LIMITED DEVELOPMENT AS A TOOL FOR AGRICULTURAL PRESERVATION IN MASSACHUSETTS

by

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Bachelor of Arts
Boston University
Boston, Massachusetts
1979

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREES MASTER OF CITY PLANNING AND MASTER OF SCIENCE IN ARCHITECTURE STUDIES AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

FEBRUARY, 1988

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Submitted to the Department of Architecture on January 15, 1988 in partial fulfillment of the requirements of the degrees Master of City Planning and Master of Science in Architecture Studies

ABSTRACT

Limited development offers the hope of turning market development pressure which threatens open land into a means for financing its protection. In theory, the profit from developing a small portion of a parcel can be used to subsidize the protection of the remainder. This thesis critically examines the financial, institutional, and agricultural effectiveness of limited development as a tool for protecting farmland.

An alternative accounting methodology is proposed which expresses cash flows as sources and uses of subsidies for the support of non-market land uses, allowing comparison of limited development and traditional tools for financing land conservation. The model also attempts to determine the extent to which limited development profits are due to enhancement of development land value by the restriction of adjacent open space, market appreciation in real estate prices, and deal-making and subdivision of land. The model assumes the perspective of a non-profit limited developer.

The model is then applied to three Massachusetts case studies of farmland preservation through limited development. The agricultural viability of the protected farmland is briefly examined in each case study.

The thesis concludes that limited development often provides only a minor supplement to public subsidy programs and private contributions in the protection of farmland, although it can supply significant subsidies in some cases. Furthermore, limited development can put a non-profit into the awkward and risky role of a for-profit developer. Agriculturally, limited development leaves small farm parcels adjacent to residential use. While not ideal, such a pattern is typical of metropolitan areas, and one to which some farmers have successfully adapted.

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ACKNOWLEDGEMENTS

Undertaking and completing this thesis would have been unimaginable without the assistance and support of many persons.

Professor Phillip B. Herr helped shape a viable thesis topic from my interest in the maintenance of metropolitan agriculture through multiple land uses. His emphasis on the practical lessons of limited development made this a better and more useful thesis. As an advisor, Phil was frank in his criticism, but entirely supportive of both this thesis and its author.

Professor J. Mark Davidson Schuster's perspective on limited development as a policy instrument and analogies to other fields clarified my conceptual understanding of limited development. Mark's advice on presentation and organization were invaluable, as were his constant support and encouragement.

Professor Lynne Sagalyn's criticism of Chapter II made it a far more articulate and accessible explanation of the financial structure of limited development and my approach to analyzing it.

Other M.I.T. faculty and alumni helped in shaping this thesis, including Rink Dickinson and Professors Mel King, Larry Susskind, Roger Simmonds, and Michael Wheeler.

Key participants in the three case study limited development projects--Wesley Ward of the Massachusetts Farm and Conservation Land Trust for the Barton and Powisset Farms, and Mark Zenick of the Franklin Land Trust and John Feingold of the Trust for Public Land for Loomis Farm--were more than generous with their time. Their repeated searches of files and memories provided the basic information on which the case studies are based. I hope that this thesis provides some small reward for their patient help.

Others who provided valuable information for the case studies deserve thanks for their help: builder Creighton Hamill, Warren Flint of Matlock Associates, and realtors Jeanne Flynn, Maureen Loynd, and John Haslett for the Barton Farm; Peg Crowley of Realty World Brown, Karen MacTavish of the Dover Assessors office, attorney Harry Rice, and realtor Jay Hughes for the Powisset Farm; Steve Judge and Harry Dodson, both of the Franklin Land Trust, and realtors Kim Levitch, Susan Louisigneau, and Phillip Pless for the Loomis Farm.

Several other farms were considered for use as case studies. Although they were not used in the end, knowledge of these other limited developments enriched my understanding of the case studies. Those who took the time to share their experiences of limited development include: George S. Wislocki of the Berkshire Natural Resource Council, Whitney Beals of the Sudbury Valley Trustees, Concord (Massachusetts) Natural Resources Coordinator Daniel Monahan, Max Russell of Goodale Orchards, Mark Racicot of the Vineyard Open Land Foundation, and Joe Casilinova of Lookout Farms.

A number of persons in the New England conservation and land trust community provided important insight into the practice of limited development. These include: Davis Cherington of the Land Planning and Management Foundation, Ralph Goodno of Country Lands, Inc., Dunham Barney of Farmvest, Peter Stein of the Trust for Public Land, Richard Perkins of LandVest, James Catterton of Walden Associates, and Gordon Abbott of The Trustees of Reservations.

In addition, several persons concerned with agriculture in Massachusetts and in metropolitan areas provided generous assistance to this thesis. They include: the farmers of the three case study projects, Stephen Verrill and Nat Arena at Barton Farm, Scott Nutting at Powisset Farm, and Patricia Libby at Loomis (now Cross) Farm; James Alicata, Craig Richov, and Charles Chase of the Bureau of Land Use of the Massachusetts Department of Food and Agriculture; Judith Gillan and the staff of the New England Small Farms Institute; Tufts University Professor William Lockeretz; Thomas Johnston of the University of Waterloo, Ontario; and Charlotte Kahn of Boston Urban Gardeners.

Thanks are due to Cathy Keppler and Mark Gaydos for their kind hospitality on several flying visits to western Massachusetts and Connecticut.

Finally, I want to thank my wife and closest friend, Karin Scholle Tuttle, for proofreading and for her constant support and understanding. Karin kept this thesis and the past two-and-a-half years of M.I.T. in perspective, teaching me both the value of my work, and that there are things more important.

CONTENTS

CHAPTER I: INTRODUCTION

In the face of increasing need and cost to protect land of agricultural or natural resource value, limited development is being held out as one alternative to public subsidies or private contributions for financing land and resource protection. Limited development is, in the words of one of its foremost practitioners, on the "cutting edge" of land conservation.[1]

The allure of limited development is that it can provide a market-driven mechanism for financing the purchase of resource land. In theory, the profits from developing only a portion of a property can pay for the purchase and permanent protection of the remainder of the property. There is tremendous appeal in this idea that the market forces that make land conservation necessary can also make it possible.

Others see in limited development a way to reconcile competing public demands for dwindling and increasingly expensive undeveloped land, including agriculture, open space, and affordable housing.

This thesis is an attempt to critically examine the

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[1] Davis Cherington, "Public and Private Acquisition Strategies," presentation at "Planning for the Changing Rural Landscape of New England: Blending Theory and Practice," conference sponsored by Center for Rural Massachusetts, Durham, N.H., November 17, 1987.

effectiveness of limited development as a tool for land protection, specifically for the protection of viable agricultural land in three Massachusetts case studies. Because limited development is primarily a financial tool, the bulk of this thesis is a financial analysis of these case studies.

Limited development can at times live up to its promise: it can provide a replacement for public subsidies and private contributions. More often, I have concluded, it provides only a marginal supplement to traditional methods of financing land protection, and places non-profit conservation groups in the often uncomfortable and risk-laden role of a for-profit developer. From a public policy perspective, I believe limited development cannot eliminate or significantly reduce the need for direct public or private assistance, or public policy initiatives to conserve land.

DEFINING LIMITED DEVELOPMENT

Limited development, also known as partial development, creative land development, and compromise development, has come to mean many things. It has been applied to a range of situations, from simply subdividing an existing house lot from a farm for sale, to cluster development bylaws which provide density incentives. It is important to carefully define limited development in order to identify the

questions which must be addressed in this thesis.

The essence of limited development is that it is "limited"--that the site is developed at less than its legal capacity. This frames the basic question about limited development: Who is paying for the forgone development potential of the land? Put another way, who is paying for the public good of protecting land?

In order for land to be developed less than is legally allowed, some person or entity--the seller, the purchaser, a government or other outside body--must be willing to pay for or subsidize the protection of land. Limited development offers the hope that the limited developer will pay for protection of the undeveloped portion of the site with the profit earned by developing the other portion.

In this sense limited development is not cluster zoning, which typically allows the same or greater density of development on a site, but allows or requires it to be concentrated on one section of the site in order to maintain the remainder as open land. Although cluster development can achieve some of the same objectives, it presents a different array of questions and policy concerns.

That the site is being developed at less than its legal capacity also distinguishes limited development from a subdivision in which unbuildable land is "protected." In such a case, the developer has not forgone any development potential.

A second component of limited development is that it is **permanently** limited. In other words, the undeveloped land must be permanently protected from future development, normally through a deed restriction. The farmer who sells off a house lot has not protected the remainder of the farm, which can still be developed.

For the purposes of this thesis, I will also draw a distinction between development which is limited only by reducing the amount of development, rather than by setting aside a portion of the land for public access or use, or some publicly supported objective such as agricultural preservation. In this sense, limited development is not simply reduction of the density of a development. Thirty-acre house lots are still house lots, and are, although at a lower density, developed.

For the purposes of this thesis, limited development is examined only as it is practiced by non-profit conservation organizations. Although for-profit developers can, and sometimes do, undertake limited development, theirs is necessarily a different approach that raises different concerns.

LIMITED DEVELOPMENT AND AGRICULTURAL PRESERVATION

As a tool for the preservation of viable agricultural activity, limited development offers the hope of filling the often substantial gap between the value of land for

development and what a farmer can pay for it from agricultural income.

Limited development can prove problematic in the protection of farmland, however. Conflicts between residential and agricultural use are common complaints by farmers in metropolitan areas. The potential for these conflicts are imbedded in agricultural limited development, which places residential use in close proximity to protected farmland. In addition, the conservation mission of many limited developers can sometimes be in subtle conflict with the agricultural preservation goals of a specific project.

Why Preserve Agriculture?

The intent of this thesis is not to justify the preservation of agricultural activity or the protection of farmland. Rather, it is an attempt to assess the effectiveness of one tool for agricultural preservation. In approaching limited development from the perspective of non-profit limited developers, I am assuming, rather than questioning, the validity of their underlying motivation.

Several basic arguments are usually made in support of agricultural preservation:

* **Self-sufficiency in food production, both nationally and regionally.** The continuing and largely permanent conversion of prime farmland to non-agricultural use raises the specter, albeit a distant one, of a nation unable to feed itself.

* **Continued local production of food, providing higher quality, fresher food.**

* **Maintenance of an agricultural, rural lifestyle as viable alternative to urban life.**

* **Preservation of the rural landscape.**[2]

Although often minimized, the latter two bases for farmland preservation are often very strong. There is an often deeply felt need to perpetuate what one writer calls the "garden image" of America, an image which links our self-perception as individualists to the landscape around us. To the few for whom this is not just an image but a lifestyle, there is very often a strong ethic attached to farming that is apparent in the frequent willingness of farmers to sell their land for far less than its full value to ensure that it will continue to be farmed actively.

Approaches to Agricultural Preservation

There are two basic approaches to the preservation of farming. The first is an attempt to maintain the availability and affordability of the resource base of agricultural land. Programs to accomplish this fall into two categories:

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[2] Robert E. Coughlin, et al, Saving the Garden: The Preservation of Farmland and Other environmentally Valuable Land, Philadelphia: Regional Science Research Institute, (1977), p. 1; Robert E. Coughlin and John C. Keene, eds., The Protection of Farmland: A Reference Guidebook for State and Local Governments, Washington D.C.: U.S. Government Printing Office, (1981), p. 16; Rink Dickinson, Revitalizing Farmland in Massachusetts: An Analysis of the Development Rights Program, Cambridge, Mass.: unpublished M.I.T. Master of City Planning Thesis (1986), pp. 1-3.

* Discouraging the conversion of farmland by reducing its relative attractiveness for development, usually by directing development through metropolitan planning of infrastructure.

* Preventing the conversion of farmland through zoning, other development controls, purchase of development rights, or outright purchase and restriction of land.[3]

The second basic approach deals not with protecting land resources, but with improving the financial viability of farming as an activity and allowing it to better compete with development for land. Techniques again fall into two broad categories:

* Reducing costs of farming by offsetting additional burdens placed on farming by urbanization, including relief from real estate taxes, utilities charges, and protection from public takings of land.[4]

* Increasing farmers' income through better distribution and marketing, particularly in metropolitan areas where direct access to urban markets can offset some of the pressures put on farming by urbanization.[5]

The Loss of Agricultural Land

Regardless of the approach taken, maintaining a base of land in agricultural use is essential to preserving farming as an activity, particularly in metropolitan areas. The

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[3] Coughlin and Keene, Protection of Farmland, pp. 37-38.

[4] Ibid.

[5] Dickinson, pp. 19-22, 62-63.

conversion of farmland to non-agricultural activity, for all intents and purposes--is permanent. While it easy for farmland to be developed for residential, commercial, or industrial use, it is difficult to reverse that process and convert developed land into farmland.

The growth of metropolitan areas since the introduction of the automobile has put severe pressure on agricultural land use in metropolitan areas throughout the United States. Simultaneous changes in the technology of transporting agricultural products--refrigeration and the advent of the interstate highway system--have reduced the market advantage once enjoyed by farmers on the metropolitan fringe. Even seemingly rural areas beyond the metropolitan fringe can feel tourist development pressure driven by neighboring metropolitan areas.

Nationally, 23.4 million acres of agricultural land were converted to non-agricultural use between 1967 and 1975. The worst-hit region was the Northeast, including New England, New York, Pennsylvania, New Jersey, and Delaware. Of non-federal Northeast land available for agriculture in 1967, 3.3 percent of it had been converted to non agricultural use eight years later.[6]

In Massachusetts, the amount of agricultural land declined from 1.9 million acres in 1940 to 600,000 acres in 1974. At the same time the number of farms in the state

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[6] Coughlin, The Protection of Farmland, p. 32.

declined from 39,000 to 7,000.[7]

Difficulty in acquiring and holding land is one of, if not the, main hurdle to farming in the Northeast. An early 1980's survey--before the steepest escalation in land prices--rated the rising cost of land as the most critical issue facing small farmers in the Northeast Region.[8]

Agricultural Preservation in Massachusetts

Agricultural preservation in Massachusetts has made use of all the basic tools available. In addition to the marketing efforts of the state's Department of Food and Agriculture (DFA), public agricultural preservation efforts in Massachusetts can be broken down into three areas: relief from taxation, local land use regulation, and the DFA's purchase of development rights program.

Massachusetts Chapter 61A allows farmers to lower their real estate tax burden, while providing some disincentives to conversion of farmland. Farmers who enroll their land are taxed on the basis of agricultural income from their property rather than the potential value of the property for development. The law also provides that when land is withdrawn from the program, the owner must pay a penalty which decreases over 10 years, as well as paying all of the

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[7] Dickinson, pp. 8-10.

[8] Howard W. Kerr, Jr., "Update on Small Farms Survey in the Northeastern Region," in Research for Small Farms, Beltsville, Maryland: U.S. Department of Agriculture (1982), pp. 27-37.

taxes avoided in the previous five years.

Although it provides cost-savings to enrolled farmers, Chapter 61A often proves ineffective as barrier to farmland conversion. In very active real estate markets, paying withdrawal penalties can become just another component in the cost of acquiring development land. The reasoning that voluntary preferential tax assessment programs should be used to lure farmers into long term commitment of their land is flawed. If the penalties are severe enough to really discourage conversion, they will likely discourage enrollment in the first place.

A number of towns in Massachusetts have attempted to promote agriculture through local land use regulation. Tools in use include state-sanctioned creation of agricultural districts which provide a series of benefits to farmers, and transfer of development rights (TDR). The latter attempts to allow farmers to realize the equity in their land in return for a permanent commitment to agricultural use. Under a TDR scheme, a farmer can sell the right to develop his or her farm to a developer, who can then use the development rights to increase the density allowed on another site in a designated area. For a TDR scheme to work, there must be a "market" with a number of buyers and sellers. Establishing that market within a single town has proven difficult, and has limited the effectiveness of municipal TDR in Massachusetts.

The primary--and most effective public tool for agricultural preservation in Massachusetts has been the Agricultural Preservation Restriction (APR) program. Under the program, the state purchases and retires the development rights to farmland.[9] Farmers who sell an APR to the state are able to realize the equity in their land and continue in ownership. The APR itself is a deed restriction, preventing all future owners from developing the farm.

The APR program has been largely successful at preserving prime agricultural land and creating a market in affordable agricultural land.[10] The effort has been expensive, however. As of October, 1987, about $41 million had been spent since the program's first purchases in 1979. The money bought development rights on 219 farms totalling just under 20,000 acres. The recently passed open space bond bill included another $30 million in funding for the APR program.[11]

The APR program has been increasingly priced out of the real estate market, particularly in the Boston suburbs. As development pressure increases on farmland, the development

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[9] The value of the development rights is equal to the market value of the farmland for development, minus the value of the land for agriculture (based on capitalized potential income).

[10] Dickinson, pp. 32-60.

[11] Interview with Craig Richov, Bureau of Land Use, APR Program, Massachusetts Department of Food and Agriculture, October 23, 1987.

value of farmland rises much faster than its agricultural value, widening the gap that the APR program must fill. "We're limited in what we can do [within the metropolitan Boston area]," the Chief of the DFA's Bureau of Land Use said.[12]

Private Preservation Efforts and Limited Development

Still another tool for the protection of farmland in Massachusetts has been the outright purchase of farms by town conservation commissions, private conservation groups, and in some instances neighbors. In some cases the land is then leased to a farmer, in others it is sold with a deed restriction, effecting a purchase of development rights.

Limited development was born as a method of easing the financial burden of purchasing conservation land. The town of Lincoln has been in the forefront of developing techniques to protect land. A group of citizens concerned with protecting natural and scenic resources in Lincoln carried out a "creative land development" project in 1966, protecting sections of the Wheeler Farm. The project was the first in an ongoing series that have served as models for limited development.[13]

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[12] Interview with James Alicata, Chief, Bureau of Land Use, Massachusetts Department of Food and Agriculture, December 7, 1987.

[13] Robert A. Lemire, Creative Land Development, Bridge to the Future, Lincoln, Mass.: Robert A. Lemire (1979), pp. 55-111.

The 1970's saw a number of limited developments in the state. Several farms have been protected on Martha's Vineyard through the efforts of the town and a local land trust.[14] In two cases, the Lookout Farm in Natick and the Goodale Orchard in Ipswich, neighbors purchased a farm, developed portions, and sold the remainder to farmers with deed restrictions preventing future development.[15] In the 1980's, limited development as been turned to other uses as well. The town of Harvard combined market development, affordable housing, and farmland protection in a 1985 project.[16]

The 1980's have also seen the emergence of conservation groups whose main focus is limited development. The Massachusetts Farm and Conservation Lands Trust (MFCLT) has undertaken several limited development projects, including two of the case study farms examined in this thesis. The Land Planning and Management Foundation was formed in 1986 by statewide private conservation organizations as an experimental limited development entity.[17]

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[14] Lemire, pp. 128-130; telephone interview with Mark Racicot, Director, Vineyard Open Lands Foundation, October 13, 1987.

[15] Telephone interview with George Mumford, Lookout Farm Trust, November 24, 1987; telephone interview Max Russell, Goodale Orchards, Ipswich, September 21, 1987

[16] Lemire, p. xv.

[17] Telephone interview with Wesley Ward, Executive Director, Massachusetts Farm and Conservation Lands Trust, October 5, 1987; telephone interview with Davis Cherington,

The Role of Limited Development

Limited development is a method of financing the purchase and protection of farmland, and in some rare cases in providing financial assistance to farm operations.

It is often used, as in the three case studies, in conjunction with the APR program. In this role, limited development serves two functions. First, limited development decreases the amount of land for which an APR is sought, lowering the cost of protecting the farmland, ensuring that APR funds are spent only on critical agricultural land, and lessening the extent to which the program takes land out of the marketplace.[18]

The second function is to supplement the subsidy paid by the APR, allowing DFA to purchase an APR at a bargain price. This role is seen by DFA as increasingly important in the metropolitan Boston area. DFA's Alicata said limited development is "a means of accomplishing APR's in areas that are beyond our reach."[19]

This second role is the one of greatest concern in this thesis: does limited development have the potential not just to limit, but to significantly replace APR subsidies?

OCtober 22, 1987.

[18] Interview with Craig Richov, Massachusetts Department of Food and Agriculture, APR Program, October 23, 1987.

[19] Alicata interview.

PURPOSE AND ORGANIZATION OF THESIS

In this thesis, I have attempted an evaluation of the effectiveness of non-profit limited development as a tool for financing the protection of farmland. In addition the thesis considers the impact of limited development on the agricultural viability of protected farmland in an increasingly metropolitan state, and the institutional implications of limited development for non-profit organizations.

Chapter II outlines the financial analysis methodology on which the bulk of the analysis in this thesis rests. This methodology is an alternative cash accounting model. It is designed to determine not simply whether a project will make ends meet, but how it can make ends meet when the final use of the land cannot produce income enough to finance the purchase of the land at market prices. The methodology is intended to answer two questions:

1. Who is paying for the public good of farmland preservation?

2. How does limited development generate the "profits" that can help pay for this public good?

This analysis is intended to provide insight into the future policy role of limited development as an instrument in the preservation of farmland. In addition, it is intended to offer insight on strategies for limited development.

The financial analysis assumes the perspective of the

limited developer. It does not examine the motivations of sellers of land or local communities which seek to protect agricultural land. Although the thesis addresses the relationship of limited development to the APR program, the financial analysis of the case studies is as limited development projects which included APR's, not as APR projects which included limited development.

The financial analysis, is particularly concerned with the **non-profit** limited developer. The non-profit limited developer typically approaches limited development from a "make ends meet" point of view. The non-profit limited developer usually is seeking to meet maximum land protection goals with a minimum level of development, and often a minimum return. It is not pursuing limited development to make money, but to protect land. The financial analysis methodology described in Chapter II and applied to the three case studies assumes this point of view.

The for-profit developer, on the other hand, is most concerned with obtaining the greatest return possible from an investment. Competition forces the for-profit developer to maximize its return, at least in theory. Rather than the "make ends meet" analysis used here, a for-profit developer uses a cost-benefit approach, comparing potential returns. This perspective is inappropriate to limited development. It would evaluate a limited development project in terms of the potential development income forgone rather than meeting

actual costs of acquiring and protecting the land.

Chapters III to V tell the stories of three limited development projects in Massachusetts, the Barton Farm in Sudbury (1981-82), the Powisset Farm in Dover (1985-88), and the Loomis Farm in Ashfield (1985-88). Each chapter presents a chronology of the limited development project and considerations it raised, a discussion of its impact on agricultural viability of the farmland, and a financial analysis.

Chapter VI uses the case study analyses to draw conclusions about the financial, agricultural, and institutional effectiveness of limited development as a tool for farmland protection.

Financially, it is intended to offer a policy perspective of limited development, assessing its potential as a significant vehicle for agricultural preservation as well as to suggest strategies for limited development.

Institutionally, the conclusion examines the effectiveness of non-profit organizations as limited developers and the constraints under which they operate. It poses the question: is it possible for a single organization to successfully be both a land conservator and land consumer?

Agriculturally, the conclusion looks at the viability of farming in Massachusetts on small dispersed parcels adjacent to residential uses.

Finally, the conclusion offers a broad policy perspective of the potential role for limited development in agricultural preservation and land conservation.

CHAPTER II: FINANCIAL ANALYSIS

OVERVIEW

Limited development offers the hope that the very market development forces that threaten agricultural land can be harnessed to finance its preservation. The financial analysis in this thesis is designed to examine the extent to which limited development fulfills this promise.

This thesis proposes a new method of financial accounting in order to determine not only whether the case study limited development projects were financially successful, but why they were successful. It is hoped that this accounting methodology will help answer two basic questions about each limited development project:

1. How effective was limited development as a tool for financing land preservation, and was it able to supplant or significantly supplement other tools for financing the preservation of agricultural land?

2. How did limited development create the internal "profits" used to finance agricultural preservation, and under what conditions was it most effective in doing so?

In addressing the first question, this analysis is meant to provide a policy perspective for public officials and private conservation organizations concerned with the protection of agricultural land. It can help in discerning

the future role of limited development and its place in the array of tools for financing agricultural preservation and land conservation in general.

In dealing with the second question, this analysis is intended to provide a better understanding of the financial structure and potential of limited development and to guide future strategies for limited developers. This financial analysis is concerned, in particular, with the non-profit organization as limited developer.

Limited development also can be viewed from the perspective of the private seller of resource land which is used in a limited development project, or from the perspective of a local community or state concerned with land protection but not acting as a limited developer. From both of these perspectives, however, limited development differs little from traditional land conservation projects. Neither perspective exposes the internal financial structure which distinguishes limited development from a simple purchase of resource land at market or reduced prices.

The financial analysis used is a reconfiguration of traditional income and expense cash accounting methodology, which I have called "subsidy source and use." Income and expense accounting aggregates all income and all expenses for a project and is primarily intended to determine whether the project can make ends meet--whether all of the income can cover all of the expenses.

Subsidy source and use accounting, on the other hand, looks at the net income or net expenses attributable to each final land use within a limited development project, and at outside sources of income not based on use of the land. It is intended to reveal where the resources come from that allow land to be used in ways, such as farming in most of Massachusetts, that do not provide enough income to purchase the land at market prices.

CONCEPTUAL FRAMEWORK

The Need for a Subsidy

Underlying subsidy source and use accounting is the need for a subsidy to support land uses which cannot compete for land at market prices.

In a market economy, the market value of a piece of land is based on its "highest and best use"--the legally allowable use which will produce the greatest net income. The price a buyer is willing to pay for land is the income from selling the final product of the land's highest and best use, such as houses or subdivided house lots, minus the costs of producing the final product, and minus what the developer considers a reasonable return for the effort and risks involved. The highest and best use of most farmland in Massachusetts (and in all three of the case studies) is residential development.

When land is used in a way, such as farming on most

sites in Massachusetts, that produces less net income than the highest and best use, there is a gap between what the "lower," or non-market use can pay for the property based on income, and the market value of property (see Figure 2-1). A lower or non-market use of land cannot pay the market value of the land solely on the basis of income from use of the land.

For farming in Massachusetts this gap can be quite wide. The 1986 agricultural value--what a farmer could pay for land based solely on agricultural income--of farmland in Massachusetts ranges between $1,000 and $30,000 per acre.[1] Because prime farmland in Massachusetts is usually flat, cleared land near an urban market, it is also prime development land, and its market value can exceed $100,000 per acre. Farming simply cannot compete in the marketplace for developable land throughout most of Massachusetts.

In order to use land for a lower or non-market use, this gap between its economic value for non-market use and its market value determined by its highest and best use must be filled. The gap must be filled, in particular, when land is permanently converted to a non-market use (by a deed restriction or conservation easement, for instance), removing any future possibility of realizing the property's market value.

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[1] U.S. Department of Agriculture, "Land Value Survey Questionnaire" for each Massachusetts county, photocopied document from Massachusetts DFA, 1986.

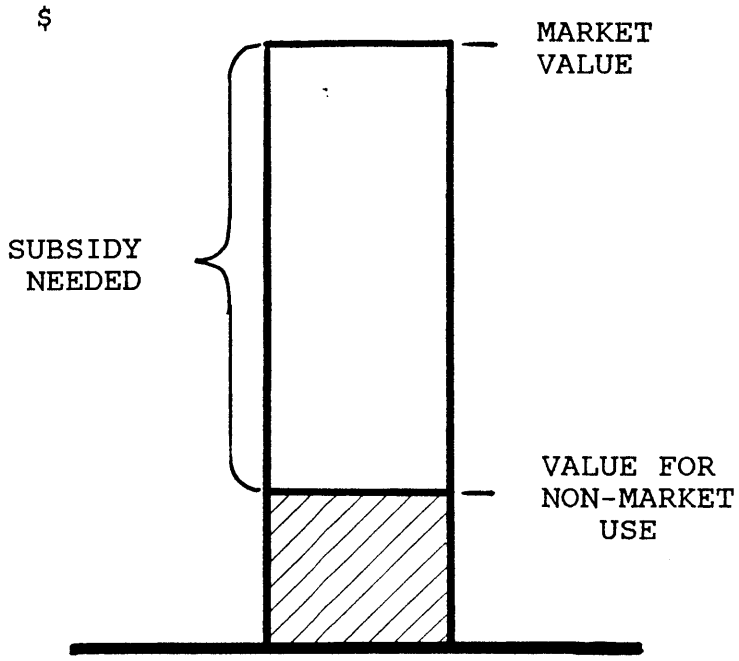

Figure 2-1: The Need for a Subsidy

In order for this gap between non-market and marketvalues to be filled, some person or entity has to commit economic resources to a non-market use without being repaid from use of the land--what I am calling a "subsidy."

The purpose of subsidy source and use accounting is to determine where those uncompensated resources are coming from: who is giving up money to allow land to be farmed rather than developed? To answer this, it is important to distinguish between income from subsidies and income in general.

Redefining "Subsidy"

In order to compare disparate sources and forms of uncompensated resources, it is helpful to first broaden the definition of subsidy. We normally think of a subsidy as "a grant by a government to a private person or company to assist an enterprise deemed advantageous to the public."[2]

For the purposes of this analysis, it is more helpful to understand a subsidy as a grant not to a person or entity, but to the "advantageous enterprise"--the non-market use of land. Rather than subsidizing a farmer, then, one is subsidizing farming. Rather than subsidizing a purchaser of conservation land, one is subsidizing the conservation of land.

It is more helpful, too, to think of subsidies as being

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[2] Webster's New Collegiate Dictionary, Springfield, Mass.: G & C. Merriam Co. (1981), p. 1153.

granted not only by governments, but also by individuals and private organizations. Thus, a private conservation organization or an individual land seller, as well as a town or state government, can subsidize the protection of farmland or open space.

Another useful broadening of the definition is to understand a subsidy not only as a grant of cash, but also of potential economic resources. Thus a seller's willingness to forgo income by accepting a lower price for property (a "bargain sale") can be seen as subsidizing the non-market use of the property. The federal government's willingness to forgo income tax revenue by allowing a charitable contribution deduction for a bargain sale also constitutes a subsidy, as does a land trust's willingness to absorb staff costs resulting from a limited development.

What is most important in the definition of a subsidy, and what distinguishes a subsidy from other sources of income, is that it is "a grant" given to support what is essentially a public good (eg. the preservation of agricultural land or the protection of open space). It is the use of economic resources without the expectation of economic compensation, promoting a public purpose. It is not money invested to obtain an economic return.

Several examples from limited development may help clarify this point:

Income from the sale of restricted land at its

agricultural value to a farmer is **not** a subsidy. The farmer who purchases the land will be repaid through income from farming the land. The farmer is not giving away his or her money, but investing it.

The purchase of an Agricultural Preservation Restriction **is** a subsidy because the Department of Food and Agriculture is not buying something of economic value or receiving economic compensation. Although in theory the state is buying development rights to farmland, legally and politically it cannot use those development rights to recoup its investment. In reality, the state is not purchasing development rights, but is purchasing a restriction on the farmland.

The purchase of open space or conservation land by a municipality also can be thought of as a subsidy. Although the town is receiving property in return for its money, it is politically and legally prevented from using that property to recoup its expenditure.[3] Although the town is not subsidizing a person or entity, purchasing open space can be thought of as subsidizing the non-market use of land as open space.

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[3] Although it is often argued that purchasing open space brings economic returns through increased surrounding land values and tax revenues, this is a secondary effect of purchasing the open space. Municipalities generally do not purchase open space in an effort to increase tax revenues. These added tax revenues are best thought of as a reduction in the net cost of purchasing open space, not as a return on an investment.

Gross income from the sale of development parcels by a limited developer is **not** a subsidy. The builder who buys those parcels is not giving away money--he or she is investing in land and will be repaid from the resale of finished houses.

The limited developer's "profit" from the sale of development parcels--what is left from sales income after the cost of the land and development expenses have been paid--**is** available to be used as a subsidy, however. This profit is used in limited development to fill the gap between the non-market and market values of the non-market portions of the limited development. The limited developer is "giving" that profit to the non-market portion of the project, using those economic resources without economic compensation.

Modelling Subsidy Flows

Like income and expenses, subsidies are best thought of as cash flows--money coming from a source and going to a use. This analysis is an attempt to account for those cash flows in an effort to determine who is paying for the non-market use of land, and how.

Both income and expense and subsidy source and use accounting are based on the same cash income and the same cash expenses, and thus produce the same "bottom line" difference between gross income and gross expenses or total subsidy sources and uses. By accounting for those cash

flows in different ways, however, income and expense and subsidy source and use accounting provided different insights into the financial structure of a limited development.

Income and Expense

Income and expense accounting breaks a project's income and expenses down by where the cash actually came from, and how it was actually spent. All money received is income and all money spent is expense.

This accounting is inadequate to explain limited development because it does not show how big the gap between non-market and market values is, or how it was filled. Rather, it shows only how gross income meets gross expense.

Furthermore, income and expense accounts for all income and expenses equally. For instance, it treats $200,000 spent to acquire an agricultural parcel which will need to be subsidized as the equivalent of $200,000 spent to acquire a parcel which will be developed and sold at a profit. The $200,000 spent on the development parcel will not be an "expense" to the effort to preserve farmland since its purchase price will be repaid when it is sold.

Similarly, an income and expense analysis treats the receipt of a $200,000 APR as the equal of selling $200,000 of development land. The APR contributed the entire $200,000 to the agricultural use of part of the limited development. The sale of development land, however,

contributed only the profits that remained after the cost of acquiring and converting the development parcels was paid.

Subsidy Source and Use

Subsidy source and use accounting isolates the flow of subsidies--that cash which is used to fill the gap between the non-market value and market value of the non-market portions of a limited development project.

Subsidy source and use accounting is perhaps best understood as a series of income and expense analyses for the different land **uses** within a limited development project. Use of the agricultural portion of the development for farming cannot pay the market value of the land, so it creates a net expense, or subsidy use. Similarly, use of land for open space produces no income to pay the market value of the land, so it creates a net expense, or subsidy use.[4]

Selling a portion of the project for market development, however, produces net income, and is a source of subsidy. Payments under the APR program, the purchase of open space by a municipality, and a buyer's willingness to sell the land at less than its market value all produce net income, and are sources of subsidy.

By accounting for cash flows as subsidy sources and

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[4]Although sale of the land to a town does produce income, its **use** as open space does not. Again, for this analysis, subsidies should be thought of as going to a non-market use of land, not to the land or its owner.

uses, it is possible to identify and compare the sources of subsidies which allow land to be converted to non-market uses. For each case study, subsidy source and use analysis allows a comparison of the subsidies from development profits with those from external sources unrelated to development of a portion of the project, such as an APR payment, sale of open space, or a bargain sale. This comparison gives some measure of the effectiveness of limited development in internally subsidizing the non-market use of land through development profits.

In addition, subsidy source and use accounting tries to account for what created the limited developer's development profits. This provides some insight into strategies and market conditions which make limited development most effective.

Sources of Subsidies

Subsidy sources have been divided into two categories: "non-development" subsidies which come from external sources and are not due to sale of part of the site for development; and "development" subsidies, which are the result of the sale of development land.

Non-Development Subsidy Sources

Four non-development subsidies have been considered in this analysis: bargain sale and federal tax subsidy, Agricultural Preservation Restriction (APR) subsidy, open

space sale subsidy, and cost subsidy.

Bargain Sale and Federal Tax Subsidy

A bargain sale occurs when the seller of a property sells it for less than it is worth. By lowering the price and forgoing potential income, the seller is providing a subsidy.

Part of this subsidy is actually being provided by the federal government through foregone income and capital gains taxes. The difference between the market value of the land and the actual sale price can be treated as a charitable contribution which can provide a federal income tax deduction to the seller, who will also pay capital gains tax only on the actual sale price of the property.

Because this analysis is concerned with the perspective of the limited developer who purchases the property, these two subsidy sources have not been calculated separately. Instead, both components are included together as the "Bargain Sale Subsidy" to the buyer of the property (see Figure 2-2).

The Bargain Sale Subsidy is equal to the market value of the land (because the highest and best use of the land in the case studies was for development, I have called the market value of the entire parcel the "Total Development Value") minus the price at which it was actually sold to the limited developer:

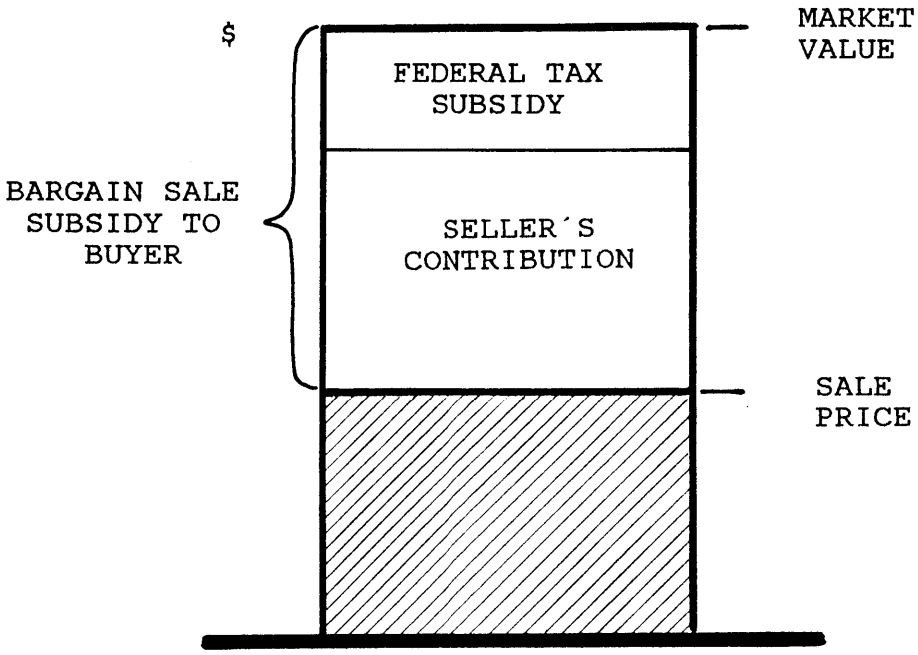

Figure 2-2: Bargain Sale Subsidy to Buyer

Bargain Sale Subsidy	=	Total Development Value	-	Sales Price.

APR Subsidy

In theory the purchase of an APR by the Massachusetts Department of Food and Agriculture is a complete subsidy, providing all of the subsidy needed to support the permanent restriction of agricultural land. The price the state is willing to pay for an APR is the difference between the market value (for development) of the land and its economic value as agricultural land (capitalized value of potential agricultural income).

In response to the growing cost of purchasing development rights, particularly in metropolitan eastern Massachusetts, however, the APR program has sought to buy development rights for less than the difference between fair market value and agricultural value.[5]

Because the entire APR payment acts as a subsidy, the value of the APR Subsidy to a limited developer is equal to the full payment by the state.

Open Space Sale Subsidy

The purchase of land for use as open space,

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[5] Interview with James Alicata, Chief, Bureau of Land Use, Massachusetts Department of Food and Agriculture, December 7, 1987.

recreation, or conservation land, usually by a town, is viewed in this analysis as a subsidy to the use of the land.

It can also be argued that the purchase of open space by a town is not a subsidy, but represents income from actual use of the land, paid collectively by the town's taxpayers. This view of open space purchase is a useful way of estimating the economic value of the open space to the townspeople. But it is not useful in this analysis, the purpose of which is to determine who is paying for a public good, not the economic value society collectively places on that public good.

As with the APR Subsidy, the value of the Open Space Sale Subsidy is equal to the entire purchase price paid by the town.

Cost Subsidy

A Cost Subsidy is created by the willingness of a participant in a limited development to absorb costs rather than seeking payment for them. In essence, the value of the service is being donated as a subsidy. The costs can include transaction costs such as legal and surveying costs, administrative and other overhead costs, and "soft" development costs such as site planning.

A Cost Subsidy typically comes from limited developers themselves, which often absorb project costs

as part of their operating budgets. Other sources of Cost Subsidies are a government agency (the Massachusetts Department of Food and Agriculture usually pays for the professional services involved in determining the value of an APR, and has provided some assistance in planning limited developments[6]), a conservation organization, the seller of the land, or the providers of professional services (pro bono legal or site planning services, for example).

