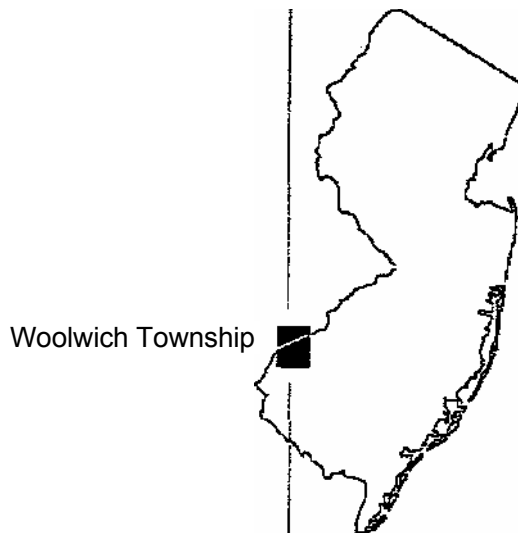


WORKBOOK
for planning
in the
ENVIRONS
of a
center



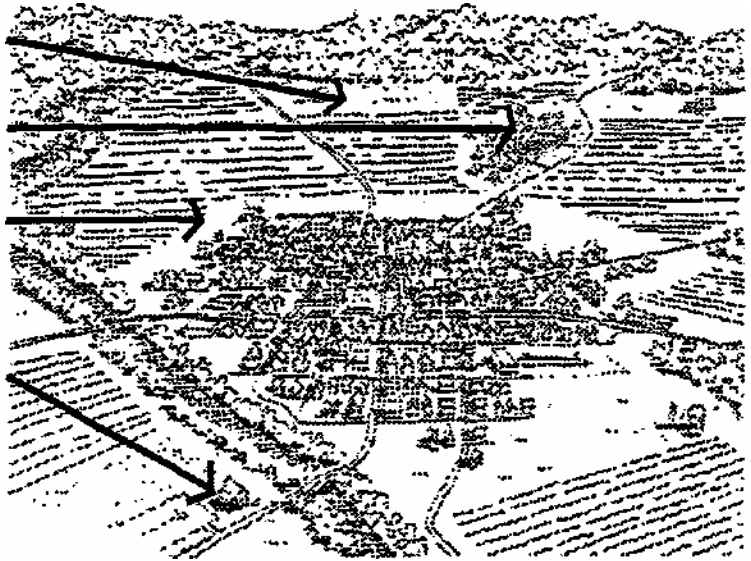
Prepared for: Gloucester County, NJ



Prepared By: Brown & Keener Urban Design
Urban Partners Lehr &
Associates A-Tech Engineering

A. sustain viability of agriculture

- Protect continuity of agricultural land
- Enable/encourage development of new compact, mixed-use communities by revised zoning and award of density credits for appropriate projects
- Establish buffer at non-farm uses
- Farmland Preservation through voluntary purchase of land and development rights
- Protect farm markets with broad definition in Right-to-Farm Ordinance
- Create equity insurance program to encourage young farmers to stay and expand operations



A.01
 Contiguity of Agricultural Land

CONTIGUITY DIAGRAM

SUMMARY: FARMLAND SUBDIVISION - A CATALOGUE OF LAND USE TECHNIQUES...

A.02
 The Zoning Code and the Rural Development Overlay Plan

CONSERVATION SUBDIVISION DESIGN "A FOUR STEP PROCESS"

A.03
 Establish buffer at non-farm uses • BUFFER DIAGRAMS

A.04
 Voluntary Preservation Programs

A.05
 Farmland Preservation through purchase of land and development rights

Protect farm markets with broad definition in Right-to-Farm Ordinance

copy of AGRICULTURE MANAGEMENT PRACTICES FOR FARMER-TO CONSUMER DIRECT MARKETING...

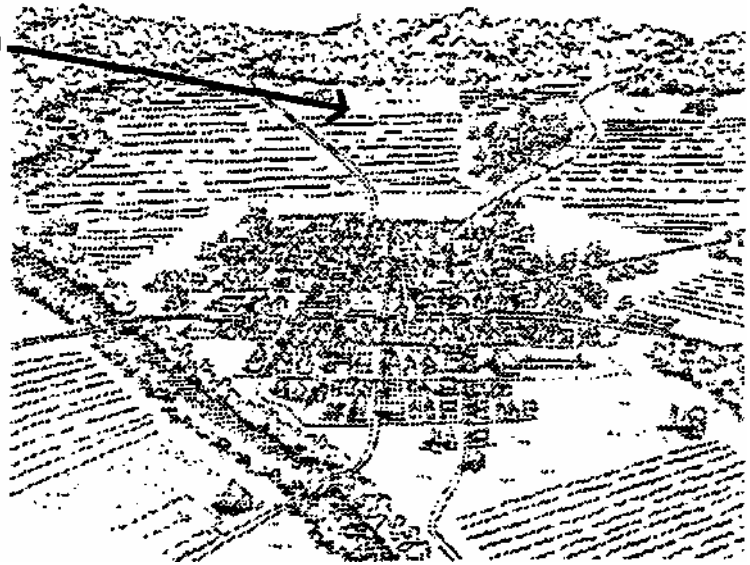
A.07
 equity insurance program to encourage young farmers to stay and expand operations

DESCRIPTION OF GLOUCESTER EQUITY INSURANCE PILOT PROGRAM

A. sustain viability of agriculture

Protect continuity of agricultural land

A.01
Contiguity of Agricultural Land



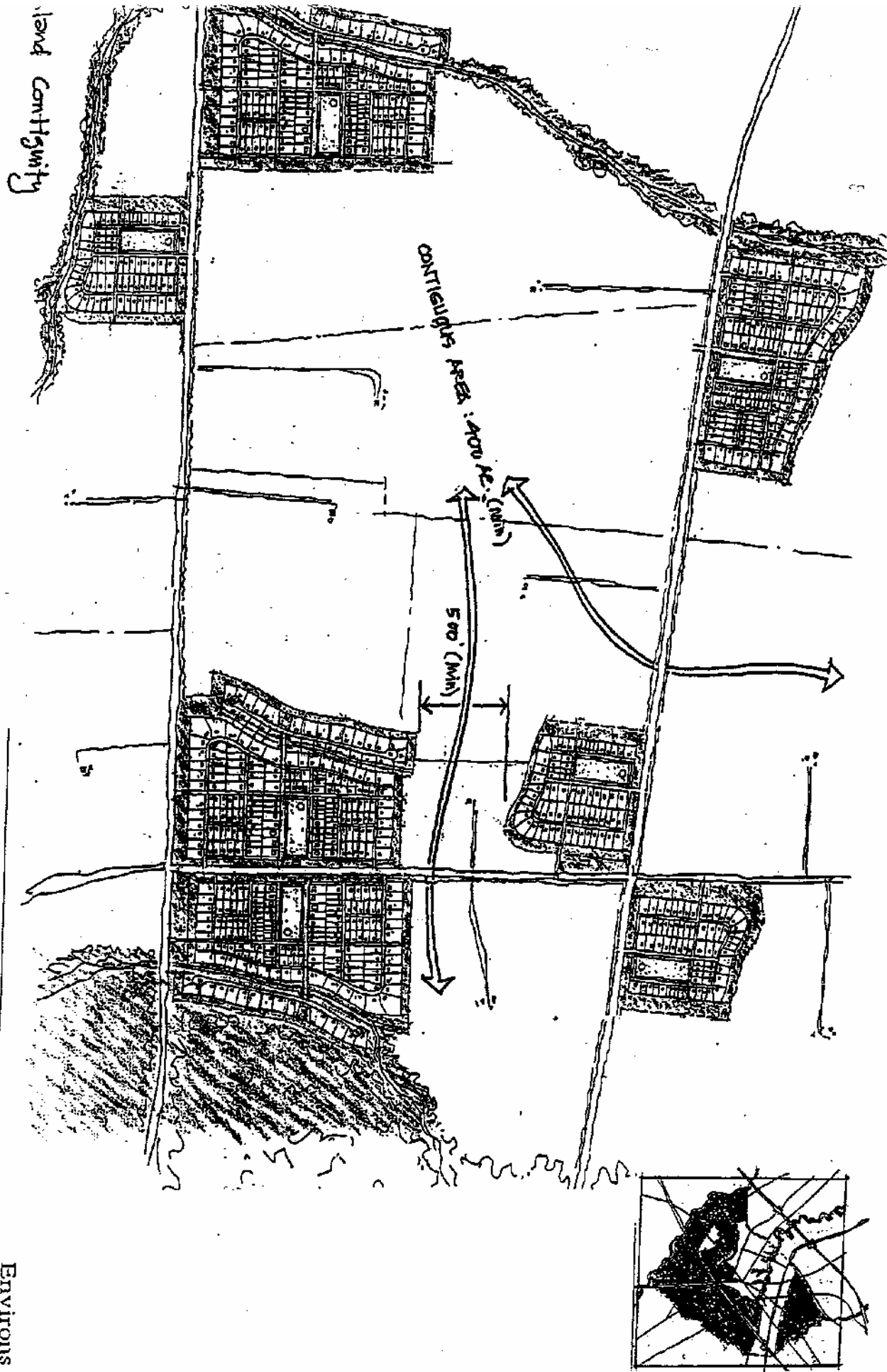
coNTIGUFTY DIAGRAM

If was mentioned in the public meetings that for the practice of agriculture to remain viable in areas where conversion to residential is occurring that three land use issues must be addressed:

1) **Nuisance Protection:** Nuisance issues arising from operational practices necessary to farming

1 "Critical Mass": there needs to be enough farming going on so that service providers (feed, fertilizer, equipment repair, processing, etc... do not relocate.

2) **Contiguity:** the subdivision of land, regardless of uses, has been shown to contribute to the progressive decline in agriculture—this issue is often not addressed directly in farmland preservation legislation. The diagram on the next page is meant to illustrate a subdivision ordinance to demonstrate the concept; and suggests that in certain circumstances, a subdivision application should be denied if it will result in changing what was a large area of contiguous farmland to disconnected parcels of less than some benchmark area (here 400 acres was used, 200 or even 100 acres may be a viable production unit in some places).



land contiguity

CONTIGUOUS AREA: 400 AC. (MIN)

500' (Mins)

Environs



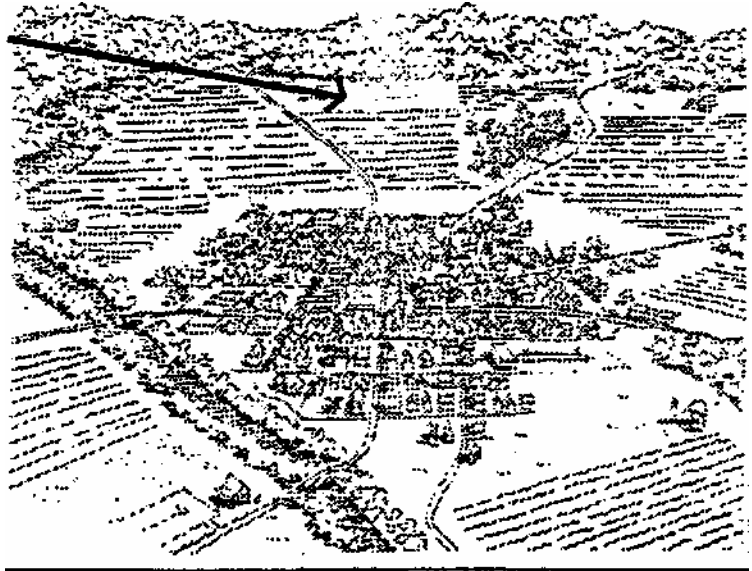
Planning for The Environs of a Developing Regional Center—Environs

E N V I R O N S

Protect continuity of agricultural land

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Contiguity of Agricultural land

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A. sustain viability of agriculture



SUMMARY: FARMLAND SUBDIVISION - A CATALOGUE OF LAND USE TECHNIQUES...

This is a portion of a larger report., it is included because it presents a good overall description of the various approaches to ensuring the viability of agriculture over time in concert with other kinds of development. But see especially the CONCLUSIONS (p iv) on the effect of subdivision.

The objective of this report is to catalogue land use techniques related to subdivision for preserving and enhancing agricultural uses of land. This report responds to the current concerns raised during discussions regarding potential revisions to the Pineiands Comprehensive Management Plan (CMP) related to farmland subdivision standards. A central concern identified for study is whether any subdivision, except for specific agricultural uses, should be permitted as it may fragment the farms and affect their future viability.

Overall, there are many more techniques in current use across the country than when the Pineiands Plan was adopted. Some of these may be applicable to the Pineiands Areas, and may be replicated or revised to meet the goals of the CMP. This report identifies those techniques, and documents the advantages and disadvantages of each. These standards apply to farm related residential, other farm related, and non-farm related subdivisions. Economic, environmental, fiscal, intergovernmental, legal, and/or social/quality of life issues related to each technique are detailed. The study summarizes these techniques, and recommends areas for further analysis. Because the ordinances cited here are complex, many of the details cannot be fully summarized in this report. However, the key aspects of each technique are included, and references provided for further investigation. At the conclusion of this report is a bibliography of relevant literature on farmland subdivision standards. While not exhaustive, it does reflect many of the key sources on this topic, and will provide the reader with a firm base for additional research.

HIGHLIGHTS OF FINDINGS

"The conversion of agricultural land is a complex process, often taking place over a period of fifteen or twenty years. It involves such factors as farm profitability, urban growth pressures, land values, personal decisions about work and retirement, community expectations, taxes and government programs, incentives, and regulations....At some point, the process becomes irreversible, and farm after farm is subdivided and developed" (Coughlin and Keene, 1981, p.16).

Many states have responded to factors such as those listed above by developing programs to preserve or enhance agricultural uses of land. Coughlin

and Keene. 1981, categorize these programs under three purposes:

- (1) programs that reduce the relative attractiveness of a farming area for development.
- (2) programs that offset additional burdens placed on farmers by approaching urbanization, and
- (3) programs that prevent changes of use from agriculture to built-up uses.

Lapping. Daniels and Keller, 1989, cite three instruments for the regulation of land use in small towns and rural areas: private property agreements, zoning ordinances and subdivision control. This report will concentrate on programs that prevent land use changes, although the Pinelands Commission may desire to further investigate opportunities for private property agreements and other controls included here to achieve the goal of preserving and enhancing agricultural uses of land.

"Agricultural Zoning" is the most common method of preventing the development of agricultural land: and, according to Robert E. Coughlin, is the method that holds the most promise for protecting a major portion of the nation's farmland (Coughlin, 1991). Areas that possess good agricultural soils, a viable farming industry and moderate land prices are prime for agricultural zoning. In Pennsylvania, 35 municipalities in Lancaster County have 268,000 acres under effective agricultural zoning, while in York County, 17 municipalities have "zoned 159,000 acres in a similar fashion (Coughlin, Denworth, Keene, Rogers and L 1992).

Because agricultural zoning programs vary widely, many so-called agricultural zoning districts offer little protection to agricultural land (Coughlin, Keene, et al., 1981). The National Agricultural Lands Study. An Inventory of State and Local Programs to Protect Farmland (Coughlin, Esseks and Toner, 1981) includes agricultural zoning ordinances that met three tests:

- (1) Is the ordinance an exclusive agricultural zoning ordinance?
- (2) If not, does the ordinance require a minimum lot size or density standard of at least 20 acres?
- (3) If not, does the ordinance require a minimum lot size or a density standard often acres coupled with additional controls over site improvements?

According to William Toner, a former consultant to the National Agricultural Lands Study (NALS), serious agricultural zoning has two distinguishing features:

first, the basic purpose of the ordinance is to protect and maintain farms and farm operations; second, non-farm uses, especially housing, are curtailed or excluded altogether (Toner, 1984).

There are two basic types of agricultural zoning ordinances: exclusive and nonexclusive (Coughlin and Keene, 1981). The least common and most extreme is exclusive agricultural zoning which prohibits the construction of any non-farm dwellings.

A variation on this is existing use zoning (Gottsegen for the Burlington County Freeholders, 1992; Humbach, 1989), which is a growth management tool intended to zone land according to its existing or current use (e.g., land currently used for agricultural production is zoned for agricultural use).

More prevalent is the nonexclusive agricultural zoning, which allows a limited amount of non-farm development. Two major types of nonexclusive agricultural zoning ordinances are large minimum-lot-size zoning and area-based allocation. As the term indicates, large minimum-lot-size zoning requires a substantial minimum lot size, often 40+ acres; however, ordinances from around the country have varied from as little as 10 acres to over 300 acres. The two main approaches to large-lot zoning involve non-farm residences as either a permitted use or a "special" or "conditional" use.

Area-based allocations allow the landowner to build a number of dwelling units as determined by the total acreage of the property; small building lots, often 1 acre, are utilized. The two types of area-based allocation ordinances are fixed and sliding scale. Owners are allowed to build one dwelling per 40 acres, or some other specified area of land, under the fixed area-based allocation ordinance. The number of dwellings allocated per unit area, under sliding scale, decreases as the size of the tract increases.

A variant of the sliding scale is "parcel-based* allocation, which allows a given number of new dwellings on any parcel, regardless of how large it is. This approach results in low overall densities unless the parcels are small.

Two zoning techniques that can be problematic, according to Toner, 1981 are rezonings and parcel splits. Rezonings are simply a change in zoning designations (e.g., from the agricultural zone to a residential zone). "Parcel splits" in which a single parcel may be split or divided into four or fewer lots with a minimum size are allowed in many states by statute.

"Subdivision regulations" are a comprehensive set of guidelines for physical development (Lapping, Daniels and Keller, 1989). As the term may indicate, these regulations set standards for dividing larger tracts of land into smaller lots. These

regulations directly influence infrastructure decisions and ensure conformity among standards within a community. These regulations also seek to avoid haphazard and inefficient development patterns. Subdivision controls assure that there is an adequate transition between uses at the boundaries of different zoning districts. In Pennsylvania, many municipalities that do not have zoning ordinances and classifications of land rely on subdivision ordinances to control tract size or site development. Without zoning, these regulations must include uniform requirements for "minimum setback lines and minimum lot sizes which are based upon the availability of water and sewage" (Coughlin, Denworth, Keene, Rogers and Brown, 1992).

Additional land use techniques included in this report are: variances, conditional uses, special exceptions or permits, private property agreements and compensable zoning. Other controls cited include: special overlay zones to protect agricultural or forrest activities; special use permit procedures; strengthened goals or statements that address the need to protect agricultural land rather than agricultural clusters; limitations on public investments that would encourage non-farm development; modifications to state agency administration regulations and procedures to encourage maintenance of viable farming in agricultural districts; site planning standards that ensure the careful location of non-farm development on each tract; joint planning among owners of adjacent tracts; careful location of infrastructure; acquisition of development rights using revenues from the tax on land sales; and the donation of development rights (Coughlin and Keene, 1987). "Right-to-Farm" ordinances and differential assessment programs may also be used to reduce farmland subdivision and preserve and enhance agricultural uses of land (Lapping, Daniels and Keller, 1989}.

Because of the high cost of acquiring development rights and the complexities of private agreements, agricultural zoning will probably continue to be the most common method of directly protecting agricultural lands from conversion (Coughlin, 1991}. Indirect methods, such as agricultural districting and tax incentives, have made it easier for farmers to continue fanning; however, in almost all cases cited, this does not prevent them from selling the land for development.

Maintaining the land in a form that allows the continuation of agriculture is a major objective of agricultural zoning. The first sub-objective, according to Coughlin, 1991 is to restrict the division (or parcellation) of farmland to avoid its breaking-up into small parcels. This situation has accelerated the shift of the land market from rural to suburban and urban. However, the critical question. "How do you define the acreage beneath which division of a tract should not be permitted?" remains without an easy answer, and there is little research on which

FARMLAND

SUBDIVISION

Executive Summary

to rely. The extensive literature on the economics of farm size is of little direct use. according to Coughlin and others, in determining the minimum acreage that should be permitted. A 1984 study of three townships in York County, Pennsylvania, attempted to determine how large individual farms were in the area of interest, and at the "farm core" to identify the minimum amount of contiguous land necessary to farm in an efficient manner. A general standard of 100 acres was chosen as the limit beneath which division should not be permitted outside of the subdivision process (Coughlin, Keene and Laarakker, 1984). A similar result was found in Clarke County, Virginia (Coughlin and Keene, 1987).

The second sub-objective of agricultural zoning, according to Coughlin, is to keep open enough land that agriculture remains functionally viable. Area-based allocation zoning provides flexibility in site planning to allow a large portion of land to remain open. 'The total amount of land depends upon the tract size-class schedule, the minimum allowable lot size and the size distribution of all the tracts existing at the date specified in the zoning ordinance. Clarke County, Virginia, and York County, Pennsylvania, used this technique.

Evaluating the effectiveness of agricultural zoning has not been easy, according to experts such as Thomas L. Daniels and Robert E. Coughlin. They note that this type of zoning cannot be proven effective solely because conversions to non-farm uses do not occur after the institution of agricultural zoning. A case study of land ownership and implied intention of use in Shrewsbury Township, Pennsylvania, (where agricultural zoning was adopted in 1976) demonstrates that the adoption of agricultural zoning significantly reduced the flow of land in the agricultural district from owners who generally intended to keep the land in rural use to owners with intentions of developing the land.

Although zoning is viewed as a suspect technique because it is easily changed when development pressures rise, agricultural zoning is less likely than other types of zoning to be changed to allow development. The public purpose, incentives and presence of supportive state legislation enhance the effectiveness of agricultural zoning. In addition, growth management programs that facilitate development in other areas where public facilities are provided, along with available development incentives and an expedited approval process were found to increase the long-term effectiveness of agricultural zoning.

Critics also complain that agricultural zoning is "exclusionary." "environmental zoning in disguise" and that it ignores agricultural interests (Toner, 1984). A survey by the American Planning Association of jurisdictions represented in the National Agricultural Lands Study asked local officials about five areas of interest. According to Toner, 1984, the initial results made clear that agricultural zoning activity had increased substantially since the NALS. that

FARMLAND

SUBDIVISION

Executive Summary

officials seemed satisfied with agricultural zoning, and that the agricultural community had played a strong role in developing and implementing the ordinances.

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Many of the techniques listed in this report attempt to protect the agricultural land base by limiting the division of agricultural land; this occurs primarily by preventing the division of land into small or medium parcels that are too small to comprise economically viable farms. An assessment of the alternative techniques in this report address the economic, environmental, fiscal, intergovernmental, legal and social/quality of life implications of such actions. Table 1 provides a listing of techniques cited in this report, along with the major advantages and disadvantages of each.

CONCLUSIONS

"As the land resource is broken up into smaller and smaller tracts, its value for agriculture is diminished. Two effects can be observed:

First, the assembly of enough land for a farm of minimum efficient size becomes more * difficult, and farmers are forced to farm several f scattered tracts. These are less efficient to farm than is one farm composed of contiguous tracts.

Second, as parcelization progresses, more and more non-farm owners are brought into the market because the supply of land contains more tracts of the size they can afford. They bid up the price of land beyond agricultural use value, making it unaffordable by farmers, especially beginning farmers attempting to acquire land for a core farm....

The change in the size distribution of tracts that constitute the agricultural land resource is invisible and often precedes more obvious changes in land use, but it is a real change in the land market that almost inevitably leads to changes in land use years later. This progression is difficult to reverse, but it can be stopped." (Coughlin and Keene. 1987, pp. 97-98)

This report identifies over 25 techniques cited in the literature which may address how to preserve land and enhance agricultural uses of land in the face of subdivisions. Agricultural zoning techniques were found to be the most widely used, with varying intents and results. Exclusive agricultural zoning can eliminate subdivisions: however, this may be legally and politically contested. Existing use zoning follows the same direction and may provide similar opportunities and constraints.

Non-exclusive agricultural zoning will address preservation and development issues, yet may require additional administration. Large minimum lot size ordinances seek to reduce growth pressures and the need for urban services: they may also result in conflicts between residences and farming operations. Area-based allocations (i.e.. fixed, sliding-scale and parcel-based) increase the opportunities for development — especially on poor soils — yet increase the administrative and infrastructure costs.

The other techniques listed provide additional avenues for study. Utilized in conjunction with a strong agricultural zoning ordinance, one or more of these techniques could strengthen the agricultural industry and the farmland base.

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Enable/encourage development of new compact, mixed-use communities by d revised zoning and award of density credits for appropriate projects



A.02
*The Zoning Code and the Rural
Development Overlay Plan*

A. sustain viability of aariculture

ANNOTATED ZONING CODE

All of the current township ordinances have been carefully crafted over time to ensure that: 1) when development occurs , it is built to very high standard, and that good development and construction practices are observed; 2] landowners have a wide range of options as to the scale and intensity of future uses they might consider.

This is the Table of Contents of the current Woolwich Township Zoning Code with a few hand-written notes about where to consider possible amendments to integrate the recommendations proposed in Plan for the Environs of a Center —providing additional oportunittes to create small communities that are compatable with the rural character or the area, while protecting environmental systems, and enlarging the potential market for incremental development.

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Hamlet/Village Ordinance:

- section 1: • Special requirements (and rates) for application fees, review fees and escrow, inspection fees.*
- Additional review issues to be considered by the Planning Board is form and continuity and design criteria*
- section 2: definitions for Hamlet, Village, Development Compact, yield Plan ...*
- section 4: Add Ag land, farms, wetlands ... consider requiring a "Existing Features and analysis site plan" and key map that will identify how the site fits in w/ County wide open space Plan.*
- Reference to forthcoming DPE report on locational criteria for small wastewater treatment facilities*

section 5: modify requirements for curbside visits & construction specifications to allow narrower widths when appropriate, omit curbs @ rural & some hamlet streets ...

section 6: Add ord language that supports continued practice of agriculture and recognizes that with properly planned "transition area or buffer for active farms near new residential areas .. can be a desirable amenity

- (6.04) Permit narrower curbing widths in hamlet/village subdivisions
- (6.10) Permit, not prohibit alleys in hamlet/village subdivisions
- (6.14) Define criteria for "Buffer Strip" or "Transition area" between active farming and new residences
- (6.18) Reference forthcoming Regulations being developed by NJ DEP for smaller community treatment facilities
- (6.19) Develop criteria for public open space & community facilities for Hamlet/Village development

Section 7: Consider special requirements to administer application process for Hamlet/Village development.

^ Definitions

y

Village:

A village is a predominantly residential development with a minimum of 150 dwelling units (du's) constructed at a density of 3 du/gross acre to 6 du/gross acre after deduction for designated wetlands and dedicated open space. Village developers within development compact areas must negotiate with the compact for density credits. Village developers outside compact areas may construct units utilizing the density credits associated with the property on which the development is located and in addition they may purchase density credits from any other property owner in the Township. Village developers outside compact areas receive a bonus of 20% in density credits for developing in a village pattern. Village development must comply with Village Development Design Guidelines and must be served by sewer.

Example: A village developer purchases a 60 acre parcel with 45 density credits. The developer plans to build 240 units at a density of 4 du/gross acre. The developer requires 240 density credits, of which 45 were purchased with the property and 40 come as the 20% bonus for village development. Therefore, the developer must purchase an additional 155 density credits from other property owners in the Township.

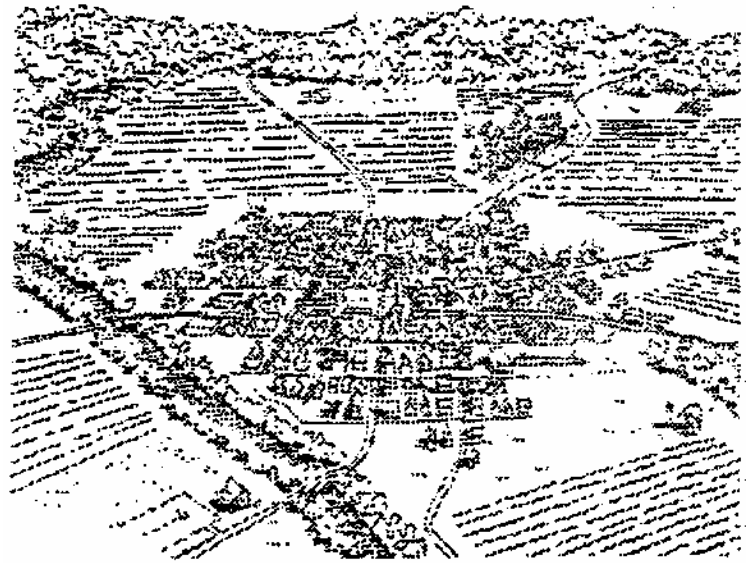
Hamlet:

?

A hamlet is a predominantly residential development with a minimum of 50 dwelling units (du's) constructed at a density of 3 du/gross acre to 5 du/gross acre after deduction for designated wetlands and dedicated open space. Hamlet developers may construct units utilizing the density credits associated with property on which the development is located and in addition they may purchase density credits from any other property owner hi the Township. Hamlet developers receive a bonus of 15% in density credits for developing in a hamlet pattern. Hamlet development must comply with Hamlet Development Design Guidelines and must be served by sewer.

Example: A hamlet developer purchases a 20 acre parcel with 15 density credits. The developer plans to build 60 units at a density of 3 du/gross acre. The developer requires 60 density credits, of which 15 were purchased with the property and 8 come as the 15% bonus for hamlet development. Therefore, the developer must purchase an additional 37 density credits from other property owners in the Township.

Enable/encourage development of new compact, mixed-use communities by d revised zoning and award of density credits for appropriate projects



/t. sustain viability of agriculture

*A.02
The Zoning Code and the Rural
Development Overlay Plan*

***CONSERVATION SUBDIVISION DESIGN "A FOUR STEP
PROCESS"***

This is a handout, produced by Natural Lands Trust that provides a useful description of a subdivision application review process that could be a model for hamlet/village development. It provides a basis for calculating lot yield and for evaluating impact on rural character and environmental systems. The density credit overlay was not illustrated in the example, however, it could be easily added to the process.



CONSERVATION SUBDIVISION DESIGN

A Four-Step Process

NATURAL LANDS TRUST, INC.

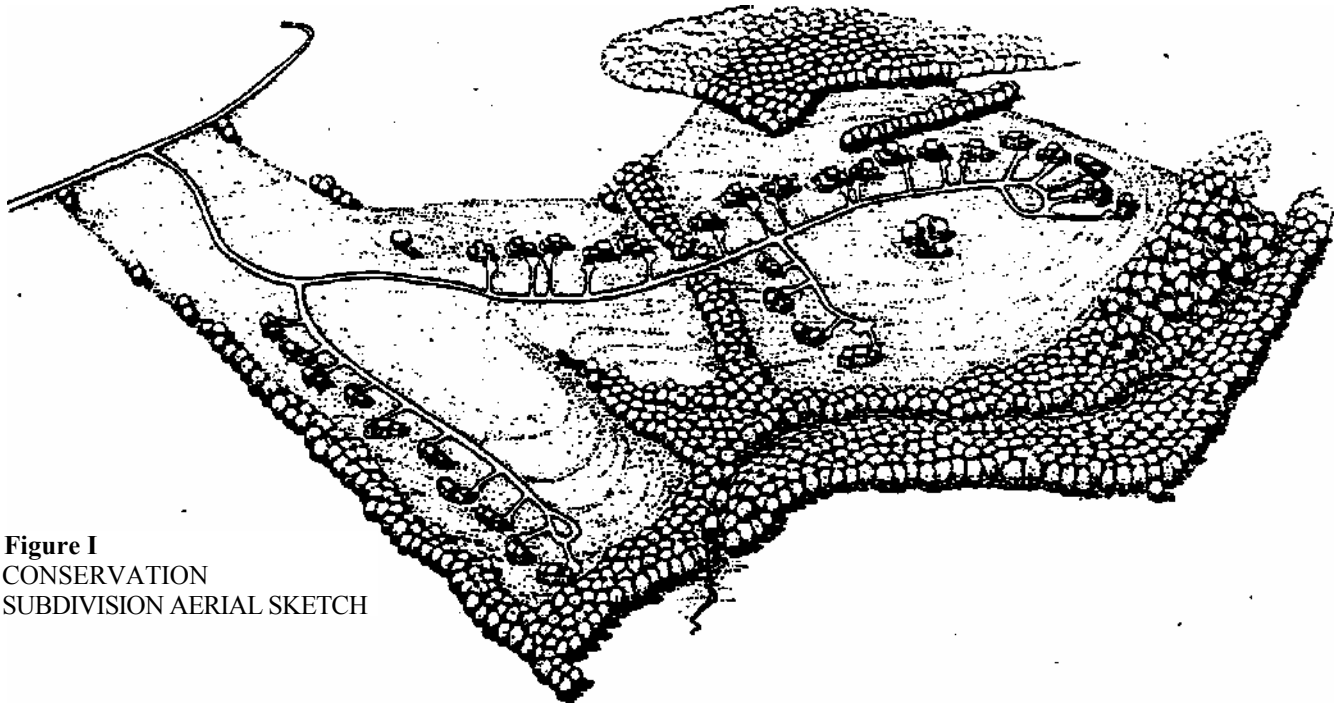


Figure I
CONSERVATION
SUBDIVISION AERIAL SKETCH

NATURAL LANDS: SPECIAL PLACES IN YOUR COMMUNITY

If you live in a rural area or along the suburban fringe, chances are that you live not far from a stream valley, wild/lower meadow, or patch of woods. Chances are also good that none of these special places will be recognizable 20 or 30 years from now, unless they are in a public park, state forest or wildlife refuge, or unless they happen to be protected through a conservation easement held by a conservation organization such as the Natural Lands Trust.

That is because most townships have adopted zoning and subdivision ordinances whose principal purpose is to set rules for the orderly conversion of virtually all land that is dry, flood-free and flat to moderately sloping, into developed properties.*

Fortunately, practical alternatives do in fact exist, and this publication describes a straight-forward way to ensure that new subdivisions are designed around the central organizing principle of conservation. This technique can also be used to help communities create an interconnected network of open space through creative approaches to land development.

SPECIAL FEATURES WORTH CONSERVING

The aerial drawing above shows how a partially wooded property could be developed at the full two-acre density allowed under local zoning, following the principles of conservation design. Altogether, two-thirds of this 82-acre parcel could be conserved, including 17 acres of wetlands and steep slopes, and 37 acres of upland without any building constraints.

Although the hedgerows on this site are not visually spectacular, they are capable of providing instant

buffering between backyards in addition to their intrinsic habitat value. The species found there along a typical 300-foot length- include white ash, cockspur hawthorn, wild crabapple, black cherry, shadblow serviceberry, hackberry and white oak. These trees provide many perching, feeding and nesting opportunities for a variety of arboreal birds such as indigo buntings, tree swallows and bluebirds.

Below them grows a dense thicket of shrubs including black chokeberry, box huckleberry, pin cherry, American hazelnut, viburnum, elderberry and blackberry bramble which, together with a variety of thick meadow grasses, offer excellent cover for meadow voles and other small rodents, providing abundant food sources for foxes and other carnivores.

The little hollow sheltering the spring house where the stream rises is filled with rue anemone, sweet flag, marsh bellflowers, turdehead, spearmint, milkweed, silky dogwood and summersweet or sweet pepperbush, and the wildflower meadow in the northwest corner of the property is noted for its wild strawberry, sleepy catchfly, tall anemone thimble weed and broom sedge. These features can also be seen in Figure 2, showing the site in its pre-development state.

Under normal development circumstances, not one of these features would rate highly enough for it to be designed around and saved, or even noted, as local ordinances typically do not address conservation of such natural areas. However, they provide food and shelter for a myriad of birds, small mammals, amphibians and insects. (For example, milkweed is a critical plant in the life cycle of the Monarch butterfly, a species that is currently suffering markedly from the careless destruction of this kind of habitat, which is almost universally being replaced by tidy suburban lawns.)

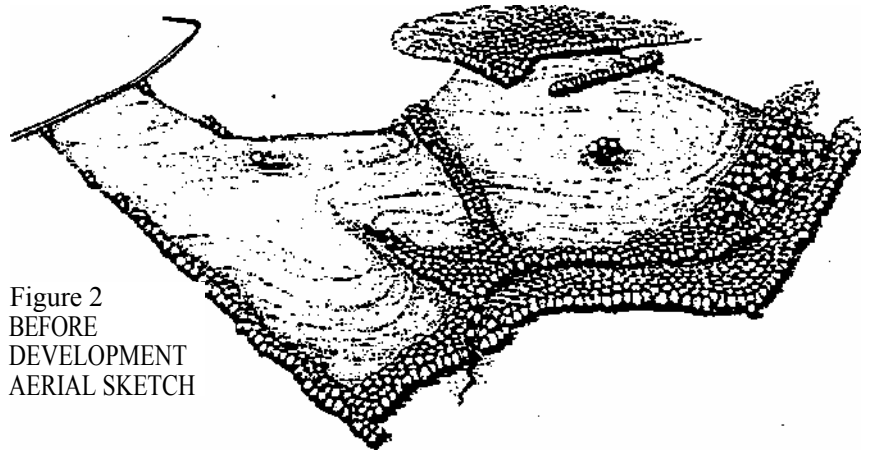


Figure 2
BEFORE
DEVELOPMENT
AERIAL SKETCH

Figure 3
YIELD PLAN

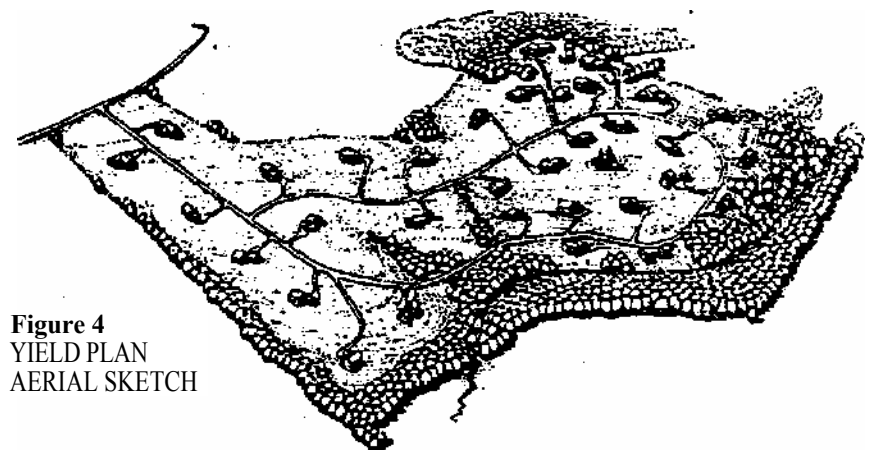
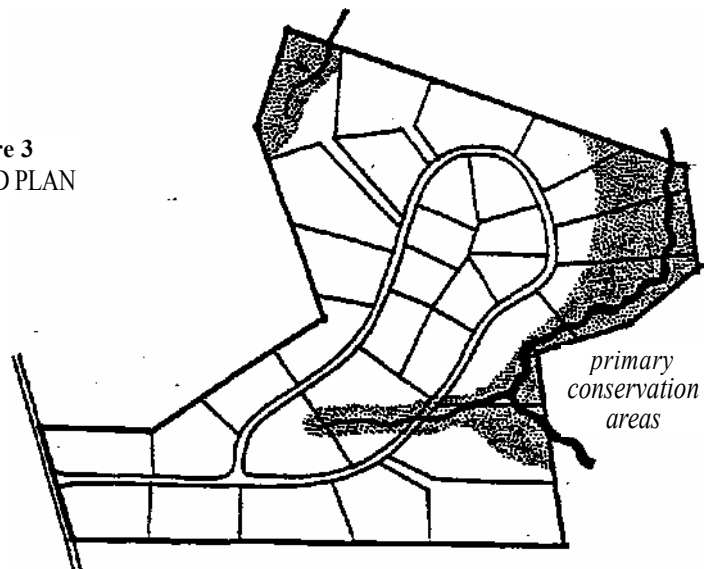


Figure 4
YIELD PLAN
AERIAL SKETCH

CONVENTIONAL SUBDIVISION DESIGN

Figures 3 and 4 illustrate the typical kind of "checkerboard" layout that is permitted (sometimes even required) by local zoning and subdivision ordinances. Conventional developments such as this needlessly displace wildlife habitat and convert other natural areas into ecologically diminished suburban yardspace. The same number of houses could just as easily be accommodated onto a smaller portion of the land, not only reducing development costs but also helping to foster a greater sense of community among the new residents by providing them with a more neighborly arrangement of homes. The two-acre lots shown in these drawings are "too large to mow and too small to plow." Meanwhile, many forms of wildlife are driven farther away, and opportunities to take woodland walks or weekend strolls across wildflower meadows simply do not exist, because every acre has been divided into private lawns and yards.

