Urban Ecosystems, 4: 27–47, 2001

An evaluation of the effectiveness of cluster development in the Town of Southampton, New York

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Abstract. Clustering new development, and as a result retaining protected open space, has been a simultaneously much touted and much maligned planning tool. Its relative merits as a tool to preserve farmland, open space and rural character have been debated for the past 40 years. To place this debate in context, this study presents a detailed, on the ground analysis of the physical and spatial results of 20 years of the Town of Southampton, New York's cluster ordinance. The analysis finds that although the tool was surprisingly effective in maintaining land in farming, the effects on visual quality were much less successful.

Keywords: open space, land conservation, farmland conservation, cluster development

Introduction

Clustering development to retain open space within a community has been part of the planning consciousness for most of the past century. The Standard State Zoning Enabling Act of 1926 included authorization for the use of cluster developments (Rice, 1996), and many articles were written about the virtues of cluster during the 1960's and 70's by leaders such as William Holly Whyte (1964), describing it as "on the verge of becoming the dominant pattern of new residential development." Cluster has, from its inception, been distinguished by two characteristics: (1) homes grouped together on a tract of land, and (2) the presence of undeveloped land that is held for the common enjoyment of the neighboring residents or the community at large (Rosenthal, 1960). An article in a 1959 edition of House and Home (Anon, 1959) described the advantage of cluster subdivision: "Cluster layouts preserve the rural character of the land by retaining stretches of open fields and stands of trees, and by leaving brooks, hillocks, and similar natural assets undisturbed."

Since this early euphoria over the potential of clustering, much has been written about both the strengths and shortcomings of the tool. A series of widely circulated books including Dealing with Change in the Connecticut River Valley (Yaro *et al*., 1987), Rural by Design (Arendt *et al*., 1994) and Conservation Design for Subdivisions (Arendt, 1996), have described recommended methods for using clustering in rural and metropolitan fringe areas, preserving both agricultural land and rural character. However, support for this planning tool has not always been positive, particularly in areas where agricultural land preservation is a primary goal. The tool has been touted as a method to protect scenic quality, and variously recommended or disparaged as a farmland preservation tool (Schiffman, 1989; Marsh,

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1997; Arendt *et al*., 1994; Daniels, 1997; Coughlin *et al*., 1981). One commentary describes clustering in this manner: "its potential unrealized and overestimated, it has become one of the most misunderstood, maligned and misused concepts in planning, zoning and development circles" (Emanuel, 1985). Certainly, poorly conceived cluster developments have led to public misconceptions regarding the tool and its use. These misconceptions have led to the renaming of the tool as "open space development" or "conservation design" in an effort to overcome the negative stigma (Arendt, 1996).

However, given the rich diversity of commentary, there has yet to be a detailed, on the ground analysis of the physical and spatial results of a cluster ordinance. This paper presents analysis of cluster development in the Town of Southampton, New York, one of the first cluster ordinances in the country formulated to protect agricultural land and rural character. With an analysis of farmland use in the protected open space, and an analysis of clustering's effect on visual quality, the paper quantifies the successes and failures of 20 years of program implementation.

Agriculture in the Town of Southampton, New York

The Town of Southampton covers a land area of 41,015 ha on the south fork of eastern Long Island (figure 1). Part of the New York metropolitan area, Southampton both benefits and suffers by its association with New York. Located less than 100 km outside of New York City, the Town's attractiveness as both a visitor and second home destination supports a

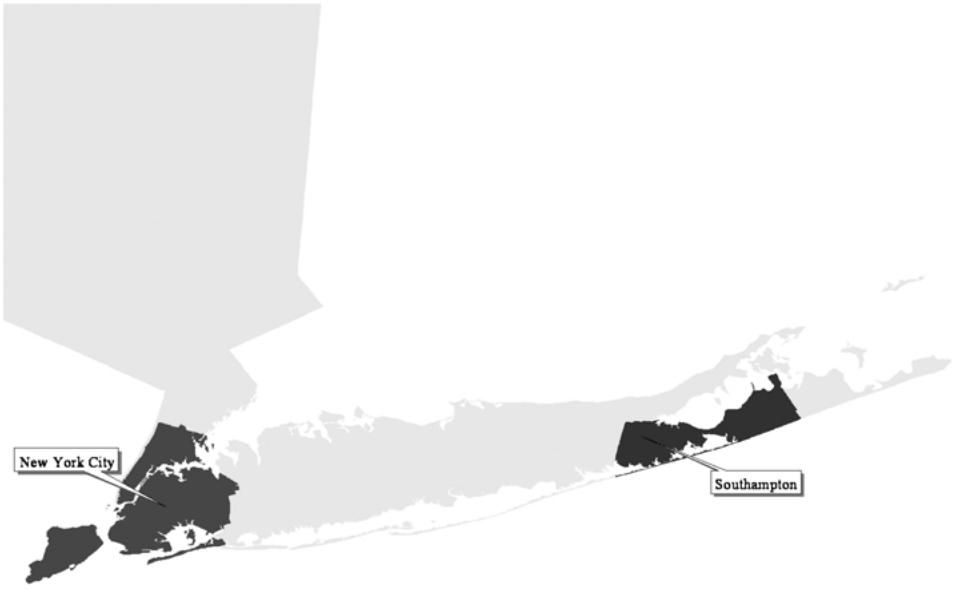

Figure 1. The Town of Southampton on the south fork of Long Island, shown in context with New York City and the remainder of the island.

thriving economy. However, intense demand for new housing particularly in the waterfront areas threatens its agricultural and natural resources.

Settled in 1640, Southampton has a long history of agricultural production, centered primarily on the outwash plains along the south shore. Straddling the Shinnecock Inlet, the Town has two distinct areas—the western half, composed primarily of Pine Barrens and the eastern half, composed of high moraine and Pine Barrens to the north and outwash plains to the south, terminating in sandy ocean beaches. It is in this southeastern area of the Town that agriculture historically took hold. With the development of the Village of Southampton as the Town's first settlement, agricultural fields were initially developed to the east of the village and later in the western portion of Town. Today the agricultural land in the western portion of town has largely disappeared while agriculture production continues in the east.

With the extension of the railroad to the eastern end of Long Island in the 1860's, the agricultural economy of the Town began to be supplemented with tourism. Wealthy residents of New York traveled to Southampton by train to spend the summer months outside of the city. Tourist homes and boarding houses developed into the hotels and motels of the past century, with the result that today, Southampton's summer population is almost 3 times larger than its year round population of 46,382 (Land Ethics, Inc., 1998a).