Although Cost Subsidies can be important to limited development projects, determining their value is at best difficult and often impossible. They have not been addressed in the subsidy source and use analysis, although they are discussed qualitatively in the case studies.

Development Subsidy Sources

What makes limited development attractive to advocates of land conservation is the hope that the profit from developing part of a project can pay for, or subsidize, the protection of the remainder.

This total profit from the development component of the project, which I have called the "Total Development

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[6] Interview with Craig Richov, APR Program, Massachusetts Department of Food and Agriculture, October 23, 1987; interview with Charles Chase, APR Program, Massachusetts Department of Food and Agriculture, October 23, 1987.

Subsidy," is equal to gross income from selling the development land, minus the expenses of acquiring the development land, and minus the expenses of turning it into developable land. In order not to include what is really a bargain sale subsidy as a development subsidy, the cost of acquiring the development land is assumed to be its market value (for development) when acquired, not the price paid.

Total Development Subsidy	=	Gross Sales Income	-	Market Value of Development Land at Acquisition	-	Development Costs

The total development subsidy also can be viewed as the increase in the value of the development land from the time when it was acquired until the time it was sold, minus the costs of increasing its value by turning it into developable land. If we assume that the limited developer sold the development land for its full market value (i.e. that gross sales income equals market value at the time the development parcels were sold), then:

Gross Sales Income	-	Market Value of Development Land at Acquisition	=	Increase in Market Value of Development Land.

If this is substituted into the previous equation, then:

Total Development Subsidy	=	Increase in Market Value of Development Land	-	Development Costs.

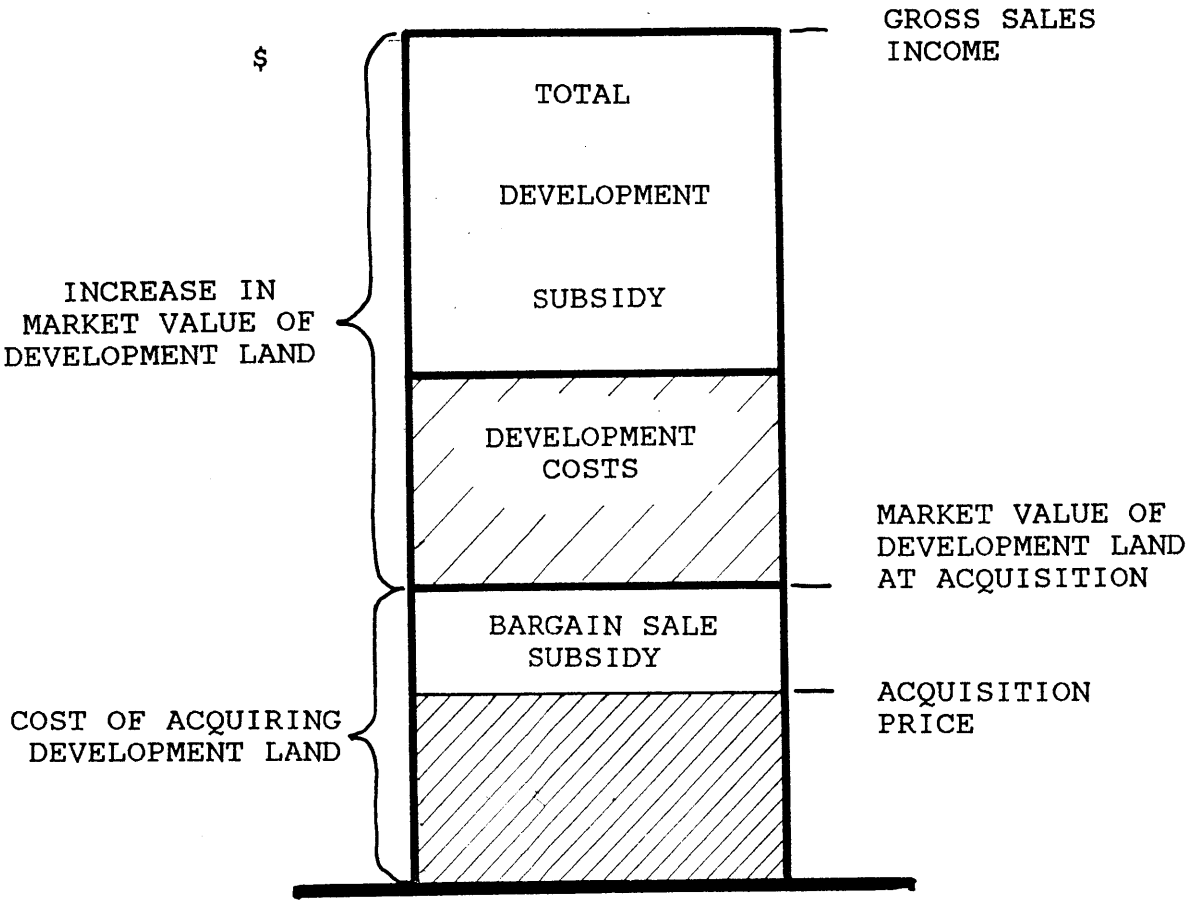

Figure 2-3: Total Development Subsidy

In other words, the subsidy generated by developing a portion of the property is equal to the value added by developing it minus the costs of developing it (see Figure 2-3).

Value can be added to the development parcels in three ways in a limited development, each of which I have considered a separate development subsidy source (see Figure 2-4). First, by restricting adjacent land to agricultural or open space use, the value of the development land can be enhanced, creating what I have called an "enhancement" subsidy. Second, appreciation in market land values can add value to the development land, providing an "appreciation" subsidy. Lastly, the act of turning raw land into buildable lots--including deal-making, design, approvals, and marketing--adds value to land, contributing a "subdivision" subsidy to a limited development project.

Enhancement Subsidy

An often stated advantage of limited development is the opportunity to capture the value added to surrounding land when a piece of land is restricted for agricultural or conservation purposes. In an economist's terms, limited development makes it possible to internalize a positive externality of preserving land.

The Enhancement Subsidy is simply the value added to the development parcels by the restriction of the

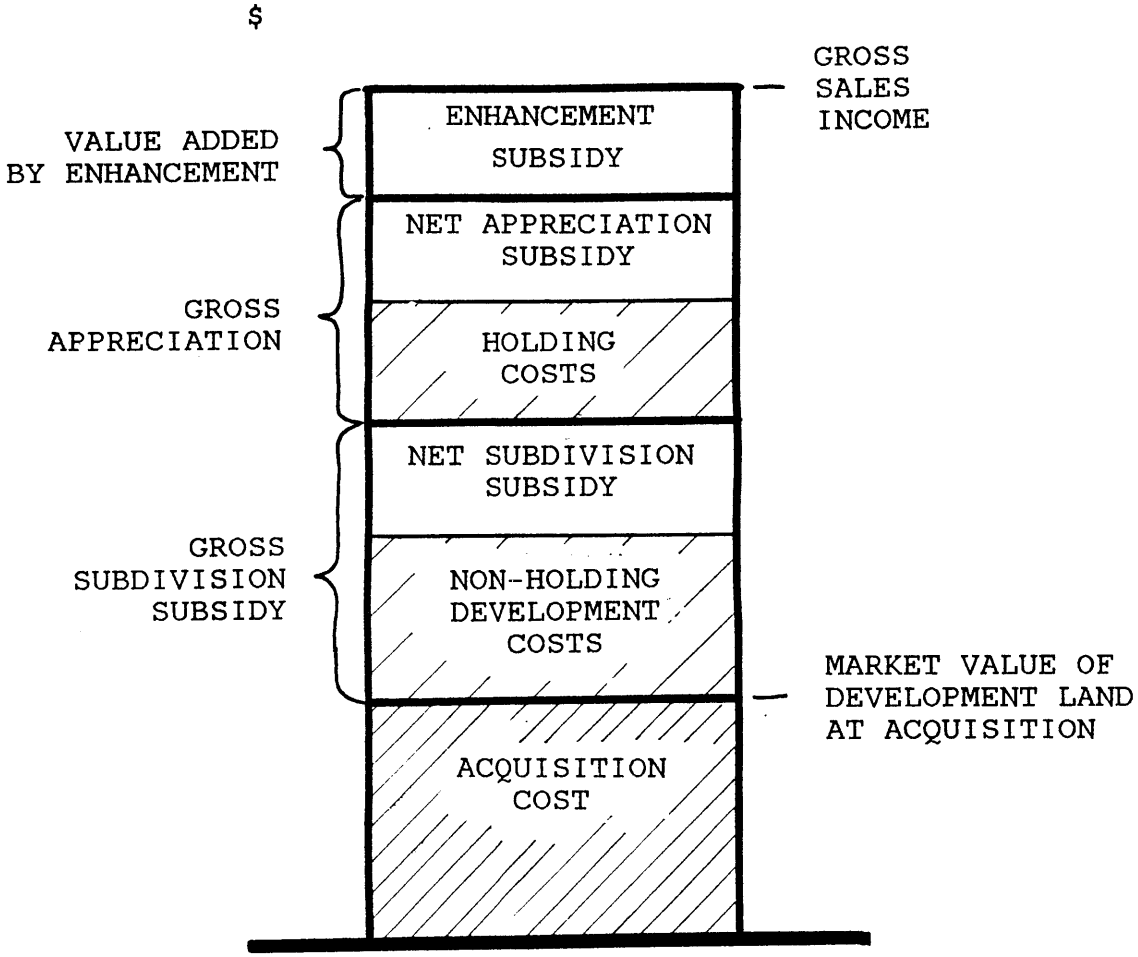

Figure 2-4: Enhancement Subsidy, Net Appreciation Subsidy, and Net Subdivision Subsidy

agricultural and open space portions of a limited development. Because the limited developer is unable to capture the value added to surrounding land under different ownership, those increases in value are not part of the Enhancement Subsidy.

It is important to note the difference between the Enhancement Subsidy--the value added to the development land by the restriction of adjacent farmland--and what I have called the enhancement **premium**. The latter is the rate at which the development land is enhanced. An enhancement **premium** of 10 percent, then, means that the value of the development parcels is increased by 10 percent by the adjacent restrictions. If their original value was $200,000, this would result in an Enhancement **Subsidy** of $20,000.

Net Appreciation Subsidy

The appreciation subsidy takes into account the effects of time on the project. By simply holding the development parcels in an inflationary land market, they increase in value.[7]

But holding land also incurs expenses, primarily

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[7] Although all of the land in a limited development increases in value due to appreciation, that increase in value can only be realized by sale of the land at its market value (for development). Because only the development parcels are sold at their market value, only the appreciation on the development land provides a subsidy to the project.

interest, real estate taxes, and insurance, which erode the subsidy provided by appreciation (see Figure 2-4). The subsidy due to appreciation is the **net** appreciation in the value of the development land, which equals the gross appreciation in the market value of the development land minus the costs of holding the development land:

Net Appreciation Subsidy	=	Gross Appreciation in Market Value of Development Land	-	Costs of Holding Development Land

Net Subdivision Subsidy

The gross subdivision subsidy is the increase in the market value of the development portion of a limited development project which is not attributable to either enhancement or appreciation.

The significance of the subdivision subsidy is that it is the subsidy the limited developer creates by acting as a land developer, creating building lots out of "raw" land. It can include the value added by bringing the various components and participants of a project together, percolation testing of land, subdivision design, obtaining needed approvals, legally subdividing land, and marketing subdivided building lots.

The gross subdivision subsidy is determined by a residual calculation (see Figure 2-4). It equals the

total increase in the market value of the development land, minus the enhancement subsidy, minus the gross appreciation in the market value of the development land:

Gross Subdivision Subsidy	=	Increase in Market Value of Development Land	-	Enhancement Subsidy	-	Gross Appreciation.

The gross subdivision subsidy does not reflect the costs of developing and subdividing the development portions of a limited development project, however, and is not an accurate measure of the subsidy actually provided through land development and subdivision. In order to calculate the Net Subdivision Subsidy, all of the "non-holding costs"--all of the development costs which are not the result of simply holding the property--attributable to the development portion of the project must be subtracted from the gross subdivision subsidy:

Net Subdivision Subsidy	=	Gross Subdivision Subsidy	-	Non-holding Costs Attributable to Development Land.

The non-holding costs are costs which are not related to time, including professional services, staff salaries and overhead, and any "hard" development costs. It is important to distinguish between these costs, which are the result of changing the land or its

legal status, and time-related or holding costs which are the result of simply holding the property over time.

Uses of Subsidies

Three non-market uses of land which require subsidizing are of interest in the case studies: agricultural preservation, (non-agricultural) open space protection, and the contribution or bargain sale of land for affordable housing. Although agricultural preservation is the subsidy use of most concern in this analysis, the protection of non-agricultural open space is a component of many agricultural limited developments. Providing land at lower-than-market costs to support the production of affordable housing is an increasingly important part of land preservation projects.

For each non-market land use, the use of subsidy is equal to the cost of acquiring and converting the portion of land it uses to the non-market land use, minus the economic value of the land for the non-market use of the land.[8] To avoid incorrectly attributing bargain sale subsidies as development subsidies, the cost of acquiring the land for each non-market use have been considered its market value

[8] In determining the economic value of the land for a non-market use, I am again drawing a distinction between subsidies to non-market use of land, such as an APR or sale of open space, and income produced from actual use of the land, such as farming. Sale of restricted land to a farmer is based on the land's value for farming, and is income from non-market use. Sale of an APR is a subsidy to allow non-market use of land, not income from that non-market use.

for development when acquired. The costs of converting the land include those non-holding development costs attributable to that portion of the property.

All three subsidy uses are calculated with the same formula (see Figure 2-5):

Subsidy Use by Non-Market Land Use	=	Market Value of Non-Market Land at Acquisition	+	Non-holding Development Costs Attributable to Non-Market Land Use	-	Value for Non-Market Use

Agricultural preservation

For Agricultural Preservation, I have assumed that the value for non-market use is the sale price of restricted agriculture to a farmer. In cases where the agricultural land is leased rather than sold, I have assumed that the value for agricultural use is the capitalized annual rent.

Open Space Protection

For Open Space Protection, I have assumed that the value for non-market use is zero. While there is some potential for income from recreational use of open space land, it is insignificant in the three case studies.

Although increased tax revenues from surrounding properties is likely and in some cases may be significant, I have not included them as income from **use** of the land for open space. Instead, I have assumed that these increased revenues are included in the town's payment for the open space, and are a source of subsidy to the project. Rather

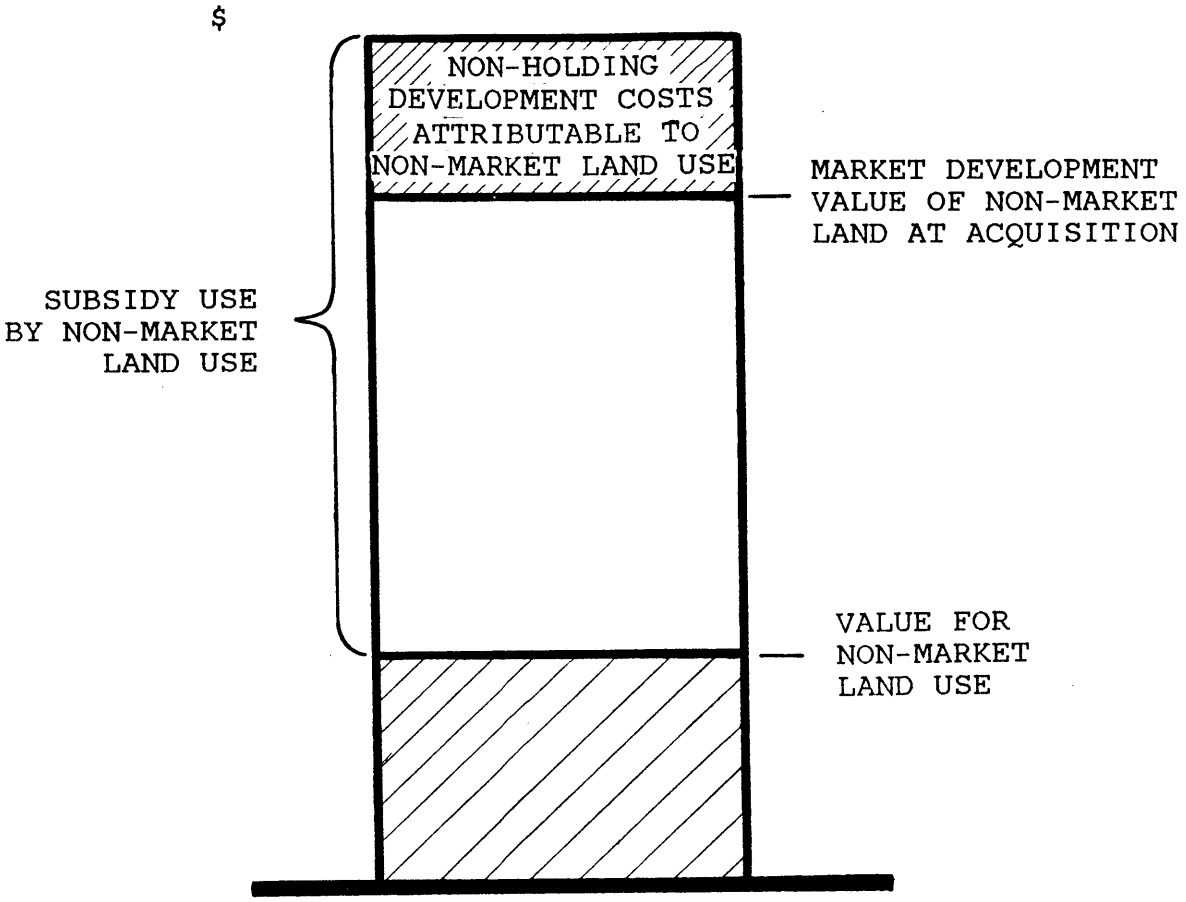

Figure 2-5: Subsidy Use by Non-Market Land Use

than paying to use the adjacent land as open space, then, the neighbors can be thought of as subsidizing its protection as open space through their increased tax payments.

Affordable Housing Land Contribution

Production of affordable housing is often subsidized by the donation or bargain sale of land. When a limited developer contributes all or part of the value of land to support affordable housing, as occurred in one of the three case study projects, it is a use of subsidy by the limited development project.

For the Affordable Housing Land Contribution, I have assumed that the value for non-market use is the price at which the affordable housing land was sold. Sale of land for affordable housing is income from the actual non-market use of the property, not a subsidy allowing that non-market use to occur.

It is important to note, as well, that the market development value of the affordable housing land is **at acquisition** by the limited developer, not when sold by the limited developer. This analysis is an accounting of the actual use of subsidies by non-market land uses, not a cost-benefit analysis comparing these to alternative uses of the land.

METHODOLOGICAL AND DATA COLLECTION ISSUES

Apportionment of Value and Costs to Different Land Uses

The conceptual framework described above presents two underlying methodological difficulties:

1. How to divide the market value of the entire site at acquisition (the "Total Development Value") among the component final land uses to determine the market value of each portion of the project at acquisition.

2. How to attribute the overall costs of project to the specific components that caused them.

Total Development Value

Because many limited developments include bargain sales, it is erroneous to assume that the Total Development Value is the price paid for the land by the non-profit limited developer. Making such an assumption would ignore the often significant subsidy contribution by the seller of the property.

In the marketplace, Total Development Value of a site--what a developer is willing to pay for it--is equal to the final value of the site when developed, minus the costs of developing it, and minus the developer's return. With land zoned for single-family residential development (as in all three case studies), the final value of the site when developed is based on the value of the potential final building lots (or houses).

Ideally, the way to divide the total development value among the final land uses would be by the same method. The market value (for development) of each portion of land within a project would be equal to the value of the potential final building lots that portion could physically and legally accommodate, minus the costs of developing those lots, minus a reasonable return. This requires a detailed appraisal broken down by the final land use components, however.

In the absence of such appraisals, two methods might reasonably be used to divide the Total Development Value: by the proportion of acreage and by the proportion of existing road frontage.

Dividing value by acreage assumes that the value of land for development lies primarily in its area. An acreage-based analysis is most appropriate to parcels with large sections of interior land that do not have frontage and for real estate markets in which the retail value of the building lots will support the cost of building subdivision roads to gain access to interior land.

Dividing value by frontage assumes that the value of land for development lies primarily in frontage, and that interior land is of little or no value. It is most appropriate for parcels which have extensive frontage and in real estate markets in which final retail values will not support the construction of subdivision roads.

Neither method is ideal. The acreage method undervalues frontage land. Because this land is predominantly used for development in most limited developments, an acreage analysis tends to exaggerate the development subsidies generated. Acreage-based division also overvalues the interior land by ignoring the added costs that would be needed to build roads in order to develop the land. Because this land is typically used for agriculture and open space, an acreage analysis tends to exaggerate these subsidy uses.

The frontage method, on the other hand, overvalues frontage land, tending to underestimate the development subsidies generated when this land is used primarily for development. It also undervalues interior land, typically understating subsidy use by agriculture and open space.

In each case I have chosen the method that I feel is most appropriate given the site and market conditions. Because the two methods represent extremes, I have compared them to draw bounds of possible results in some cases.

Development Costs

Because none of the limited developers in the case studies accounted for expenses by land use components, I have used the same acreage- or frontage-based divisions as a rough estimate of the division of costs.

Only non-time related costs are divided in this way, however. All of the time-related costs are attributed to

the development portion of the project. This assumes, somewhat simplistically, that the agricultural, open space, and affordable housing components of a project do not incur holding costs. While they do incur such costs, in all three case studies the bulk of the carrying costs can reasonably be attributed to the development portions of the projects.

Data Sources and Collection

The Subsidy Source and Use model requires assumptions, some specific to each project, and some a function of the local real estate market. Collection and reliability of these data, specifically the Total Development Value, the value added by enhancement, and the market appreciation rate, pose difficulties.

Because all three assumptions are estimates, each case study financial analysis includes analysis of the sensitivity of the results to assumptions of Total Development Value, enhancement premium, and appreciation rate.

Total Development Value

Where possible, the Total Development Value is based on a "true" appraisal of the property's value for development. Where this has not been possible, it has been based on estimates by case study participants of the property's true market value, or the sale price where there is reason to believe it reflected the property's market value.

Enhancement

The enhancement premiums assumed are based on estimates by case participants and area realtors. In two cases, enhancement is treated as a uniform rate across all development lots. For the third, where the realtor who marketed the lots was able to estimate the enhancement value added lot by lot, those estimates have been used.

Appreciation

Monthly appreciation rates assumed in the analyses are based primarily on quarterly and annual median residential sales prices (including finished homes and building lots) from County Comps, a subscription service which reports sales of properties to realtors for use as "comparables." The appreciation rates assumed are also based on interviews with area realtors and case participants.

An additional problem with appreciation is that the model is based on a uniform, rather than variable, monthly appreciation rate for the entire period of the limited development project. Appreciation often occurs unevenly, and the model fails to account for wide variations in appreciation over brief periods.

An inherent difficulty with all appreciation data is that to be useful, it must be from a narrow geographic area (a single town), and measured over short periods of time. This limits the number of individual sales on which the data are based, however, tending to undermine the comparability

of median sales.

ANALYSIS PRODUCTS

The basic outputs of the financial analysis are two summary tables, one for income and expense accounting, the other for subsidy source and use accounting.[9] In addition, I have used a graphic representation of the subsidy source and use accounting. Tabular presentations of sensitivity analyses appear in each case study text.

Income and Expense

The Income and Expense table (see Table 2-1) is a standard form, accounting for all sources of income and all expenditures in a project. The "bottom line" is the surplus (or shortfall) of income over expenses, and is expressed as a percentage of the total expenses of the project--the return on all the money invested in the project.

Subsidy Source and Use Summary

The Subsidy Source and Use Summary (see Table 2-2) shows the absolute and percentage amounts of each subsidy source and subsidy use. The subsidy sources are sub-totalled as Non-Development and Development subsidies for comparison.

The percentage column for subsidy sources shows the

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[9] The full spreadsheets which produced the summary tables are included as appendices.

TABLE 2-1: SAMPLE INCOME AND EXPENSE TABLE

INCOME	
Total Rental Income	$1,500
Sale to Farmer	$25,000
APR Sale	$200,000
Total Restricted Agricultural Land Sales	$225,000
Open Space Land Sales	$100,000
Market Development Land Sales	$500,000
Affordable Housing Land Sales	$50,000
Total Development Land Sales	$550,000
Other Income	$0
TOTAL INCOME	**$876,500**

EXPENSES	
Purchase Price	$700,000
Financing	$15,000
Real Estate Taxes	$3,000
Insurance	$2,000
Legal Services	$20,000
Planning & Engineering	$10,000
Surveying	$5,000
Other Services	$5,000
Total Professional Services	$40,000
Staff Overhead	$30,000
Other Expenses	$0
TOTAL EXPENSES	**$790,000**

INCOME AND EXPENSES	
+ TOTAL INCOME	$876,500
- TOTAL EXPENSES	$790,000
SURPLUS or (SHORTFALL)	**$86,500**
RETURN ON TOTAL EXPENSES	**10.9%**

percentage of all subsidy sources represented by each individual subsidy source or category of subsidy sources. The percentage column for subsidy use shows the percentage of the entire subsidy use by the project represented by each individual subsidy use.

The "bottom line" in the Subsidy Source and Use Summary is the surplus (or shortfall) of subsidy sources over subsidy uses. It shows whether the project received and provided enough subsidies to cover those that the non-market uses of land required.

Note that this "bottom line" is the same absolute amount as that shown in the Income and Expense Table because the two account for the same inputs and outputs of cash. The Subsidy Source and Use Summary expresses this surplus or shortfall as a percentage of the total subsidy uses, however. This gives an indication of the degree to which a project exceeded or fell short of the subsidies it needed.

Subsidy Source and Use Graphic Summary

The total subsidy sources and uses for each case study project are presented graphically as stacked bar graphs. In each case study the subsidy sources and uses are presented in terms of actual dollars. In order to compare the three cases in the conclusion, each subsidy source and use has been expressed there as a percentage of the Total Development Value of the particular project.

TABLE 2-2: SAMPLE SUBSIDY SOURCE AND USE SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources
Bargain Sale Subsidy	$200,000	29%
APR Subsidy	$200,000	29%
Open Space Sale Subsidy	$100,000	14%
Total Non-Development Subsidies	**$500,000**	**72%**
Enhancement Subsidy	$65,217	9%
Net Appreciation Subsidy	$30,208	4%
Net Subdivision Subsidy	$95,075	14%
Total Limited Development Subsidies	**$190,500**	**28%**
TOTAL SUBSIDY SOURCES	**$690,500**	**100%**

SUBSIDY USES	Actual	Percent of Subsidy Uses
Agricultural Preservation	$460,000	76%
Open Space Protection	$97,000	16%
Affordable Housing Contribution	$47,000	8%
TOTAL SUBSIDY USES	**$604,000**	**100%**

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$690,500
- TOTAL SUBSIDY USES	$604,000
SUBSIDY SURPLUS or (SHORTFALL)	**$86,500**
PERCENT OF SUBSIDY USES	**14.3%**

PREDICTIVE ANALYSIS

The basic subsidy source and use analysis described above is an analysis of what actually happened in each case study. The sensitivity analyses do not test what would have happened had reality been different, but are testing the analysis results given different assumptions about what actually happened.

This model does not allow us to test the performance of these limited development projects under different market conditions. Of particular interest is the effect of market appreciation rates on these projects, and, to a lesser extent, the effect of different enhancement premiums.

The basic model does not permit variations in appreciation or enhancement because the calculation of development subsidies is a residual analysis. The model determines a total development subsidy based on the actual sales from development land, then subtracts estimates of enhancement and gross appreciation to arrive at the gross subdivision subsidy. Using this model, assuming a higher appreciation rate does not increase the value of the final sales or the total development subsidy, only the proportion of the total development subsidy attributed to appreciation.

Rather than starting with the final sales and ending with the value added through subdivision, the predictive model starts with the market value of the subdivided development parcels (as determined by the original residual

analysis) first adds appreciation, then adds enhancement, producing a final market value. This final market value is then used as the sales price of the development land.

Because it uses subdivided land values determined by the original analysis, this predictive model is sensitive to the original division of Total Development Value and development costs, and the original assumptions of Total Development Value, appreciation rate, and enhancement premium. The results of this model should be qualified not only with regard to the alternative assumption about appreciation or enhancement, but also with regard to all the original assumptions.

The basic output of this analysis is the "bottom line" surplus or shortfall. The question it attempts to answer is: all else equal, would this project have worked if appreciation (or enhancement) had been different than it actually was? Although it is sensitive to the original assumptions, and it is nearly certain that all else would **not** have been equal, this analysis at least suggests how susceptible a project is to market changes beyond the control of the limited developer.

SUMMARY

Permanent non-market land uses such as agricultural preservation and open space protection require a subsidy of some sort. A number of subsidies are provided in a limited

development project.

Some of the subsidies provided, including bargain sale, APR sale, open space land sale, and cost subsidies, are not generated by the development aspects of a limited development project. Others--enhancement, net appreciation, and net subdivision subsidies--are a direct result of developing a portion of a property.

The goal of the case study financial analyses is to determine whether the development aspects of each limited development project provided significant benefits to the project, and if so, which development subsidies were most significant.

CHAPTER III: BARTON FARM

The 1981 limited development at the Barton Farm in Sudbury, Massachusetts, succeeded in protecting 43 acres of farmland and 15 acres of wetlands from an 81-acre farm. It did so only with significant external assistance, however, relying heavily on external subsidies which were supplemented by relatively small development subsidies.

The Barton Farm project also suggests some of the risk limited development presents to a non-profit land trust. Even with the external subsidies it received, virtually no carrying costs, and the assumption of staff costs by the limited developer, the Barton Farm failed to break even.

CASE HISTORY

In 1980 the Barton family heirs petitioned for settlement of the family estate, including the 80.5-acre North Sudbury farm (Figures 3-1, 3-2). Although 86-year-old Ralph Barton had given up farming in the 1960's, he had kept the farm intact, leasing it to dairy and vegetable farmers and a wholesale nursery.[1]

Sudbury is a commuting suburb about 20 miles west of

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[1] Kay Longcope, "A Unique Land-Use Plan in Sudbury," Boston Globe, December 8, 1981, p. 19; the Massachusetts Farm and Conservation Land Trust, Annual Report 1981, Beverly, MA (1982), pp. 5-6.

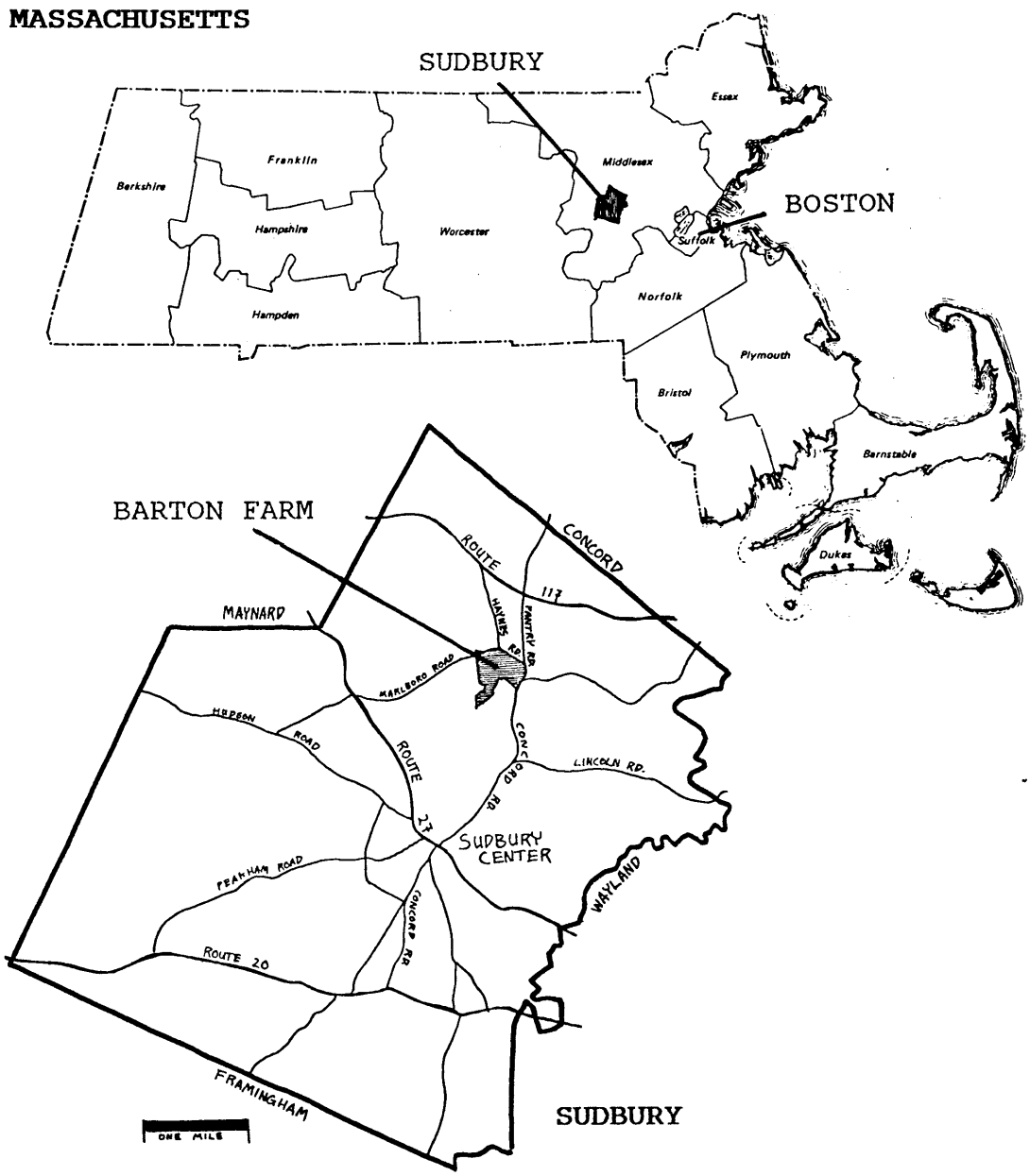

Figure 3-1: Barton Farm Locus Maps

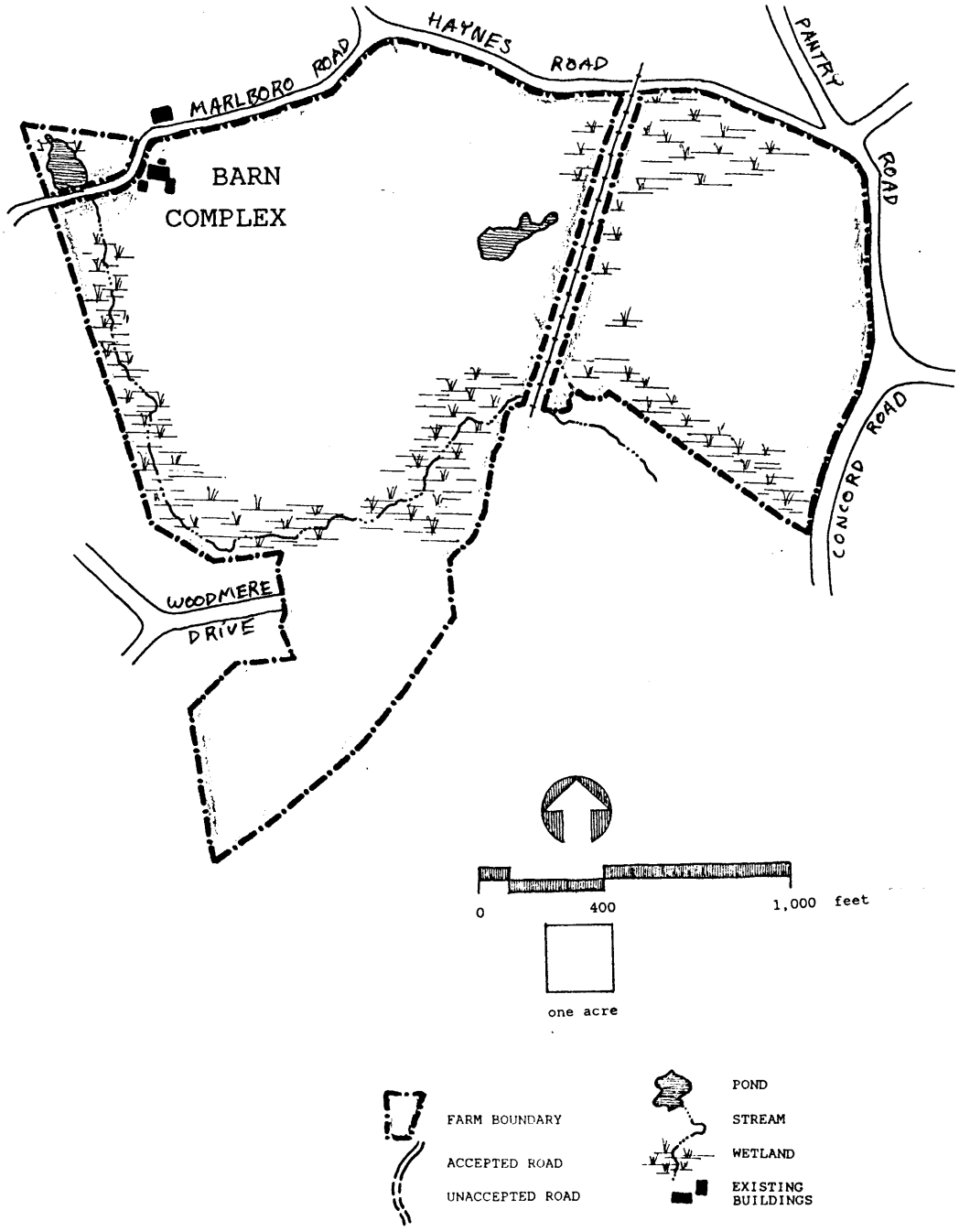

Figure 3-2: Barton Farm Original Conditions

Boston which was beginning to come under development pressure in the early 1980's, particularly for large-lot "luxury" single-family homes. The land was zoned for single-family residential, with minimum lot size of 40,000 square feet and minimum road frontage of 180 feet. Because of the Barton Farm's approximately 4,600 feet of frontage on three roads and access from a fourth, the Sudbury Conservation Commission feared that the farm would be fully developed, and contacted the Massachusetts Farm and Conservation Land Trust (MFCLT) for assistance in saving part of the farm.

MFCLT was created in July, 1980 when the preservation of productive farmland was added to the goals of the existing Land Conservation Trust. The new organization was intended to work with the Agriculture Preservation Restriction (APR) program of the Massachusetts Department of Food and Agriculture (DFA). MFCLT acted as an "interim buyer," purchasing land and giving farmers immediate access to the value of their land during the period it took the APR program to purchase the development rights. MFCLT could act faster than the year or more that the APR program frequently took to purchase development rights in 1981. MFCLT also could provide a farmer with the full value of his land, not just the value of the development rights. Unlike the APR program, MFCLT could act as a limited developer, developing land which was not agriculturally significant, thus lowering

the cost of an APR and preserving only productive farmland.[2]

MFCLT is affiliated with The Trustees for Reservations (TTOR), a statewide conservation organization founded in 1891 to preserve "beautiful and historic places and tracts of land" in Massachusetts. TTOR provided MFCLT with access to a $200,000 revolving fund to finance projects.[3]

The Barton Farm was one of several efforts to preserve farmland in Sudbury in 1980-1981. The April 1981 Sudbury Town Meeting approved a warrant article to contribute $500 per acre toward the purchase of agricultural preservation restrictions on six open space parcels (including the Barton Farm), totalling 194 acres. Farmer Stephen Verrill of Concord, who leased several of the parcels and eventually purchased some of the restricted land, was instrumental in initiating the APR process.[4]

In addition to the $500-per-acre contribution to the APR purchase, the same Town Meeting voted to pay up to $110,000 to purchase 15.3 acres of the Barton Farm as conservation land, including a pond, brook, and surrounding wetlands.[5]

MFCLT had hired Matlock Associates, a land planning

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[2] MFCLT, Annual Report 1981, pp. 2, 4-5.