THE CONTEXT

Municipal Planning for Conservation and Development

To broaden land conservation efforts throughout the region, the Natural Lands Trust has for the past three years been working on an approach to revising local zoning and subdivision ordinances that will multiply the options available to landowners, setting higher standards for both the quantity and quality of land that is set aside for permanent conservation.

Network of Conservation Lands

The ultimate goal of these planning efforts is to help communities identify and protect an intercon-

nected network of natural lands woven into the fabric of new development, to assure greener futures for succeeding generations of residents. While traditional conservation methods such as acquisition, easements and "limited development" (involving greatly reduced densities) will continue to play an important role in certain instances, it is likely that the vast majority of undeveloped parcels in our region will ultimately be proposed for full-density residential development in the years to come. It is therefore essential that more conservation-oriented design standards be incorporated into the local land-use ordinances that govern subdivision proposals, so that the majority of new developments will contain a substantial percentage of protected open space.

Municipal Open-Space Plans

The site planning principles which the Trust advocates for individual properties that are proposed by their owners for development—principles which are the main subject of this article — are part of a much larger effort to help local officials prepare community-wide open space plans. These plans typically include maps combining a variety of natural resource data with tax parcel boundaries to identify, well in advance of development, broad opportunities for conservation throughout the community.

Ordinance Improvements

After completing these maps and drafting specific planning policies to conserve significant resources, the next step involves helping local officials to update their land-use ordinances. A key provision recommended by the Trust allows municipalities to require that developers take those pre-identified conservation areas into account and design their houselots and streets around them in a respectful manner. In a typical situation, flexible standards for lot size and frontage allow for the

full legal density to be achieved on one-third to one-half of the buildable land, leaving the balance in permanent conservation.

Several townships in our region have also taken the further step of requiring that developers group their homes on half or less of their unconstrained land so that upland terrestrial habitat and other ecologically important areas may be maintained



in their natural state. Current regulations in most municipalities protect only unbuildable areas such as wetlands, floodplains, and steep slopes (the so-called "obligatory open space"). Without open space design standards such as advocated by the Trust, most developers would continue to overlook other important conservation possibilities in their subdivisions, fragmenting many kinds of natural lands into individual houselots, rather than designing around them to create undivided conservation areas managed for long-term resource protection.

The kind of resource fragmentation described above is illustrated in Figures 3 and 4 and in the upper part

of Figure 5, showing a typical large-lot subdivision layout that divides all upland and lowland areas on the subject parcel into a checkerboard of houselots and streets. Houses would, of course, be located away from wetlands, floodplains and steep slopes, under most current ordinances, but woodlands and meadows would typically be cut up into indi-

Although lots that abut conservation land typically sell more quickly and at premium prices compared with standard lots surrounded by more of the same, many developers lack experience in designing and marketing this kind of alternative, and therefore tend to continue subdividing in the conventional land-consumptive manner.

vation principles, in accordance with new planning policies and ordinance standards developed by the Trust to help communities implement their visions of a greener future for the generations that will follow our own.

Designing Around Conservation Features: The Four-Step Process

Until now, the zoning regulations in most communities have established a "one size fits all" approach to regulating lot sizes in each of their various districts, essentially creating a single standard size for new houselots which frequently results in "checkerboard" layouts of nearly identical lots covering the entire parcel. This result is illustrated in Figures 3 and 4, which for the purposes of the following example serves one useful purpose — as a "Yield Plan" demonstrating the legal development potential of the site (in this case, 32 lots could be created).

To provide more options for landowners (and developers) who might want to conserve their site's most special features, while at the same time receiving an acceptable economic return on their property, the Trust has drafted model zoning regulations that offer a wide range of density options (from rural estate lots to village designs), each of which is related to specific standards for open space conservation. This approach is known as "multi-tiered zoning."

In addition, our staff has been drafting new standards for designing residential subdivisions and improved procedures for governing the process in which these development proposals are reviewed. The basic idea is to set up an approach in which land conservation becomes the central organizing principle around which houselots and streets are sensitively designed. As a general rule, this approach would conserve at least half the land area of each site, in addition to the wetlands, floodplains and steep slopes that are typically

CONSERVATION SUBDIVISIONS

A new breed of development — known as "conservation subdivisions" — is illustrated in the middle section of Figure 5. In communities where all three controlling documents (the comprehensive plan and the zoning and subdivision ordinances) are coordinated to produce an interconnected network of natural lands — even after the last unprotected property is ultimately developed — subdivisions would typically contain between 50 and 70 percent conservation land. Those areas would be located in broad conformance with a community-wide "Map of Conservation and Development" to ensure that the eased land in each development will connect with similar areas on adjoining parcels.

Conserving a parcel in its entirety — either through fee ownership or holding an easement — as illustrated in the lower example in Figure 5 is, of course, preferable, but may not always be practicable. The Trust's system of preserves is based on this principle, made possible largely through the generosity of conservation-minded landowners and donors. However, neither county open space bond monies, nor funding available from the state's new "Key 93" program, will allow any single municipality to protect more than a handful of properties in this manner. The balance of this article describes a practical approach for designing full-density subdivisions around conser-

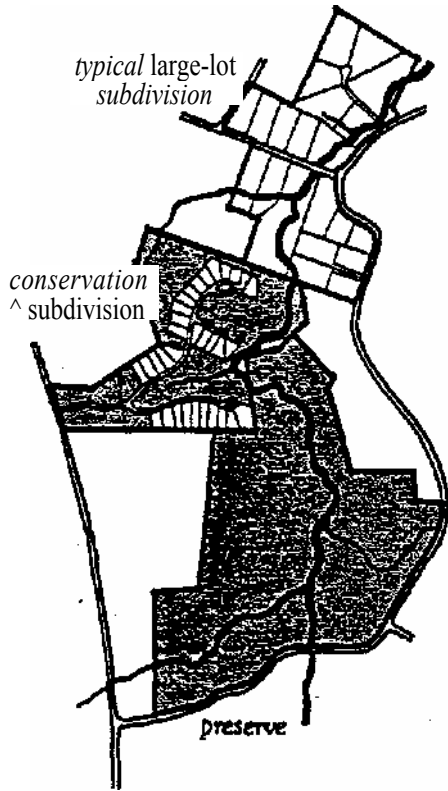


Figure 5
THREE PARCELS ON A
STREAM VALLEY

vidual lots and converted to suburban yard space, precluding any overall management to enhance wildlife habitat or conserve other resource values.

In the majority of cases where complete protection of the land is not possible, new ordinance standards can be adopted to ensure that developers lay out their houselots and streets around the central organizing principle of open space conservation.

protected under existing codes. This approach has been drafted to work well at both reduced density and full density levels, so that the principle of landowner equity is respected.

Among the procedures recommended by the Trust is the preparation of an "Existing Features and Site Analysis Plan." (In this article these features are all shown on Figures 6 and 7.) This critical element identifies all the special characteristics of the subject property, from unbuildable areas such as wetlands, floodplains and steep slopes, to other kinds of land that are developable but which contain certain features that merit the small amount of additional effort needed for their conservation. Such features might include mature or healthy and diverse woodlands, wildlife habitats critical for breeding or feeding, hedgerows and prime farmland, scenic views into and out of the site, and historic buildings in their rural context.

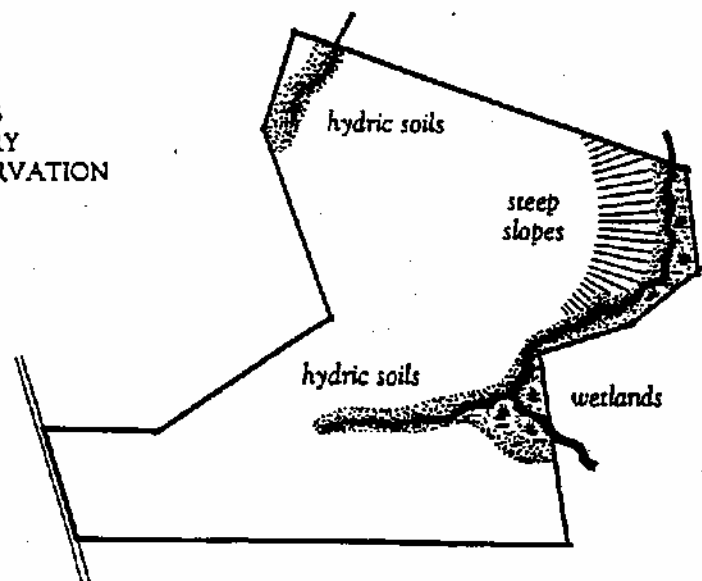
Production of the "Existing Features and Site Analysis Plan" sets the stage for beginning the four-step design process.

**Step One:
Identifying
Conservation Areas**

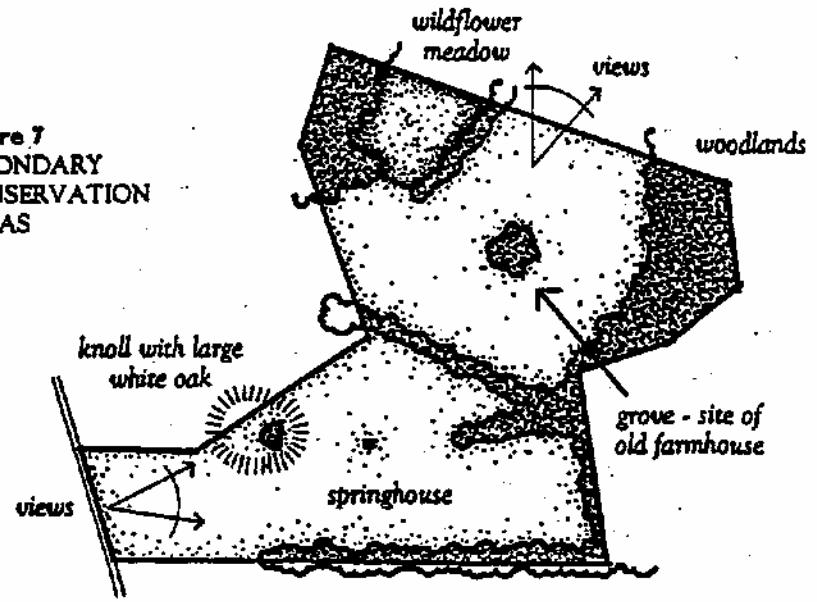
The first step, which involves the identification of open space worthy of preservation, is divided into two parts: Primary Conservation Areas (Figure 6) limited to regulatory wetlands, floodplains and steep slopes, and Secondary Conservation Areas (Figure 7) including those unprotected elements of the natural and cultural landscape that deserve to be spared from clearing, grading, and development.

The act of delineating conservation areas also defines "Potential Development Areas," which occupy the balance of the site (Figure 8). This completes the first step and virtually ensures that the site's fundamental integrity will be protected, regardless of the actual configuration of houselots and streets that

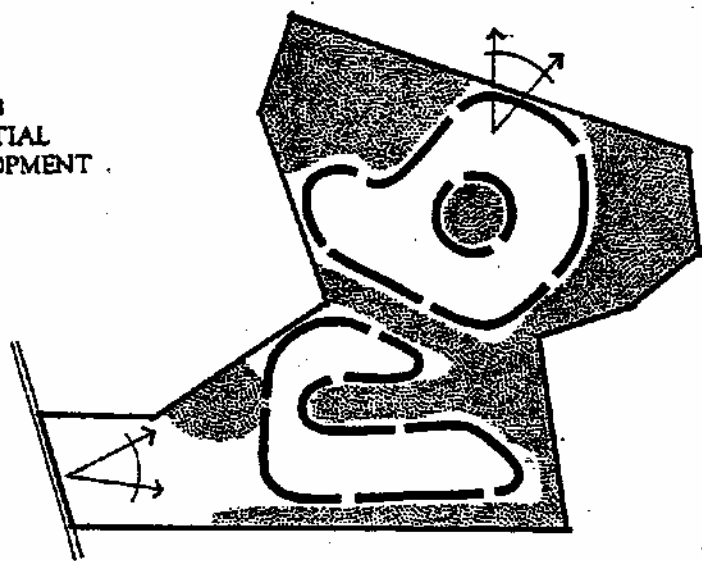
**Figure 6
PRIMARY
CONSERVATION
AREAS**



**Figure 7
SECONDARY
CONSERVATION
AREAS**



**Figure 8
POTENTIAL
DEVELOPMENT
AREAS**



will follow. In other words, once the "big picture"* of conservation has been brought into focus, the rest of the design process essentially involves only lesser details. Those details, which are of critical importance to developers, realtors and future residents, are addressed during the last three steps. In Figure 7, those features include hedgerows, wildflower meadows, a large white oak tree, a grove of trees on the site of the original farmhouse and rural roads into the property from the township road.

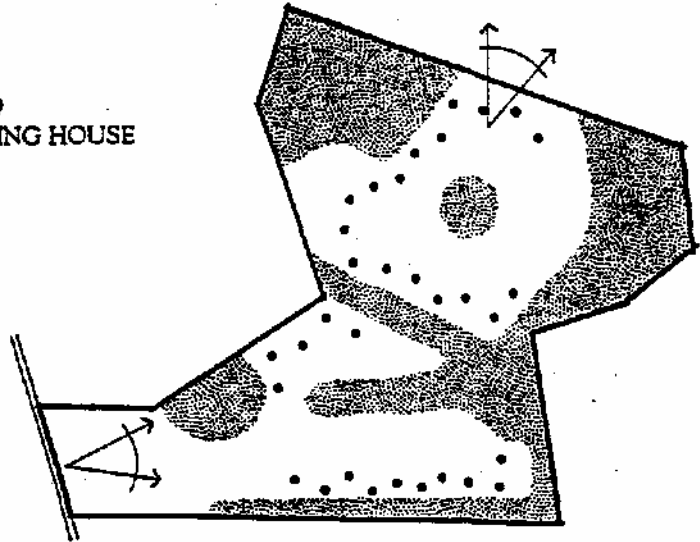
Step Two: Locating House Sites

The second step involves locating the approximate sites of individual houses, which for marketing and quality-of-life reasons should be placed at a respectful proximity to the conservation areas, with homes backing up to woodlands or hedgerows for privacy, fronting onto a central common or wildflower meadow, or enjoying long views across open fields or boggy areas (Figure 9). In a foil-density plan, the number of house sites will be the same as that shown on the "Yield Plan" (32 in this example). Other options would include voluntarily reducing that density to create a "limited development" plan, which under certain circumstances might produce the same economic payoff for the landowner.

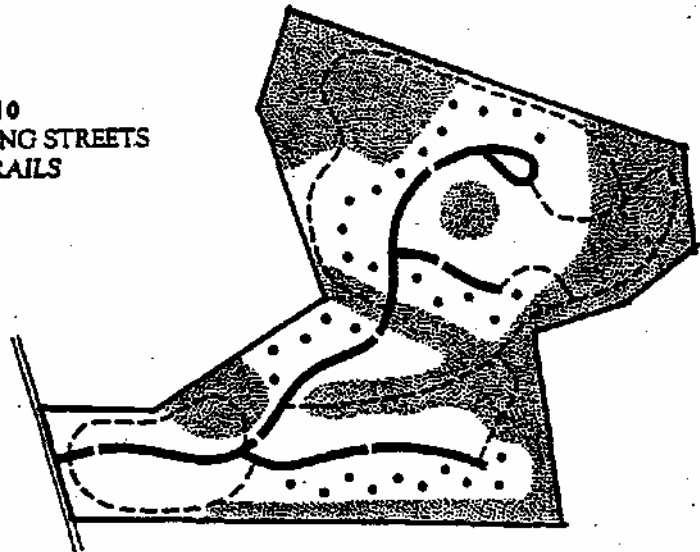
Step Three: Aligning Streets and Trails

The third step consists of tracing a logical alignment for local streets to access the 32 homes and for informal footpaths to connect various parts of the neighborhood, making it easier for residents to enjoy walking through the open space, observing seasonal changes in the landscape and possibly meeting other folks who live at the other end of the subdivision (Figure 10).

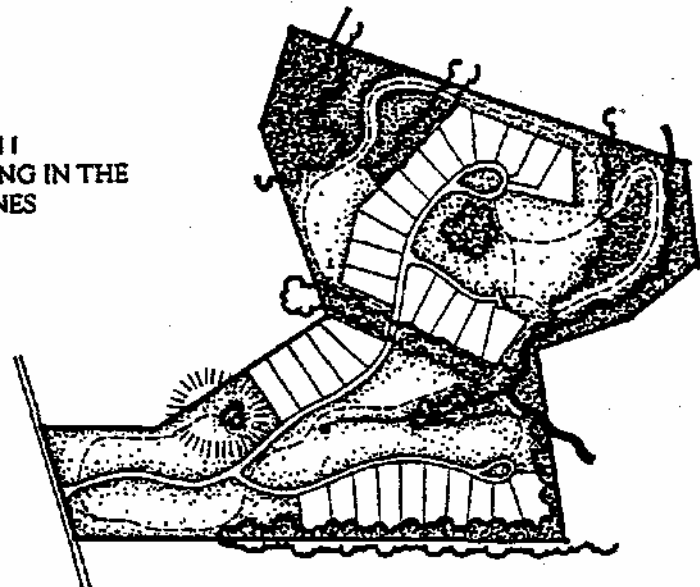
**Figure 9
LOCATING HOUSE SITES**



**Figure 10
ALIGNING STREETS AND TRAILS**



**Figure 11
DRAWING IN THE LOT LINES**



**Step Four: Drawing
In the Lot Lines**

The final step is simply a matter of drawing in the lot lines, perhaps the least important part of the process. Successful developers of open space subdivisions know that most buyers prefer homes in attractive park-like settings, and that views of protected open space enable them to sell lots or houses faster and at premium prices (Figures 1 and 11). Such homes also tend to appreciate more in value, compared with those on lots in standard "cookie-cutter" developments offering no views or nearby open space.

SUMMING UP

**Advantages for
Municipalities, Developers,
and Residents**

Perhaps the most significant aspect of this design process is the way that it can help communities build an interconnected network of conservation areas. As described at the beginning of this publication, township-wide open space plans, containing "Maps of Conservation and

to be conserved in each new residential subdivision. Of course, such plans must be supplemented by amendments to zoning and subdivision ordinances to ensure that developers design around the natural features on their property and place them into undivided conservation areas rather than allowing them to be converted to suburban lawns and streets. Conservation planning staff at the Trust have worked with a number of municipalities in our four-county region to implement such improvements and have acted as advisors to many landowners and developers.

These kinds of designs are finding a ready market among homebuyers, who are placing greater emphasis on "quality of life" issues when purchasing new houses. In our area several developers have recognized the value of open space conservation, using it successfully as a marketing tool in some of their recent subdivisions. Long vistas across 137 acres of permanently preserved fields, plus 76 acres of protected woodlands, have helped make one 418-acre subdivision in lower Bucks the fastest selling development in its price range in the County. Similarly, preserva-

tion of nearly half the woodlands at another development in southern Delaware County, has boosted sales to prospective purchasers, each of whom receives 3 handsome crail brochure when touring the model homes in each project.

Confirming what Trust staff had long suspected, an informal survey by *The Philadelphia Inquirer* has revealed that as many as four out of five house buyers in two new golf course developments in Montgomery County have little or no interest in playing golf. They have chosen homes there primarily because they prefer to dwell in park-like settings, ones that offer attractive views from their windows and pleasant places in which to stroll. Developers find that lots abutting or looking onto open space sell faster — and at premium prices — compared with lots that are surrounded by more of the same. The good news for everyone is that huge sums need no longer be spent clearing natural land to create artificial open space in the form of golf courses. Developers who let Nature alone can reap the same benefits at minimal cost—and with minimal disturbance to woodlands, meadows and fields. *

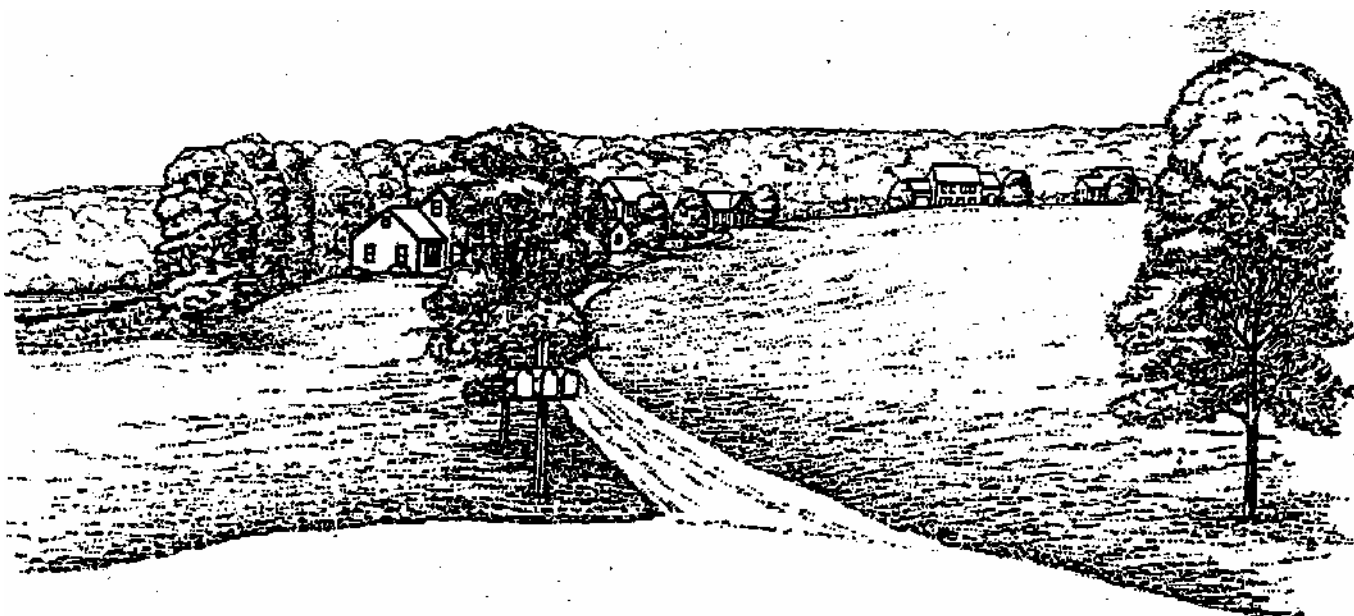


figure 12
A view across a protected meadow toward a group of new homes built at the edge of the woods. This view, from a township road, typifies the pattern of conservation and development represented by the examples illustrated in Designing Open Space Subdivisions.

Development", can pie-identity land

TOWARD A NEW LAND ETHIC

The idea of a "land ethic" represents an evolution from the ancient Judeo-Christian ethics that govern relations among individuals and between individuals and society. Sixty years ago, Aldo Leopold suggested a third kind of ethic to deal with man's relation to the land.

As Leopold, who founded the discipline of game management at the University of Wisconsin, observed in 1933, "There is yet no ethic dealing with man's relation with the land and the animals and plants which grow upon it... The land-relation is still strictly economic, entailing privileges but not obligations."

The idea of a land ethic is probably very much alive in the minds and hearts of many rural residents, including many landowners. What farmer, for example, would truly prefer the noise of traffic or the hum of air conditioners over the sound of bird-song or the rustle of wind through the leaves? Who would prefer to see rooftops defining the horizon line instead of treetops, or parking lots instead of fields and meadows?

In Leopold's time there were few financial alternatives for those who depended upon the value of their land to ease their retirement years, or to pay for health care costs. Today a variety of options exist, allowing landowners to realize the economic value of their farms and woodlands without destroying the wildlife and ecological values of their properties. The 150-page handbook described in this brief publication (*Designing Open Space Subdivisions*) illustrates one of these options, one that could be used along with others to strike a better balance between development and natural areas conservation.



Among those other options are the purchase of development rights, the transfer of development rights, "landowner compacts" involving density shifts among contiguous parcels, bargain sales to land conservancies, and "limited development". Of the entire range of alternatives, it is likely that the approach described in our new handbook offers the greatest potential because it does not require public expenditure, does not depend upon landowner generosity, does not need a special "high end" market, does not involve complicated regulations for transferring rights to other sites and does not depend upon the cooperation of two or more adjoining landowners.

This is not to imply that the other options should not be actively encouraged in your community, but rather to place those techniques in a realistic perspective as supporting elements in *an areawide program of conservation and development that is most logically based upon the flexibility and advantages offered by "conservation subdivision design"*, within a *comprehensive planning framework as delineated on a town-stop-wide "Map of Conservation and Development"*.

The great advantage of some of those other options is that many of them preserve parcels in their entirety, although they are implemented less frequently. The great advantage of open space planning and conservation design is that when they are institutionalized into local zoning and subdivision ordinances, they will be used on a day-to-day basis to protect significant percentages of land in each new subdivision that is proposed.

Further information about this approach is contained in Natural Lands Trust's newest publication, *Designing Open Space Subdivisions**. Available for \$25.00 from the Trust's offices, this comprehensive 150-page handbook is written in non-technical language and illustrates each step of the design process for six different sites. Model ordinance language is also provided in an extensive appendix, which also describes the economic benefits of conserving natural lands in new subdivisions.

Production of the handbook was made possible by grants from Ac w*. Alton Jones Foundation and the U.S. Environmental Protection Agency.

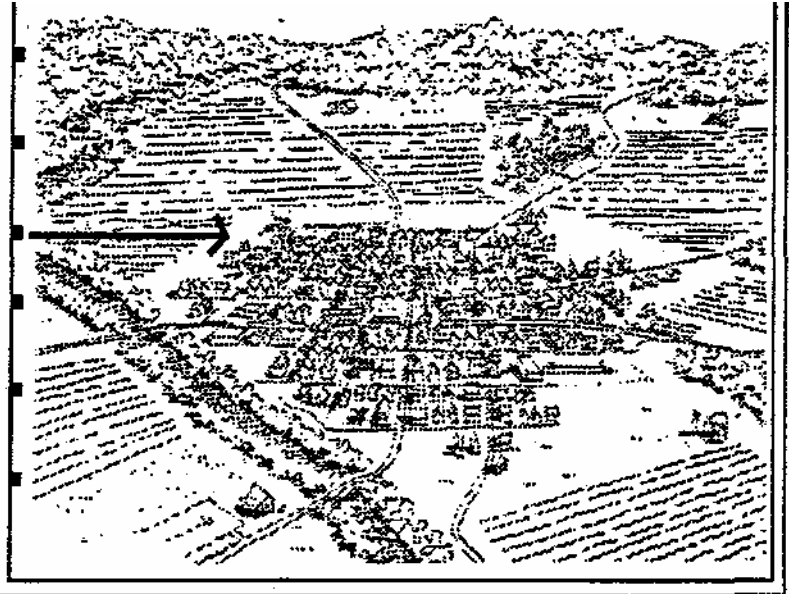


Natural Lands Trust is a regional land trust dedicated to working with people to conserve land in the Delaware Valley and other nearby areas of environmental concern by acquiring and managing preserve properties, accepting conservation easements, and encouraging and supporting the conservation efforts of landowners, communities, government agencies, and non-profit organizations.

HILDACY FARM
1031 PALMERS MILL ROAD
MEDIA, PENNSYLVANIA 19063
TEL: (610) 353-5587
FAX: (610) 353-0517

A. sustain viability of agriculture

Establish buffer at non-farm uses



A.03

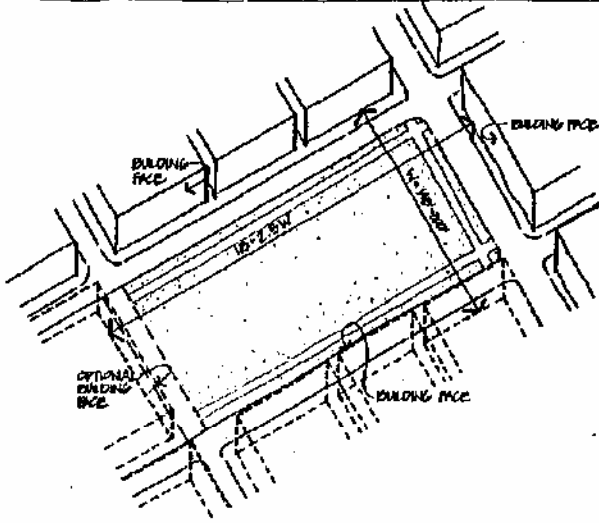
Establish buffer at non-farm uses

- BuffiEKDMGftAMS

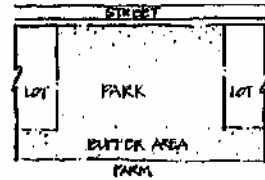
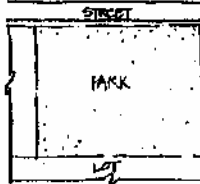
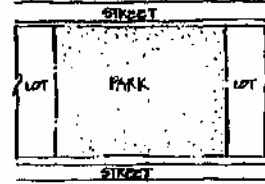
Where roads, streams or existing hedgerows do not provide an effective buffer between land under cultivation and planned new development, a broad planted buffer (a suburban image) or more traditional rural landscape element might include a transition area with hedgerow, a fence and native understory plants should be required as a condition of approval for any new subdivision that is adjacent to farmland. This will minimize the potential for conflicts.

The following diagrams are meant to illustrate some possibilities to plan the relationship of hamlet/village development and adjoining fields to minimize conflicts. Certain circumstances may allow for a less substantial separation.

Open Space Requirements

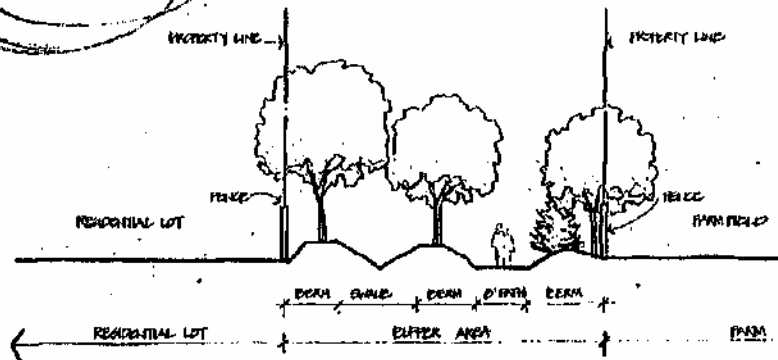
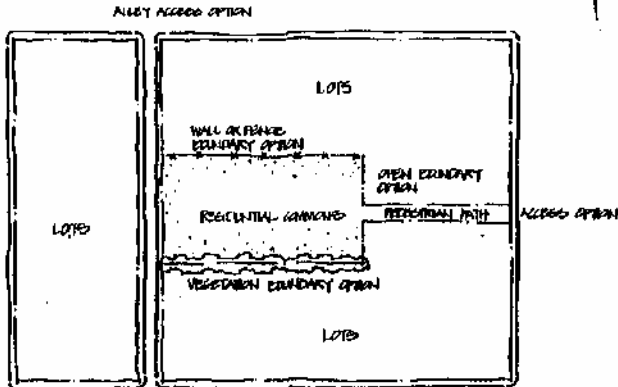


Neighborhood Park



Commons

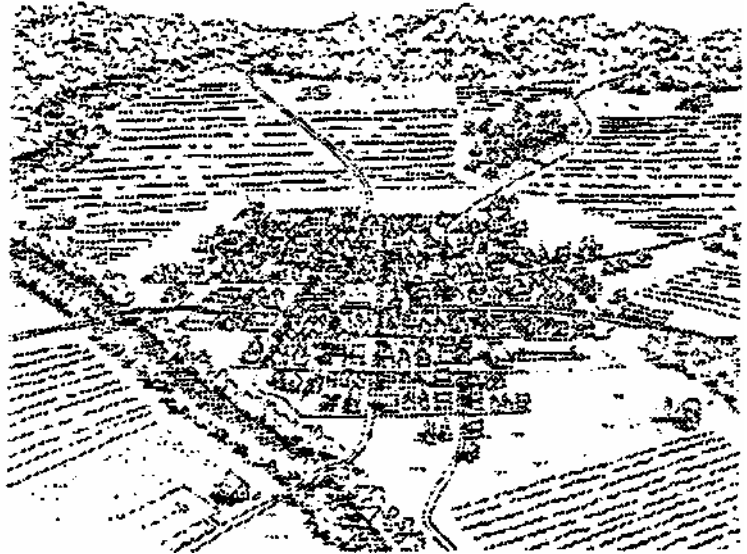
Buffer Edge



A. sustain viability of aariculture

Farmland Preservation through voluntary purchase of land and development rights

A.04
Voluntary Preservation Programs



OVERVIEW OF THE VARIOUS PROGRAMS AND FOUNDATIONS ACME IN THIS AREA. INOT YET INCLUDED}

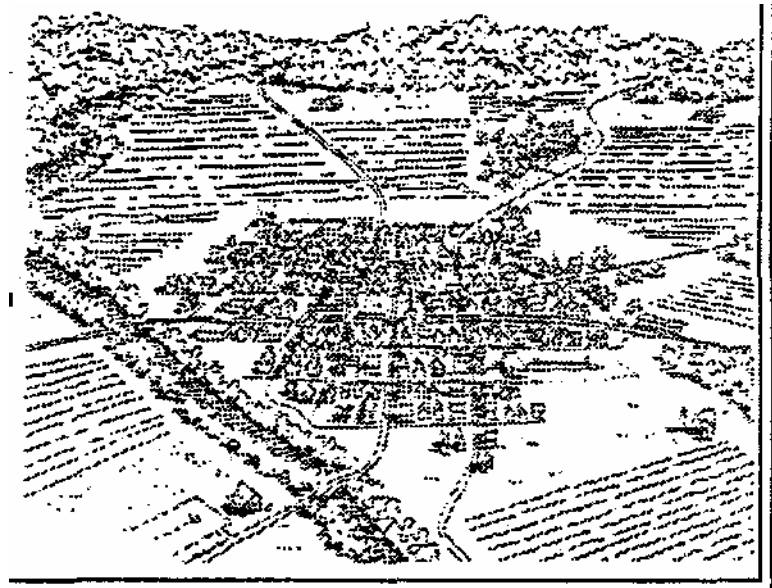
It will be useful to contact some of these institutions. Each will have their own agenda, but this may be a way for the Township to get technical assistance as well as direct funding at some point in the planning, marketing, design, or construction of hamlet/village development or with the effort to preserve the rural character of the township in the future.

N S

A. *sustain viability of aariculture*

Farmland Preservation through voluntary purchase of land and a'velopment rights

A05
Farmland Preservation through purchase of land and development rights



• **DESCRIPTION OF PRESERVATION PROGRAM**

The Gloucester County Agriculture Development Board administers two programs: The first is the GCADB Eight-year Farmland Preservation program which provides landowners with funding for certain agriculture-related improvements and protection from eminent domain acquisition for the agreement period in exchange for temporary surrender of development rights. The second is the State program for purchase of development easements and fee interest in agricultural land.

There are three factors that limit the usefulness of these methods: 1) The budget for these programs is limited, therefore only a few of the landowners that may be inclined to enter these programs can be included in any given year. 2) The criteria for selection (shown on the following pages) strongly favors the landowner offering the lowest price, therefore prices are so low that almost any alternative means for realizing value for the land will be more attractive. 3) Since the program is often the means of last resort, sometimes farms are selected that ultimately begin to fail. The farmer then finds that his options are severely limited; because of his obligations to the preservation program, he cannot borrow, build, sell or engage in commercial endeavors that may have allowed him to stay on the land. As a result, the ground could be subject to foreclosure or seized for taxes—causing some to observe that the cure (the Preservation Program) can be, in certain instances, worse than the disease.

GLOUCESTER COUNTY AGRICULTURE DEVELOPMENT BOARD
COUNTY OFFICE BUILDING
CLAYTON, NEW JERSEY 08312
609-863-6661

REVISED DRAFT – ADA CRITERIA REVISIONS

STATUTORY CRITERIA

- A. The area must be productive agricultural lands which are currently in production or have a strong potential for future production in agriculture and in which agriculture is a permitted use under the current municipal zoning ordinance or in which agriculture is permitted as a non-conforming use.
- B. The . area must be reasonably free of suburban and conflicting commercial development.
- C. The are must comprise not greater than 90% of the agricultural land mass of the County.

PLANNING CRITERIA

- 1. The soils of the ADA are to be primarily prime agricultural soils (Class I, Class II, or Class II) or those soils classified as unique or of statewide importance by the U.S. Soil Conservation Service.
- 2. The land in an ADA must meet the eligibility requirements of the Farmland Assessment Act of 1964, P.L. 1964, Chapter 48.
- 3. Existing developed areas and lands owned by federal, state, county, municipal government or ,any governmental agencies shall be excluded from an ADA unless such lands have been purchased for the specific purpose of agricultural development and retention.
- 4. The lands in an ADA must not have received any final development plan approval for the construction of non-farm development.

5. The ADA should be compatible with the Gloucester County Development Management Plan. "Growth Areas" indicated on the county's comprehensive plan are to be excluded from an ADA. Only areas designated as "rural agriculture" or in special instances "limited growth" or "environmentally sensitive" areas should be placed in an ADA.
6. ADAs must consist of approximately 250 acres of contiguous farmland or reasonably contiguous farmland (within 1/2 mile) in order to create a reasonable critical mass of farmland. Minimum eligibility criteria for farmland preservation programs should be at least 20 acres situated within an ADA. Parcels may be assembled by more than one landowner.
7. Special exceptions: An individual landowner or group of landowners who were excluded from consideration, but who meet the majority of the above criteria and can give evidence that the land to be included has a reasonable chance of long-term continued agricultural production, may request a special review and consideration for inclusion into the program. The action of the Board should be based on whether the parcel of land will contribute to the success of agriculture in the county.

Jay Kandle, Chairman
Gloucester County Agriculture Development Board

ADOPTED:

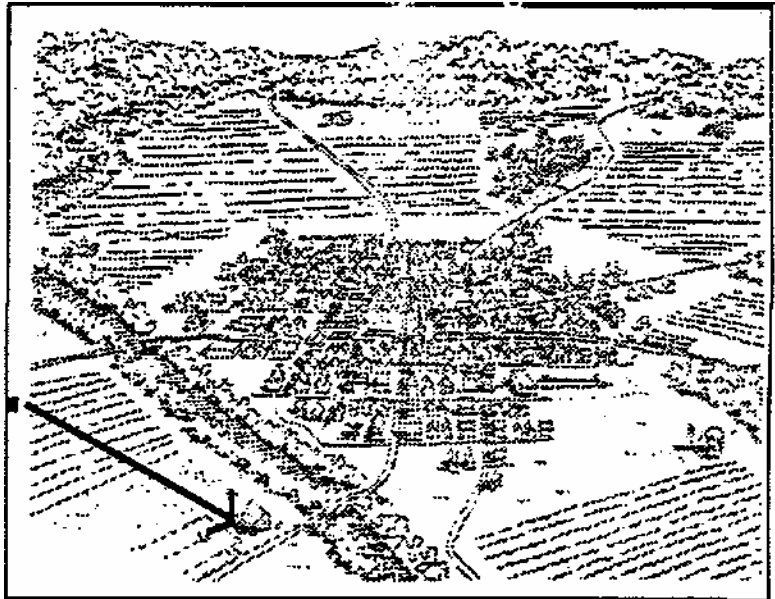
10. The proposed site must be situated within the boundaries of the Priority 1 area of the "Easement Purchase Area Map" as designated by the Gloucester County Agriculture Development Board. Special exceptions may be made where a proposed site is located within a one-half (1/2) mile area of the boundary line and meets all of the other criteria.
11. Municipalities and farmers outside of the designated Priority 1 area may establish easement purchase programs if they provide approximately 1,000 contiguous acres and local funding from the municipality.
12. Each applicant may request that certain criteria be waived if the majority of the other criteria have been met.
13. Any amendments to the criteria which are adopted on or after August 2, 1990, shall not be applicable to any easement purchase applications that were granted preliminary approval prior to that date.

