development as compared to the rest of the Town developed with mostly conventional grid subdivisions is a method to assess the value of living next to permanently protected open space and in turn the cluster development alternative.

In August of 1990, this method was utilized by Jeff Lacy in his research for the Center for Rural Massachusetts. His research involved analyzing the percent change in appreciation for both a cluster subdivision and a conventional grid subdivision within the Town of Amherst, Massachusetts. His findings revealed that the cluster subdivision exceeded its conventional counterpart: the average purchase price of a dwelling unit in the cluster subdivision yielded a higher rate of return on the original investment that the conventional development. This is interesting to note since the higher value is in spite of the nearly 2:1 lot size difference.

A similar study by Lacy for the same research project compared the cluster subdivision with the rest of the Town. In this instance, the market appreciation was at a higher

percentage rate for the cluster than for the remainder of the Town for all but one year (1982). When the overall duration of the study was measured, the cumulative appreciation rate for the cluster was 167.9% (21% annually), while the Town's rate was 141.9% (18.4% annually). These data reveal an appreciation rate 26 points higher for the cluster development with protected open space than for residential properties with significantly larger private yards, but without the associated open space.

3.3a. Comparative Approach: Discussion of the Method

The method outlined by Jeff Lacy in his study discussed earlier was utilized for this research project. This comparative approach is a relatively simple method based on calculations of appreciation in market value for those dwelling units in a typical cluster development as compared with the appreciation in market value for dwelling units in a grid subdivision or for the rest of the Town. Appreciation is measured as the percent increase, not as an absolute dollar amount, in open-market selling price over the original sales price of a dwelling unit. Changes in cluster housing development are compared against those for conventional housing within the same time period.

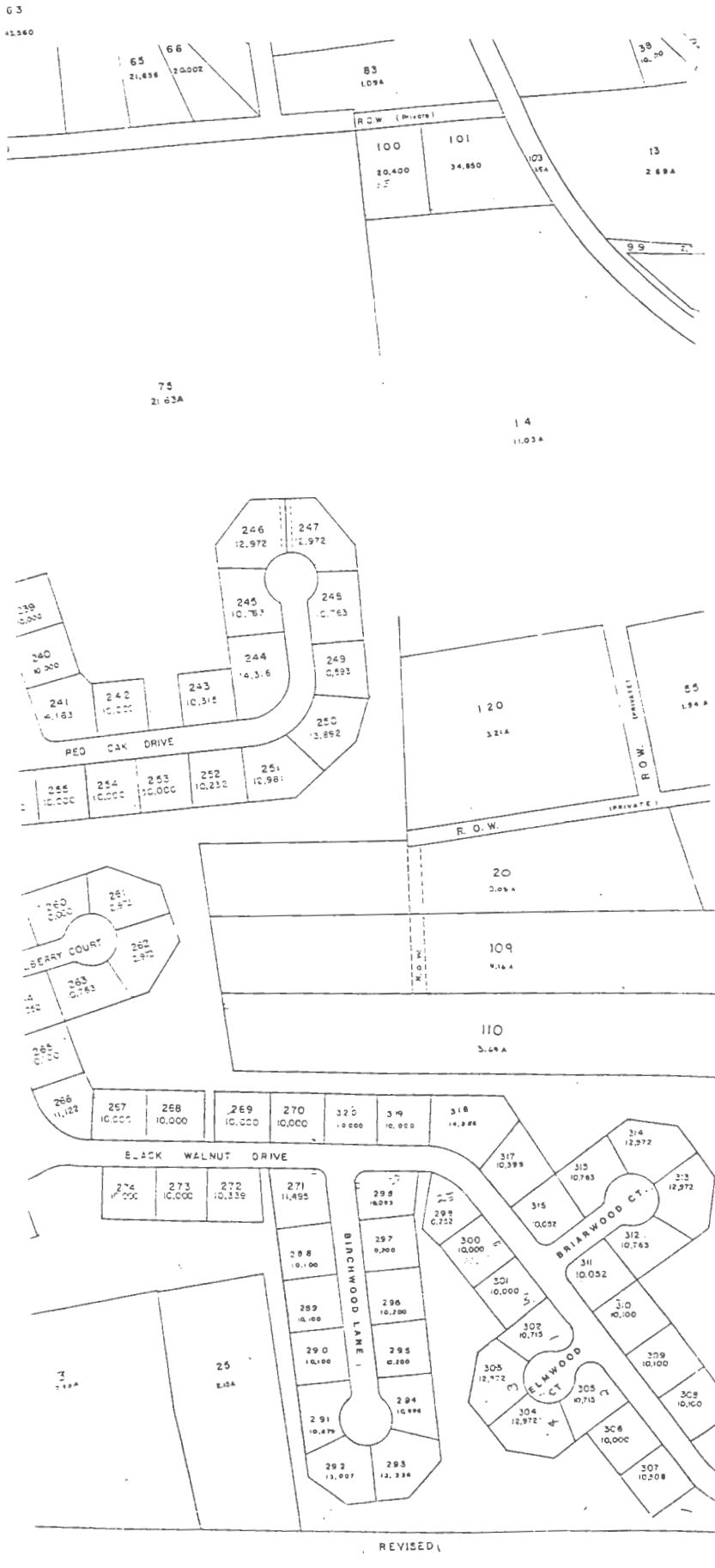
3.3b. Application of the Method to the Study Area

For the comparative approach method, the cluster development known as "Red Oak Estates" located in the Town of Coventry was the study area. This was the Town's first residential cluster subdivision developed in 1980. It consists of 160 lots with 46 acres of permanently preserved open space and an average lot size of 10,000 square feet. All of the lots within this subdivision front on the preserved open space area. Figure 7 is a reproduction from the Assessor's Plat map indicating this subdivision layout.

This cluster subdivision was selected for analysis due to the large number of lots as well as the year of the development. It was assumed that the number of lots would allow for a larger sample size, and the subdivision was developed long enough ago that several of the dwellings units may have sold more than once. This would also allow for a more significant comparison of the appreciation rates.