[3] Ibid.

[4] Ibid, pp. 3, 6; telephone interview with Stephen Verrill, Verrill Farms, Concord, December 10, 1987.

[5] MFCLT, Annual Report, pp. 3, 6.

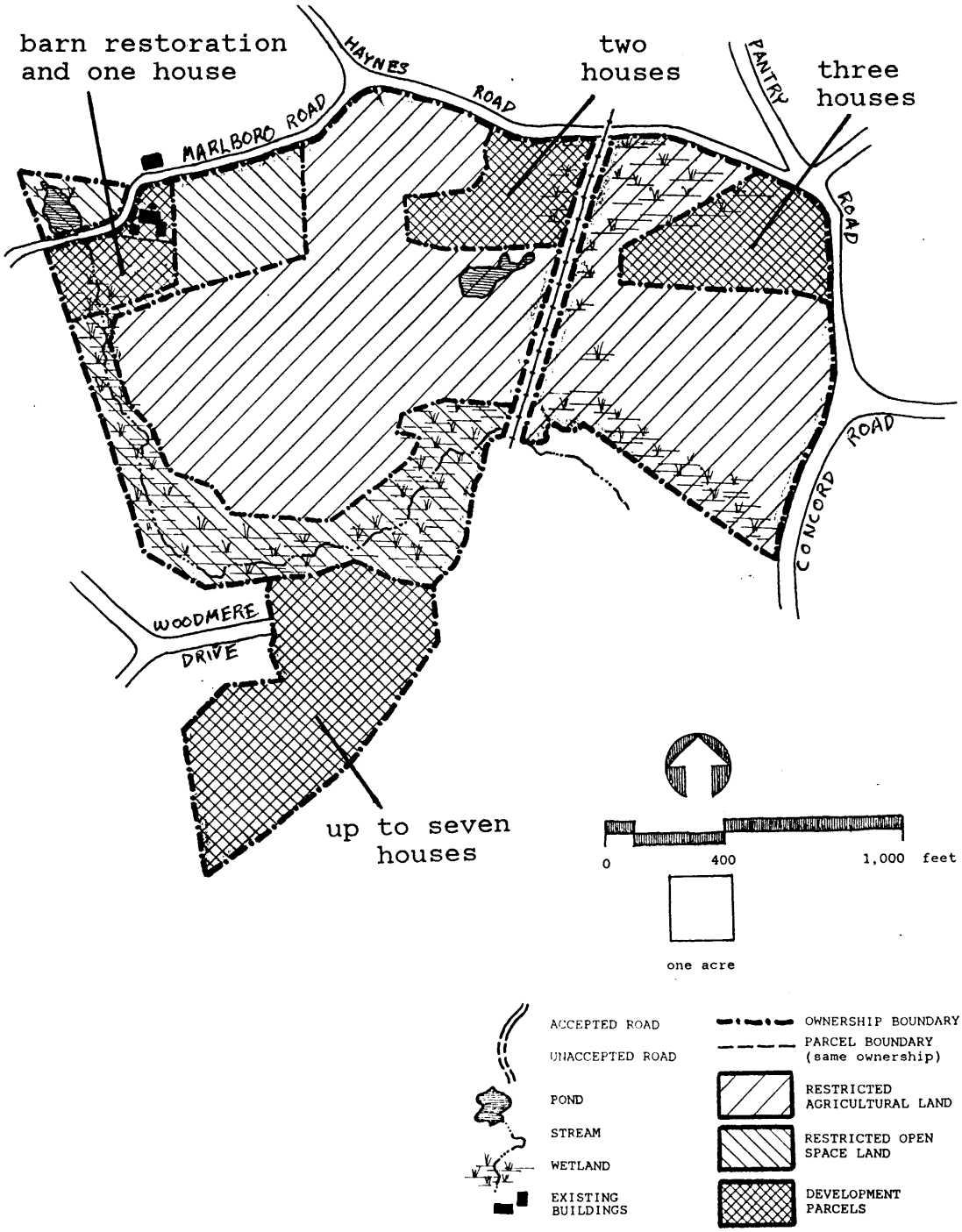

Figure 3-3: Barton Farm Limited Development Plan

firm in Lincoln, Massachusetts specializing in conservation and limited development planning, to assist in planning for the Barton Farm. Four separate development areas were identified, totaling 22 acres (Figure 3-3). The land was sold with deed restrictions limiting it to 13 building lots.[6]

An historic 19th-century barn complex was isolated on another 2.7-acre parcel adjacent to one of the development parcels. Deed restrictions prohibiting any additions and calling for the retention of roof profiles, cupolas, several facades were placed on the barns. The restrictions did allow one barn to become an apartment.[7]

Two agricultural parcels, divided by an unused railroad right of way, remained. The eastern parcel (Figure 3-3) included 17 acres, with about 10 acres of high quality soils. The 26-acre western parcel has soils of varied quality.[8]

MFCLT competed with two other developers to purchase the farm from the Barton estate. Although their bid was lower than the other two, and lower than an appraisal for the estate, MFCLT was able to win the contract to buy the

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[6] MFCLT, Annual Report, pp. 6-7.

[7] MFCLT, "Preservation Restriction," 1982 (in DFA APR file for Barton Farm).

[8] MFCLT, Annual Report, pp. 6-7; the MFCLT, "Preservation Restriction," 1982 (in DFA APR file for Barton Farm).

farm. In doing so, MFCLT argued that the estate's appraisal had been unrealistic and that contingencies in the other bids were not as valuable as estimated due to less accurate soil testing. In addition, MFCLT offered the estate an earlier closing date.[9]

Purchase and sale agreements between MFCLT, the Barton estate, the Town of Sudbury, and Creighton Hamill, a local builder of custom homes, were signed in October, 1981. The APR was approved in November, 1981. Simultaneous closings on the development parcels, the town conservation land, and the APR took place in February, 1982. MFCLT paid the estate $537,500 for the entire 80.5 acres, a price MFCLT Executive Director Wesley Ward said was "very close to the value given by independent fair market value appraisal." The Town of Sudbury paid $99,650 for the conservation land.[10]

Hamill paid $272,300 for the four development parcels. Because of the high interest rates at the time (18-percent mortgage rates), the builder's uncertainty over approvals on raw land, and siting restrictions placed on some of the lots by MFCLT, Ward said MFCLT was "lucky" to find a builder willing to purchase the development parcels. Hamill was the only builder interested, he said. Although MFCLT felt the price was a bargain for Hamill, the builder said it was "a

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[9] Ward interview, December 1, 1987.

[10] MFCLT, Annual Report, pp. 6-7; Department of Food and Agriculture, "Certificate of Vote," November 18, 1981 (in DFA APR file for Barton Farm).

fair price. By the time we got through with it, it got expensive."[11]

MFCLT chose to wholesale the development parcels to Hamill undivided and without any approvals (MFCLT's subdivision of the development parcels from the main farm parcels did not require subdivision approval). The organization had, however, done a great deal of the preliminary planning on the project and established its credibility with the planning board and conservation commission.[12]

The state Department of Food and Agriculture and the Town of Sudbury jointly paid $200,350 for the development rights on the 43 acres of farmland, $140,000 of it for the smaller farmland parcel, and $60,500 for the larger restricted parcel. The total $200,350 paid for the APR was $30,150 less than the value of the development rights as determined by the review appraisal done for the APR program. Because the DFA was less interested in the larger, less agriculturally significant parcel, the program paid less than its worth, according to Ward.[13]

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[11] MFCLT, Annual Report, pp. 6-7; Ward interview, December 1, 1987; telephone interview with Creighton Hamill, December 23, 1987.

[12] Ward interview, October 5, 1987.

[13] DFA, "Certificate of Vote"; James J. Czupryna, "Appraisal Review and Valuation Analysis of Barton parcels (I and II)," 1981 (in DFA APR file for Barton Farm), p. 15; interview with Wesley Ward, Executive Director, MFCLT, October 5, 1987.

The two restricted farmland parcels were sold approximately six months later to two Concord farmers, Stephen Verrill and Nat Arena, for a total of $22,235. During the delay, the farmers were charged rent equal to the carrying costs of the agricultural parcels.[14]

MFCLT attempted in both the Barton and Powisset (Chapter IV) limited developments to minimize complications that would add delay, expense, and risk. "We kept them pretty simple," said Wesley Ward. "We were interested in both cases in speed and quick turnover because we might get eaten up by interest, and it might complicate the survey." That simplicity and speed came at "the risk of not being innovative," he added.[15]

In particular, MFCLT avoided any plan calling for clustered or attached housing on the development parcels, particularly since neither Sudbury nor Dover allowed cluster or multifamily development by right. Drawbacks to cluster development included complicating and lengthening the approvals process and greater difficulty in marketing the final units, and thus the development parcels, Ward said.[16]

The simultaneous closings--and the willingness of the estate to hold the property while MFCLT planned and marketed it--allowed MFCLT to keep carrying costs to a minimum. No

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[14] Ward interview, October 5, 1987.

[15] Ward interview, October 5, 1987.

[16] Ibid.

financing was need for the purchase at all, and interest costs were approximately $2,700, excluding six months of interest resulting from the six-month delay in selling the agricultural parcels.[17]

MFCLT's other expenses for the project included:

Legal Services	$21,066
Planning and Engineering	9,900
Appraisals	1,050
Overhead (5%)	26,875[18]

Although MFCLT accounted for overhead and staff salaries and benefits at five percent of the purchase price, the actual overhead was not tracked and was certainly higher, according to Ward.[19]

To date, Hamill has built 12 of the 13 houses he was allowed, and now lives in the one adjacent to the barn complex. Lots were divided and houses built largely in accordance with the planning by Matlock on the three parcels adjacent to the farmland. Woodmere Drive was extended into the southeast corner of the farm where it terminates in a cul-de-sac. Seven house lots were laid out along the road, of which six have been built on. Hamill said he still intends to build on the seventh lot.[20]

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[17] Ward interview, October 5, 1987; telephone interview with Ward, October 28, 1987.

[18] MFCLT, Annual Report 1981, p. 7.

[19] Ward interview, October 5, 1987.

[20] Hamill interview.

AGRICULTURAL IMPACT

Both of the agricultural parcels at Barton Farm have remained productive, largely because they were sold to two established farm operations.

The smaller, more agriculturally valuable parcel sold to Verrill Farms included about 10 acres of tillable cropland and eight acres of woodland and wetland. The larger parcel, sold to Arena Farms, included nine acres of tillable cropland (four of which were still used by the nursery) four of pasture, and three of woodland and wetland.[21]

Farmer Stephen Verrill had leased the parcel he eventually purchased for several years prior to the limited development project. He has continued to use the parcel's tillable land for silage corn for his Concord-based dairy operation.[22]

After allowing the nursery to phase out its use of the parcel Arena Farms has gradually been planting its 26 acres with a variety of field crops suited to its eight different soil types. Crops have included sweet corn, broccoli, cabbage, gourds, pumpkins, squash. Planned crops include

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[21] MFCLT, Barton Farm Application Form, Agricultural Preservation Restriction Act, 1981 (in DFA APR file for Barton Farm), p. 2.

[22] Verrill interview.

asparagus and berries.[23]

Neither farmer reported any significant conflict with their limited development neighbors. Verrill attributes that to little "visible" use of chemicals on his field. Given the few trees left as a buffer between the three adjacent parcels and his field, Verrill said conflict with neighbors "could be a problem" at the Barton Farm. In addition, he has had considerable conflict with a neighbor of the parcel directly across the street, which he also owns.[24]

Nat Arena of Arena Farms, also in Concord, said he has had questions regarding insecticide use in his cornfield adjacent to one of the three limited development houses which abut his property. The questions came first from the owners of a house surrounded by farmland on three sides and then from a realtor selling the house (for the third time since it was built). Arena cautioned residents against going in the cornfield after it was sprayed, and sprays in the early evening when there is less wind.[25]

Both the Verrill and Arena Farms provide examples of adaptation to survive in a metropolitan area. Both farm a large number of small, dispersed parcels, and to some extent market directly through retail farmstands.

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[23] Interview with Nat Arena, November 13, 1987.

[24] Verrill interview.

[25] Arena interview.

Although farming small, dispersed parcels "raises hell with the efficiency," Verrill said he has used such a pattern to stay in business. After "overextending" himself in land purchases to protect himself from eviction from rented land, Verrill said he has recently been able to consolidate somewhat, selling off more distant parcels. The parcels he currently owns are up to seven miles from his main farm in Concord, but most are within three miles.[26]

In addition to a dispersed parcels, Verrill has begun to shift his operation from wholesale dairy to retail vegetables and berries in recent years to provide diversity and greater profit per acre (although how inventory is accounted for affects the relative profitability within his operation). In addition to retail vegetables, Verrill has a pick-your-own strawberry operation.[27]

Arena Farms includes about 100 owned and leased acres, including the 26 APR acres at Barton Farm, 12 acres adjacent to the farmstand on Route 2 in Concord, and several parcels under short-term lease in Concord and Wayland. Along with Arena Farms produce, the farmstand sells a wide variety of produce and food products.[28]

Although he feels that the parcel he purchased was capable of supporting a new farm starting up, Nat Arena said

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[26] Verrill interview.

[27] Ibid.

[28] Arena interview.

it is easier for an established farmer with existing outlets for products to make use of the land. "The bottom line to being able to use the farmland is marketing, being able to sell the product," he said. In addition, an established farm has other landholdings and credibility with local banks, easing access to financing. Arena said past business dealings was a factor in obtaining financing for the Barton Farm purchase, but said the loan was secured only by the Barton parcel.[29]

FINANCIAL ANALYSES

Financially, the Barton Farm suggests the continued importance of external, non-development subsidies. Without question the main subsidy sources to the Barton Farm limited development project were the APR sale to the state and the sale of the open space land to the Town of Sudbury.

Because the simultaneous purchase and sale agreements and closings eliminated the possibility of any significant appreciation, the Barton Farm offers an opportunity to deal only with the two remaining development subsidies, enhancement and subdivision. This allows an estimation of the probable range of actual enhancement rather than relying on estimates.

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[29] Ibid.

TABLE 3-1: BARTON FARM INCOME AND EXPENSE TABLE

INCOME	
Total Rental Income	$1,554
Sale to Farmer	$22,235
APR Sale	$200,350
Total Restricted Agricultural Land Sales	$222,585
Open Space Land Sales	$99,650
Market Development Land Sales	$272,300
Affordable Housing Land Sales	$0
Total Development Land Sales	$272,300
Other Income	$0
TOTAL INCOME	**$596,089**

EXPENSES	
Purchase Price	$537,500
Financing	$4,232
Real Estate Taxes	$5,375
Insurance	$0
Legal Services	$21,066
Planning & Engineering	$9,900
Surveying	$0
Other Services	$1,050
Total Professional Services	$32,016
Staff Overhead	$26,875
Other Expenses	$0
TOTAL EXPENSES	**$605,998**

INCOME AND EXPENSES	
+ TOTAL INCOME	$596,089
- TOTAL EXPENSES	$605,998
SURPLUS or (SHORTFALL)	**($9,909)**
RETURN ON TOTAL EXPENSES	**-1.6%**

Income and Expense

Despite minimal carrying costs and probable underestimation of MFCLT's staff and overhead costs, the Barton Farm project ran a deficit of $9,900, or two percent of the total project expenses (Table 3-1). In terms of what was a successful effort to preserve farmland and protect open space, this shortfall is insignificant.

The slight loss may be attributable to MFCLT's difficulty in finding a builder, which was probably translated into a lower sales price for the development land. But the same market conditions that made it difficult for MFCLT to find a builder should have had a similar impact on the price at which they purchased the farm.

With a total of $300,000 in income from the APR and sale of open space land and $272,000 from the sale of the development parcels, the income and expense analysis suggests that the project was almost equally reliant on each source of income.

Subsidy Source and Use

When viewed in terms of subsidy source and use, the Barton Farm project was less reliant on development subsidies than it was on the non-development subsidies from sale of the APR and open space land to the Town of Sudbury. Based on initial assumptions about enhancement, appreciation, Total Development Value, and apportionment of Total Development Value by frontage, 84 percent of the

subsidies available to the project were from outside, non-development subsidy sources, with the remainder coming from development sources (Table 3-2, Figure 3-4).

The development subsidies really provided only a marginal supplement to the non-development subsidies

TABLE 3-2: BARTON FARM SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources
Bargain Sale Subsidy	$0	0%
APR Subsidy	$200,350	56%
Open Space Sale Subsidy	$99,650	28%
Total Non-Development Subsidies	**$300,000**	**84%**
Enhancement Subsidy	$24,755	7%
Net Appreciation Subsidy	($8,053)	-2%
Net Subdivision Subsidy	$40,105	11%
Total Limited Development Subsidies	**$56,807**	**16%**
TOTAL SUBSIDY SOURCES	$356,807	100%

SUBSIDY USES	Actual	Percent of Subsidy Uses
Agricultural Preservation	$251,975	69%
Open Space Protection	$114,740	31%
Affordable Housing Contribution	$0	0%
TOTAL SUBSIDY USES	$366,716	100%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$356,807
- TOTAL SUBSIDY USES	$366,716
SUBSIDY SURPLUS or (SHORTFALL)	($9,909)
PERCENT OF SUBSIDY USES	-2.7%

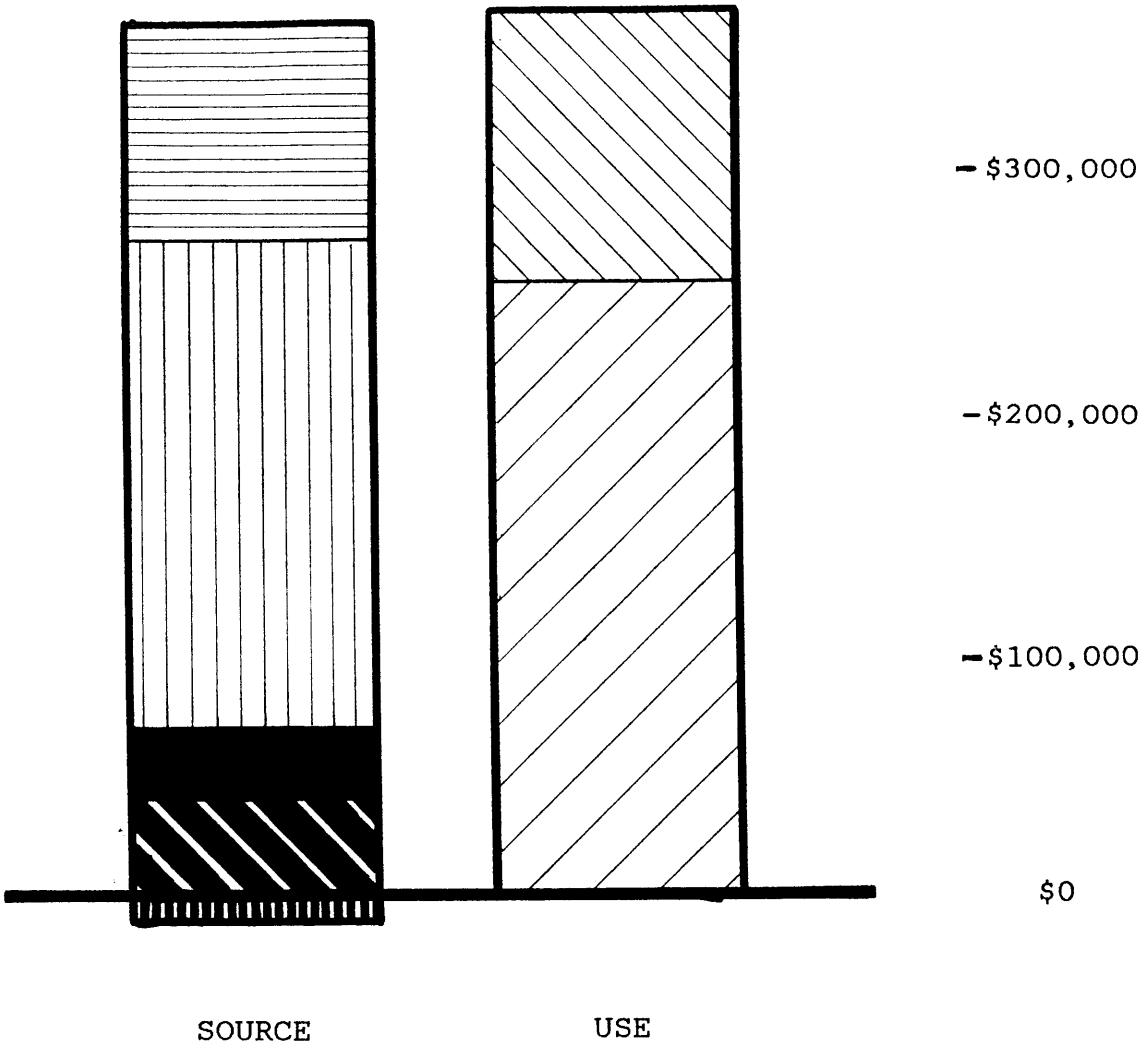

Figure 3-4: Barton Farm Subsidy Source and Use Summary

intended for each subsidy use. The APR subsidy of $200,400 provided for most of the $252,000 subsidy required for agricultural preservation, and the $99,700 open space sale nearly covered the $114,700 in subsidies needed for open space protection.

Apportionment of Total Development Value and Development Costs

Apportionment of Total Development Value and development costs in the Barton Farm analysis was based on frontage. With the exception of the southern tip of the original farm, all potential house lots on the property could have had frontage on existing roads.[30] Although there is interior land to the west of the railroad tracks, most of was unbuildable because it lay within the 100-year floodplain, was wetlands, or was unsuitable for septic systems.[31]

Frontage is not as useful a measure for the southern tip of the farm, however, which had no frontage. Rather, an existing subdivision road ended at the property line, and has since been continued to form a cul-de-sac and create

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[30] Matlock Associates, "18 Lot Development Sketch, Barton Property - I, Sudbury, Mass," Lincoln, Mass.: photocopied map from Matlock Associates, undated; and "6 Lot Layout Plan, Barton II Property, Sudbury, Massachusetts," Lincoln, Mass.: photocopied document and map from Matlock Associates, July 28, 1981.

[31] Matlock Associates, "Development Constraints," Lincoln, Mass.: photocopied plan from Matlock Associates, February, 1981.

frontage. Further, virtually all of this section of the farm was dry and suitable for septic systems.[32]

There is little difference in the results of the analysis if based on acreage rather than frontage, however. When based on acreage, development subsidies accounted for a somewhat greater proportion of the total subsidy sources--25 rather than 16 percent.[33]

Non-Development Subsidy Sources

Bargain Sale Subsidy

Because of the competing factions of the estate, the fiduciary responsibility of the estate, comments by case participants, and the appraisal as a basis for MFCLT's bid for the property, I have used the purchase price of $537,500 as the Total Development Value for the Barton Farm analysis. This means there was no Bargain Sale Subsidy.

APR and Open Space Sale Subsidies

The sale of the APR and Open Space land gave a combined subsidy of $300,000 to the Barton Farm project. With the actual level of development that took place, if the project had an APR of zero, it would have run a deficit of $210,000. Without the APR, either a great deal more development would have been required, an alternate source of non-development

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[32] Ibid.

[33] See Appendix B-1 for full acreage-based analysis.

subsidy would have been needed, or the project would not have been possible.

Cost Subsidy

The willingness of the estate to carry the property while MFCLT planned the limited development project and marketed the development parcels represents a sort of cost subsidy.

MFCLT also provided cost subsidies to the project by absorbing staff costs as part of its operating budget, the extent of which is unknown. MFCLT also absorbed the $9,900 deficit of the project, providing another subsidy.

Development Subsidy Sources

Enhancement Subsidy

The basic Subsidy Source and Use analysis for Barton Farm has assumed an overall enhancement premium of 10 percent. In other words, I have assumed that 10 percent was added to the value of the unenhanced development parcels due to the restrictions on the adjacent agricultural and open space parcels. This assumption yielded an Enhancement Subsidy of $24,800--only seven percent of the total subsidy sources.

The basic assumption of 10 percent is not based on firm data, however. Interviews with realtors and case participants provided little clear insight into the value added to the development by the restrictions on adjacent

parcels.

The realtor who sold the finished houses that Creighton Hamill produced, Jeanne Flynn, felt there was no value added by the agricultural and open space restrictions at that time the lots were sold. She added, however, that the restrictions would add value to the houses in the future. "The real value of this won't be realized for years," she said.[34]

Hamill himself felt he paid no more for the land than he would have without the restrictions. He said he had "reservations" about the adjacent agricultural use, and felt that potential buyers might share these.[35]

Two other local realtors not involved in the case provided little insight into the value of the enhancement, but maintained that it was tied to the specific site conditions.

The first estimated that adjacent non-agricultural restricted land would add between $25,000 and $50,000 to a $200,000 house lot. Her estimates were for Sudbury in 1987, however, five years after Hamill bought the land. She added that restricted agricultural land would add no value to adjacent building lots. She also argued that traffic past some of the development parcels at Barton would counteract

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[34]Telephone interview with Jeanne Flynn, J. M. Flynn Realty, Sudbury, December 3, 1987.

[35]Hamill interview.

any enhancement of their value.[36]

The second realtor also argued that enhancement was a function of the individual project and development parcel. "So much depends on the specifics," said John Haslett. He added that much of the value depends on the particular lot buyer as well as the lot itself.[37]

MFCLT's Ward felt there was a premium on the development land due to the restriction of the agricultural land, and felt it might have been as high as 30 percent of the value of the improved development land. He added, however, that part of that premium was attributable to the exclusive housing Hamill produced, which best took advantage of the value of the restrictions.[38]

More important than the enhancement premium assumed is the range of possible values of the Enhancement Subsidy. It can be argued that the entire value added to the development land was the result of enhancement: because of the simultaneous closings, there was no appreciation in the value of the land; and because MFCLT sold the development parcels without subdividing them, there may have been no value added through subdivision. If we accept this argument and assume that the appreciation and subdivision subsidies

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[36] Telephone interview with Maureen Loynd, December 1, 1987.

[37] Telephone interview with John Haslett, Davenport Boyd West Realty, Dover, December 7, 1987.

[38] Ward interview, October 5, 1987.

were both zero, then the enhancement premium would have been 31 percent of the value of the unenhanced land. It is unlikely that the enhancement premium was higher than 31 percent, and it was probably much less.

At 30 percent, enhancement would add a $63,000 subsidy to the project, but this still would represent only 18 percent of the total subsidies provided (Table 3-3). Even under extreme assumptions, then, enhancement added relatively little to the success of the Barton Farm project.

TABLE 3-3: BARTON FARM
ENHANCEMENT SUBSIDY SENSITIVITY
TO ENHANCEMENT RATE

Enhancement Premium	Enhancement Subsidy	Percent of Subsidy Sources
0.0%	$0	0%
10.0%	**$24,755**	**7%**
20.0%	$45,383	13%
30.0%	**$62,838**	**18%**

Appreciation Subsidy

Because the simultaneous closings eliminated any holding period for the project, I have assumed that appreciation added no value to the Barton Farm development parcels. The slight negative Net Appreciation Subsidy is the result of the minimal interest and real estate costs incurred by the project. Although MFCLT did not realize any appreciation, Hamill was able to realize significant appreciation during the time he built and marketed his

houses, according to Ward.[39]

Net Subdivision Subsidy

Although it sold the development parcels undivided, it is likely that MFCLT did realize a "subdivision" subsidy. MFCLT added value to the development parcels by bringing the entire project together, doing soil tests for septic suitability on the development parcels, doing the preliminary planning and design for the development parcels, and establishing the plan's credibility with the town planning board and conservation commission. In its development role, MFCLT probably also decreased the value of the value of the development parcels by placing limits on the number of buildings that were allowed, and with the preservation and rehabilitation restrictions on the barn complex.

Based on the assumption of a 10-percent enhancement premium, the net subdivision subsidy was $40,100, or 11 percent of the total subsidy sources (Table 3-4). The value of the subdivision subsidy is sensitive to assumptions for the enhancement premium and Total Development Value, however.

The Net Subdivision Subsidy does vary with assumptions about the enhancement premium--from zero if enhancement is assumed to have accounted for all of the value added to the

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[39] Ibid.

development parcels, to $64,900 if subdivision is assumed to have accounted for all the increase in value of the development parcels (Table 3-5). Even assuming an enhancement premium of 30 percent, the Net Subdivision accounts for only 18 percent of the total subsidy sources.

TABLE 3-4: BARTON FARM NET SUBDIVISION SUBSIDY

Total Development Value	$537,500
* Market Development Land Percentage	35%
Value of Development Land at Acquisition	$186,957
Gross Sales of Development Land	$272,300
- Value of Development Land at Acquisition	$186,957
Increase in Value of Development Land	$85,343
- Total Enhancement	$24,755
- Gross Appreciation	$0
Gross Subdivision Subsidy	$60,589
- Professional & Staff Costs	$20,484
NET SUBDIVISION SUBSIDY	**$40,105**

Although I have assumed that the purchase price of the Barton Farm represents its Total Development Value, it is possible that the real Total Development Value was slightly higher (it is doubtful it was lower, however). A higher Total Development Value means that the development parcels were worth more when acquired, so there was less value added to reach the sales price, and less subsidy attributable to the land development process. The Net Subdivision Subsidy is approximately zero when the Total Development Value is assumed to be $650,000 (Table 3-6). It is possible, then,

that there was little or no Net Subdivision Subsidy.

TABLE 3-5: BARTON FARM SENSITIVITY OF NET SUBDIVISION SUBSIDY TO ENHANCEMENT RATE

Enhancement Rate	Net Subdivision Subsidy	Percent of Subsidy Sources
0.0%	$64,860	18%
10.0%	**$40,105**	**11%**
20.0%	$19,476	5%
30.0%	$2,021	1%

TABLE 3-6: BARTON FARM SENSITIVITY OF NET SUBDIVISION SUBSIDY TO TOTAL DEVELOPMENT VALUE

Total Development Value	Net Subdivision Subsidy	Percent of Subsidy Sources
$537,500	**$40,105**	**11%**
$600,000	$18,366	5%
$650,000	**$975**	**0%**

Value added by assembling the players and pieces of the Barton Farm project, preliminary engineering and subdivision design, and initiating the approvals process was a small part of the subsidy sources for the project, providing no more than 18 percent of the subsidies.

Summary

Regardless of the relative size of the enhancement and net development subsidies for the Barton Farm, the $57,000 in total Development Subsidies was much less important than the $300,000 in subsidies from Non-Development sources (the

sale of the APR to the state and the conservation land to the Town of Sudbury).

Although the data do not allow an exact determination of Enhancement or Net Subdivision Subsidies, each was between $0 and $65,000. Enhancement added between zero and 30 percent to the value of the unenhanced land.

The Barton Farm project is not an illustration of limited development as an alternative to the purchase of development rights or land by government agencies. Rather, it is an example of how limited development can marginally augment these purchases.

CHAPTER IV: POWISSET FARM

The Powisset Farm limited development in Dover, Massachusetts, also the work of the Massachusetts Farm and Conservation Land Trust (MFCLT), shows the promise of limited development, saving 106 acres of farmland and 29 acres open space with relatively small public subsidies.

The basic financial analysis suggests that the 54 acres of development land at Powisset Farm generated more benefits than all non-development sources combined--enough to have supported the preservation of agricultural land and the protection of open space without any non-development subsidies. Uncertainty over basic assumptions casts doubt on the reliability of this result, however.

CASE HISTORY

On her death in May, 1984, conservationist and philanthropist Amelia Peabody left 542 acres of her Dover estate to The Trustees of Reservations (TTOR, see Chapter III), creating the Noanet Woodlands Reservation. Left to be sold for charitable causes was the adjacent 187-acre Powisset Farm (Figures 4-1 and 4-2), where she had

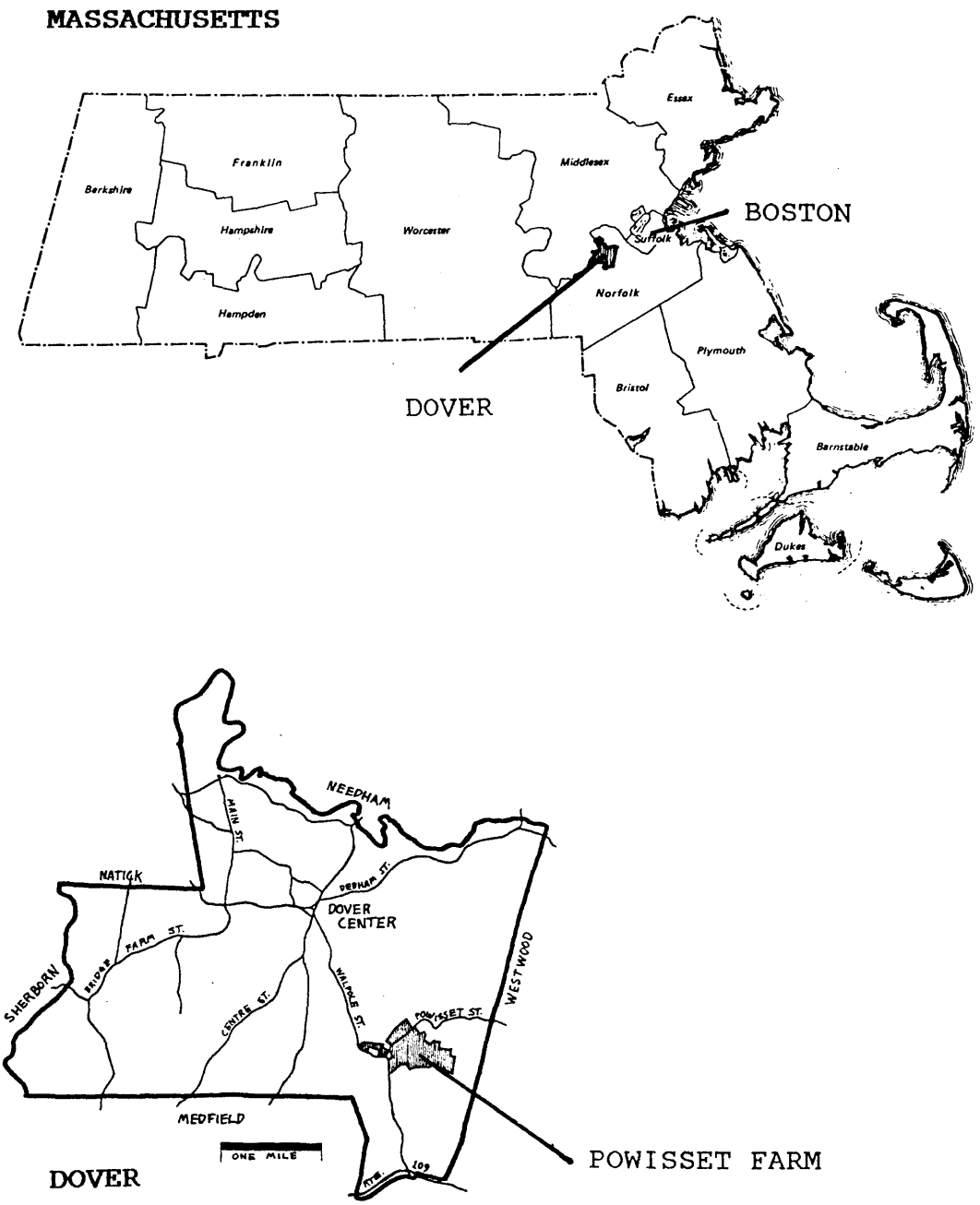

Figure 4-1: Powisset Farm Locus Maps

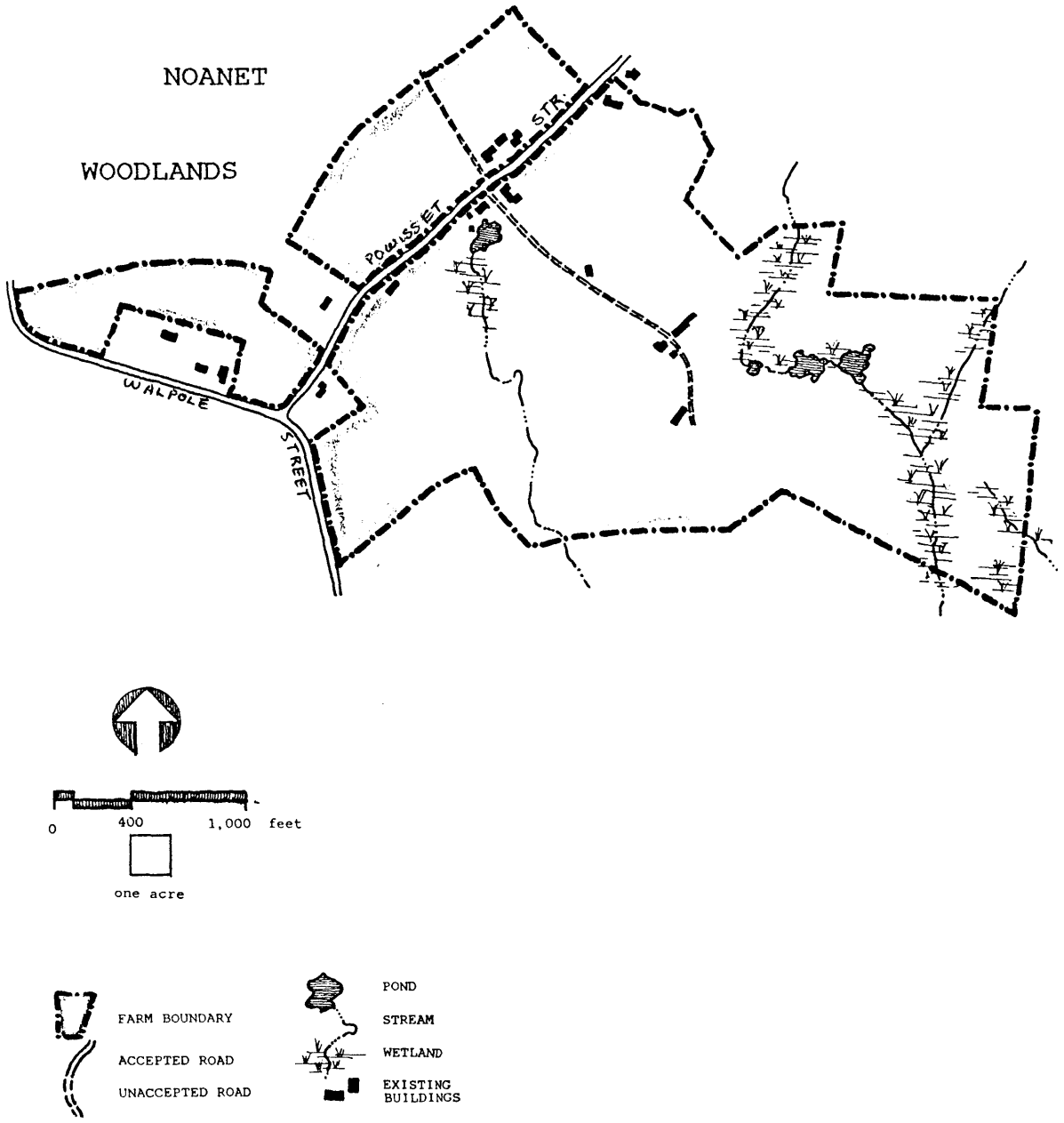

Figure 4-2: Powisset Farm Original Conditions

overseen the raising of prize cattle and pigs.[1]

TTOR's affiliated organization, the Massachusetts Farm and Conservation Land Trust (MFCLT, see Chapter III), sought to purchase the property in order to control development next to Noanet woodlands, create a link between Noanet and another reservation in Medfield, and to preserve the productive farmland.[2] By 1984, MFCLT had evolved from a farmland preservation organization assisting the APR program into the land acquisition arm of TTOR. Despite the shift, according to MFCLT Executive Director Wesley Ward, farmland preservation remained a priority for the organization.[3]

The executor of the Peabody estate, attorney Harry Rice, was concerned that development of the farm be sensitive to neighbors' and the town's concerns. Ms. Peabody's will, as well as town zoning, limited development to a minimum lot size of one acre. Rice had already received one offer from a developer whom he did not trust to develop the land sensitively.[4]

Facing the high cost of buying Powisset Farm from the Peabody estate, MFCLT proposed a limited development plan

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[1] The Trustees of Reservations, "The Trustees of Reservations, Summer Newsletter 1985," Beverly, Mass (1985), p.1.