Adopted: August 2, 1990

GLOUCESTER COUNTY AGRICULTURE DEVELOPMENT BOARD
EVALUATION CRITERIA FOR THE PURCHASE OF DEVELOPMENT EASEMENTS

1. The proposed site must consist of approximately 50 contiguous acres that are of one-owner entity. About 60 percent of this land should be actively farmed.
2. The proposed site must be enrolled in either an eight-year farmland preservation program or under the Option Agreement alternative. Preference will be given to those properties that are enrolled in a municipally-approved farmland preservation program.
3. The proposed site must be in commercial farm production and serve as an economically viable unit of farm production.
4. The proposed site's purchase should encourage the survivability of productive agriculture in the area. Priority consideration will be given to those sites in which the change of the land* from productive agriculture to a non-agriculture use would constitute a significant and irreversible trend toward urban development.
5. The proposed site must not be within a service area of publicly-funded water or sewer systems, especially where there is excess capacity which would be capable of serving future development.
6. The proposed site must not be within a one-half (1/2) mile radius of an interchange of Route 55. •
7. All other factors being equal, highest preference will be given to landowners whose asking price is the lowest.
8. All other factors being equal, highest preference will be given to those properties wherein the municipality agrees to contribute to the purchase of the development easement.
9. All applications, under the Option Agreement, must have verification as to the reasonableness of the asking price by either a certified appraiser, realtor, and/or attorney based on comparable sales in the area.

Protect farm markets with broad definition in Right-to-Farm Ordinance



A. sustain viability of agriculture

A.06
Protect farm markets with broad definition in Right-to-Farm Ordinance

COPY OF RIGHT-TO-FARM IEG/SL4770N

The municipal Right-to Farm ordinance lays the groundwork for the necessary compromises that will be required on the part of farmers and home-owners if they are to co-exist amicably as residential and mixed-use development occurs in the future. Municipalities can craft local legislation that supports a broad range of activities/ including direct marketing of farm-related products (see 4:1 C-9)

168 West State St., Trenton, New Jersey, 08608 tel. (609) 393-7163

Date: 2-15-96

From: Helen H. Heinrich

Organization: NJ Farm Bureau

Address: 71 Green Village Road
Madison, NJ 07940

Phone: (201) 377-3956

Fax: (201) 966-0937

To: MARK KEENER

Organization:

Address:

Phone: 215-751-1133

Fax: 215-561-6507

We are transmitting 8 pages, including this cover sheet.
IF THE TRANSMISSION IS NOT COMPLETE, please call us at
(201) 377-3956.

Additional Information: NJ RIGHT TO FARM ACT

Transmitted On: 2-15
(Date)

2:47 PM
(Time)

AGRICULTURE—DOMESTIC ANIMALS

CSAPTEE 1C

ACRICULTURAL DEVELOPMENT AND FARMLAND PRESERVATION

Short

- 4:10-1. Legislative findings.
- 2. Definitions.
- 4:10-3. State agriculture development committee; establishment; membership;
- 4:10-4. terms; vacancies; compensation; meetings; minutes; staff.
 - Powers of committee.
 - Duties of committee.
- 4:10-7. Additional duties of committee.
- 4:10-8. Appropriated moneys; use by secretary.
- 4:10-9. Commercial farm owners and operators; permissible activities.
 - Commercial agricultural operation, activity or structure; presumption.
- 4:10-11. Short title.
- 4:10-12. Legislative findings and declarations.
 - Definitions.
- 4:10-14. County agriculture development board; membership terms; vacancies; compensation; chairman; existing public bodies.
 - Duties.
- 4:10-15. Powers,
- 4:10-16. Subregional agricultural retention board; membership; dissolution.
- 4:10-17. Agricultural development area; recommendation and approval
- 4:10-18. Land acquisition or construction in agriculture development area; notice of intent; review; hearing.
- 4:10-19. Petition for farmland preservation program; approval; agreement between board and landowner.
- 4:10-20. Petition for municipally approved program; -content; review.
- 4:10-21. Documentation of municipally approved program.
- 4:10-22. Zoning of land in program.
- 4:10-23. Agreement to retain land in agricultural production or to convey development easement; restrictive covenant; filing and recording; soil and water conservation project grants.
- 4:10-24. Eminent domain; funding for construction of facilities to serve nonfarm structures.
- 4:10-25. Actions; presumption; complaint
- 4:10-26. Exemption from emergency restrictions on use of water and energy.
- 4:10-27. Farm structure design.
- 4:10-28. Length of program; termination; inclusion of additional landowners.
- 4:10-29. Withdrawal of land; taxation.
- 4:10-30. Offer to sell developmental land; price; evaluation of suitability of land; appraisal
- 4:10-31. Farmland within certified agricultural development area; sale by landowner; acquisition by committee; resale; payment of taxes by state.
- 4:10-32. Rules* and regulations.
 - Conveyance of easement following purchase; conditions and restrictions; payment
- 4:10-33. Enforcement of conditions or restrictions.
- 4:10-34. Persons acquiring developmental easement; sale to board.
- 4:10-35. Donation of development easement to board.
- 4:10-36. Pxnlaads-area.
- 4:10-37. Joint legislative oversight committee; duties.
- 4:10-38. Purchase and acquisition of fee simple absolute interest in land.
- 4:10-39. Notice of executed contract of sale of fee simple absolute interest in land enrolled in farmland preservation programs; first right and option to purchase of committee.
 - Certificate of termination of first right and option to purchase; conclusiveness.

Lost additions In text Indicated by underline; deletions by

AGRICULTURE—DOMESTIC ANIMALS

4:1C~2

Sale of land to third party likely to negatively impact-maintenance of Action positive agricultural business climate; priority purchase for committee. Land acquired by committee; held of record in name of State; offer 4:10-42. for

sale with permanent restriction on nonagricultural development. Appropriation.

4-1044. Legislative findings and declarations. Inventory of state properties suitable for agricultural production, not

currently fanned by state agency and available for lease. Priority of offering for agricultural production. Rules and regulations. Sale of surplus state land for agricultural use; covenant of use in conveyance.

Short title

This act shall be known and may be cited as the "Bight to Farm Act" 19SJ3, c. 31, § I, eft Jan. 26.1983.

Senate NaUuul Reaurcct ftad Afiiultort Committee Statement Senatc/No. 8S4-U19S3, c.«

The principal purpose of this bul is to promote, to the greatest extent practicable and feasible, the continuation of agriculture in the State of New Jersey while recognizing the potential conflicts among all lawful activities in the State. To this end, the bul provides for the establishment of the State Agriculture Development Committee.

The purpose of the committee is to aid in the coordination of State policies which affect the agricultural industry ia a manner which will mitigate Unnecessary constraints on essential farming practices by recommending to Appropriate State departments a program of agriculture manageraent practices which, if consistent with relevant federal and State law, and nonthrea^• ening to the public health and safety, would afford the farmer protection against municipal regulations and private nuisance suits,

The bfl further establishes a 120-day period of negotiation during which time the committee and State instrumentalities regulating agriculture in a manner inconsistent with recommended agriculture management practices iwould seek to negotiate a mutually agreeable solution to the conflict

HUU»ic)l «ad Statutory Note*

Title «f Ace

Aft Act concerning agriculture and supplement* kg Title 4 of the Revised Statutes. U19S3, c. 3L

Library Reference*

AJpiculnire «*1, 2.

OJ.S, Apiculture §§ 2 to 9 a »cq, 27 to 29, 37.38,51.65.67,96, 100,102,134.162.175.

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J 4:1,0-2. LeffflslatiTc finding

The Legislature finds and declares that

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AGRICULTURE—DOMESTIC ANIMALS

10. The retention of agricultural activities would preserve the best interest of all citizens of this State by insuring the numerous social, economic and environmental benefits which accrue from one of the largest industries in the Garden State;

b. Several factors have combined to create a situation wherein the regulations of various State agencies and the ordinances of individual municipalities may unnecessarily constrain essential farm practices;

c. It is necessary to establish a systematic and continuing effort to examine the effect of governmental regulation on the agricultural industry;

d. All State departments and agencies thereof should encourage the maintenance of agricultural production and a positive agricultural business climate;

e. It is the express intention of this act to establish as the policy of this State the protection of commercial farm operations from nuisance action, where recognized methods and techniques of agricultural production are applied, while, at the same time, acknowledging the need to provide a proper balance among the varied and sometimes conflicting interests, of all lawful activities in New Jersey.

LJ983. c. 31, § 2, eff. Jan. 26, 1983.

Editorial and Statutory Note

Editorial Note.

W4—U9S3, c. 31. KC § 4-1C-1.

4:1C-3. Definitions¹

As used in this act

a. "Commercial farm" means any place producing agricultural or horticultural products worth \$2,500.00 or more annually;

b. "Committee" means the State Agriculture Development Committee established pursuant to section 4 of this act.*

1*1983, c 81. § 8, eff. Jan. 26, 1983.

Editorial and Statutory Note*

Library Reference*

Words used in

4:1C-4. State agriculture development establishment; membership;

terms; vacancies; compensation; meetings;
minutes; staff a, in order that the State's regulatory action with respect to agricultural activities may be undertaken with a more complete understanding of the needs and difficulties of agriculture, there is established in the Executive Branch of the State Government a public body corporate and politic, with corporate succession, to be known as the State Agriculture Development Committee. For the purpose of complying with the provisions of Article V, Section IV, paragraph 1 of the New Jersey Constitution, the committee is allocated within the Department of Agriculture, but, notwithstanding that allocation, the committee shall be independent of any supervision or control by the State Board of Agriculture, by the department or by the secretary or any officer or employee thereof, except as otherwise expressly provided in this act. The committee shall constitute an instrumentality of the State, exercising public and essential governmental functions, and the exercise by the committee of the powers conferred by this or any other act shall be held to be an essential governmental function of the State.

1. The committee shall consist of 11 members, five of whom shall be the Secretary of Agriculture, who shall serve as chairman, the Commissioner of Environmental Protection, the

Commissioner of Community Affairs, the State Treasurer and

Last additions in text indicated by underline; deletions by

the Dean of Cook College, Rutgers University, or their designees, who shall serve ex officio, and six citizens of the State, to be appointed by the Governor with the advice and consent of the Senate, four of whom shall be actively engaged in running, the majority of whom shall own a portion of the land that they farm* and two of whom shall represent the general public. With respect to the members actively engaged in farming, the State Board of Agriculture shall recommend to the Governor a list of potential candidates and their alternates to be considered for each appointment.

c. Of the six members first to be appointed, two shall be appointed for terms of 2 years, two for terms of 3 years and two for terms of 4 years. Thereafter, all appointments shall be made for terms of 4 years. Each of these members shall hold office for the term of the appointment and until a successor shall have been appointed and qualified. A member shall be eligible for reappointment for no more than two consecutive terms. Any vacancy in the membership occurring other than by expiration of term shall be filled in the same manner as the original appointment but for the unexpired term only.

d. Members of the committee shall receive no compensation but the appointed members may, subject to the limits of funds appropriated or otherwise made available for these purposes, be reimbursed for expenses actually incurred in attending meetings of the committee and in performance of their duties as members thereof.

e. The committee shall meet at the call of the chairman as soon as may be practicable following appointment of its members and shall establish procedures for the conduct of regular and special meetings, including procedures for the notification of departments of State regulating the activities of commercial agriculture, provided that all meetings are conducted in accordance with the provisions of the "Open Public Meetings Act," P.L. 1975, c. 231 (C. 12:87 et seq.),

f. A true copy of the minutes of every meeting of the committee shall be prepared and forthwith delivered to the Governor. No action taken at such meeting by the commission shall have force or effect until 15 days, exclusive of Saturdays, Sundays and public holidays, after such copy of the minutes shall have been so delivered. If, in said 15-day period, the Governor returns such copy of the minutes with a veto of any action taken by the commission at such meeting, such action shall be null and void and of no force and effect.

g. The department shall provide any personnel that may be required as staff for the committee.

L.1983, c. 31, § 4, effective January 28, 1983.

Historical and Statutory Note**

Stratton Committee **Interim** to Senate, No. 8M-X.19&3. t 31. Kc { 4:1C-1.

Libra? Beneficial

Agriculture *»1
CJ-S. Auricular* § 8 u «q, SI. 67, 96, 100, 175.

41C-2. Powers of committee

The committee may: * *

- a. Adopt bylaws for the regulation of its affairs and the conduct of its business;
- b. Adopt and use a seal and alter the same at its pleasure;
- c. Sue and be sued;
- d. Apply for, receive, and accept from any federal, State, or other public or private source, grants or loans for, or in aid of, the committee's authorized purposes;
- e. Enter into any agreement or contract, execute any instrument, and perform any act or thing necessary, convenient, or desirable for the purposes of the committee or to carry out any power expressly given in this act;

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«*.-. f. Adopt, pursuant to the "Administrative Procedure Act," P.L. 1958, c. 410 (C. 17:27-1 et seq.), rules and regulations necessary to implement the provisions of this act.

#.. g. Request assistance and avail itself of the services of the employees of any State, county or municipal department, board, commission or agency as may be made available for these purposes.

L.1983, c-40 § 5, eff. Jan. 26, 1983, operative Jan. 26, 1983.

Code Reference

of development caanaita, ppaer- Acqnttioaa cf development cue* «f «§rical«nl liada, KB N.J.A.C 2:76-6.1 cocoa, KB NJL.C. 2:76-9.1 ec 10}.

Soil ud *4ter conacrviaaa project lofr rules, MB NJA.C 3:76-5.1 e(»oq.

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CrotioD of fiu&Uaad pvcscntioa pcognau. KC NJ-A-C &76-U et icq* 2:76-4.1 a *aq,

4:10-6. Duties of committee

* The committee shall:

a. Consider any matter relating to- the improvement of farm management practices;

b. Review and evaluate the proposed rules, regulations and guidelines of any State agency in terms of feasibility, effect and conformance with the intentions and provisions of this act;

c. Study, develop and recommend to the appropriate State departments and agencies' thereof a program of agricultural management- practices which shall include, but not necessarily be limited to air- and water quality control, noise control pesticide control, fertilizer application, integrated pest management, and labor practices; -

d. Upon a finding of conflict between the regulatory practices of any State instrumentality and the agricultural management practices recommended by the committee, commence a period of negotiation not to exceed 120 days with the State instrumentality is an effort to reach ft resolution of the conflict, during which period the State instrumentality shall inform the committee of the- reasons for conditionally accepting or rejecting the committee's recommendations and submit a schedule foV implementing all or a portion of the committee's recommendations.

c. Wfthioyearof the effective date of this act and at least anauafly thereafter, recommend to the Governor, the Legislature and the appropriate State departments and agencies thereof any actions which should be taken that recognize the need to provide & proper fr*yfo**c* a^nopg the varied and sometimes conflicting intereata of all lawful activities in the State, minimise unnecessary constraints on fnlfitfal agricul- tural activities, and are consistent with the promotion of the public-health, safety and welfare, -.

U1983, c/31^5 6, eff. Jan. 26. 1983.

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BUtocieal mnd Statutory Notei it to Scute* No.

Stm.

S54—U983, C.3U MB

CJi Apiculture §§ 8

175.

Ubrary References ;. 51.

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--The conunittee shall:

• a. E&tablsh guidelines and adopt criteria for identification of agricultural suitable for inclusion in agricultural development anaa and farmland preservation

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programs to be developed and adopted by a board applying for moneys from the fund;

b. Certify to the secretary that the board has approved the agricultural development area and the farmland preservation program within the area where matching grants from the fund shall be expended;

c. Review State programs and plans and any other public or private action which would adversely affect the continuation of agriculture as a viable use of the land in agricultural development areas and ~~and~~ any administrative action, executive orders or legislative remedies which may be appropriate to lessen these adverse effects;

d. Study, develop and recommend to the departments and agencies of State government a program of recommended agricultural management practices appropriate to agricultural development areas, municipally approved programs (provided that these practices shall not be more restrictive ~~than~~ for those areas not included within municipally approved programs) and other farmland preservation programs, which program shall include but not necessarily be limited to: air and water quality control; noise control; pesticide control; fertiliser application; soil and water management practices; integrated pest management; and labor practices;

e. Review and approve, conditionally approve or disapprove on applications for funds pursuant to the provisions of this act; and

f. Generally act as an advocate for and promote the interests of productive agriculture and farmland retention within the administrative processes of State government.

L.1983, c. 32, § 6, eff. Jan. 26, 1983, operative Jan. 26, 1983.

Code Reference*

NJ.A.C. 2:76-3.1 et seq. 2:76-4.1 et

Reference*

Agriculture §2.

CJ-i Agriculture §§ 8 ff. W, 100, **IM. 175.**

4UC-S. Appropriated moneys; use by secretary

The secretary shall use the sum of money appropriated by section 31 of this act, and any other sums as may be appropriated from time to time for like purposes, to assist the committee in administering the provisions of this act to make grants to assist board* or any other local unit as authorized herein, to acquire development easements, to purchase fee simple absolute titles to farmland for resale, with agricultural deed restrictions for farmland preservation purposes, and to make grants to landowners to fund soil and water conservation projects, on land devoted to farmland preservation programs within duly ~~adopted~~ certified agricultural development areas.

With respect to moneys to be utilized to ~~grant~~ grants for soil and water conservation projects, the secretary shall not approve any grant unless it shall be for a project which is also part of a farm conservation plan approved by the local soil conservation district

L.1983, c 32, i 4, eff. Jan. 26,1983, operative Jan. 26,1983. Amended by L.1988, c. 4, § 2, eff March 9, 1988.

Editorial and Substantive Changes

Statement; Committee Report to Scaau, No. 1*74—L.1983, i 4, «ce «

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AGRICULTURE—DOMESTIC ANIMALS

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CJ.S. 134,
173.

1, 57, 96. 100.

***4:IC-9. Commercial form owners and operators; permissible activities**

The owner or operator of a commercial farm which meets the eligibility criteria for differential property taxation pursuant to the "Farmland Assessment Act of 1964," PJu. 1964, c. 48 (C. 54:4-4&l et seq.) and the operation of which conforms to agricultural management practices recommended by the committee and all relevant federal or State statutes or rules and regulations adopted pursuant thereto a&d which does not pose a direct threat to public health and safety may;

- a. Produce agricultural and horticultural crops, trees and forest products, live stock, and poultry and other commodities as described in the Standard Industrial Classification for agriculture, forestry, fishing and trapping;
- b. Process and package the -agricultural output of the commercial farm;
- c. Provide for the wholesale and retail marketing of the agricultural output of the commercial farm, and related products that contribute to farm income, including the construction of building and rfft*"irc areas in conforxnance with municipal standards; "
- d. Replenish soil nutrients;
- e. Control peats, predators and diseases of plants and animals; . ' .
- f. Clear woodlands using open butxung.a&d other tochniqnea, install and maintain vegetative-and terrain alterations and other physical facilities for water and soil conservation and surface water control in wetland areas; and
- g. Conduct en-site disposal of organic agricultural wastes.

L.1933, c. 31, fi 6, eff. Jan. 26, 1983.

Historical and Statutory Note*

834-1.1983, c. 31. we \$ «C-L

Llbmr Reference*

Tuition c»34&l(3).
CJA Twrinoa { 411

4:1010. Commercial agricultural operation* activity or structure; presumption

In all relevant actions filed subsequent to the effective date of this.act, there shall east a rebuttable presumption that no commercial agricultural operation, activity or structure which conforms to agricultural management practices recomTrendPie by the committee, and aH relevant federal or State statutes or rules and regulations adopted pursuant thereto and which does not pose a direct threat to public health and safety, shall constitute a public or private nuisance, nor shall any such operation, activity or structure be deemed to otherwise invade or interfere with the use and enjoyment of 'any other land or property.

L.19S3. c. 31, § 7, eft Jan. 26, 19S3.

Historical *ad Statutory Notes

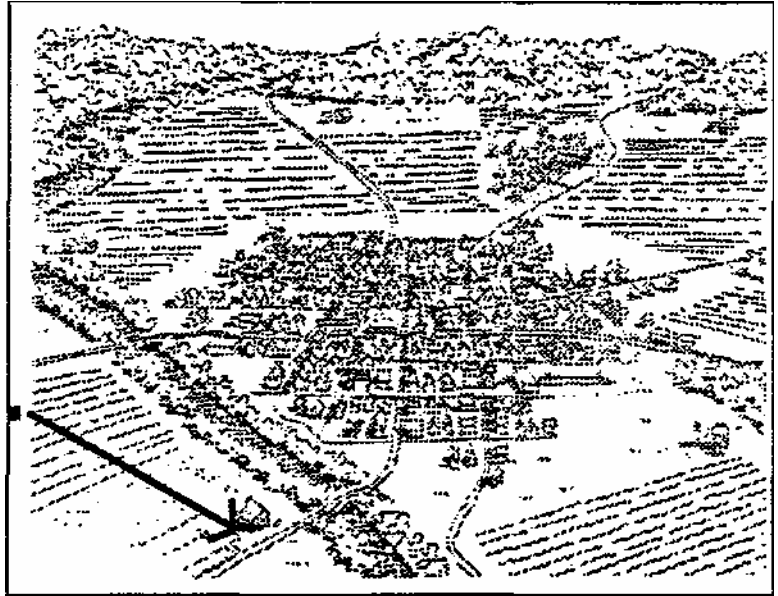
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*Protect form markets with broad definition in
Right-to-Farm Ordinance*



A. *sustain viability of agriculture*

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*Protect farm markets with bmad
definition in Right-to-Farm Ordinance*

*COPY OF "AGRICULTURE MANAGEMENT PRACTICES
FOR FARMER-TO CONSUMER DIRECT MARKETING..."*

This is included because it should be referenced in the Right-to-Farm Ordinance and because it contains a good discussion of the problems and opportunities related to operating a year-round Farm Market. This document will soon be revised to include useful information for municipalities interested in refining criteria for "farm-related products".

AGRICULTURAL MANAGEMENT PRACTICES
FOR FARMER-TO-CONSUMER DIRECT MARKETING
ON FARMS I?T NEW JERSEY

Recommended by the New Jersey

STATE AGRICULTURE DEVELOPMENT COMMITTEE

February 24, 1994

CN 330
Trenton, NJ 08625
Phone: (609) 984-2504
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AGRICULTURAL MANAGEMENT PRACTICES FOR
FARMER-TO-CONSUMER DIRECT MARKET I 1*K
ON FAFMS IH HE" JERSEY

SUMMARY

DIRECT MARKETING REQUIRES GOOD MANAGEMENT, IMAGINATIVE MERCHANDISING, SENSITIVITY TO CONSUMER ATTITUDES AND NEEDS, AND A FARM ATMOSPHERE PROVIDING A DIFFERENCE FROM COMPETITION.

Agriculture is a business which involves production of commodities, and often includes the processing, packaging, wholesale and retail marketing of the agricultural output of the commercial farm.

To remain competitive, farmers need to be able to develop, maintain, shift, and expand markets for agricultural commodities produced on their farms as well as ^related products and activities .

Farmer-to-consumer direct marketing alternatives can be vital to the economic survival of farmers helping to provide sufficient net returns to allow the farmer and family members to remain on the farm.

Farmer-to-consumer direct marketing provides consumers with alternative sources of "farm fresh" agricultural products at competitive prices.

Success in agricultural marketing helps significantly in economically preserving farmland and open-space which in turn contributes to maintaining the quality of life in the community.

"AGRICULTURAL MANAGEMENT PRACTICES" MEANS PRACTICES WHICH HAVE BEEN RECOMMENDED BY THE STATE AGRICULTURE DEVELOPMENT COMMITTEE WHICH SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO, AIR Afofc ,, WATER QUALITY CONTROL, NOISE CONTROL, PESTICIDE CONTROL, - ' FERTILIZER APPLICATION, INTEGRATED PEST MANAGEMENT AND LABOR PRACTICES.

The purpose of these agricultural management practices is to set forth appropriate guidelines for establishing and/or operating a farmer-to-consumer direct marketing enterprise as an integral part of a farm business in line with New Jersey's Right to Farm Act (Chapter 31. L. 1983 - N.J.S.A. 4:1C-9)-

PROVISIONS NEEDED FOR VIABLE FARMER-TO-CONSUMER DIRECT MARKETING ENTERPRISES FOLLOW.

Provisions of these agricultural management practices and those of the Right to Farm Act allow for the establishment and/or operation of farmer-to-consumers direct marketing enterprises.

»

The site requirements necessary to qualify as a commercial farm under the Right to Farm Act are the following:

eligible to meet the site requirements of the Farmland Assessment Act of 1964;
produces \$2,500 of agricultural commodities annually;
the agricultural operation conforms to appropriate agricultural management practices and all relevant federal or State statutes or rules and regulations adopted pursuant thereto; and
the operation does not pose a direct threat to public health and safety.

For direct marketing enterprises that operate on less than 5 acres and meeting the other site requirements as listed above, should an action be filed against the operation, the Right to Farm act provides a rebuttable presumption that no commercial agricultural operation, activity or structure shall constitute a public or private nuisance, nor shall any such operations, activity or structure be deemed to otherwise invade or interfere with the use and enjoyment of any other land or property. This same protection is afforded -Ob direct marketing enterprises over 5 acres.

The agricultural output of the commercial farm includes those agricultural commodities produced under the management of that farm operation on one or more tracts of land.

The agricultural output of the farm may be processed and packaged on location or' elsewhere for marketing on the farm.

Farmer-to-consumer direct marketing enterprises include pick-your-own operations and farm marketing facilities which may range from temporary seasonal structures or apparatus to single/multipurpose structures.

A bona fide relationship must exist between the agricultural commodities produced at the site and those marketed, meaning that:

there exists at the farmer-to-consumer direct marketing enterprise site a direct connection between the use of the land in growing agricultural commodities and the marketing of those commodities to consumers; and

the acreage that is part of this farm enterprise - whether contiguous or non-contiguous, owned entirely or rented, "in the municipality or partly in another - is demonstrably actively devoted to the production of products offered for sale in this *- market.

Agricultural marketing also includes, under provisions of the Right to Farm Act, the sale of related products that contribute to farm income and are designed to attract customers as an integral part of the marketing enterprise. Related products that contribute to farm income are either:

complimentary: an item commonly used for personal or household use in conjunction with, or for, preparation of the agricultural output of the commercial farm; or,
supplementary: agricultural commodities produced by other commercial farms; specialty products with a relationship to the farming operation; or appropriate food and drink items.

The design and construction of building and parking areas for farmer-to-consumer direct marketing enterprises are to conform with appropriate municipal standards which are meant to protect the public health and safety. If construction requirements are not appropriate to the type and scale of farmer-to-consumer marketing enterprise being proposed, the viability of the proposed marketing facility and even the total farm operation may be seriously affected.

Adequate directional and identification signs should be colorful, well designed, maintained, not misleading, appropriate to the area and to the type and scale of the farmer-to-consumer direct marketing enterprise.

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AGRICULTURAL MANAGEMENT PRACTICES FOR
FARMER-TO-CONSUMER DIRECT MARKETING -
ON FARMS IN NEW JERSEY

BACKGROUND

Farming is a commercial business which involves production of commodities, and often includes the processing, packaging, wholesale and retail marketing of the agricultural output of the commercial farm. Agriculture in New Jersey has historically included farm operations which sell crops and livestock directly to the public from the production site or at nearby farmers' market outlets. With large markets available in the Philadelphia and New York metropolitan -areas, the pattern of direct sales from the farm to the consumer is a well-established part of New Jersey agriculture. Increased suburbanization of many rural areas since World War II brought with it large numbers of new residents with needs. Man[^]-farmers changed their operations to focus on retailing commodities in addition to other market technologies in order to enhance their sales and meet the demands of this new population. Since the mid 1970's, there has been considerable growth in interest and participation in farmer-to-consumer direct marketing by growers and consumers.

A farmer operates in a global market. Daily on-farm management decisions are influenced by often conflicting national and global forces which have kept prices low while the costs of production have increased. To remain competitive, farmers need to be able to develop, maintain, shift and expand markets for agricultural commodities produced on their farms as well as related products • and activities'. The agricultural industry has been kept alive and profitable by the sales of a wide diversity of products and by the opportunity to develop many different types and scales of farm operations. Reflecting this diversity, products sold by farmer-to-consumer direct marketing enterprises in New Jersey have included vegetables, fruits and berries, nursery stock and bedding plants, cut flowers, Christinas trees, forest products and livestock products. Sometimes crops and livestock are sold in a processed form, such as cider, baked goods, or meat products, with the processing taking place on or off the production site. Since labor is one of the most significant cost factors for agriculture, a farmer may invite the consumer to the farm to "choose and cut" or "pick your own" products.

New Jersey's farmer-to-consumer direct marketing industry is an important part of the State's agricultural economy. Farmer-to-consumer direct marketing provides consumers with alternative sources of "farm fresh" agricultural products at competitive prices. Farmer-to-consumer direct marketing alternatives can be vital to the economic survival of farmers helping to provide sufficient net returns to allow the farmer and family members to remain on the farm. In helping to keep agriculture profitable, farmer-to-consumer direct marketing also contributes to the quality of life in the Garden State.

When beginning or expanding a farmer-to-consumer direct marketing enterprise, a farmer needs to assess: (a) the proximity to potential customers with the desire and ability to purchase products to be offered; (b) the amount of fresh quality agricultural products already available through other retail establishments within an appropriate radius; and, (c) whether a differentiated product and service mix will be provided. It is best for a direct marketer to allow the facility to evolve, that is, start with a small venture and grow in stages related to experience and customer demand associated with the location. Sometimes a farmer-to-consumer direct marketing enterprise remains in a simple beginning stage of development indefinitely, although more typically it will begin to grow as demand increases for the operation's products and services. Community and farm family changes contribute to the growth and diversification of a farm market over time. The use of related products and activities designed to attract customers tends to increase with income needs. Growth usually generates new facilities, and investment in agriculture which helps demonstrate the market operator's commitment to the community and farm preservation.

The difficulty and expense of trying to meet the labor and other production requirements of many different kinds of products limits an individual farmer's ability to produce the diversity of products demanded by today's consumers who look for one-stop shopping all year around. A sufficient variety of products must be sold to support an investment in the appropriate type and scale of retail facility to satisfy these consumer demands. Products not produced on the farm are sold to complement or supplement the range of products the farmer is able to grow. In addition to production limitations and satisfying consumer requests, maintaining key employees is another factor that affects a farmer's decisions regarding sales of related products and year-round operation.

Fanner-to-consumer direct marketing enterprises provide opportunities for some farmers. Success reflects intelligence, hard work, resourcefulness, imagination, flexibility and consideration for learning on the part of the operator.. Farmer-to-consumer direct marketing enterprises require good management, imaginative merchandising, sensitivity to customer attitudes and needs and a farm atmosphere providing a difference from competition. However, farmer-to-consumer direct marketing is not for all growers. Some farmers have tried and found that it was not as easy as envisioned or in some cases just not for them. It should not be thought of as a cure-all for all farmers. Expanding or building a new facility must increase net returns within the presently available management time and talent structure or it will require the hiring of additional help. The size of the new operation must cover the additional costs.

Farmer-to-consumer direct marketing enterprises provide consumers with alternative sources of Jersey Fresh agricultural products at competitive prices. Without fresher quality or a better selection of agricultural products, convenience or some other benefit(s), consumers may not be willing to support a farmer-to-consumer direct marketing enterprise. Supermarkets and other outlets for food often imitate the country atmosphere of a farm market realizing the attractiveness of farm-fresh products plus the country flavor of the shopping experience draws consumers. This use of illusionary "farm" image builders by non-farm retailers creates a competitive climate for the farmer trying to make a profit in production agriculture through fanner-to-consumer direct marketing enterprises.

Fanner-to-consumer direct marketing enterprises begin with a bona fide relationship to the land, differing from other commercial marketing facilities in that:

- there is active farming at the site,
- there are at least 5 open acres of land, not requiring services,
- it can be verified that the site is "actively devoted" to agricultural production, and
- products sold must relate to the farm operation and products grown.

Communities benefit when they allow landowners to invest in and/or maintain farming operations. Farms provide fresh locally produced agricultural products which reminds neighbors how food and fiber is produced. Keeping the land open helps maintain high property values in the remainder of the municipality and requires few municipal services. Success in agricultural marketing contributes significantly in economically preserving farmland.

JUSTIFICATION

Since the early 1960's the citizens of the Garden State have passed three statutes and two bond issues to provide support for agriculture as a major land use and industry in the state.

The Farmland Assessment Act of 1964 (Chapter 48. L. 1964 - N.J.S.A. 54:4-23.1 et seq.) required a constitutional amendment to allow differential taxation to those whose land was "actively devoted" to the production of agricultural products for sale. The change was justified because of public benefits provided to all citizens of the state, such as nearby available food • supplies, open space for city dwellers and rural scenery.

Testimony for the statute stated that the preservation of farmland would conserve water, help control soil erosion and provide opportunities for recreation and hunting and fishing, all at little or negligible cost to the public. Furthermore, farms require few services, from the municipalities or capital improvements which drive taxes upward.

The Right to Farm Act of 1983 (Chapter 31.L, 1983 - N-J-S.A. 4:1C-9) was passed out of recognition that the retention of agricultural activities "would serve the best interest of all citizens of this State by insuring the numerous social, economic and environmental benefits which accrue from one of the largest industries in the Garden State".

The Legislature found that "all State departments and agencies should encourage the maintenance of agricultural production and a positive agricultural business climate".

The express intention of this Act is to establish as policy of this state the "protection of commercial farm operations from nuisance action where recognized methods and techniques of agricultural production are applied while at the same time acknowledging the need to provide a proper balance among the varied and sometimes conflicting interests of all lawful activities in New Jersey".

The Agricultural Retention and Development Act of 1983 (Chapter 32.L- 1983 - 4?1C-11) again declared that the "strengthening of the agricultural industry and the preservation of farmland are important to the present and future economy of the State" and the welfare of its citizens.

Two farmland preservation bond issues in 1981 and 1986 were overwhelmingly supported by the voters making public monies available to retain farmland by the purchase of development easements protecting farmland equity.

DEVELOPMENT OF AGRICULTURAL MANAGEMENT PRACTICES

The Right to Farm Act: allows for the establishment andj'or operation of farmer-to-consumer direct marketing enterprises en commercial farms where agricultural management practices are applied. "AGRICULTURAL MANAGEMENT PRACTICES" ¹MEAS PRACTICES WHICH HAVE BEEN RECOMMENDED BY THE STATE AGRICULTURE DEVELOPMENT COMMITTEE WHICH SHALL INCLUDE BUT NOT NECESSARILY BE LIMITED TO AIR AND WATER QUALITY CONTROL, NOISE CONTROL, PESTICIDE CONTROL, FERTILIZER APPLICATION, INTEGRATED PEST MANAGEMENT AND LABOR PRACTICES.

The following Rule Changes to the development and application of Agricultural Management Practices were adopted by the New Jersey State Agricultural Development Committee (SADC) - (New Jersey Register, May 17, 1993):

2.76-2.2 Recommendations of agricultural management practices »

- (a) The Committee at its initiative may recommend agricultural management practices.
- (b) Any person or organization may request the Committee to recommend agricultural management practices.
- (c) In considering agricultural management practices the Committee may consult with the following agencies, organizations or persons:
 - 1. The New Jersey Department of Agriculture;
 - 2. The New Jersey Agricultural experiment Station;
 - 3. County Agricultural Development Boards;
 - 4. The State Soil Conservation Committee; or
 - 5. Any other organization or person which may provide expertise concerning the particular practice.
- (d) Upon the Committee's recommendation the agricultural management practice shall be forwarded to the appropriate State department and agencies.

2.76-2.3 Utilization of agricultural management practices

The agricultural management practices recommended by the Committee may be utilized by owners and operators of commercial farms to receive protection afforded pursuant to the Right to Farm Act, NJSA 4:1C-1 et seq., P.L. 1983, c-31 and Agriculture Retention and Development Act, N.J-S-A. 4:1C-11 et seq., P.L. 1983, c-32, as amended.

1-In discussions of the Hew Jersey Right to Farm Act, the term "Best Management Practice" (BMP) is often used synonymously with "Agricultural Management Practice" (AMP).

2.76-2.4 Negotiation of conflicts between State regulatory practices and SADC recommended agricultural management practices. The Committee shall upon a finding of conflict between regulatory practices of any State instrumentality and the agricultural management practices recommended by the Committee commence a period of negotiation not to exceed 120 days with the State instrumentality in an effort to reach a resolution of the conflict during which period the State instrumentality shall inform the Committee of the reasons for accepting, conditionally accepting or rejecting the Committee's recommendations and submit a schedule for implementing all or a portion of the Committee's recommendations.

The New Jersey Department of Agriculture is the arm of the State Executive branch responsible for agricultural regulation, development and promotion.

The New Jersey Agricultural Experiment Station (NJAES) is the legislated research and extension arm of the State of New Jersey dedicated to renewable natural resources. Beyond the traditional, land-grant mission of being directly responsive to production agriculture and the food and fiber industry NJAES has a broad mandate to improve the quality of life of New Jersey citizens by addressing issues of environmental quality, natural resources, human health and nutrition and the public policy aspects of these issues. The New Jersey Agricultural Experiment Station's research results, applied to contemporary and foreseeable problems through Rutgers Cooperative Extension, confront issues that threaten the quality of life of all residents of New Jersey.

County Agriculture Development Boards were established pursuant to the adoption of the New Jersey Retention and Development Act of 1983 to administer the rules of the Agricultural Retention Program at the local level.

The New Jersey State Soil Conservation Committee formulates comprehensive plans for the conservation of soil resources and the prevention of soil erosion within the state through research and education programs conducted cooperatively with the NJAES, the NJ Department of Agriculture and other agencies.

The purpose of these agricultural management practices is to set forth appropriate guidelines for establishing and/or operating a farmer-to-consumer direct marketing enterprise as an integral part of a farm business in line with New Jersey's Right to Farm Act (Chapter 31.L. 1983 - N.J.S.A. 4:1C-9).

PROVISIONS

A "FARM" INCLUDES THE SUM TOTAL OF CROPLAND, WOODLAND, /PERMANENT OR TEMPORARY PASTURE TOGETHER WITH THE NECESSARY BUILDINGS AND OTHER STRUCTURES OR FACILITIES BOTH CONTIGUOUS OR NON-CONTIGUOUS THAT COME UNDER ONE FARM MANAGEMENT UNIT.

IN NEW JERSEY'S RIGHT TO FARM ACT, A "COMMERCIAL FARM" MEANS ANY PLACE PRODUCING AGRICULTURAL OR HORTICULTURAL PRODUCTS WORTH \$2,500.00 OR MORE ANNUALLY.