The continued attraction of Southampton as a tourism and second home destination is largely due to two factors: the farming landscape and the natural landscape, particularly the wide, sand beaches. In 1970, the Town completed its first Comprehensive Plan, which identified the critical importance of the Town's rural character and natural resources to its economy (McCrosky-Reuter, 1970a). The 1970 Plan identified the need to place limits on overall development density:

> In the past, the Southampton Community has benefitted materially because of its unique physical characteristics, much more so than most communities. They have been the resource on which the resort economy, the shellfish industry and farming have been based. Until relatively recent times the community's development and population have not been sufficient to create any major problems with respect to these natural resources.
>
> Now it is apparent that the evolution of the human community could result in the destruction of these very natural features upon which such high value was placed in the past (McCrosky-Reuter, 1970a).

The 1970 Plan also described the importance of views and vistas to the community in the following narrative:

> As a person travels along these main roadways just in from the shoreline, he passes through settled areas where the roadside scenery is apt to be buildings and community activities relatively close at hand; then he is treated to a complete change, often a more natural wooded setting. Or he comes to an estuary where his view opens out over the waterbody, frequently on both sides of the road; and then, in turn, through another settled area. Aside from its scenic qualities, this land form provides a natural answer to the much discussed suburban sprawl, or sea of houses (McCrosky-Reuter, 1970a).

Concern for scenic quality and rural character continues for the residents of Southampton. The vision statement of the 1998 Comprehensive Plan states that

> The Southampton of the future will protect its valuable natural, historic and scenic resources. . . . Southampton's unique scenic quality and sense of place is derived from the interrelationship between rural farmland, areas of undeveloped open space, water frontage (bay, ocean), and the hamlet centers. This rural character, graced with significant natural and historic resources is the quality that maintains its vitality as a resort, second home and visitor attraction, and also as an attractive place to live and work (Land Ethics, Inc., 1998a).

Of the 650 residents who responded to a written survey included in the 1998 Comprehensive Planning process, 45% strongly agreed with the statement that "Southampton should maintain its rural and historic character and the quality of its beaches and marinas in order to remain a premier tourist destination" (Land Ethics, Inc., 1998b).

In 1970 there were 4,720 ha of farmland in the Town. In 1998, that total had declined to 3,410.8 ha of active farmland (Town of Southampton Farmland Committee 1998). Thus, over the intervening 28 years approximately 1,309.2 ha or 27.7% of the Town's farmland had been developed or removed from active production. This translates into an average annual loss of 48.48 ha or 1% of farmland resources (Land Ethics, Inc., 1998a).

Of these 3,410.8 ha, 7.3% were already under approved subdivision plats for future residential development, and 29.6% were protected (see Table 1). Thus, 61% of the agricultural land remained unprotected and subject to further conversion or development.

Even with the farmland losses, Southampton's agricultural community remains strongly active and viable. Employment in farming, forestry and fishing in Southampton increased by 41.9% during the decade from 1980 to 1990, exceeding a countywide increase of 30%. This indicates that a relatively large share of Suffolk County's natural resource-based workforce (and business owners) are active in Southampton. In addition, a large percentage of farmers

Table 1. Agricultural land inventory as of 1998, inclusive of land outside of the Agricultural Overlay zone (Land Ethics, Inc., 1998a).

Land status	Area (ha)	Relative area (%)
Unprotected land in agricultural use	2,085.2	61.14
Subdivided lots	248.8	7.30
Pending town PDR	66.0	1.93
Total unprotected land in agricultural use	2,400.0	70.37
Subdivision reserve areas	357.2	10.47
Private land trusts	58.0	1.70
Town and county PDR programs	595.6	17.46
Total protected farmland	1,010.8	29.63
Total farmland	3,410.8	100

in Suffolk County, 70%, list farming as their principal occupation although no statistics are available on Southampton's farmers (Land Ethics, Inc., 1997).

The increase in workforce, and Southampton's proportionally larger share may be due to the types of agriculture active in the town. Horse farms, vineyards, and nurseries are all relatively labor intensive compared to field crops. According to the Town's agricultural land survey, the highest acreage crops in 1998 were corn and potatoes at 621.6 ha and 598.8 ha respectively. However, equestrian uses were also very popular in the Town, covering approximately 363.6 ha, and nursery, row crops and truck farming covered another 474 ha.

Program to protect farmland and rural character

In 1970, the prevailing development pattern was degrading the rural character of the Town:

> frequently the loss of agricultural land in this area occurs through small parcel sales along existing rural roads on a year-to-year basis. The resulting development pattern is apt to be far from satisfactory in terms of future road layout, the efficiencies of municipal operating costs, general appearance and the permanent loss of the characteristic charm of these areas (McCrosky-Reuter, 1970b).

To solve this problem, the 1970 Plan envisioned a cluster ordinance. The ordinance was intended to protect 80% of the farmland, and cluster the development "along a greenbelt park which would preserve the watershed's ponds, streams and areas of high water table" (McCrosky-Reuter, 1970b) (figure 2). In order to "accomplish the reservation of good agricultural soils and the greenbelt" the Plan anticipated that the density of the new development would be clustered at rates of between "7.4 units per ha for single-family detached houses up to 20 units per ha for single-family town houses and 40 units per ha for garden-type apartments" (McCrosky-Reuter, 1970b).

Implementation of this vision was never fully realized, however it formed the basis of today's agricultural preservation program. Various provisions were included in the Town's code at various times, resulting in a rather confusing mix of overlapping ordinances. Borrowing the language from the 1970 Plan, clustering in the Town's code was termed planned residential development, with the land set aside for conservation termed the subdivision reserve area.

The zoning ordinance that enacted the recommendations in 1979 instituted a CR-80 (County Residence) zone, which, with a single family lot size of 0.72 ha, was the largest single family lot in the zoning ordinance, ignoring recommendations in the Plan for 0.8 ha and 1.2 ha minimum lot sizes. However, this zone was restricted to the aquifer recharge areas to the north of the farming region, and around only a portion of the area identified in the Master Plan as a targeted greenbelt. The Country Residence zone did little to restrict associated uses except to prohibit accessory rental units and the development of cemeteries.

Although the proposed "Greenbelt Park" recommended in the 1970 plan was not implemented, an Agricultural Overlay District (Town Code § 330-47), was established in the 1979 zoning ordinance. The intent of the Agricultural Overlay District was to protect the most agriculturally productive soils and "the open rural land use environment so highly valued by