Information was obtained from the Assessor's Field Cards for each individual dwelling unit which had been sold as to the year and selling price. The selling price was derived from the total number of transfer stamps indicated on the deed. This data is available as it was noted earlier that the Assessor's office includes this information on the field cards for each property. Again, all transfers of property between relatives and other

Figure 7
Red Oak Estates Cluster Subdivision



transfers which did not take place in an open market situation were not included in the analysis. Sales data were collected from 1982 through 1986. The data was then statistically analyzed using a LOTUS spreadsheet program to determine the average for each year and the percent change over the total years.

The same statistical analysis was performed with town-wide data rather than information from any specific development. The Rhode Island Annual State Reports for the years 1983 through 1987 were utilized to determine the average sale price for one-family residential units in the Town of Coventry. Since their are only a few new cluster subdivisions in the Town, in addition to the Red Oak Estates development, this information was used as a comparable standard. To completely separate the data from the Red Oak Estates development, the sales figures and total number of units sold for a certain year were deleted from the Annual State Report figures. In this way, a new average was determined not including the Red Oak Estates figures. The average lot sizes within the remainder of the Town are considerably larger than those in the Red Oak Estates development. The Town has areas of half-acre, two-acre and five-acre zoning districts.

3.3c. Findings

The results of this analysis reveal that the dwelling units in Red Oak Estates Development did not appreciate at

a rate as high as the remainder of the Town with the exception of 1984 when the appreciation rate of Red Oak Estates was considerably higher.

Table 7 indicates the percent change in selling price from 1982 - 1987 and Figure 8 graphs this data.

TABLE 7: PERCENT CHANGE IN SELLING PRICE 1982 - 1986
"RED OAK ESTATES CLUSTER AND TOWN OF COVENTRY"

YEAR	AVERAGE CLUSTER SELLING PRICE	% CHANGE	AVERAGE TOWN SELLING PRICE	% CHANGE
1982	$48,833		$48,776	
1983	50,239	2.88	52,295	7.00
1984	57,426	14.31	55,431	6.00
1985	65,077	13.32	65,215	17.65
1986	77,486	19.07	79,785	22.34
TOTAL		58.68		63.24

The percent increase in the market value for the Red Oak Estates development between 1983 and 1984 was 14.3% with the remainder of the Town only seeing a 6% increase in market value: an over 7% difference. This may be due to the fact that the Red Oak Estates development had more dwelling units sold in 1984 than in any other year. It should be noted, however, that the incremental percent increase in market value as well as the overall percent increase between 1982 to 1986 for the Red Oak Estates cluster development was comparable to that for the Town. The percentage rate for Red Oak Estates is four percent and three percent below that of the Town for 1985 and 1986 respectively.

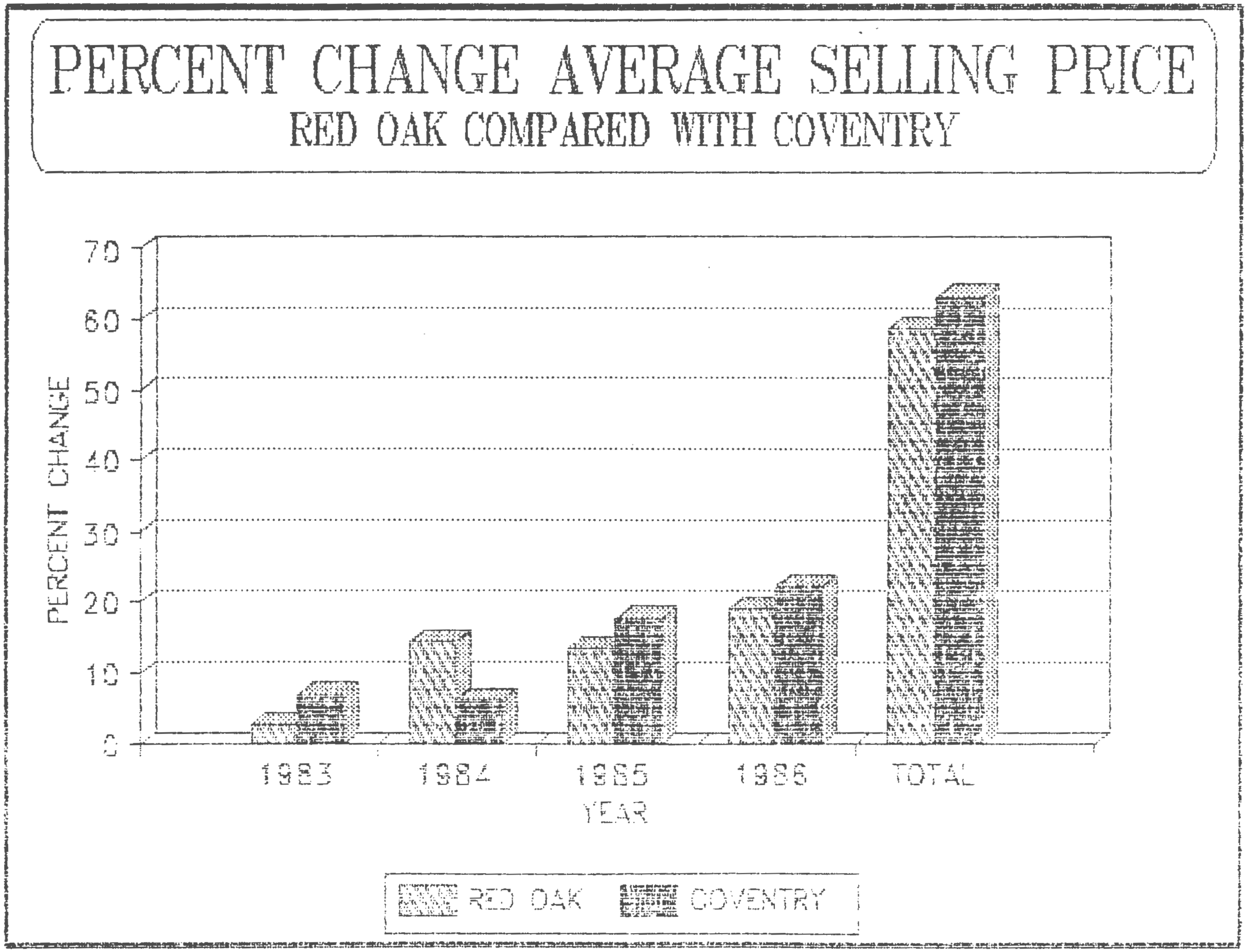

PERCENT CHANGE AVERAGE SELLING PRICE
RED OAK COMPARED WITH COVENTRY
PERCENT CHANGE
0
10
20
30
40
50
60
70
1983
1984
1985
1986
TOTAL
YEAR
RED OAK
COVENTRY

Figure 8

For the total percent change from 1982 to 1986, the Red Oak Estates subdivision is 5% below that of the Town.