[2] Ibid.

[3] Telephone interview with Wesley Ward, Executive Director, MFCLT, December 1, 1987.

[4] Telephone interview with Harry Rice, December 3, 1987.

for the site. Rice felt TTOR's plan to continue active agriculture on the farmland would have pleased Ms. Peabody, and he trusted TTOR to produce a development sympathetic to the surroundings. "The Trustees of Reservations had too much visibility to act up on me," he said.[5]

MFCLT signed a purchase and sale agreement for the farm in April, 1985, and purchased the farm October 31, 1985 for $2,407,270. Rice believed the price was a little--perhaps $200,000--below what he might have gotten by selling it to a for-profit developer. The land was being sold to fund two charities created by Ms. Peabody; Rice served as the trustee of one of them. Ward agreed that the price seemed like a bargain at the date of the closing, but said it represented the value of the land at the signing of the purchase and sale six months earlier.[6]

The purchase was financed by a $400,000 loan from TTOR's revolving fund, $250,000 from the Town of Dover for the purchase of 33 acres of conservation land from the farm, and a commercial bank loan for the balance.[7]

MFCLT's limited development plan identified 106 acres of agricultural land to preserved and 29 acres of

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[5] Ibid.

[6] Ibid; Telephone interview with Karen MacTavish, Assessors Office, Town of Dover, December 3, 1987; TTOR, "Summer Newsletter 1985"; telephone interviews with Wesley Ward, December 1 and 23, 1987.

[7] TTOR, "Summer Newsletter"; MacTavish interview; Ward interview, December 1, 1987.

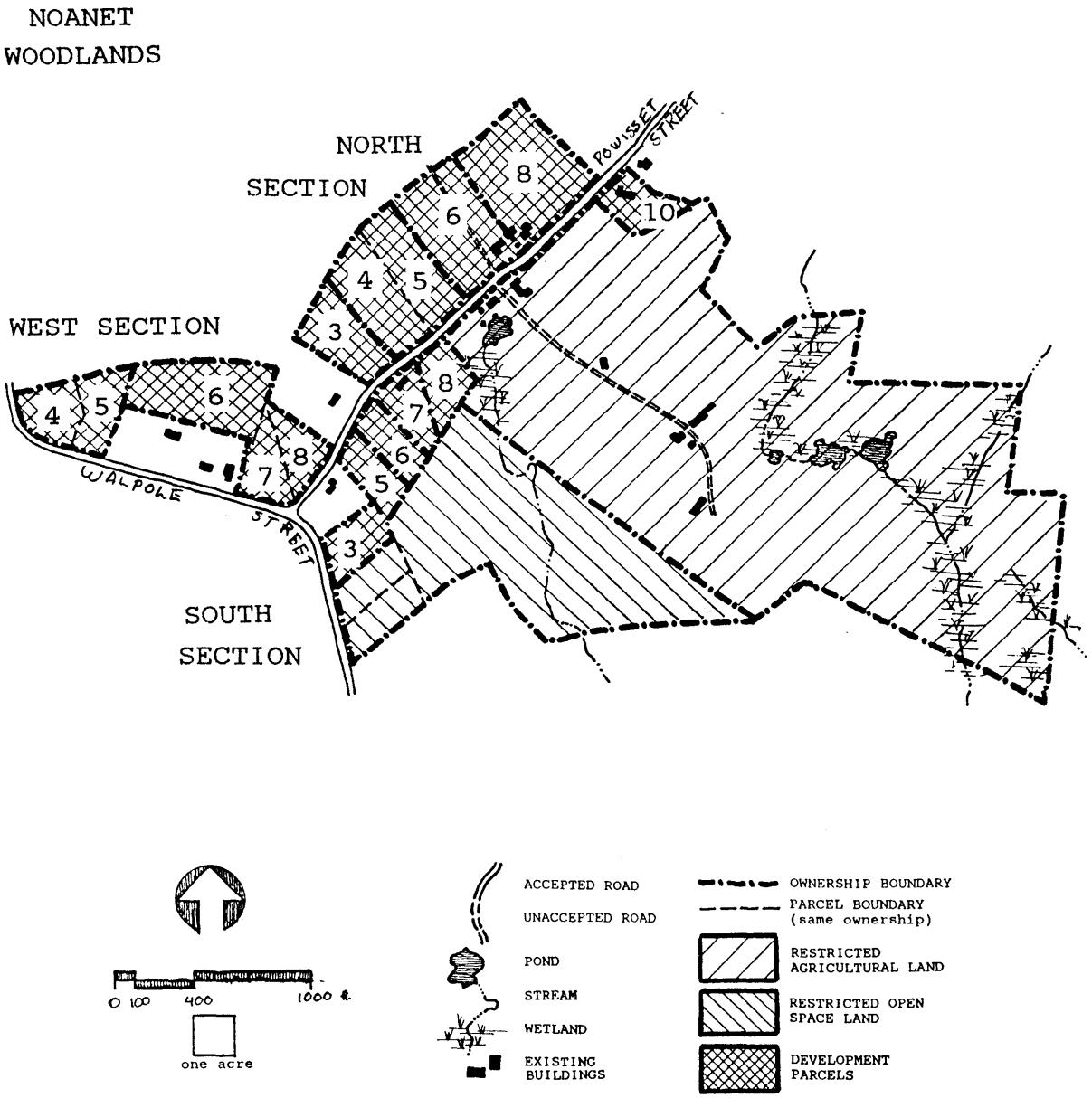

Figure 4-3: Powisset Farm Limited Development Plan

conservation land to be sold to the Town of Dover (Figure 4-3). The remaining 54 acres were subdivided into 15 potential house lots, four of which included existing houses, and all of which had frontage on Walpole or Powisset Streets.[8] Although MFCLT did not necessarily prefer the large-lot pattern dictated by the plan, Ward said it kept the deal as simple and swift as possible.[9]

Several development lots were combined when sold, and deed restrictions limited the number of new houses on the development parcels to no more than seven.[10] In all, deed restrictions barred construction on 15 of the 54 acres of development land, all adjacent to Noanet Woodlands. Sections of two lots must be maintained as open fields, and deed restrictions prevent the expansion of any new or existing dwelling by more than 30 percent in gross floor area.[11]

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[8] TTOR, "Preservation & Limited Development Plan (Preliminary) ...," photocopied plan, May, 1985.

[9] Ward interview, October 5, 1987; TTOR, "Preservation & Limited Development Plan (Preliminary) ...."

[10] Lots four and five in the western section of the limited development were sold together and restricted to a single house; lots six, seven, and eight in the western section were sold together and restricted to a single house; and lots four and five in the northern section were combined and restricted to a single house. All other development parcels allow construction of one house or maintenance of an existing house. Interview with Peg Crowley, Realty World Brown, Dover, Mass., December 7, 1987.

[11] Paul V. O'Leary, Appraisal Review of Powisset Farm, (DFA Powisset Farm APR file), March 12, 1986, p. 4.

Rather than wholesaling undivided lots to a builder as it had with the Barton Farm, MFCLT chose to retail the houses and development lots to individual buyers and small builders.[12] Sales and contracted sales of house lots to date total $3,175,000 (Table 4-1).

TABLE 4-1: POWISSET FARM MARKET DEVELOPMENT LOT SALES

Lot Designation	Sale Date	Acres	Sale Price
South 3	10/85	2.1	$170,000
South 5	10/85	2.0	$175,000
South 7	10/85	2.2	$240,000
South 10	10/85	2.0	$185,000
North 3	10/85	3.7	$240,000
North 4 & 5	10/85	8.5	$345,000
South 6	11/85	2.1	$175,000
North 8	12/85	8.3	$425,000
West 6, 7, & 8	3/86	10.3	$375,000
North 6	7/86	6.5	$470,000
West 4 & 5	1/88	4.5	$375,000
South 8	UNSOLD	2.1	$0
TOTAL		54.4	$3,175,000

[13]

Lot number eight on the south side of Powisset Street has yet to be sold, and probably will be kept as additional

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[12] Ward interview, October 5, 1987.

[13] MFCLT, "Powisset Farm Project, Summary of Income & Expense," undated photocopied document; Crowley interview; telephone interviews with Karen MacTavish, Dover Assessors office, December 3 and 23, 1987; Cheney Engineering, "Plan of Land in Dover, Mass., being a subdivision of land remaining on land court plan 27910A...," and "Plan of Land in Dover, Mass., being a subdivision of Lot 2, land court plan 18890C and a subdivision of lot shown on land court plan 14550A," Needham, Mass.: Cheney Engineering, blueprints from original mylar subdivision plans.

open space. A trail easement across the lot has been given to the Town of Dover by TTOR, providing a second entrance to the town's conservation parcel.[14]

An APR on 106 acres of farmland was sold for $350,000 ($300,000 from the state, $50,000 from the Town of Dover) in June, 1987. The price paid by the state for the APR was well below its appraised worth. The review appraisal of the property for the Department of Food and Agriculture estimated the market development value of the restricted agricultural land at $2,475,000 as of December, 1985, and its value (including a house and several farm buildings) when restricted as $700,000. The value of the APR, then, was estimated to be $1,775,000.[15]

James Alicata of the DFA's Bureau of Land Use termed the sale of the APR a "bargain sale" by MFCLT. The APR program could not afford the full cost of the APR, he said, and agreed to buy it only at the lower price.[16]

Rather than selling the restricted farmland, MFCLT has leased it to two different farmers for an annual total of $10,000 plus real estate taxes.[17]

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[14] Ward interview, December 23, 1987.

[15] O'Leary, Appraisal Review, pp. 6-13.

[16] Interview with James Alicata, Massachusetts Department of Food and Agriculture, Land Use Bureau, December 7, 1987.

[17] MFCLT, "Powisset Farm Project, Summary of Income & Expense," Beverly, Mass.: MFCLT, photocopied document, undated.

Although it certainly added to the sales income realized by MFCLT, retailing the lots added expenses for drilling wells, moving a barn, building repairs, and the broker's commission.[18] MFCLT's expenses for the project included:

Interest	$30,163
Real Estate Taxes	$25,605
Insurance	$3,120
Appraisal	$800
Planning Services	$7,044
Legal Services	$60,121
Surveying	$2,812
MFCLT Staff and Overhead Expenses (7.5%)	$180,545
Building Repair, Moving Barn, Well Drilling, Grounds Maintenance	$108,130
Heat, Light, Water, & Telephone	$4,713
Miscellaneous	$1,070 [19]

As described below in the financial analysis, the Powisset Farm produced a considerable surplus. These excess funds were added to the endowment for the maintenance of Noanet Woodlands.[20]

AGRICULTURAL IMPACT

TTOR, which owns and manages the farmland at Powisset, chose to lease it out in order to maintain productive agriculture. If the farmland had been sold, TTOR feared

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[18] Ward interview, October 5, 1987.

[19] MFCLT, "Summary of Income & Expense."

[20] Ward interview, October 5, 1987.

that it would quickly become a horse estate at "two or three times the price"--beyond the reach of most farmers.[21]

Scott Nutting, who lives in the farmhouse for $700 per month, leases 102 acres of the farmland. Because of differences between Nutting and TTOR, the lease is expected to be cancelled in April, 1988. Officially the farm is leased by the Powisset Dairy Corporation, which has a "paper" agreement to pasture heifers (young cows not yet producing milk) for the Shady Oaks Farm in Medway, owned by Nutting's cousins. Because the heifers require only an hour of feeding and washing each day, Nutting is strictly a part-time farmer, working a full-time job off of the farm.[22]

Relations between Nutting and TTOR have been strained. "The Trustees [of Reservations] saved this for farming, but they apply suburban values to it," Nutting claimed. A conservation organization leasing farmland needs to "just trust [the farmer] and walk away," he argued.[23]

Nutting said the conflict centered around use of farm buildings and physical changes to the farm. He felt TTOR had been slow in permitting changes to the farm, but admitted that he had made changes to the property without

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[21] Telephone interview with Davis Cherington, Land Planning and Management Foundation (formerly of TTOR and MFCLT), December 29, 1987.

[22] Ward interviews, October 5, and December 1 and 23, 1987; telephone interview with Scott Nutting, November 10, 1987.

[23] Nutting interview.

consulting TTOR, and that there had been farm management problems.[24]

Davis Cherington, then Executive Director of MFCLT, insisted TTOR did not hamper farming activity at Powisset in any way. Nutting was not prohibited from using chemical pesticides, for instance, only required to submit a list of chemicals in use to TTOR. Cherington maintained that leased farmland is often abused because of the lack of long-term commitment by the lessee.[25]

Nutting said he and his cousins originally intended to put 60 cows at Powisset, producing about one million pounds of milk annually for sale in neighboring towns and at the farm itself. They had intended to convert one building into a small bottling plant, selling milk, egg nog, hay, grain, and other farm products. Similar marketing at Shady Oaks had been "a gold mine," Nutting said.[26]

Sandy Hall currently leases less than an acre of land and a former piggery building for his specialty sheep farm now based on another estate in Dover.[27]

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[24] Nutting interview.

[25] Cherington interview, December 29, 1987.

[26] Ibid.

[27] Ward interviews, October 5 and December 1 and 23, 1987.

FINANCIAL ANALYSES

The clearest financial conclusion about the Powisset limited development project is that it was enormously successful, generating a surplus of just over $1 million.

Much less certain is exactly what produced that surplus. The subsidy source and use analysis of Powisset Farm suggests that the development parcels provided enough subsidy to carry the entire project--including both the agricultural and open space protection land uses.[28] According to the analysis, the success of the project was primarily due to the subdivision of the land into building lots.

Uncertainty over market appreciation rates, the Total Development Value of the farm, as well as the method of dividing the Total Development Value all undermine the reliability of the analysis, however.

Income and Expense

Powisset Farm produced a 37-percent return on the total expenses (Table 4-2). This success came in spite of the very low sale of the APR to the state, and not selling the final development lot. Viewed simply as income, the sale of the limited development lots and houses drove the success of

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[28] Throughout this analysis, the use of the surplus for the Noanet Woodlands endowment is disregarded. Open space protection refers only to the protection of the 29 acres of open space land that was part of Powisset Farm.

TABLE 4-2: POWISSET FARM INCOME AND EXPENSES

INCOME	
Total Rental Income	$0
Annual Rents Capitalized @ 10%	$100,000
APR Sale	$350,000
Total Restricted Agricultural Land Sales	$450,000
Open Space Land Sales	$250,000
Market Development Land Sales	$3,175,000
Affordable Housing Land Sales	$0
Total Development Land Sales	$3,175,000
Other Income	$0
TOTAL INCOME	**$3,875,000**

EXPENSES	
Purchase Price	$2,407,270
Financing	$30,163
Real Estate Taxes	$25,605
Insurance	$3,120
Legal Services	$60,121
Planning & Engineering	$7,044
Surveying	$2,812
Other Services	$800
Total Professional Services	$70,777
Staff Overhead	$180,545
Other Expenses	$113,913
TOTAL EXPENSES	**$2,831,393**

INCOME AND EXPENSES	
+ TOTAL INCOME	$3,875,000
- TOTAL EXPENSES	$2,831,393
SURPLUS or (SHORTFALL)	**$1,043,607**
RETURN ON TOTAL EXPENSES	**36.9%**

the entire project.

As with the Barton Farm, MFCLT was able to contain their interest costs by selling nine out of 15 development lots within two months. Through an agreement with the Peabody estate, several of the lots were actually sold two weeks before MFCLT closed on the farm.[29] By the ninth month of the project only two combined lots remained, and the project was safely in the black.

This quick turnaround on the development parcels contained all holding costs--interest, real estate taxes, and insurance. The three expenses totaled only 2.4 percent of the purchase price. Although there were "hard" costs and other expenses, they totaled only $114,000.

It should be noted that because there was no sale of farmland, I have used the capitalized value of the annual rents to show the value of the income stream from the agricultural land to TTOR. Rent paid for the farmland during the sell-out period of the development parcels is included in this capitalized income stream in both the income and expense and subsidy source and use analyses.

Subsidy Source and Use

The financial lesson of Powisset Farm is that limited development can, under the right conditions, provide significant subsidies to support agricultural preservation.

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[29] Ward interview, December 23, 1987.

TABLE 4-3: POWISSET FARM SUBSIDY SOURCES AND USES SUMMARY (acreage-based)

SUBSIDY SOURCES	Actual	Percent Subsidy Sources
Bargain Sale Subsidy	$392,730	12%
APR Subsidy	$350,000	11%
Open Space Sale Subsidy	$250,000	8%
Total Non-Development Subsidies	**$992,730**	**31%**
Enhancement Subsidy	$275,000	9%
Net Appreciation Subsidy	$423,352	13%
Net Subdivision Subsidy	**$1,510,893**	**47%**
Total Limited Development Subsidies	**$2,209,245**	**69%**
TOTAL SUBSIDY SOURCES	**$3,201,975**	**100%**

SUBSIDY USES	Actual	Percent Subsidy Uses
Agricultural Preservation	$1,676,190	78%
Open Space Protection	$482,179	22%
Affordable Housing Contribution	$0	0%
TOTAL SUBSIDY USES	$2,158,368	100%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$3,201,975
- TOTAL SUBSIDY USES	$2,158,368
SUBSIDY SURPLUS or (SHORTFALL)	**$1,043,607**
PERCENT OF SUBSIDY USES	**48.4%**

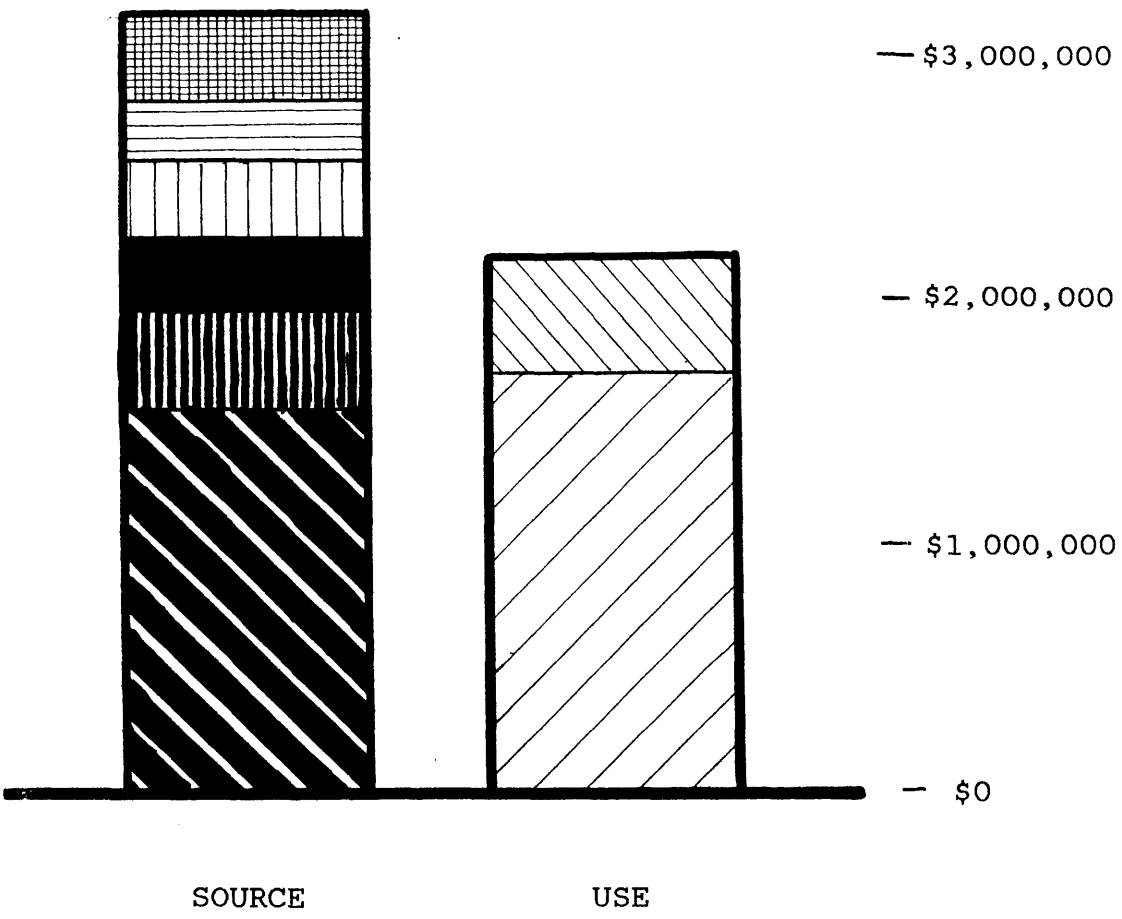

Figure 4-4: Powisset Farm Subsidy Source and Use Summary

Using an acreage-based analysis and assumptions discussed below, development subsidies accounted for 69 percent of the subsidy sources (Table 4-3, Figure 4-4). It is likely that this analysis underestimates both appreciation and the extent and relative importance of the bargain sale, however.

Apportionment of Total Development Value and Development Costs

Unlike the two other case studies, Total Development Value and Development Costs were apportioned by acreage, not frontage, for the Powisset Farm subsidy source and use analysis.

The acreage-based analysis better accounts for the large amounts of buildable land that lacked frontage on an existing road, particularly the land that became the agricultural and open space parcels. Indeed, appraisals for the APR showed the potential for at least 15 large house lots on interior sections of the agricultural parcel. And lot prices in Dover in 1985 and 1986 would easily support the construction of subdivision roads to make use of these potential interior lots.[30]

Using acreage as the basis for apportioning the Total Development Value of the farm at acquisition overestimates the value of the agricultural portion of the parcel and underestimates the value of the development parcels,

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[30] LandVest, "Highest and Best Use Plan," and "Soils Suitability & Highest and Best Use Plan Combined," photocopied plans from DFA Powisset Farm APR file, both undated.

however. The agricultural land includes several wetlands and areas unsuitable for septic systems.[31] An acreage-based analysis also does not account for the cost of constructing roads, attributing an equal value to an acre of interior land and an acre of frontage land. Neither the acreage nor frontage method takes account of the value of the four existing houses. Because it attributes less initial value to the development parcels, the acreage-based analysis exaggerates the Net Subdivision Subsidy.

TABLE 4-4: POWISSET FARM FRONTAGE-BASED SUBSIDY SOURCE SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources
Bargain Sale Subsidy	$392,730	22%
APR Subsidy	$350,000	20%
Open Space Sale Subsidy	$250,000	14%
Total Non-Development Subsidies	**$992,730**	**57%**
Enhancement Subsidy	$275,000	16%
Net Appreciation Subsidy	$423,352	24%
Net Subdivision Subsidy	**$60,665**	**3%**
Total Limited Development Subsidies	**$759,017**	**43%**
TOTAL SUBSIDY SOURCES	**$1,751,747**	**100%**

Because the preponderance of the frontage was used for development and most of the acreage was restricted to agricultural use, the Powisset subsidy sources are quite sensitive to the method of apportioning the Total

[31] LandVest, "Septic System Suitability Plan," photocopied plan in DFA Powisset Farm APR file, undated.

Development Value. Using a frontage-based analysis (Table 4-4, compare with Table 4-3), more of the subsidies are provided by the non-development sources. The most significant difference is in the Net Subdivision Subsidy: using an acreage-based analysis it is the largest single subsidy, accounting for almost half of the subsidy source (Table 4-3); under a frontage-based analysis it is the smallest subsidy at only three percent of all subsidy sources (Table 4-4).

Such a wide variation casts doubt on the results of either method. In the absence of a full appraisal, it is simply impossible to be certain of the apportionment of the Total Development Value and the subsidies from each source at Powisset Farm.

Non-Development Subsidy Sources

Under an acreage-based analysis, non-development subsidies accounted for only 31 percent of all the subsidies provided. Because of uncertainty over the Total Development Value, however, they could have been higher.

Bargain Sale Subsidy

Executor Harry Rice said the $2.4-million sale price for Powisset Farm was about $200,000 less than it was worth. In the belief that this is still a low estimate of the farm's development value at acquisition, I have assumed its Total Development Value was $2,800,000.

Assuming a Total Development Value of $2,800,000 yields a Bargain Sale Subsidy of just under $400,000, or 12 percent of all subsidy sources.

It is possible that the Total Development Value was much higher. The APR review appraisal set the development value of the agricultural land alone at $2,475,000 in December, 1985, only three months after the land was purchased by MFCLT, and nine months after the signing of the purchase and sale. Ward felt there was a sharp increase in values between the signing of the purchase and sale agreement by the estate and MFCLT in April and the closing six months later.[32]

Assuming a higher Total Development Value results in a much higher, and much more significant Bargain Sale Subsidy (Table 4-5). Assuming a Total Development Value of $4 million--which is certainly possible--would mean a bargain sale subsidy of $1.6-million--almost 40 percent of all subsidy sources.

TABLE 4-5: POWISSET FARM BARGAIN SALE SUBSIDY SENSITIVITY TO TOTAL DEVELOPMENT VALUE

Total Development Value	Bargain Sale Subsidy	Percent of Subsidy Sources
$2,800,000	**$392,730**	**12.3%**
$4,000,000	**$1,592,730**	**39.2%**
$5,000,000	$2,592,730	54.3%

[32] O'Leary, Appraisal Review; Ward interview, October 5, 1987.

Agricultural Preservation Restriction Subsidy and Open Space Sales Subsidy

While both of the other case studies can be characterized as APR projects that were assisted by development subsidies, Powisset Farm can be seen as a successful limited development project that received assistance from the sale of an APR and open space.

Under an acreage-based analysis, the $350,000 APR provided 11 percent of the total subsidy sources, while the Open Space Sales accounted for another eight percent.

The project would easily have produced a surplus without the sale of either the APR or the conservation land to Dover, a fact Ward said was not apparent until the project was well underway.[33]

Cost Subsidy

It is unlikely that there was much of a cost subsidy provided at Powisset Farm. Ward felt certain that the $180,500 attributed to staff and overhead costs **did** reflect MFCLT's actual costs.

The estate provided a sort of cost subsidy by agreeing to a late closing date, holding the farm while MFCLT planned and executed the project with minimal carrying costs.

Development Subsidies

Taken as a whole, the development subsidies were

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[33] Ward interview, October 5, 1987.

responsible for 69 percent of the total subsidies provided under an acreage-based analysis. Even under a frontage-based analysis development subsidies amount to almost half of the subsidies provided, and still cover all of the subsidy use by the project (Table 4-4, Appendix C-2).[34]

Enhancement Subsidy

Enhancement of the development lots by the agricultural restriction or town conservation land at Powisset Farm is difficult to assess. The assumptions of enhancement in this case are based on lot-by-lot estimates provided by realtor Peg Crowley, who marketed the lots (Table 4-6). Rather than the enhancement premium being a rate assumed across all of the lots, then, the premium shown is the result of adding all of the individual lot enhancement values.

Enhancement at Powisset is complicated by the fact that eight of the original 15 development lots abut Noanet Woodlands. Any enhancement value added to lots by Noanet should **not** be considered a subsidy resulting from the Powisset Farm limited development project. Noanet had already been donated to TTOR by the Peabody will by the time the farm was purchased. In theory, the enhancement value added to Powisset development parcels by Noanet Woodlands would have been reflected in the market value of the farm

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[34] Because a frontage-based analysis attributes less of the total development value to non-market land uses, less subsidies are required.

when MFCLT purchased it. The enhancement subsidy measures the **internal** enhancement--value added to the development parcels by the restriction of sections of the limited development project itself.

TABLE 4-6: POWISSET FARM LOT-BY-LOT ENHANCEMENT ESTIMATES

Lot Designation	Sale Price	Enhancement Premium	Unenhanced Value	Percent of Unenhanced Value
South 3	$170,000	$25,000	$145,000	17%
South 5	$175,000	$25,000	$150,000	17%
South 7	$240,000	$25,000	$215,000	12%
South 10	$185,000	$75,000	$110,000	68%
North 3	$240,000	$0	$240,000	0%
North 4 & 5	$345,000	$0	$345,000	0%
South 6	**$175,000**	**$25,000**	**$150,000**	**17%**
North 8	**$425,000**	**$100,000**	**$325,000**	**31%**
West 6, 7, & 8	$375,000	$0	$375,000	0%
North 6	$470,000	$0	$470,000	0%
West 4 & 5	$375,000	$0	$375,000	0%
South 8	$0	$0	$0	0%
TOTAL	**$3,175,000**	**$275,000**	**$2,900,000**	**9%**[35]

In addition, enhancement is difficult to assess at Powisset because many of the development parcels did not actually abut the restricted farmland or open space. Only

[35] The "South 3, 5, 6, and 7" lots are all similar and abut the Town of Dover's open space parcel. The "South 10" lot has restricted farmland on two sides, and includes a house which Crowley felt actually detracted from the value of the land.

Crowley felt the setting and restrictions on adjacent land were important to the buyer of the "North 8," but declined to estimate a value added. The $100,000 estimate is mine. It represents, I believe, the maximum that can be attributed to enhancement by the agricultural parcel across the street.

Crowley felt the restrictions were of no importance or value whatsoever to the "North 6" buyer."

six of the 15 development lots abut the farmland or open space, and two more lots are across Powisset Street from the farmland. Crowley felt that value was added only to those lots which abutted or faced the restricted agricultural land or town conservation land.[36]

Crowley also maintained that enhancement was a function of specific buyers, with some placing a high premium on the setting and adjacent land uses and restrictions, and others none at all.[37]

The $275,000 in enhancement value added to the lots, represents about nine percent of the unenhanced value of all of the development land. In other words, restricting part of the land increased the overall value of the remainder by only nine percent.

Compared to the other subsidy sources, the $275,000 enhancement subsidy was small--only nine percent of all subsidy sources under an acreage-based analysis.

Although higher assumptions of the value added through enhancement produce higher enhancement subsidies, very high assumptions are necessary for enhancement to figure significantly in the limited development (Table 4-7). Even if the value added had been as high as 40 percent of the unenhanced value, the Enhancement subsidy would account for less than 30 percent of the total subsidy sources.

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[36] Ibid.

[37] Crowley interview.

TABLE 4-7: POWISSET FARM ENHANCEMENT SUBSIDY SENSITIVITY TO ENHANCEMENT PREMIUM

Enhancement Rate	Enhancement Subsidy	Percent of Subsidy Sources
0.0%	$0	0.0%
10.0%	$288,636	9.0%
40.0%	**$907,143**	**28.3%**

Net Appreciation Subsidy

Because the Powisset development parcels were sold so quickly, appreciation contributed little to the project. Indeed, more than half of the appreciation that did accrue was on the two final sales.

I have added four months to the actual holding time of all the development parcels to account for appreciation between the purchase and sale between MFCLT and the estate and the closing. While six months elapsed between the agreement on a price for the farm and the closing, most of the lot sale prices were agreed to only two months before their closings.

The "Monthly Appreciation Rate" assumed is 2.0 percent, which translates into an annual rate of 27 percent. Data on appreciation in Dover from County Comps (comparables), also known as County Home Data, a subscription service to New England realtors, is shown in Tables 4-8 and 4-9. The data are flawed because the median residential sale figures are not based on comparable sales. Nevertheless, the County

Comps data provide at least a rough benchmark for measuring appreciation.

TABLE 4-8: INCREASE IN DOVER MEDIAN RESIDENTIAL SALES, 1st QUARTER 1985 to 3rd QUARTER, 1987

Quarter	Median Residential Sale	Monthly Increase Rate from 1st Q, 1985
1st, 1985	$260,000	
2nd, 1985	$295,000	4.30%
3rd, 1985	**$279,500**	**1.21%**
4th, 1985	$326,250	2.55%
1st, 1986	$244,000	-0.53%
2nd, 1986	$326,500	1.53%
3rd, 1986	$325,500	1.26%
4th, 1986	$325,000	1.07%
1st, 1987	$360,000	1.37%
2nd, 1987	$426,000	1.85%
3rd, 1987	**$452,500**	**1.86%**
TOTAL PERCENTAGE INCREASE		74.0%
MONTHLY INCREASE RATE		1.86%

[38]

There are two important points at which to measure the appreciation rates for Powisset Farm. The first is during the six months from the signing of the purchase and sale to the closing (first to third quarters, 1985), when appreciation was added to all of the development lots. The County Comps data show a monthly appreciation rate of 1.2 percent for this period. Overall rates as of the preceding and subsequent quarters were higher, however.

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[38] County Home Data, "Median Report for Dover," Shelburne, Vt.: County Home Data, photocopied documents, fourth quarter, 1986 and third quarter 1987.

The second period of concern is from the first quarter of 1985 to the present, because the greatest amount of appreciation was on the last lots sold. Based on the quarterly median residential sales (Table 4-8), the overall monthly appreciation rate from the third quarter of 1985 to the third quarter of 1987 was 1.9 percent. If the monthly appreciation rate is based on annual medians (including the first half of 1987, Table 4-9), the rate is again just under two percent.

TABLE 4-9: INCREASE IN MEDIAN RESIDENTIAL SALES, 1985-1987
DOVER AND NORFOLK COUNTY

	DOVER		NORFOLK COUNTY	
YEAR	Number	Median Residential Sale	Number	Median Residential Sale
1985	105	$266,000	12,617	$136,510
1986	139	$325,000	15,269	$173,586
Ja-Jun, 1987	90	$377,500	10,567	$184,164
1985 to 1986 TOTAL PERCENTAGE INCR.		22.2%		27.2%
MONTHLY INCREASE RATE		1.68%		2.02%
1984 to January-June, 1987 TOTAL PERCENTAGE INCR.		41.9%		34.9%
MONTHLY INCREASE RATE		**1.96%**		1.68%

[39]

[39] County Home Data (County Comps), "Statistical Report for the Year of 1985 for Norfolk County," "Statistical Report for the Year of 1986 for Norfolk County," and "Statistical Report for the Months of January thru June, 1987 for Norfolk County," Shelburne, Vt.: County Home Data, photocopied documents, 1986 and 1987.

In all likelihood, land was appreciating at rates much higher than buildings during this period and these figures, which include both finished houses and unbuilt lots, underestimate the appreciation rate for in land alone.

Assuming two-percent monthly appreciation, **gross** appreciation of the **un**enhanced development land was $482,200. When holding costs of interest, real estate taxes, and insurance are subtracted, the **Net** Appreciation Subsidy is $423,400 (Table 4-10). This accounted for 13 percent of all subsidies provided in the Powisset Farm project.

TABLE 4-10: POWISSET FARM NET APPRECIATION SUBSIDY

Gross Appreciation	$482,240
- Interest, Real Estate Taxes, & Insurance	$58,888
+ Rental Income	$0
NET APPRECIATION SUBSIDY	**$423,352**

TABLE 4-11: POWISSET FARM NET APPRECIATION SUBSIDY SENSITIVITY TO MONTHLY APPRECIATION RATE

Monthly Appreciation Rate	Net Appreciation Subsidy	Percent of Subsidies Provided
0.00%	($58,888)	-1.8%
1.00%	$202,931	6.3%
2.00%	**$423,352**	**13.2%**
3.00%	$611,463	19.1%
4.00%	$774,019	24.2%

Sensitivity analysis (Table 4-11) shows that the Net Appreciation Subsidy would have a significant impact on the project only given extremely high assumptions of monthly appreciation. For net appreciation to account for a quarter of the subsidy sources, we would have to assume appreciation of four percent per month, or 60 percent annually. While appreciation that high may have occurred for several months, it is unlikely it continued for an extended period of time.

Net Subdivision Subsidy

The acreage-based analysis suggests that the surplus produced by the Powisset Farm limited development was largely the result of the creation and marketing of subdivided building lots. Given the division of the Total Development Value by acreage and initial assumptions of enhancement, appreciation, and Total Development Value, the **Net** Subdivision Subsidy was $1,511,000 (Table 4-12), or 47 percent of all the subsidies provided.

This result is sensitive to a number of assumptions, however. It is sensitive to both enhancement value added and the appreciation rate, but in both cases only extreme assumptions alter the basic conclusion that the Net Subdivision Subsidy was the single most important subsidy provided.

The result is extremely sensitive to the method of dividing the Total Development Value. Part of the reason for the large Net Subdivision Subsidy can be seen in Table

4-12 in the relatively low development value at acquisition, $802,200, attributed to the development land. A frontage-based analysis attributes a much higher value--$1.9 million--to the development land at acquisition, but attributes a very low value--$529,000--to the agricultural land.

TABLE 4-12: POWISSET FARM NET SUBDIVISION SUBSIDY

Total Development Value	$2,800,000
* Market Development Land Percentage	29%
Value of Development Land at Acquisition	**$802,224**
Gross Sales of Development Land	$3,175,000
- Value of Development Land at Acquisition	$802,224
Increase in Value of Development Land	$2,372,776
- Total Enhancement	$275,000
- Gross Appreciation	$482,240
Gross Subdivision Subsidy	$1,615,536
- Professional & Staff Costs	$104,643
NET SUBDIVISION SUBSIDY	**$1,510,893**

TABLE 4-13: POWISSET FARM NET SUBDIVISION SUBSIDY SENSITIVITY TO TOTAL DEVELOPMENT VALUE

Total Development Value	Net Subdivision Subsidy	Percent of Subsidy Sources
$2,800,000	$1,510,893	47.2%
$4,000,000	$1,167,083	28.8%
$5,000,000	$880,575	18.5%

This suggests that it is the assumption of Total Development Value itself which is too low. If we assume a higher Total Development Value (Table 4-13), the Net Subdivision Subsidy remains significant in absolute terms,

but its relative importance as a subsidy source declines a great deal.

Summary

Powisset Farm provides an example of the financial potential of limited development. It also demonstrates the limitations of the financial model used in this thesis.

Assumptions about the Total Development Value of the farm and how that value is divided have a significant effect on the results of the Powisset Farm analysis. Under any assumptions, however, the development component of the project provided a significant source of subsidy.

Attributing that Development Subsidy to specific sources is more problematic. Although the acreage-based analysis suggests that the Net Subdivision Subsidy was by far the most important, a frontage-based analysis shows Net Subdivision contributing very little to the project.

The assumption used for Total Development Value has a marked effect on the results of the analysis as well. Assuming a higher Total Development Value results in a conclusion that more of the subsidy available to the project came from non-development sources--specifically the Bargain Sale--and less of it from development sources--specifically Net Subdivision.

Powisset Farm was either a limited development supported largely by the benefits of subdividing and selling building lots, or by a bargain sale of the land.

CHAPTER V: LOOMIS FARM

Although successful in protecting 176 acres of farmland in Ashfield, Massachusetts, the Loomis Farm limited development project illustrates some of the conflicts inherent in limited development.

Without a financial need to do so, the limited developer did not exploit the full potential of the development parcels, subdividing them at very low densities. Rather than producing a subsidy, the development portion of the project was actually supported to some extent by the subsidy provided by an APR.

Institutionally, the Loomis Farm shows the awkward position a local land trust can be put in by assuming the role of a developer. In addition, it illustrates what can be a balancing act between the need for access to capital and legal and development expertise, and the need for local contacts and local market and political knowledge.

CASE HISTORY

The 451-acre farm Loomis Farm is located in Ashfield, a Western Massachusetts "hilltown" where homebuyers commuting to jobs in the Connecticut River Valley and buyers of second homes are beginning to compete with agriculture--still the town's main industry--for land. Since the early 1950's, the

number of dairy farms in Ashfield has dwindled from more than 40 to six.[1]

In spring 1985, Russell V. Loomis decided to sell the dairy farm he had assembled in the 1940's. The farm was actually two farms about a half-mile apart. At the time he sold the farm, Loomis had 60 acres in corn, 20 acres in pasture; the remaining 350 acres were woodland and wetland. He planned to use the equity realized to buy a farm for his son-in-law in Washington County, New York, an area that had less non-agricultural competition for land.[2]

The Loomis farm's impressive views over wooded hills and pastures and its 12,500 feet of road frontage along two roads[3] (Figures 5-1, 5-2) had attracted bids from two "cut-and-run speculators."[4] The parcel could have accommodated up to 43 subdivision-approval-not-required house lots with the minimum two acres and 200 feet of frontage required by Ashfield bylaws, according to a plan prepared by the

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[1] Telephone interview with Mark Zenick, Director, Franklin Land Trust, November 30, 1987.