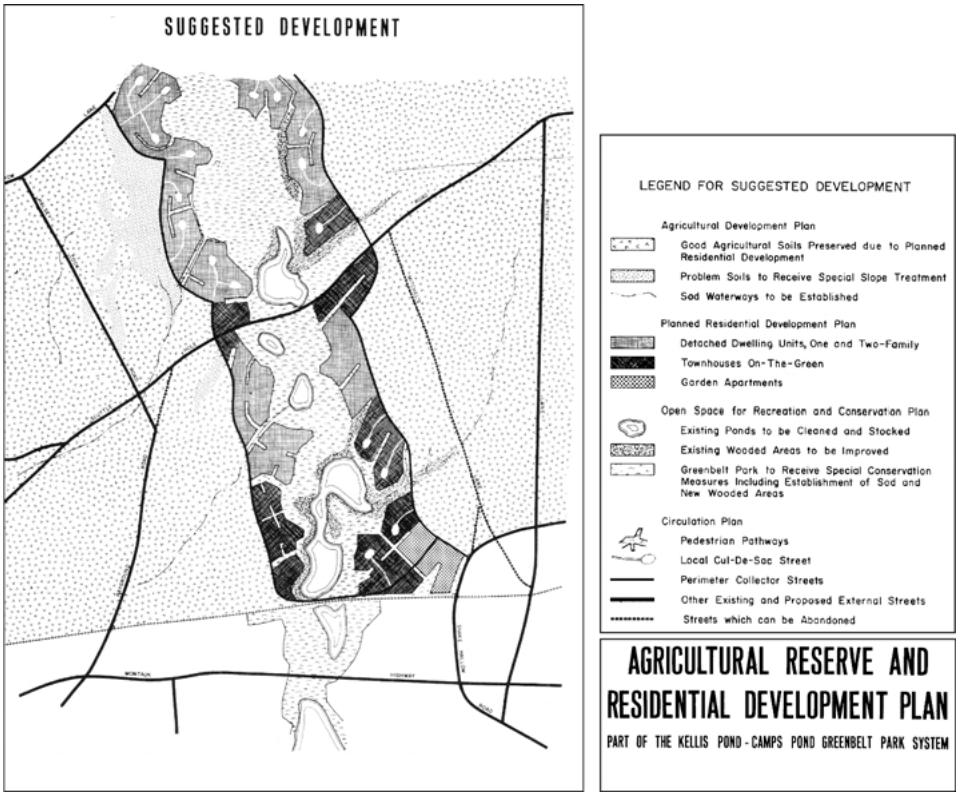

Figure 2. The cluster scenario recommended as part of the 1970 Comprehensive Plan, showing cul-de-sac residential areas and connected greenspace.

those persons who support the Town of Southampton's recreational and resort economy, as well as by year round residents" (Town Code § 330-47(A)). The District allowed *voluntary* clustering of new residential units with a compensatory increase in the permitted residential density in exchange for preserving "intact the maximum possible land area for agricultural purposes" (Town Code § 330-47(B)). The preserved land, termed "agricultural reserve" and today termed subdivision reserve area (SRA) was to be dedicated to a "public or quasi-public land trust" (Town Code § 330-47(B)). The ordinance language did not include a reference to the Plan's goal of 80% protection for agricultural land, nor did it include an increase in permissible lot sizes. Supplementing these provisions were the requirements of §292-11 Planned Residential Development, part of the Subdivision Code also adopted in 1979, reinforcing the clustering option and requiring consideration of agricultural land and scenic resources in the development of the cluster subdivision design.

A further code provision was adopted in 1982, strengthening the implementation of the Planned Residential Development provisions. Revising the requirements of Planned Residential Development, Chapter 247 Open Space included a specific section on farmland protection (§247-8) and the requirement to preserve at least 25% of the land on a plat

(§247-7(A)). Further improvements were made subsequent to the major Comprehensive Plan update in 1983. Although the primary stated goal of the 1983 plan revisions was to protect groundwater quality and quantity (Zepatowski Associates, Inc., 1983), the increase in minimum lot sizes resulted in the potential to protect greater amounts of farmland.

The principal change in strategy to come out of the 1983 Plan Update was the recommendation that all existing CR-80 (Country Residence) zones be rezoned to a much lower density consistent with their overall character and to meet the objectives for protection of groundwater resources. These recommendations resulted in the creation of the RC-200 (Resource Conservation) with a minimum lot size of approximately 1.86 ha lots, and the rezoning of the agricultural overlay into a range of minimum lot sizes from just under 0.1 ha to just over 1.8 ha. In fact, very little of the agricultural overlay was zoned to the lowest density of 1.8 ha. The majority was zoned for CR-80 (Country Residence) at 0.74 ha lot sizes.

Changes to the code culminated in 1983 and 1984 (Table 2). Under the Subdivision Code, the Planning Board was granted the discretion to require a planned residential development

Table 2. Summary of Comprehensive Plan and code revisions affecting residential clustering between 1970 and 1984.

Provision	1970 Comprehensive Plan	1979 Code	1983 Comprehensive Plan update	1983–1984 Code amendments
Requirement of clustering (termed "Planned Residential Development")	Voluntary	Voluntary (330-47(B) Agricultural Overlay District)	Does not address	Discretionary on the part of the Planning Board
Amount of open space preservation (termed "Subdivision Reserve Area")	80%	Undetermined	Recommends increase	Sliding scale (see Table 3)
Protect Prime Soils	Yes	Yes (330-47(A) Agricultural Overlay District; 292-11(D)(2)(a)[6] Subdivision of Land)	Does not address	Sliding scale
Protect rural character/scenic quality	Yes	Yes (330-47(A) Agricultural Overlay District; 292-11(D)(2)(a)[7] Subdivision of Land)	Does not address	Yes (330-47(A) Agricultural Overlay District; 292-11(D)(2)(a)[7] Subdivision of Land)
Density bonus for clustering	No	No	No	No

where agricultural lands or scenic vistas were involved (§292-11(D)(2)(a); §247-3(B)). In 1984 the sliding scale of open space requirements was codified, providing a target range of preservation from 35% of the prime agricultural soils on a subdivision parcel in zones with minimum lot sizes of from .09 ha to .55 ha, and 65% for zones with minimum lot sizes of 1.11 ha to over 1.85 ha (§247-8 Farmland and Watershed Protection).

Assessing the effectiveness of farmland protection efforts

The issue of protecting farmland in the metropolitan fringe has been hotly debated since the 1930's, when concerns over the loss of farmland were first raised. The debate came to a head in the 1970's when concerns over farmland loss were at a peak (Bryant and Johnston, 1992), a concern reflected in Southampton's 1970 Comprehensive Plan. From the beginning of the debate, the key issue has been the movement of urbanites from dense urban cores to the rural fringes of the city, increasing development pressures on the existing agricultural land. A common sentiment among land use planners in the northeastern United States is quoted in Pfeffer and Lapping (1995):

> Agriculture has not been a profitable business in this region for quite a while. This is a result of many circumstances, including the rise of land values, increase in taxes, threat of development, and the decline of agriculture-support businesses. Unless radical changes are made, this situation is expected to continue.

Leading the reasons for flight from the cities has been a combination of social issues, desire for more open space and the amenities of rural lands. In fact, "amenities are increasingly more important than economic factors in explaining residential location, even though budgetary constraints may limit house and lot size in amenity locations" (Heimlich, 1989). The issue is seemingly simple: "Urbanites settle outside of central cities because they enjoy the open space and bucolic environment farming provides" (Lapping *et al*., 1989; Bryant and Johnston, 1992).