Summary

There are several reasons why the appreciation rate has increased at a lower percent for the Red Oak Estates Development than the Town. One explanation may be that the housing is relatively new; that is, most of the sales were reflecting the original sale of the builder. Builders' prices are to some extent "administered" prices rather than "market" prices. Typically, a builder will charge a standard price for a given house model. (Hammer, Coughlin and Horn 1974: 275) The study may indicate that the builder generally doesn't take into account the fact that the development is tied in with preserved open space.

Another explanation may be that the Town as a whole experienced such increased growth during the period of the 1980's that the Town's total sales are much higher than normal. Therefore, even though the Red Oak Estates sales increased at a high percent, they still did not exceed the Town's increased appreciation rate brought on by the increase in growth.

A third reason may be that because there is already such a large percentage of protected open space in the Town it is not viewed as a limited resource. That is to say

the population may not value the preserved open space of a cluster subdivision enough to sacrifice the lot size which they could obtain elsewhere in the Town.

It was also noted, in conducting this study that the proximity to open space within a cluster does not relate to the market value. This is due to the fact that each lot within a cluster owns a percentage of the open space based on the total number of lots in the development. For example, in a cluster development with 10 lots, each lot owner would also own 1/10 of the open space through the homeowners association.

C H A P T E R F O U R

ANALYSIS OF FINDINGS

The research methods discussed in this paper were intended to measure the externalities generated by preserved open space in order to determine whether it is fiscally prudent for municipalities to invest in this preservation effort. While the fiscal impact analysis was the only empirical work which supported this theory, the other analyses revealed findings which are directly a result of the study area. The Town of Coventry is a community with unique characteristics such as the amount of preserved open space in the Town, the large lot zoning districts, and the overall size of the municipality. This study finds that the fiscal impact of open space preservation is more complicated than the previous studies suggest.

It is the opinion of the researcher that the results of this study could not be generally applied to other areas, with perhaps the exception of the fiscal impact analysis. It is assumed that the fiscal impact analysis would generally indicate that residential development demands more in services than it pays in revenues, given the knowledge of the service to revenue ratios for residential development in other towns. However, the multiple regression analysis and comparative approach methods

utilized have provided results which could not be generally applied to other areas of the State.

It is evident from the multiple regression analysis that the open space in western Coventry does not provide a greater increase in the value of the adjacent property. This may be explained by the Town's rural character and large amount of preserved open space, as well as some negative aspects associated with it. The adjacent properties do not reflect the value of this resource which may occur in smaller, more populated communities. Perhaps an analysis of an open space parcel and the adjacent land values in the eastern portion of the Town would better prove the hypothesis.

It is also important to note that there are other externalities which have not been tested in this research. These include the benefits received from the open space by those who pass by it even though they may not live near it. Open space creates external benefits such as viewsheds and water recharge areas which are important for the entire community even those who don't live immediately adjacent to it.

An additional externality not studied in this research, but none the less important, is the economic benefits which preserved open space brings to a community. In many areas of the State the openness and rural character brings with it increased revenues to the local economy through tourism. This is particularly important in areas which

rely heavily on tourism and a seasonal economy for their economic growth and development. While Coventry has some second homes and seasonal tourists, there is not the reliance on this sector for the local economy as there is with towns that have a heavy tourist-based economy such as Block Island.

C H A P T E R F I V E

CONCLUSIONS AND POLICY IMPLICATIONS

As towns throughout Rhode Island deal with growth management questions, consideration must be given to the amount of preserved open space in relation to the amount of development. As noted earlier, there has been a considerable amount of prior research conducted which concludes that preserved open space and parkland increase the value of the adjacent land. However, these studies have been applied in more urban areas.

Application of these methods to the Town of Coventry did not yield the same findings. Apparently, where open space is more abundant, it is taken for granted. However, this is not to say that preserved open space is not important in towns that are still rural. Rural areas have more opportunities and the land available for preservation efforts. As this land becomes scarcer elsewhere, perhaps the trend in Coventry may change. It would be interesting to conduct another study of this area in the future to see if the values of land adjacent to preserved open space change.

The Town's remaining open space is a valuable resource and provide the public qualities which cannot be met by the private marketplace; such as wildlife habitats and scenic vistas. It also makes up a large part of the Town's

environmentally sensitive land including wetlands. The failure of the private market system to serve the public interest and provide protection to these lands justifies governmental intervention in open space protection. The primary benefits of open space preservation also include flood protection, water recharge and supply. As past research has revealed secondary benefits are also gained such as the increased value of the adjacent property providing additional fiscal and economic support to the Town.

In light of this, it must be realized that not all open space needs to have recreational facilities. Open space can include trails, drainage areas, wetlands, forests, floodplains, tidal areas, steep slopes, vacant lots, and passive open space within subdivisions as well as the traditional recreational areas such as parks, and ball fields.

The Town of Coventry's current goal to provide a comprehensive open space and recreation plan for the community will be achieved in part through the objective of an open space procurement program. This program is proposed to include State and Federal Assistance as well as non-governmental entities such as land trusts. To insure continued funding for open space it is important that towns continue to work in cooperation with land trusts and agencies like the Nature Conservancy and Audobon Society to meet their open space preservation goals. By utilizing some private funds or non-profit agencies, towns can

achieve the benefits of open space preservation and conservation without using their own resources; further enhancing the fiscal benefits preservation brings. Public education on the choices between development and open space is also necessary or referendums for open space bonds face the possibility of being voted down as was recently done in several States, including California and New York.