The site requirements necessary to qualify as a commercial farm under the Right to Farm Act are the following:

- eligible to meet the site requirements of the Farmland Assessment Act of 1964;
- produces \$2,500 of agricultural commodities annually;
- the agricultural operation conforms to appropriate agricultural management practices and all relevant federal or State statutes or rules and regulations adopted pursuant thereto; and
- the operation does not pose a direct threat to public health and safety.

For direct marketing enterprises that operate on less than 5 acres and meeting the other site requirements as listed above, should an action be filed against the operation, the Right to Farm Act provides a rebuttable presumption that no commercial agricultural operation, activity or structure shall constitute a public or private nuisance nor shall any such operations, activity or structure be deemed to otherwise invade or interfere with the use and enjoyment of any other land or property. This same protection is afforded to direct marketing enterprises over 5 acres .

THE "AGRICULTURAL OUTPUT" OF THE COMMERCIAL FARM INCLUDES THOSE AGRICULTURAL COMMODITIES AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE'S STANDARD INDUSTRIAL CLASSIFICATION PRODUCED UNDER THE MANAGEMENT OF THAT FARM OPERATION ON ONE OR MORE TRACTS OF LAND. All agricultural output of the commercial farm is eligible to be marketed at a site meeting the Right to Farm criteria. The agricultural output of the farm may be processed and packaged on location or elsewhere for marketing on the farm.

FARMER-TO-CONSUMER DIRECT MARKETING ENTERPRISES

"FARMER-TO-CONSUMER DIRECT MARKETING" 15 THE RETAIL SALES OF AGRICULTURAL PRODUCTS FROM FARMER TO CONSUMER.

On-site farmer-to-consumer direct marketing enterprises include pick-your-own operations and farm marketing facilities which may range from temporary/seasonal farm markets to single or multiple purpose structures. The type and scale of the farmer-to-consumer direct marketing facility selected must be consistent with the level of retail activity to be generated and meet the needs of the farmer to market the output of the commercial farm. The type and scale preferred will reflect the economic and other resources of the farmer and consideration of this marketing alternative as feasible given local market conditions.

A "PICK-YOUR-OWN MARKETING OPERATION" (P-Y-0) IS AN ALTERNATIVE WHICH PROVIDES RETAIL CUSTOMERS THE OPPORTUNITY TO PICK (HARVEST) FROM THE FARMER'S (PRODUCER'S) FIELD AGRICULTURAL PRODUCTS SUCH AS VEGETABLES, FRUITS, FLOWERS, (P-Y-0 OR DIG-YOUR-OWN), CHRISTMAS TREES, (CUT-YOUR-OWN, CHOOSE-AND-CUT, CHOOSE-AND-HAVE-IT CUT) . Often farms offering P-Y-0 also have products already picked, cut or dug and waiting for the customer allowing the customer to pick some or none of the products sought.

A "TEMPORARY/SEASONAL FARM MARKET" IS A MOVABLE OR REMOVABLE STRUCTURE OR APPARATUS FROM WHICH THE AGRICULTURAL OUTPUT OF THE COMMERCIAL FARM AND RELATED PRODUCTS WHICH CONTRIBUTE TO FARM INCOME ARE SOLD, PREPARED OR STORED. It is an accessory structure which can be removed at the end of the selling period.

A "FARM MARKET" IS A SINGLE OR MULTIPLE PURPOSE STRUCTURE/FACILITY FROM WHICH THE AGRICULTURAL OUTPUT OF THE COMMERCIAL FARM AND RELATED PRODUCTS WHICH CONTRIBUTE TO FARM INCOME ARE SOLD, PREPARED OR STORED. Examples of multiple purpose structures used as farm markets include greenhouses, barns and other types of structures, pre-existing or new, necessary to the farm operation. A farm market facility may consist of several structures, a portion of a structure or no structure and may be used for retail sales, either year-round or during the harvest season while other farm operations (e.g. crop production, processing, packaging, storage, etc.) may utilize the remainder of the facility and/or season.

This document does -not refer to off-farm farmer-to-consumer direct marketing alternatives such as farmers' markets or tailgate markets which ar? sites where farmers congre7ats tc sell agricultural products . The site may or may not be owned by farmers but is operated by or for farmers in an urban, suburban or rural area.

Other terms used for farmer-to-consumer direct marketing facilities selling agricultural products which may or may not fit the definitions used in this document include: farm stands or markets; garden centers; greenhouses; produce stands or markets; retail nursery operations; roadside stands or markets; country stores; cider mills and wineries.

A "BONA FIDE RELATIONSHIP" MUST EXIST BETWEEN THE AGRICULTURAL COMMODITIES PRODUCED AT THE SITE 'AND THOSE MARKETED, MEANING THAT:

THERE EXISTS AT THE FARMER-TO-CONSUMER DIRECT MARKETING ENTERPRISE SITE A DIRECT CONNECTION BETWEEN THE USE OF THE LAND IN GROWING AGRICULTURAL COMMODITIES AND THE MARKETING OF THOSE COMMODITIES TO CONSUMERS; AND,

THE ACREAGE THAT IS PART OF THIS FARM ENTERPRISE, WHETHER CONTIGUOUS OR NON-CONTIGUOUS, OWNED ENTIRELY OR RENTED, IN THE MUNICIPALITY OR PARTLY IN ANOTHER IS DEMONSTRABLY ACTIVELY DEVOTED TO THE PRODUCTION OF PRODUCTS OFFERED FOR SALE AT THIS FACILITY.

RELATED PRODUCTS

Agricultural marketing also includes under provisions of the Right to Farm Act the sale of related products that contribute to farm income and are designed to attract customers as an integral part of the marketing enterprise. "RELATED PRODUCTS" THAT CONTRIBUTE TO FARM INCOME ARE EITHER:

COMPLEMENTARY: AN ITEM COMMONLY USED FOR PERSONAL OR HOUSEHOLD USE IN CONJUNCTION WITH OR FOR PREPARATION OF THE AGRICULTURAL OUTPUT OF THE COMMERCIAL FARM; OR,
SUPPLEMENTARY: AGRICULTURAL COMMODITIES PRODUCED BY OTHER COMMERCIAL FARMS, SPECIALTY PRODUCTS WITH A RELATIONSHIP TO THE FARMING OPERATION OR APPROPRIATE FOOD AND DRINK ITEMS.

Research shows that farmer-to-consumer direct marketers in New Jersey presently sell a wide variety of complementary and/or supplementary products which play a significant role in attracting customers to the market and bolstering the viability of the operation. Farmers often begin selling related products to satisfy customer requests or to extend the season of operation in order to retain key employees. Providing customers with a

diversity of produces allows for more one-stop shopping which benefits both the customer and the farmer. Sales of the agricultural production of other farmers and fisherman enhance the marketability- of local production and provide alternative market outlets for those producers other-wise forced to rely only on wholesale marketing. This multiplier effect enhances the viability and stability of other agricultural operations.

The proportion of products grown on-site varies considerably in different parts of New Jersey, depending upon the size and scale of the farm operation, the competition from other vendors of food products, demand of local consumers and community support for agriculture. Farmers need to be able to develop, maintain, shift and expand markets for agricultural commodities produced on their farms as well as related products and activities to maintain a profitable level of competition with ever-changing, ever-expanding sources of so-called "farm" or "country" products such as supermarket chains.

A set percentage of related products or one list of items to be allowed statewide cannot reflect these variations in size, scale and local competition. Rather, a community seeking to encourage more long-term commitment to farming as a way to save open space and to control municipal expenditures while protecting some standard of rural quality of life should correlate the level of related products allowable with existing indications of commitment to long-term agriculture in the community and region. Information on how to identify such indications may be obtained from the local offices of Rutgers Cooperative Extension, County Agricultural Development Boards and County Boards of Agriculture. Farm operations with the greater investment in the long-term viability of the farmer-to-consumer direct marketing facility and the most evidence of long-term commitment to agricultural activity should be given the highest levels of flexibility as to the sale of related products to keep their operations viable and competitive.

Marketing, as recently identified by the FARMS Commission Workshop - April 1, 1993 on the viability of agriculture in New Jersey, is a critical function which enhances the profitability and stability of the farm operation and preserves farmland. Marketing activities on the farm are very important in attracting customers to the farmer-to-consumer direct marketing facility as well as a way to educate the non-farm public about the modern agricultural industry of the Garden State. Related activities can be educational, recreational and public relations events/activities including but not limited to: farm tours; festivals featuring various crops, livestock and products; open-house dayfc; craft workshops; hay rides; special activity days; corn roasts and holiday celebrations.

SITE SELECTION AND FACILITY DESIGN CONSIDERATIONS

The New Jersey Right to Farm Act states the design and construction of building and parking areas for farmer-to-consumer direct marketing enterprises are to conform with appropriate municipal standards which are meant to protect the public health and safety. In municipalities where agriculture is a major land use or the town wants to retain agriculture, depending on the type and scale of the farmer-to-consumer direct marketing enterprise being proposed, planning boards may opt to waive formal site plan requirements.

New Jersey's Municipal Land Use Law (Chapter 291.L. 1975 - N.J.S.A. 40:550-1 et seq.) empowers municipalities to adopt ordinances requiring site plan review and approval for all types of development or change in land use. Construction in New Jersey is governed by the State Uniform Construction Code (N.J.S.A. 52:270-199 et seq.; -122 et seq.; N.J.S.C. 5:23 et seq.) which is based on a national Building Officials and Code Administrators International (BOCA) standards. According to BOCA farm market structures come under the use group "mercantile". Where food service is provided the operation must comply with State and local health requirements.

Municipalities assure themselves that a proposed farmer-to-consumer direct marketing enterprise will not adversely affect human health and safety by reviewing the farmer's provisions for factors such as traffic circulation, grading and drainage, soil erosion and sediment control. Depending upon the type and scale of the farmer-to-consumer direct marketing enterprise and the surrounding land-use a review of other site requirements (noise, lighting, landscaping, buffering and screening) may be in order. Planning standards for facility design and site development must be appropriate to the type and scale of the farmer-to-consumer direct marketing facility being proposed to enhance the viability of the proposed facility and the total farm operation.

It is recommended that a farmer proposing to establish a farmer-to-consumer direct marketing facility or to expand an existing operation should first seek the assistance of the United States Department of Agriculture's Soil Conservation Service (SCS) for developing a site plan that will be compatible with the physical characteristics of the site and the needs of the farm operation. Contact may be made with SCS through the county soil conservation district.

SITE SELECTION CONSIDERATIONS include: access to utilities, marketing targets, soil type and site drainage, space for expansion, visibility and accessibility, and zoning and building ordinances. Farmers usually choose to locate the farmer-to-consumer direct marketing facility in a place easily accessible and visible to the public to increase awareness and utilization. There must be adequate sight distances for entrance and exit driveways in order to prevent traffic hazards on the adjacent roadway.

FACILITY DESIGN CONSIDERATIONS include: structural design, market layout, storage and parking. Detailed information about these items can be found in suggested readings.

Model plans for farmer-to-consumer direct marketing facilities that may be modified to meet local requirements are available from the New Jersey Agricultural Experiment Station, the Northeast Regional Agricultural Engineering Service and other sources. Many commercial agricultural building suppliers list designs for farm market facilities in their catalogs.

SIGNS

A farm business needs to be able to attract customers. Signs are a means of providing directions and information to potential customers passing by a farmer-to-consumer direct marketing facility. Success of the enterprise requires the use of several types of signs: permanent, temporary and/or directional. The use of unobtrusive directional signs at key intersections is an appropriate means of informing motorists of the way to a farm market that is not on a heavily traveled highway. For special agricultural events temporary signs are often needed for a short length of time. Adequate directional and identification signs should be colorful, well designed, maintained, not misleading, appropriate to the area and to the type and scale of the farmer-to-consumer direct marketing enterprise.

OPERATIONAL AND MANAGERIAL CONSIDERATIONS

Operating an agricultural enterprise is a challenging task combining many management skills in agricultural production, marketing and financial management. It is important early in the planning process to consider carefully consumer demand in relation to supplies. A profitable enterprise requires ample supplies of a variety of fresh good quality agricultural products and prices consistent with the quality. For many

CJisccrasrs qua-i^y, ace-ear ancr, gc ..*.; ccp.aici.-m- ma cur i--.-, ripeness and fiavcr are cicsey interrelated with freshness. Various studies have indicated that these are major reasons why

we 1 1 condi t ioned aor ic^ii t"ir^l cr~c'icts farmers s hould rna-'-te ev^r" e^~crt cc pr'-"ide ser"i'-'3f wr.i^mii -i33-"~cia~3 zrieir ccsrszi - i ' *i "i^e customer -'s mind v/ich a *jr.iJU--5 ar.c plaasant experience. While ocerstor ccs~3 and ccnsumer demcarachic variables are ncrncll"- reflected in prices studies have shown that direct marketers are advised to maintain reasonable, fair and competitive prices.

OPERATIONAL CONSIDERATIONS include: time of opening (hours of the day, days of the week and months of the year), size of the facility and permanence of the structure. Decisions about these issues will be dictated by the type and scale of the farmer-to-consumer direct marketing facility and the nature of the farm products and related products sold.

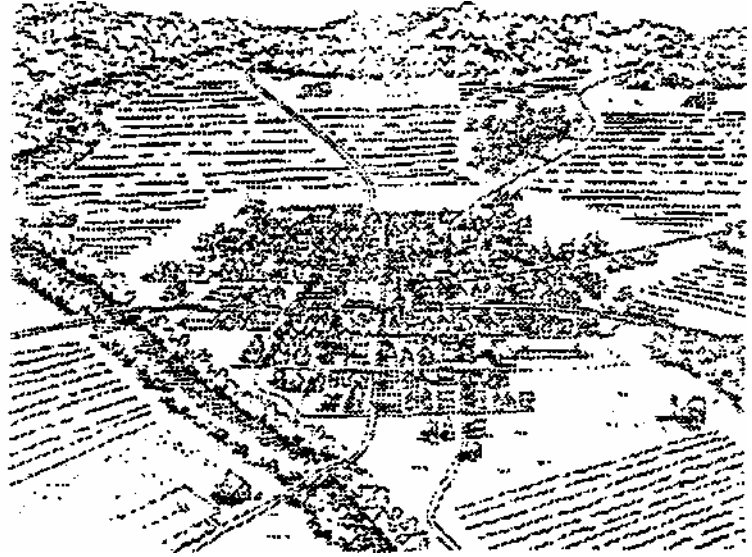
MANAGERIAL CONSIDERATIONS include: advertising .and promotion, appearance and cleanliness, employee selection, motivation and training insurance, merchandising, pricing consistent with quality, planning and record keeping.

Farmer-to-consumer direct marketing requires good management, imaginative merchandising, sensitivity to consumer attitudes and needs and a farm atmosphere providing a difference from competition.

E N V I R

sustain viability of agriculture

Create equity insurance program to encourage young farmers to stay and expand operations



Create equity insurance program to encourage young farmers to stay and expand operations

« COPY OF GLOUCESTER EQUITY INSURANCE PILOT PROGRAM DESCRIPTION

This should be of interest to Woolwich farmers because it has the potential of securing the long-term value of agricultural land for agriculture. It also can provide for retirement when the farmer wants to retire, rather than when (or if) an attractive development deal comes along.

SUB-PROJECT 5: Analysis of PDR, TDR, Equity Insurance and Other Cost Effective Farmland Preservation Tools

INVESTIGATORS: Adesoji Adelaja
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Actuarial Consultant
Donald Applegate

SUB-PROJECT COST: 555,315

DELIVERY DATES: March 1,1995 -> Report on Review of TDR and PDR Programs and on Review of Alternative Methods of Funding Farmland Preservation Programs in NJ.
Nov 1,1995 —> Report on Conceptualization of Actuarial Analysis of Equity Insurance.
Nov 1,1996 —> Report on Actuarial Analysis of Equity Insurance.
May 1, 1997 ~-> Summary Report Including Recommendations.

SUB-PROJECT DESCRIPTION

Sines 1950, almost half the farmland in New Jersey has been converted to nonfarm uses. Consequently, the Garden State has lost agricultural related jobs, income, and open space benefits. Between 1950 and 1990, the average conversion rarely exceeded fifty-five acres per day (US Department of Agriculture 1951-1991). Although the recession has slowed this trend, half of New Jersey's counties are on the American Farmland Trust's list of the nation's most threatened agricultural areas (see "Farming Seen in Peril in 10 N.J. Counties" in New Jersey Farmer, August, 1993). The potential loss of income, employment, and quality of life resulting from the dwindling agricultural land base continues to draw attention to policies designed to preserve agricultural land area.

New Jersey's commitment to preserving agricultural open space has been substantial for over three decades. The state has spent over one billion dollars in various preservation programs, and has given up millions more in forgone property tax revenues in current use assessment programs. Preserving agricultural land is clearly important to New Jersey; however, the costs and effects of alternative preservation strategies are the subject of acrimonious debate (see, for example, "Florio Staffers Chased Off Whitman Property" and "Sowing Support: Whitman Defends the Homestead", The Star-Ledger, August 12,1993, and August 17,1993, respectively) and have yet to be quantified.

In many New Jersey localities, Transfer of Development Rights (TDR) have been used as a farmland preservation tool as part of adopted growth management strategies. For example,

gubproject #3: Pilot Equity Insurance Program for Gloucester County

PROJECT COST: 535,000 from NJDA

**INVESTIGATORS: Adcsoji Adclaja
Barbara Listokin
Steve Decter Karen
Tank Peter Parks
Leslie Small
Graduate Assistant**

**NJDA OVERSEERS: George Horzcpa
Donald Appiegate**

DELIVERABLES:

March 1996	QPreliminary report detailing findings related to objectives 1, 2, 3, and 4 below.
November 1996	QFinal report submitted to the NJDA detailing the feasibility of equity insurance for Gloucester County as a case study and for the state and providing an actual program design for Gloucester County that is ready for implementation.

JUSTIFICATION

New Jersey is the most industrialized and urbanized state in the nation. With two of the largest cities in the country at its eastern and western borders (New York and Philadelphia), almost all counties in the state are within commuting distance of major employment centers and are thus subject to developmental pressures. The counties closest to major population and employment centers have seen the greatest loss of farmland to suburban construction. The loss of farmland represents not only the decline of a major industry but a deterioration in the "quality of life".

Beginning in the 1960s, New Jersey correctly acknowledged the growing problem of suburbanization and began to retard the annual loss of farmland through statewide policies such as farmland assessment (1963), right to farm (1984) and farmland preservation (1981) as well as other programs (e.g., TDRs and zoning). TDRs have been highly criticized by farmers, especially in the Pinelands. Zoning and other local growth management tools are also often seen as "takings", considering that the object of growth management is quality of life improvement of all residents. The state's farmland preservation program, which is essentially a purchase of development rights (PDR) program whereby the state/county buys the development rights to farmland, has been very successful in retarding the loss of farmland. However, given the high cost of land in New Jersey, it could be very expensive. To date, \$77 million has been expended out of three \$50 million bond issues totaling \$150 million, and 22,000 acres have been permanently preserved. Not that the goal

is realistic, but it has been estimated that it would require \$2.3 billion in 1990 dollars to acquire development rights on all of the state's remaining farmland.

In the current period of fiscal strain and pressure to reduce public spending, there is a need to explore other cost effective methods of preservation, perhaps methods that would allow the state/county to spread out payments to landowners. Methods by which more acreage can be tied down now with payments later will be looked at quite favorably by policy makers. Creative financing methods have been initiated in New Jersey and in other states to facilitate PDR programs. An installment sale approach (as opposed to a "Mill up-front sale") has been completed in Mercer County and proved to be effective in acquiring preservation easements on a key farm and another is currently underway. In Maryland, a lease-purchase option has been implemented which is similar to an installment sale but bypasses limitations on government borrowings that may curtail commitments for installment sales. In Lancaster County, Pennsylvania a "Hike-kind-exchange" program is being utilized whereby a qualified third party intermediary acquires "investments" which are then transferred to the farmer for his deeded development easement. Possible benefits to the farmer from these installment arrangements include the postponement of capital gains.

The concepts of equity insurance and equity mortgage have been proposed as alternative or supplementary programs that would allow the state to preserve more acreage at a more reasonable annual cost. While these approaches have not yet been utilized anywhere to acquire farmland easements, they need to be researched based on the promise they hold.

Equity insurance involves a government sponsored "take-out compensation" for farmland in exchange for development easements. This is based on the notions that (1) in any given year only a small portion of farmers actually sell portions of their land and would need to be compensated. (2) many of the farmers selling land in the first place do so to generate sufficient funds to cover inheritance/estate tax, retirement income or operational expenses when they are losing money. (3) by designing a program that allows people in need of improved cash-flow to tap a source when they need to but that also allows everyone to cash in on their equity at death, retirement or resale to another farmer, farmers can be convinced to make a commitment to preserving their land.

Equity insurance would operate as follows. The state, county or municipality would establish an insurance program that would guarantee farmers payment of the current difference between the market value of their farmland and the value for agricultural use only. The difference would be paid: 1) when the farmer sells land to another farmer, 2) when the farmer dies, or 3) when the farmer retires, whichever comes first. A set interest rate equal to the rate of return on common investments could be applied to the payoff on the policy. As in a conventional insurance program, the state would pay the insurance premiums for a program that would provide death benefits, retirement benefits and if desired, an ability to borrow against the cash value of the program. As these payments are actually part of the state's payments for the development easements, the proceeds may be tax free or at least tax deferred. Moreover, the program can be fine tuned to respond to individual farmers needs without incurring prohibitive administrative costs. The state can use private sector insurance companies for this program or alternatively it can develop a self-insurance program.

public program described above would apply only to active farmers, with a possible private program for land speculators and others who lease land to farmers. The private program for nonfarmers could be tied to a farmland buyout program that allows tenant farmers to purchase land at their agricultural use values. The sellers would be compensated for the market value difference through the equity insurance they would obtain.

Equity mortgage is a similar concept. In this case, the state would essentially make out a mortgage with the development easements as the collateral. Payout could be over an extended period thus allowing the state the ability to put as much acreage as possible under development restrictions.

Equity insurance and mortgage would: 1) reduce the financial burden on the State to payment of annual insurance premiums: 2) allow the state greater flexibility to acquire farmland easements in areas not immediately threatened with development oftentimes at significantly lower easement costs than otherwise possible: 3) eliminate runs on compensation, not tied to real estate development cycles: 4) keep the serious farmer unharmed and not worried about the future and the loss of retirement income: and 5) lower the acquisition cost of farmland to a more moderate level so that farmers could readily purchase farmland at a reasonable price.

Of course, these concepts are currently ideas. So were the ideas of PDR and TDR before they were analyzed, pilot tested and implemented. For equity insurance or equity mortgage to be well understood, and if viable, adopted, it needs to be well studied in a given setting and perhaps pilot tested. Gloucester county is a good case study of a county where land values are currently low and where equity insurance/mortgage can go a long way in securing the land base and thus has been selected for a case study of New Jersey. The proposed study will conduct a detailed actuarial/mortgage analysis to determine if the potential is there to pilot test equity insurance/mortgage. If so, the proposed study will also design a program to be pilot tested in Gloucester county.

Of primary importance is an accurate and complete survey of all the farmers in the townships designated to be part of the study. This survey will compile information on the individual farmers as well as data on the farmland involved. Farmer data necessary for actuarial purposes include the age and health of the farmer, years to retirement, intent to sell the farm within a specified time frame, and liquidity needs prior to retirement. Also surveyed would be the farmer's general interest in a conservation easement program such as equity insurance, and future farming goals including whether the farmer's heirs have interest in continued farming. Farm data acquired in the survey include the number of acres owned and farmed, soil quality, wetlands and/or other environmentally sensitive acreage, exclusion of house and some land, farm earnings and farm debt.

The above data will define the number of farms and farmers suitable to the equity insurance program and farmland conservation easements. Much of the preliminary determinations will be made based on objective criteria such as farmer age and farm soil quality. Farmers over the age of sixty may not be suitable for equity insurance as the time frame to retirement is too short to adequately fund the benefits. Farms with poor soil quality may not be desirable candidates for farmland preservation

.^easements and should probably not be included.

/ ' Alter the Farms/farmers eligible to be included in the equity insurance program are identified, valuation initiatives will be undertaken. A system will be implemented to ascertain the market value and the development rights of the farms. This system cannot be prohibitively expensive and time consuming, yet must also be accurate and equitable in its valuation methods and outcomes. The value findings for each farm will then be used to provide the farmer with a pro-forma analysis of the future death benefit, value at retirement, and cash value after 10 years of participation in the equity insurance program. The aim of the research team in this segment of the research is to determine the interest in participation given the value finding on a farm, the promise to pay this amount to the farmer through equity insurance over time, and, perhaps, that farmers receive some portion of the value up-front.

This research will quantify the costs of the program for the pilot study area and, perhaps, projected to the state given the information on the level of interest. In addition, a feasibility analysis will be conducted to determine the acquisition costs per farmer and acre.

OBJECTIVES

- I. Study the feasibility of a pilot equity insurance program for Gloucester County by surveying all farmers in selected townships of the county to obtain data necessary for actuarial analyses of interest and projection of participation.
- I. Provide proforma projections to farmers regarding program benefits.
3. Develop valuation methods for land and easements.
4. Develop cost-benefit analysis of equity insurance for Gloucester County and project the feasibility of a statewide program.
5. Design and prepare ready for implementation an actual pilot program.

E N V I R O N S

B. establish incentives for landowners

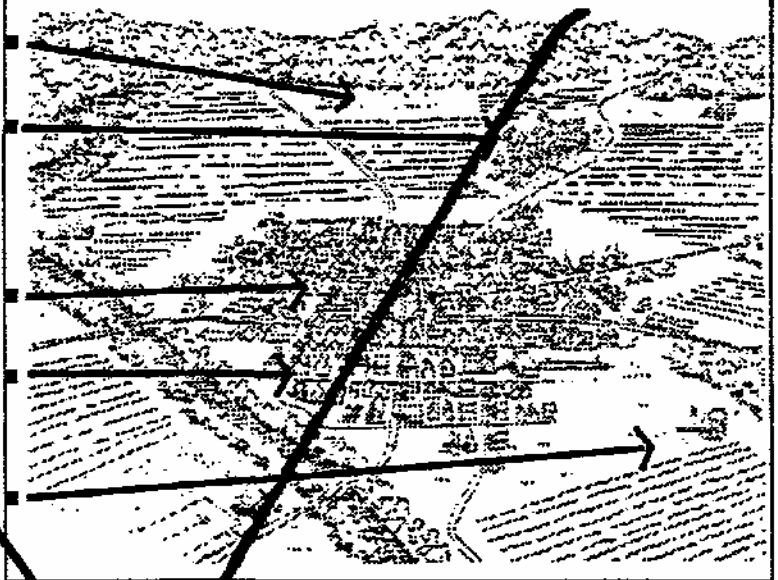
Revise zoning to create Rural Development Overlay District and to change ordinances so that area of the districts reflect market projections

Incentives to encourage commercial development as part of residential development

Award density credits for hamlet/village projects

Impact fees and site plan submission criteria that make rural hamlet/village development more attractive than dispersed tract houses

Encourage collaboration between landowners that create "development compacts", eligible for bonus density credits



B.01
Rural Development Overlay District

MAP SHOWING RDO DISTRICT

RDO District
1-12

B.02
Density credits

DESCRIPTION OF DENSITY CREDITS

B.03
Impact fees, Site plan criteria

DIAGRAM SHOWING HYPOTHETICAL APPLICATION OF DENSITY CREDITS

B.04
Development Compacts

DESCRIPTION OF DEVELOPMENT COMPACTS

DIAGRAM SHOWING HYPOTHETICAL DEVELOPMENT COMPACT VILLAGE PROJECT

E N V I R O N S

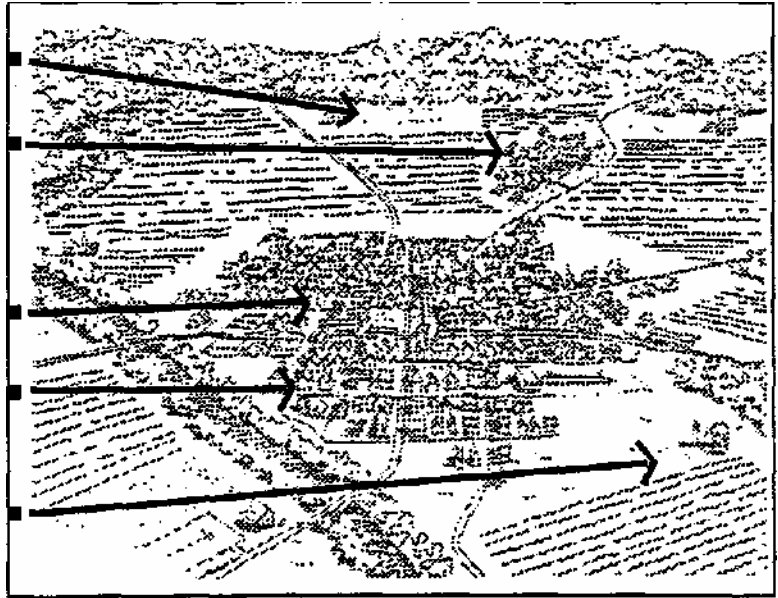
Revise zoning to create Rural Development Overlay District and to change ordinances so that area of use districts reflect market projections

Incentives to encourage commercial development as part of residential development

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D. establish incentives for landowners

B.01

Rural Development Overlay District

- MAP SHOWING RDO DISTRICT

6.02 Density credits

DESCRIPTION OF DENSITY CREDIT

6.03

Impact fees, Site plan criteria

- DIAGRAM SHOWING HYPOTHETICAL APPLICATION OF DENSITY CREDITS

6.04

Development Compacts

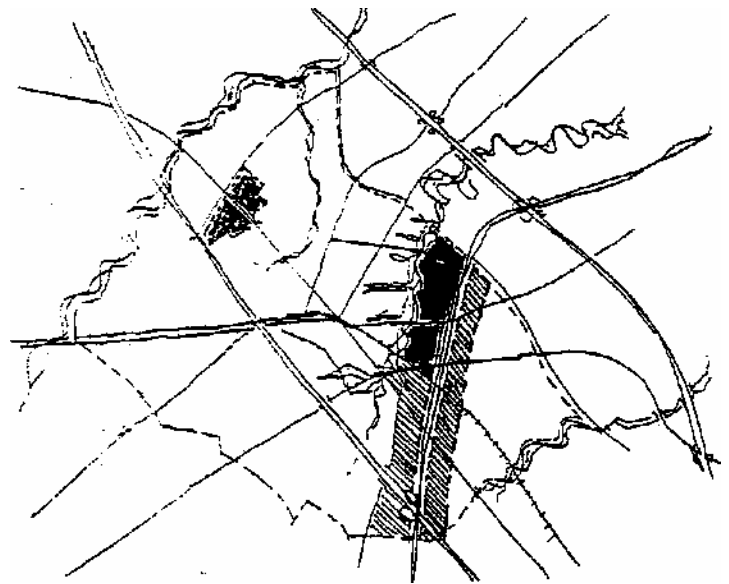
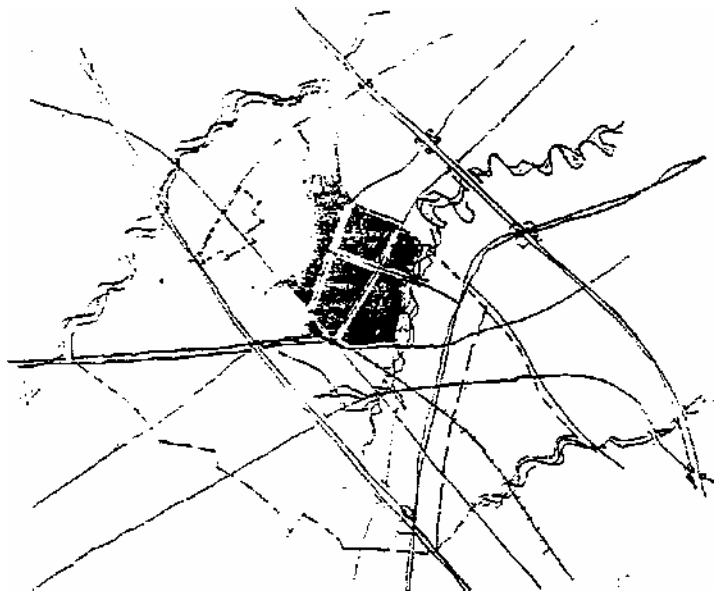
- « DESCRIPTION OF DEVELOPMENT COMPACTS

DIAGRAM SHOWING HYPOTHETICAL DEVELOPMENT COMPACT VILLAGE PROJECT



ENVIRONS:
Area of the Rural Development Study
Woodwick Township, NJ.

Planning for The Environs of a Developing Regional Center



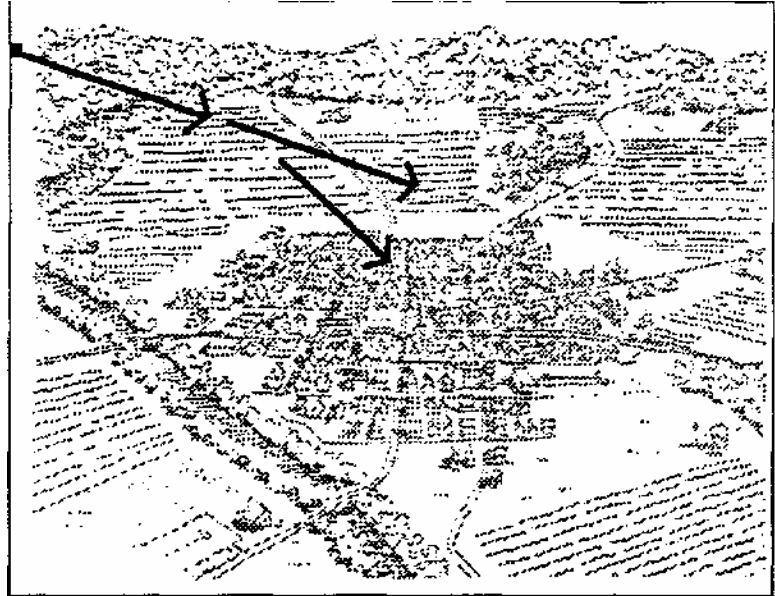
Planning for The Environs of a Developing Regional Cents

1. Revise Zoning To Create Rural Development Overlay District

Zoning in R-1 and R-2 zones would be changed to encourage hamlet and village-type developments in a variety of ways. Current overlays for R-1 and R-2 zoning would be eliminated. Instead, these areas would be designated Rural Development Overlay Districts. Each property owner would receive an allocation of density credits. The property owner could use these density credits to develop his or her property in exactly the same way as now allowed under current base zoning or the property owner could exercise several other options open to him or her under this approach. The number of density credits allocated to each property owner would be based on the current base zoning of the property and the development characteristics of the parcel.

E N V I R O N S

Revise zoning to create Rural Development Overlay District and to change ordinances so that area of use districts reflect market projections



D. establish incentives for landowne

6.0J

Rural Development Overlay District

D/577?/a

Projections and assumptions for the Rural Development Overlay District about:

- Amount of hamlet/village development likely to occur
- Amount of commercial development **iikely** to occur

Anticipated Pattern of Development (1996-2020)

Development Zone	New Residential Dwelling Units	Office/Industrial		SF	Commercial	
		SF	Acres		Acres	Blocks
In Center	2,250			200,000	12	2.
In Business Corridor	150	2,700,000	180			
In Rural Development Zone						
On Larger Lots	450					
In Hamlets and Villages	900			40,000	3	
Total	3,750	2,700,000	180	240,000	15	

Woolwicii Township

Residential Buildout-Alternative Growth Scenarios

Scenario	Basis	2020 Population	Housing Units Developed 1995-2020		Associated Retail/Office Support (SF)	Percentage of Capacity Developed	Years To Full Zoning Buildout (Base 1995)
			On Septic	Sewer-Served			
Moderate Growth	25% Above DVRPC Forecast	6,600	248	1,402	110,000	8%	400 Years
Aggressive Growth	Subregion Growth 25% Above DVRPC Forecast; Woolwich Captures 80%	12,900	563	3,187	250,000	15%	185 Years
Very Aggressive Growth	30% of Gloucester County Growth	33,300	1,165	9,385	600,000	38%	70 Years

Commercial/Retail Development

Commercial Potential

Population Increase--1995-2020 Commercial Space	12.900
Demand Generated (SF) Likely Commercial Space	280.000
Captured In Woolwich	240.000

Big Box Retail Development

Supermarket (SF)--Yes Eventually	50.000
Home Improvement Center-Only If Also Draws From Logan; Woolwich Supports One Quarter of A Store	
Discount Department Store-Only If Also Draws From Logan: Woolwich Supports One Quaner of A Store	

Likely Smaller Commercial Development

Restaurants (SF)	25.000
Drug Stores (SF)	25.000
Apparel (SF)	25.000
Home Furnishings/Electronics (SF)	25.000
Other Shopping Goods (SF)	15.000
Other Retail Stores (SF)	30.000
Personal Services (SF)	20.000
Professional/Financial Services (SF)	25.000
Commercial Employment	825

Commercial Development Options

#1—Supermarket Located In Center: 80% of Smaller Commercial Development Located In Center:
20% Located In Villages

Space Required	SF	Acres	Blocks
In Center	200,000	12	2.5
In Villages	40,000		
Per Village (Five Villages)	8,000	0.5	
Total	240,000	15	

#2-Supermarket Located In Corridor: 70% of Smaller Commercial Development Located In Center:
30% Located In Villages

Space Required	SF	Acres	Blocks
In Corridor	50,000		
In Center	135,000		8
In Villages	55,000		4
Per Village (Five Villages)	11,000	0.7	
Total	240,000	15.5	

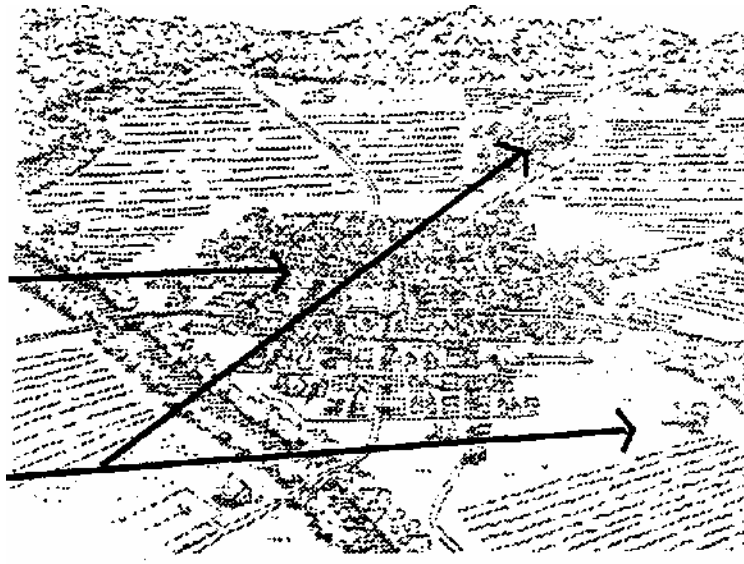
Industrial/Office Development In Business Corridor

Acres Developed/Yr.	7.2
Square Feet of Industrial/Office Development Yr.	108,000
Square Feet of Industrial Office Development-25 Years	2,700,000
Jobs Created--25 Years	3915
Acres Developed--2 [^] Years	180
Percent of Industrially Zoned Land Developed By Year 2020	15.1%

D. establish incentives for landowne

Award density credits for hamlet/village projects

Encourage collaboration between landowners that create "development compacts", eligible for bonus density credits



B.02
Density credits

DESCRIPTION OF DENSITY CREDITS

The Density Credits in the RDO district (Rural Development Overlay) replace the Bonus Density incentives in the current Master Plan for sewage connection. The objective is that future residential development will be designed as compact communities with local wastewater treatment facilities. In contrast, the current policy requires new development to provide dry sewer to be connected to centralized facilities at some future date. It is likely that this practice will, over time, create a continuous swath of suburban development along existing roads. The proposed RDO Density Credits are structured to provide incentives to maintain some land as farmland or open space and to encourage the landowner, developer, the township and the local utility authority to cooperatively work to provide local community utility infrastructure and service.