However, the development of new residential subdivisions in formerly purely rural areas at some point results in a loss of the very amenities that attracted people to the rural fringe: open space and rural character. As a result, "new residents in the most rapidly growing fringes of metropolitan areas combine political and economic sophistication with the desire to retain rural land uses around their new homes" (Heimlich, 1989). While consumer demand for home sites in rural landscapes competes with agriculture for available land, it ultimately provides support for farmland protection programs and right-to-farm laws (Heimlich, 1989).

Since 1970, the U.S. Census Bureau has recognized a diffuse settlement pattern of dense urban nodes within the "less densely settled rural fringes of major cities" (Heimlich, 1989). While these new patterns of development had the potential to impact farmland and farmland loss on a larger scale, they also made "agricultural adaptation to metro settings increasingly possible because they drew urban consumers closer to agricultural areas and made intensive use of better-quality land competitive with low density development" (Heimlich, 1989). The demand for fresh, locally grown produce has increased over the last decades due to an increasingly health conscious population and concerns over pesticide use and misuse

(Daniels, 1997). Thus, the stage is set for the expansion of niche farming and support for "a different type of agriculture that produces higher-value products for the local market and often sells directly to customers" (Davis *et al*., 1994). Metro farms typically are smaller, specialize in high value crops and sell more products directly to consumers than non-metro farms (Heimlich, 1989).

However, at the same time that urbanites are moving out to the country and demanding more direct marketing of fruits and vegetables, they are also putting a strain on the farmland resource. Residential developments fragment the available farmland and cause a series of conflicts with existing farmers including the noise, dust and odors associated with farming, damage to crops due to unauthorized field access, and conflicts between cars and tractors on increasingly congested roads (American Farmland Trust, 1997).

Analysis of the effectiveness of farmland preservation programs

While detailed, quantitative analyses of farmland protection efforts are sparse in the literature, commentators on farmland protection programs have identified a series of criteria for determining the effectiveness of agricultural land programs. These criteria can be quantified through the use of a series of indicators as detailed below:

(a) *The protection of a critical mass of farmland* for efficient farming, enabling support businesses to survive (Daniels, 1997).
Indicators:

1. *The number of ha protected*: This is the most commonly reviewed measure of success, often included in assessments of program success such as those produced by the American Farmland Trust (1997) and Chesapeake Farms for the Future (1998).
2. *Size of parcels* (Daniels, 1997; Gerard, 1984): Parcel size is a key indicator for large-scale, traditional farming enterprises, and is often relied upon as an indicator of fragmentation and degradation of the resource (Pfeffer and Lapping, 1995). However, in metropolitan fringe areas, there is some indication that parcel size may not be as important an indicator of continued farm production, due to a change in focus from field crops to high yield specialty crops (Pfeffer and Lapping, 1995; Scarfo, 1990).
3. *Contiguity*, or the degree to which the protected parcels connect to other protected parcels, creating a large agglomeration of land available for farming (Lapping *et al*., 1989).
4. *Access to the protected parcels*, either directly from a road or from another protected parcel is a key indicator of future potential for farming use. Lack of access for farm equipment can effectively render any protected parcel unsuitable for farming.
5. *Number of ha in active farming*: The question of whether the protected land is used for farming is the overall indicator of the success of the program, indicating adequate parcel size, quality of access and critical mass.

(b) *Maintaining affordable land prices* for farm expansion and the entry of new (young) farmers (Lapping *et al*., 1989; Gerard, 1984):
Indicator:

1. To a considerable extent, the surrounding real estate market determines the value of any parcel. However, the degree to which development rights have been removed from the land, and the question of whether that removal is permanent is key in determining the value of a parcel.

(c) *A reliable protection program* that is likely to protect farmland over the long-term (Gerard, 1984);
Indicator:

1. *Legal development restrictions in perpetuity* are preferable in land conservation programs, since they assure the long term availability of the farmland resource. They also remove the potential that some time in the future the land will revert to development, negating the tendency to disinvest in a particular region. This is termed the "impermanence syndrome" in which farmers reduce investment in their farms as they foresee their eventual conversion to residential and open space uses (Coughlin *et al*., 1981).

(d) *Community support* (Pfeffer and Lapping, 1995): In metropolitan areas such as Southampton, community support is critical to the success of a land protection program, providing the political support to enact ordinances and provide funding for acquisition programs (Heimlich, 1989).
Indicators:

1. *Cost effectiveness*: The tax paying community will be concerned with the cost and amount of preservation that is achieved.
2. *Visual quality*: The extent to which rural character and visual quality are protected under the program provides an indication to residents of the effectiveness of their programs.

Methodology

Given the previous framework for evaluating metropolitan farmland protection programs, this paper focuses on assessing the spatial effects of the planned residential development program in Southampton, New York. The methodology was developed for two specific aspects of program assessment: the quantification of the land area affected by the program, and its effectiveness in preserving farmland and rural character. Program analysis focused on the Agricultural Overlay District in the Town for two reasons: (1) this district included the predominant areas of prime agricultural soils and active farmland in the Town; and (2) planned residential development requirements in Southampton's code relate specifically to this area. While it is acknowledged that factors other than the cluster development strategy may also have been important in the development of housing sites, this analysis focuses on a critical evaluation of the effect of the cluster strategy.

In order to assess whether a critical mass of farmland was protected, 1998 data from the Town and County's Geographic Information System were obtained. However, the pre-development extent of each of the subdivisions and current land use of the subdivision reserve areas was not available in digital format. Therefore, to determine the extent, configuration and date of subdivision, paper records were reviewed in the Town of Southampton's

Assessor's Department. Current land use of the subdivision reserve areas was identified through field analysis in the summer of 1999. Thus, the indicators of total number of hectares protected, the pre- and post-development size of the parcels, and contiguity were determined through GIS data and paper records. Access to the protected parcels and the number of hectares in active farming were determined though field surveys conducted in July of 1999.

The determination of the second and third criteria identified above, maintaining affordable land prices and long-term protection, were investigated through the same indicator—the existence of development rights. This indicator was assessed by an analysis of the Code requirements for planned residential development and actual implementation of the program.

The final criteria, community support, is identified in the literature by two indicators—cost effectiveness and visual quality. Cost effectiveness was not investigated as part of this research effort, however the program's effect on visual quality was extensively documented.

The determination of whether rural and scenic quality in the Subdivision Reserve Areas was protected by the program was based on an analysis of preferences contained in the Town's 1998 Comprehensive Plan Update (Land Ethics, Inc., 1998b). A visual preference survey was completed in the Town as part of the Comprehensive Plan. Similar in process to "picture preference" surveys of Kaplan and Kaplan (1989) and "visual preference" surveys of Nelessen (1994), the visual preference survey consisted of 160 photographic images, which illustrated a wide variety of existing conditions within the Town. A total of 51 slides illustrated scenic and agricultural preservation issues, along with roadside residential development slides which illustrated single and multi-family residential developments. In addition, 16 slides showed aerial images of development. Survey participants were asked to rate the slides on a scale of -10 to $+10$ indicating unacceptable and acceptable images. The slide survey was accompanied with a 50-question written survey, with 650 residents of the town completing both the slide and written surveys.