[2] Trust for Public Land, Application Form for Loomis Farm, Agricultural Preservation Restriction Act, Massachusetts Department of Food and Agriculture, dated August 29, 1985, p. 2; telephone interview with Russell V. Loomis, Sr., December 18, 1987.

[3] APR Application, Attachment #2, "Degree of threat to continuance of farming"; telephone interview with Mark Zenick, December 23, 1987.

[4] Zenick interview, October 2, 1987.

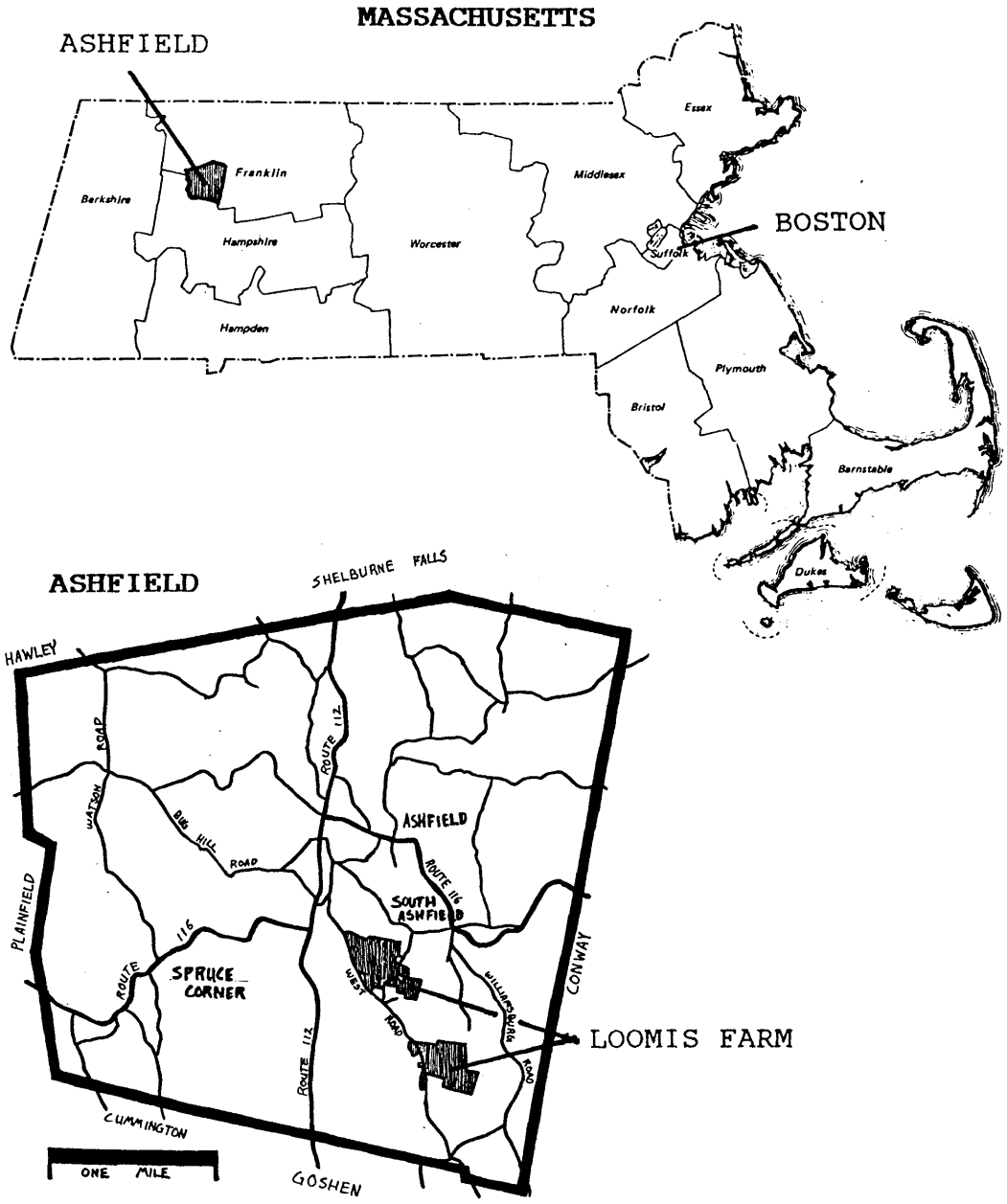

Figure 5-1: Loomis Farm Locus Maps

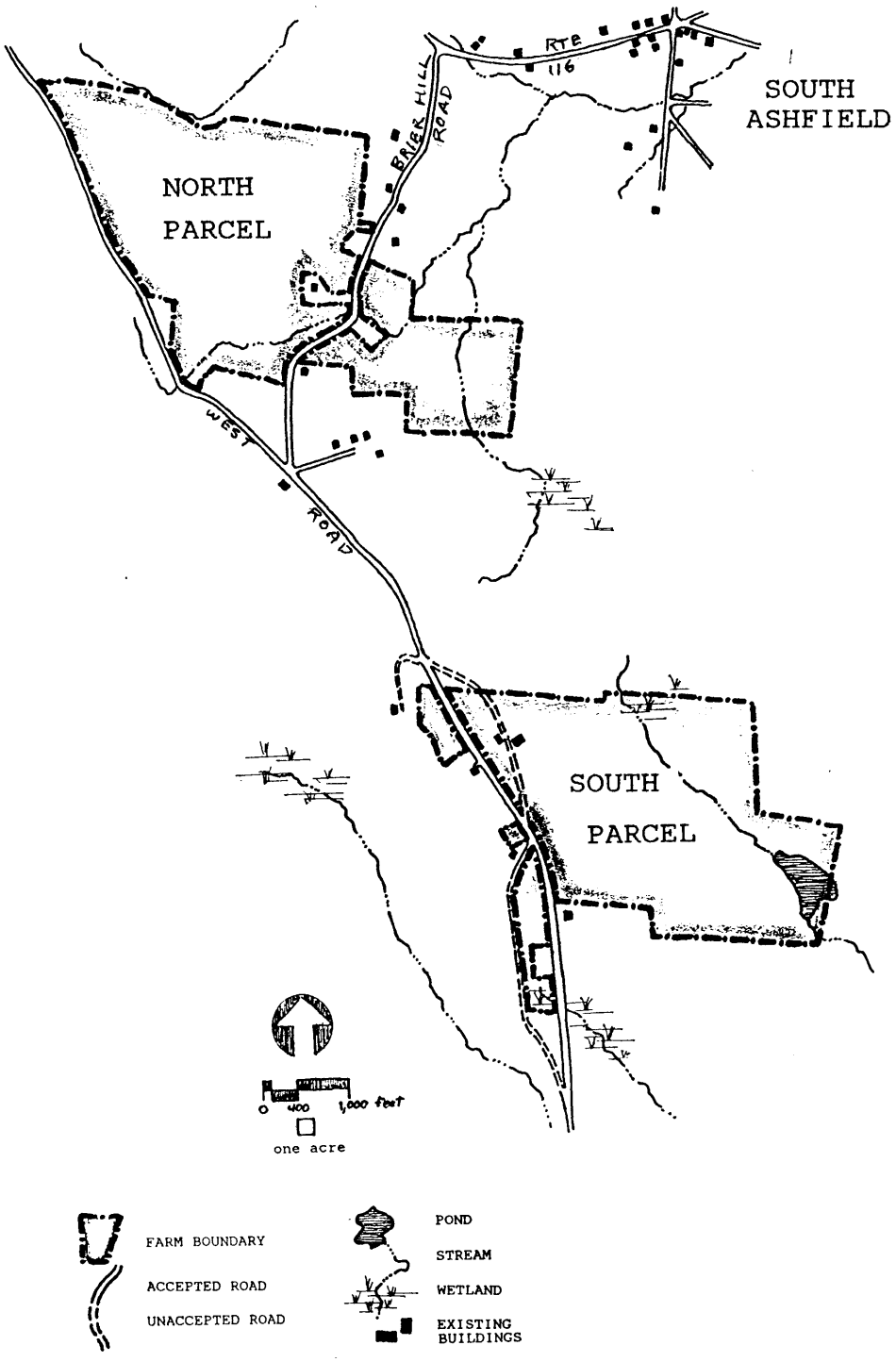

Figure 5-2: Loomis Farm Original Conditions

Franklin Land Trust.[5]

At the time Loomis was deciding to sell his farmland, two local residents, landscape architect Harry Dodson and Franklin County Building Inspector Steve Judge, had begun discussing the formation of a land trust dedicated to preserving productive farmland in Franklin County. The pair began discussions with Loomis and sought assistance from several groups in establishing the land trust and protecting the Loomis Farm from development. Dodson contacted an acquaintance, John Feingold of the Trust for Public Land (TPL). TPL, which had recently established a regional office in Boston, agreed to assist in the creation of what was to become the Franklin Land Trust (FLT), and to participate in the effort to preserve the Loomis farm.[6]

TPL is a San Francisco-based national organization founded in 1974 to be an "interim land owner," facilitating the transfer of land from private to public hands. As a private tax-exempt organization, is often able to act more quickly than public agencies to secure land, and is able to create charitable contribution benefits for sellers. TPL sees its role as securing short-term control of the land,

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[5] Franklin Land Trust, "Loomis Farm, Full Development Potential," photocopied map, April, 1987; "Protective By-Laws, Town of Ashfield, Massachusetts," Ashfield, Mass.: Town of Ashfield, photocopied document, (1979), p. 4.

[6] Telephone interview with Harry Dodson, Dodson Associates, November 30, 1987; telephone interview with Steve Judge, December 21, 1987.

then selling it to public agencies or another organization capable of long-term ownership and management. TPL also seeks to work with existing local land preservation organizations or assist in the creation of new ones, often pursuing joint ventures with local land trusts which become the eventual owners of the property. TPL deals with a wide variety of land, including forest, farmland, and urban open space.[7]

TPL was primarily interested not in saving the Loomis Farm, which it felt was "unremarkable," but in using preservation of the farm as a "rallying point" around which to establish a local organization to pursue open space and farmland preservation in Franklin County. TPL felt the Loomis farm was important symbolically and that other Franklin County farmland would face the same development threat.[8]

The Franklin Land trust was informally organized in May, 1985, and was officially incorporated in April, 1986. A prime focus of the organization, which has a local membership, was the preservation of active farming, particularly dairy farming, in the hill towns of western Franklin County.[9]

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[7] Interview with John Feingold, Director, Boston office, Trust for Public Land, October 16, 1987.

[8] Telephone interview with John Feingold, September 29, 1987; Zenick interview, November 30, 1987.

[9] Zenick interview, November 30, 1987; Judge interview.

Despite his retirement and goals of establishing his son-in-law as a farmer in New York, Loomis wanted to see his farm continue in agriculture use. Loomis, who cannot remember what offers were made for the property and what values were estimated by appraisers, reportedly received offers of $300,000 to $350,000 from private developers, and a non-qualified (i.e. not acceptable to the Internal Revenue Service[10]) appraisal of $387,750. He agreed in June, 1985 to a contract sale price of $310,000 with TPL. A subsequent IRS-qualified appraisal--considered low by some involved in the case--set the value of the farm at $319,000, allowing Loomis to claim a $9,000 charitable contribution deduction from his federal income tax.[11]

Loomis was paid $50,000 in cash ($37,000 from TPL, and $13,000 in zero-interest loans from three local residents), and TPL assumed Loomis's $88,000, 11% fixed rate, 30-year mortgage from the Farm Credit Service. The final $172,000 was in the form of secondary financing provided by Loomis, with $15,000 quarterly principal payments and 11-percent interest.[12]

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[10] For an appraisal to qualify, it must be done by an appraiser certified by one of several national organizations recognized by the IRS.

[11] Feingold interview, October 16, 1987; Loomis interview.

[12] Feingold interview, October 16, 1987; Trust for Public Land, "Certified Copy of a Resolution Adopted by the Executive Committee of the Board of Directors of the Trust for Public Land," (included with Agricultural Preservation Restriction file, Massachusetts Department of Food and

A group of farmers assisted FLT in identifying which portions of the original farm parcel should be preserved to provide for an economically viable farm. They identified 176 acres for protection, including all of the open pasture and cropland, and 100 acres of wooded land.[13] TPL applied for an agricultural preservation restriction (APR) from the Massachusetts Department of Food and Agriculture on the 176 acres in September, 1985. The eight-acre farmstead parcel with the original farmhouse (Loomis lived in a newer house across the street which he has retained), was not included in the APR. TPL intended to lease both the farmland and the farmstead parcel to a farmer pending approval of the APR, when it would be sold to the farmer.[14]

The remaining land was subdivided into 16 potential development parcels, of which 12 were actually sold for development. Deed restrictions on combined lots reduced the number of houses which can be built to a maximum of nine.[15] The original plan (Figure 5-3) provided for nine frontage lots of four to 12 acres each along West Road in the northern section of the farm. In addition, the plan called

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Agriculture), dated September 5, 1986.

[13] TPL, Loomis Farm APR application form, p. 2.

[14] APR application; Zenick interview, October 2, 1987; Feingold interview, October 16, 1987; Judge interview.

[15] Lots "F" and "G" in the northern section of the farm were sold to a single buyer and restricted to only one house, as were lots "J," "K," and "L," also in the northern section of the farm.

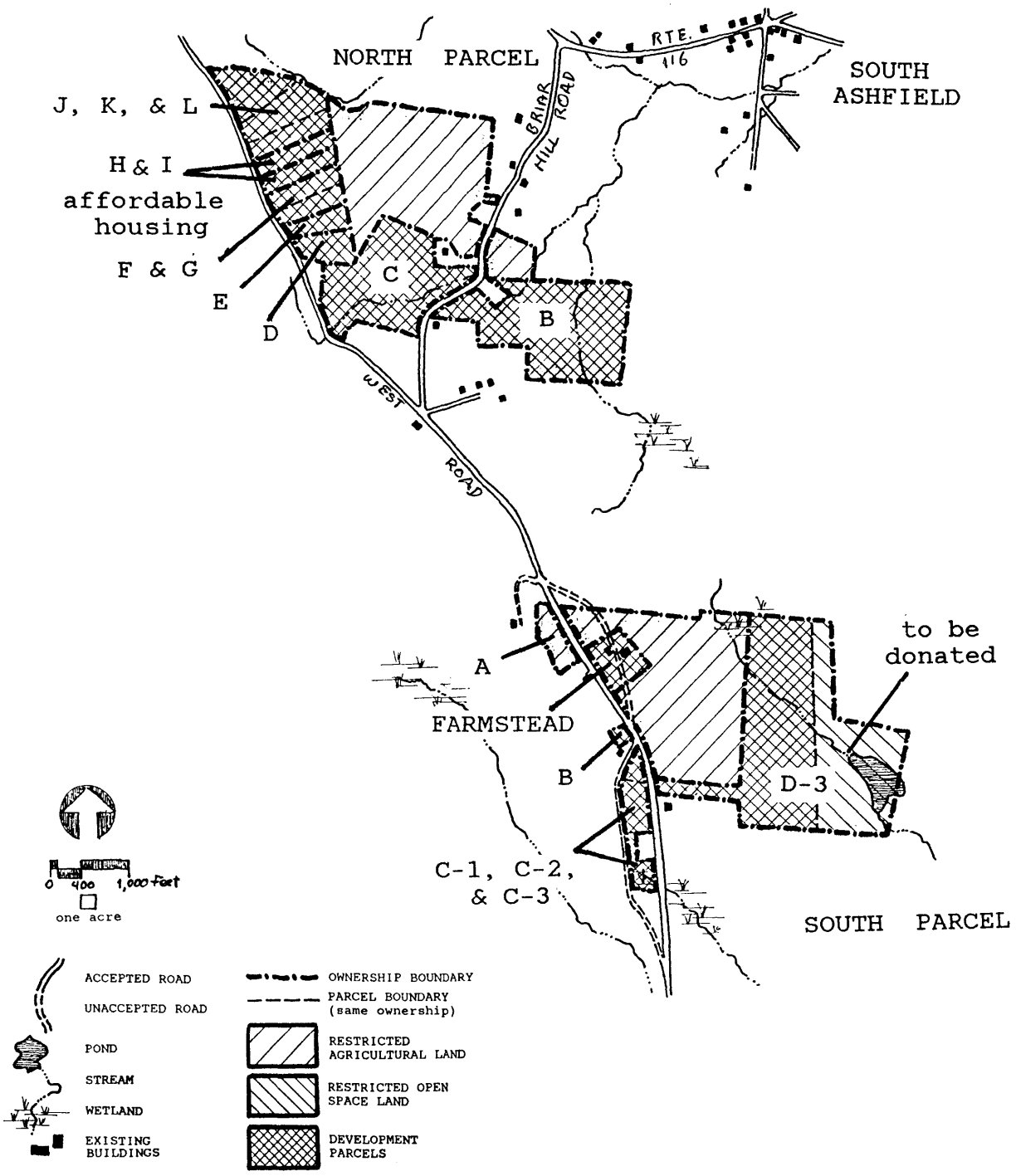

Figure 5-3: Loomis Farm Limited Development Plan

for three large lots of 42, 50, and 107 acres, each restricted to a single house.[16]

Had the APR been rejected or been smaller than hoped, FLT had a contingency development plan calling for additional development parcels. The contingency plan included five additional lots on the 42-acre parcel (parcel "C" of the north section of the farm), and three lots on what has become restricted farmland with frontage on West Road (parcel "A" on the south portion of the farm).[17]

TPL preferred higher density subdivision of the development parcels, but the financial contribution of the APR and the failure of some lots to pass percolation tests led to implementation of the lower density plan, one participant said. Although it would have used less land for development, clustered detached housing on smaller lots or attached housing was rejected for the site because it was not allowed under Ashfield bylaws and subdivision controls and it was felt there was little or no market for it in Franklin County.[18]

All of the development lots were wooded and carried

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[16] Franklin Land Trust, "Loomis Farm, Farmland Preservation Plan," photocopied map, April, 1987.

[17] Zenick interview, October 2, 1987.

[18] Zenick interview, October 2, 1987; "Protective By-Laws, Town of Ashfield, Massachusetts," Ashfield, photocopied document, p.5 (Section IV, B); "Rules and Regulations Governing the Subdivision of Land in the Town of Ashfield, Mass.," Ashfield, photocopied document, p. 9 (Section VI, C); Judge interview.

deed restrictions requiring the maintenance of a 200-foot wooded buffer along the road. Deed restrictions also required that utilities to the lots be buried and limiting driveways to 12 feet in pavement width and a 16-foot cleared swath. Although not required to, buyers have been encouraged to share driveways.[19]

TPL had considerable difficulty attracting a farmer. Advertisements in New England Farm elicited responses from "hobbyists and retirees, but not farmers."[20] A dairy farmer found by FLT moved into the farmhouse during the winter of 1985-86, but negotiations to purchase the farm broke down and he moved out.[21] Subsequently, Department of Food and Agriculture staff put TPL in contact with Patricia Libby and Kim Reardon, two part-time goat farmers looking for a farm. They began leasing the farm in June 1986 for $600 per month.[22]

After a "long, frustrating, protracted process"[23] the Department of Food and Agriculture purchased an APR on the 176 acres of farmland for $166,000 in December, 1986. The state paid the entire sum, with the Town of Ashfield

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[19] Zenick interview, October 2, 1987.

[20] Telephone interview with John Feingold, October 29, 1987.

[21] Feingold interview, October 16, 1987; Zenick interview, November 30, 1987; Judge interview.

[22] Feingold interview, October 29, 1987; telephone interview with Patricia Libby, November 23, 1987.

[23] Zenick interview, October 2, 1987.

attributing its inability to contribute to the constraints imposed by Proposition 2 1/2.[24] The farm, including the unrestricted farmstead parcel as well as the 176 restricted acres, was sold to Libby and Reardon in April, 1987 for $130,000.

Libby and Reardon reported considerable difficulty in obtaining financing. Limits on the security value of the restricted land and the price of the farm given its "terrible" condition were reasons given for denying them financing. They were forced to put $30,000 down to get a conventional $100,000 bank mortgage secured by the unrestricted farmstead and buildings. Financing was further complicated by a contaminated spring providing water to the house, obliging TPL to install a well.[25]

The farmers also said they felt TPL had little interest in them purchasing the land and little concern with their ultimate success as farmers. In contrast, they claim that Mark Zenick, Director of the Franklin Land Trust, "came through" and has provided "moral support." Zenick attributed the difficulties between the farmers and TPL to a "real clash of cultures" between the farmers and TPL's New York legal staff.[26]

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[24] APR application.

[25] Libby interview.

[26] Libby interview; Zenick interview, October 2, 1987.

TABLE 5-1: LOOMIS FARM DEVELOPMENT LOT SALES

Lot Designation	Sale Date	Acres	TPL Sales to FLT	Final Sale Price
South B, C-1, C-2, & C-3	2/87	14.6		$7,000
North C	2/87	42.1	$38,675	$45,500
North E	2/87	4.5	$17,850	$21,000
Farmstead	4/87	8.4		$56,000
North D	4/87	5.3	$16,575	$19,500
North F & G	5/87	9.4	$30,600	$36,000
North J, K, & L	10/87	23.9		$29,900
South D-3	12/87	106.6		$46,640
North H & I	12/87	10.0	$14,875	$17,500
North B	UNSOLD	50.3		UNSOLD
TOTAL		275.1		$279,040

Lot sales got underway in late 1986, and are being completed as of this writing (Table 5-1). FLT purchased an option from TPL on seven of the development parcels at the higher of a base wholesale price or 85 percent of their final sale price. TPL's Feingold said this was an attempt to repay FLT for its planning and marketing work on behalf of the project. By putting FLT in the chain of title to the land, it also gave the local organization legal standing to enforce the development restrictions attached to the deeds of the parcels.

Two lots, "H" and "I" in the northern section of the farm, were purchased in December, 1987 by the Franklin County Community Development Corporation for affordable housing. The FCCDC paid a total of $17,500 for the two lots, of which $14,875 went to TPL and the remainder to FLT. FLT's Mark Zenick estimated the market value of the combined

lots to be at least $35,000. FCCDC has contracted local builders to produce two single family homes, which are expected to retail for about $90,000 each.[27]

TPL has contracted to sell the 106-acre lot ("D-3" on the southern section of the farm) for $46,640, with a closing expected in January 1988. Although FLT will not get 15 percent of the final sale price, it will hold a mortgage on the property worth close to 15 percent of the sale price. The purchaser of the land is expected to donate 46 interior acres, including a beaver pond and stream, to FLT. FLT plans to donate the 46 acres, in turn, to The Trustees of Reservations, which has purchased an adjacent parcel, which is itself adjacent to an existing TTOR reservation. Because there is no contractual requirement that the lot buyer donate the land, however, he will be able to claim a charitable contribution deduction if a donation occurs.[28]

The 50-acre lot ("B" on the northern section of the farm) has failed all percolation tests within 300 feet of the road, and any development of the lot is likely to be set back at least 1,000 feet. The land was advertised in the Boston Globe as "recreation land" for $45,000 in December, 1987, and Zenick reported interest from several parties.

Four parcels totaling about 15 acres ("B," "C-1,"

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[27] Feingold interview, October 29, 1987.

[28] Feingold interview, October 29, 1987; Zenick interviews, October 2, November 30, and December 22, 1987.

"C-2," and "C-3" on the southern section) were sold to abutters seeking a buffer area for $7,000 in November, 1986.[29]

TPL's expenses for the entire project were:

Financing Costs	$56,000
Real Estate Taxes	$5,500
Insurance	$2,000
Legal Services	$19,000
Planning & Engineering	$4,000
Surveying	$10,100
Staff Salary and Benefits	$30,400
Administrative Overhead	$15,200
Travel	$750

The $30,400 in TPL Staff Salary and Benefits is based on records of billable time, according to Feingold. The $15,200 Administrative Overhead fee is based on 50 percent of the billable hours and benefits.[30]

Land planning for the project was provided free by Dodson, who estimated its value between $8,000 and $10,000, and FLT provided most of the marketing of the development land. Although no accounting of project expenses was kept by FLT, the $20,800 it made by reselling the seven lots can be attributed entirely to FLT's expenses and did not produce a surplus for the local organization, according to Mark

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[29] Feingold interview, October 29, 1987; Zenick interviews, October 2, November 30, and December 22, 1987; Boston Sunday Globe, real estate classified section, December 20, 1987, p. A-58.

[30] Feingold interview, October 16, 1987.

Zenick.[31]

John Feingold of TPL attributed the two-year development process and added interest expenses at Loomis Farm to several factors. Winter stalled both the survey and percolation tests until the spring of 1986. "Time was against us," said Feingold. In addition, the survey was stalled by title complications and poor deeds. Finding a farmer to lease and purchase the restricted farmland further complicated the project, as did the delay in obtaining the APR.[32] Legal expenses were increased because of an abandoned attempt to arrange a tax-free exchange, purchasing the New York farm to swap with Loomis for his farm. Feingold felt the lessons of Loomis Farm were to limit the "moving parts" of future limited developments to expedite the projects and contain costs, and to try to sell restricted agricultural land to established local farmers who are looking to expand.[33]

The relationship between TPL and FLT was cooperative, with FLT supplying local knowledge and representation, as well as planning and marketing, and TPL providing the capital to undertake the project, and the legal and development expertise to carry it out.

There was some conflict inherent in the relationship,

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[31] Dodson interview; Zenick interview, December 22, 1987.

[32] Feingold interview, October 29, 1987.

[33] Feingold interviews, September 29 and October 29, 1987.

however, and it was occasionally strained.[34] FLT had conceived of and initiated the limited development project, but TPL, as the purchaser and developer, held legal title to the land and ultimate control of the project. FLT's objectives for the Loomis Farm were to preserve active agriculture with as little development as possible. TPL's main interest was in establishing FLT. But TPL also supports itself in part through its projects, and needs some income from each project. While FLT answered to a local membership, TPL is not a membership organization, and answered to its national office.[35]

FLT and the Loomis Farm limited development project have met with some antagonism from townspeople who felt the entire farm should have been preserved. "We were viewed with distrust and suspicion locally, as just another developer," said Steve Judge. Many of those misgivings have been dispelled with the successful completion of the project and the realization that very little of the farmland has been visibly developed, Mark Zenick said.[36]

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[34] Judge interview.

[35] Feingold interview, October 16, 1987.

[36] Judge interview; Zenick interview, December 22, 1987.

AGRICULTURAL IMPACT

Pat Libby and Kim Reardon have had difficulty establishing a new farm on the former Loomis Farm. Problems have included lack of capital, poor condition of the farm and farmhouse, and being unable to farm full time.

Libby brought livestock--70 to 75 goats which had been kept on leased land--with them, but no equipment. Without equipment, they have been unable to seed down pasture land that had been allowed to go to weeds in the year that the farmland went unused. They have had to close in and rewire the barn and do a great deal of work on the house. Their first winter on the farm saw a barn roof collapse and illness among their livestock.[37]

Libby and Reardon continue to work full-time jobs in addition to farming, limiting the effort they can put into improving and maintaining the farm. "You sort of get used eating dinner at eleven o'clock and getting up at five," said Pat Libby. Attempts to produce hay proved difficult because there was not enough daylight left after work to mow the hay. They have hired part-time help on occasion and often resort to bartering to pay for work around the farm.[38]

The two farmers plan to eventually put in 20 acres of small fruit trees and vegetables, and keep 60 acres in

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[37] Libby interview.

[38] Ibid.

pasture and hay to support the herd of goats. In addition to the goats, they produce small quantities of beef, poultry, and vegetables for their own consumption and for barter.[39]

To date, only one house has been built on the development lots. The farmers have reported no conflict with this homeowner, but have had two complaints from other neighbors, one complaining about wind-blown corn husks, the other objecting to the cutting of trees on the restricted farm parcel (the APR in no way restricts the cutting of trees). The farmers anticipate little conflict with neighbors over agricultural practices because of the large wooded buffer zones (400 to 1,500 feet) between all but one of the houses and the fields, and their intention to use few if any chemical pesticides.[40]

FINANCIAL ANALYSES

The main financial lesson of the Loomis Farm is that environmentally motivated, low-density planning can undercut potential "subdivision" subsidies. In this case, TPL and FLT forwent potential income from the development parcels by subdividing into large lots with extensive frontage after paying for the land based on close to its maximum

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[39] Ibid.

[40] Ibid.

development potential.

In addition, the case suggests that inflationary land markets can add considerably to the value of the land selected for development, but that much of that potential benefit can be eaten up by added interest costs of holding the development land.

Financial analysis of the Loomis Farm project also points out how unimportant enhancement of development lots can be, particularly in rural areas where open space is commonplace.

Income and Expense

Assumptions

The purchases of the restricted farmland and the unrestricted farmstead parcel to Libby and Reardon have been separated for this analysis. I have considered only the restricted farmland to be agricultural land, and have treated the farmstead as a development parcel. I have used the APR review appraiser's estimate of the agricultural value of the 176 restricted acres as the sale price of agricultural land to the farmer. The $56,000 difference between the $130,000 Libby and Reardon paid for both the farmland and the farmstead and the $74,000 has been considered the sale price of the farmstead parcel.[41]

In order to analyze the project as a whole rather than

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[41] Feingold interview, October 16, 1987.

TABLE 5-2: LOOMIS FARM INCOME AND EXPENSES

INCOME

Total Rental Income	$5,400
Sale to Farmer	$74,000
APR Sale	$166,000
Total Restricted Agricultural Land Sales	$240,000
Open Space Land Sales	$0
Market Development Land Sales	$261,540
Affordable Housing Land Sales	$17,500
Total Development Land Sales	$279,040
Other Income	$0
TOTAL INCOME	$524,440

EXPENSES

Purchase Price	$310,000
Financing	$56,000
Real Estate Taxes	$5,500
Insurance	$2,000
Legal Services	$19,000
Planning & Engineering	$4,000
Surveying	$10,100
Other Services	$0
Total Professional Services	$33,100
Staff Overhead	$46,350
Other Expenses	$20,925
TOTAL EXPENSES	$473,875

SURPLUS AND RETURN

+ TOTAL INCOME	$524,440
- TOTAL EXPENSES	$473,875
SURPLUS or (SHORTFALL)	**$50,565**
RETURN ON TOTAL EXPENSES	**10.7%**

simply from TPL's perspective, I have used the final sales prices for the lots resold by FLT under the option agreement with TPL. The 15 percent of the sale price that went to FLT has been considered payment for development expenses, and entered into the spreadsheet as "Other Expenses."

The "Staff Overhead" entry includes TPL's accounting of staff salaries and benefits, the added overhead described in the case history, and travel expenses.

Results

The project was quite successful in "making ends meet," producing a surplus of $50,600--an 11 percent return on the Total Expenses (Table 5-2).

Two considerations suggest that the project was, or could have been, even more successful than the analysis indicates. First, this surplus is what remained after TPL fully accounted for staff salaries and benefits, as well as for its overhead fee. FLT's returns on the lot sales also have been accounted for as an expense rather than part of the surplus.

Second, the 11-percent return is based on total expenses, which include high interest and legal costs. If the surplus is viewed in light of the purchase price, it appears much more substantial.

Subsidy Source and Use

In terms of subsidy sources and uses, the Loomis Farm was very successful (Table 5-3, Figure 5-4). Based on assumptions about Total Development Value, appreciation, and enhancement (discussed below), subsidy sources provided are almost double the subsidies needed by non-market portions of the project.

The project's success was due entirely to external, non-development subsidies. Rather than providing a cross-subsidy to the agricultural component of the project, the development component of the Loomis Farm actually received a subsidy from the non-development sources--the APR and the bargain sale.

Non-Development Subsidies accounted for $175,000, or 163 percent of all subsidy sources, virtually all of it from the $166,000 APR subsidy. Total Development Subsidies were **negative** $67,300--a 63-percent drain on the total subsidies provided.

Apportionment of Total Development Value and Development Costs

Because 1985 house lot prices in Ashfield would not have supported the construction of roads to service interior lots, I have apportioned the Loomis Farm Total Development Value and development costs by frontage, not acreage.

Switching to an acreage-based analysis would not change the basic conclusion that non-development subsidy sources

TABLE 5-3: LOOMIS FARM SUBSIDY SOURCE AND USE SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources
Bargain Sale Subsidy	$9,000	8%
APR Subsidy	$166,000	154%
Open Space Sale Subsidy	$0	0%
Total Non-Development Subsidies	**$175,000**	**163%**
Enhancement Subsidy	$10,000	9%
Net Appreciation Subsidy	$13,398	12%
Net Subdivision Subsidy	($90,738)	-84%
Total Development Subsidies	**($67,339)**	**-63%**
TOTAL SUBSIDY SOURCES	**$107,661**	**100%**

SUBSIDY USES	Actual	Percent of Subsidy Uses
Agricultural Preservation	$58,970	103%
Open Space Protection	$0	0%
Affordable Housing Contribution	($1,874)	-3%
TOTAL SUBSIDY USES	**$57,096**	**100%**

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$107,661
- TOTAL SUBSIDY USES	$57,096
SUBSIDY SURPLUS or (SHORTFALL)	**$50,565**
PERCENT OF SUBSIDY USES	**88.6%**

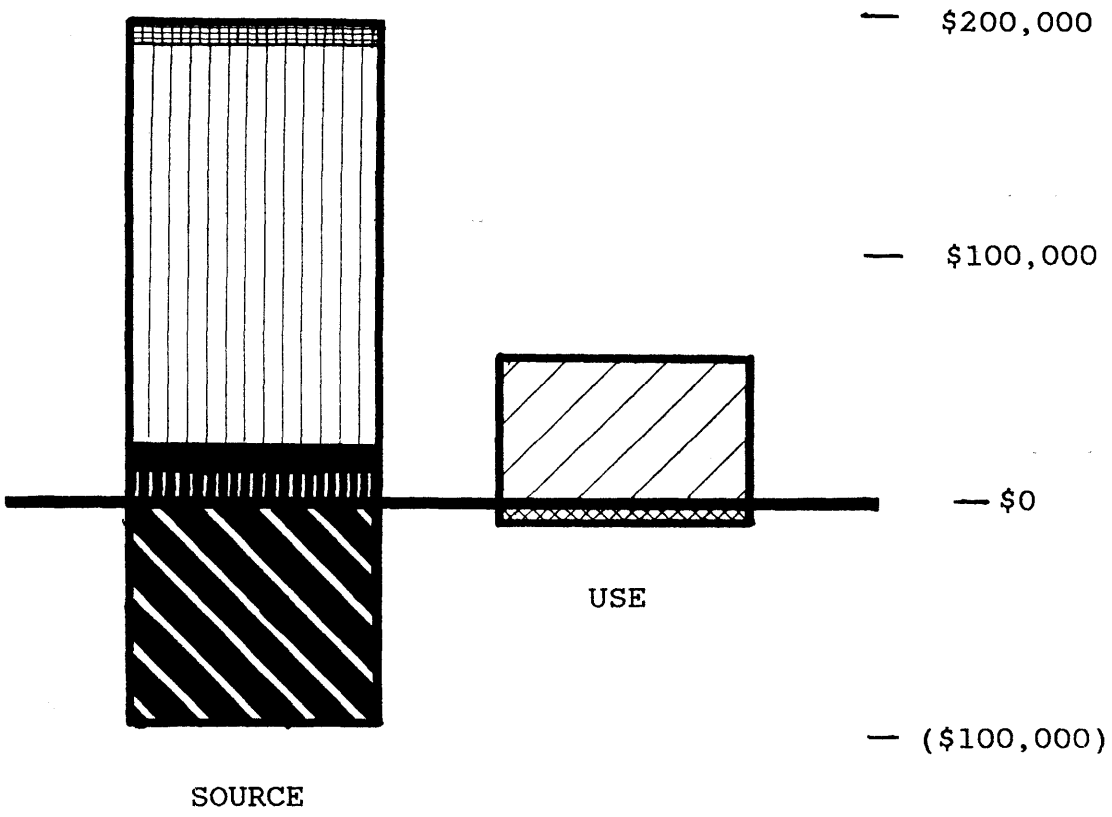

Figure 5-4: Loomis Farm Subsidy Source and Use Summary

were responsible for the success of the project. Under the acreage-based analysis (Appendix D-1), 133 percent of all subsidies would come from non-development sources, and development sources would represent a 33 percent drain on subsidies.

Non-Development Subsidy Sources

Bargain Sale Subsidy

The Total Development Value assumed was the $319,000 qualified appraisal of the entire farm sold by Loomis. There were no reliable numbers available for the developers' offers made to Loomis before TPL purchased the farm. Although there was a much higher, unqualified appraisal, I feel it may have overestimated the value of the farm by failing to take into account the limited suitability of some parts of the farm for septic systems.

This assumption of $319,000 Total Development Value results in a minimal bargain sale subsidy of $9,000. Using the unqualified appraisal amount of $387,750 as the Total Development Value would yield a significant bargain sale subsidy of $77,750.

Agricultural Preservation Restriction Subsidy

The subsidy supplied by the sale of the APR to the state for $166,000 provided for all of the subsidy use by preservation of the agricultural land, as well as helping to cover the negative Net Subdivision Subsidy. In other words,

the analysis suggests that a high APR not only subsidized agricultural preservation, but also contributed to the subsidy **used** by the low-density subdivision of the development parcels and to the project surplus.

The APR was based on the difference between a fair market value (of only the 176 acres covered by the APR) appraisal of $260,000 and an agricultural value appraisal of $74,000. In addition, the review appraiser deducted $10,000 in value he felt would be added to the other parcels owned by TPL as a result of the restriction.[42]

If the initial development value of the 176 acres of restricted farmland is based on frontage, it was worth $101,000, considerably less than the $260,000 estimated by the APR appraiser. Some of this difference in value can be attributed to appreciation between the purchase of the land by TPL and the APR appraisal. The remaining discrepancy is due to either undervaluation by the qualified appraiser, overvaluation by the APR appraiser, or incorrect apportionment of the initial value of the entire farm in this analysis.

Open Space Sale Subsidy

Because there was no direct sale of open space, no Open Space Sale Subsidy has been analyzed here. There was, however, a slight subsidy through the sale of the 46 acres

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[42] Ibid.

from the 106-acre lot that is expected to be contributed to FLT and eventually to TTOR. If the value of the 60 acres alone was known, any additional amount paid by the lot purchaser in expectation of a charitable contribution deduction for the donation of the 46-acre section would represent a subsidy to conservation of the open space. Wetlands, steep slopes, and limited road access make it unlikely that the rear 46 acres has much development value alone.[43]

Development Subsidy Sources

Enhancement Subsidy

Because Ashfield and surrounding towns are still rural, value added to the development parcels due to restriction of adjacent land was probably minimal.

The review appraisal done for the APR program estimated the total value added to TPL's unrestricted land at the Loomis Farm because of the agricultural restriction (which it calls "estate value") to be $10,000.[44]

I have adopted this $10,000 assumption as the overall value added to the development parcels through enhancement. This translates into an enhancement premium of 5.1 percent of the unenhanced value of the lots. The $10,000 Enhancement

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[43] FLT, "Loomis Farm ... Farmland Preservation Plan."

[44] Zenick interview, October 2, 1987; Feingold interview, October 16, 1987.

Subsidy represented only nine percent of all the subsidy sources.