NEW LEGISLATION ON THE DEFINITION AND STANDARDS GOVERNING PLANNED UNIT DEVELOPMENTS

in January of 1996 the State Assembly enacted new legislation changing the definition of Planned Unit Developments. This is import to the RDO concept because it allows land that is designated within a Planned Unit Development to be non-contiguous, meaning that a site that is exceptionally attractive for development and one that is part of a viable farm production unit can be combined in a Planned Unit Development—even if they are not next to each other—even if they are in different counties.

2, Award Density Credits To Hamlet/Village Projects

A property owner could develop his or her property in a hamlet or village pattern by concentrating development on a portion of the total property and maintaining the remaining portion of the property as open space or farmland. A hamlet is a predominantly residential development with a minimum of 50 dwelling units (du's) constructed at a density of 3 du/gross acre to 5 du/gross acre after deduction for designated wetlands and dedicated open space. A village is a predominantly residential development with a minimum of 150 dwelling units (du's) constructed at a density of 3 du/gross acre to 6 du/gross acre after deduction for designated wetlands and dedicated open space.

The Rural Development Overlay District would encourage a property owner to develop his or her property as a hamlet or village by awarding density credit bonuses for this style of development. Property owners will receive a bonus of 15% of density credits for developing in a hamlet pattern and 20% of density credits for developing in a village pattern. Hamlet and village developers may also purchase density credits from any other property owner in the Rural Development Overlay District to increase the size of the hamlet or village.

Example #1: 150 acres, no wetlands, zoned R-1. After allowing for internal streets, the property could be subdivided into 85 lots of one and a half acres each. This property would be allocated 85 density credits. The property owner could use these density credits to develop 85 homes on 1 1/2 acre lots. Alternately, the owner could choose to develop in a more concentrated manner and receive a 15% bonus for developing a hamlet. In that case, the property owner would be able to develop 98 homes (85 - 15% hamlet bonus). The property owner could also sell his or her 85 density credits to a developer building homes on another parcel in the township.

Example #2: A village developer purchases a 60 acre parcel with 45 density credits. The developer plans to build 240 units at a density of 4 du/gross acre. The developer requires 240 density credits, of which 45 were purchased with the property and 40 come as the 20% bonus for village development. Therefore, the developer must purchase an additional 155 density credits from other property owners in the Township.

Each property owner in the Rural Development Overlay District has several options:

1. Develop his or her property as allowed under base zoning.
2. Develop the property in a hamlet or village pattern, with a 15% or 20% bonus over the base zoning, thereby preserving a major portion of the open space or farmland.
3. Sell his or her density credits to any entity interested in farmland or open space preservation.
4. Join with adjacent property owners to form a development compact which would pool density credits and receive a 30% density credit bonus.
5. Sell density credits to any hamlet or village developer.

ASSEMBLY, No, 1584

STATE OF NEW JERSEY

INTRODUCED MAY 2, 1994

By Assemblywoman OGDEN

1 AN ACT changing definition of and standards governing planned
2 unit developments and amending P.L.1975, c.291.

3
4 BE IT ENACTED by the Senate and General Assembly of the
5 State of New Jersey:

6 I. Section 3.3 of P.L.1975, c.291 (C.40:55D-6) is amended to
7 read as follows:

8 3.3. "Party immediately concerned" means for purposes of
9 notice any applicant for development, the owners of the subject
10 property and all owners of property and government agencies
11 entitled to notice under section 7,1 of P.L.1975, c.291
12 (C. 40:550-12).

13 • "Performance guarantee" means any security, which may be
14 accepted by a municipality, including but not limited to surety
15 bonds, letters of credit under the circumstances specified in
16 section 16 of P.L.1991, c.256 (C.4Q:55D-53.5), and cash.

17 "Planned commercial development" means an area of a
18 minimum contiguous qr^no neon t iguo us size as specified by
19 ordinance to be developed according to a plan as a single entity
20 containing one or more structures with appurtenant common
21 areas to accommodate commercial or office uses or both and any
22 residential and other uses incidental to the predominant use as
23 may be permitted by ordinance.

24 "Planned development" means planned unit development,
25 planned unit residential development, residential cluster, planned
26 commercial development or planned industrial development.

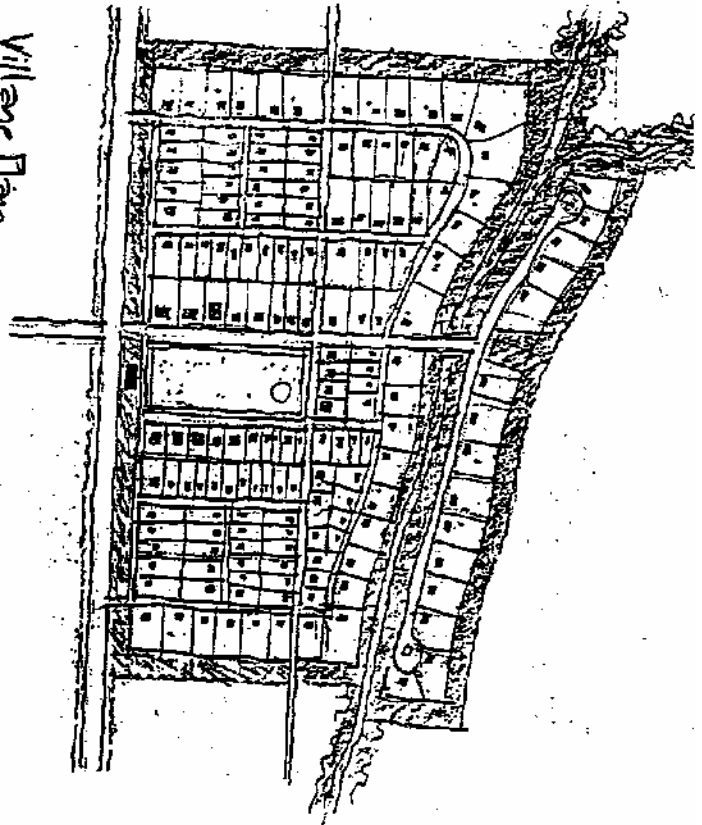
27 "Planned industrial development" means an area of a minimum
28 contiguous crjigiicgntiguous size as specified by ordinance to be
29 developed according to a plan as a single entity containing one or
30 more structures with appurtenant common areas to accommodate
31 industrial uses and any other uses incidental to the predominant
32 use as may be permitted by ordinance.

33 "Planned unit development" means an area with a specified
34 minimum contiguous or^ioncontiguous acreage of 10 acres or
35 more to be developed as a single entity according to a plan,
36 containing one or more residential clusters or planned unit
37 residential developments and one or more public, quasi-public,
38 commercial or industrial areas in such ranges of ratios of
39 nonresidential uses to residential uses as shall be specified in the
40 zoning ordinance.

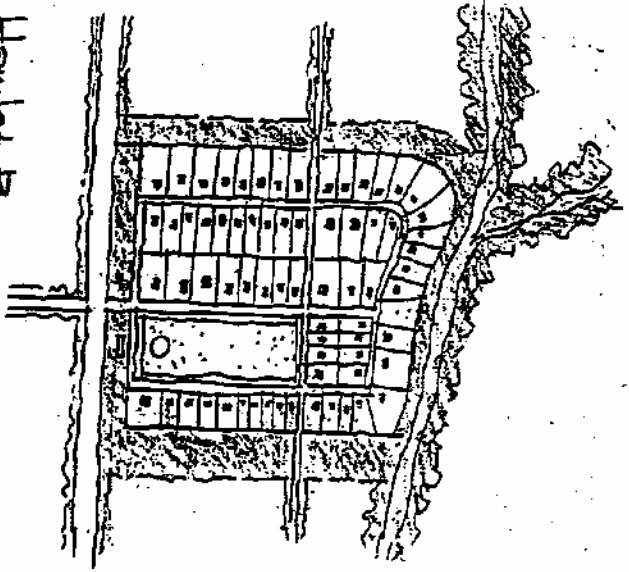
41 "Planned unit residential development" means an area with a
42 specified minimum contiguous or noncontiguous acreage of 5
43 acres or more to be developed as a single entity according to a
44 plan containing one or more residential clusters, which may

EXPLANATION—Hatter **enclosed** in bold-faced brackets [thus] in the
above bill **is not enacted and is intended** to be omitted in the law.

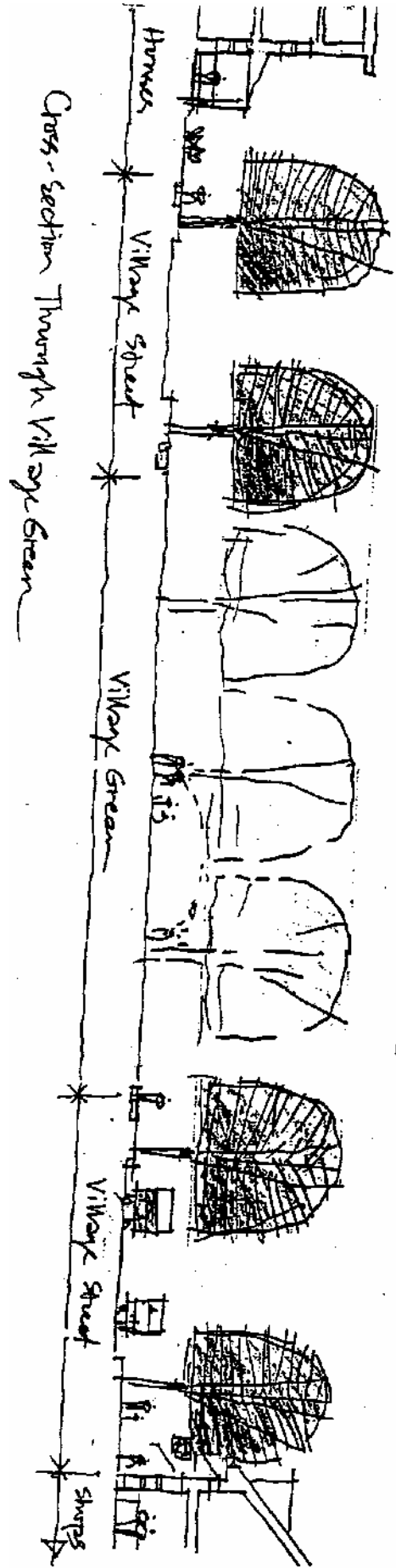
Hatter **underlined** thus is new matter.



Village Plan



Hamlet Plan



Cross-section Through Village Green



1 include appropriate commercial, or public or quasi-public uses ail
2 primarily for the benefit of the residential development.

3 "Planning board" means the municipal planning board
4 established pursuant to section 14 of P.L.1975, c.291
5 (C.40:550-23).

6 "Plat" means a map or maps of a subdivision or site plan.

7 "Preliminary approval" means the conferrai of certain rights
8 pursuant to sections 34, 36 and 37 of P.L.1975, c.291
9 (C.40:55D-46; C.40:55D-48; and C.40:55D-49) prior to final
10 approval after specific elements of a development plan have been
11 agreed upon by the planning board and the applicant.

12 "Preliminary floor plans and elevations" means architectural
13 drawings prepared during early and introductory stages of the
14 design of a project illustrating in a schematic form, its scope,
15 scale and relationship to its site and immediate environs.

16 "Public areas" means (1) public parks, playgrounds, trails, paths
17 and other recreational areas; (2) other public open spaces; (3)
18 scenic and historic sites; and (4) sites for schools and other public
19 buildings and structures.

20 "Public development proposal" means a master plan, capital
21 improvement program or other proposal for land development
22 adopted by the appropriate public body, or any amendment
23 thereto.

24 "Public drainage way" means the land reserved or dedicated
25 for the installation of storm water sewers or drainage ditches, or
26 required along a natural stream or watercourse for preserving the
27 biological as well as drainage function of the channel and
28 providing for the flow of water to safeguard the public against
29 flood damage, sedimentation and erosion and to assure the
30 adequacy of existing and proposed culverts and bridges, to induce
31 water recharge into the ground where practical, and to lessen
32 nonpoint pollution.

33 "Public open space" means an open space area conveyed or
34 otherwise dedicated to a municipality, municipal agency, board of
35 education, State or county agency, or other public body for
36 recreational or conservational uses.

37 "Public utility" means any public utility regulated by the Board
38 of Regulatory Commissioners and defined pursuant to R.3.48:2-13.

39 "Quorum" means the majority of the full authorized
40 membership of a municipal agency,

41 "Residential cluster" means [an] a contiguous, grjioncontiguous
42 area to be developed as a single entity according to a plan
43 containing residential housing units which have a common or
44 public open space area as an appurtenance.

45 "Residential density" means the number of dwelling units per
46 gross acre of residential land area including streets, easements
47 and open space portions of a development.

48 "Resubdivision" means (1) the further division or relocation of
49 tot lines of any lot or lots within a subdivision previously made
50 and approved or recorded according to law or (2) the alteration of
51 any streets or the establishment of any new streets within any
52 subdivision previously made and approved or recorded according
53 to law, but does not include conveyances so as to combine
54 existing lots by deed or other instrument.

55 (cf: P.L.1991, c.412, s.3)

1 2. Section 52 of P.L.1975, c.291 (C.40:55D-65) is amended to
2 read as Follows:

3 52. A zoning ordinance may;

4 a. Limit and restrict buildings and structures to specified
5 districts and regulate buildings and structures according to their
6 type and the nature and extent of their use, and regulate the
7 nature and extent of the use of land for trade, industry,
8 residence, open space or other purposes.

9 b. Regulate the bulk, height, number of stories, orientation,
10 and size of buildings and the other structures; the percentage of
11 lot or development area that may be occupied by structures; lot
12 sizes and dimensions; and for these purposes may specify floor
13 area ratios and other ratios and regulatory techniques governing
14 the intensity of land use and the provision of adequate light and
15 air, including, but not limited to the potential for utilization of
16 renewable energy sources.

17 c. Provide districts for planned developments; provided that an
18 ordinance providing for approval of subdivisions and site plans by
19 the planning board has been adopted and incorporates therein the
20 provisions for such planned developments in a manner consistent
21 with article 6 of this act. The zoning ordinance shall establish
22 standards governing the type and density, or intensity of land use,
23 in a planned development. Said standards shall take into account
24 that the density, or intensity of land use, otherwise allowable
25 may not be appropriate for a planned development. The
26 standards may vary the type and density, or intensity of land use,
27 otherwise applicable to the land within a planned development in
28 consideration of the amount, location and proposed use of
29 [common] open space; the location and physical characteristics of
30 the site of the proposed planned development; and the location,
31 design and type of dwelling units and other uses. Such standards
32 may provide for jfae clustering of development between
33 noncontiguous parcels and may, in order to encourage the
34 flexibility of [housing] density, intensity of land uses, design and
35 type, authorize a deviation in various [residential] clusters from
36 the density, or intensity of use, established for an entire planned
37 development. The standards and criteria by which the design,
38 bulk and location of buildings are to be evaluated shall be set
39 forth in the zoning ordinance and all standards and criteria for
40 any feature of a planned development shall be set forth in such
41 ordinance with sufficient certainty to provide reasonable criteria
42 by which specific proposals for planned development can be
43 evaluated.

44 d. Establish, for particular uses or classes of uses, reasonable
45 standards of performance and standards for the provision of
46 adequate physical improvements including, but not limited to,
47 off-street parking and loading areas, marginal access roads and
48 roadways, other circulation facilities and water, sewerage and
49 drainage facilities; provided that section 41 of this act shall apply
50 to such improvements.

51 e. Designate and regulate areas subject to flooding (1)
52 pursuant to P.L.1972, c.185 (C.58:16A-55 et seq.) or (2) as
53 otherwise necessary in the absence of appropriate flood hazard
54 area designations pursuant to P.L.1962, c.19 {C.58:16A-50

1 et seq.) or floodway regulations pursuant to P.L.1972, c.185 or
2 minimum standards for local flood fringe area regulation pursuant
3 to P.L.1972. c.185.

- 4 f. Provide for conditional uses pursuant to section 54 of this
5 act.

5 g. Provide for senior citizen community housing.
7 fi. Require as a condition for any approval v.-iiidi is required
8 pursuant to such ordinance and the provisions of this chapter,
9 that no taxes or assessments for local improvements are due or
10 delinquent on the property for which any applicaaon is made.

11 i. Provide for historic preservation pursuant to section 5 of
12 P.L.1991 c.199 (C.40:55U-65.1).

13 (cf: P.L.1991, c.199, s.4)

14 3. This act shall take effect immediately.

15

16

17

STATEMENT

18

19 This bill redefines the terms "planned commercial
20 development," "planned development," "planned industrial
21 development," "planned unit development," and "planned unit
22 residential development" under the Municipal Land Use Law,
23 P.L.1975, c.291 (C.40:55D-1 et seq.) to allow for clustering
24 among noncontiguous parcels of land. Currently, as those terms
25 are defined under that law, only areas that fulfill a minimum
26 contiguous size as specified by ordinance may be considered a
27 planned development.

28 In addition, the bill redefines the term "residential cluster" to
29 allow an area which is contiguous or noncontiguous to fulfill the
30 definition of that term. The current definition does not
31 distinguish between contiguity and noncontiguity.

32 The bill amends subsection c. of C.40:55D-65 which sets forth
33 the standards governing the zoning of districts for planned
34 developments to provide for the clustering of development
35 between noncontiguous parcels of land.

36 In addition, the amendments to that section make changes in
37 the language governing a deviation from the density or intensity
38 of use established For an entire planned development. Under
39 current law, the standards, in order to encourage the flexibility
40 of housing density, design and type, may authorize a deviation in
41 various residential clusters from the density or intensity of use.

42 The amendments would broaden the standard for allowing such
43 a deviation by extending the deviation to include non-residential
44 clustering in order to encourage the flexibility of non-residential
45 density and intensity of land uses.

46

47

48

49

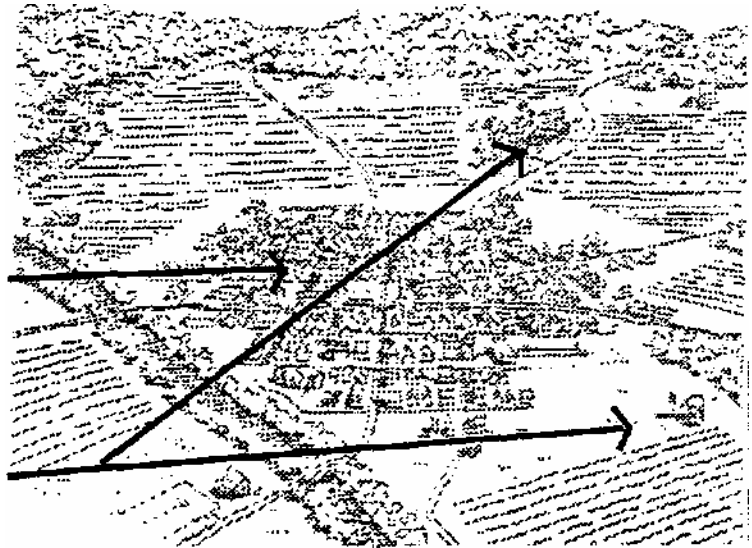
50 Allows clustering among noncontiguous parcels under Municipal
51 Land Use Law and broadens deviation from planned unit
52 development standards for nonresidential development.

D. establish incentives for landowners

Award density credits for hamlet/village projects

*Impact fees and site plan submission criteria that make rural hamlet/village **development more attractive** than dispersed tract houses*

Encourage** collaboration between landowners that create "development compacts", eligible for **bonus density credits



B.03

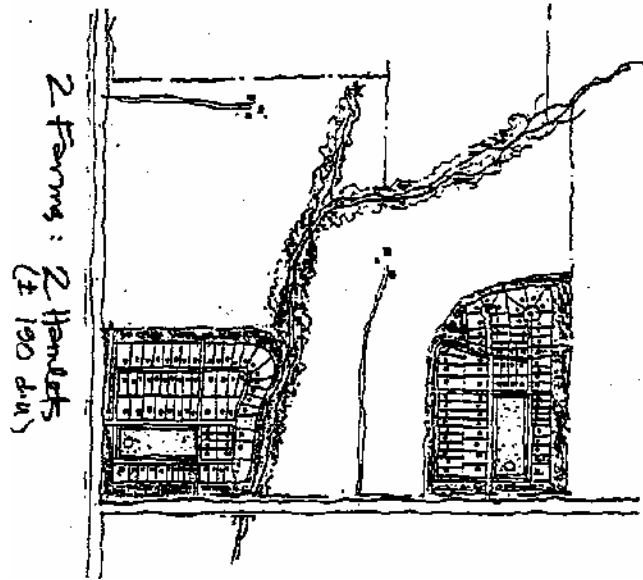
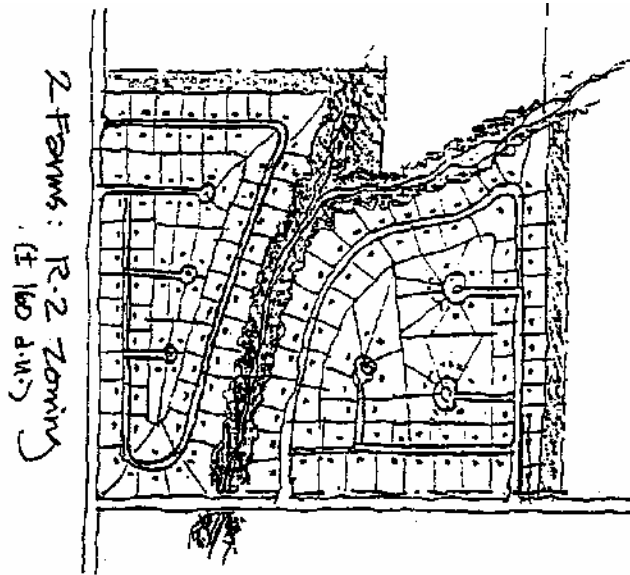
Impact fees, Site plan criteria

• DIAGRAM SHOWING HYPOTHETICAL APPLICATION OF DENSITY CREDITS

These diagrams show two alternatives for developing the same land.

The first entitled 2 forms: *R-2 Zoning* shows how 160 houses could be built on 1 1/2 acre lots and the farms would be gone.

The second entitled 2 forms: *2 hamlets* shows how 190 houses could be built on smaller lots and the farmers could still keep the farmhouses, farm buildings, and enough surrounding land to keep farming, or to sell or lease to another farmer.



Planning for The Environs of a Developing Regional Center—Environs

3. Impact Fees/Site **Plan** Submission Criteria To Encourage Hamlet/Village Development

Hamlet and village development must comply with Hamlet/Village Development Design Guidelines and must be served by sewer. The implementation of these criteria have the potential of discouraging hamlet and village development by encumbering the development process with procedural costs and delays.

The encouragement of hamlet and village development must be accompanied by a streamlining of review processes. These processes should include at least three areas:

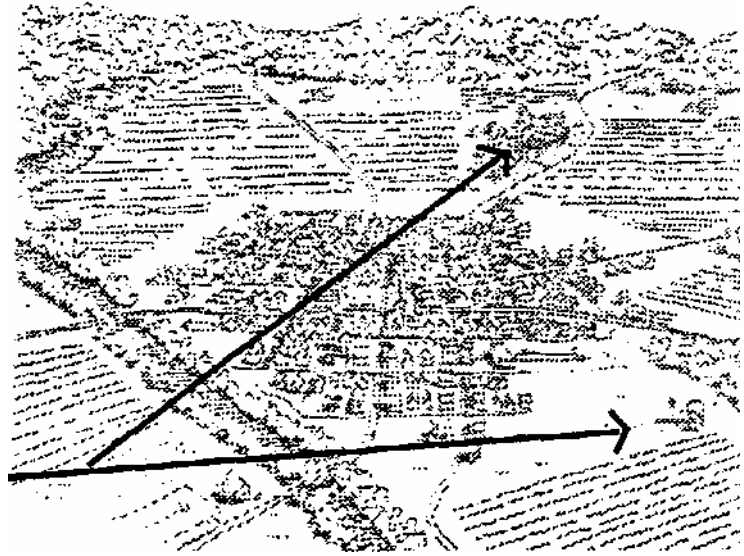
1. The process for determining the density credits for any specific property must be simple and inexpensive. Once the number of density credits is determined for a property, the process for transferring these credits must involve a simple registration.
2. The application of Hamlet/Village Development Design Guidelines must be a clear-cut process with a timely review procedure. Guidelines must be easily understood by developers, so that initial submissions can be as complete as possible.
3. Since hamlets and villages will require sewer service and since much of this requirement is likely to be met through small package plants, the approval of these package plants must be a streamlined process. This will require commitments from Municipal Utilities Authorities to manage these facilities, as well as the streamlining of the state permitting process for these facilities when they support compact development in a hamlet or village pattern. The bonuses provided for hamlet and village development will be insufficient to encourage the desired pattern unless sewer approval procedures are also simplified.

6. Financing Package Plants

The State and/or County can provide further incentives for hamlet and village development patterns by financially supporting sewer system development within the Rural Development Overlay District. Where developers anticipate that the market will slowly absorb housing production, they will be discouraged from hamlet or village development because of the significant up-front costs of package plants and other sewer system improvements.

State or County financing of these sewer system improvements would encourage developers to pursue more compact development by removing the negative impacts and risk of long carrying periods for these systems through the development period.

D. establish incentives for landowne



Encourage collaboration between landowners that create "development compacts", eligible for bonus density credits

B.04
Development Compocfs

" DESCRIPTION OF DEVELOPMENT COMPACTS

The Development Compact is a special optional incentive for a group of landowners to cooperatively plan development of a larger project to be implemented **over** time. This will involve some additional time and expense to establish a formal legal corporation or partnership and to **work** out the specifics of the contractual rights and obligations of each participant. In return **they** should be able to realize greater profit and have **more** control of the scale and location of future development.

DIAGRAM SHOWING HYPOTHETICAL DEVELOPMENT COMPACT VILLAGE PROJECT

These diagrams show two alternatives for developing the same land.

The first, entitled 2 forms: *R-2 Zoning* shows how 160 houses could be built on 1 1/2 acre lots and the farms would be gone.

The second, entitled 2 forms: *Village* shows the advantages of the Development Compact: 220 houses and some non-residential uses could be built on the same land and the farmers could still keep the farmhouses, farm buildings, and enough surrounding land to keep farming, or to sell Or lease to another farmer.

4. Development Compacts

The Rural Development Overlay District will encourage cooperation among property owners to create an orderly and compact development program. This level of cooperation will enable property owners to more easily attract developers with the capability of producing village development patterns. Cooperation will be encouraged through development compacts.

A development compact is a formal legal entity (partnership or corporation) voluntarily formed by adjacent property owners holding together a minimum of 115 density credits. Participating property owners would be able to transfer their density credits into the entity in exchange for proportionate ownership of the compact entity. These compacts will be encouraged through the allocation of a density credit bonus equal to 30% of the credits contributed by the participants.

Development within a development compact area must occur in one or more villages; density credits held by a development compact can only be used for village development within the compact area. Developers of these villages must secure density credits from the development compact. These developers also must purchase land from one or more owners on which to site the villages.

Example #1: Three adjacent property owners have the following holdings:

Owner A: 100 acres of land; 60 density credits.
Owner B: 80 acres of land; 45 density credits.
Owner C: 35 acres of land; 25 density credits.

These three owners form a development compact with a total of 130 density credits. The compact holds these 130 credits plus the bonus 39 credits for a total of 169 credits.

A developer purchases the property of Owner C and the density credits of the compact to construct a village of 169 units at an average density of 4.83 du/gross acre. The developer purchases the land of Owner C for \$1500 per acre (\$52,500) and the density credits for \$5000 each (\$845,000). Owner A receives 46.2% of the density credit payment (\$390,000); Owner B receives 34.7% (\$292,500). Owner C receives 19.1% of the density payment (\$162,500) plus the land payment for a total of \$215,000.

Example #2: Six adjacent property owners have the following holdings:

Owner A: 200 acres of land; 130 density credits.
Owner B: 150 acres of land; 110 density credits.
Owner C: 35 acres of land; 25 density credits.
Owner D: 100 acres of land; 60 density credits.
Owner E: 120 acres of land; 100 density credits.
Owner F: 85 acres of land; 75 density credits.

These six owners form a development compact with a total of 500 density credits. The compact holds these 500 credits plus the bonus 150 Credits for a total of 650 credits. ~

A developer purchases the property of Owner F and 255 density credits of the compact to construct a village of 255 units at an average density of 3 du/gross acre. The developer purchases the land of Owner F for \$1500 per acre (\$127,500) and the density credits for \$5000 each (\$1,275,000). The owners receive the following funds:

Owner A:	26% of credit payment--\$331,500.
Owner B:	22% of credit payment--\$280,500.
Owner C:	5% of credit payment--\$63,750.
Owner D:	12% of credit payment--\$153,000.
Owner E:	20% of credit payment--\$255,000.
Owner F:	15% of credit payment (\$191,250) plus the \$127,500 for land.

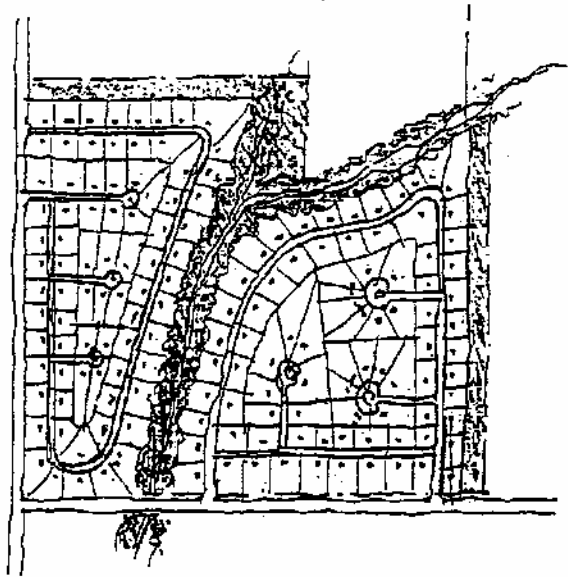
The compact retains ownership of 395 density credits.

Development compact participants may choose to dissolve the compact. In this event the remaining density credits held by the compact are first reduced by the remaining portion of the compact bonus and then allocated back to the participants. In example #2 above, the remaining 395 credits would be allocated this way:

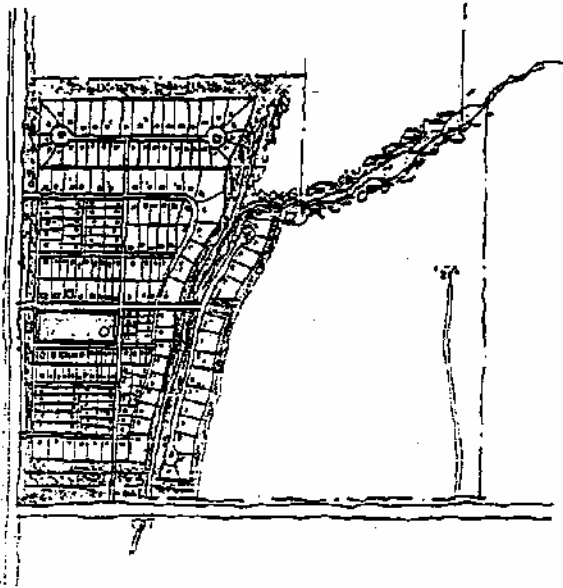
Forfeited Bonus:	91 credits
Owner A:	26% --79 credits.
Owner B:	22% -67 credits.
Owner C:	5%-15 credits.
Owner D:	12% -36 credits.
Owner E:	20% -61 credits.
Owner F:	15% -46 credits.

Owner F has no remaining land on which to develop these 46 credits; however, he or she can sell the credits to the developer of any hamlet or village within the Township.

2 Farms: R-2 Zoning
(7 160 a.c.)



2 Farms: V. High
(7 260 a.c.)



Environ : 3

The Economics of Traditional Neighborhoods:

Competing for the Bottom Line with Conventional Subdivisions-A Case Study of Four Mile Creek

By Peter H. Brown

Three Colorado developers learn that community design influenced by the principles of neotraditionalism can speed approval time and reduce development costs.

[Very major city, large or small, seems to have its share of older 'traditional neighborhoods. For the most part, these neighborhoods are viewed as the most desirable places to live. The homes and streets are attractive; neighbors stroll along the streets and take advantage of such nearby conveniences as shopping, offices, entertainment, parks, and recreation facilities.

In an effort to recapture the ambience of the nation's older neighborhoods, today's neotraditionalism movement marks a return to the traditional planning and site design principles that produced so many extraordinary communities in the late 19th and

early 20th centuries—places such as Riverside in the Chicago's suburbs, Roland Park in Baltimore, and the Main Line and Chestnut Hill in Philadelphia.

While the ideological basis for neotraditionalism is complex, it can be characterized as a genuine concern over the deterioration of the quality of life in both cities and suburbs, but particularly in the suburbs. Sprawling repetitive subdivisions, generally laid out by efficiency-motivated civil engineers, have created an isolating, look-alike society, a faceless wasteland almost totally dependent on the private automobile. Cost-savvy developers have contributed to the monotony by

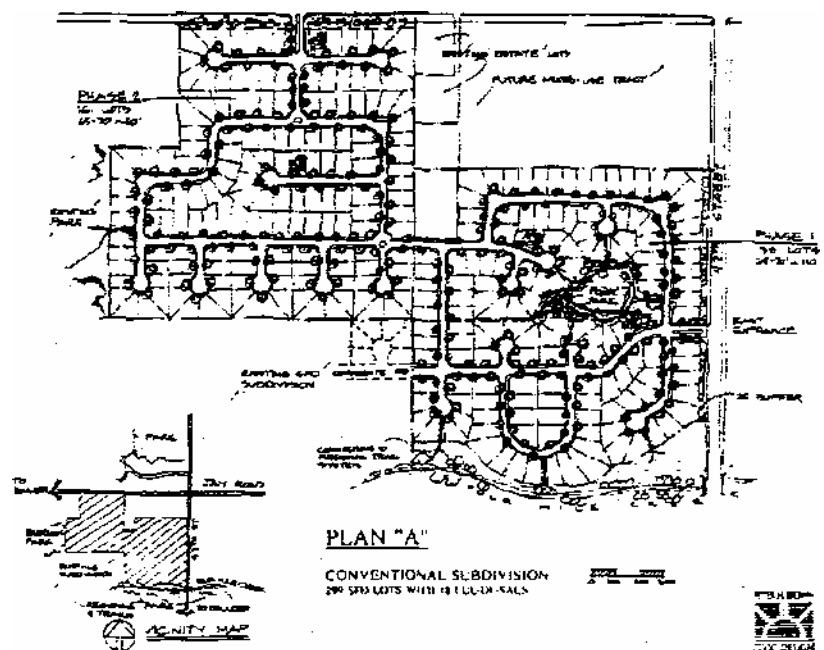


Figure 1. The conventional plan featured many cul-de-sacs.

reiving on standardized housing types that evidence little variety in price and floor plans. In addition, sidewalks and common amenities such as neighborhood parks, schools, churches, and convenience shopping are often missing from these communities. Finally, conservative zoning has not helped. Nothing contributes more to suburban sprawl than one-quarter to one-acre-lot zoning.

The collective result of these highly regulated, individually planned developments is an inefficient, fragmented, urban-suburban pattern—and a deteriorating sense of community. This pattern often leads to compromised environmental values that take the form of flooding, air and water pollution, and destruction of important natural habitats.

About six years ago, a group of planning-oriented architects, including Andres Duany and Elizabeth Plater-Zyberk, Peter Calthorpe, Daniel Solomon; Leon Krier, and others, said, "Enough is enough, we are on the wrong track, there has got to be a better way. Let's look at the successful

subdivisions and neighborhoods of the past as models for the future." It made eminent good sense. In the wake of changing lifestyle patterns, the public has been hungering for a new approach. Fewer and fewer households want the 1940s Levittown-inspired form of suburbia. Instead, the contemporary suburb needs to accommodate the lifestyle needs of two working parents, single parents, individuals, and childless couples of all ages.

However, despite the obvious appeal of much publicized "traditional" neighborhoods such as Seaside and Windsor in Florida, Mashpee Commons in Massachusetts, Kentlands outside of Washington, D.C., and Harbor Town in Memphis, Tennessee, critics complain that these communities are "too expensive" compared to the tried-and-true meandering street and cul-de-sac layouts. Some even suggest that perhaps neotraditionalism is a megalomaniacal exercise in elitist social engineering.

Far me Creek

These issues came into dramatic focus

last year in Boulder, Colorado, a planning-oriented city grown weary of uninspired subdivisions and tract developments that compare unfavorably in lifestyle quality to the city's older neighborhoods. Absent from Boulder's newer developments were the classic boulevards, pedestrian-oriented streets, small courts, and exciting architecture that characterized the city's established areas.

In 1991, developers Don Cook, firm Postle, and Jim Hudson, owners of a 140-acre tract with gently rolling terrain in Boulder County, petitioned the city of Boulder to annex their parcel. The development benefits of annexation were enormous—central water and sewer service and zoning for two to three units per acre instead of one unit per 35 acres. Cook and Associates initially wanted to develop the property as standard single-family lots, with homes selling in the \$200,000 to \$300,000 range.

The Boulder City Planning Department required Cook and Associates to submit a preliminary subdivision plan as part of their annexation petition. In the spring of 1992, Cook and his colleagues submitted a plan for 299 single-family detached lots—mostly on cul-de-sacs—with a density of just over two units per acre (Figure D). The city categorically rejected the plan as boring and unimaginative and asked the developers to return to the drawing board.

Both the planning commission and the city council complained to Garner Stoll, Boulder's new planning director, that the quality of proposed new subdivisions was generally lackluster and uninspiring. As a result, the city retained architect planner Peter H. Brown to prepare an alternative sketch plan for Four Mile Creek based on traditional neighborhood design principles and, later, to work with the developers to revise their initial scheme for the proposed development.