To conclude, it is hoped that the research conducted and presented here will enlighten decision makers and provide thought for land conservation. As local communities are faced with dwindling financial resources and budgetary constraints, it is becoming increasingly important to further analyze and justify open space conservation decisions. This research indicates that secondary issues such as the fiscal and economic consequences of policy decisions should not be overlooked.

In closing, the following statement made by Mr. Donald Harris of the Seattle Department of Parks and Recreation is one which planners and local decision makers should keep in mind when deciding on open space policies: (Henderson 1990: 1)

> "Consider what it was like when you grew up. Most of you probably had many vacant lots or undeveloped areas for play and adventure. And consider, if we do not act to preserve open space now, what it may be like growing up or growing old in the future."

BIBLIOGRAPHY

B I B L I O G R A P H Y

_____. 1989. Appraising Easements: Guidelines for Valuation of Historic Preservation and Land Conservation Easements. Washington D.C.: National Trust for Historic Preservation.

_____. 1989. Cost of Community Services Study: Towns of Beekman and Northeast Dutchess County, NY. Dutchess County: Cornell Cooperative Extension and American Farmland Trust.

_____. 1990. Northeast Farmland Update: Studies Show Fiscal Benefits of Farms. Massachusetts: American Farmland Trust.

_____. 1989. Conservation Restrictions on Cape Cod: A Tool to Protect Land Privately. Barnstable: The Compact of Cape Cod Conservation Trusts, Inc.

_____. 1986. Fiscal Impacts of Major Land Uses in the Town of Hebron, Connecticut. Massachusetts: American Farmland Trust.

_____. 1990. The Griffith Report.

Allagash Environmental Institute. 1977. The Comparative Economics of Residential Development and Open Space Conservation. Center for Research of Advanced Study. University of Maine, Portland: Gorham Maine.

Baumol, William J and Wallace E. Oates. 1979. Economics, Environmental Policy, and the Quality of Life. New Jersey Prentice Hall, Inc.

Beaton, W. Patrick. 1985. Municipal Expenditures, Revenues, and Services: Economic Models and Their Use by Planners. New Brunswick: Center for Urban Policy Research.

Burchell, Robert W., David Listokin, and William R. Dolphin. 1985. The New Practioner's Guide to Fiscal Impact Analysis. New Brunswick: Center for Urban Policy Research.

Burchell, Robert W., and David Listokin. 1978. The Fiscal Impact Handbook: Estimating Local Costs and Revenues of Land Development. New Brunswick: Center for Urban Policy Research.

Caputo, Darryl F. 1979. Open Space Pays: The Socioenvironomics of Open Space Preservation. The New Jersey Conservation Foundation.

Carpenter, Mary Anne L. 1988. Open space Evaluation and Preservation. University of Rhode Island: an unpublished research project in partial fulfillment of the requirements for the degree of Master of Community Planning and Area Development.

Carr, James H. 1984. Crises and Constraint in Municipal Finance: Local Fiscal Prospects in a Period of Uncertainty. Rutgers: The State University of New Jersey.

Correll, Mark R., Jane H. Lillydahl and Larry D. Singell. The Effects of Greenbelts on Residential Property. Land Economics 54(1978): 204:217.

Dasmann, Raymond F., John P. Milton and Peter H. Freeman. 1974. Ecological Principles for Economic Development. London: Wiley.

Didato, Barry. 1990. The Paths Less Traveled: A Wrapup on the Nation's Greenways. Planning (APA) 56,1 (January): 10.

diPretoro, John E. 1973. Open Space Preservation in Rhode Island. University of Rhode Island: an unpublished research project in partial fulfillment of the requirements for the degree of Master of Community Planning and Area Development.

Elfring, Chris. 1989. Preserving Land Through Local Land Trusts: How Small Groups Have Saved More Than 2 Million Acres of Open Space. Bioscience 39 (February): 71-74.

Emilita, David. 1969. Suburban Commercial Overzoning: Suffolk County, NY. University of Rhode Island: an unpublished Master's Thesis in partial fulfillment of the requirements for the degree Master of Community Planning and Area Development.

Fox, Tom. 1990. Urban Open Space: An Investment that Pays. New York: The Neighborhood Open Space Coalition.

Gallion, Arthur; Eisner, Simon. 1986. The Urban Pattern: City and Urban Planning. Van Nostrand: Reinhold, NY.

Grosof, Miriam Shapior; Hyuman Sardy. 1984. A Research Primer for the Social and Behavioral Scineces. Academic Press: Orlando, Florida.

Hammer, Thomas R; Coughlin, Robert E.; Horn, Edward T. IV. Research Report: The Effect of a Large Park on Real Estate Value. Journal of the American Institute of Planners. July 1974.

Henderson, Harold. 1990. Open Space: How to Get it and Keep it. Planning (APA) 4 (November): 4-9.

Kitchen, J. W. Land Values Adjacent to an Urban Neighborhood Park. Land Economics 43 (3 1967): 357-360.

Knack, Ruth Eckdish. 1990. Selling Cluster. Planning (APA) 4 (September): 4-10.

Lacy, Jeff. 1990. An Examination of Market Apprecation for Clustered Housing with Permanently Protected Open Space. A Master's Thesis in Partial Fulfillment of the Graduate Degree Requirements in Regional Planning at the University of Massachusetts, Amherst, MA.

Land Design Research Inc. 1976. Cost Effective Site Planning. National Association of Home Builders.

Lewis-Beck, Michael S. 1982. Applied Regression: an Introduction. Sage University Papers: 22.

Listokin, David. 1982. Landmarks Perservation and the Property Tax. Rutgers: The State University of New Jersey.

Little, Charles E. 1968. Challenge of the Land. Open Space Action Institute, Inc.

McHarg, Ian L. 1971. Design with nature. New York: Doubleday.

Manheim, Patt and Timothy J. Tyrell. 1986. The Social and Economic Impacts of Tourism on Block Island: A Case Study. University of Rhode Island: Marine Technical Report No. 89.