Although previous preference studies have shown that "human elements in the natural setting are often comforting and highly preferred" (Kaplan *et al*., 1998) and receive a positive rating when "the human influence is central to the content, but the built content is in keeping with the setting and does not dominate the natural elements in the scenes" (Kaplan and Kaplan, 1989), respondents to the Southampton survey indicated an aversion for human presence. Even in a "wide open" spatial configuration, typically among the lowest in preference surveys (Kaplan and Kaplan, 1989), images in the Southampton survey rated very high scores as long as there were no visible human intrusions. The six highest rated slides of the survey (figure 3) show images of the Town that are in a "natural condition," with no human intrusion. As human intrusions increased in the photographs, scores decreased. This is particularly evident when viewing the series of 16 aerial views included in the survey. The highest scores were given to those images with no development evident, while scores decreased steadily with increased evidence of human intrusions (Table 3).

Respondents to the survey were also asked a series of 50 multiple choice questions including two relevant to visual quality. When asked how respondents would like the Town to develop, 64% responded positively to the statement "a rural place with strong hamlet centers." When asked the respondent's favorite aspect of Southampton, 53% chose "natural beauty and rural character" (Land Ethics, Inc., 1998b). These responses were reinforced

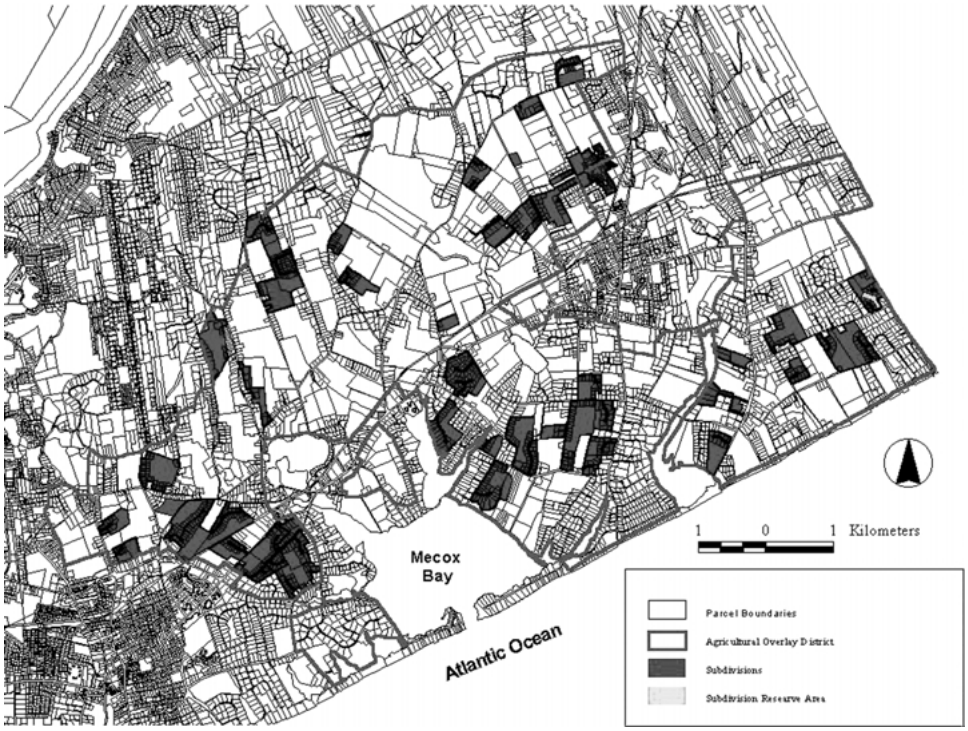

Figure 3. Location of the planned residential developments in the Agricultural Overlay zone, with the boundary of the Agricultural Overlay district highlighted.

with the response to the least favorite aspect of Southampton, to which 56% responded "destruction of natural beauty."

Based on these survey results, a methodology was developed to quantify the erosion of rural character resulting from the clustering of subdivisions. Since the presence of built intrusions in the viewshed was identified in the survey as an indicator of visual quality, the extent of visual intrusion was assessed for each subdivision reserve area.

Each Subdivision Reserve Area was photographed from a public right of way, and scored in the field according to the existence of building intrusions visible in the background, middle ground and foreground of the view. Scores decreased as the development intrusions increased in number, and/or moved progressively from the background to the middle ground and the foreground of the scene.

Analysis of the Southampton clustering program

Protection of a critical mass of farmland

The Agricultural Overlay District covers 5,301.9 ha of the total 42,360.4 ha in the Town of Southampton. In the 5,301.9 ha of the Agricultural Overlay, 47 subdivisions were developed

Table 3. Scores of the 16 aerials in the slide preference survey.

Score	Comments	Image number
8.5	No development evident	2.79
7.0	Home development in far background	2.68
6.2	Farmsteads in middle ground	2.75
6.1	Farmstead in foreground	2.71
6.0	Home sites in a sea of trees	2.78
4.7	Home sites in foreground on large lots	2.66
3.6	Cluster in foreground. Some open land in middle ground	2.80
3.0	Heavily treed portion of hamlet	2.69
2.9	Extensive marina in foreground	2.65
1.9	Large lot residential development in foreground to middle ground	2.74
0.5	Hamlet with moderate number of trees and water in background	2.72
−0.2	Hamlet with moderate number of trees	2.70
−0.7	Home sites along beach front—few trees	2.77
−1.5	Fully developed with home sites—no trees except in background	2.67
−2.2	Big box retailer in foreground	2.73
−5.9	Highway intersection	2.76

between 1979 and 1997, 46 located in the eastern portion of the Town (figure 4), and one developed in the western portion of the Town (not shown on map). Pre-development parcel sizes ranged from the smallest at 2.7 ha to the largest at 28.7 ha.

Total area protected

Land in the Agricultural Overlay is protected under 5 different programs: Planned Residential Development, County Purchase of Development Rights, Town Purchase of Development Rights, local land trusts and county, state and town owned land (figure 5 and Table 4). Total preserved land accounts for 18% (966.4 ha) of the total land area within the Agricultural Overlay. Unprotected land in farm use (1,645 ha) accounts for 31.0%; the remaining 50.5% (2,646.68 ha) are developed or vacant.

The 47 Planned Residential Development (cluster) subdivisions within in the Agricultural Overlay, including their associated Subdivision Reserve Areas (preserved open space), account for 682 ha with an average subdivision size (before development) of 15.5 ha. The subdivision reserve areas protected a total of 305.8 ha, with an average area of protected land of 5.5 ha. Thus, from a land resource of 682 ha, the clustering was only able to save 45% of the land area.