Case participants, local brokers, and the APR appraiser concurred that there was little or no enhancement value added to the development parcels. Mark Zenick of FLT, who has marketed most of the lots, felt there was no value added to them due to enhancement, but speculated that the lots sold quicker because of the restriction on the farmland, providing an unknown benefit to FLT and TPL. In a second interview, he estimated that restriction of adjacent farm or open space land could have added at most 13 percent to the value of the development parcels.[45]

Three area realtors and appraisers interviewed all felt that there was no enhancement value added to the development lots. "It's just not going to happen," said Susan Louisigneau, a realtor and appraiser. "It's still very, very rural up here. People aren't worried about a subdivision in their backyard." She echoed Zenick's feeling that the restrictions on the adjacent farmland probably facilitated lot sales, but maintained it would not have added to the prices paid by consumers. Louisigneau stressed the same point made by all realtors and brokers interviewed: without being able to compare otherwise identical lots with

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[45] Zenick interviews, October 2 and November 30, 1987. The 13 percent premium represents $4,000 in value added to the $26,000 base value of a hypothetical two-acre building lot with views comparable to those at the Loomis Farm.

and without adjacent restricted land--almost an impossibility to find--there is no way to be certain of the value added by enhancement.[46]

Realtor Philip Pless of Masamont Realty insisted that the agricultural restriction provided no enhancement whatsoever of the value of the Loomis development lots. Reasons he stated were the length of the lots, the abundance of undeveloped land in Ashfield, and the lesser importance to homebuyers of protecting land behind, rather than to either side, of their lots.[47]

Appraiser Kim Levitch of Levitch Realty asserted that there would be no enhancement value added because of the point in the "real estate cycle" at which the lots were sold. He maintained that in periods of high demand, such as that in Ashfield in 1986 and 1987, amenities add less to the value of real estate. Only when there is a surplus of supply over demand in building lots will buyers weigh and pay for such amenities as adjacent restricted land, he claimed.[48]

If enhancement is assumed to be more than $10,000, the value of the Enhancement Subsidy would be higher (Table 5-4), but not significantly. Even at 15 percent--more than

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[46] Telephone interview with Susan Louisigneau, December 22, 1987.

[47] Telephone interview with Philip Pless, Masamont Realty, November 30, 1987.

[48] Levitch interview.

anyone involved with the case suggested it could have been, it would account for only $26,800 in subsidy.

TABLE 5-4: LOOMIS FARM ENHANCEMENT SUBSIDY SENSITIVITY TO ENHANCEMENT PREMIUM

Enhancement Premium	Enhancement Subsidy	Percent of Subsidies Provided
0.0%	$0	0.0%
5.0%	**$9,788**	**9.1%**
10.0%	$18,685	17.4%
15.0%	$26,810	24.9%

Net Appreciation Subsidy

TPL's purchase and subsequent sale of the Loomis farm coincided with a extraordinary increase in land values seen in Franklin County.

I have assumed a monthly appreciation rate of two percent based on data from County Comps and interviews with case participants and area realtors.

The County Comps data on quarterly median sales, which are based on relatively small samples and include the Loomis Farm lot sales themselves, suggest an overall monthly appreciation rate of about 2.6 percent, with wide variations (Table 5-5). The annual median sales suggest a monthly appreciation rate of two to three percent for Ashfield itself and 1.7 to 1.8 percent for Franklin County as a whole (Table 5-6). It should be remembered that the median residential sales are primarily sales of finished homes, not

unbuilt lots. One of the realtors interviewed and Ashfield Assessor Malcolm Clark stressed that appreciation in the value of land alone exceeded overall appreciation of houses and land.[49]

TABLE 5-5: INCREASE IN ASHFIELD MEDIAN RESIDENTIAL SALES, 2nd QUARTER, 1985 to 3rd QUARTER, 1987

Quarter	Median Residential Sale	Monthly Appreciation Rate from 2nd Q, 1985
2nd, 1985	$62,000	
3rd, 1985	$68,500	3.38%
4th, 1985	$69,450	1.91%
1st, 1986	$51,000	-2.15%
2nd, 1986	$79,250	2.07%
3rd, 1986	$92,250	2.68%
4th, 1986	$80,000	1.43%
1st, 1987	$173,500	5.02%
2nd, 1987	$94,500	1.77%
3rd, 1987	$122,500	2.55%
TOTAL PERCENTAGE INCREASE		97.6%
MONTHLY INCREASE RATE		**2.55%**

[50]

Interviews with Zenick, three area realtors, and an Ashfield assessor provided similar results. Zenick estimated that values of buildable raw land rose 50 percent from 1985 to 1987. Levitch set the annual increase for 1985 and 1986 at about 25 and 27 percent respectively--an overall

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[49] Pless interview; telephone interview with Malcolm Clark, Chairman, Ashfield Board of Assessors, December 3, 1987.

[50] County Home Data, "Median Report for Ashfield," fourth quarter, 1986 and third quarter, 1987, Shelburne, Vt.: County Home Data, photocopied documents.

monthly appreciation rate of two percent. Louisigneau estimated monthly appreciation during the period at two percent, but said it was uneven, ranging from zero to three or four percent. Pless estimated that raw land values had doubled during the same period--a monthly appreciation rate of 2.9 percent. This view was shared by Malcolm Clark, Chairman of the Ashfield Board of Assessors, who based his rough estimate on comparisons of recent residential sales with the assessments on the same property, last revalued in 1985.[51]

TABLE 5-6: INCREASE IN MEDIAN RESIDENTIAL SALES, 1985-1987, ASHFIELD AND FRANKLIN COUNTY

	DOVER		NORFOLK COUNTY	
YEAR	Number	Median Residential Sale	Number	Median Residential Sale
1985	56	$62,000	1,873	$61,840
1986	65	$79,000	2,470	$75,760
Ja-Jun, 1987	35	$106,250	791	$86,365
1985 to 1986				
TOTAL PERCENTAGE INCREASE		27.4%		22.5%
MONTHLY INCREASE RATE		**2.04%**		**1.71%**
1985 to January-June, 1987				
TOTAL PERCENTAGE INCREASE		71.4%		39.7%
MONTHLY INCREASE RATE		**3.04%**		**1.87%**

[52]

[51] Zenick interview, November 30, 1987; Levitch interview; Louisigneau interview; Pless interview; Clark interview.

[52] County Home Data, "Statistical Report for the Year 1985 for Franklin County," "Statistical Report for the Year 1986 for Franklin County," and "Statistical Report for the MOnths of January thru June, 1987 for Franklin County,"

Assuming two percent monthly appreciation, **gross** appreciation added a very high $71,500 to the value of the development land. When holding costs are subtracted, and rental income added, however, the **Net** Appreciation subsidy is only $13,500 (Table 5-7). This represents only 12 percent of all subsidy sources. Despite sustained, very high appreciation in Ashfield during the period of the development, then, appreciation contributed little in subsidies to the Loomis Farm project.

TABLE 5-7: LOOMIS FARM NET APPRECIATION SUBSIDY

Gross Appreciation	$71,498
- Interest, Real Estate Taxes, & Insurance	$63,500
+ Rental Income	$5,400
NET APPRECIATION SUBSIDY	**$13,398**

TABLE 5-8: LOOMIS FARM NET APPRECIATION SUBSIDY SENSITIVITY TO MONTHLY APPRECIATION RATE

Monthly Appreciation Rate	Net Appreciation Subsidy	Percent of Subsidy Sources
0.00%	($58,100)	-54.0%
2.00%	**$13,398**	**12.4%**
4.00%	$57,566	53.5%

This result is sensitive to the monthly appreciation rate assumed (Table 5-8). Although the monthly appreciation rate certainly varied and may have been higher than two percent, it is unlikely that it was higher than four percent

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Shelburne, Vt.: County Home Data, photocopied documents.

for any sustained period of time. Even assuming overall monthly appreciation of four percent, the Net Appreciation Subsidy would be $57,566--still much less significant that the APR Subsidy of $166,000, or the negative Net Subdivision Subsidy.

Net Subdivision Subsidy

The large negative Net Subdivision Subsidy is the most surprising result of the financial analysis of the Loomis Farm (Table 5-9). This doesn't seem to make sense: when land is legally subdivided and passes percolation tests, its value usually goes up, not down.

TABLE 5-9: LOOMIS FARM NET SUBDIVISION SUBSIDY

Total Development Value	$319,000
* Market Development Land Percentage	65%
Value of Development Land at Acquisition	$205,970
Gross Sales of Development Land	$261,540
- Value of Development Land at Acquisition	$205,970
Increase in Value of Development Land	$55,570
- Total Enhancement	$10,000
- Gross Appreciation	$71,498
Gross Subdivision Subsidy	($25,928)
- Professional & Staff Costs	$64,809
NET SUBDIVISION SUBSIDY	**($90,738)**

But the Net Subdivision Subsidy includes more than that. It also includes the value added to or lost from the development portion of the original farm as a result of the design of the subdivision that takes place. At the Loomis

Farm, the negative Net Subdivision Subsidy reflects TPL's and FLT's decision not to use the full development potential of the development parcels, as well as the negative impact of the restrictions placed on the development lots.

By subdividing the development land into relatively large parcels with long frontage, TPL and FLT gave up potential subsidies from the development of the land. According to plans prepared by Dodson, the entire farm might have supported 43 lots as-of-right. Twenty-five of these possible lots would have been in the portions of the original farm that were designated for development--more than twice the number of house lots called for in the original limited development plan. On a smaller scale, the four parcels sold for $7,000 to neighbors as a buffer zone could have been sold (if they passed percolation tests) as three house lots, and the 42-acre lot could have supported six house lots.[53]

As in the other cases, the Net Subdivision Subsidy is sensitive to assumptions of monthly appreciation rate and the Total Development Value. The enhancement premium assumed has little effect on the conclusions.

This result is not particularly sensitive to the monthly appreciation rate assumed. Even with no appreciation the Net Subdivision Subsidy would still be

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[53] Franklin Land Trust, "Loomis Farm, Full Development Plan" and "Loomis Farm, Farmland Preservation Plan," both photocopied plans, April, 1987.

negative, although much smaller (Table 5-10). And had the appreciation rate been higher, there would be an even larger negative Net Subdivision Subsidy.

TABLE 5-10: LOOMIS FARM NET SUBDIVISION SUBSIDY SENSITIVITY TO MONTHLY APPRECIATION RATE

Monthly Appreciation Rate	Net Subdivision Subsidy	Net Appreciation Subsidy
0.00%	($19,240)	-18%
2.00%	**($90,738)**	**-84%**
4.00%	($134,905)	-125%

The basic conclusion that there was a significant subsidy loss due to the development plan is not sensitive to the Total Development Value assumed (Table 5-11). Nobody involved in the case has suggested that TPL paid **more** for the farm than it was worth, and assuming a higher Total Development Value produces an even lower Net Subdivision Subsidy. In other words, if the farm was worth more than assumed here, then it had even greater development potential that was not exploited.

TABLE 5-11: LOOMIS FARM NET SUBDIVISION SUBSIDY SENSITIVITY TO TOTAL DEVELOPMENT VALUE

Total Development Value	Net Subdivision Subsidy	Percent of Subsidy Sources
$319,000	($90,738)	-84%
$387,750	($135,128)	-102%
$450,000	($175,321)	-114%

Summary

The Loomis Farm demonstrates that development does not always produce a profit which can be used as a subsidy. The analysis makes it clear that the development parcels used a subsidy rather than producing one.

This is not to say that TPL or FLT made the "wrong" decision in subdividing the land so sparsely--the project was financially quite successful without any added development. As land conservation organizations, both TPL and FLT were concerned with minimizing the impact of development on the environment. FLT, as a locally-based membership organization, could have lost a great deal of support by pursuing denser development, threatening its existence and hindering further projects.

It is important to observe, however, that decisions concerning density of development can have a profound effect on the subsidy generated by development. Because of its institutional structure and political position, a non-profit land trust may not be able to fully assume the role of a developer. The nature, make-up, and motivation of a non-profit may prevent it from seeking a significant return through development.

CHAPTER VI: CONCLUSIONS

Although many see limited development as the answer to financing land protection in the face of escalating land prices, it is not a panacea. Limited development rarely can provide all, or even most, of the financial support necessary to support the purchase and protection of resource land.

Limited development also casts a non-profit conservation organization in the role of a for-profit developer, creating conflicts in motivation and temperament. It forces the non-profit to make basic development strategy decisions and to accept considerable financial risk.

When limited development is used for agricultural preservation, the reduction in size of the farmland does not necessarily reduce its agricultural viability. Proximity to residential use can be troublesome but is not unusual for farms in metropolitan areas. Protection of farmland does not ensure agricultural success, and can even limit farmers' access to credit.

Given these limitations, it is unlikely that limited development can be more than a marginal tool in the protection of farmland--in rare cases providing significant subsidies for land protection, but most often providing only supplemental support.

This chapter will discuss limited development from four perspectives: financial effectiveness and strategy considerations; institutional implications; agricultural viability; and policy context.

FINANCIAL EFFECTIVENESS AND STRATEGY CONSIDERATIONS

In examining non-profit limited development from a financial perspective, there are two basic questions to address:

1. Is limited development effective in subsidizing the non-market use of land? Can it provide significant cross-subsidies, or does it merely supplement existing public and private subsidies?

2. What is the source of the subsidies that limited development does provide? Is it enhancement by adjacent restricted land? Is it a windfall from appreciation in land values? Or is it turning raw land into legally buildable lots? What strategies does this imply for a non-profit limited developer?

Non-Development v. Development Subsidies: Is Limited Development Financially Effective?

Limited development is often seen in land conservation circles as a way to finance the protection of land by harnessing market development forces. The three case studies suggest, however, that except in very active real estate markets limited development is only marginally effective as a tool for financing land conservation.

The case studies offer only one suspect example--

Powisset Farm--of limited development wholly paying for the protection of valuable land. At both the Barton and Loomis Farms, it was non-development subsidies--the APR and sale of open space--that provided most or all of the subsidies used to protect farmland and open space (Table 6-1, Figure 6-1).

At Barton, only 16 percent of the total subsidies provided came from development sources. The development subsidies covered only 15 percent of what the project's non-market land uses required in subsidies. At the Loomis Farm, the development aspects of the Loomis Farm actually **used** subsidies, rather than contributing to the subsidies available.

TABLE 6-1: NON-DEVELOPMENT AND DEVELOPMENT SUBSIDIES COMPARED

	Barton	Powisset	Loomis
Non-Development Subsidies	$300,000	$792,730	$175,000
Percent of Total Sources	84%	26%	163%
Percent of Total Uses	82%	37%	307%
Development Subsidies	$56,807	$2,288,214	($67,339)
Percent of Total Sources	16%	74%	-63%
Percent of Total Uses	15%	106%	-118%
TOTAL SUBSIDY SOURCES	$356,807	$3,080,944	$107,661
TOTAL SUBSIDY USES	$366,716	$2,158,368	$57,096

In contrast, at Powisset Farm the development portion of the project accounted for most of the subsidies available. Furthermore, the analysis suggests that limited development could have supported all of the non-market uses

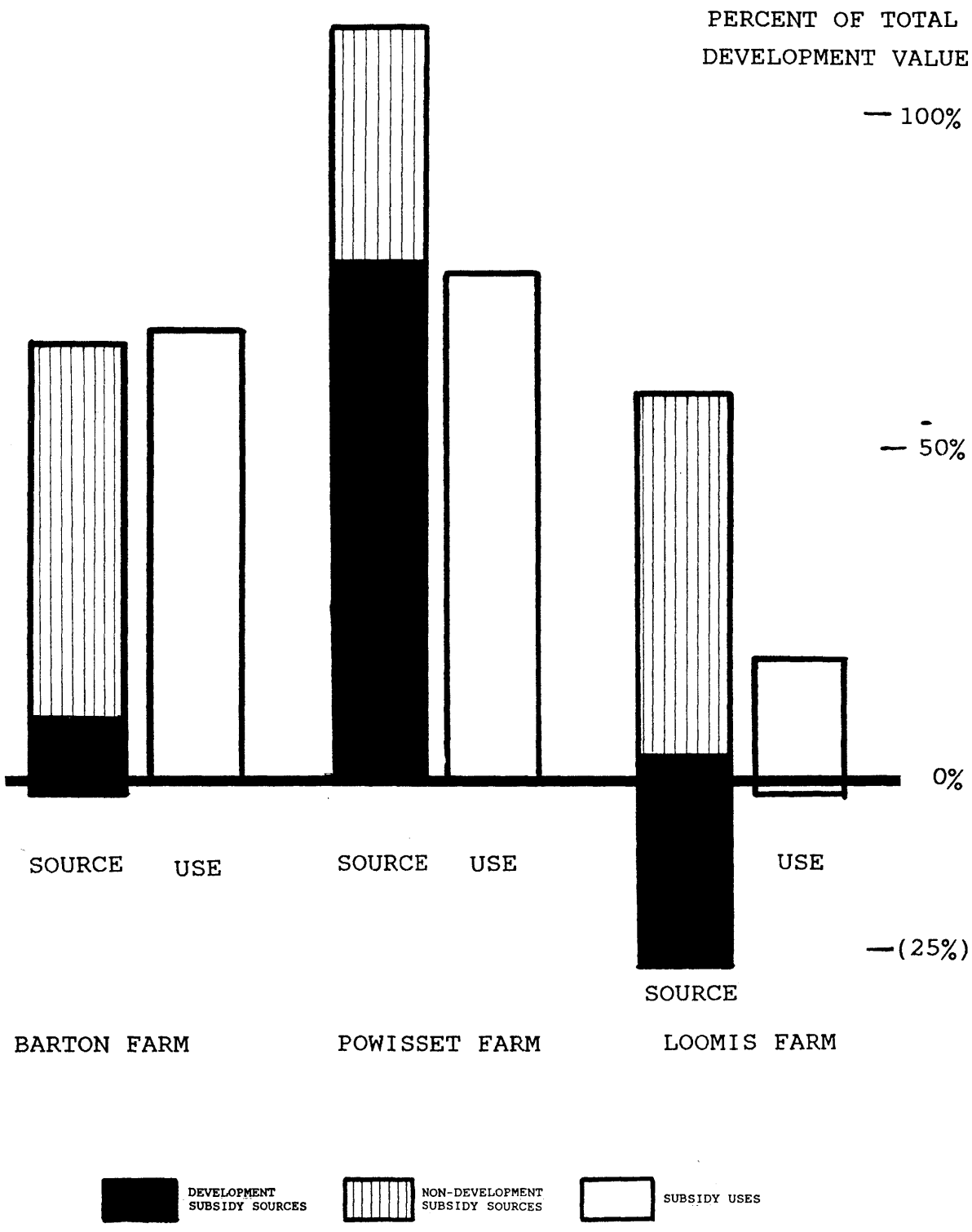

Figure 6-1: Barton, Powisset, and Loomis Farm Subsidy Source and Use Comparison

without any external subsidies from the APR, sale of open space, or bargain sale.

The relative importance of the development and non-development subsidies is sensitive to the assumptions in each case study. For Powisset Farm, alternative assumptions would diminish the importance of the development subsidies, although they would continue to be significant. For both Barton and Loomis, alternative assumptions would have little impact on the basic conclusion that the development subsidies were not significant. Even under alternative assumptions, then, of the three case study projects, only Powisset Farm was effective in subsidizing non-market land uses through limited development.

Some of success of limited development at Powisset is probably due to its location in Dover, one of the most expensive real estate markets in the Boston area. Most practitioners feel that limited development works best in a "somewhat overheated"[1] market such as Dover's.[2] Assessing the constraints of limited development in research that led to the creation of the Land Planning and Management Foundation (LPMF), Davis Cherington noted that

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[1] Interview with Peter Stein, Trust for Public Land, October 27, 1987.

[2] John Malamut, "Compromise Development: Bridging the Gap between Development and Preservation," Urban Land, March, 1987, p. 4.

> [g]enerally, [limited development] works best in upper income real estate markets where buyers are willing to pay a substantial premium for proximity to preserved land.[3]

Inability to find projects in "active real estate markets" was cited by Cherington as one of several difficulties which hampered LPMF's first year of operations.[4]

Such real estate markets are not necessarily in metropolitan areas. In rural northwestern Connecticut and New York's Duchess county, a private limited developer, Country Lands, Inc., relies on a market fueled by wealthy, often New York-based clientele purchasing second homes.[5]

The case studies suggest, then, that limited development generally does not provide more than marginal support to non-market land uses, and can require support itself. Only in an active, expensive real estate market did the development component of one of the case study projects provide significant subsidies to non-market land uses.

Even without providing subsidies, limited development can help make land conservation more affordable by limiting the amount of land that needs to be subsidized. Reselling

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[3] Davis Cherington, "Limited Development Research Project, Final Report," Beverly, Mass.: The Trustees of Reservations, The Society for the Protection of New Hampshire Forests, and the Ottauqueechee Land Trust, (July, 1986).

[4] Letter from Davis Cherington, President, Land Planning and Management Foundation, December 23, 1987.

[5] Interview with Ralph Goodno, partner, Country Lands, Inc., November 6, 1987.

development parcels permits a limited developer to protect and subsidize only critical portions of a site.

Where Do Development Subsidies Come From?

The case study financial analyses, because they are based on assumptions and often suspect data, cannot definitively tell us what created the development profits that were available to subsidize non-market land uses. But however inconclusive, the case studies do provide some evidence of what creates development subsidies.

While most land conservationists put great store in enhancement as the source of limited development profits, the case studies do not bear this out. Rather, they suggest that what I have collectively called "subdivision"--design, testing, surveying, obtaining subdivision approvals, marketing, and, importantly, bringing the pieces and players of a complex project together--adds the greatest value to limited development parcels. While specific data is scant, the case studies provide some evidence that enhancement is limited in value and is a function of the specific site, lot, and buyer. Appreciation can add significantly to the value of development land, but usually at the expense of added holding costs and risk.

The significance of each development subsidy implies certain strategies for non-profit limited development, including decisions about the limited developer's role in the project, the holding period, and design. Like any

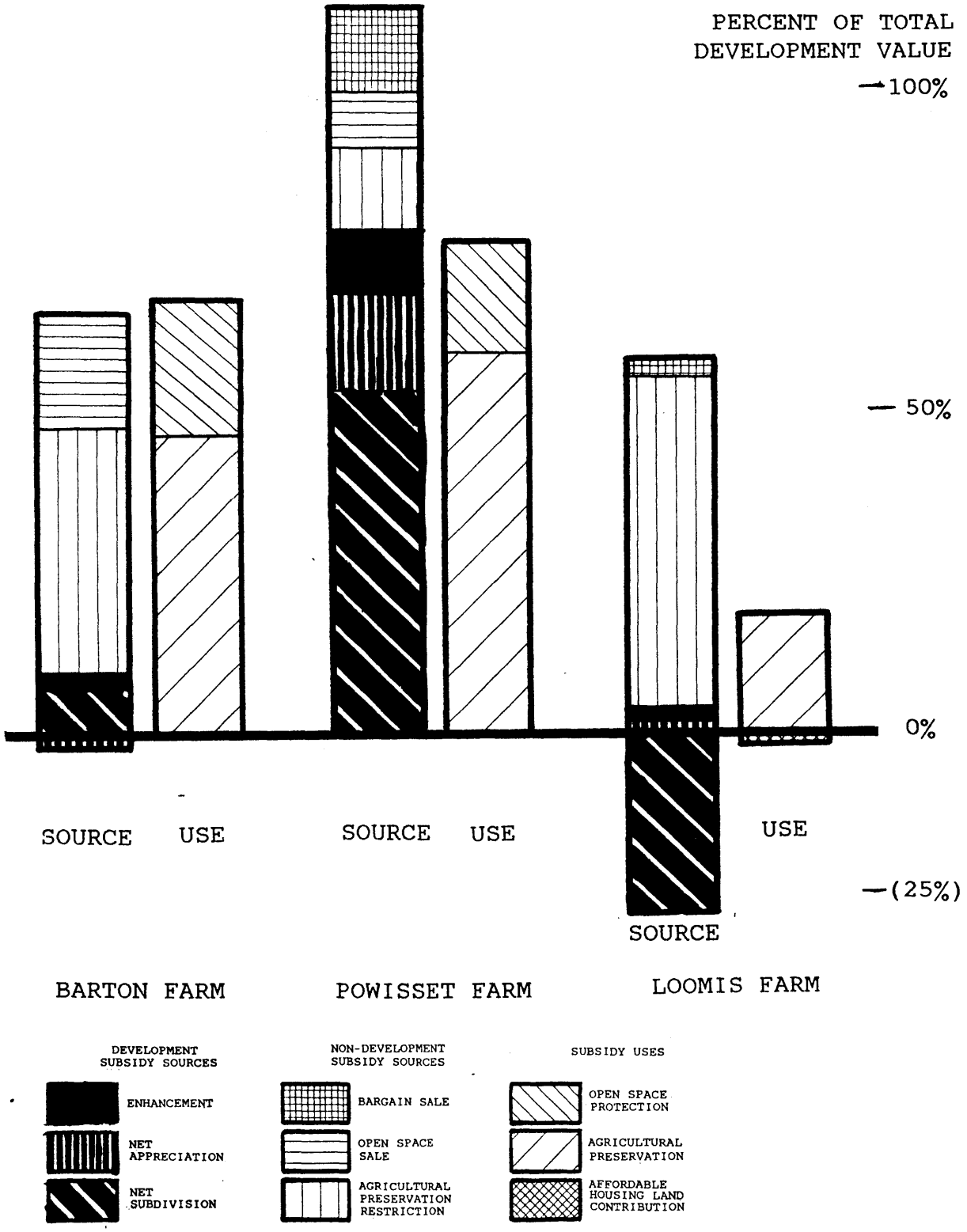

Figure 6-2: Barton Farm, Powisset Farm, and Loomis Farm Subsidy Source and Use Compared (figures from Appendix E)

developer, a non-profit limited developer must consider its purpose, its expertise, its access to capital, and its willingness to accept risk in making these decisions. It must also weigh the benefits and risks involved in the specific project and inherent in the real estate market in which it is operating.

Net Subdivision Subsidy

If we accept the assumptions and inputs discussed in each case study, subdivision was the most important source of **gross** value added to development parcels at Barton and Powisset Farms (Table 6-2).

TABLE 6-2: GROSS VALUE ADDED TO DEVELOPMENT LAND

	Barton	**Powisset**	**Loomis**
Total Development Sales	$272,300	$3,175,000	$261,540
- Initial Value	$186,957	$744,922	$205,970
Total Value Added to Development Land	$85,343	$2,430,078	$55,570
Total Enhancement	$24,755	$275,000	$10,000
Percent of Value Added	**29%**	**11%**	**18%**
Gross Appreciation	$0	$482,240	$71,498
Percent of Value Added	**0%**	**20%**	**129%**
Gross Subdivision Subsidy	$60,589	$1,672,838	($25,928)
Percent of Value Added	**71%**	**69%**	**-47%**

When holding and development costs are subtracted from gross appreciation and the gross subdivision subsidy, respectively, the conclusion remains that the Net Subdivision Subsidy was the most important source of

development subsidies at both farms (Table 6-3, Figure 6-2).

These conclusions must be tempered by the reliability of the data and assumptions on which they rest, however. At Barton, there was no appreciation and the value of enhancement is purely an assumption. The Powisset result is questionable due to uncertainty over the Total Development Value and method used to apportion it.

For the Loomis Farm, the low-density subdivision actually decreased the value of the development land (Table 6-2). When development costs are subtracted, a small drop in value becomes a large negative Net Subdivision Subsidy (Table 6-3).

TABLE 6-3: DEVELOPMENT SUBSIDY SOURCES
(NET VALUE ADDED TO DEVELOPMENT LAND)

	Barton	Powisset	Loomis
Enhancement Subsidy	$24,755	$275,000	$10,000
Percent of Development Subsidies	**44%**	**12%**	**15%**
Net Appreciation Subsidy	($8,053)	$445,019	$13,398
Percent of Development Subsidies	**-14%**	**19%**	**20%**
Net Subdivision Subsidy	$40,105	$1,568,195	($90,738)
Percent of Development Subsidies	**71%**	**69%**	**-135%**
TOTAL DEVELOPMENT SUBSIDIES	$56,807	$2,288,214	($67,340)

That the creation of buildable lots adds more value to land than appreciation or enhancement should not be surprising. When the highest and best use of land is for

development, the basic value of that land is in the legal permission to build on it, or the potential to obtain that permission. Appreciation is not based on the land itself, but on the value of the legal right or potential to build on that land. Similarly, enhancement should not be viewed as value added to the land, but as value added to the underlying value of being able to build on land. Attractive views or adjacency to protected land adds little or nothing to the value of a piece of land that cannot be built upon.

The importance of what I have generically called "subdivision" in creating development subsidies has implications for limited development strategy. A limited developer must decide whether it will act only as the assembler and deal-maker of a project who wholesales undivided development parcels to a builder, or if it will assume the added role of a land developer who tests, designs, subdivides, and markets the subdivided building lots.

Underlying this decision are questions of how much internal development subsidies are needed to make the project successful, and whether the limited developer has the expertise need for land development and is willing to assume the risk involved. Wholesaling development land limits the potential benefits from development parcels, but also limits the risk to the limited developer from added financial commitment, the approvals process, and marketing

the lots.

Decisions affecting the intensity of development have a profound impact on subsidies produced by limited development. In order to maximize subdivision subsidies, the limited developer must be willing to act like a for-profit developer and exploit the full development potential of the non-restricted land. In order to obtain any subdivision subsidy, the limited developer must be willing to subdivide the land at densities high enough to cover at least the land and development costs due to the development parcels. When the limited developer is a non-profit conservation organization, however, decisions over density are often driven as much by concerns with the natural environment, landscape quality, and public image as they are by maximizing returns.

Appreciation

Although it is often thought that holding land in an inflationary land market brings a huge windfall, the cost of holding land usually eats away at any benefits to a limited developer and presents serious risk.

Of the two projects that experienced appreciation, Loomis is the most instructive. Despite two years of phenomenal inflation in the Ashfield real estate market, appreciation provided little in **net** benefits to the project. The gross value added to the Loomis development parcels by appreciation was $71,500 (Table 6-2)--35 percent of the

value of the development land when acquired (Total Development Value divided by frontage). But when holding costs are subtracted, only $13,400 in Net Appreciation Subsidy remains.

Although it provided little benefit to the Loomis project, the extended holding period could have easily jeopardized its success. Had monthly appreciation been one percent--13 percent annually--the project would have barely broken even, producing little in surplus (Table 6-4).

TABLE 6-4: LOOMIS FARM NET APPRECIATION SUBSIDY, SURPLUS or (SHORTFALL), AND RETURN ON TOTAL EXPENSES GIVEN MONTHLY APPRECIATION RATE

Monthly Appreciation Rate	Net Appreciation Subsidy	Surplus or (Shortfall)	Return on Total Expenses
0.0%	($58,100)	($24,589)	-5.2%
1.0%	**($26,351)**	**$8,783**	**1.9%**
2.0%	$13,398	$50,565	10.7%

[6]

With both the Barton and Powisset Farms, MFCLT strove to avoid risk from holding land, selling development parcels as soon as--or even before--the farms were purchased. This quick turnaround limited any benefits from appreciation, but allowed MFCLT to avoid the risk of holding either property.

When a limited developer must pay holding costs, even very high appreciation can provide little benefit. The

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[6] This uses the predictive analysis described in Chapter II. As related there, it is based on the initial assumptions of the frontage-based Loomis Farm analysis discussed in the case study.

irregularity of appreciation also poses great risk to a non-profit limited developer, who have little ability to ride out even short-term market swings. All of this points to the wisdom of MFCLT's strategy of selling development parcels as quickly as possible.

Enhancement

Most descriptions of the benefits of limited development stress the value added through enhancement. It is attractive to conservationists that what they do--protect natural resources--can provide some of the money with which to do it. Although the case studies offer no definitive proof, I believe enhancement does not provide substantial benefits in most limited developments.

In four different studies of the value added to real estate by adjacent park land, estimates range between 10 and 45 percent[7], while the National Association of Home Builders has argued that enhancement by park land may only 15 to 20 percent.[8]

Realizing this potential enhancement value through limited development is difficult, however. The value of

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[7] Daniel S. Greenbaum and Arleen O'Donnell, Losing Ground: The Case for Land Conservation in Massachusetts, Lincoln, Mass.: Massachusetts Audubon Society (October, 1987), pp. 30-31.

[8] Open Space Pays, The Socioenvironomics of Open Space Preservation, New Jersey Conservation Foundation, Morristown, New Jersey, p. 9, cited in Greenbaum and O'Donnell, p. 30.

enhancement to a limited developer is not the long-term value added to the development parcels, but only the extra amount buyers of the development parcels are willing to pay due to the adjacent restricted land. Because the potential worth of an adjacent amenity may not be understood for many years, enhancement may be worth little to a limited developer who must sell lots immediately. For both the Barton and Loomis Farms, participants and realtors suggested that the limited developer realized little in enhancement subsidies, but that enhancement would add more to the value of the lots in the future.

Using the assumptions described in the case studies, enhancement contributed relatively little to the increase in value of development parcels or the subsidies to non-market land uses in any of the case study projects (Tables 6-2 and 6-3). The Barton financial analysis suggests that enhancement added no more than 30 percent to the unenhanced value of the development parcels, and probably much less. At Powisset, realtor Crowley's estimates of enhancement suggest that enhancement by the restricted farmland and open space added about 10 percent to the overall value of the development land. Participants, realtors, and the APR review appraisal all felt enhancement was negligible at Loomis Farm.

The most important lessons about enhancement from the case studies are qualitative, not quantitative. Enhancement

is largely dependent on factors beyond the control of the limited developer, including the local real estate market, the physical qualities of the site itself, local regulations which govern site design, and the individual buyer who places a monetary value on enhancement.

From the Loomis Farm the clear lesson is that restricted open land adds little value to surrounding properties in rural areas. In other words, adjacent open land is worth less where there is more of it, and restrictions prohibiting development are worth less where there is less perceived threat of development.

The physical arrangement of parcels in a limited development has an impact on enhancement as well. Realtor Crowley argued that value is added only when development parcels actually abut restricted land. Realtor Philip Pless maintained for Loomis Farm that restricted parcels on either side of a development lot add more value than they do at the rear where there is less likelihood of future development. He also asserted that with larger lots there is less enhancement value added because the restricted land is farther away and of less concern. Virtually all of the brokers interviewed also insisted that the value added by enhancement is largely a function of the individual purchaser.

Enhancement by restricted farmland is even more problematic. The noise, smells, and perceived threat of

chemical pesticides associated with farming limit potential enhancement of surrounding property values. The degree to which active agriculture provides enhancement is a function of the type of agriculture, the siting and landscaping of the house lots, the terrain, and the individual homeowners and farmers involved.

Enhancement of the value of development parcels by adjacent restricted land is not what drives limited development. Rather, enhancement can provide only slight increases in the value of development parcels and is difficult to realize. The potential for enhancement value is specific to each site and lot, and is largely beyond the control of the limited developer.

Careful arrangement of development lots--maximizing adjacency to restricted land and making full use of views and natural features--may increase the value of enhancement. Pursuit of enhancement should not take priority over the creation of building lots in the first place, however.

Summary

Limited development typically provides only marginal subsidies to non-market land uses which can be used to supplement traditional methods of financing land conservation. It is perhaps best thought of not as a potential source of subsidies, but as disposition of land which is not critical to the conservation goals for which the site was purchased.

To the extent that subsidies are sought from limited development, the effort should concentrate on adding value by turning raw land into subdivided building lots. Non-profit limited developers should minimize carrying costs and financial risk by selling development lots as quickly as possible.

INSTITUTIONAL IMPLICATIONS

The very term "limited development" suggests the underlying institutional contradiction: developers don't try to limit their own profits, and those who limit developers actions don't seek profit from development.

Non-profit, environmentally motivated land trusts face inherent conflicts in purpose, motivation, and temperment when they act as limited developers. They are constrained in the pursuit of development profits by their membership, need to maintain a public image, and access to development skills and capital.

For-profit limited development are constrained by the need to earn a return on their investment of effort and risk, and by the competition from other developers willing to exploit the development potential of land fully.

This section is primarily concerned with institutional constraints on the non-profit limited developer, and only secondarily with the potential role of private limited developers.

The Non-Profit as Limited Developer

The case studies provide some indication of the institutional contradictions of a non-profit conservation organization trying to profit from development.

When pursuing the primary goals of farmland and open space protection, the case study limited developers were clearly and comfortably acting as conservationists. When they assumed the role of a for-profit developer to pursue the secondary goal of making money from the exploitation of land, however, the limited developers were less certain of their purpose. Their actions as developers were restrained by their instincts as conservationists. While a for-profit developer would try to maximize profits within legal and political limitations, the non-profit limited developers tried to earn only a minimum profit with the least development possible.

At both Powisset and Loomis Farms the limited developers lowered the original density of the project by combining lots and pursuing a less intense subdivision as it became apparent that they did not need additional funds to make ends meet. At Loomis, the final development did not even support itself, requiring a subsidy from other sources. In all three cases, development parcels were sold with a range of environmentally motivated restrictions which may have lowered the prices the limited developer received. Although it appears that the protection of farmland and open

space was not impaired by sparse subdivision and development restrictions, they reveal an underlying conflict in roles.

Some of this conflict is due to the structure of the non-profit organizations undertaking limited development. The control of a non-profit limited developer by membership and the need to maintain its public image can hinder it in seeking a profit from land development.

The Loomis Farm provides examples of two extremes. The Trust for Public Land, as a non-membership national organization which derives operating income from "non-profit profits," is freer and more motivated as an organization to maximize subsidies from the development components of its projects. But TPL lacked the local knowledge essential to effective land development. The Franklin Land Trust, because it is a local organization, has to answer to its membership and to some extent to the larger community. Even the minimal development at the Loomis Farm drew criticism.

This conflict is not unique to FLT. The criticism the Housatonic Valley Association (HVA) received for a limited development it carried out in Connecticut was among the factors that led Ralph Goodno to leave HVA and form Country Lands, Inc., a private for-profit limited developer.[9]

Public image is also cited as a problem for non-profit limited developers by former MFCLT Executive Director and

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[9] Interview with Ralph Goodno, November, 1987; telephone interview with Ralph Goodno, October 10, 1987.

TTOR Deputy Director Davis Cherington in research on the structure of a new limited development organization, the Land Planning and Management Foundation (LPMF), which he now heads. "Without careful attention to public relations, a land trust's development activities are often misconstrued and criticized," his report states.[10]

These role conflicts have financial implications for limited developers. Goodno cited lack of access to capital as the most difficult hurdle land trusts must overcome as limited developers. Land trusts, he said, are either unable to get cash, or afraid--with good reason--of debt.[11] Cherington links this difficulty to the nature of the projects and the organizations undertaking them:

> Charitable trusts have found it difficult to raise private investment capital in part because entrepreneurs are understandably wary of projects with a combination of charitable and for-profit objectives. Land trusts, in turn, are wary of entering into partnerships which may be difficult to control, particularly when the entrepreneurs may be board members of the organization, or abutters of the parcel undergoing limited development.[12]

LPMF was an "experiment" in creating a new limited development entity which is a non-profit foundation with a

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[10] Cherington, "Limited Development Research Project, Final Report," p. 1.

[11] Goodno interview, October 10, 1987.

[12] Cherington, "Limited Development Research Project, Final Report," p. 2.

for-profit subsidiary. LPMF and the subsidiary were intended to form limited partnerships with for-profit builders and developers around specific projects.[13]

After 14 months of operation, however, LPMF was unable to support itself through returns on limited development projects as planned. Cherington attributes this to seven factors, including "...lack of sufficient investment capital to undertake projects which involve more than a few months holding time." In addition, he cited problems of high land prices, diminished income tax incentives for bargain sales, covering too large a geographic area (Massachusetts, New Hampshire, and Vermont) and reliance on three parent organizations for referrals of potential projects.[14]

If limited development is to be more than a marginal tool for land protection, it must generate significant subsidies to non-market land uses. The reluctance of non-profit environmental groups to fully exploit land for profit decreases the subsidies generated by limited development, as well as hampering the limited developer's access to capital.

Alternative Limited Development Entities

Non-profit environmental groups are not the only limited developers. Municipalities and for-profit entities also have undertaken limited development.

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[13] Ibid, pp. 7-8, 11-12.

[14] Cherington letter, December 23, 1987, p. 1.