At first, the developers were skeptical, perhaps even antagonistic, about i

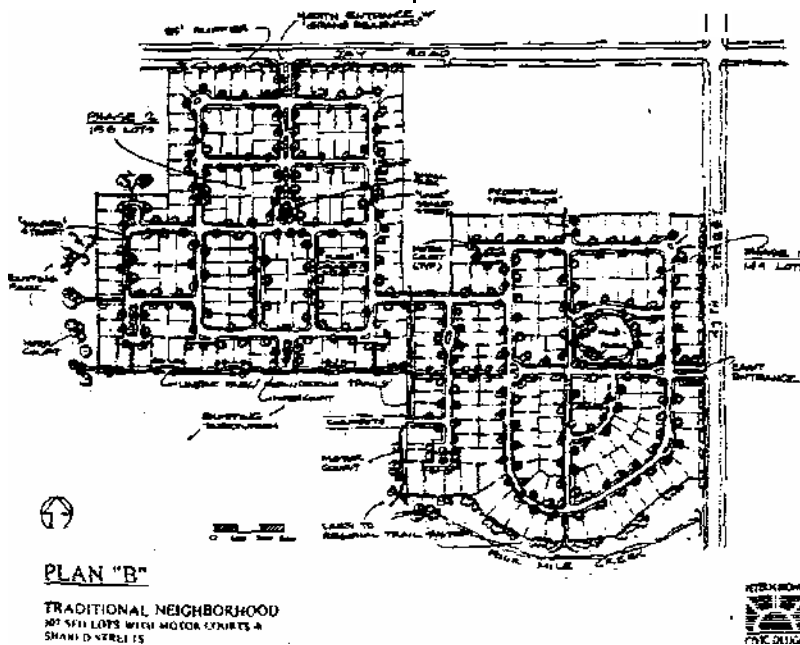
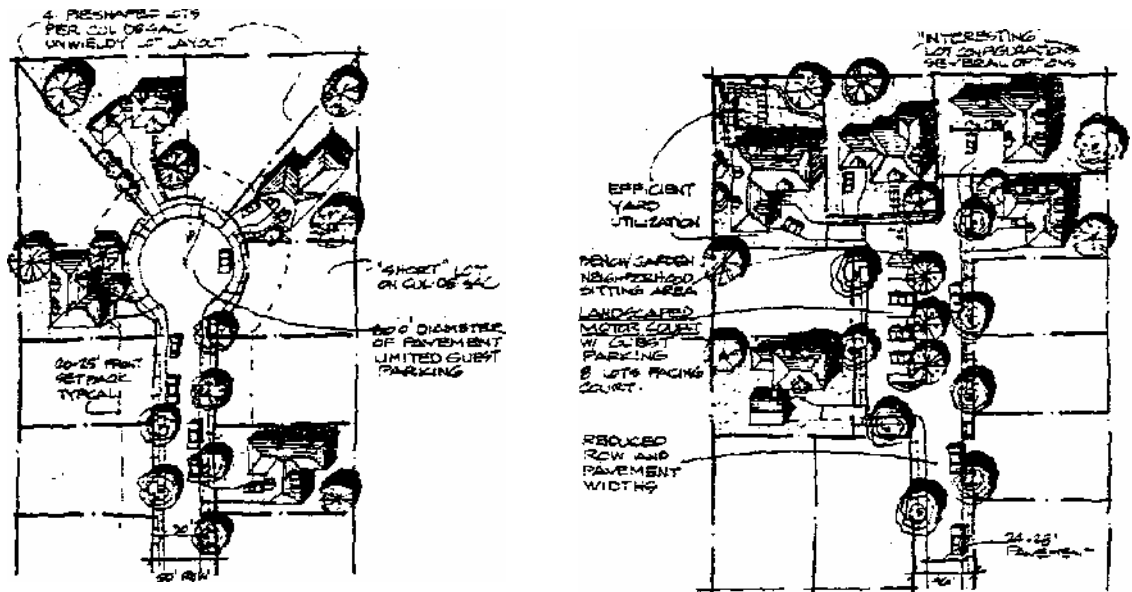


Figure 2. The traditional plan features short through streets and motor courts.



TYPICAL CUL-DE-SAC—PUN "A"
Conventional Subdivision

TYPICAL MOTOR COURT—PLAN "B"
Traditional Neighborhood

Figure 3. Details of a cul-de-sac and a motor court.

following an uncharted course that they feared could be more costly than their original plan and, possibly, unmarketable. Nonetheless, the developers agreed to continue meeting with Brown to work out a new plan. After Brown presented in great detail the principles and advantages of a traditional neighborhood design, the planning director made it clear that the city would not consider annexation of the 140-acre tract unless the plan for Four Mile Creek were revised.

Following several meetings between Cooke, the city planning staff, and Brown to evaluate plan alternatives, the parties agreed to a traditional neighborhood plan. In fact, over the course of several months, the developers began to see that a traditional neighborhood offers clear merits not just where the marketplace is concerned but also in terms of fostering a more attractive and socially cohesive living environment. The city granted the developer reasonable concessions in street and lot standards—particularly with respect to street widths, curb

radii, and yard setbacks—in exchange for a traditional plan with motor courts instead of cul-de-sacs. For its part, the planning department did not favor a design organized around cul-de-sacs, which, it believes, isolates different sections of the community, discourages walking, creates policing problems, and leads to a monotonous streetscape. Further, cul-de-sacs make snow removal difficult, and the resulting pie-shaped lots relegate most of the frontage to garages and driveways.

The original plan (Figure 1) featured 16 cul-de-sacs connected by a random pattern of streets. It is efficient but uninspired. The remaining collector and arterial streets were designed expressly for automobiles. All the lots and proposed homes were to be similar in size, price, general layout, and exterior architecture.

The traditional neighborhood plan (Figure 2) departs entirely from the collector/cul-de-sac plan. The key features of the plan, reflecting design principles worked out with the planning staff, include the following:

- a variety of local residential streets with reduced pavement widths, including "shared streets" (for the use of pedestrians and automobiles) that can be closed off to traffic, and motor courts with guest parking and landscaped miniparks (Figure 3);
- two neighborhood parks that serve as the visual focal points of the two main entrances, one of which preserves an existing wetlands and ponds;
- opportunities for walking within the neighborhood as reflected in interesting destinations and interconnections with the park, the adjacent neighborhood! and the regional trail system;
- a variety of lot sizes from 55-foot-wide patio or zero lot line lots to large 80- to 90-foot-wide "estate" lots;
- sensitive integration with the adjacent Four Mile Creek Regional Park, a greenbelt of nature trails, wildlife habitats, and the cottonwoods along the intermittent stream corridor; and
- interconnected pedestrian greenways and trails that tie into the regional trail system.

Two unresolved design issues concerned the accommodation of alleyways and granny flats, often common elements of traditional neighborhoods. Initial plans called for a "symbolic" alleyway with garages located at the rear of homes, but the final plan contains no alleyways and no provision for accessory¹ apartments.

Critics of traditional neighborhoods have claimed that such neighborhoods are more costly in terms of infrastructure and site improvements than curvilinear, cul-de-sac-based site plans. While little comparative research has been completed to date, the alternative site layouts prepared for Four Mile Creek offered a unique opportunity to investigate the critics' claims.

Developer Jim Hudson is straightforward in comparing the two different plans. "There are no real differences in costs, if at all. There is nothing in the site development in this first phase of Four Mile Creek that jumps out at you [as being more costly]." Codeveloper Don Cooke, a seasoned area builder, agrees. Cooke said recently, "The sitework costs of Four Mile Creek are very much in line with those of more conventional subdivisions in the area. I don't see any increased cost of neotraditional design, at least not in this case." Cooke goes on to explain that extra amenities such as small parks and esplanades—typically absent from conventional plans—add somewhat to overall costs. But Hudson adds, "The greater variety of lot sizes has worked out just fine—it gives us more flexibility in lot and home prices." In addition, the cost savings associated with the reduced street widths achieved in the neotraditional design offset the upfront amenity costs.

Table 1 suggests that neotraditional design does not cost more. In fact, on a per lot basis in Phase I of Four Mile Creek, site development costs (based on estimates for the cul-de-sac subdivision and actual bid prices for the tra-

ditional neighborhood plan, including streets, water, sewer, drainage, landscaping, underground utilities) amounted to \$1,396 less per lot—and neotraditional communities offer decidedly more amenities than the conventional subdivision.

Streets and Paving

The repetitive cul-de-sac plan calls for 11,800 lineal feet of streets plus 16 cul-de-sac turnarounds. The total area of streets with a 30-foot pavement width is 354,000 square feet. Added to that is 80,400 square feet for the 80-foot-diameter turnarounds at the ends of the 16 cul-de-sacs for a grand total of 434,000 square feet of paved area, all with standard curbs. In contrast, the neotraditional plan contains a somewhat increased length of streets at 13,599 feet (15 percent), but the total area of pavement, including seven motor courts and 10 "eyebrows," is 394,000 square feet, a reduction of 40,000 square feet or 10 percent.

The reduction in pavement area was the result of Boulder's willingness to accept alternative street and paving standards. Curb-to-curb street widths were reduced from 30 feet to 26 feet for the local streets. In addition, 25 percent of the streets are pedestrian-oriented lanes whose pavement widths average 20 feet. Furthermore, many of the streets use "mountable" rolled or depressed curbs instead of the typical vertical curbs. The benefits of alternative curb types include easy snow removal, the elimination of curb cuts for driveways, and, perhaps most importantly, parallel parking that "hugs" the curb and eases the passage of through traffic.

Lot Yields and Sizes

The conventional cul-de-sac scheme provides for a total of 299 lots in two lot configurations: 65 feet x 110 feet and 75 feet x 120 feet. Among the 299 lots are 70 pie-shaped cul-de-sac lots, which always pose a design challenge. In contrast, the traditional neighbor-

hood offers a variety of lot sizes, including the following:

Patio Garden Lots	55-60 feet wide, 40°
Standard Lots	65-70 feet wide, 40°
Estate Lots	75-80 feet wide, 13V

The result is a slightly higher lot yield of 307 versus 299. More importantly, the traditional neighborhood eliminates "narrowed-necked" pie-shaped lots. Further, instead of looking out on cul-de-sac concrete circles, 61 lots (20 percent) face landscaped motor courts with visitor parking; another 67 lots (22 percent) front on low-speed, low-volume "shared streets." Therefore, in the traditional plan, almost half of the lots enjoy a special neighborhood setting other than a repetitive streetscape or cul-de-sac.

Marketing Advantage

The traditional neighborhood offers a decided marketing advantage from both an environmental and safety/security viewpoint. We all know that urban crime has spread from the cities to the suburbs. Few if any communities are immune. According to the principles of the National Crime Prevention Institute as presented in *Crime Prevention Through Environmental Design—Applications of Architectural Design and Space Management Concepts* (Timothy D. Crowe, Butterworth-Heinemann, Boston, 1991), smaller, lower-volume streets are unattractive to thieves and burglars—it's too difficult to hide and make a fast getaway. Since these streets are designed to encourage walking and to get neighbors out on the streets, they provide an added "self-policing" or neighborhood watch benefit.

The conventional cul-de-sac plan provides for one major open space in the form of the wetlands pond and surrounding buffer as well as for several peripheral buffers, four 25-foot-wide pedestrian pavements between lots, and one pedestrianway/bikeway that is approximately 1,100 feet long.

Cost Component	Cul-de-sac Subdivision (138 lots)	"Traditional" Neighborhood (149 lots)
Excavation and Grading	\$ 152,800	\$ 150,800
Streets, Curbs, Sidewalks, Cul-de-sacs, and Courts	533,000	525,000
Water	180,000	201,000
Sewer	225,000	251,000
Drainage	250,000	225,000
Landscaping and irrigation, Bikeways, Fencing	177,000	177,000
Underground Utilities (electric, gas, telephone)	150,000	171,000
	\$1,767,800 or \$12,810 per lot	\$1,700,800 or \$11,414 per lot

The plan's overall open space area totals 137,000 square feet or 3.1 acres.

By contrast, the traditional neighborhood accommodates a variety of open space areas that total 5.1 acres, from the wetlands park area to a series of smaller parks, courts, and plazas. In addition, 5,000 lineal feet of interconnected pedestrianways/bikeways link Four Mile Creek's south boundary to the regional trail system. During the early stages of development, common area amenities represent important assets that help sell a community, after project completion, these same amenities serve the lifestyle needs of permanent homeowners and residents. While increasing open space by over 60 percent, the traditional plan also achieves greater variety of lot sizes (and sales prices, perhaps another marketing advantage) and provides an increase of nine lots. Another environmental benefit of the traditional plan is reduced storm water runoff due to the 10 percent reduction in paved area.

Summary

As of July 1993, site work had begun on Four Mile Creek. The Phase I lots will be ready for home construction before the end of the year. Home prices will range from \$225,000 to \$400,000. In fact, homes are expected to sell as fast as they are constructed.

The most expensive homes will be sited on larger lots that directly face the creek and its rows of cotton woods and distant views to the south.

The developers and builders are pleased with the plan and the prospects for the future. According to developer Jim Hudson, "We are in a hot market. There is a lot of interest in the lots."

Just as it is unfair to blame a failing project in a depressed market on "neo-traditional design," it is also stretching logic to attribute success in a "hot" market to the attributes of the site plan. It is clear, however, that without a more innovative "traditional" plan, the developers would still be at the starting gate in terms of development approvals. Boulder is a small city with unusually high expectations for the quality of new development. It is willing to experiment, to innovate, and to avoid the "cookie-cutter subdivision" syndrome. Even though the development approval process took longer than projected, in particular due to the normal lack of coordination between the planning and engineering departments, the city approved the plan, including annexation, in about 15 months. This may be a record for a project of Four Mile Creek's magnitude in a town like Boulder. All of the parties, on the city side and the developer side, including the civil and traffic

engineers, contributed to the success of the review and approval process.

Four Mile Creek offers everyone, including the future residents, a win-win outcome. The good reason from this project is that good design—yes, neotraditional design—does not cost more. With alternative subdivision standards geared toward a more pedestrian-oriented environment, good design can even cost less. The additional amenities and hometown character should also mean faster absorption and sales, indirectly reducing cost further.

The city of Boulder is enthusiastic about the alternative street standards and has started a process to adopt similar standards for the entire city. The traditional neighborhood approach will be applied to other growing areas of the city, particularly the northwest planning area (about 2,000 acres) and the northeast annexation areas surrounding Four Mile Creek.

"Although the developer is still unhappy about the time it took to approve the project, I would say we are at least a year ahead of where we would be with a conventional project," says John Fernandez of the Boulder Planning Department. "Four Mile Creek will set some new standards for traditional neighborhood planning—here and elsewhere in the country."

The developers of Four Mile Creek have now become articulate spokespersons for many of the concepts of traditional neighborhood design and are excited about building the project. Homebuyer demand is strong, and the project has received a lot of favorable publicity.

"The in-town housing market in Boulder is superhot," according to developer Don Cooke. "We feel Four Mile Creek will offer a similar ambience to the wonderful older neighborhoods of Boulder."¹¹

Peter H. Brown, AIA, AICP, architect and city planner, is president of Peter H. Brown Civic Design, located in Houston.

E N V I R O N S

C. define nature of roads and streets

Protect Character of Rural Roads

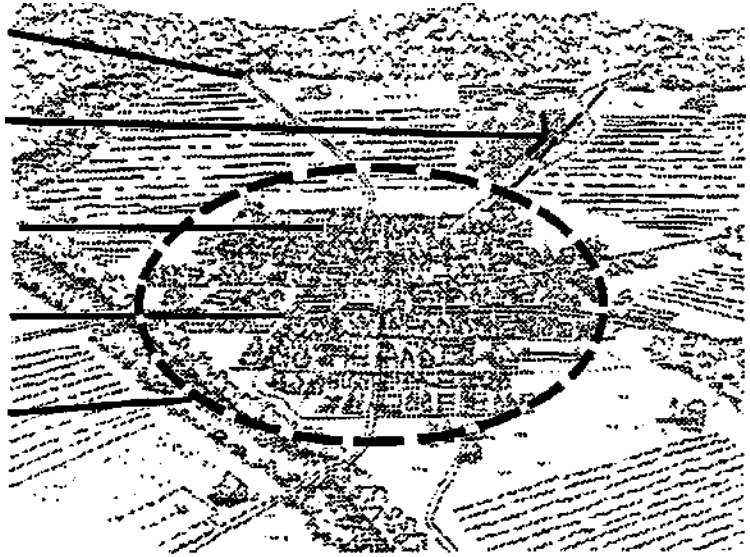
Access to arterial roads should be permitted only from public streets (except for farm vehicle access to fields and farm driveways))

Require rural scenic buffers along highways as new development occurs. Maintain country road design standards for local roads

Provide appropriate street structure for hamlet/village development

Plan development and limits of growth so that internal trips are walkable

Provide opportunities for walkers and cyclists



C01

Protect character of rural roads

EXAMPLE OF RURAL ROADS CHARACTER ASSESSMENT AND DESIGN GUIDELINES

C02

Permit Access to arterial roads only

from public streets EXAMPLE OF **COUNTY ACCESS PLAN**

EXAMPLE OF MUNICIPAL ACCESS PLAN

C.03

Require scenic buffers or easements

COPY OF SCENIC HIGHWAY LEGISLATION

CM

Establish appropriate street structure for hamlet/village development

EXAMPLE OF DESIGN GUIDELINES FOR HAMLET/VILLAGE STREETS AND BLOCK STRUCTURE

C.05

Provide opportunities for walkers and bicyclists

SECTION DIAGRAM SHOWING REQUIREMENTS AT SHOULDER FOR PEDESTRIANS AND BICYCLISTS

C.06

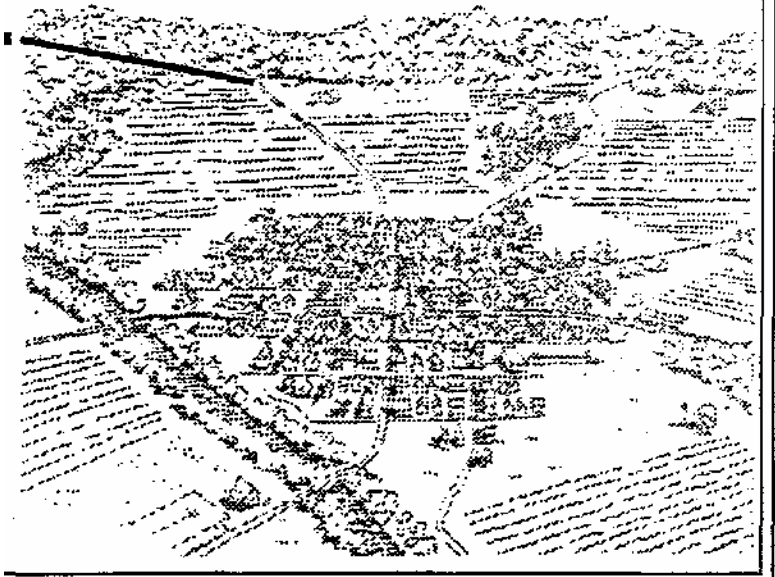
Plan development and limits of growth so that internal trips are walkable

DIAGRAM OF WALKING DISTANCES IN HAMLET / VILLAGE DEVELOPMENT

C. define nature of roads and streets

Protect Character of Rural Roads

C.O;
Protect character of rural roads



' DESIGN GUIDELINES AND EXAMPUE OF RURAL ROADS CHARACTER ASSESSMENT MAP

The attached description of Country Roads differs from the Woolwich Township Master Plan and Zoning Code in small but important ways, because of the expressed desire of the residents to preserve the sense of a rural way of life, even after new growth and development takes place.

1. The list of road types in the Country Roads is similar, but is simplified to have fewer "sub-types", so that proposed changes to roads when future development takes place can be more easily evaluated.
2. The roadway and right-of-way widths in Country Roads are narrower, to encourage traffic to move more slowly, and thereby to permit their use by walkers and bicyclists, and to keep the calm qualities of the rural environment that is enjoyed now.
3. The recommendation for the inclusion of "frequent roadway curves" in the Country Roads descriptions is obviously general, and does not apply specifically to Woolwich.
4. The description of hamlet and village streets in Country Roads that suggests short and relatively straight streets laid out in a grid, and that recommends the use of natural swales instead of curbs, is a set of details that is extremely important in maintaining the county / rural character of the Township in the future. The Master Plan does not deal with this goal, nor does it get to this level of detail.

SCENIC ROAD CORRIDO
AND VIEWSHED ANALYS
Township of Lower Merion

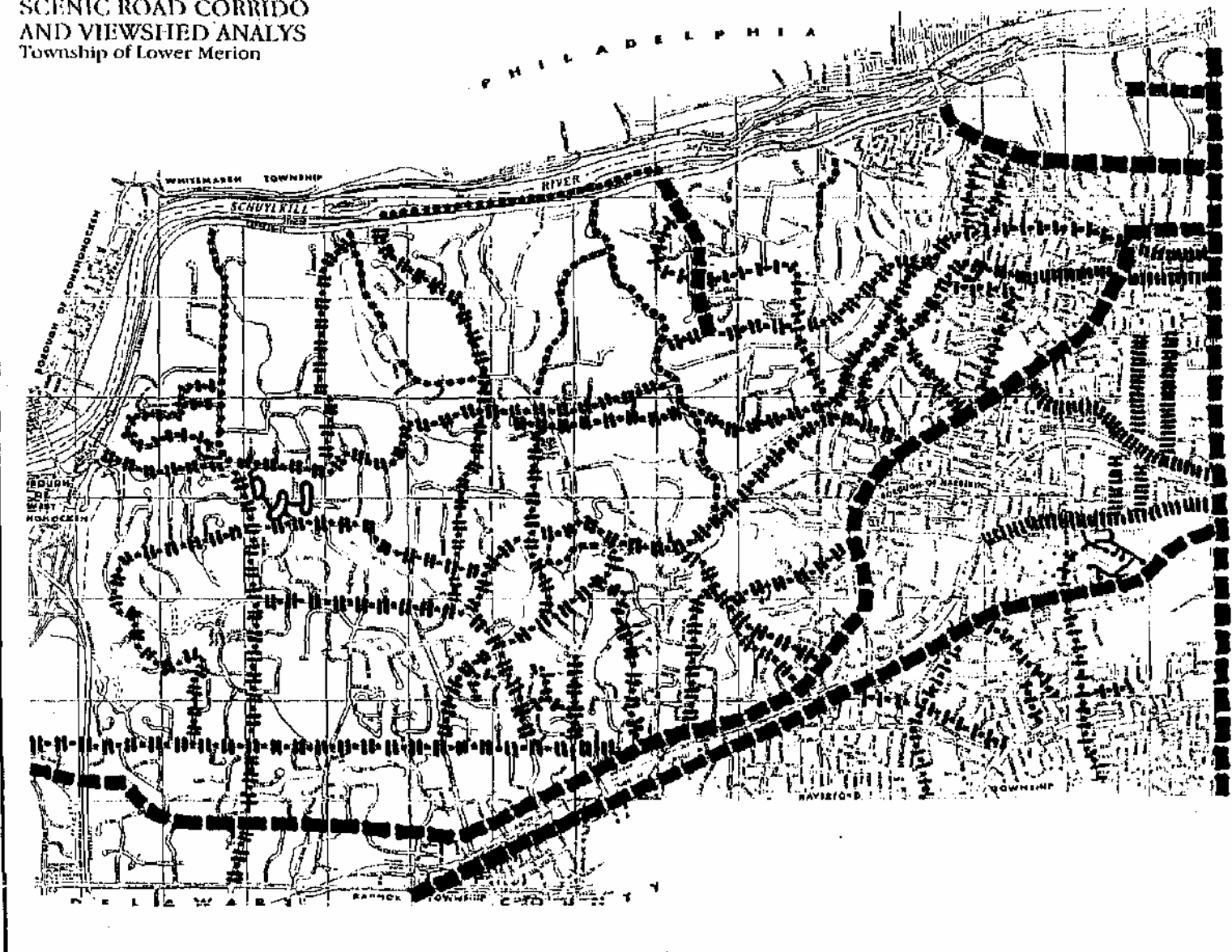








Figure 4
Road Classification System

-  Country lane
-  Rural Residential Road
-  Classic Railroad Suburb
-  Automobile Suburb
-  Contemporary Suburb and PUD
-  Connector Roads

TOWNSHIP OF LOWER MERION
Department of Planning and
Community Development

SOUTH STREET DESIGN COMMITTEE
CAMERON THOMAS & COMPANY

North

Primary

COUNTRY ROADS

Many states, counties and towns are currently seeking to preserve the character of rural roads. Programs to preserve the character of country roads have been adopted both in recognition of the scenic qualities of these roads, which are valued by both residents and tourists, and to support land use goals which encourage future development to be located within targeted growth areas.

Country road programs work differently on different types of roadways. This paper summarizes appropriate country road preservation efforts for different functional classes of roadways.

Principal arterials: Land adjoining principal arterial highways that has significant scenic value should be preserved through the acquisition of scenic easements, conservation easements or application of appropriate land use controls. Billboards and other commercial signs should be prohibited within view of the highway corridor unless directly associated with the property and in scale with the land use.

Interchanges on freeways should be widely spaced and connect only with other principal arterials having access control, or with minor arterials and collector roads providing essential linkages to rural town centers. To discourage development along roads not having access control, access rights should be purchased for at least one-half mile from the highway interchange, or until growth boundary of the rural or urban center has been reached, whichever is less. Direct access to adjoining properties should be limited to public streets and roads, to farm homesteads or central farm processing centers, and to field access roads if the arterial is the only roadway offering field access. In addition, direct access to utility structures, drainage structures, or other essential public features may be provided if daily vehicle trips would average less than five and a service road would otherwise have to be constructed.

Minor arterials: Land adjoining minor arterials that has significant value should be preserved through the acquisition of scenic easements, conservation easements or application of appropriate land use controls. Direct access to adjoining property should be limited to agricultural purposes. Farm markets should be either incorporated into village development plans or into farm homestead developments.

Roadways should be designed and managed to maintain a rural character and kept to one lane in each direction. However, because of higher vehicle volumes and operating speeds, some improvements are required to protect the safety of motorists, bicyclists and pedestrians. Roadways should have a maximum lane width of twelve feet; and a paved five foot shoulder should be provided in each direction for bicyclists and pedestrians. In addition, a clear, graded area of two to four feet is desirable to provide pedestrians with a refuge outside of the roadway. A 50 MPH design speed is appropriate for these highways,

and periodic curves and intersections are desirable to interrupt sections with higher design speeds.

Collector roads:

Collector roads provide access to rural villages and hamlets. They should be designed to discourage fast travel speeds and maintain rural character. Because these roads will usually have lower vehicle volumes and speeds, they do not require major roadway improvements or high design speeds. Low pedestrian and vehicle volumes will result in few pedestrian/vehicle conflicts. Vehicles should be able to safely pass pedestrians by encroaching on the opposing lane of traffic or by waiting until an opposing vehicle drives by.

Roadway widths of 18 feet provide acceptable service for rural collector roads. An additional five foot grass graded area should be provided on each side of the roadway to provide pedestrians with a safe refuge off of the roadway. Total right-of-way on rural collector roads will usually be either half a chain (33 feet or 10 meters), or 40'. Design speeds of 40 MPH and posted speeds of 35 MPH are desirable. Relatively frequent roadway curves can help to limit operating speed on these roadways. Overhanging tree limbs, proximity of field fences or hedgerows and other rural design measures should be employed to enhance the rural character of the roadway.

Direct access onto collector roads should be discouraged except for farm homesteads, other agricultural uses, essential resource extraction land uses or within hamlets or villages. Where direct access is provided, properties should provide a visual buffer in keeping with the rural character of the roadway.

Local roads:

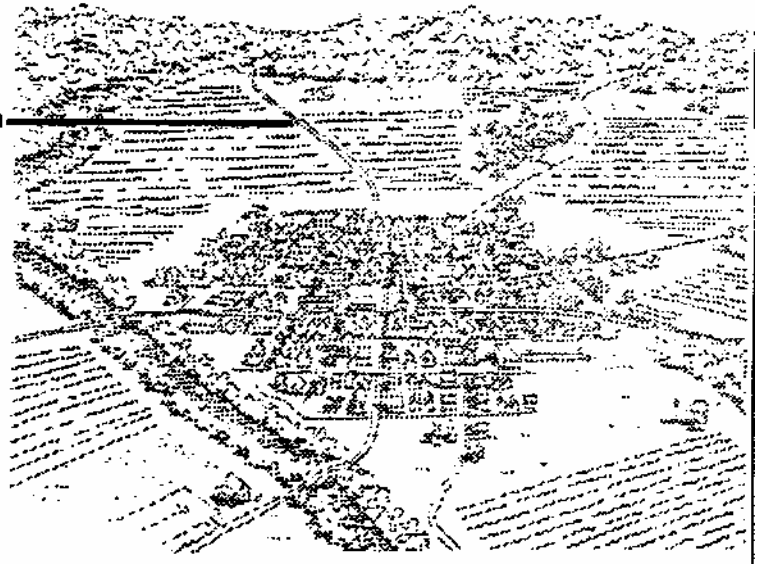
Local rural roads should serve to provide access to farm communities or to isolated homesteads or processing facilities. Local roads also provide additional access in villages and hamlets. As with all local roads, roadway design should discourage fast operating speeds. Because rural roads have low traffic volumes, and because lots on rural roads should be sufficiently large to permit all parking to occur on-site, local rural roads can be very narrow. Roadway widths of 12' to 14' are appropriate within cleared rights-of-way of 33'. Traffic markings should only be applied at intersections with higher order roads.

The function of local roads is to provide access to property. Roadways should be relatively short in length and not be designed to provide major shortcuts. Houses constructed on local roads should be encouraged to have either very small or very large setbacks. Uniform 30' to 50' setbacks can create an inappropriate suburban look to development on rural roads.

C. define nature of roads and streets

Access to arterial roads should be permitted only from public streets (except for farm vehicle access to fields and farm driveways)

C.02
Permit Access to arterial roads only from public streets



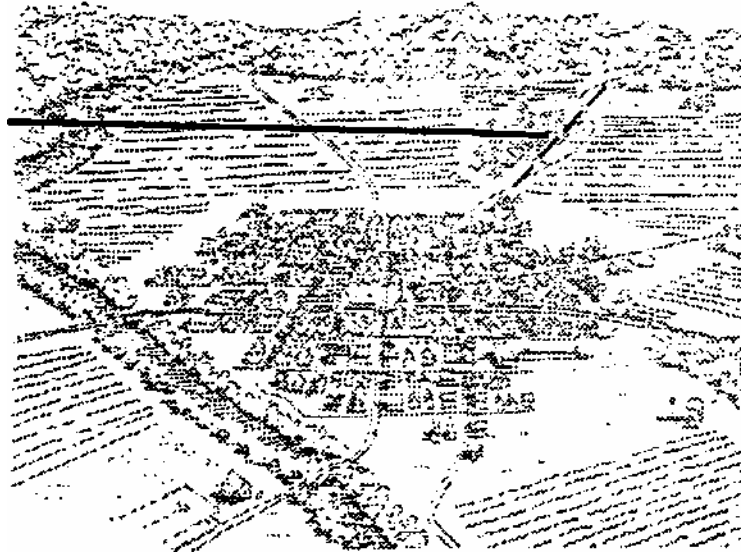
**EXAMPLE OF COUNTY ACCESS PLAN
(NOT YET INCLUDED)**

**EXAMPLE OF MUNICIPAL ACCESS PLAN
(NOT YET INCLUDED)**

Examples from these **types** of documents should be included to provide a model for future planning...

C. define nature of roads and streets

Access to arterial roads should be permitted only from public streets (except for farm vehicle access to fields and farm driveways))



C03

Require scenic buffers or easements

COPY OF LEGISLATION DESCRIBING THE POWERS OF THE COUNTY AND MUNICIPALITIES TO GUIDE FUTURE DEVELOPMENT ALONG EXISTING CORRIDORS AND SCENIC HIGHWAYS— (NOT YET INCLUDED)

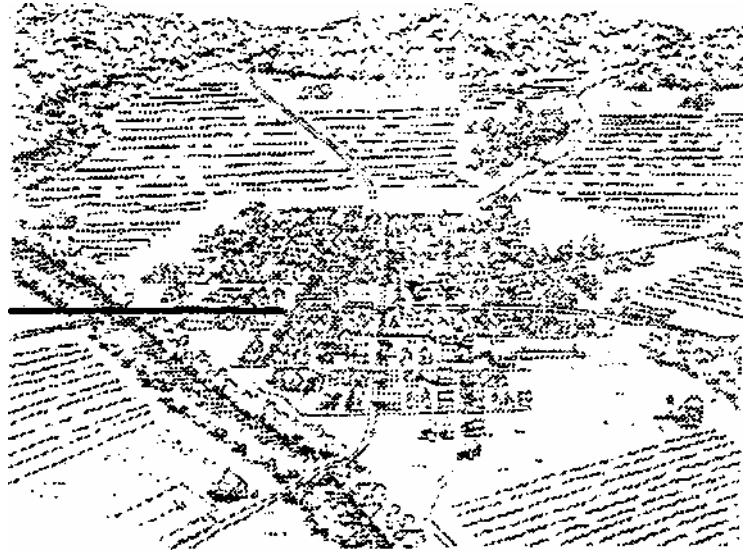
Check w/ Chuck Romick...will be essential to define content and purpose of the county and township Access Management Plans

C* define nature of roads and streets

*Provide appropriate street structure for hamlet/
village development*

C04

*Establish appropriate street structure
for hamlet/village development*



**EXAMPLE OF DESIGN GUIDELINES FOR HAMLET/
VILLAGE STREETS AND BLOCK STRUCTURE**

These examples are included to show the kind of illustrative guidelines that will provide neighbors, developers, lenders and investors a clear picture of the qualities and character of hamlet/village development.

Writing and Illustrating Codes and Ordinances

4. A maximum of five percent of all lots for single family detached dwellings may be flag lots. Refer to Illustration 24.

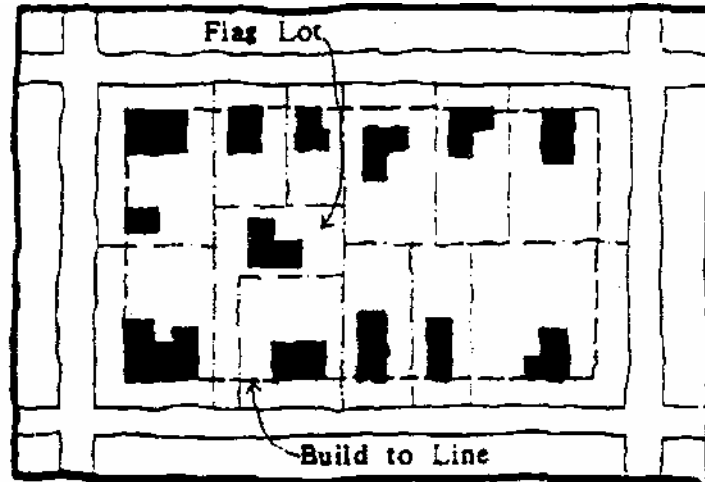


Illustration 24 Diagram of varied lot sizes, including a flag lot. Front yard setbacks must conform to a build -to line.

SECTION 13. STREETS WITHIN PLANNED SMALL COMMUNITY

1. The street layout shall be a modified grid street pattern adapted to the topography, unique natural features environmental constraints of the tract, and peripheral open space areas. The street layout shall take into consideration the location of the community focus, other internal open space areas, gateways, and vistas. Refer to Illustration 25. A minimum of two interconnections with the existing public street system rated as an arterial or collector shall be provided where possible. Linkages to adjacent developments and neighborhoods with pedestrian and bicycle paths are recommended where possible.

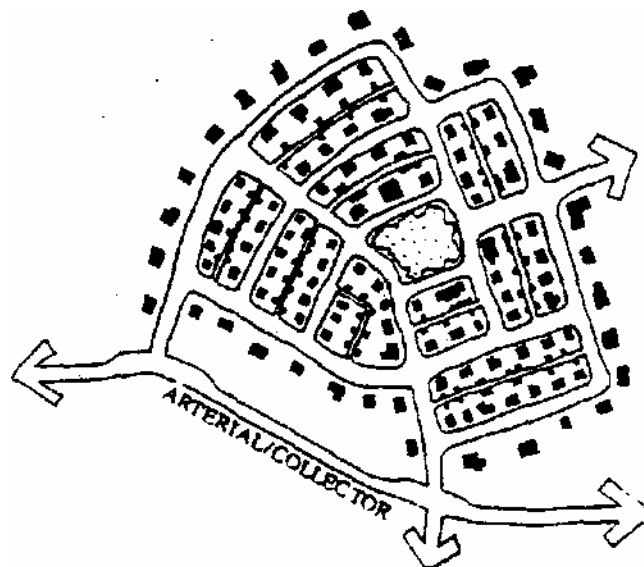


Illustration 25 Diagram of a modified grid street pattern with three connections to the surrounding street system. Each small community must have at least two peripheral attachments.

Are traffic snarls a necessary accompaniment of suburban growth? The advocates of neotraditional planning and pedestrian pockets say "no." If we just change the way we design communities to eliminate some car trips and shorten others. Their ideas seem workable, and will soon be tested in real-life communities.

"Automobiles tire j^:-n cGni'tnientfy tagged as the il-lams responsible for :he ills of cities and the disappointments and futilities of dty planning. But the destructive effects of automobiles an much less a cause than a symptom of our mcompet^njre at city building. Of course planners, including highwaymen with fabulous sums of money and enormous powers at their disposal are at a loss to make automobiles and cities compatible irith one another. They do not kncrz -±-bat to do izith automobiles m cities because they do not knoir how to plan for workable and "ital cities biles. — vith or without automo—"—Jane Jacobs!

Ask any resident of a rapidly growing suburban area what she dislikes most about where she lives and the answer is likely to be, "the traffic!" This response is not the result of mass delusion. The facts bear it out.

According to the recently released *Xationiside Personal Transportation Study* (NPTS) conducted for the U.S. Department of Transportation, vehicle miles traveled (VMT) increased nationwide by a staggering 41 percent between 1983 and 1990. In contrast, the population increased by just 6 percent, an increase that would have accounted for only 14.8 percent of total tn-own in traffic had it not been for other demographic changes such as growth of the labor force.²

As shown in Figure 1, nearly two-thirds of the traffic growth occurring during the seven-year period can be attributed to increases in the number of vehicle trips and increased trip distances. The growing reliance on the car for daily travel needs accounted for over 25 percent of the growth in travel. *NPTS* data show that while the average number of *person trips* per household increased only slightly, the number of *vehicle trips* increased almost three times as fast (despite a drop in the number of persons per household). The data indicate that people are driving alone more frequently.

The *NPTS* also shows that longer distances of trips accounted for nearly 38 percent of the growth in VMT. Despite — or perhaps because of—increased suburbanization of jobs, services, and entertainment during the 1980s, travel distances increased measurably during the seven-year period. Commuting distances increased by a whopping 25 percent, revealing an even poorer relationship between jobs and housing than experts expected to find.

Not surprisingly, traffic is at the forefront of almost every no-growth movement in the country. Planners and traffic engineers have stood helpless as road congestion mounts. Citing traffic patterns, local politicians and grass-roots citizen groups have led often successful campaigns to slow — or stop — development in jurisdictions all over the nation.

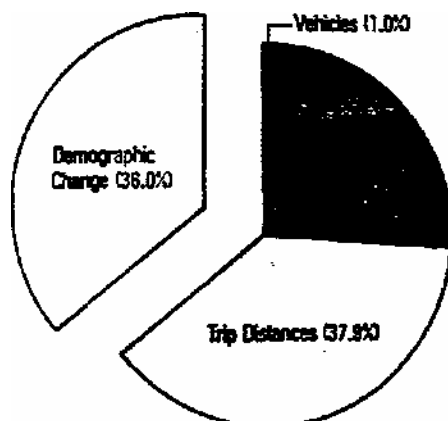
Neotraditional planners, however, believe that growth can be accommodated without suburban gridlock. According to Andres Duany of the Coral

Neotraditional Town Planning

IO 7~1 7 .
*Lars, Pedestrians,
And Transit*

LLOYD W. BOOKOUT

FIGURE 1: COMPONENTS OF GROWTH IN HIGHWAY TRAVEL 1983-1990



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 which growth occurs.
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 but the pattern of
 growth that is
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 that Duany and others
 of the neotraditional
 school may have a
 point. VMT would
 have increased by
 about two-thirds less
 between 1983 and 1990
 if the total number of
 trips and the lengths of
 those trips could have
 been held at 1983
 levels. At issue is the
 relationship between
 land uses, between jobs
 and houses, houses and
 stores, and so on. Must
 people continue to drive
 between each and every
 one of the places they
 visit regularly?