However, the total area of land affected and preserved tell only part of the story. From 1979 until 1984, the use of the planned residential development provision was voluntary. In 1984, discretionary power to require clustering was delegated to the Planning Board. The mean preserved area for 17 subdivisions approved before 1984 was 39.3% of the subdivision area, and after 1984 that jumped to 59.9%. Looking at the amount of the prime

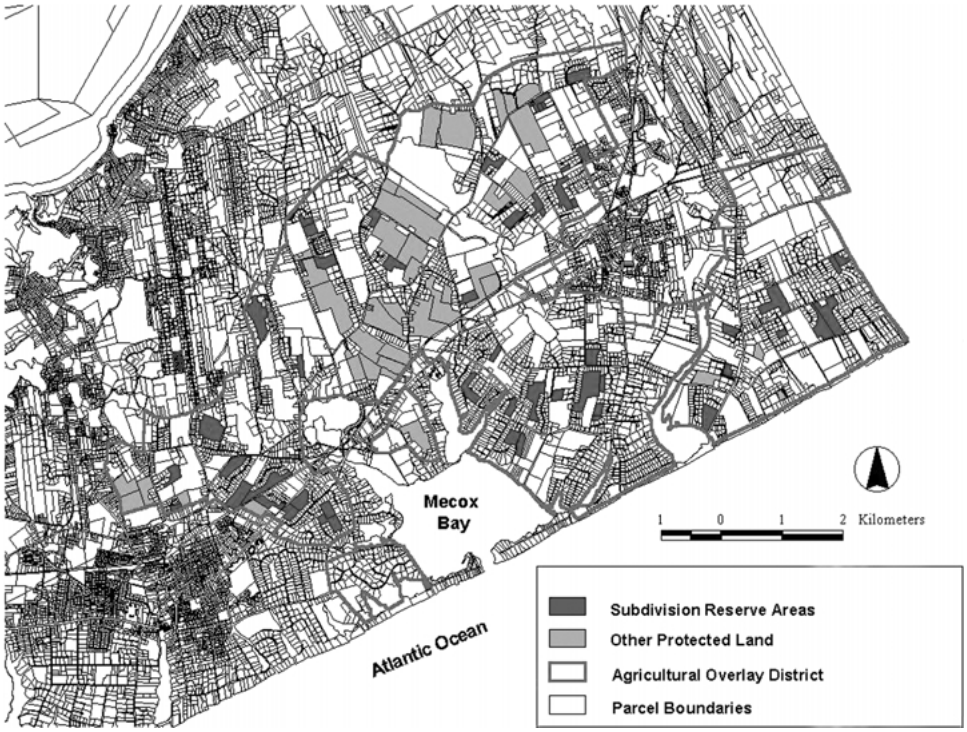

Figure 4. Protected land in the Agricultural Overlay zone, showing subdivision reserve areas and other town, county and privately protected land.

soils preserved tells a similar story—before 1984, 37.8% of prime soils were preserved, while after 1984, that number jumped to 59.2% (Table 5). Between 1986 and 1997, 13 out of 23 subdivisions preserved greater than the amount of prime soil targeted for preservation in the ordinance, and two exactly equal program directives. Only 2 subdivisions preserved less than 90% of the prime soils recommended in the ordinance, and only 1 preserved 70% or less of the recommended amount of prime soil. These results indicate that discretionary approval achieved targeted soil conservation goals more than 65% of the time after the Planning Board was given discretionary power, and in addition to the overall improvement in land area preserved, it is clear that granting discretionary approval to the Planning Board was a positive step in achieving preservation goals.

Size of protected parcels

While land in agricultural production managed by a single farmer in Southampton's Agricultural Overlay District may total well over 40 ha, individual parcel sizes tend to be quite small. The mean size of a subdivision reserve area in farm use is 5.5 ha, with two over 16 ha in size, and 13 under 4 ha in size. This can be compared with the mean size of unprotected parcels in farming which is 3.3 ha. The small size of unprotected parcels reflects the large

Figure 5(a–f). The six highest ranking slides in the preference survey revealing a preference for natural images with no human intrusions.

number that are currently subdivided but remain in farming until development pressures and prices encourage the owner to sell.

Contiguity of protected parcels with other preserved areas

The literature indicates that contiguity with other protected land can be an important factor in the long term farming status of a particular parcel of land. In Southampton, only 36% of the protected parcels were adjacent to other subdivision reserve areas, and 46% were adjacent to only unprotected parcels. Exacerbating the issue of adjacency, 17% of the protected parcels (8 of the 47 subdivision reserve areas) were completely surrounded by residential subdivisions.

Table 4. Land status by area in the Agricultural Overlay District.

Land type	Total area (ha)	Total area (%)	Average parcel size (ha)
Total land in farming use	2558.82	48.8	4.45
Total protected	943.45	17.8	7.49
Subdivision reserve areas	305.82	5.8	5.54
County purchase of development rights	270.9	5.1	12.3
Town purchase of development rights	306.39	5.8	12.26
Local land trusts	60.34	1.1	1.38
Unprotected	1645.37	31.0	3.32
Total land not in farming use	2713.1	51.2	3.62
Protected	22.95	0.4	–
Developed and vacant land	2677.69	50.5	0.69
Public land	12.46	0.2	0.65
Total agricultural overlay	5301.92	100	–

Table 5. Analysis of preservation by year in Subdivision Reserve Areas (SRA).

Year of subdivision approval	Number of subdivisions	Mean area of subdivision (ha)	Mean area of total subdivision preserved (%)	Mean area of prime soils preserved (%)
1979	1	12.6	36	42
1980	2	24.9	47.4	54
1981	1	24.7	3.9	40
1982	5	13.5	46.3	34
1983	4	20.1	39.2	32.8
1984	4	12.2	31.2	24.3
1986	3	12.9	47.4	47
1987	5	24	59.4	52.6
1988	2	25.6	55.2	50
1991	2	10.1	53.8	51
1993	4	11.7	55.5	56
1994	2	9.2	54.8	53
1995	3	9.4	50.2	59
1996	1	8.5	72.2	71
1997	1	4.7	90.5	93
Total[a]	40	–	–	–
Mean	2.67	15.5	49.53	50.65

[a]Does not include 7 subdivisions for which no date of approval could be determined.

In assessing the impact of the aggregation of protected parcels on the subdivision reserve areas, of the protected parcels 64% were isolated from other subdivision reserve areas, with an average protected aggregation of only 12 ha. The additive effect of other tools in reducing fragmentation is particularly obvious here, since the average aggregation size rose to 21.7 ha with the aggregation of County and Town owned PDR parcels and acquisitions by local land trusts (figure 4).