Municipalities are in some ways better suited to be limited developers than land trusts. Towns have much easier access to capital, and can bear much greater financial risk--in the end they do not have to make ends meet. It is common for municipalities to subsidize land protection from non-project revenue. But getting an appropriation or bonding approval from town meeting or a city council can be difficult and subjects a project to open public debate. Municipalities as limited developers face the basic constraint, too, that each one can act only within its borders.

For-Profit Limited Development

For-profit limited development is a paradox. It requires a developer who is normally driven to maximize profit to sacrifice profit. In for-profit limited development, limits must somehow be imposed on the profit motive of the developer.[15]

At Country Lands, Inc., the limits are imposed by the partners' willingness not to develop land fully. This commitment permits Country Lands to buy properties from buyers unwilling to sell to conventional developers. Country Lands also is able to get "bargain sales" from land

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[15] Throughout this discussion, a "for-profit limited developer" is one who subsidizes non-market land use through development profits. It does not mean a developer who is paid by the state (as with an APR) or town (by sale of open space) for the protection of land.

owners who don't want their property fully developed, even without offering charitable contribution deductions. And unlike a non-profit, a for-profit limited developer can take advantage of tax deductions for contributions of land or development rights.[16]

Other ways Country Lands is able to compete with conventional developers include savings in infrastructure costs and cost subsidies, chiefly in the form of cost sharing of agricultural planning services offered by the Soil Conservation Service.[17]

Country Lands structures its projects as limited partnerships, maintaining control as the general partner. Although its objective is to develop as little of the land as possible and there is no guaranteed return to the limited partners, Country Lands must maintain a strong enough return to continue attracting investors for future projects.[18]

Another Connecticut-based for-profit investment company, Farmvest, also uses limited development, but views it primarily as a source of cash to purchase farms and finance capital investment in the farming operation.[19]

Limited development calls for a marriage between a

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[16] Goodno interviews, October 10 and November 6, 1987.

[17] Ibid.

[18] Ibid.

[19] Dougald MacDonald, "Clients Don't Know Red Top From Ragweed on Folly Farm," New England Business; interview with Austin Dunham Barney and Brad Beeler, November 6, 1987.

conservation ethic and the profit motive. Any marriage of the two is bound to involve conflicts, and it is perhaps the greatest challenge of limited development to structure the marriage to resolve, or at least sidestep those conflicts.

AGRICULTURAL VIABILITY

The use of limited development for farmland protection poses the question of whether the protected farmland remains viable. Concerns which underlie this question are the reduced size of farms protected by limited development, potential conflicts with residential neighbors, the form of tenure, and finding farmers willing and able to operate the farm.

The case studies suggest that limited development--at least in New England, and particularly in metropolitan areas--does not necessarily diminish the viability of the farmland it protects. Although limited development pose potential handicaps for agriculture, these are best understood as part of a larger pattern of urbanization which has compelled farmers to adapt their operations.

In terms of size, little or no land was taken out of agricultural production by the three case study limited development projects. Even the relatively small parcels at Barton Farm remained viable when used by established farmers accustomed to farming small, dispersed parcels. Furthermore, smaller farm sizes and more intensive use of

agricultural land are typical of farming in metropolitan areas.[20]

Although annoying to farmers, conflicts with residential neighbors usually do not threaten agricultural viability.[21] In each of the three case studies limited development added residential abutters for the farms. This adjacency is a fact of life for metropolitan farmers, however. In the long-run, any farm in Sudbury or Dover will abut residential uses. Limited development at least offers the opportunity to design the physical interface between the two land uses in a way that diminishes conflicts.

Moreover, none of the farmers in the three case studies reported significant conflicts with neighbors. Through careful management and by providing information to neighbors, Verrill and Arena minimize conflicts. Libby's intention to farm organically will also eliminate some potential conflicts.

The form of tenure created difficulties at Powisset Farm. Although TTOR leased the land to ensure that it

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[20] Christopher R. Bryant and Thomas R. R. Johnston, "The City's Countryside: Landscapes of Opportunities or Conflict for Farming," Waterloo, Ontario: Department of Geography, University of Waterloo, unpublished paper presented at the annual meeting of the Association of American Geographers, Portland, Oregon, April, 1987, p. 2.

[21] Tom Johnston and Barry Smit, "An Evaluation of the Rationale for Farmland Preservation Policy in Ontario," Land Use Policy, July, 1985, pp. 232-33.

continued to be used for "meaningful" agriculture,[22] conflicts arose between the farmer and the owner over changes to the land and buildings. Davis Cherington also asserted that leased farmland is typically abused by tenants who have no long-term interest in the land.

Both the Powisset and Loomis Farms show the potential difficulty in finding a viable farmer to purchase or rent protected farmland. Comparison with the Barton Farm suggests that established local farmers looking to expand are better able to assume and use the restricted farmland. Locating such a farmer can be difficult or impossible, however.

One of the hopes of restricting farmland through the APR program or limited development is to remove land cost as an obstacle to new farmers. Pat Libby's and Kim Reardon's experience at what is now Cross Farm suggests that undercapitalization is also a major obstacle to starting new farms. Because the deed restriction on the farmland reduced its market value, it also reduced Libby's and Reardon's access to credit in purchasing and starting the farm.

The two for-profit Connecticut limited developers, Farmvest and Country Lands, provide examples of how limited development can help overcome this obstacle. In both cases profit from the sale of development parcels is invested in the farming operation as well as being used to subsidize the

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[22] Cherington interview, December 29, 1987.

purchase of the farmland. Country Lands retains and operates the farmland itself, trying to reestablish profitability, while Farmvest offers investors partnerships in operating farms.[23]

There is a basic question of whether environmental groups preserve agricultural land for its continued use or for aesthetic reasons, and what impact their motives have on the viability of farmland. Cherington felt the two motivations are not mutually exclusive, and pointed to MFCLT's successful work with farmers on a number of projects.[24]

Dunham Barney of Farmvest argued that environmentalists in land trusts are not connected to the agricultural community or agriculture. "Environmentalists aren't fundamentally supportive of agriculture," he said. "If you're going to preserve farmland, you must preserve farmers. You need to design not just the development, but the agricultural use of the land."[25]

Limited development does not necessarily affect the viability of farmland. To the extent that it is effective in financing the protection of farmland, limited development increases the viability of farmland by lowering its price. The constraints limited development places on farming are no

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[23] Goodno interviews, Barney and Beeler interview.

[24] Cherington interview, December 29, 1987.

[25] Barney interview.

different than those faced by farmers throughout metropolitan areas.

POLICY CONTEXT

Protecting farmland through limited development poses several broad policy questions, including:

1. Does the protection of agricultural land and open space justify the exclusive housing typical of limited development? Does limited development work only with exclusive housing?

2. Where, and under what circumstances is limited development most appropriate as a tool for agricultural preservation?

3. What is the role of limited development? Can it replace direct subsidy programs? Can it compete with full development for land?

Affordable Housing v. Conservation: Limited Development for Whom?

Because limited development typically produces exclusive housing, there have been charges that it is "gentrifying" the countryside. Moreover, protection of farmland and open space diminishes the supply of land available for housing, driving up housing prices.[26]

Ralph Goodno defended Country Lands' exclusive product by arguing that its first priority is to preserve land and its second priority is to produce a profit so it can

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[26] Malamut, p. 6; Goodno interviews.

continue to attract investors.[27] In his research report, Cherington notes the conflict over housing affordability as well:

> Because lots must sell for premium prices, limited development tends to have a "gentrifying" effect on an area. Arguably, however, upper income buyers should be the ones to pay for open space preservation from which the public-at-large may then derive some benefit.[28]

In the face of finite resources, the fundamental goal of farmland or open space protection takes precedence in limited development. At the Barton Farm, for instance, added subsidy use by affordable housing would have increased the project's shortfall.

The question of affordable housing becomes important when a limited development project generates a surplus. After meeting their initial conservation goals, a limited developers has a number of options. It can decrease the density of the development, creating even more exclusive house lots but lowering the profit from the development parcels; it can protect additional land rather than selling it for development; it can put the surplus to a related use (such as providing a maintenance endowment Noanet Woodlands from the Powisset surplus); it can use the surplus to provide non-land support to agriculture; or it can include

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[27] Goodno interviews.

[28] Cherington, "Final Report," p. 6.

affordable housing.

There is potential for combining affordable housing and agricultural preservation in limited development projects. At Loomis Farm, for example, two out of nine potential houses will be affordable. The negative $1,900 subsidy use by affordable housing at Loomis Farm (Table 5-3, page 143) means that TPL and FLT made a slight profit on the sale of the affordable lots--despite selling them at half their expected market price. Although the Loomis market development parcels did not produce a subsidy, the higher density and more efficient use of land allowed the affordable lots to generate a small subsidy despite discount prices.

It is not a forgone conclusion that exclusive housing is necessary to make limited development work. Because upper income lot buyers are able to pay the highest premium for the amenity of adjacent restricted land, creating exclusive lots supposedly provides a greater subsidy--through enhancement--to the project.

The case study financial analyses suggest, however, that even with exclusive buyers enhancement creates far less in subsidies than the basic act of creating approved building lots. If this is true, limited developers may be able to provide greater subsidies to non-market land uses by creating greater numbers of smaller, more affordable lots.

A Tool for the Suburbs and the Metropolitan Fringe

To the extent that it is effective as a tool for financing land conservation, limited development is most effective in areas with high demand for housing--typically the suburbs and metropolitan fringe.

Limited development produces subsidies through the sale of house lots, and is predicated on a demand for those lots. The same development pressure that creates the need for land conservation in the first place provides the market for limited development lots. One of the reasons Cherington cited for LPMF's difficulties was that "[m]any of the partial development opportunities ... were located outside of active real estate markets, making partial development infeasible."[29] This feature of limited development is not unique to New England.[30]

Although enhancement appears not to be important to the success of limited development, it is likely to contribute more to limited development where open land is scarcer or there is a perception that open land is disappearing.

In suburban and metropolitan fringe areas, as well, limited development can to some extent mitigate the impact of urbanization on agriculture.

Because it is market-driven, limited development works best where direct subsidy programs can least afford to

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[29] Cherington letter, p. 1.

[30] Malamut, p. 4.

operate. Limited development allows the APR program to keep operating at least at the fringe of the metropolitan Boston region.[31] At Powisset Farm, for example, limited development produced subsidies which the APR program could not afford to provide. Realistically, the APR at Powisset Farm was a token contribution to ensure a permanent agricultural restriction on the land. Limited development offers a complement to the APR program, not a way to replace it.

Can Limited Development Make a Difference?

Perhaps the most important question about limited development is whether it can make a significant difference in protecting farmland, or whether it provides a series of interesting but anomalous experiments.

If, as the financial analyses suggest, substantial bargain sales, government subsidies, and government purchases of conservation land are needed for limited development to work, then it is only a marginal tool for financing land protection. Limited development usually provides only supplemental subsidies, bridging the gap between traditional subsidy sources and the subsidies needed for non-market land uses. In very active real estate markets limited development can complement public subsidy

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[31] Interview with James Alicata, Chief, Bureau of Land Use, Massachusetts Department of Food and Agriculture, December 7, 1987.

programs.

Limited development does not offer the hope that conservation can compete with market development for land on a wide scale. Without additional subsidies from non-development sources, limited development usually cannot make ends meet, and for-profit developers willing to exploit the full development potential of a property will almost always be able to outbid a limited developer.

Limited development is not a panacea, but is another in the array of tools that can be combined to help pay for the protection of farmland and open space. Private charity through bargain sales and donations of conservation easements, and public policy instruments such as the APR, federal income tax deductions, and regulation of development will continue to be the primary tools for protecting open land.

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APPENDIX A: THE ANALYSIS SPREADSHEET

This appendix provides an explanation of the basic spreadsheet used in the financial analyses of the case studies. Each section below explains a single table of the spreadsheet line by line. Differences between the basic spreadsheet and the predictive spreadsheet are described at the end.

LAND VARIABLES

This table shows inputs for the division of the entire project into its various components, including agriculturally restricted land, non-agricultural open space land, market development land, and affordable housing land.

Land which includes conservation restrictions but is sold to the buyer of a developable parcel has been treated as development land, not open space. Open space refers to land which is owned for conservation purposes by a town, state, or federal agency or private land conservation organization such as The Trustees of Reservations or a local land trust.

The land is divided by both acreage and legal road frontage, with absolute and percentage divisions shown. The "Percent Analyzed" column indicates which percentage is being used throughout the spreadsheet in allocating costs and value. If this column shows the percentage by acreage, then the entire analysis is acreage-based, if by frontage, then it is frontage based.

INCOME VARIABLES

Information on rental and sales income from the entire project are entered in this table.

The "Months Rented" and "Monthly Rent" entries include rent from both agricultural land and existing houses.

The "Sale to Farmer" entry is the total sales of restricted farmlands. In the case of Powisset Farm, the "Sale of Farmer" has been replaced by annual rents capitalized at 10 percent. The "APR Sale" entry is the total of state and local contributions to the purchase of an Agricultural Preservation Restriction on the farmland. "Total Agricultural Sales" is the sum of the "Sale to Farmer" and "APR Sale."

"Open Space Sales" includes the purchase of all open space land by public bodies and private conservation organizations.

"Market Development Land Sales" is the total sales of market development land, including restricted parcels. It is drawn from the total of the fifth column, "Sale Price," in the **MARKET DEVELOPMENT LOT SALE SCHEDULE** table (see below).

"Affordable Development Sales" is the total sale price of all land sold at less than market value in order to subsidize the production of affordable housing.

EXPENSE VARIABLES

All data on project expenses are entered in this table.

"Purchase Price" is the actual price at which the limited developer purchased the land.

"Financing Costs" shows the aggregate **interest** costs to the limited developer. "Real Estate Taxes" shows aggregate taxes paid by the limited developer for the period during which the land was held. "Insurance" is the insurance carried by the limited developer on buildings purchased with the farm.

"Legal," "Planning & Engineering," "Surveying," and "Other Services" include all non-staff professional services paid for by the limited developer to complete the project, and are summed under "Total Professional Services."

"Staff Overhead" is the estimate supplied by the limited developer of staff overhead costs. "Other Expenses" includes all other expenses, including any "hard" development costs.

SUBSIDY ASSUMPTIONS

This table includes information and assumptions used in calculating the different subsidy sources and uses of the limited development project.

"Total Development Value" is the best estimate available of the fair market value (for development) of the entire project at the time it was acquired by the limited developer.

"Monthly Appreciation Factor" is the assumption used for the uniform monthly rate at which land appreciated from the purchase of the farm to the sale of the final development lot.

"Enhancement Premium" is the estimated overall percentage by which the market development lots were enhanced by the restriction of the farm and conservation components of the project. Where enhancement was analyzed lot by lot (Powisset Farm), this item is the percentage of the unenhanced value represented by enhancement, drawn from the **MARKET DEVELOPMENT LOT SALE SCHEDULE** (see below).

INCOME

This table calculates the gross income for the project.

The "Per Acre" column shows the values divided by the appropriate acreage, drawn from the **LAND VARIABLES** table. The "Sale to Farmer," "Total APR Purchase," and the "Total Restricted Agricultural Land Sales" are each divided by the "Agriculturally Restricted" acreage from the "Land Variables" table. The "Open Space Land Sales," "Market Development Land Sales," "Affordable Development Land Sales," and "Total Development Land Sales" are each divided by the corresponding acreage from the "Land Variables" table. The "TOTAL INCOME" is divided by the total acreage of the project.

"Total Rental Income" is simply the product of the "Months Rented" and "Monthly Rent" entries. All other items are drawn directly from the **INCOME VARIABLES** table.

"TOTAL INCOME" is the sum of the "Total Rental Income," "Total Restricted Agricultural Land Sales," "Open Space Land Sales," "Total Development Land Sales," and "Other Income."

EXPENSES

This table shows project expenses, drawn directly from the **EXPENSE VARIABLES** table. Each item is again divided by the corresponding acreage from the **LAND VARIABLES** table.

"TOTAL EXPENSES" is the sum of "Purchase Price," "Financing," "Real Estate Taxes," "Insurance," "Total Professional Services," "Staff Overhead," and "Other Expenses."

INCOME AND EXPENSES

This table subtracts the "TOTAL EXPENSE" from "TOTAL INCOME" to show the "SURPLUS or (SHORTFALL)" resulting from the entire project, both as a total and per acre. "RETURN ON TOTAL EXPENSES" divides the "SURPLUS or (SHORTFALL)" by "TOTAL EXPENSES."

MARKET DEVELOPMENT LOT SALE SCHEDULE

This table includes information on the sale of market development lots, and accounts for enhancement and appreciation in value.

The "Lot Designation" column indicates the designation given to the lot or lots on the subdivision plan. The "Sale Date" indicates the month in which it was sold, while the "Project Month" column is the number of months from the purchase of the farm (or agreement on price in the case of Powisset Farm) by the limited developer to the sale of the particular lot. "Sale Price" is the price paid by the lot purchaser to the limited developer.

The "Enhancement Premium" column indicates for the Loomis and Barton Farm projects the amount the individual lot would have been enhanced at the overall enhancement rate from the **SUBSIDY ASSUMPTIONS** table. For the Powisset Farm, it indicates the estimates of enhancement value given by the realtor who sold the lots. "Unenhanced Value" is the sale price less the "Enhancement Premium."

"Gross Appreciation" is the amount of the "Unenhanced Value" due to appreciation given the "Project Month," and the "Monthly Appreciation Factor" from the **SUBSIDY ASSUMPTIONS** table. "Percent Appreciation" is the percent of the "Unappreciated, Unenhanced Value" represented by the gross appreciation--in other words it is the appreciation rate on that particular lot.

"Unappreciated, Unenhanced Value" is the sale price of the lot less the "Enhancement Premium" and less the "Gross Appreciation."

BARGAIN SALE SUBSIDY

This table calculates the "BARGAIN SALE BENEFIT" to the limited developer by subtracting the "Purchase Price" (**EXPENSE VARIABLES** table) from the "Total Development Value" (**SUBSIDY ASSUMPTIONS** table).

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

This is the amount paid by the state (and town in some cases) for the Agricultural Preservation Restriction, taken from the **INCOME VARIABLES** table.

OPEN SPACE SALE SUBSIDY

This is the amount paid by town, state, federal or private land conservation organizations for open space portions of the project, taken from the **INCOME VARIABLES** table.

ENHANCEMENT SUBSIDY

This table simply shows the total enhancement subsidy, which is drawn from the "TOTAL" of the "Enhancement Premium" column of the **MARKET DEVELOPMENT LOT SALE SCHEDULE** table.

NET APPRECIATION SUBSIDY

This table calculates the "**Net** Appreciation Subsidy" provided. The "Gross Appreciation" entry is drawn from the **MARKET DEVELOPMENT LOT SALE SCHEDULE** table. From this is subtracted the total time-dependent expenses for the entire project: "Financing Costs," "Real Estate Taxes," and "Insurance" from the **EXPENSE VARIABLES** table. To this is added "Total Rental Income" collected during this period, drawn from the **EXPENSES** table.

NET SUBDIVISION SUBSIDY

This table estimates the **net** subsidy resulting from subdivision of the property.

First, "Initial Value [of the] Development Land" is calculated by multiplying the "Total Development Value" (**SUBSIDY ASSUMPTIONS** table) by the "Percent Analyzed" for "Market Development Land" (**LAND VARIABLES** table).

This "Initial Value Development Land" is subtracted from the "Total Unappreciated, Unenhanced Value" of the development land, drawn from the "TOTAL" of the "Unappreciated Value" of the **MARKET DEVELOPMENT LOT SALE SCHEDULE**. The remainder is the "Gross Subdivision Subsidy," or the gross income generated by subdivision of the property.

From this is subtracted "Professional & Staff Costs" attributable to the development portion of the project. These costs are the sum of "Total Professional," "Staff Overhead," and "Other Expenses" from the **EXPENSE VARIABLES** table, **multiplied** by the "Percent Analyzed" for "Market Development Land" from the **LAND VARIABLES** table. The remainder is the "NET SUBDIVISION SUBSIDY."

AGRICULTURAL PRESERVATION
OPEN SPACE PROTECTION
AFFORDABLE HOUSING LAND CONTRIBUTION

All three of these tables estimate the subsidies **use** by the three non-market land uses involved in the case studies.

For each, the initial "Development Value" of the land is calculated by multiplying the "Total Development Value" from the **SUBSIDY ASSUMPTIONS** table by the appropriate "Percent Analyzed" from the **LAND VARIABLES** table. This product represents what it would have cost to acquire the portion of land dedicated to the specific non-market use at the beginning of the project.

To this is added the "Professional & Staff Costs" attributable to that portion of the project. These costs are estimated by multiplying the sum of "Total Professional Services," "Staff Overhead," and "Other Expenses" from the **EXPENSE VARIABLES** table, by the appropriate "Percent Analyzed" from the **LAND VARIABLES** table.

For **AGRICULTURAL PRESERVATION**, the "Sale Price to Farmer," from the **INCOME VARIABLES** table, is then subtracted. For **AFFORDABLE HOUSING LAND CONTRIBUTION**, the "Affordable Housing Land Sales," also from the **INCOME VARIABLES** table, is subtracted. The sale income of conservation land is not subtracted for Open Space Protection because that sale is considered a subsidy source, not use.

SUBSIDY SOURCES

This table summarizes the subsidies estimated earlier. The subsidies are grouped and summed. The entries are drawn from the corresponding **SUBSIDY SOURCES** tables. "Non-Development Subsidies" are those which are not the result of the limited development project, while "Limited Development Subsidies" are those which resulted from the development of a portion of the original property.

The "Percent of Subsidies Sources" column shows each subsidy source divided by the "TOTAL SUBSIDY SOURCES," i.e. the percent of the total subsidy sources represented each individual subsidy source. The "Percent of Total Development Value" column shows each subsidy represented as a percent of the "Total Development Value," from the **SUBSIDY ASSUMPTIONS** table. This latter column is to allow comparability between the three case studies.

SUBSIDY USES

This table summarizes the use of subsidy by "Agricultural Preservation," "Open Space Preservation," and "Affordable Housing Land Contribution," drawn from the corresponding **SUBSIDY USES** tables. The "Percent of Subsidy Use" column shows each subsidy use divided by the "TOTAL SUBSIDY USES," i.e. the percent of the total subsidy use represented each individual subsidy use. The "Percent of Total Development Value" column shows each subsidy use represented as a percent of the "Total Development Value," from the **SUBSIDY ASSUMPTIONS** table. This latter column is to allow comparability between the three case studies.is the column here is percent of the subsidies **used.**

SUBSIDY SURPLUS OR SHORTFALL

This table simply determines the "SUBSIDY SURPLUS or (SHORTFALL)" by subtracting the "TOTAL SUBSIDIES USED" from the "TOTAL SUBSIDIES PROVIDED." The "SURPLUS or (SHORTFALL)" is also divided by the "TOTAL SUBSIDY USES" and shown as a "PERCENT OF SUBSIDY USES."

PREDICTIVE ANALYSIS

The predictive analysis spreadsheet differs in that it calculates the sales price of the lots based on assumptions of enhancement and appreciation, rather than accounting for enhancement and appreciation given the sales prices.

The **MARKET DEVELOPMENT LOT SALE SCHEDULE** starts with the "Unappreciated, Unenhanced Value" of each lot, drawn from the same table in the basic spreadsheet. To this is **added** "Gross Appreciation," based on the "Monthly Appreciation Factor" (**SUBSIDY ASSUMPTIONS** table) and the "Project Month." To this is then added the "Enhancement Premium," based on the "Enhancement Premium" (**SUBSIDY ASSUMPTIONS** table). The final sum is the predicted "Sales Price" of each lot.

The total of the "Sales Prices" is the source of the "Market Development Land Sales" in the **INCOME VARIABLES** table, from which it is used in the **INCOME** table and the **NET SUBDIVISION SUBSIDY** table.

APPENDIX B-1: BARTON FARM ACREAGE-BASED SPREADSHEET

CASE: Barton Farm, Sudbury
ANALYSIS: Acreage based

FILE: bartonla.wkl
DATE: 1/6/88

LAND VARIABLES	Acres	Percent of Acreage	Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	43	54%	2,115	46%	54%
Open Space Land	15	19%	885	19%	19%
Market Development Land	22	27%	1,600	35%	27%
Affordable Housing Land	0	0%	0	0%	0%
Total Development Land	22	27%	1,600	35%	27%
TOTAL	81	100%	4,600	100%	100%

INCOME VARIABLES	
Months Rented	6
Total Monthly Rents	$259
Sale to Farmer	$22,235
APR Sale	$200,350
Total Agricultural Land Sales	$222,585
Open Space Land Sales	$99,650
Market Development Land Sales	$272,300
Affordable Housing Land Sales	$0
Total Development Land Sales	$272,300
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$537,500
Financing Costs	$4,232
Real Estate Taxes	$5,375
Insurance	$0
Legal Services	$21,066
Planning & Engineering	$9,900
Surveying	$0
Other Services	$1,050
Total Professional Services	$32,016
Staff Overhead	$26,875
Other Expenses	$0

SUBSIDY ASSUMPTIONS	
Total Development Value	$537,500
Monthly Appreciation Factor	0.0%
Enhancement Premium	10.0%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$1,554	
Sale to Farmer	$22,235	$512
APR Sale	$200,350	$4,609
Total Restricted Agricultural Land Sales	$222,585	$5,120
Open Space Land Sales	$99,650	$6,586
Market Development Land Sales	$272,300	$12,422
Affordable Housing Land Sales	$0	$0
Total Development Land Sales	$272,300	$12,422
Other Income	$0	
TOTAL INCOME	$596,089	$7,403

EXPENSES	Total	Per Acre
Purchase Price	$537,500	$6,675
Financing	$4,232	$53
Real Estate Taxes	$5,375	$67
Insurance	$0	$0
Legal Services	$21,066	
Planning & Engineering	$9,900	
Surveying	$0	
Other Services	$1,050	
Total Professional Services	$32,016	$398
Staff Overhead	$26,875	$334
Other Expenses	$0	
TOTAL EXPENSES	$605,998	$7,526

INCOME AND EXPENSES		
+ TOTAL INCOME	$596,089	$7,403
- TOTAL EXPENSES	$605,998	$7,526
SURPLUS or (SHORTFALL)	($9,909)	($123)
RETURN ON TOTAL EXPENSES	-1.6%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Sale Price	Enhancement Premium	Unenhanced Value	Gross Appreciation	Percent Appreciation	Unappreciated Unenhanced Value
TOTAL	2/82	0	21.9	$272,300	$24,755	$247,545	$0	0%	$247,545

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$537,500
- Purchase Price	$537,500
BARGAIN SALE SUBSIDY (to buyer)	$0

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$200,350

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$99,650

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$24,755

NET APPRECIATION SUBSIDY

Gross Appreciation	$0
- Interest, Real Estate Taxes, & Insurance	$9,607
+ Rental Income	$1,554
NET APPRECIATION SUBSIDY	($8,053)

NET SUBDIVISION SUBSIDY

Total Development Value	$537,500
* Market Development Land Percentage	27%
Initial Value Development Land	$146,324
Total Unappreciated, Unenhanced Value	$247,545
- Initial Value Development Land	$146,324
Gross Subdivision Subsidy	$101,222
- Professional & Staff Costs	$16,032
NET SUBDIVISION SUBSIDY	$85,190

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$537,500
* Agriculturally Restricted Percentage	54%
Development Value of Agricultural Land	$290,178
+ Professional & Staff Costs	$31,793
- Sale Price to Farmer	$22,235
AGRICULTURAL PRESERVATION SUBSIDY USE	$299,736

OPEN SPACE PROTECTION

Total Development Value	$537,500
* Open Space Land Percentage	19%
Development Value of Open Space Land	$100,998
+ Professional & Staff Costs	$11,066
OPEN SPACE PROTECTION SUBSIDY USE	$112,064

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$537,500
* Affordable Housing Land Percentage	0%
Development Value, Affordable Housing Land	$0
+ Professional & Staff Costs	$0
- Affordable Housing Sales	$0
AFFORDABLE HOUSING LAND CONTRIBUTION USE	$0

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$0	0%	0%
APR Subsidy	$200,350	50%	37%
Open Space Sale Subsidy	$99,650	25%	19%
Total Non-Development Subsidies	$300,000	75%	56%
Enhancement Subsidy	$24,755	6%	5%
Net Appreciation Subsidy	($8,053)	-2%	-1%
Net Subdivision Subsidy	$85,190	21%	16%
Total Limited Development Subsidies	$101,891	25%	19%
TOTAL SUBSIDY SOURCES	$401,891	100%	75%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$299,736	73%	56%
Open Space Protection	$112,064	27%	21%
Affordable Housing Contribution	$0	0%	0%
TOTAL SUBSIDY USES	$411,800	100%	77%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$401,891
- TOTAL SUBSIDY USES	$411,800
SUBSIDY SURPLUS or (SHORTFALL)	($9,909)
PERCENT OF SUBSIDY USES	-2.4%

APPENDIX B-2: BARTON FARM FRONTAGE-BASED SPREADSHEET

CASE: Barton Farm, Sudbury
ANALYSIS: Frontage based

FILE: bartonlb.wk1
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Approximate Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	43	54%	2,115	46%	46%
Open Space Land	15	19%	885	19%	19%
Market Development Land	22	27%	1,600	35%	35%
Affordable Housing Land	0	0%	0	0%	0%
Total Development Land	22	27%	1,600	35%	35%
TOTAL	81	100%	4,600	100%	100%

INCOME VARIABLES	
Months Rented	6
Total Monthly Rents	$259
Sale to Farmer	$22,235
APR Sale	$200,350
Total Agricultural Land Sales	$222,585
Open Space Land Sales	$99,650
Market Development Land Sales	$272,300
Affordable Housing Land Sales	$0
Total Development Land Sales	$272,300
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$537,500
Financing Costs	$4,232
Real Estate Taxes	$5,375
Insurance	$0
Legal Services	$21,066
Planning & Engineering	$9,900
Surveying	$0
Other Services	$1,050
Total Professional Services	$32,016
Staff Overhead	$26,875
Other Expenses	$0

SUBSIDY ASSUMPTIONS	
Total Development Value	$537,500
Monthly Appreciation Factor	0.0%
Enhancement Premium	10.0%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$1,554	
Sale to Farmer	$22,235	$512
APR Sale	$200,350	$4,609
Total Restricted Agricultural Land Sales	$222,585	$5,120
Open Space Land Sales	$99,650	$6,586
Market Development Land Sales	$272,300	$12,422
Affordable Housing Land Sales	$0	$0
Total Development Land Sales	$272,300	$12,422
Other Income	$0	
TOTAL INCOME	$596,089	$7,403

EXPENSES	Total	Per Acre
Purchase Price	$537,500	$6,675
Financing	$4,232	$53
Real Estate Taxes	$5,375	$67
Insurance	$0	$0
Legal Services	$21,066	
Planning & Engineering	$9,900	
Surveying	$0	
Other Services	$1,050	
Total Professional Services	$32,016	$398
Staff Overhead	$26,875	$334
Other Expenses	$0	
TOTAL EXPENSES	$605,998	$7,526

INCOME AND EXPENSES		
+ TOTAL INCOME	$596,089	$7,403
- TOTAL EXPENSES	$605,998	$7,526
SURPLUS or (SHORTFALL)	($9,909)	($123)
RETURN ON TOTAL EXPENSES	-1.6%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Sale Price	Enhancement Premium	Unenhanced Value	Gross Appreciation	Percent Appreciation	Unappreciated Unenhanced Value
TOTAL	2/82	0	21.9	$272,300	$24,755	$247,545	$0	0%	$247,545

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$537,500
- Purchase Price	$537,500
BARGAIN SALE SUBSIDY (to buyer)	$0

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$200,350

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$99,650

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$24,755

NET APPRECIATION SUBSIDY

Gross Appreciation	$0
- Interest, Real Estate Taxes, & Insurance	$9,607
+ Rental Income	$1,554
NET APPRECIATION SUBSIDY	($8,053)

NET SUBDIVISION SUBSIDY

Total Development Value	$537,500
* Market Development Land Percentage	35%
Initial Value Development Land	$186,957
Total Unappreciated, Unenhanced Value	$247,545
- Initial Value Development Land	$186,957
Gross Subdivision Subsidy	$60,589
- Professional & Staff Costs	$20,484
NET SUBDIVISION SUBSIDY	$40,105

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$537,500
* Agriculturally Restricted Percentage	46%
Development Value of Agricultural Land	$247,133
+ Professional & Staff Costs	$27,077
- Sale Price to Farmer	$22,235
AGRICULTURAL PRESERVATION SUBSIDY USE	$251,975

OPEN SPACE PROTECTION

Total Development Value	$537,500
* Open Space Land Percentage	19%
Development Value of Open Space Land	$103,410
+ Professional & Staff Costs	$11,330
OPEN SPACE PROTECTION SUBSIDY USE	$114,740

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$537,500
* Affordable Housing Land Percentage	0%
Development Value, Affordable Housing Land	$0
+ Professional & Staff Costs	$0
- Affordable Housing Sales	$0
AFFORDABLE HOUSING LAND CONTRIBUTION USE	$0

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$0	0%	0%
APR Subsidy	$200,350	56%	37%
Open Space Sale Subsidy	$99,650	28%	19%
Total Non-Development Subsidies	$300,000	84%	56%
Enhancement Subsidy	$24,755	7%	5%
Net Appreciation Subsidy	($8,053)	-2%	-1%
Net Subdivision Subsidy	$40,105	11%	7%
Total Limited Development Subsidies	$56,807	16%	11%
TOTAL SUBSIDY SOURCES	$356,807	100%	66%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$251,975	69%	47%
Open Space Protection	$114,740	31%	21%
Affordable Housing Contribution	$0	0%	0%
TOTAL SUBSIDY USES	$366,716	100%	68%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$356,807
- TOTAL SUBSIDY USES	$366,716
SUBSIDY SURPLUS or (SHORTFALL)	($9,909)
PERCENT OF SUBSIDY USES	-2.7%

APPENDIX B-3: BARTON FARM PREDICTIVE SPREADSHEET

CASE: Barton Farm, Sudbury
ANALYSIS: Frontage based, with variable appreciation and enhancement

FILE: barton2a.wk1
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Approximate Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	43	54%	2,115	46%	46%
Open Space Land	15	19%	885	19%	19%
Market Development Land	22	27%	1,600	35%	35%
Affordable Housing Land	0	0%	0	0%	0%
Total Development Land	22	27%	1,600	35%	35%
TOTAL	81	100%	4,600	100%	100%

INCOME VARIABLES	
Months Rented	6
Total Monthly Rents	$259
Sale to Farmer	$22,235
APR Sale	$200,350
Total Agricultural Land Sales	$222,585
Open Space Land Sales	$99,650
Market Development Land Sales	$272,300
Affordable Housing Land Sales	$0
Total Development Land Sales	$272,300
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$537,500
Financing Costs	$4,232
Real Estate Taxes	$5,375
Insurance	$0
Legal Services	$21,066
Planning & Engineering	$9,900
Surveying	$0
Other Services	$1,050
Total Professional Services	$32,016
Staff Overhead	$26,875
Other Expenses	$0

SUBSIDY AND BENEFIT ASSUMPTIONS	
Total Development Value	$537,500
Monthly Appreciation Factor	0.0%
Enhancement Premium	10.0%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$1,554	
Sale to Farmer	$22,235	$512
APR Sale	$200,350	$4,616
Total Restricted Agricultural Land Sales	$222,585	$5,129
Open Space Land Sales	$99,650	$6,471
Market Development Land Sales	$272,300	$12,377
Affordable Housing Land Sales	$0	$0
Total Development Land Sales	$272,300	$12,377
Other Income	$0	
TOTAL INCOME	$596,089	$7,377

EXPENSES	Total	Per Acre
Purchase Price	$537,500	$6,652
Financing	$4,232	$52
Real Estate Taxes	$5,375	$67
Insurance	$0	$0
Legal Services	$21,066	
Planning, Engineering, & Surveying	$9,900	
Other Services	$1,050	
Total Professional Services	$32,016	$396
Staff Overhead	$26,875	$333
Other Expenses	$0	
TOTAL EXPENSES	$605,998	$7,500

INCOME AND EXPENSES		
+ TOTAL INCOME	$596,089	$7,377
- TOTAL EXPENSES	$605,998	$7,500
SURPLUS or (SHORTFALL)	($9,910)	($123)
RETURN ON TOTAL EXPENSES	-1.6%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Unappreciated Unenhanced Value	Gross Appreciation	Appreciated Unenhanced Value	Enhancement Premium	Final Value (Sales Price)
TOTAL	2/82	0	13.0	$247,545	$0	$247,545	$24,755	$272,300

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$537,500
- Purchase Price	$537,500
BARGAIN SALE SUBSIDY (to buyer)	$0

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$200,350

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$99,650

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$24,755

NET APPRECIATION SUBSIDY

Gross Appreciation	$0
- Interest, Real Estate Taxes, & Insurance	$9,607
+ Rental Income	$1,554
NET APPRECIATION SUBSIDY	($8,053)

NET SUBDIVISION SUBSIDY

Total Development Value	$537,500
* Market Development Land Percentage	35%
Initial Value Development Land	$186,957
Total Unappreciated, Unenhanced Value	$247,545
- Initial Value Development Land	$186,957
Gross Subdivision Subsidy	$60,588
- Professional & Staff Costs	$20,484
NET SUBDIVISION SUBSIDY	$40,105

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$537,500
* Agriculturally Restricted Percentage	46%
Development Value of Agricultural Land	$247,133
+ Professional & Staff Costs	$27,077
- Sale Price to Farmer	$22,235
AGRICULTURAL PRESERVATION SUBSIDY USE	$251,975

OPEN SPACE PROTECTION

Total Development Value	$537,500
* Open Space Land Percentage	19%
Development Value of Open Space Land	$103,410
+ Professional & Staff Costs	$11,330
OPEN SPACE PROTECTION SUBSIDY USE	$114,740

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$537,500
* Affordable Housing Land Percentage	0%
Development Value, Affordable Housing Land	$0
+ Professional & Staff Costs	$0
- Affordable Housing Sales	$0
AFFORDABLE HOUSING LAND CONTRIBUTION USE	$0

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$0	0%	0%
APR Subsidy	$200,350	56%	37%
Open Space Sale Subsidy	$99,650	28%	19%
Total Non-Development Subsidies	$300,000	84%	56%
Enhancement Subsidy	$24,755	7%	5%
Net Appreciation Subsidy	($8,053)	-2%	-1%
Net Subdivision Subsidy	$40,105	11%	7%
Total Limited Development Subsidies	$56,806	16%	11%
TOTAL SUBSIDY SOURCES	$356,806	100%	66%

SUBSIDY USES	Actual	Percent of Subsidy Uses	
Agricultural Preservation	$251,975	69%	47%
Open Space Protection	$114,740	31%	21%
Affordable Housing Contribution	$0	0%	0%
TOTAL SUBSIDY USES	$366,716	100%	68%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$356,806
- TOTAL SUBSIDY USES	$366,716
SUBSIDY SURPLUS or (SHORTFALL)	($9,910)
PERCENT OF SUBSIDY USES	-2.7%

APPENDIX C-1: POWISSET FARM ACREAGE-BASED SPREADSHEET

CASE: Powisset Farm, Dover
ANALYSIS: Acreage based

FILE: powsstla.wkl
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	106	56%	1,153	19%	56%
Open Space Land	29	15%	404	7%	15%
Market Development Land	54	29%	4,541	74%	29%
Affordable Housing Land	0	0%	0	0%	0%
Total Development Land	54	29%	4,541	74%	29%
TOTAL	190	100%	6,098	100%	100%

INCOME VARIABLES	
Months Rented	0
Total Monthly Rents	$833
Annual Rents Capitalized @ 10%	$100,000
APR Sale	$350,000
Total Agricultural Land Sales and Value	$450,000
Open Space Land Sales	$250,000
Market Development Land Sales	$3,175,000
Affordable Housing Land Sales	$0
Total Development Land Sales	$3,175,000
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$2,407,270
Financing Costs	$30,163
Real Estate Taxes	$25,605
Insurance	$3,120
Legal Services	$60,121
Planning & Engineering	$7,044
Surveying	$2,812
Other Services	$800
Total Professional Services	$70,777
Staff Overhead	$180,545
Other Expenses	$113,913