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 in response to the orientation
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 a neigtjorfood park.

The grid pattern was
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KENTLANDS

The master plan for
 Kentlands in Gaithersburg,
 Maryland, demonstrates how
 the grid street pattern is
 broken frequently by traffic
 circles, proposed butngs,
 or significant features.

At the heart of the neotraditional movement is the objective of returning to the land of communities in which the automobile does not reign supreme, and in which residents and workers can realistically walk or bicycle to work, school, or shopping. As Victor Mirontschuk, president of Houston-based EDI Planning and Architecture, explains, "The neotraditional concept is not radical—it acknowledges that Americans have a love affair with their cars. But it also acknowledges that Americans should be given a choice and *not forced* to use their cars for every travel need."

Another pan to the neotraditional vision also offers hope for reducing traffic growth. Advocates of traditional neighborhood developments (TNDs) aim to create land use patterns and circulation systems that effectively reduce the distances of trips. Through the better integration of employment, residential, and commercial activities, they seek to pro-

vide more direct routes over shorter distances between uses.

To reduce either the number of vehicle trips or trip distances, neotraditionalists have put forward several basic planning and design principles:

- A return to a grid circulation system, or at least the provision of more direct connections between any two points within the community.
- A return to communities that are more "friendly" to pedestrians and bicyclists, and less dominated by the appetite of the car for space and speed.
- An increase in the viability of transit as an alternative to the private automobile.

The Return of the End

One of the most commonly held perceptions of a TND is that it is based on a circulation system laid out in a grid pattern. Most of the neotraditional communities now in planning or under development do, in fact, feature a grid theme over large portions of their planning areas. Brambleton in Loudoun County, Virginia, and Kentlands in Gaithersburg, Maryland, are examples.

In contrast, the PUDs of the 1970s and 1980s are strongly dominated by curvilinear street patterns, culs-de-sac, and a rigid hierarchy of street classifications. Duany has likened such circulation systems to a bowl of spaghetti of different sizes. "How could anything so random actually happen?" he asked at an American Planning Association-sponsored workshop in September 1989 on neotraditional planning, referring to a plan for one Florida project.

These curvilinear street patterns emerged because of perceived flaws with the grid circulation scheme. Most criticized was the opportunity the grid offers for traffic to cut through residential neighborhoods. To eliminate the traffic on residential streets, planners created labyrinthine street networks with a minimum number of through connections. They placed houses around culs-de-sac to farther minimize traffic volumes, and homebuyers showed their support for these schemes by often paying a premium for the most isolated lots. By reducing grading and the number of trees removed, the curvilinear street patterns were also seen as a way to minimize development impacts to the natural environment.

Has anything happened to indicate that suburban residents are now willing to give up their culs-de-sac in trade for the grid (or something like it) concept? Not really. Except they may have concluded from their frequent experience of emerging from their local residential streets into long lines of cars on the arterial highway system that one reason traffic is so bad in the suburbs is that everyone is forced to drive on the same limited number of collector and arterial streets, no matter where they are going.

This is an argument raised by TND advocates. The solution, they believe, may be to open up more connections between destinations and effectively to shorten the distances between those destinations. The grid is the most effective, direct, and simple system for connecting all points within a travel area.

But as Jay Parker, president of HOH Associates in Alexandria, Virginia, noted at a June 1991 ULI seminar on trends in developing master-planned communities, the grid system also means more streets. "Neotraditional plans typically require about 20 to 25 percent more streets than conventional PUD designs. However, [streets in neotraditional communities] tend to be narrower. The additional streets are necessary to support the approximately 20 percent increase in density and the smaller planning parcels."

A 1990 study prepared for the American Society of Civil Engineers (ASCE) estimates that TND's use of land for streets exceeds that of a conventional PUD by about 13 percent. However, the study also notes that the "greater intensity of land use and the use of local streets for parking under the TND pat-

tern results in a ratio of total automobile use space (streets plus parlour per developable foot of area) that is equivalent *fa*: both [design options]."¹

Not everyone believes that returning to the grid is, in itself, a solution. Planner Lane Kendig suggests there may be other motives behind the call for the grid: "Most neotraditional plans are prepared by architects who are used to working with T-squares. Also, straight streets better accommodate grand, high-style architecture and that is what most architects like to design," Duany agrees that it is difficult to establish a sense of place on curving streets: "Curvilinear streets are unmemorable because the eye is always moving. An architect cannot design a memorable building when the eye will not focus on it."

Is it possible to balance the traffic objectives of the neotraditional vision with the apparent market support for "quiet" residential streets? Perhaps, with modifications to the basic grid scheme. Plans for most neotraditional communities underway frequently break the grid with radial streets, traffic circles, and street terminuses that tend to limit the overall expanse of the grid and reduce the lengths of streets. The grid pattern in these plans is most evident in zones long-believed to be most tolerant of traffic—commercial and higher-density residential areas. As densities decrease, the grid tends to be broken more often or dropped altogether.

Neotraditional planning theory also argues that cars, pedestrians, and houses can coexist on streets that are designed with coexistence in mind. Some fresh thinking on how streets should function is required.

Rethinking the Function of Streets

We have come to think streets should be built first and foremost for the convenience and speed of moving cars, overlooking the feet of the matter—that the point is to move people, not cars. We have set in motion an endless need for more and bigger roads, because residents of suburbs are given no viable alternatives to driving. The neotraditional vision holds that there is something very wrong with this way of thinking.

Making streets more inviting to pedestrians and bicycles will first require reducing the speeds at which cars can safely travel. Neotraditionalists suggest that in most communities residential streets are overdesigned, allowing cars to move much faster than they safely should. For example, many subdivision codes require right-of-way distances of 70 to 80 feet for local streets. If the objective of these streets is to carry only local traffic, it is not really necessary to design them so generously.

Neotraditionalists believe that by being so accommodating to the needs of cars, planners have neglected the needs of people. The needs of pedestrians and bicyclists and considerations of "street appeal" and safety must also be accommodated.

This is especially so when densities get higher. With single-family houses built on lots smaller than 5,000 square feet, the impact of cars on the aesthetics and function of streets can be severe.⁴ The treatment of garages is of primary importance.

To minimize the negative effects of garages and driveways on residential streets, most neotraditional plans either require the garages to be pushed to the rear of the lot (with access via a long driveway near the side yard lot line), or to be located on an alley behind the houses. Alirontschuk explains: "Alleys can be an effective design solution when densities get high. In the Lake Park community in Union County, North Carolina, alleys were specified for the houses located around the town center core where we felt it was essential for the streetscape to have a continuous flow. Garage doors and curb cuts would have caused too many visual and functional interruptions."

Street design can also help to minimize the dominance of cars. Reducing the distance that pedestrians must traverse to cross a street at an intersection is important. Crossing distance is not only a function of street width, but also of the radius of the circle formed by the curb's corner curve—the curb radius. Duany argues: "Pedestrians do not want to walk across intersections that are designed to the Department of Transportation's standard radius of 25 to 35 feet. A more appropriate radius for accommodating pedestrians is eight feet, which was the standard used in Washington, D.C.'s Georgetown and in [Old Town] Alexandria, Virginia."⁵

Traffic signals can be set short and simple to accommodate pedestrians and bicyclists, and other streetscape elements, including setback and parking (more on these in future articles), designed to create street appeal and enhance pedestrian safety.

Designing for Transit

While most TNDs proposed or underway in the eastern United States focus on making communities that are more accommodating to pedestrians and bicyclists—and may potentially reduce trip distances—some recent California projects have been termed transit-oriented developments (TODs). The TOD movement has been led by Peter Calthorpe of San Francisco-based Calthorpe Associates, promoter of the "pedestrian pocket" concept, defined as a "simple cluster of housing, retail space and offices within a quarter-mile walking radius of a transit system."

TODs are similar to TNDs in their espousal of compact development patterns and highly integrated land uses to permit nonvehicular travel. Further, both encourage having residential and employment uses close to one another to foster improved jobs/housing relationships and reduced commute distances. The primary characteristic that distinguishes between the two concepts is transit. TODs are predicated on convenient access to transit—such

as light rail—whereas most TNDs do not necessarily have a transit orientation.

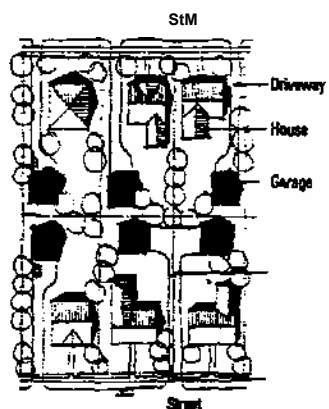
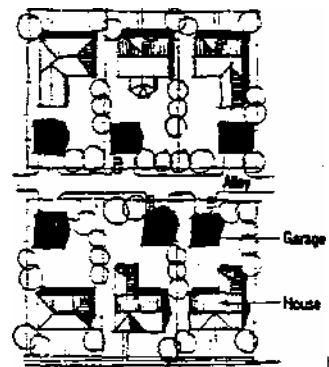
Also, TODs and pedestrian pockets are not as closely linked as TNDs to historic small towns, either architecturally or rhetorically. According to Calthorpe: "The problem is to introduce the needs of the pedestrian and transit into the auto-dominated regions of our metropolitan areas, not to return to the fiction of small-town America...."⁷

TODs have been promoted most widely in northern California as an alternative to urban sprawl and as a way to minimize the negative traffic and air quality impacts of growth. The rapidly growing Sacramento region especially has embraced the concept as a way to accommodate growth and yet avoid the automobile-dependent land use pattern so evident in southern California and much of the San Francisco Bay Area. County planners hope to channel growth along future extensions of their 18-mile light rail starter line.

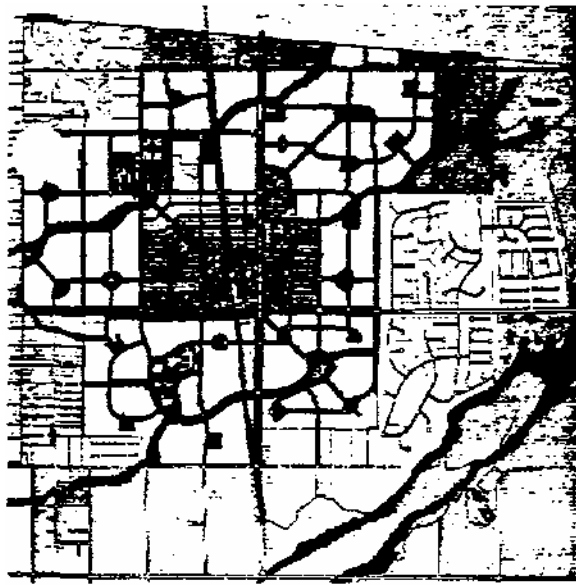
In 1990, Sacramento County initiated an amendment to its general plan to incorporate the draft Transit-Oriented Development Guidelines prepared by Calthorpe Associates. If adopted, these guidelines would be used as a basis upon which to evaluate new development proposals. Growth would be directed into "Urban TODs," "Neighborhood TODs," and "Secondary Areas," each of which would be served by varying levels of (and proximity to) transit. The guidelines define a TOD as:

... a mixed-use community within an average one-fourth mile walking distance of a transit stop and core commercial area. The design, configuration, and mix of uses emphasize a pedestrian-oriented environment and reinforce the use of office, open space, and public uses within comfortable walking distance, making it convenient for residents and employees to travel by transit, bicycle or foot, as well as by car.

The 800-acre community of Laguna West about 12 miles south of Sacramento is emerging as the first pedestrian pocket, and a prototype for future TODs. The project features 2,300 housing units across a broad range of types and prices, located in five neighborhoods; a 65-acre lake; and a town center. The town center is designed to accommodate



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1,000 higher-density units, 90,000 square feet of retail, and 150,000 square feet of service office. Unfortunately, Laguna West is lacking the light rail transit element that would make it an exemplary TOD. County planners hope that one day rail transit will be extended to me project and believe that, in the meantime, a land use pattern is emerging that will make transit

feasible. The community therefore will include a transit stop for buses. A recently released study from the University of Wisconsin-Milwaukee confirms that, in general, TND and pedestrian pocket concepts are supportive of transit.⁸ The study assesses 10 "exemplars"—suburban projects that represent a trend toward more concentrated development and mixed land

Dry Creek Ranch is a 1,850-acre community being planned by Calthorpe Associates in northern Sacramento County, California. This mixed-use, pedestrian-oriented community is one of three transit-oriented developments (TODs) being planned concurrently under the umbrella of a single community plan. Dry Creek Ranch will feature a transit station located within its commercial core that will provide bus service to future light rail transit stations about two miles to the east and south of the community.

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A recently released study from the University of Wisconsin-Milwaukee confirms that, in general, TND and pedestrian pocket concepts are supportive of transit.⁸ The study assesses 10 "exemplars"—suburban projects that represent a trend toward more concentrated development and mixed land

use.' As only one of these communities has been built, the study's findings are based on an examination of proposed plans and an analysis of the potential for transit services.

All of the projects studied feature a wide range of uses and a mixture of housing types. And eight of the projects feature neighborhood-level commercial services within a quarter-mile radius (walking distance) of residential areas—a logical location for a transit stop.

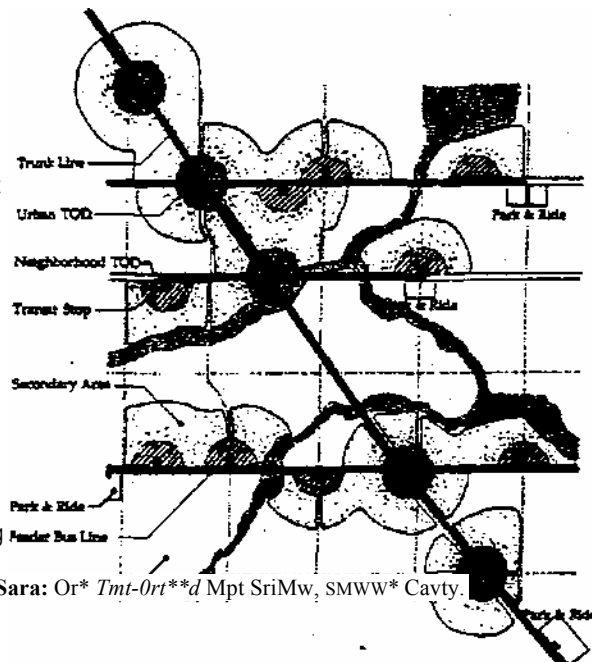
Interestingly, however, only four of the projects actually include transit in their planning programs. The study concludes that the "critical principles underlying most of these proposals, whether they included transit or not, are based on a village or neighborhood in contrast to suburban sprawl, and this concept is indeed transit friendly. Their higher densities, concentrated locations, pedestrian orientation, and mix of uses make them largely transit compatible. However," the report continues, "there are some limitations in the lack of direct transit routing, turns required, and right-of-way that could be obstacles to easy operations of transit."¹⁰ It may be noted, however, that in most of the projects reviewed in the University of Wisconsin-Milwaukee study, there was little need to incorporate "transit-friendly" provisions because there was no major urban area nearby with which to connect the projects. While transit provisions may have been trendy, there was no compelling reason to incorporate them into the design.

The Evidence to Date

Empirical data on the traffic impacts of TND awaits the full coming into being of one or more developments based on the concept. Traffic models suggest that TNDs offer the potential to reduce traffic growth. The 1990 ASCE study suggests that a TND design could produce 57 percent less VMT than a comparably sized project laid out in a more conventional PUD style. This reduction applies only to trips internal to the community and is explained by the more direct traffic routing of the TND scheme. The modeling is based on hypothetical, 700-acre developments containing similar land uses: a TND featuring a simple grid pattern and highly integrated land uses and a PUD-style project with curving streets and land uses segregated into distinct development pods.¹

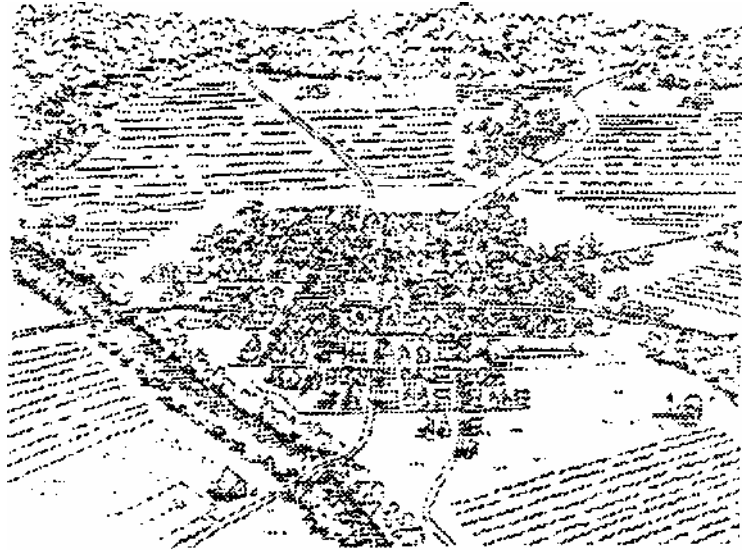
Figure 2 summarizes some of the results of the study and points out some of the tradeoffs that would come from total VMT reduction. The most notable difference between the two concepts is the TND's greater reliance on local streets for intra-community travel. While internal travel could be expected to drop substantially on arterial streets within a TND, local streets could realize up to 400 percent more daily VMT. Even so, the study indicates, local streets would continue to operate at

Urban TODs would be located at primary transit points oriented to commercial and job development. Neighborhood TODs would be located close to the primary transit system and oriented to housing, retail, and services. Secondary areas would surround TODs, offering lower-density housing. Location within biking



Distance of a TOD.

C. cfeffne nature of roads and streets



Provide opportunities for walters and cyclists

COS
Opportunities for walkers and cyclists

SECTION DIAGRAM SHOWING REQUIREMENTS AT SHOULDER FOR PEDESTRIANS AND BICYCLISTS (NOT YET INCLUDED)

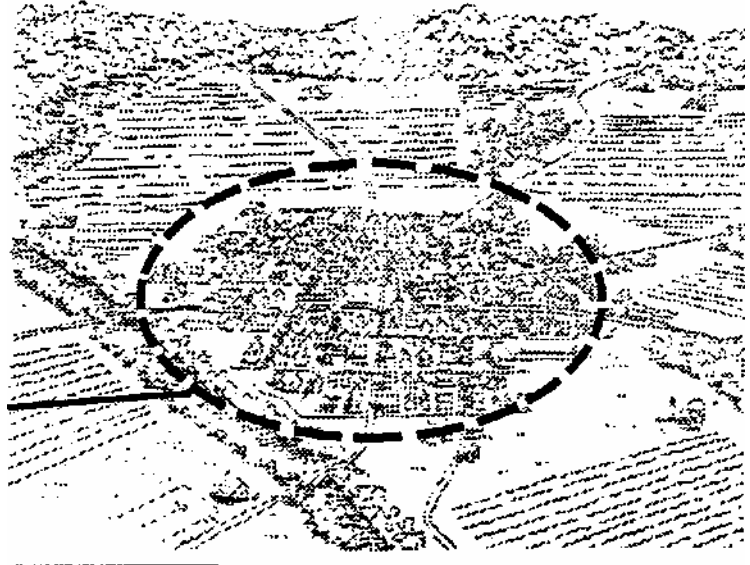
Will be useful to **visualize** the character and use of the **roadway** edge. In **woolwich** tKe requirements are modest and not cosy to include in the cours of normal improvements or development.

C. define nature of roads and streets

Plan development and limits of growth so that internal trips are walkable

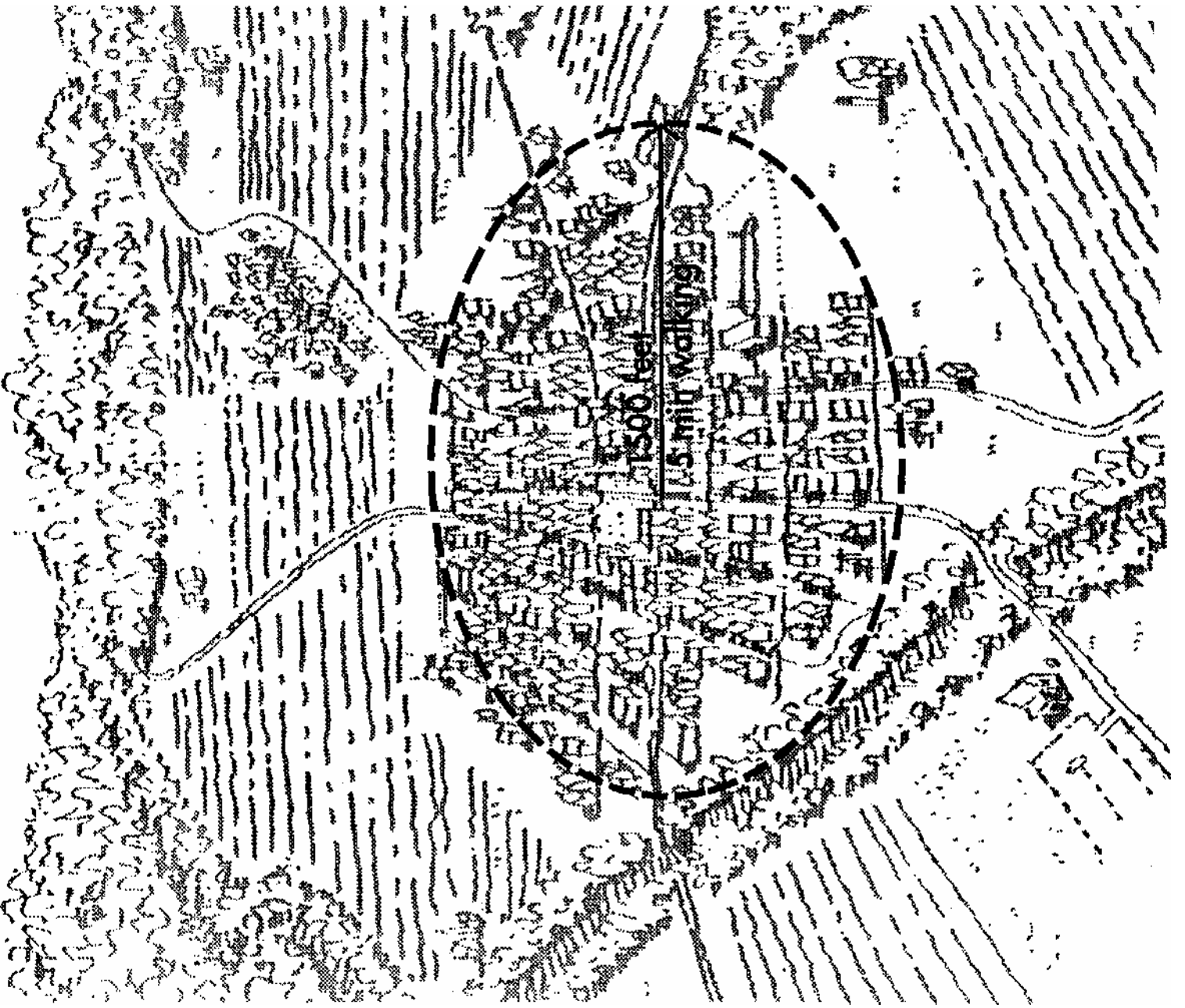
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Plan development and limits of growth so that internal trips are walkable



**OF WALKING DISTANCES IN
HAMLET / VILLAGE DEVELOPMENT**

A good rule of thumb is that a person walks about 280 feet a minute and a village in the country/ or a neighborhood in a town/ should be of a size that most people will choose to walk for internal trips when the weather is nice. Studies indicate that a five minute walk is about as long as most people will feel is comfortable for local convenience trips so the build-out area for a village should occur within a 1500 foot radius of the center of the community.



E N V I R O N S

D. review/revise local regulations

Revise Land Use Element of the Master Pfafi to identify Rural Development Overlay District

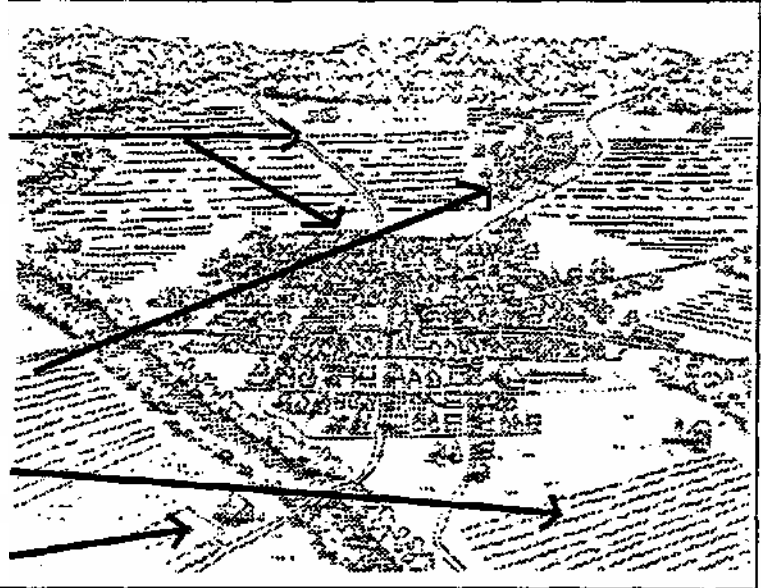
Revise Circulation Element of the Master Plan to reference design standards and access management policies for rural roads & community streets

Revise Utility Element of the Master Plan to include alternatives to centralized waste wafer treatment systems and individual septic systems

Revise Zoning Ordinances to refine area of each land use district uses to reflect market projections. Describe density credits for hamlet/village projects

Develop Subdivision Ord, to include compact communities & protect contiguity of ag. land

Revise Right-to-Farm Ord. on farmer's markets to protect farmer's right to sell agricultural products



D.0T

Master Plan Land Use Element

ANNOTATED WOOLWICH LAND

DM

Master Plan Circulation Element

• ANNOTATED WOOLWICH

D.03

Master Plan Utility Element

• ANNOTATED WOOLWICH UTILITY ELEMENT

DM

Revise Subdivision, Zoning and Site Plan Ordinances

**• COPY OF:
MODEL PLANNING ADN ORDINANCE PROPOSAL
"DEFINING COMPATIBILITY WITH THE STATE PLAN"**

• ANNOTATED EXAMPLE OF ZONING ORDINANCE

• ANNOTATED SUBDIVISION ORDINANCES

**EXAMPLE OF EXAMPLE OF DESIGN GUIDELINES FOR
HAMLET/VILLAGE DEVELOPMENT**

D.05

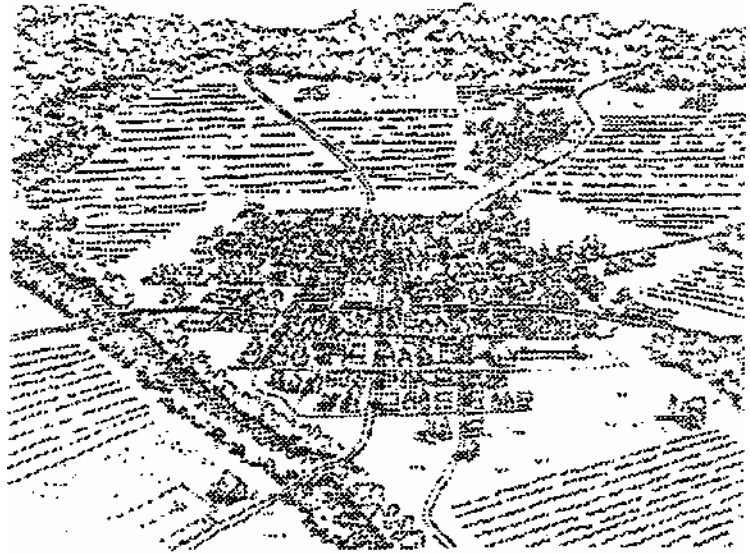
Revise Right to Farm Ordinances

**ANNOTATED WOOLWICH RIGHT-TO FARM
ORDINANCE**

E N V I R O N S

Revise Land Use Element of the Master Plan to
identify Rural Development Overlay District

D. review/revise local regulations



D.07

Master Plan Land Use Element

ANNOTATED WOOLWICH LAND USE ELEMENT

Notes re the Land Use Chapter of the 1990 Woolwich Township Master Plan

1. The eight goals stated on pp 1 and 2 of the Land Use Plan are completely consistent with the objectives outlined in Plan for the Environs of a Center:

- Make of a new regional center (which is also consistent with the NJ State Development and Redevelopment Plan).
- Promote a balance of land uses.
- Development should take place in "nodes" (which is embodied in the plan for hamlet- and village- type developments recommended in the Handbook).
- Development should be more orderly than other suburbs (note the assumptions of "suburban" development, rather than rural).
- Protect the natural environment.
- Clarify the patterns of sewer service.
- Integrate open space with new development.
- Preserve the "rural" land (note that no specific mention is made concerning the preservation of farmland or farming).

2. Most of the details of the Land Use Plan (e.g., 1 and 1.5 ac residential lots, 2,000 ac of non-residential uses, etc.) are based on a population assumption of 75,000 to 98,000 people (in contrast to the 1996 population of about 1,400), which now appears to be much larger than the current market assumptions for the next 25 years, or about 13,000 people. The recommendations of the Plan for the Environs of a Center acknowledge this market reality.

3. The nature of the specific regulations recommended in the Land Use Plan will not, in fact, encourage "nodes" or the preservation of "rural" land, because the pattern of residential development that requires 1 and 1.5 acre lots is the recipe for the typical sprawl pattern of all the suburbs in the south New Jersey region (and therefore not "more orderly" than other suburbs). This pattern will not be rural, and will inevitable remove the farms and farmland.

4. Plan for the Environs of a Center recommends reducing the non-residential lands even further than does the Land Use Plan, since the current zoning will permit 3,000,000 sf of new development, which is far greater than any market possibilities. The Handbook therefore recommends changing some of the commercially zoned areas to permit the more likely residential market to take place.

5. The Land Use Plan will permit the sale of land for residential purposes to only a small portion of the actual residential market - that which desires larger, more expensive homes on large lots. As a result, people such as retirees, single people, and young workers will not be able to live in the Township in the future.

WOOLWICH TOWNSHIP
MASTER PLAN LAND USE
PLAN ELEMENT

INTRODUCTION

The proposed Land Use Plan Element (Plan) for Woolwich Township combines the attributes of the various land use concepts studied over the past several years with the planning goals identified by the Township. The following set of planning goals have been developed by Township Officials to serve as broad guidelines for the development of the community.

1. *Make Woolwich a local business and residential center serving area communities.*

Create in the longer term a community that functions at a local center scale, containing a variety of business and residential opportunities which serve a local and inter-municipal radius, rather than a multi-county or regional market.

2. *As a local center, make the Township a community of Balanced land, uses.*

Provide for a balance of uses, where commercial, residential and employment activities exist in complementary and harmonious fashion.

3. *Concentrate more intensive uses into nodes.*

Concentrate more intensive development in nodes J suggested by (present or future) factors involving: Transportation and access, utilities, proximity to emerging development patterns and environmental suitability. ^J

4. *Create a community that is planned in a more orderly and attractive manner than other suburban towns.*

Provide alternative physical modes of development by avoiding characteristic patterns

or urban/suburban sprawl (such **as**: creation of intensive linear commercial strips; excessive scattering of non-residential development; promotion of conflicting land use interfaces; and similar patterns).

S. Permanently protect the fragile environmental systems. %

Retain and protect the stream corridors and creeks, with their slopes, woodlands, wetlands and flood plain as a natural greenbelt,

6. *Clarify the pattern of sewer service requirements.*

Provide a clearer understanding of which areas are intended to receive public sanitary sewer service, and plan in accordance with these assumptions.

7. *Use flexible planning methods to integrate open space and development.*

Establish a land use structure in which planned development and clustering incentives are available, as a means of adding value to the land while preserving open space.

8. *Preserve significant tracts of rural land, even as the Township grows.*

Preserve significant tracts of the rural environment to the greatest extent possible, effecting gradually, and in the long term a transition from agricultural uses to a rural/residential context.

The proposed Plan identifies and preserves important natural resources and environmentally sensitive areas. The Plan provides abundant opportunities for a wide range of commercial, business, manufacturing, and light industrial activities. Various types of housing are possible depending on the availability of public sewerage.

Although environmental factors will be the primary determinants of growth in the Township, community design, accessibility, economic viability, and the availability of community services will also play an important role in shaping the land use policies for Woolwich Township. The Plan provides for the gradual growth of this rural Township into a diverse suburban community with an ultimate potential population of approximately

75,000. The Plan is designed to guide an alternative form of development which decreases the likelihood of repeating familiar suburban patterns.

NON-RESIDENTIAL AND MIXED USES

As a means of encouraging non-residential and mixed uses, the Plan establishes a Town center zone in the vicinity of Center Square, Woodstown and Auburn Roads. This 150 acre mixed-use district is intended to be the activity core of the community and will encourage retail, service, business office, institutional, cultural and limited residential uses. Public sewerage and water supply services are encouraged for all non-agricultural uses. The Town Center is to be pedestrian-oriented, a goal which is to be accommodated by provision of an adequate road network toward the perimeter of the activity centers, and by situating the majority of off-street parking spaces to the rear of buildings or in parking structures.

The Route 322 corridor provides opportunities for a wide variety of commercial and industrial uses. Since Route 322 functions as the main east-west artery in the Township, design standards for this corridor shall encourage the clustering of uses punctuated with "green spaces" to prevent strip development. Access points are to be controlled and reverse frontage required where appropriate to maintain consistency with the "1989 State Highway Access Management Code." Service Office, Light Industrial/Office and Highway Commercial districts will permit limited retail, office, Light Industrial, research and development, automotive dealerships, motels, flex buildings and warehouse/distribution facilities. The Service Office Center which occupies approximately 295 acres at the intersection of Route 322 and Repaupo Road, encourages highway convenience and service businesses, limited retail and offices. Eating establishments, convenience stores, automotive service stations, banks, and similar uses seeking a central highway location will be permitted. This district is intended to serve occupants of nearby employment centers, travelers and residents in the northern part of the Township.

Two distinct areas totaling approximately 1600 acres, one adjacent to Logan Township on Route 322 and the other in the vicinity of the New Jersey Turnpike Exit #2 are intended to serve as major employment centers. The Light Industrial Office zone shall specifically permit the following uses with individual on-site sewer and water:

1. Farm houses and farm buildings
2. Commercial and non-commercial agriculture or horticulture

and the following uses with centralized sewer and water:

• — •//•

1. of office buildings
2. Flex buildings
3. Research, experimental or testing laboratories
4. Hotels/motels
5. Planned Industrial Development
6. Municipal facilities
7. Utility facilities
8. Limited commercial (15% of gross floor area) such as banks, daycare, restaurants as part of a PUD.
9. General manufacturing, processing, fabrication and assembly of all products except those which have characteristics which are noxious, injurious, offensive or hazardous to health, safety or general welfare.

The larger of these two areas extends across Kings Highway north of Kingsway Regional High School. The configuration of this district will enable potential users to benefit by direct access to an active freight rail line located along the back of this zone.

A Manufacturing zone approximately 300 acres in size is located at the intersection of the Pedricktown-Harrisonville Road and Auburn Road. The primary purpose of this zone is to encourage uses which are compatible with the U.S. Drop Forge Corporation facility and to buffer this facility from adjacent residential uses. This district will permit manufacturing, fabrication, warehousing and distribution, and neighborhood commercial uses including: food market, delicatessen, bakery, shoe shop, laundry, barber shop, beauty parlor, hardware shop and drugstore. All uses in this zone shall be serviced by public water supply and wastewater systems or other systems acceptable to the Township.

The Highway Commercial district located at the intersection of Route 322 and Kings Highway permits some of the more traditional "strip" uses including automotive dealerships and motels. This 60 acre district will require the availability of public sewer and water systems for all uses with the exception of agricultural and horticultural uses. Other uses to be permitted by right include automobile service stations, eating and drinking establishments and amusement or recreation facilities.

The Service Office Center district encourages highway convenience and service businesses, limited retail and office buildings. This zone extends to Kings Highway and encompasses the intersection area of Route 322 and Swedesboro-Paulsboro Road. This district is intended to serve occupants of the nearby employment center, through-travelers and Woolwich residents.

All of the districts described above have available planned unit development overlay options in which significant density, bonuses and flexibility of design are available, in exchange for: v^< *>-^)-^

committing to a master plan for the site; preserving open space, providing selected amenities or public facilities; and/or increasing setbacks of buffers. Although public water and sewer facilities are generally preferred for all uses except agriculture and horticulture, it is recognized that such facilities are not always available. The Township will consider alternative water supply and wastewater treatment facilities on an individual basis.

RESIDENTIAL

The residential land use designations along with the medium density cluster designations embodied in the existing ordinances are essentially retained in the Plan but with zoning map locational changes. All residential land use designations have available clustering options which function as a variable lot size provision which may permit a 50 percent reduction in individual lot sizes. All of the residential districts have available planned residential overlay options which offer bonuses, design flexibility and some limited commercial uses in exchange for: committing to a master plan for the site; preserving open space and recreation land; and buffering from incompatible uses.

The 4,000 acre segment south of Raccoon Creek and east of the Turnpike requires minimum of 1.5 acre lot sizes for detached single-family residences. Land use intensity is purposely limited in the R-1 district due to the existence of severe soil constraints; the distance of this area to the centers of activity? ana'tfle~desire tg maintain this areT'as rural/agricultural'.

A medium density cluster designation surrounds the Town Center district on two sides. Swedesboro is to the north and a light industrial zone forms the eastern boundary. The configuration of the RMD district corresponds with the village/town center concept which locates higher density residential uses in the "core area" with a general decreasing of densities as land uses radiate outward.

The remaining residential land use designations located north of Raccoon Creek, south of the Town Center and west of the Turnpike, are divided between 1/2 acre and 1 acre densities.

PLANNED UNIT DEVELOPMENT

The Planned Unit Development (PUD) concept offers a variety of inducements to the developer, in exchange for various community benefits. In the Woolwich Plan, every zoning district either has a matching PUD or PRD (Planned Residential Development) overlay option.

In general, the planned development concept allows a developer greater flexibility in site layout and design, and sometimes in the

type and mix of uses. The PUD process allows an entire site or parcel to be planned as a single unit on a long-term basis, while conventional zoning tends to impose a more rigid or lot-by-lot approach. Density or space bonuses are sometimes available. A tract with a minimum of 100 contiguous acres with direct access to "Collector" road is required in order to utilize the PUD development option. -

In exchange, the community requires more Control and commitment, as well as various public benefits. Typically, a conceptual master plan is required before more detailed site planning occurs. There are often requirements to preserve open space and/or to provide public facilities or amenities of various sorts. Specific provisions for each district regarding utilization of these planning techniques are to be included in the zoning regulations.

PLANNED RESIDENTIAL DEVELOPMENT

Planned Residential Development (PRD) is offered as an overlay development option in the R-1, R-2, R-3 and RMD districts. The intent of the PRD provisions is to promote the long-term public health, safety and welfare, by providing for an alternative type of suburban development that generates comparatively greater benefits for housing, the natural environment, and certain public services and facilities.

A PRD is intended to permit the development of a balanced residential community while preserving a significant amount of flexibility and a broad range of housing types and densities. This development technique also offers the capacity to master plan an entire parcel of land. These development options may only be utilized where the tract contains a minimum of 100 contiguous acres and where the development has direct access to a "Collector" roadway. Bonus densities will range from 2.0 units per acre in the R-1 district to 6.5 units per acre in the RMD district.

CLUSTER DEVELOPMENT

The intent of the cluster development option is to provide residential developers and subdividers with an alternative means of subdividing land and grouping homes for the primary purpose of preserving common open space. In permitting and encouraging clustered configurations, relatively small projects, or those not qualifying as a planned residential development, may be eligible for and proceed under the cluster provisions.