However, contiguity with active farmland is not a significant factor in the agricultural status of a preserved parcel in Southampton. Only nine Subdivision Reserve Area parcels were not contiguous with other farm fields (15.5% of all SRAs), and of those nine, only one was not actively farmed. Of the parcels that are actively farmed and inaccessible from roads, all were contiguous with at least one other parcel of farmland. The data provided no indication that the adjacent farmland must be protected for a parcel to be farmed, as there were 14 actively farmed Subdivision Reserve parcels contiguous only with unprotected agricultural lands, 17 actively farmed parcels contiguous only with protected agricultural land, and 7 actively farmed parcels contiguous to a combination of protected and unprotected farmland.

Accessability of preserved areas

The Town's use of Planned Residential Development in the Agricultural Overlay has not resulted in any parcels that are inaccessible. All parcels have access either by road or contiguous farmland: 62% of all Subdivision Reserve Areas are accessible via roads, while 38% are accessible through adjacent farmland. The only road in the Agricultural Overlay District that presents a problem for farm equipment accessibility is Highway 27 (it is a major highway, unsuitable for travel by farm machinery). Highway 27 affects three Subdivision Reserve Areas, one of which has an alternative access point.

However, there is potential danger in future accessability for those parcels that have unprotected farmland as their sole access point. Without careful design of the new subdivisions, future access control could be restricted.

Percentage of preserved area in active farm use

Field observations performed in April and July 1999 found that 42 parcels or 89% of Subdivision Reserve Area acreage was actively farmed. For the purposes of this study, land in agricultural production includes equestrian land (45.48 ha), land used by commercial nurseries and orchards (49.9 ha), and farmland producing row or specialty crops (168.85 ha).

It is important to note that some Subdivision Reserve Areas are not used for agricultural purposes and are either reverting to old fields or are managed as wildflower meadows by the adjacent home owners associations (22.04 ha). While this provides open space for the adjacent landowners, conversion of additional agricultural parcels would be detrimental to the farming economy in Southampton. As noted previously, almost 15.1% (45.48 ha) of the Subdivision Reserve Areas have been converted to equestrian uses, accounting for the largest farm use on Subdivision Reserve Area parcels. The State of New York and therefore Southampton Town classifies equestrian uses as farm uses, and so it follows that this study classifies them as active farm use. However, the Town recognizes that equestrian uses remove land from the more traditional types of agricultural production, and greatly increase the area of building (particularly riding arenas) and impervious surface coverage,

precluding the land's return to production agriculture. While farm related buildings are not prohibited in Subdivision Reserve Areas, the required building intensity is not as great for other uses except perhaps for greenhouse production facilities.

Larger parcels are more likely to be farmed than smaller parcels in Southampton. Half of the parcels under 2 ha were actively farmed; 91% of parcels 2 to 4 ha were farmed; 79% of parcels 4 to 8 ha were farmed; and 100% of parcels larger than 8 ha were farmed. One hypothesis for the dip in percentage of parcels being farmed in the 4 to 8 ha category is that 4 ha may be too large to be leased for efficient truck farming and 8 ha too small to support efficient row crop production.

Visual quality

Throughout the Agricultural Overlay district, the parcel sizes are generally too small to allow for complete exclusion of the development intrusions in the viewshed of any subdivision development. Only three of the Subdivision Reserve Areas, all located in Sagaponack, have good protected views, one of them buffered from residential development by a hedgerow. For the remainder of the subdivisions, 16 are almost entirely surrounded by residential development, three have development in the foreground of the view, 16 have residential development appearing of the mid-ground of the view and the remaining ten have development appearing in the background. Based on the rankings of the Southampton slide preference survey, those parcels which are surrounded by development or have development intrusions in the foreground can be said to have compromised scenic views. Using this standard, only 6% of the Subdivision Reserve Areas have uncompromised scenic views, while 40% have highly compromised views. This analysis does not take into account, however, the value obtained by the residents of the protected open space, no matter how visually compromised.

Conclusions

The Southampton cluster program was envisioned in the 1970 Master Plan with the lofty program goals of saving 80% of the farmland in the Town. Given 20 years of program implementation, it is instructive to evaluate whether the program actually reached its goal. On the face, the Planned Residential Development ordinance protected only 49% of the predevelopment land base—the agricultural land that was converted to subdivision development. Although the Comprehensive Plan goal of 80% was reduced in the enacting ordinance to a range of 65% to 35% prime soil retention, the ordinance goal has not been met. However, the granting of discretionary power to the Planning Board to require clustering, improved performance of the program, and the ordinance goals were achieved 61% of the time. Clearly the goal of 80% land preservation in the 1970 Master plan has not been met or even approximated. However, has the program achieved its other goals of saving farmland and rural visual quality?

The answer to that question is certainly mixed (Table 6). While the program saved a total of 305.8 ha, more than half was lost in the development process. The protected parcels are small and often isolated from other protected land. Inherent in the use of the cluster development tool is the loss of land to development, making it an imperfect tool for agricultural land conservation, and not one that alone could protect the agricultural land

Table 6. Summary of program effectiveness and indicators for Southampton's cluster program.

Criteria	Indicator	Measurement	Evaluation
Protection of a critical mass	Total area protected	Amount of predevelopment land protected	45%
		Amount of total farmland resource protected	6%
	Size of protected parcels	Mean size of subdivision reserve area	15.5 ha
	Contiguity	Contiguous with another SRA	36%
		Average aggregate size	12 ha
		Contiguous with other protected land	19%
		Average aggregate size	21.7 ha
	Accessability	Access by road or contiguous farmland	100%
	Active farm use	Number of parcels	89%
Reliable protection program	Legal development restrictions	Existence of conservation easement	100%
Community support	Visual quality: development	Highly compromised	40%
	intrusions in the viewshed	Uncompromised	6%

base in an urbanizing community. However, of the 305.8 ha that were saved, 89% remain in active farm use. This result argues well for the fact that agricultural use can survive effectively on protected land in urbanizing areas where crop values are high, even if the parcels are small. The issue is complicated somewhat by the question of whether, given market demand for the parcel, protected lands should be allowed to be used merely as open space for adjacent subdivisions. In addition, the question of whether equestrian and greenhouse uses are appropriate given their high level of impervious surface will have to be addressed in future revisions to Southampton's ordinance, given the fact that the entire Agricultural Overlay Zone is under intense development pressure.

It appears from these results that cluster development has merit as part of the toolbox of approaches to land conservation in urbanizing areas. As discussed earlier, the tension between agriculture and development in urbanizing areas is intense. And, as a result of the increased market for direct marketing and specialty crops, the viability of small acreages for agricultural production is increased. Since Southampton's Subdivision Reserve Areas continued to be farmed at 89% of the land area, this indicates a continued viability for the protected parcels. Therefore, clustering should not be dismissed as a viable tool to add protected farmland to the acreage that can be protected through purchase, easement and transfer of development rights programs. However, it must be noted that the sharp decrease in the total land resource and the decrease in protected parcel size does not indicate that the tool would lend itself well to those areas where large acreage production agriculture is the norm. Nor should clustering be used as the only or the primary tool for farmland preservation, given the tool's inherent reduction of the farmland base, and placement of new development in close proximity to the protected land.