Mazour, Leonard P. Converted Railroad Trails: The Impact on Adacent Property. Master's Thesis, Kansas State University, Manhattan, 1988.

More, Thomas, Thomas Stevens and P. Allen. The Economics of Urban Parks: A Benefit/Cost Analysis. Parks and Recreation (August 1982): 31-33

Muller, Thomas. 1976. Economic Impacts of Land Development: Employment, Housing and Property Values. Washington, D.C.: The Urban Institute.

Muller, Thomas. 1975. Fiscal Impacts of Land Development: A Critique of Methods and Review of Issues. Washington, D.C.: The Urban Institute.

Muller, Thomas and Grace Dawson. 1972. The Fiscal Impact of Residential and Commercial Development: A Case Study. Washington, D.C.: The Urban Institute.

Robinson, Mark H. 1990. Strategy for a Town Conservation Program. Barnstable: The Compact of Cape Cod Conservation Trusts, Inc.

Schaenmann, Philip S. and Thomas Muller. 1974. Measuring Impacts of Land Development: An Initial Approach. Washington, D.C.: The Urban Institute.

Schroeder, T.D. The Relationship of Local Public Park and Recreation Services to Residential Property Values. Journal of Leisure Research 14 (1982)223:234.

Shropshire, N.I. Toward Quantitative Measures of Open Space Value in Urbanized Regions (Draft). New Haven: Yale University Institute for Social and Policy Studies, August 1974.

Steinlieb, George et. al. Housing Development and Municipal Costs. Center for Urban Policy Research. Rutgers University. The Institute for Community Economics. 1982. The Community Land Trust Handbook. Pennsylvania: Rodale Press.

Tietenberg, Tom. 1988. Environmental and Natural Resource Economics. Glenview, Il: Scott, Foresman and Company.

Trudeau, Richard. Citizens Get a High Return on Their Tax Investment. Parks and Recreation (September 1978).

Weicker, John C. and Robert H. Zerbst. The Externalities of Neighborhood Parks: An Empirical Investigation. Land Economics 49 (February 1973): 99-105.

Winter, Steve. Steady Increase in RI Property Taxes Reported. Providence Journal. November 16, 1990:C-3.

Zube, Ervin H. Scenery as a Natural Resource: Implication of Public Policy and Problems of Definition, Description and Evaluation. Landscape Architecture. January 1973.

Zube, Ervin H. Rating Everyday Rural Landscapes of the Northeastern U.S. Landscape Architecture. July 1973.

APPENDIX A

TOWN BUDGET INFORMATION

Town of Coventry

BUDGET SUMMARY

	Budget 1988/89	Actual 1988/89	Budget 1989/90	(Preliminary) Actual 1989/90	Budget 1990/91
Taxes-Current	$15,261,666	$15,982,235	$17,186,112	$17,186,112	$20,667,303
Taxes-Prior Year	745,500	656,053	750,000	700,000	700,000
State Aid	985,999	960,391	1,040,312	825,312	287,333
State Aid-Operating Transfer	213,941	213,941	0	0	0
Town Revenues	1,029,242	1,419,995	1,081,180	1,275,355	1,208,000
State Aid to Education	10,890,802	10,926,765	11,979,019	11,979,019	13,063,532
School Revenues	1,604,887	2,370,085	1,730,911	1,811,137	1,680,229
State Aid to School Housing	220,922	220,708	220,708	220,708	475,240
Fund Balance Allocated	875,000	875,000	1,000,000	1,000,000	1,000,000
Financed Borrowing	419,000	375,785	1,066,000	0	0
Bonded	1,368,000	0	0	0	0
TOTAL REVENUES	33,614,959	34,000,958	36,054,242	34,997,643	39,081,637
Municipal Government	7,874,740	7,634,470	8,356,299	8,271,824	9,235,800
School Department	22,669,994	23,527,616	24,860,532	24,860,532	27,393,504
School Housing Debt	773,875	773,875	736,375	515,667	1,470,125
Municipal Dept	0	0	157,411	157,411	301,051
Capital Improvement:					
Municipal Government	2,111,250	471,617	1,730,025	544,525	531,157
School Department	185,100	105,202	213,600	213,600	150,000
TOTAL EXPENDITURES	33,614,959	32,512,780	36,054,242	34,563,559	39,081,637

Comparative Statement of Revenues and Fund Balance

	Actual 1988/89	Budget 1989/90	Estimated 1989/90	Proposed 1990/91	Approved 1990/91
MUNICIPAL GOVERNMENT					
Real Estate Taxes Current	2,232,962	2,722,360	3,521,767	4,549,615	4,549,615
Prior Year Taxes	656,053	750,000	700,000	700,000	700,000
Auto Excise Tax	2,512,665	1,881,947	1,082,540	1,397,102	1,397,102
Interest & Penalties	274,090	280,000	280,000	280,000	280,000
Interest Sewer Bond	50,000	0	35,000	0	0
Interest - Roof Bond	37,795	0	0	0	0
Total Taxes	5,763,565	5,634,307	5,619,307	6,926,717	6,926,717
Building Permits	131,657	85,000	85,000	85,000	85,000
Plumbing & Heating	11,034	7,300	8,400	8,000	8,000
Electrical Permits	9,410	5,580	7,100	6,000	6,000
Recording Fees	93,273	75,000	100,000	110,000	110,000
Probate Fees	17,982	14,000	18,000	20,000	20,000
Marriage Licenses	1,316	1,600	1,000	1,600	1,600
Dog Licenses	8,313	8,600	8,600	8,600	8,600
Animal Rescue Fees	36,440	35,000	35,000	40,000	40,000
Realty Fees	42,585	33,000	35,000	35,000	35,000
Alcoholic Bev License	18,705	19,000	18,900	27,000	27,000
Hunt & Fishing License	23	100	100	100	100
Planning Commission	0	0	7,000	8,500	8,500
Planning Com. Recreation Fees	0	0	0	30,000	30,000
Planning Com. Inspection Fees	0	0	0	25,000	25,000
Mis License Fees	39,692	47,000	47,000	45,000	45,000
TOTAL LICENSES & FEES	410,930	331,180	371,100	449,800	449,800
Municipal Court	10,137	10,000	5,000	10,000	10,000
Payment in Lieu of Taxes	18,191	20,000	20,055	18,200	18,200
Interest in Investment	537,313	380,000	490,000	380,000	380,000
Miscellaneous Receipts	81,539	60,000	74,200	70,000	70,000
Total Miscellaneous	647,180	470,000	589,255	478,200	478,200
Telephone Tax	288,820	309,492	309,492	264,471	264,471
State Aid General	623,310	683,200	495,200	0	0
State Aid - Operating Transfer	213,941	0	0	0	0
Highway Aid	27,643	27,000	0	0	0
Library Grant	20,618	20,620	20,620	22,862	22,862
TOTAL STATE AID & GRANTS	1,174,332	1,040,312	825,312	287,333	287,333
TOTAL REVENUES	7,996,007	7,475,799	7,404,974	8,142,050	8,142,050
SCHOOL DEPARTMENT					
State Aid to Education	10,926,765	11,979,019	11,979,019	13,063,532	13,063,532
School Revenues	690,344	645,416	725,642	554,326	554,326
Restricted Revenues	1,679,741	1,085,495	1,085,495	1,125,903	1,125,903
Taxes Operational	10,174,305	11,150,602	11,150,602	12,649,743	12,649,743
Capitial Schools Taxes	185,100	213,600	213,600	150,000	150,000
TOTAL SCHOOL DEPARTMENT	23,656,255	25,074,132	25,154,358	27,543,504	27,543,504