SUBSIDY AND BENEFIT ASSUMPTIONS	
Total Development Value	$2,800,000
Monthly Appreciation Factor	2.0%
Enhancement Premium	9.5%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$0	
Annual Rents Capitalized @ 10%	$100,000	$939
APR Sale	$350,000	$3,287
Total Restricted Agricultural Land Sales	$450,000	$4,226
Open Space Land Sales	$250,000	$8,648
Market Development Land Sales	$3,175,000	$58,393
Affordable Housing Land Sales	$0	$0
Total Development Land Sales	$3,175,000	$58,393
Other Income	$0	
TOTAL INCOME	$3,875,000	$20,419

EXPENSES	Total	Per Acre
Purchase Price	$2,407,270	$12,685
Financing	$30,163	$159
Real Estate Taxes	$25,605	$135
Insurance	$3,120	$16
Legal Services	$60,121	
Planning & Engineering	$7,044	
Surveying	$2,812	
Other Services	$800	
Total Professional Services	$70,777	$373
Staff Overhead	$180,545	$951
Other Expenses	$113,913	
TOTAL EXPENSES	$2,831,393	$14,920

INCOME AND EXPENSES		
+ TOTAL INCOME	$3,875,000	$20,419
- TOTAL EXPENSES	$2,831,393	$14,920
SURPLUS or (SHORTFALL)	$1,043,607	$5,499
RETURN ON TOTAL EXPENSES	36.9%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Sale Price	Enhancement Premium	Unenhanced Value	Gross Appreciation	Percent Appreciation	Unappreciated Unenhanced Value
South 3	10/85	4	2.1	$170,000	$25,000	$145,000	$11,042	8%	$133,958
South 5	10/85	4	2.0	$175,000	$25,000	$150,000	$11,423	8%	$138,577
South 7	10/85	4	2.2	$240,000	$25,000	$215,000	$16,373	8%	$198,627
South 10	10/85	4	2.0	$185,000	$75,000	$110,000	$8,377	8%	$101,623
North 3	10/85	4	3.7	$240,000	$0	$240,000	$18,277	8%	$221,723
North 4 & 5	10/85	4	8.5	$345,000	$0	$345,000	$26,273	8%	$318,727
South 6	11/85	5	2.1	$175,000	$25,000	$150,000	$14,140	10%	$135,860
North 7-8	12/85	6	8.3	$425,000	$100,000	$325,000	$36,409	13%	$288,591
West 6, 7, & 8	3/86	9	10.3	$375,000	$0	$375,000	$61,217	20%	$313,783
North 6-7	7/86	13	6.5	$470,000	$0	$470,000	$106,675	29%	$363,325
West 4 & 5	1/88	31	4.5	$375,000	$0	$375,000	$172,033	85%	$202,967
South 8	UNSOLD		2.121	$0	$0	$0	$0	0%	$0
	TOTAL		54.4	$3,175,000	$275,000	$2,900,000	$482,240	20%	$2,417,760

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$2,800,000
- Purchase Price	$2,407,270
BARGAIN SALE SUBSIDY (to buyer)	$392,730

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$350,000

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$250,000

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$275,000

NET APPRECIATION SUBSIDY

Gross Appreciation	$482,240
- Interest, Real Estate Taxes, & Insurance	$58,888
+ Rental Income	$0
NET APPRECIATION SUBSIDY	$423,352

NET SUBDIVISION SUBSIDY

Total Development Value	$2,800,000
* Market Development Land Percentage	29%
Initial Value Development Land	$802,224
Total Unappreciated, Unenhanced Value	$2,417,760
- Initial Value Development Land	$802,224
Gross Subdivision Subsidy	$1,615,536
- Professional & Staff Costs	$104,643
NET SUBDIVISION SUBSIDY	$1,510,893

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$2,800,000
* Agriculturally Restricted Percentage	56%
Development Value of Agricultural Land	$1,571,236
+ Professional & Staff Costs	$204,954
- Annual Rent Capitalized @ 10%	$100,000
AGRICULTURAL PRESERVATION SUBSIDY USE	$1,676,190

OPEN SPACE PROTECTION

Total Development Value	$2,800,000
* Open Space Land Percentage	15%
Development Value of Open Space Land	$426,540
+ Professional & Staff Costs	$55,638
OPEN SPACE PROTECTION SUBSIDY USE	$482,179

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$2,800,000
* Affordable Housing Land Percentage	0%
Development Value, Affordable Housing Land	$0
+ Professional & Staff Costs	$0
- Affordable Housing Sales	$0
AFFORDABLE HOUSING LAND CONTRIBUTION USE	$0

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$392,730	12%	14%
APR Subsidy	$350,000	11%	13%
Open Space Sale Subsidy	$250,000	8%	9%
Total Non-Development Subsidies	$992,730	31%	35%
Enhancement Subsidy	$275,000	9%	10%
Net Appreciation Subsidy	$423,352	13%	15%
Net Subdivision Subsidy	$1,510,893	47%	54%
Total Limited Development Subsidies	$2,209,245	69%	79%
TOTAL SUBSIDY SOURCES	$3,201,975	100%	114%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$1,676,190	78%	60%
Open Space Protection	$482,179	22%	17%
Affordable Housing Contribution	$0	0%	0%
TOTAL SUBSIDY USES	$2,158,368	100%	77%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$3,201,975
- TOTAL SUBSIDY USES	$2,158,368
SUBSIDY SURPLUS or (SHORTFALL)	$1,043,607
PERCENT OF SUBSIDY USES	48.4%

APPENDIX C-2: POWISSET FARM FRONTAGE-BASED SPREADSHEET

CASE: Powisset Farm, Dover
ANALYSIS: Frontage based

FILE: powsstlb.wk1
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	106	56%	1,153	19%	19%
Open Space Land	29	15%	404	7%	7%
Market Development Land	54	29%	4,541	74%	74%
Affordable Housing Land	0	0%	0	0%	0%
Total Development Land	54	29%	4,541	74%	74%
TOTAL	190	100%	6,098	100%	100%

INCOME VARIABLES	
Months Rented	0
Total Monthly Rents	$833
Annual Rents Capitalized @ 10%	$100,000
APR Sale	$350,000
Total Agricultural Land Sales and Value	$450,000
Open Space Land Sales	$250,000
Market Development Land Sales	$3,175,000
Affordable Housing Land Sales	$0
Total Development Land Sales	$3,175,000
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$2,407,270
Financing Costs	$30,163
Real Estate Taxes	$25,605
Insurance	$3,120
Legal Services	$60,121
Planning & Engineering	$7,044
Surveying	$2,812
Other Services	$800
Total Professional Services	$70,777
Staff Overhead	$180,545
Other Expenses	$113,913

SUBSIDY AND BENEFIT ASSUMPTIONS	
Total Development Value	$2,800,000
Monthly Appreciation Factor	2.0%
Enhancement Premium	9.5%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$0	
Annual Rents Capitalized @ 10%	$100,000	$939
APR Sale	$350,000	$3,287
Total Restricted Agricultural Land Sales	$450,000	$4,226
Open Space Land Sales	$250,000	$8,648
Market Development Land Sales	$3,175,000	$58,393
Affordable Housing Land Sales	$0	$0
Total Development Land Sales	$3,175,000	$58,393
Other Income	$0	
TOTAL INCOME	$3,875,000	$20,419

EXPENSES	Total	Per Acre
Purchase Price	$2,407,270	$12,685
Financing	$30,163	$159
Real Estate Taxes	$25,605	$135
Insurance	$3,120	$16
Legal Services	$60,121	
Planning & Engineering	$7,044	
Surveying	$2,812	
Other Services	$800	
Total Professional Services	$70,777	$373
Staff Overhead	$180,545	$951
Other Expenses	$113,913	
TOTAL EXPENSES	$2,831,393	$14,920

INCOME AND EXPENSES		
+ TOTAL INCOME	$3,875,000	$20,419
- TOTAL EXPENSES	$2,831,393	$14,920
SURPLUS or (SHORTFALL)	$1,043,607	$5,499
RETURN ON TOTAL EXPENSES	36.9%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Sale Price	Enhancement Premium	Unenhanced Value	Gross Appreciation	Percent Appreciation	Unappreciated Unenhanced Value
South 3	10/85	4	2.1	$170,000	$25,000	$145,000	$11,042	8%	$133,958
South 5	10/85	4	2.0	$175,000	$25,000	$150,000	$11,423	8%	$138,577
South 7	10/85	4	2.2	$240,000	$25,000	$215,000	$16,373	8%	$198,627
South 10	10/85	4	2.0	$185,000	$75,000	$110,000	$8,377	8%	$101,623
North 3	10/85	4	3.7	$240,000	$0	$240,000	$18,277	8%	$221,723
North 4 & 5	10/85	4	8.5	$345,000	$0	$345,000	$26,273	8%	$318,727
South 6	11/85	5	2.1	$175,000	$25,000	$150,000	$14,140	10%	$135,860
North 7-8	12/85	6	8.3	$425,000	$100,000	$325,000	$36,409	13%	$288,591
West 6, 7, & 8	3/86	9	10.3	$375,000	$0	$375,000	$61,217	20%	$313,783
North 6-7	7/86	13	6.5	$470,000	$0	$470,000	$106,675	29%	$363,325
West 4 & 5	1/88	31	4.5	$375,000	$0	$375,000	$172,033	85%	$202,967
South 8	UNSOLD		2.121	$0	$0	$0	$0	0%	$0
	TOTAL		54.4	$3,175,000	$275,000	$2,900,000	$482,240	20%	$2,417,760

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$2,800,000
- Purchase Price	$2,407,270
BARGAIN SALE SUBSIDY (to buyer)	$392,730

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$350,000

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$250,000

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$275,000

NET APPRECIATION SUBSIDY

Gross Appreciation	$482,240
- Interest, Real Estate Taxes, & Insurance	$58,888
+ Rental Income	$0
NET APPRECIATION SUBSIDY	$423,352

NET SUBDIVISION SUBSIDY

Total Development Value	$2,800,000
* Market Development Land Percentage	74%
Initial Value Development Land	$2,085,111
Total Unappreciated, Unenhanced Value	$2,417,760
- Initial Value Development Land	$2,085,111
Gross Subdivision Subsidy	$332,649
- Professional & Staff Costs	$271,984
NET SUBDIVISION SUBSIDY	$60,665

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$2,800,000
* Agriculturally Restricted Percentage	19%
Development Value of Agricultural Land	$529,394
+ Professional & Staff Costs	$69,055
- Annual Rent Capitalized @ 10%	$100,000
AGRICULTURAL PRESERVATION SUBSIDY USE	$498,449

OPEN SPACE PROTECTION

Total Development Value	$2,800,000
* Open Space Land Percentage	7%
Development Value of Open Space Land	$185,495
+ Professional & Staff Costs	$24,196
OPEN SPACE PROTECTION SUBSIDY USE	$209,691

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$2,800,000
* Affordable Housing Land Percentage	0%
Development Value, Affordable Housing Land	$0
+ Professional & Staff Costs	$0
- Affordable Housing Sales	$0
AFFORDABLE HOUSING LAND CONTRIBUTION USE	$0

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$392,730	22%	14%
APR Subsidy	$350,000	20%	13%
Open Space Sale Subsidy	$250,000	14%	9%
Total Non-Development Subsidies	$992,730	57%	35%
Enhancement Subsidy	$275,000	16%	10%
Net Appreciation Subsidy	$423,352	24%	15%
Net Subdivision Subsidy	$60,665	3%	2%
Total Limited Development Subsidies	$759,017	43%	27%
TOTAL SUBSIDY SOURCES	$1,751,747	100%	63%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$498,449	70%	18%
Open Space Protection	$209,691	30%	7%
Affordable Housing Contribution	$0	0%	0%
TOTAL SUBSIDY USES	$708,140	100%	25%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$1,751,747
- TOTAL SUBSIDY USES	$708,140
SUBSIDY SURPLUS or (SHORTFALL)	$1,043,607
PERCENT OF SUBSIDY USES	147.4%

APPENDIX C-3: POWISSET FARM PREDICTIVE SPREADSHEET

CASE: Powisset Farm, Dover
ANALYSIS: Acreage based, with variable appreciation and enhancement

FILE: powsst2a.wk1
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	106	56%	1,153	19%	56%
Open Space Land	29	15%	404	7%	15%
Market Development Land	54	29%	4,541	74%	29%
Affordable Housing Land	0	0%	0	0%	0%
Total Development Land	54	29%	4,541	74%	29%
TOTAL	189	100%	6,098	100%	100%

INCOME VARIABLES	
Months Rented	0
Total Monthly Rents	$833
Annual Rents Capitalized @ 10%	$100,000
APR Sale	$350,000
Total Agricultural Land Sales	$450,000
Open Space Land Sales	$250,000
Market Development Land Sales	$2,131,393
Affordable Housing Land Sales	$0
Total Development Land Sales	$2,131,393
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$2,407,270
Financing Costs	$30,163
Real Estate Taxes	$25,605
Insurance	$3,120
Legal Services	$60,121
Planning & Engineering	$7,044
Surveying	$2,812
Other Services	$800
Total Professional Services	$70,777
Staff Overhead	$180,545
Other Expenses	$113,913

SUBSIDY AND BENEFIT ASSUMPTIONS	
Total Development Value	$2,800,000
Monthly Appreciation Factor	-2.7%
Enhancement Premium	9.5%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$0	
Annual Rents Capitalized @ 10%	$100,000	$943
APR Sale	$350,000	$3,302
Total Restricted Agricultural Land Sales	$450,000	$4,245
Open Space Land Sales	$250,000	$8,621
Market Development Land Sales	$2,131,393	$39,470
Affordable Housing Land Sales	$0	$0
Total Development Land Sales	$2,131,393	$39,470
Other Income	$0	
TOTAL INCOME	$2,831,393	$14,981

EXPENSES	Total	Per Acre
Purchase Price	$2,407,270	$12,737
Financing	$30,163	$160
Real Estate Taxes	$25,605	$135
Insurance	$3,120	$17
Legal Services	$60,121	
Planning & Engineering	$7,044	
Surveying	$2,812	
Other Services	$800	
Total Professional Services	$70,777	$374
Staff Overhead	$180,545	$955
Other Expenses	$113,913	
TOTAL EXPENSES	$2,831,393	$14,981

INCOME AND EXPENSES		
+ TOTAL INCOME	$2,831,393	$14,981
- TOTAL EXPENSES	$2,831,393	$14,981
SURPLUS or (SHORTFALL)	$0	$0
RETURN ON TOTAL EXPENSES	0.0%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Unappreciated Unenhanced Value	Gross Appreciation	Appreciated Unenhanced Value	Enhancement Premium	Final Value (Sales Price)
South 3	10/85	4	2.1	$133,958	($13,928)	$120,030	$11,382	$131,412
South 5	10/85	4	2.0	$138,577	($14,408)	$124,169	$11,775	$135,944
South 7	10/85	4	2.2	$198,627	($20,652)	$177,975	$16,877	$194,852
South 10	10/85	4	2.0	$101,623	($10,566)	$91,057	$8,635	$99,692
North 3	10/85	4	3.7	$221,723	($23,053)	$198,670	$18,839	$217,509
North 4 & 5	10/85	4	8.5	$318,727	($33,139)	$285,588	$27,082	$312,670
South 6	11/85	5	2.1	$135,860	($17,421)	$118,439	$11,231	$129,670
North 7-8	12/85	6	8.3	$288,591	($43,817)	$244,774	$23,211	$267,985
West 6,7, & 8	3/86	9	10.3	$313,783	($68,678)	$245,105	$23,243	$268,348
North 6-7	7/86	13	6.5	$363,325	($109,028)	$254,297	$24,114	$278,411
West 4 & 5	1/88	31	4.5	$202,967	($116,287)	$86,680	$8,220	$94,899
South 8	UNSOLD		2.1					
	TOTAL		54.3	$2,417,761	($470,977)	$1,946,784	$184,609	$2,131,393

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$2,800,000
- Purchase Price	$2,407,270
BARGAIN SALE SUBSIDY (to buyer)	$392,730

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$350,000

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$250,000

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$184,609

NET APPRECIATION SUBSIDY

Gross Appreciation	($470,977)
- Interest, Real Estate Taxes, & Insurance	$58,888
+ Rental Income	$0
NET APPRECIATION SUBSIDY	($529,865)

NET SUBDIVISION SUBSIDY

Total Development Value	$2,800,000
* Market Development Land Percentage	29%
Initial Value Development Land	$800,000
Total Unappreciated, Unenhanced Value	$2,417,761
- Initial Value Development Land	$800,000
Gross Subdivision Subsidy	$1,617,761
- Professional & Staff Costs	$104,353
NET SUBDIVISION SUBSIDY	$1,513,408

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$2,800,000
* Agriculturally Restricted Percentage	56%
Development Value of Agricultural Land	$1,570,370
+ Professional & Staff Costs	$204,841
- Sale Price to Farmer	$100,000
AGRICULTURAL PRESERVATION SUBSIDY USE	$1,675,211

OPEN SPACE PROTECTION

Total Development Value	$2,800,000
* Open Space Land Percentage	15%
Development Value of Open Space Land	$429,630
+ Professional & Staff Costs	$56,041
OPEN SPACE PROTECTION SUBSIDY USE	$485,671

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$2,800,000
* Affordable Housing Land Percentage	0%
Development Value, Affordable Housing Land	$0
+ Professional & Staff Costs	$0
- Affordable Housing Sales	$0
AFFORDABLE HOUSING LAND CONTRIBUTION USE	$0

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$392,730	18%	14%
APR Subsidy	$350,000	16%	13%
Open Space Sale Subsidy	$250,000	12%	9%
Total Non-Development Subsidies	$992,730	46%	35%
Enhancement Subsidy	$184,609	9%	7%
Net Appreciation Subsidy	($529,865)	-25%	-19%
Net Development Subsidy	$1,513,408	70%	54%
Total Limited Development Subsidies	$1,168,152	54%	42%
TOTAL SUBSIDY SOURCES	$2,160,882	100%	77%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$1,675,211	78%	60%
Open Space Protection	$485,671	22%	17%
Affordable Housing Contribution	$0	0%	0%
TOTAL SUBSIDY USES	$2,160,882	100%	77%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$2,160,882
- TOTAL SUBSIDIES USES	$2,160,882
SUBSIDY SURPLUS or (SHORTFALL)	$0
PERCENT OF SUBSIDY USES	0.0%

APPENDIX D-1: LOOMIS FARM ACREAGE-BASED SPREADSHEET

CASE: Loomis Farm, Ashfield
ANALYSIS: Acreage based

FILE: loomisla.wk1
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	176	39%	3,957	32%	39%
Open Space Land	0	0%	0	0%	0%
Market Development Land	265	59%	8,058	65%	59%
Affordable Housing Land	10	2%	465	4%	2%
Total Development Land	275	61%	8,523	68%	61%
TOTAL	451	100%	12,480	100%	100%

INCOME VARIABLES	
Months Rented	9
Total Monthly Rents	$600
Sale to Farmer	$74,000
APR Sale	$166,000
Total Restricted Agricultural Land Sales	$240,000
Open Space Land Sales	$0
Market Development Land Sales	$261,540
Affordable Housing Land Sales	$17,500
Total Development Land Sales	$279,040
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$310,000
Financing Costs	$56,000
Real Estate Taxes	$5,500
Insurance	$2,000
Legal Services	$19,000
Planning & Engineering	$4,000
Surveying	$10,100
Other Services	$0
Total Professional Services	$33,100
Staff Overhead	$46,350
Other Expenses	$20,925

SUBSIDY AND BENEFIT ASSUMPTIONS	
Total Development Value	$319,000
Monthly Appreciation Factor	2.0%
Enhancement Premium	5.1%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$5,400	
Sale to Farmer	$74,000	$421
APR Sale	$166,000	$944
Total Restricted Agricultural Land Sales	$240,000	$1,365
Open Space Land Sales	$0	$0
Market Development Land Sales	$261,540	$987
Affordable Housing Land Sales	$17,500	$1,753
Total Development Land Sales	$279,040	$1,014
Other Income	$0	
TOTAL INCOME	$524,440	$1,163

EXPENSES	Total	Per Acre
Purchase Price	$310,000	$687
Financing	$56,000	$124
Real Estate Taxes	$5,500	$12
Insurance	$2,000	$4
Legal Services	$19,000	
Planning & Engineering	$4,000	
Surveying	$10,100	
Other Services	$0	
Total Professional Services	$33,100	$73
Staff Overhead	$46,350	$103
Other Expenses	$20,925	
TOTAL EXPENSES	$473,875	$1,051

INCOME AND EXPENSES		
+ TOTAL INCOME	$524,440	$1,163
- TOTAL EXPENSES	$473,875	$1,051
SURPLUS or (SHORTFALL)	$50,565	$112
RETURN ON TOTAL EXPENSES	10.7%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Sale Price	Enhancement Premium	Unenhanced Value	Gross Appreciation	Percent Appreciation	Unappreciated Unenhanced Value
South B, C-1 C-2, & C-3	2/87	19	14.6	$7,000	$341	$6,659	$2,088	46%	$4,571
North C	2/87	19	42.1	$45,500	$2,214	$43,286	$13,573	46%	$29,713
North E	2/87	19	4.5	$21,000	$1,022	$19,978	$6,265	46%	$13,714
Farmstead	4/87	21	8.4	$56,000	$0	$56,000	$0	0%	$56,000
North D	4/87	21	5.3	$19,500	$949	$18,551	$6,312	52%	$12,240
North F & G	5/87	22	9.4	$36,000	$1,752	$34,248	$12,095	55%	$22,153
North J, K, & L	10/87	27	23.9	$29,900	$1,455	$28,445	$11,780	71%	$16,665
South D-3	12/87	29	106.6	$46,640	$2,269	$44,371	$19,385	78%	$24,986
North B	NOT YET SOLD		50.32						
	TOTAL		265.1	$261,540	$10,000	$251,540	$71,498	40%	$180,041

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$319,000
- Purchase Price	$310,000
BARGAIN SALE SUBSIDY (to buyer)	$9,000

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$166,000

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$0

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$10,000

NET APPRECIATION SUBSIDY

Gross Appreciation	$71,498
- Interest, Real Estate Taxes, & Insurance	$63,500
+ Rental Income	$5,400
NET APPRECIATION SUBSIDY	$13,398

NET SUBDIVISION SUBSIDY

Total Development Value	$319,000
* Market Development Land Percentage	59%
Initial Value Development Land	$187,531
Total Unappreciated, Unenhanced Value	$180,041
- Initial Value Development Land	$187,531
Gross Subdivision Subsidy	($7,489)
- Professional & Staff Costs	$59,008
NET SUBDIVISION SUBSIDY	($66,497)

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$319,000
* Agriculturally Restricted Percentage	39%
Development Value of Agricultural Land	$124,406
+ Professional & Staff Costs	$39,145
- Sale Price to Farmer	$74,000
AGRICULTURAL PRESERVATION SUBSIDY USE	$89,551

OPEN SPACE PROTECTION

Total Development Value	$319,000
* Open Space Land Percentage	0%
Development Value of Open Space Land	$0
+ Professional & Staff Costs	$0
OPEN SPACE PROTECTION SUBSIDY USE	$0

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$319,000
* Affordable Housing Land Percentage	2%
Development Value, Affordable Housing Land	$7,063
+ Professional & Staff Costs	$2,222
- Affordable Housing Sales	$17,500
AFFORDABLE HOUSING LAND CONTRIBUTION USE	($8,214)

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$9,000	7%	3%
APR Subsidy	$166,000	126%	52%
Open Space Sale Subsidy	$0	0%	0%
Total Non-Development Subsidies	$175,000	133%	55%
Enhancement Subsidy	$10,000	8%	3%
Net Appreciation Subsidy	$13,398	10%	4%
Net Subdivision Subsidy	($66,497)	-50%	-21%
Total Limited Development Subsidies	($43,098)	-33%	-14%
TOTAL SUBSIDY SOURCES	$131,902	100%	41%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$89,551	110%	28%
Open Space Protection	$0	0%	0%
Affordable Housing Contribution	($8,214)	-10%	-3%
TOTAL SUBSIDY USES	$81,337	100%	25%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$131,902
- TOTAL SUBSIDY USES	$81,337
SUBSIDY SURPLUS or (SHORTFALL)	$50,565
PERCENT OF SUBSIDY USES	62.2%

APPENDIX D-2: LOOMIS FARM FRONTAGE-BASED SPREADSHEET

CASE: Loomis Farm, Ashfield
ANALYSIS: Frontage based

FILE: loomislb.wk1
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	176	39%	3,957	32%	32%
Open Space Land	0	0%	0	0%	0%
Market Development Land	265	59%	8,058	65%	65%
Affordable Housing Land	10	2%	465	4%	4%
Total Development Land	275	61%	8,523	68%	68%
TOTAL	451	100%	12,480	100%	100%

INCOME VARIABLES	
Months Rented	9
Total Monthly Rents	$600
Sale to Farmer	$74,000
APR Sale	$166,000
Total Restricted Agricultural Land Sales	$240,000
Open Space Land Sales	$0
Market Development Land Sales	$261,540
Affordable Housing Land Sales	$17,500
Total Development Land Sales	$279,040
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$310,000
Financing Costs	$56,000
Real Estate Taxes	$5,500
Insurance	$2,000
Legal Services	$19,000
Planning & Engineering	$4,000
Surveying	$10,100
Other Services	$0
Total Professional Services	$33,100
Staff Overhead	$46,350
Other Expenses	$20,925

SUBSIDY AND BENEFIT ASSUMPTIONS	
Total Development Value	$319,000
Monthly Appreciation Factor	2.0%
Enhancement Premium	5.1%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$5,400	
Sale to Farmer	$74,000	$421
APR Sale	$166,000	$944
Total Restricted Agricultural Land Sales	$240,000	$1,365
Open Space Land Sales	$0	$0
Market Development Land Sales	$261,540	$987
Affordable Housing Land Sales	$17,500	$1,753
Total Development Land Sales	$279,040	$1,014
Other Income	$0	
TOTAL INCOME	$524,440	$1,163

EXPENSES	Total	Per Acre
Purchase Price	$310,000	$687
Financing	$56,000	$124
Real Estate Taxes	$5,500	$12
Insurance	$2,000	$4
Legal Services	$19,000	
Planning & Engineering	$4,000	
Surveying	$10,100	
Other Services	$0	
Total Professional Services	$33,100	$73
Staff Overhead	$46,350	$103
Other Expenses	$20,925	
TOTAL EXPENSES	$473,875	$1,051

INCOME AND EXPENSES		
+ TOTAL INCOME	$524,440	$1,163
- TOTAL EXPENSES	$473,875	$1,051
SURPLUS or (SHORTFALL)	$50,565	$112
RETURN ON TOTAL EXPENSES	10.7%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Sale Price	Enhancement Premium	Unenhanced Value	Gross Appreciation	Percent Appreciation	Unappreciated Unenhanced Value
South B, C-1 C-2, & C-3	2/87	19	14.6	$7,000	$341	$6,659	$2,088	46%	$4,571
North C	2/87	19	42.1	$45,500	$2,214	$43,286	$13,573	46%	$29,713
North E	2/87	19	4.5	$21,000	$1,022	$19,978	$6,265	46%	$13,714
Farmstead	4/87	21	8.4	$56,000	$0	$56,000	$0	0%	$56,000
North D	4/87	21	5.3	$19,500	$949	$18,551	$6,312	52%	$12,240
North F & G	5/87	22	9.4	$36,000	$1,752	$34,248	$12,095	55%	$22,153
North J, K, & L	10/87	27	23.9	$29,900	$1,455	$28,445	$11,780	71%	$16,665
South D-3	12/87	29	106.6	$46,640	$2,269	$44,371	$19,385	78%	$24,986
North B	NOT YET SOLD		50.32						
	TOTAL		265.1	$261,540	$10,000	$251,540	$71,498	40%	$180,041

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$319,000
- Purchase Price	$310,000
BARGAIN SALE SUBSIDY (to buyer)	$9,000

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$166,000

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$0

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$10,000

NET APPRECIATION SUBSIDY

Gross Appreciation	$71,498
- Interest, Real Estate Taxes, & Insurance	$63,500
+ Rental Income	$5,400
NET APPRECIATION SUBSIDY	$13,398

NET SUBDIVISION SUBSIDY

Total Development Value	$319,000
* Market Development Land Percentage	65%
Initial Value Development Land	$205,970
Total Unappreciated, Unenhanced Value	$180,041
- Initial Value Development Land	$205,970
Gross Subdivision Subsidy	($25,928)
- Professional & Staff Costs	$64,809
NET SUBDIVISION SUBSIDY	($90,738)

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$319,000
* Agriculturally Restricted Percentage	32%
Development Value of Agricultural Land	$101,144
+ Professional & Staff Costs	$31,826
- Sale Price to Farmer	$74,000
AGRICULTURAL PRESERVATION SUBSIDY USE	$58,970

OPEN SPACE PROTECTION

Total Development Value	$319,000
* Open Space Land Percentage	0%
Development Value of Open Space Land	$0
+ Professional & Staff Costs	$0
OPEN SPACE PROTECTION SUBSIDY USE	$0

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$319,000
* Affordable Housing Land Percentage	4%
Development Value, Affordable Housing Land	$11,886
+ Professional & Staff Costs	$3,740
- Affordable Housing Sales	$17,500
AFFORDABLE HOUSING LAND CONTRIBUTION USE	($1,874)

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$9,000	8%	3%
APR Subsidy	$166,000	154%	52%
Open Space Sale Subsidy	$0	0%	0%
Total Non-Development Subsidies	$175,000	163%	55%
Enhancement Subsidy	$10,000	9%	3%
Net Appreciation Subsidy	$13,398	12%	4%
Net Subdivision Subsidy	($90,738)	-84%	-28%
Total Limited Development Subsidies	($67,339)	-63%	-21%
TOTAL SUBSIDY SOURCES	$107,661	100%	34%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$58,970	103%	18%
Open Space Protection	$0	0%	0%
Affordable Housing Contribution	($1,874)	-3%	-1%
TOTAL SUBSIDY USES	$57,096	100%	18%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$107,661
- TOTAL SUBSIDY USES	$57,096
SUBSIDY SURPLUS or (SHORTFALL)	$50,565
PERCENT OF SUBSIDY USES	88.6%

APPENDIX D-3: LOOMIS FARM PREDICTIVE SPREADSHEET

CASE: Loomis Farm, Ashfield
ANALYSIS: Frontage based, with variable appreciation and enhancement

FILE: loomis2a.wk1
DATE: 1/7/88

LAND VARIABLES	Acres	Percent of Acreage	Frontage	Percent of Frontage	Percentage Analyzed
Agriculturally Restricted Land	176	39%	3,957	32%	32%
Open Space Land	0	0%	0	0%	0%
Market Development Land	265	59%	8,058	65%	65%
Affordable Housing Land	10	2%	465	4%	4%
Total Development Land	275	61%	8,523	68%	68%
TOTAL	451	100%	12,480	100%	100%

INCOME VARIABLES	
Months Rented	9
Total Monthly Rents	$600
Sale to Farmer	$74,000
APR Sale	$166,000
Total Agricultural Land Sales	$240,000
Open Space Land Sales	$0
Market Development Land Sales	$210,975
Affordable Housing Land Sales	$17,500
Total Development Land Sales	$228,475
Other Income	$0

EXPENSE VARIABLES	
Purchase Price	$310,000
Financing Costs	$56,000
Real Estate Taxes	$5,500
Insurance	$2,000
Legal Services	$19,000
Planning & Engineering	$4,000
Surveying	$10,100
Other Services	$0
Total Professional Services	$33,100
Staff Overhead	$46,350
Other Expenses	$20,925

SUBSIDY AND BENEFIT ASSUMPTIONS	
Total Development Value	$319,000
Monthly Appreciation Factor	0.8%
Enhancement Premium	5.1%

INCOME AND EXPENSE

INCOME	Total	Per Acre
Total Rental Income	$5,400	
Sale to Farmer	$74,000	$420
APR Sale	$166,000	$943
Total Restricted Agricultural Land Sales	$240,000	$1,364
Open Space Land Sales	$0	$0
Market Development Land Sales	$210,975	$796
Affordable Housing Land Sales	$17,500	$1,750
Total Development Land Sales	$228,475	$831
Other Income	$0	
TOTAL INCOME	$473,875	$1,051

EXPENSES	Total	Per Acre
Purchase Price	$310,000	$687
Financing	$56,000	$124
Real Estate Taxes	$5,500	$12
Insurance	$2,000	$4
Legal Services	$19,000	
Planning & Engineering	$4,000	
Surveying	$10,100	
Other Services	$0	
Total Professional Services	$33,100	$73
Staff Overhead	$46,350	$103
Other Expenses	$20,925	
TOTAL EXPENSES	$473,875	$1,051

INCOME AND EXPENSES		
+ TOTAL INCOME	$473,875	$1,051
- TOTAL EXPENSES	$473,875	$1,051
SURPLUS or (SHORTFALL)	$0	$0
RETURN ON TOTAL EXPENSES	0.0%	

MARKET DEVELOPMENT LOT SALE SCHEDULE

Lot Designation	Sale Date	Project Month	Acres	Unappreciated Unenhanced Value	Gross Appreciation	Appreciated Unenhanced Value	Enhancement Premium	Final Value (Sales Price)
South B, C-1 C-2, & C-3	2/87	19	14.6	$4,571	$705	$5,276	$270	$5,546
North C	2/87	19	42.1	$29,713	$4,583	$34,296	$1,754	$36,050
North E	2/87	19	4.5	$13,714	$2,115	$15,829	$810	$16,639
Farmstead	4/87	21	8.4	$56,000	$0	$56,000	$0	$56,000
North D	4/87	21	5.3	$12,240	$2,103	$14,343	$733	$15,076
North F & G	5/87	22	9.4	$22,153	$4,003	$26,156	$1,338	$27,493
North J, K, & L	10/87	27	23.9	$16,665	$3,768	$20,433	$1,045	$21,478
South D-3	12/87	29	106.6	$24,986	$6,116	$31,102	$1,591	$32,692
North B	NOT YET SOLD		50.3					
	TOTAL		265.1	$180,042	$23,393	$203,435	$7,540	$210,975

SUBSIDY SOURCES

NON-DEVELOPMENT SUBSIDY SOURCES

BARGAIN SALE SUBSIDY

Total Development Value	$319,000
- Purchase Price	$310,000
BARGAIN SALE SUBSIDY (to buyer)	$9,000

AGRICULTURAL PRESERVATION RESTRICTION SUBSIDY

Total APR Sales	$166,000

OPEN SPACE SALE SUBSIDY

Total Open Space Sales	$0

DEVELOPMENT SUBSIDY SOURCES

ENHANCEMENT SUBSIDY

Total Enhancement Premium	$7,540

NET APPRECIATION SUBSIDY

Gross Appreciation	$23,393
- Interest, Real Estate Taxes, & Insurance	$63,500
+ Rental Income	$5,400
NET APPRECIATION SUBSIDY	($34,707)

NET SUBDIVISION SUBSIDY

Total Development Value	$319,000
* Market Development Land Percentage	65%
Initial Value Development Land	$205,970
Total Unappreciated, Unenhanced Value	$180,042
- Initial Value Development Land	$205,970
Gross Subdivision Subsidy	($25,928)
- Professional & Staff Costs	$64,809
NET SUBDIVISION SUBSIDY	($90,737)

SUBSIDY USES

AGRICULTURAL PRESERVATION

Total Development Value	$319,000
* Agriculturally Restricted Percentage	32%
Development Value of Agricultural Land	$101,144
+ Professional & Staff Costs	$31,826
- Sale Price to Farmer	$74,000
AGRICULTURAL PRESERVATION SUBSIDY USE	$58,970

OPEN SPACE PROTECTION

Total Development Value	$319,000
* Open Space Land Percentage	0%
Development Value of Open Space Land	$0
+ Professional & Staff Costs	$0
OPEN SPACE PROTECTION SUBSIDY USE	$0

AFFORDABLE HOUSING LAND CONTRIBUTION

Total Development Value	$319,000
* Affordable Housing Land Percentage	4%
Development Value, Affordable Housing Land	$11,886
+ Professional & Staff Costs	$3,740
- Affordable Housing Sales	$17,500
AFFORDABLE HOUSING LAND CONTRIBUTION USE	($1,874)

SUBSIDY SOURCES AND USES SUMMARY

SUBSIDY SOURCES	Actual	Percent of Subsidy Sources	Percent of Total Development Value
Bargain Sale Subsidy	$9,000	16%	3%
APR Subsidy	$166,000	291%	52%
Open Space Sale Subsidy	$0	0%	0%
Total Non-Development Subsidies	$175,000	307%	55%
Enhancement Subsidy	$7,540	13%	2%
Net Appreciation Subsidy	($34,707)	-61%	-11%
Net Subdivision Subsidy	($90,737)	-159%	-28%
Total Limited Development Subsidies	($117,904)	-207%	-37%
TOTAL SUBSIDY SOURCES	$57,096	100%	18%

SUBSIDY USES	Actual	Percent of Subsidy Uses	Percent of Total Development Value
Agricultural Preservation	$58,970	103%	18%
Open Space Protection	$0	0%	0%
Affordable Housing Contribution	($1,874)	-3%	-1%
TOTAL SUBSIDY USES	$57,096	100%	18%

SUBSIDY SURPLUS or SHORTFALL	
TOTAL SUBSIDY SOURCES	$57,096
- TOTAL SUBSIDY USES	$57,096
SUBSIDY SURPLUS or (SHORTFALL)	$0
PERCENT OF SUBSIDY USES	0.0%

APPENDIX E: SUBSIDY SOURCES AND USES COMPARED

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SUBSIDY SOURCES AND USES COMPARED

	BARTON FARM		POWISSET FARM		LOOMIS FARM	
TOTAL DEVELOPMENT VALUE	$537,500		$2,800,000		$319,000	
SUBSIDY SOURCES	Actual	% of Total Development Value	Actual	% of Total Development Value	Actual	% of Total Development Value
Bargain Sale Subsidy	$0	0%	$392,730	14%	$9,000	3%
APR Subsidy	$200,350	37%	$350,000	13%	$166,000	52%
Open Space Sale Subsidy	$99,650	19%	$250,000	9%	$0	0%
Total Non-Development Subsidies	$300,000	56%	$992,730	35%	$175,000	55%
Enhancement Subsidy	$24,755	5%	$275,000	10%	$10,000	3%
Net Appreciation Subsidy	($8,053)	-1%	$423,352	15%	$13,398	4%
Net Subdivision Subsidy	$40,105	7%	$1,510,893	54%	($90,738)	-28%
Total Limited Development Subsidies	$56,807	11%	$2,209,245	79%	($67,340)	-21%
TOTAL SUBSIDY SOURCES	$356,807	66%	$3,201,975	114%	$107,660	34%
SUBSIDY USES	Actual	% of Total Development Value	Actual	% of Total Development Value	Actual	% of Total Development Value
Agricultural Preservation	$251,975	47%	$1,676,190	60%	$58,970	18%
Open Space Protection	$114,740	21%	$482,179	17%	$0	0%
Affordable Housing Contribution	$0	0%	$0	0%	($1,874)	-1%
TOTAL SUBSIDY USES	$366,715	68%	$2,158,369	77%	$57,096	18%
SUBSIDY SURPLUS or SHORTFALL						
TOTAL SUBSIDY SOURCES	$356,807		$3,201,975		$107,660	
- TOTAL SUBSIDY USES	$366,715		$2,158,369		$57,096	
SUBSIDY SURPLUS or (SHORTFALL)	($9,908)		$1,043,606		$50,564	
PERCENT OF TOTAL DEVELOPMENT VALUE	-1.8%		37.3%		15.9%	