With respect to visual quality, the results are less encouraging. Heyer (1990) cautions that "low densities, even when coupled with clustering provisions, do not protect a community's rural character. What is necessary is a more sensitive and site-specific approach. . . ." The

results of this study certainly support that statement. Given the parcel size of the predevelopment subdivisions (average of 15.5 ha) and the lack of topography, the ability to include residential development and not intrude on the viewshed was greatly reduced. Most of the subdivisions platted residential home sites around the outside perimeter of the development parcel, further restricting the view. The only subdivisions that affected even partial protection of the visual quality of the landscape were those that sited lots to one side of the protected parcel, and took advantage of adjacent protected open space to enlarge the view corridor. This finding supports Whyte's (1964) insistence on the need for connectivity between projects—"linkage is the key for it can provide the feeling of space."

It has often been stated in the literature that clustering should not be seen as a farmland preservation technique, but as a way to save rural character and open space (Arendt, 1994; Daniels, 1997). However, the results of this study indicate that at least under the physical constraints of the Town of Southampton, clustering had a more positive effect on agricultural land retention than on visual quality. Based on the results of this study, designing an effective clustering program for agricultural land and scenic conservation must use clustering only as a part of an overall land conservation program. The clustering program should set a high goal for the % of land to be preserved, use design criteria that protect the highest percentage of viable agricultural land, and identify the scenic views that are critical to visual quality in each subdivision. As was made clear in the results, enacting a mandatory or at a minimum a discretionary program, improved the attainment of farmland preservation goals.

Acknowledgment

The results of this research were aided by initial data collection efforts in 1998 by Richard Caplan, Christopher Holben, Johns Hopkins, Matthew Kowalski and Jason Navota. Chip Smith collected subsequent data and he and James T. Newton performed much of the GIS manipulation and analysis required by the project.

References

Anon (1959) Is this new idea for subdivision layouts a good answer to "big-lot" zoning? *House and Home* **16**(3), 116–117.

American Farmland Trust (1997) *Saving American Farmland: What Works*. American Farmland Trust, Washington, DC.

Arendt, R. (1996) *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks*. Island Press, Washington, DC.

Arendt, R., Brabec, E.A., Dodson, H.L., Reid, C. and Yaro, R.D. (1994) *Rural by Design: Maintaining Small Town Character*. American Planning Association, Chicago.

Bryant, C. and Johnston, T. (1992) *Agriculture in the City's Countryside*. Belhaven Press, London.

Chesapeake Farms for the Future (1998) *Farms for the Future: A Strategic Approach to Saving Maryland's Farmland and Rural Resources*. American Farmland Trust, Washington, DC.

Coughlin, R.E., Keene, J.C., Esseks, J.D., Toner, W. and Rosenberger, L. (1981) *National Agricultural Lands Study, The Protection of Farmland: A Reference Guidebook for State and Local Governments*. U.S. Government Printing Office, Washington, DC.

Daniels, T.L. (1997) Where does cluster zoning fit in farmland protection? *Journal of the American Planning Association* **63**, 129–137.

Davis, J.S., Nelson, A.C. and Dueker, K.J. (1994) The new 'burbs: the exurbs and their implications for planning policy. *Journal of the American Planning Association* **60**, 45–59.

Emanuel, M.S. (1985) Cluster, open space and conservation development—who has the options? *NYPF Planning News* **49**(1), 6–7.

Gerard, J. (1984) Criteria for agricultural land protection. In *Land Saving Action* (R.L. Brenneman and Sarah M. Bates, eds.), pp. 39–47. Island Press, Covelo, CA.

Heimlich, R.E. (1989) Metropolitan agriculture: farming in the city's shadow. *Journal of the American Planning Association* **55**, 457–466.

Heyer, F. (1990) Preserving Rural Character, PAS Report No. 429. American Planning Association, Chicago.

Kaplan, R. and Kaplan, S. (1989) *The Experience of Nature*. Cambridge University Press, Cambridge.

Kaplan, R., Kaplan, S. and Ryan, R.L. (1998) *With People in Mind: Design and Management of Everyday Nature*. Island Press, Washington, DC.

Land Ethics, Inc. (1997) Southampton Tomorrow: Technical Reports. Town of Southampton, New York.

Land Ethics, Inc. (1998a) *Southampton Tomorrow: Comprehensive Plan Update Implementation Strategies*. Town of Southampton, New York.

Land Ethics, Inc. (1998b) *Southampton Tomorrow: Slide and Written Survey Results*. Town of Southampton, New York.

Lapping, M.B., Daniels, T.L. and Keller, J.W. (1989) *Rural Planning and Development in the United States*. Guilford Press, New York.

Marsh, D.E. (1997) Evaluating Claims of Suburban Clustered Development: Case Studies and Matched Pair Comparisons, Working Paper 693. Institute of Urban and Regional Development, University of California at Berkeley.

McCroskey-Reuter (1970a) *Surveys and Analysis, Part 1, Southampton Community, New York*.

McCroskey-Reuter (1970b) *Town of Southampton Master Plan, Southampton Community, New York.*

Nelessen, A.C. (1994) *Visions for a New American Dream: Process, Principles, and an Ordinance to Plan and Design Small Communities*. American Planning Association Planning Press, Chicago.

Pfeffer, M.J. and Lapping, M.B. (1995) Prospects for a sustainable agriculture in the northeast's rural/urban fringe. *Research in Rural Sociology and Development* **6**, 67–93.

Rice, T. (1996) *Practice commentaries, New York Town Law s. 278 (McKinney Supp.)*

Rosenthal, J. (1960) Cluster Subdivisions, Information Report No. 135. Planning Advisory Service.

Scarfo, R.A. (1990) *Cultivating Agriculture: A Report of Current Trends and Future Viability of Farming in Maryland's Metropolitan Fringe*. Maryland Office of Planning and The University of Maryland.

Schiffman, I. (1989) *Alternative Techniques for Managing Growth*. Institute of Governmental Studies, University of Berkeley.

Town of Southampton (1989) *Code of the Town of Southampton*. General Code Publishers Corp., Rochester, NY.

Town of Southampton Farmland Committee, Peconic Land Trust and Department of Land Management (1998) *Town of Southampton Strategy for Farm and Farmland Preservation.* Town of Southampton, New York.

Whyte, W.H. (1964) *Cluster Development*. American Conservation Association, New York.

Yaro, R., Arendt, R., Dodson, H. and Brabec, E. (1987) *Dealing with Change in the Connecticut River Valley: A Design Manual for Conservation and Development*. Center for Rural Massachusetts, Amherst, MA.

Zepatowski Associates, Inc. (1983) Amendments to Southampton's Comprehensive Plan, Southampton, NY.