APPENDIX B

CAPUTO FISCAL IMPACT METHOD

The Tax Impact of Open Space Preservation

This section presents a procedure to follow to calculate the tax impacts of removing property from the tax rolls and of acquiring the property for open space. To determine these impacts the following information is required:

1. Assessed value of property.
2. County equalization ratio.
3. Total assessed net valuation taxable.
4. Town's assessed property tax rate.
5. Amount of acquisition cost to be raised locally in first year.
6. Total property tax levied.

(40)

The procedure is as follows:

Part 1: Calculate impact of lost revenue on the tax rate:

A. Calculate new total assessed net valuation taxable:
new valuation = total assessed net valuation taxable - assessed value of property

B. Calculate new tax rate:

$$\text{new tax rate} = \frac{\text{total property tax levied}}{\text{new total assessed net valuation taxable}}$$

C. Calculate the impact of lost revenue on the tax rate:
impact = new tax rate - old tax rate

Part 2: Calculate impact of town acquisition on the tax rate:

A. Calculate amount of acquisition cost to be raised locally in the first year:
cost = down payment on property + principal + interest on borrowed money.

B. Calculate total budget to be raised locally in first year of acquisition:
total budget = amount of acquisition cost to be raised in first year + total property tax levied

C. Calculate new tax rate:

$$\text{new rate} = \frac{\text{total budget}}{\text{new total assessed net valuation taxable}}$$

D. Calculate impact of acquisition on tax rate:
impact = new tax rate - old tax rate

Procedure for Calculating Tax Impact of Development

Part 1: Calculate annual school cost per development:

A. school-age children population =

$$\frac{\text{school-age children multiplier}}{\text{bedroom unit}} \times \frac{\text{the number of bedroom units}}{\text{development}}$$

B. annual school cost =

$$\frac{\text{school-age children population}}{\text{development}} \times \frac{\text{school property tax levied}}{\text{school-age child}}$$

Part 2: Calculate impact on the school tax rate:

A. new school tax rate =

$$\frac{\text{annual school cost + the school property tax levied}}{\text{total assessed net valuation + assessed valuation of the development}}$$

B. impact on the school tax rate = new school tax rate - old school tax rate

Part 3: Calculate annual school revenue generated per development:

Annual school revenue generated = assessed valuation of the development X new assessed school tax rate

Part 4: Calculate net annual school cost or benefit per development:*

net annual school cost or benefit =

$$\frac{\text{average annual school cost}}{\text{development}} - \frac{\text{average school revenue generated}}{\text{development}}$$

Part 5: Calculate annual non-educational service cost per development:

A. $\frac{\text{total population}}{\text{development}} = \frac{\text{total household size}}{\text{bedroom unit}} \times \frac{\text{number of bedroom units}}{\text{development}}$

B. non-educational service cost = $\frac{\text{total population}}{\text{development}} \times \left(\frac{\text{municipal property tax}}{\text{person}} + \frac{\text{county property tax}}{\text{person}} + \frac{\text{deductions property tax}}{\text{number of persons}} \right)$

Part 6: Calculate impact on the non-educational assessed tax rate:

A. new non-educational tax rate =

$$\frac{\text{annual non-educational cost + total non-educational property tax levied}}{\text{total assessed net valuation + assessed valuation of the development}}$$

B. impact on the non-educational tax rate =

new non-educational tax rate - old non-educational tax rate

Part 7: Calculate annual non-educational revenue per development:

annual non-educational revenue generated =

assessed valuation of the development X new municipal assessed non-educational property tax rate

Part 8: Calculate annual non-educational cost or benefit per development:

$$\frac{\text{net annual non-educational cost or benefit}}{\text{development}} =$$

$$\frac{\text{non-educational cost}}{\text{development}} - \frac{\text{non-educational revenue generated}}{\text{development}}$$

* Positive figure implies cost, negative figure implies benefit.

Part 9: Calculate new total tax rate:

new total tax rate = old tax rate + school tax rate impact + non-educational tax rate impact

Part 10: Calculate total tax rate impact:

total tax rate impact = school tax rate impact + non-educational tax rate impact

Part 11: Calculate the increase in taxes an individual owner of an average-value home would have to pay:

increase in taxes = market value of home X town's assessment ratio X total tax rate impact

APPENDIX C

ASSESSOR'S YEARLY REPORT

MUNICIPALITY COVENTRY

TAX ROLL YEAR 19 89

ASSESSMENT 12/31/ 88

ASSESSOR'S STATEMENT OF ASSESSED VALUES AND TAX LEVY
(Chapter 68, Public Laws 1965)

SECTION A - ASSESSED VALUES

1.	REAL PROPERTY	$ 1,427,726,548
2.	Motor Vehicles (Excise)	111,151,237
3.	Other Personalty	83,338,630
4.	TOTAL PERSONALTY (2 & 3)	194,489,867
5.	TOTAL REAL AND PERSONALTY (1 & 4)	1,622,216,415
6.	Exemptions (Section D, Group 1, Page 2)	52,277,680
7.	NET ASSESSED VALUES (5 minus 6)	$ 1,569,938,735

SECTION B - CURRENT TAX RATE

Percentage			Rate	
70%	%	School	$ 10.00	per $1000
30%	%	Municipal	$ 4.32	per $1000
100.0	%	Total	$ 14.32	per $1000

SECTION C - TAX LEVY

1.	REAL PROPERTY	$ 20,445,044
2.	Motor Vehicles (Excise)	1,591,686
3.	Other Personalty	1,193,409
4.	TOTAL PERSONALTY (2 & 3)	2,785,095
5.	TOTAL REAL AND PERSONALTY (1 & 4)	23,230,139
6.	Exemptions (Section D, Group 1, Page 2)	748,616
7.	NET TAX LEVY (5 minus 6)	$ 22,481,523

Form TA-1, DOA, Revised 1/86

PLEASE RETURN ORIGINAL, NOT A COPY TO: Rhode Island Department of Administration, Division of Local Government Assistance, Tax Equalization, 275 Westminster Mall, Providence, RI 02903-3393

TOWN OF COVENTRY

RHODE ISLAND

1990

ADDENDUM TO REAL ESTATE TAX ROLL

LAND	406,914,151	
BUILDINGS	1,000,812,391	
TOTAL REAL ESTATE		1,407,726,543
OTHER PERSONALITY	83,338,630	
TOTAL PERSONALITY		83,338,630
TOTAL REAL AND PERSONAL		1,511,065,173
EXEMPTIONS		51,959,610
NET ASSESSED VALUE		1,459,105,563

REAL ESTATE TAX LEVY

LAND	6,113,411	
BUILDINGS	14,331,633	
TOTAL REAL ESTATE		20,445,044
OTHER PERSONALITY	1,193,409	
TOTAL PERSONALITY		1,193,409
TOTAL REAL AND PERSONAL		21,638,453
EXEMPTIONS		744,061
NET TAX LEVY ON REAL ESTATE		20,894,392

$14.32 per $1,000 of assessed value

DATE: JULY 10, 1990

Patricia S. Picard

PATRICIA S. PICARD
TAX ASSESSOR

APPENDIX D

CALCULATIONS FROM CAPUTO METHOD

The Tax Impact of Open Space Preservation

Data and assumptions regarding proposed open space acquisition:

Assessed value of property - $586,200
Town equalization ratio - 97.5%
Total assessed net valuation taxable - $1,569,938,725
Amount of acquisition cost raised locally in the first year - $500,000
Total property tax levied - $20,445,044

Part 1 Impact of lost revenue on the tax rate:

New total assessed net valuation taxable:
$1,569,938,725 - 586,200 = 1,569,352,525

New property tax rate:
$20,445,044/$1,569,352,525 = $13.03

The impact of lost revenue on the property tax rate:
$13.03 - $13.02 = .01

Part 2 Impact of town acquisition on the tax rate:

Amount of acquisition cost to be raised locally in the first year: $500,000

Total budget to be raised locally in the first year of acquisition:
$20,445,044 + $500,000 = $20,945,044

New property tax rate:
$20,945,044/$1569,352,525 = $13.34

$13.34 - $13.02 - .32

From this it is determined that the removal of a 977 acre parcel from the tax rolls would increase the property tax rate by .33 per $1000 of assessed valuation, from $13.02 to $13.35.

The Tax Impact of Residential Development

Assumptions regarding proposed development:

977 acre development
5-acre zoning
School age children multiplier - .71 (from 1980 census)
Number of dwelling units - 147
Number of bedrooms per bedroom unit - 3
Market value of bedroom unit - $124,800
Household size per unit - 3.03
Assessed valuation of the development - $17,886,960

Part 1 Annual school cost per development:

School age children .71 x 147 - 104
Annual school cost 104 x $5042 = $524,368

Part 2 Impact on the school tax rate:

New School tax rate:
$524,368 + $15,737,066/$1,569,938,725 + $17,886,960= $10.24

$10.24 per thousand is the new tax rate; the existing tax rate is $10.00 per thousand. Therefore, the new development would increase the school tax rate by .24.

Part 3 annual school revenue generated per development:

$17,886,960 x $10.18/1000 = $182,089

Part 4 Net annual school cost per development:

$425,948 - $182,089 = $243,859

Part 5 Annual non-educational service cost per development:

3.03 x 147 = 445
445 x $20,445,044/$24,524 = $370,985

Part 6 Impact on non-educational tax rate:

$370,985 + $6,744,456/$1,569,938,725 + $17,886,960 = $4.50

$4.50 - $4.32 = .18

Part 7 Annual non-educational revenue generated per development:

$17,886,960 x 4.50/1000 = $80,491

Part 8 Net annual non-educational cost per development:

$370,985 - $80,491 = $290,494

Part 9 Total new tax rate:

$14.32 + .24 + .18 = $14.74

Part 10 Total tax rate impact:

.24 + .18 = .42

Part 11 Increase in taxes an individual owner of a $124,800 home would have to pay:

$124,800 x .975 x .42/1000 = $51.00

APPENDIX E

DATA SET FOR MULTIPLE REGRESSION

SORTED BY DISTANCE FROM OPEN SPACE
November 10, 1990 at 2:58 p.m. Page 1

DISO	MARKET	SALE	PL	LOT	ASSESS	AGE	B	ACR	HOUS	T
0	80000	1988	45	236	25660	0	0	8	1320	0
1320	202275	1982	46	10	161240	8	3	2	1026	0
1320	120000	1990	47	50	112270	40	3	2	952	0
1320	12000	1984	45	148	154490	0	0	2	0	0
1320	67000	1986	45	201	147100	14	2	3	1072	0
1320	14500	1987	45	198	230940	0	0	20	0	0
1320	51000	1981	47	38	126790	10	2	3	858	1
1320	37500	1981	47	39	135150	15	2	2	624	1
1320	39500	1985	46	17	0	0	0	3	0	0
1320	105000	1987	46	12	13590	3	3	2	1100	0
1320	51500	1985	47	38	126790	10	2	3	858	1
1320	87000	1990	46	20	141170	0	0	2	0	0
1320	67500	1986	47	41	151930	10	3	2	1150	1
1320	144000	1989	46	12	13590	3	3	2	1100	0
1320	87000	1990	46	21	76050	0	0	2	0	0
1320	43500	1990	46	22	40880	0	0	2	0	0
1320	40000	1981	47	40	121971	10	3	2	960	1
1320	45000	1989	46	14	0	0	0	2	0	0
1320	76500	1990	46	7	25200	0	0	27	0	0
1320	15000	1989	46	15	0	0	0	3	0	0
1320	39500	1982	46	16	168190	8	3	3	1196	1
1320	108000	1987	46	16	168190	8	3	3	1196	1
1320	141000	1988	45	155	138980	25	3	2	1700	0
1320	43560	1983	46	7	120560	7	2	27	950	1
1320	157500	1986	45	151	468260	20	3	66	2150	1
1320	100000	1988	45	201	147100	14	2	3	1072	0
1320	67000	1988	45	199	147100	14	2	186	1072	0
1320	49500	1984	45	201	147100	14	2	3	1072	0
1320	44000	1982	47	51	126820	10	3	2	1008	1
2640	11000	1989	47	101	41160	0	0	2	0	0
2640	95000	1986	47	78	156920	4	3	2	1170	1
2640	216000	1985	47	22	188070	110	4	50	884	0
2640	11000	1986	47	104	42420	0	0	2	0	0
2640	152500	1987	47	105	189700	3	3	4	1859	0
2640	48500	1985	47	87	131930	8	1	5	828	1
2640	64500	1984	47	48	157490	35	3	26	1428	1
2640	200000	1988	47	102	0	2	3	2	1092	1
2640	41500	1982	47	87	131930	8	1	5	828	1
2640	156000	1989	47	78	156920	4	3	2	1170	1
4280	31500	0	48	49	0	0	0	4	0	0
5280	41000	1988	45	207	154560	2	3	4	884	0
5280	68500	1986	48	56	99490	42	3	1	750	0
5280	27500	1988	45	208	30460	0	0	2	0	0
5280	66000	1986	47	8	141290	25	7	1	912	1
5280	112000	1985	48	61	153200	17	3	4	1040	0
5280	214500	1987	47	106	83120	0	0	10	0	0
5280	64500	1985	48	60	150530	17	3	4	1152	1
5280	228000	1990	47	95	0	1	2	2	1140	0
5280	57000	1990	47	92	0	0	0	2	0	0
5280	47000	1986	47	100	41160	0	0	2	0	0
5280	82000	1987	47	61	149940	3	2	1	1036	0
5280	82500	1986	47	13	219820	14	4	7	1092	0
5280	47000	1986	47	95	0	0	0	2	0	0
5280	31500	1987	45	27	0	0	0	4	0	0
5280	84500	1986	47	68	168970	5	3	2	1000	1

DIST	MARKET	SALE	PL	LOT	ASSESS	AGE	B	ACR	HOU	F
5280	138000	1983	47	61	149940	3	2	1	1036	0
5280	93300	1986	47	13	219820	14	4	7	1092	0
5280	112000	1988	45	61	193200	17	3	4	1040	0
5280	57000	1990	47	94	0	0	0	2	0	0
5280	118000	1988	47	6	141290	25	7	1	912	0
5280	132000	1985	47	79	218790	24	5	5	1120	0
5280	86500	1984	47	37	146700	2	3	8	816	0
5280	130000	1986	47	13	219820	14	4	7	1092	0
5280	130000	1987	47	66	168970	8	3	2	1000	1
5280	48500	1988	38	147	124900	17	3	2	1040	0
5280	67500	1984	38	167	132020	16	3	2	1009	1
5280	84000	1984	38	166	166970	17	3	1	916	0
5280	138500	1985	47	79	218790	24	5	5	1120	0
5280	47000	1984	47	93	0	0	0	3	0	0
5280	63000	1983	38	166	166970	17	3	1	916	0
5280	83000	1987	47	65	205970	60	3	1	864	0
5280	99500	1984	38	162	159180	10	7	4	1023	0
5280	44000	1983	38	163	166410	15	4	2	936	0
5280	35500	1982	38	166	166970	17	3	1	916	0
5280	111500	1987	45	61	153200	17	3	4	1040	0
5280	43500	1988	47	18	226580	2	3	8	1300	0
7920	46000	1989	45	62	0	0	0	3	0	0
7920	170000	1989	38	193	193320	1	3	2	884	0
7920	24500	1980	45	14	147170	10	3	1	1472	1
7920	155000	1989	38	192	162080	1	2	2	996	1
7920	150000	1989	38	181	157740	1	3	2	1092	0
7920	59000	1985	45	13	120820	11	3	1	1100	1
7920	152000	1989	38	180	160320	1	3	2	1092	0
7920	138500	1986	45	26	262260	110	4	4	1600	0
7920	145000	1989	38	182	154820	1	2	3	1092	1
7920	43500	1984	38	121	176270	6	2	2	912	1
7920	140000	1989	45	61	162490	2	2	5	1268	0
7920	120000	1990	45	64	122930	1	3	2	1000	1
7920	46500	1979	45	13	120820	11	3	1	1100	1
7920	134000	1990	45	65	136390	1	3	4	1100	1
7920	176000	1989	38	191	170840	1	2	2	884	0
7920	38000	1983	45	14	147170	10	3	1	1472	1
7920	138000	1990	38	181	157740	1	3	2	1092	0
7920	155000	1989	38	194	176270	1	3	2	1100	1
7920	40000	1989	45	59	0	0	0	8	0	0
7920	130000	1990	45	65	136390	1	3	4	1100	1