The cluster option is permitted as a matter of right in the R-1, R-2 and R-3 zones provided the parcel of contiguous land is a minimum of 25 acres. Single-family detached dwellings, two-family dwellings and single-family attached dwellings are permitted unit types. The density may be increased by 25 percent over the base density for each respective district provided public water and sewer are available. Otherwise, the gross density shall remain

the same as that for the base district, with resultant lot dimensions subject to Planning Board approval. The minimum lot area for an individual lot may be reduced to not less than 50 percent of the minimum lot area required in the base district. Required open space shall be equivalent to 25 percent of the gross area, and the minimum useable open space shall be not less than 30 percent of the required open space.

KEW BASE ZONING SCHEME

The zoning critique presented in the August 31, 1983 Inventory and Analysis^ Technical Memoranda Report prepared by SasaJci Associates, indicated that there was an excessive number of districts and that the whole structure of the ordinance needed to be simplified. It was also determined that there was a considerable surplus, of non-resj.dential land. A new zoning plan has been developoea based on the^ following concerns:

- A new base district was needed to accommodate the more modest and urban village-oriented Town Center.
- A new base district was needed to establish the conceot of the Service-Office Center on Route 322. " "
- A yanufacturing district was needed to accommodate and retain existing heavy industry, and to provide opportunities for new industry.
- The existing Light Industrial Office zone had to be utilized in selected new locations, in order to encourage the establishment of long-term employment centers.
- The existing Highway Cqmmereial zone had to be utilized in a new location compatible with the Plan.
- Town-wide residential form had to be rearranged to establish a pattern of gradually decreasing densities radiating outward from a more intense core.

In recognition of these needs, a zoning plan has been developed in which the following zones are retained or established:

- Town Center District
- Service Office Center District
- Highway Commercial District

- Light Industrial Office District
- Manufacturing District
- R-1 Residential (1.5 acres minimum lot size)
- R-2 Residential (1.0 acres minimum lot size)
- R-3 Residential (0.5 acres minimum lot size)
- RMD Residential Medium Density (minimum lot size is 1.0 acres, with provisions to reduce to 5,000 sq. ft. with sewer/water).

The following table compares the Township's existing zoning structure with that of the new Plan:

EXISTING

<u>EXISTING</u>			<u>PROPOSED</u>		
Zone	Acres	% Total	Zone	Acres	% Total
Residential	830	6.0	R-1	4,231	31.4
R-1 R-2 R-3 R-	3,830	27.8	R-2	4,374	32.4 0.6
R RLD RMD	800	5.8	R-3	99 0 0	0.6 (0
Subtotal	130	1.0	N/A		fc) (0
Residential	1,220	8.8	N/A		
	2,520	19.3	RMD		
	9,330	67.7		(^2^2£8	16.9T°
				10,992	81.3

<u>EXISTING</u> Zone	<u>EXISTING</u> Acres	<u>EXISTING</u> Total	<u>PROPOSED</u> Zone	<u>PROPOSED</u> Acres	<u>PROPOSED</u> % Total
Commercial					
C	1,030	7.5	N/A	0	0
BRO	325	2.4	SC	310	2.4
ETC	150	1.1	TC	183	1.4
HC	45	0.3	HC	59	0.3
Subtotal					
Commercial	1,550	11.3		552	4.1

<u>EXISTING</u> Zone	<u>EXISTING</u> Acres	<u>EXISTING</u> Total	<u>PROPOSED</u> Zone	<u>PROPOSED</u> Acres	<u>PROPOSED</u> Total
Industrial					
M	2,188	15.9	M	304	2.3
I/O	432	3.1	I/O	1,652	12.3
Subtotal					
Industrial	2,620	19.0		1,956	14.7
TOTAL	13,500	100%			100%

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This table indicates that 30 percent of the Township's land area is presently zoned for non-residential uses. This proportion

is regarded as excessive even if the Township were seeking to become a major regional commercial and industrial center. The Plan proposes residential uses on 81 percent of the Township's land, as compared to only 68 percent under present zoning. Although the total amount of land area devoted to non-residential uses has been significantly reduced, the location and regulations effecting non-residential development assume adequate business and employment opportunities.

LAND USE ANALYSIS BY SECTOR

In an effort to understand the considerations which contributed to the formulation of the Plan, the Township was divided into three (3) sub-areas or growth management sectors. The location of these sectors and their unique characteristics are described in the Utility Service Plan element of the Township Master Plan.

Sector A is bounded by Raccoon Creek to the south, East Greenwich and Harrison Township to the east and north, and Logan Township to the west. Raccoon Creek and Purgey Creek constitute the physical components of the northern and southern boundaries of this sector. This sub-area is traversed by Route 322 and includes the Exit #2 interchange of the New Jersey Turnpike. Under existing zoning, this district contains areas zoned 56 percent residential, 24 percent commercial and 20 percent industrial. Due to the locational and access advantages offered, this sub-area is intended to provide the Township with a reliable employment base associated with industrial/trade/research and development facilities. Planned residential uses at relatively higher densities are intended as an integral component of development in this sector.

Sector B is bounded by Raccoon Creek to the north, the New Jersey Turnpike to the east, Oldmans Creek to the south, and Logan Township boundary to the west. The Borough of Swedesboro is near the center of this sub-area. This sector possesses several characteristics which make it unique including its proximity to the developing areas of Logan Township and an interchange connection with Interstate 295. This area also has the most interaction with Swedesboro and continues to be the primary focus for major development proposals in the Township. Sector B is presently zoned 80 percent residential, 10 percent commercial and 10 percent industrial. The core of this sector is intended to be developed as the central business district of the township. The remainder of this sub-area shall be in medium and medium-high density residential uses.

Sector C is bounded by Raccoon Creek to the north, Harrison and South Harrison Townships to the east, and the New Jersey Turnpike to the west. This sub-area is most isolated from major transportation arteries and utilities and includes extensive areas

where the utilization of on-site septic systems will be restricted. Present zoning is 23 percent low-density residential, 46 percent medium-density residential, and 31 percent industrial. The general intent of the Plan is to maintain the rural-residential characteristics of this area. Clustering of dwelling units is to be encouraged to protect environmentally sensitive areas and to make the most efficient use of existing and proposed infrastructure improvements,

GROWTH POTENTIAL

Under existing zoning, approximately 30 percent of the Township's land area is zoned for non-residential uses. This Plan shifts approximately 2,000 acres into low-density residential districts". This adjustment permits residential development to occur on 81 percent of total land area as compared with 69 percent under the existing zoning regulations.

The critical variable in population projections for the Township is the presumption of sanitary sewer service and public water supply. In a number of the existing zoning districts there are dual sets of dimensional and density standards offered, based upon the provision of sewerage. Based on these existing standards the Township could have a population ranging from 31,000 to 93,000 persons.

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The allowable densities within this Plan also produce a range of population projections, depending upon availability of sewer systems. The Township could produce a population of anywhere from 15,000 to 75,000 persons. The high, projection of 75,000 persons would inhabit approximately 30,000 dwelling units at 2.5 persons per dwelling unit.

The following Table compares gross densities expressed in dwelling units per acre (du's/acre) of the existing development regulations with those proposed in this Plan:

Zoning District	New Base Zoning	New Overlay zoning	Existing Zoning
R-1	.67	2.0	0.5
R-2	1.0	5.5	1.0
R-3	2.0	6.0	.67
RMD	1.0	-	1.0
	5.0*	6.5*	

* With public water and sewer

The distribution of land zoned for non-residential uses changes significantly in the proposed Land Use Plan. Land areas zoned for light industrial uses have extensive frontage along Route

322. An approximately 300-acre Manufacturing district has been delineated in the vicinity of the PedricJct own-Harri sonv ill e/ Auburn Road intersection to enable the continued operation of an industrial facility at this location. Commercial zoning is prescribed along Route 322 to service transients and also adjacent to Swedesboro to reinforce the Village/Town center concept. Total land area devoted to commercial uses is approximately- 600 acres. Approximately 11,000 acres of residential land is created by the proposed plan with a mix of densities. -?:

Under the proposed Plan approximately 81 percent of the Township's total land area is zoned for residential uses, 15 percent for industrial and 4 percent for commercial uses. This mix of uses is intended to attain the objectives identified in the Plan while eliminating concerns relative to over-zoning which are present in the existing regulations.

RELATIONSHIP Or PLAN WITH PLANS OF ADJACENT MUNICIPALITIES

This section will describe the relationship between the Woolwich Plan and the plans of adjacent municipalities as required by N.J.S.A. 40:550-28. Woolwich is surrounded by four municipalities in Gloucester County and two in Salem County. The northern and southern boundaries are co-existent with Purgey Creek and Oldmans Creek, respectively.

Western Sorder

Woolwich is bounded on the west by Logan Township. Logan . encourages land uses and densities which are generally cc-patible with those prescribed in the Woolwich Plan. Due to the availability of public sewerage, Logan has been able to permit development intensities which have heretofore been unattainable in Woolwich. In general, the areas of Logan adjacent to Woolwich reflect similar sensitivity to access opportunities and environmental constraints and no land, use conflicts are anticipated.

Northern Border

' Purgey Creek serves as the Township's northern border and separates Woolwich from East Greenwich Township. The predominant land use in the southern part of East Greenwich is rural-residential. East Greenwich has adopted an agricultural zone with./ a minimum lot area" 6t three-quarters "of an agrg adjacent to v' Woolwich" in an errortr to retain the rural characteristics of this area. Al'tnough Woolwich proposes light industrial uses oetween the Reading Seashore Lines and the Turnpike, the intensity of use is controlled and is not incompatible with East Greenwich's land development policies. The remainder of land adjacent to East Greenwich requires one-acre lots for residential uses.

Eastern Border

Woolwich is bordered on the east by Harrison and South Harrison Townships. With the exception of an area bounded by a tributary of Raccoon Creek, the western border of Harrison Township is relegated to industrial uses. The rationale for this designation may relate to the access afforded by Route 322 and the New Jersey Turnpike. The Woolwich Plan is compatible with the Harrison zoning in that it prescribes light industrial uses and limited residential uses in this area.

The South Harrison plan is sensitive to the agricultural values in the area adjacent to Woolwich. South Harrison permits low-density residential uses from Pedricktown Road north along the municipal boundary. South Harrison also provides for industrial uses in the southwestern corner of the Township. South Harrison is presently updating its master plan and it is anticipated that the industrial zoning designation will be revised. With the exception of the industrial zone, the zoning proposed in Woolwich is compatible with that in South Harrison especially with respect to the retention of agriculture.

Southern Border

Oldmans Creek separates Woolwich from Oldmans and Pilesgrove Townships in Salem County. The Pilesgrove plan which was adopted in 1976 proposes a Conservation district along the entire corridor and major tributaries of Oldmans Creek. The remainder of zoning, with the exception of an industrial district along the railroad, is in medium density residential.

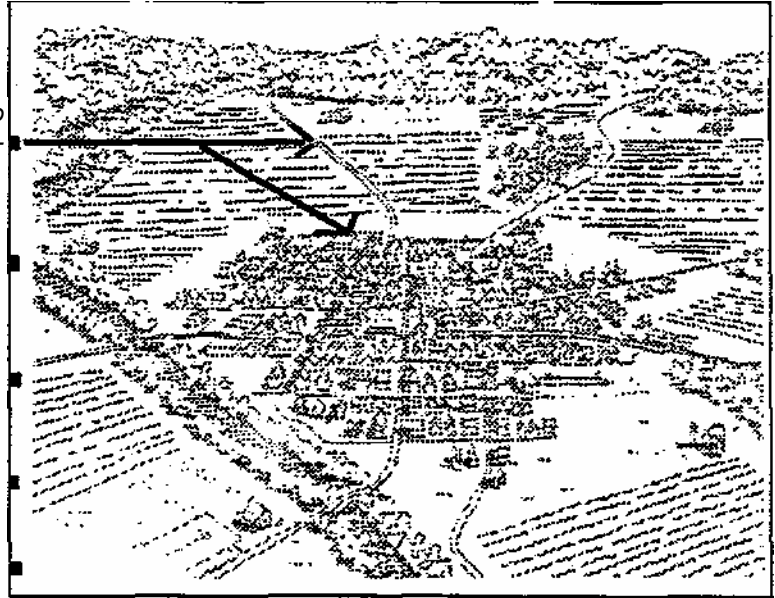
The Oldmans Master Plan, which was adopted in January 1990, delineates an Agricultural-Residential zone adjacent to Oldmans Creek which requires minimum lot areas of two acres. The zoning in both Oldmans and Pilesgrove is compatible with the low-density residential zoning proposed in the Plan. The Woolwich Plan also proposes implementation of a 300-foot buffer from wetlands which is intended to protect the environmental integrity of Oldmans Creek and its adjacent wetlands.

RELATIONSHIP OF PLAN WITH STATE GUIDE PLAN

The Woolwich Township Plan appears to be in general agreement with the goals of the Preliminary State Development and Resources Development Plan (PSDRP). Growth management strategies proposed in the Woolwich Plan may not be entirely consistent with the State Plan which seek to preserve 95 percent of gross land area. However, in recognition of the soon-to-be-completed Quia Route, lands under option and the number of large projects proposed, the proposed Plan is reasonable and necessary. The Plan is sensitive to the retention of important agricultural and environmentally

sensitive areas and encourages efforts to maintain and protect these valuable resources. The Plan, simultaneously, provides opportunities for the development of needed housing, and for employment and commercial activities. Constraints imposed by environmental factors have been instrumental in shaping the growth management policies recommended in this Land Use Plan. Similarly, opportunities for development have been carefully analyzed with respect to existing and proposed infrastructure improvements.

Revise Circulation Element of the Master Plan to reference design standards and access management policies for rural roads & community streets



D* review/revise local regulations

D.02 Master Plan Circulation Element, ^^ WOOLWICH

c)RCUIATION ELEMENT

Notes Re the Circulation Plan of the Woolwich Township Master Plan:

1. There are two key assumptions that underlie the recommendations of the Circulation Plan:
 - A significant amount of growth will take place, as also assumed in the Land Use Plan (it was also interesting to note that it appeared that a further assumption was that residential and commercial developments were productive, in contrast to farming; one inference that therefore could be made was that the rural character of the township will disappear when development occurs). It is obvious that these assumptions were made in another development market era.
 - The preference for the automobile will inevitably lead to attenuated growth along roads (note, however, that a list of traffic problems described in this Plan included the visual "clutter" of strip highway development).
2. The Road Classification List includes 6 Primary types, plus 7 Special Purpose types, of streets. The Memo concerning Rural Roads, included in this workbook, suggests that the goal of preserving the rural character should require fewer road types; the reduction of the list will create a simpler relationship to the implementation of the Hamlet/Village proposal in the 1996 Plan for the Environs of a Center.
3. The recommended new roadway widths of the Circulation Plan are much wider than those recommended in the Rural Roads memo, and in most cases do not appear to be consistent with the goal of preserving rural character (e.g., Center Square Rd. is recommended to be widened from a R.O.W. of 33' to 120'). These road widths are based on the assumptions of the considerable growth described in the Land Use Plan (and therefore not on the 1996 analysis of the market projections for the next 25 years). They also did not (and obviously could not) take into consideration the proposals for Hamlet and Village developments in the Plan for the Environs of Center, which will inevitably require different road types and sizes; they were obviously based on the typical suburban sprawl-type developments that were taking place in the region at that time.

INTRODUCTION

The purpose of the Traffic and Circulation study is twofold. First, it is a description of the characteristics of the road network throughout Woolwich Township. This element of the study is intended to summarize the operation of the existing road network with emphasis given to those situations where the present system appears to be deficient. The second purpose of the Traffic and Circulation study is to identify present plans by Gloucester County and/or the Township to modify and improve the road network within the municipality.

The organization of this study involves a series of investigative discussions in which several aspects of the transportation network are analyzed. First though, a discussion of the relationship of the transportation system with land development.

As will be demonstrated the adequacy of a community's transportation system is important to consider relative to land use planning. The transportation system greatly influences the type and intensity of growth and the ability of the community to operate efficiently. This section of the background reports, will analyze Woolwich's transportation system and identify deficiencies in that system. In addition, policies will be suggested which will help alleviate existing problems and prevent further transportation inadequacies.

In order to move traffic efficiently and safely, a community needs: (1) a road network which meets the needs of the community and region, (2) a road hierarchy based on trip purpose to eliminate conflicts; (3) adequate roads to meet the generated demand; (4) well-designed roads and intersections; and (5) roads in good condition. The following analysis will focus on each of these individual requirements.

OVERVIEW

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The Conversion of land areas for Productive such as commercial, residential or industrial, depends upon "the" factor "of accessibility. Historically, proximity was the only way to achieve this necessary requirement for urbanization. Homes and business establishments were located so as to require the least amount of travel time between trip destinations. Travel time, in turn, has been determined by the prevailing level of technology in that period of history. The antecedents of today's scattered development were strongly influenced by the prevailing transportation modes of the period. The compact and closely spaced. Other towns had their geneses in the

location of railroad stations. .Today
many of the state and county roads j g to the location ^^ /
preferences of today 'g a>tnmoh-i l& era \—'

It is important to recognize the interrelationships between Land use and the generation of vehicular traffic. If we understand tl&ls relationship, it will act as another parameter J«n both the allocation of future land uses and the need for improvements to the traffic and circulation network.

All vehicular trips are made for some purpose, and the best index of this human activity is land use. While one of the chief determinants of residential location is the easy access to employment, an entrepreneur generally prefers locations adjacent to high volumes of traffic, possibly at the intersections of major roads with access to other commercial or industrial locations within the region. chronologically, the majority of new residential and commercial construction will take place along the existing road networks. As the population continues to grow and the attendant level of traffic also increases, increasing conflicts and an overburdening of the existing transportation network is encountered. We often hear a great deal about what is considered to be the transportation "problem." Essentially, it is a summation of all of the aspects of the present highway system about which people don't like.

1. Accidents: These are probably the most dramatic and costly conflicts of the transportation problem. Between 1985 and 1958 accidents occurred most frequently on the Turnpike. During this three-year period a total of 45 accidents were reported on the Turnpike in Woolwich.
- 2- Congestion: People do not like to waste time. Wasted time results in excessive operating costs for the automobile and is also extremely upsetting.
- 3 . Inefficient Investment: People do not like paying taxes to have roads constructed and maintained. Transportation improvements should be carefully analysed to i'nsm-» t-.hat the .cost of the imprn''''qr^{nc}-TVl^{net} 'Iff "nt1 ovceed the anticipated benefits.

Clutter: As mentioned above, the very fact that transportation networks act as a catalyst for residential and commercial development has spurred the construction of- strip - highway commercial development which is often aesthetically unpleasina . detracts from the

GLOUCESTER COUNTY TRANSPORTATION IMPROVEMENT PROGRAM

	<u>Location</u>	<u>Improvement:</u>	<u>Cost</u>	<u>Year</u>
1.	Russell Mill Bridge (Raccoon Creek)	Replacement	\$670,000	FY '90
21.	CR 538/653-Between CR 670 & CR 666	Resurfacing 2.7 miles	\$1,060,000	FY '90
3.	Narraticon Lake Br,	Replacement	\$500,000	FY '91
4.	Locke Ave. Bridge	Replacement	\$2,500,000	FY '93
5.	Russell Mill Rd. Br. (Basgalore Creek)	Replacement	\$520,000	FY '93

In addition to the improvements indicated above, the County will also be repairing the bridge structure on the Pedricktown-Harrisonville Road which crosses Indian Branch in the near future.

FUNCTIONAL CLASSIFICATION

All residential streets can be described in terms of relative movements of through traffic and property access. Because residential streets serve different functions, streets, should be classified in a street hierarchy system with design tailored to function. Such a system offers numerous advantages:

Safety - Fast traffic is kept out of neighborhoods.

Municipal Efficiency - Priorities can be assigned by municipal officials to maintain operations and routing of snow plows and buses.

Residential Quality - Traffic restricted on roads immediately serving residences promotes quieter, safer, more pleasant neighborhoods.

Land Use Efficiency - overbuilding of roads is avoided, lowering maintenance costs, housing costs and adverse impact on the environment.

The street hierarchy system is defined by road function as measured by average daily traffic (ADT). The ADT may be anticipated by calculating numbers of trips by housing or other land-use category (see Exhibit 1). "Trip" means a single or one-way vehicle movement either to or from a property or study area. "Trips" can be added together to calculate the total number of trips entering and leaving a specific land use or site over a designated period of time.' Each member of the proposed hierarchy

as well as special purpose streets are described below. Recommended right-of-way and cartway widths are indicated on Exhibit 2.

Residential Access Street - These streets function primarily as access points to abutting properties, both for vehicles and pedestrians. These streets are the lowest order streets in the hierarchy and are designed to carry only traffic generated on the street itself. The elimination of through traffic promotes safety and a desirable neighborhood environment.

Residential access streets should be designed for a maximum ADT of 250; in the case of loop streets, each half may be classified as a single residential access street, but the total traffic on the loop street should not exceed 500 ADT, nor should it exceed 250 ADT at any point of traffic concentration.

Collector Streets - in theory, should gather traffic from the local streets before the design capacity of the local streets is exceeded. This traffic is then funneled to traffic generators/receptors such as shopping centers or other commercial areas, or to arterial roads, depending on the volume, source and composition of traffic, collector roads may be broken down into subcollectors or collectors.

Residential Subcollector - These streets provide frontage for access to lots and carry traffic of adjoining access streets. The subcollector is designed to carry somewhat higher traffic volumes with traffic limited to motorists having • origin or destination within the immediate neighborhood. These streets are not intended to interconnect adjoining neighborhoods or subdivisions and should not carry regional through traffic.

Residential subcollectors shall be designed so that no section carries an ADT greater than 500. Each half of a loop subcollector may be classified as a single subcollector street, but the total traffic volume carried on the loop street should not exceed 1,000 ADT, nor should it exceed 500 ADT at any point of traffic concentration.

Residential Collector - These streets conduct and distribute traffic between lower-order residential streets and higher-order streets - arterials and expressways. Collectors carry the largest volume of traffic at higher speeds, and function to promote free traffic flow. Therefore, parking should be prohibited, and direct access to homes from this type of street should be avoided. Collectors should be designed so that they cannot be used as shortcuts by non-neighborhood traffic. Maximum ADT permitted is 3,000.

Arterials - A higher order, inter-regional road in the street hierarchy which conveys traffic between centers. These road types

should be excluded from residential areas. Minimal ADT recommended for these streets is 3,000.

Special Purpose Streets -

- a. Rural Residential Lane - These streets have a very low-density area. The maximum ADT level (200) -limits the number of single-family homes on this road
- b. Alley - A service road that provides secondary means of access to lots. These streets have application in cases of narrow lot frontages. No parking shall be permitted and these streets should be designed to discourage through traffic. A total ADT of 500 corresponds to that of residential access streets.
- c. Cul-de-Sac - A street with a single means of ingress and egress and having a turnaround. These streets shall be classified and designed according to anticipated ADT level. A residential access cul-de-sac will have a maximum ADT of 250, and a subcollector cul-de-sac will have a maximum ADT level of 500.
- d. Marginal Access Streets - A service street which runs parallel to a higher-order street and provides access to abutting properties and a separation from through traffic. May be designed as residential access street or subcollector according to anticipated daily traffic. When designed as a residential access street a maximum ADT of 500 is recommended. When designed as a subcollector the maximum ADT may be increased to 1,000.
- e. Divided Street - Municipalities may require streets to be divided in order to provide alternate emergency access, to protect environmental features, or to avoid grade changes. Design standards should be applied to the combined dimensions of the two-street segments as required by the street class. Maximum permitted ADT is 500, 1,000, and 3,000 for the residential access street, subcollector and collector, respectively.
- f. Stub Street - A portion of a street which has been approved in its entirety. -These streets are permitted as part of phased development and may be required if the street is part of the overall master plan. The maximum ADT is identical to that recommended for divided streets.
- g. Parking Loop - A private street with perpendicular parking. At higher ADTs (250 or more) , used only to provide affordable housing and where no other parking and street design are practicable due to topographic, economic or other considerations. These streets should

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be geometrically designed to discourage speeds in excess of 25 mph. Recommended total ADT is 1,000.

mileage under local jurisdiction.

The essential conclusion of the jurisdictional pattern of the roadways in Woolwich Township is that it reflects the rural and undeveloped character of the municipality. One of the main problems relative to the road network is that the County roads are being called upon not only to funnel traffic between Concentrations of development and the major highways but also to provide direct access to uses along their frontage. Given the fact that almost all of the major roads in the Township are under Gloucester County jurisdiction, it is extremely important that the municipal and county planning processes are coordinated in order to insure that appropriate improvements are made to the roads which are intended to serve any projected areas of concentrated development.

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STREET RIGHT-OF-WAY WIDTHS

Shown on Plate 2.4 are the existing street rights-of-way widths throughout Woolwich Township as discerned from tax map information. This characteristic of the roadway should also give an indication of the volume and function performed by the highway network. It should be noted here that street right-of-way widths are not synonymous with the paved area of a roadway which is referred to as the "cartway width." The right-of-way width includes the paved area, or cartway, the shoulders and the sidewalks, if present.

Generally speaking, the state and federal roadways have the widest rights-of-way widths within a municipality. A view of the information presented on Plate 2.4 indicates that the New Jersey Turnpike does indeed have the widest right-of-way width of any roadway in the Township. However, the other roadways within the Township, whether under local or county jurisdiction, reflect a wide array of widths. With the exception of the Turnpike and Route 322, practically all roadways in the Township have a right-of-way width less than 60 feet. In fact, the most common right-of-way width is 33 feet.

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In most cases, no roadway should have a right-of-way width less than fifty (50) feet. These roads should perform only the basic local traffic function of providing access to abutting properties; no through traffic should be part of the traffic flow. When a roadway is called upon to handle through-traffic volumes, such as a connector road between major highways or residential concentrations, the required right-of-way will be at least sixty (60) feet and sometimes more.

Since many of the roadways in Woolwich Township must handle through-traffic volumes as well as providing access to abutting properties, it is suspected that the existing rights-of-way widths of many of the local roads are deficient. In fact, all of "the

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(Gloucester County roadways have rights-of-way widths less than fifty (50) feet in the Township.

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Certain of the Township roadways, also require additional right-of-way acquisition. However, since many of the important roadways in the municipality are under Gloucester County jurisdiction, the County's plans for right-of-way acquisition and road improvements are an extremely important aspect of the Township's planning process in Woolwich.

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TRAFFIC VOLUME AND CAPACITY

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The ability of highways to carry large volumes of traffic is controlled by several factors. The number of traffic lanes, sight distances, proportion of trucks, operating speeds and roadway clearance are some of the more important elements which affect capacity. Two-lane roads can carry as many as 5,000 cars per day but only at the expense of traffic tie-ups and delay. Roads which carry this much traffic regularly require "turn" lanes for moving traffic, preferably divided by a median strip.

Actual traffic volume is determined from road counts which are mathematically converted to Average Annual Daily Traffic (AADT) figures to estimate the average daily traffic on a road. Seasonal changes in traffic are eliminated in AADT figures. However, the relationship of peak hour volume to road capacity is more meaningful, since it indicates when the flow of the system is specifically inhibited by congestion.

Unfortunately, there is little empirical data available regarding actual traffic volumes for roads in Woolwich. Traffic counts generated by the Delaware Valley Regional Planning Commission in 1985 were for County roads which intersect Route 322. These 48-hour counts indicate that these roads were all functioning within their design limits, and that peak hour volumes were within acceptable standards.

ROAD CONDITIONS

For the most part, the arterial and collector roads traversing the Township are in fair to good condition and are adequately paved, have traffic lane markings and shoulders. The remaining roads have very rough surfaces, are in poor condition and show signs of weathering and age such as pot holes and crumbling edges. The heavy traffic volumes associated with major new developments have hastened the deterioration of some of the Township's roads.

Improved Township roads are surfaced primarily with minimal pavement which is considered practical only on roads having low traffic volumes. These roads are bituminous treated sand on a base of gravel or broken stone or both. Such road construction is satisfactory for the low traffic volumes although the cost of

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1. An uninterrupted traffic flow should be maintained by prohibiting on-street parking and limiting access points from individual properties on collector and arterial streets.
2. Marginal access streets should be required along arterial and collector streets to serve adjacent uses where lot widths warrant such provision. ***
3. Off-street parking requirements should be sufficient to obviate the need for on-street parking.
4. Regional and internal circulation systems should be designed to separate industrial, commercial and through traffic from internal residential traffic.
5. Right-of-way and pavement width requirements as well as improvement specifications should be sufficient to assure that Township streets will be adequate to serve optimum traffic volumes which are generated both locally and regionally. ^
6. Street tree planting, street lighting, landscaping, sidewalks, curbs and bike paths shall be required where deemed necessary by the Planning Board.
7. Public transportation should be encouraged in order to make the best use of existing resources and to provide improved access capabilities to residents.

Additional growth management policies which have been developed as a result of this assessment include the following:

1. Transportation Improvement Corridors should be identified and appropriate mechanisms set-up to address the impacts of growth on the transportation system.

Corridor programs can be designed to address problems on State, County and local roads. Legislation adopted last summer enables counties to adopt plans and developer assessments for comprehensive improvements in a corridor or sub-region. The Kings Highway Corridor Study, under which the Delaware Valley Regional Planning Commission is evaluating the transportation network between the Turnpike and 1-295 in Woolwich and Logan Townships, may provide the basis for developing such a program.

2. Access codes must be enacted to preserve the function of State highways and County and Township roads to prevent the proliferation of traffic congestion and safety problems.

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The function of any road is a balance between two competing needs: direct access to property and the movement of . pggpl ° *nrf g^«« At one end of the scale would be a local residential street where individual driveways serve every home. At the other extreme lie %i limited access highways, such at the New Jersey Turnpike, '•?-. , where through travel is more important than find access. State, County and Township roads fall somewhere in between, and are designated as local roads, collectors, then arterials, to reflect the different degrees of travel and access they provide.

Another legislative initiative is the State Highway Access Management Act. This Act would empower the State to adopt an access code to preserve the State system as a regional and arterial network, and would permit counties and municipalities to adopt similar codes.

One of the direct consequences of rapid growth is the proliferation of individual driveways on routes serving high volumes of traffic. Ordinarily, these high volumes on adjacent roads attract non-residential, and especially commercial, development due to these volumes. However, as access to individual sites increases, so do safety hazards and congestion.

Access control, the rational and efficient placement of individual driveways along an arterial highway, is a critical concern as suburban growth areas continue to develop. The State Highway Access Management Act represents a valuable opportunity to refine road systems to provide an efficient balance between access and mobility.

Active rail freight lines and other rail rights-of-way must be preserved for future rail and non-rail value. A rail right-of-way is valuable for other purposes as well. Potential uses include protected pedestrian ways, bicycle paths and utility placements. For these reasons, care must be taken to preserve the physical integrity of the right-of-way.

RECOMMENDED IMPROVEMENTS

Several improvements to the local transportation system are recommended in order to accommodate the traffic volumes anticipated as development continues in the Township.

A study commissioned by the Pureland Industrial Park in 1988 examined High Hill Road in Logan and Woolwich Townships. Conclusions from this study which have specific relevance to Woolwich include the following:

The highway section of High Hill Road should

be widened in its entirety to a 40-foot cartway, providing 12-foot travel lanes and 8-foot shoulders.

High Hill Road/Township Line Road Intersection - Improvements needed at this intersection include signalization and a four-lane intersection. The Township Line road should be 40 feet wide and striped for two approach lanes.

High Hill Road/Auburn Road Intersection - This intersection will need signalization and widening to four lanes on Auburn Road with a separate right-turn lane from Auburn Road onto High Hill Road.

In addition to the improvements outlined above, several new road alignments are proposed to alleviate anticipated traffic conflicts. These new alignments are recommended in anticipation of development of the lands held by Gloucester New Communities Company (GNCC). The traffic impacts of this development will be most prominent on those roads in the southwestern quadrant of the Township.

Two major new road alignments are recommended in this area to assist in the efficient and safe movement of vehicular traffic. The new alignments as shown on Plate 2.1 will improve traffic circulation in this area of the Township and shall be indicated on the official map. Thereafter, any new development which includes lands traversed by these new alignments will be required to dedicate the necessary right-of-way for the new road.

Additional right-of-way shall be provided for the following roads to allow for necessary road improvements.

High Hill Road - Proposed right-of-way for this County road should be 60 feet except for the approach to Auburn Road. An 80-foot right-of-way shall be required for a distance of 1,000 feet west of Auburn Road to permit four lanes. The existing right-of-way width is 33 feet.

Center Square Road - A 60-foot right-of-way is recommended for this road in anticipation of increased traffic demands. The present right-of-way width of this County road is 33 feet. The new width is recommended from Township Line Road to Auburn Road. A new alignment is proposed between Auburn Road and Kings Highway.

Auburn Road - The recommended right-of-way for this County road is 120 feet. The existing right-of-way is 49.5 feet. The reconstruction of this roadway should

also make allowances for any new street alignments or intersection redesigns.

Township "Line Road - The present 33-foot right-of-way should be expanded to an 80-foot width from the intersection of the new loop road approximately 2,000 south of Center Square, to Route 322. South and north of this segment a 60 or 70 foot riahF-of-wav is recommended.

T Pedricktown-Harrisonville Road - This road is presently classified as a local collector and has a right-of-way width of 49.5 feet. The 60 foot right-of-way proposed ^ for this street by Gloucester County appears adequate.

Exhibit 2 presents a comprehensive listing of existing and proposed pavement and right-of-way widths for Township and County Roads. Plate 1 indicates the proposed configuration of street types to service the Township.

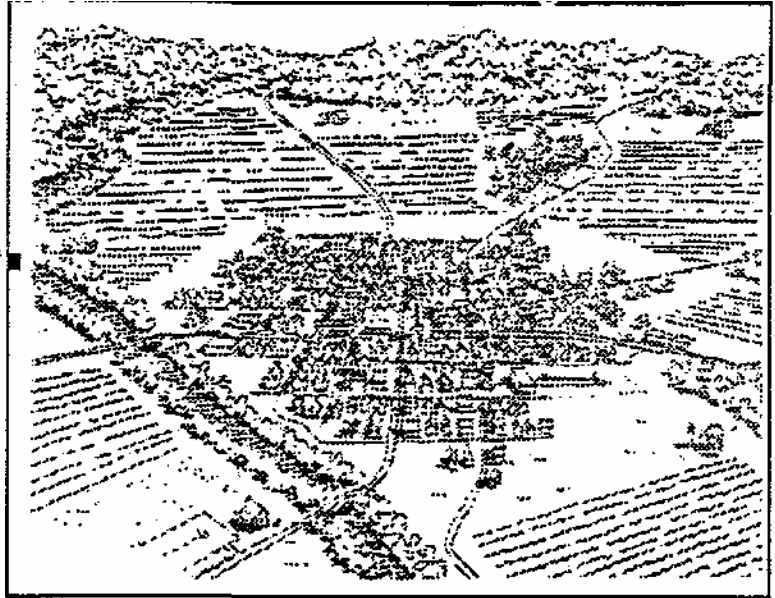
£ CONCLUSION

The basic conclusion of the Traffic and Circulation study is that the Township and County must coordinate their planning processes. In determining its future development pattern, the Township should consider the County's road improvement plan. Of .course, should changes to the County's plan appear advisable as a flk result of the municipal planning process, the Township should ™ recommend to the Gloucester County Planning Board that such changes be made. It is clear, however, that additional right-of-way widths •A will have to be acquired along many of the roadways in the Township.

M There are two primary techniques for the acquisition of future right-of-way widths. One, the dedication process, is accomplished through site plan and subdivision approval. By this procedure, a local developer is required to dedicate the right-of-way width to ^ the proposed standard. The second process, reservation, is also ™ accomplished through the local review process. The reservation requirement is appropriate when the proposed right-of-way width is in excess of what will be required to accommodate the traffic generated fay the development. This situation may occur as a result of minor subdivisions along collector or arterial roads. In this instance, the Planning Board may require a reservation of the right-of-way. This will necessitate increased building setbacks (measured from the proposed rights-of-way) so that when the need arises to widen the road, the right-of-way will have been preserved.

Additional considerations which should be addressed through appropriate land development regulations include the prohibition of on-street parking on collector roads; increasing building

Revise Utility Element of the Master Plan to include alternatives to centralized waste water treatment systems and individual septic systems



L1. review/revise local regulations

D.03
Master Plan *Utility Element*

ANNOTATED WOOLWICH VTJUTY EIEMENT

It is likely that there will be significant changes in the regulatory process and changes in the acceptable methods for wastewater treatment in New Jersey. This should make it possible to permit, construct and operate local systems and reduce dependence on large, centralized facilities. The current Utilities Element is based on the assumption that the scale and location of future development would be determined by public investment in centralized facilities and sewage collection systems. The hand-written notes by Deborah Avars, PP PE (A-Tech Engineering) highlight some ways the Utilities Element might reflect anticipated changes in the state-wide regulatory policy.

Borough of Swedesboro for water interconnections.

SEWAGE AND SANITARY WASTE TREATMENT

The management of growth in Woolwich Township is -'to a large extent dependent upon the location and capacity of. sewer Infrastructure . Like water supply, wastewater correction and disposal is considered to be a Township service which must be provided in order to protect the quality of the environment as well as the health of residents. With the possible exception of necessary transportation improvements, the greatest potential impact of new growth will be the stress¹ placed upon the environment and its capability to assimilate the wastewater produced. Once wastewater collection systems are constructed in a given area , growth will surely follow, bringing with it the demand for local services and infrastructure. For this reason, sewer service areas must be carefully defined, along with the wastewater management constraints of areas serviced by onsite treatment facilities.

The Woolwich Sewer Company, which is owned by the Gloucester New Communities Company (GNCC) , has been granted consent by Woolwich Township to provide service to the 5,000 acres west of the New Jersey Turnpike between oldmans Creek and Raccoon Creek (See Figure 1) . Recognizing that the Gloucester County Utilities Authority (GCUA) operates the regional sewer system and provides sewerage treatment in West Deptford for the consolidated portion of the County, it does not appear that the GCUA has any plans to extend interceptor lines to Woolwich.

The federal "Water Pollution Control Act Amendments" of 1972 established areawide agencies to prepare and implement Water Quality Management (WQM) Plans to protect local water resources. All sewerage facilities plans must be in conformance with the County WQM Plan, which specifically delineated sewer service areas.

Although a large area of Woolwich Township has been designated as a proposed "208" sewer service area by the Tri-County Water Quality Management Board, no public sewerage systems presently exist. The "208" area was designated during the early 1970 's to develop 6,000 acres in the west-central portion of the Township (See Figure 2) . Residents depend exclusively on the use of conventional on-site systems for the disposal of septage. Although there have been isolated cases of septic system failure resulting from poor siting or owner neglect, these systems generally function as designed. Another factor which may cause onsite septic systems to malfunction is the siting of these systems on lots which are too small to allow adequate drainage fields. On-site systems on these lots may pre-date the regulations governing setbacks from lot lines and private wells thereby making remedial action more difficult. Finally, septic tanks should be pumped out regularly to ensure proper operation especially in problem areas.

Wastewater Projections

For purposes of assessing the potential impacts of growth, the Township has been divided into three (3) growth or service sectors (see Figure 3). Within each of these areas calculations have been made for the amount of land available for development; the proportions of residential and non-residential uses; the residential growth impact with and without public sewer; and the effect in certain key public service areas. The proposed land use / plan was used to assign numerical values to the projected impacts. •

Since the most urgent need for sewerage is in the northern and western part of the Township, the future growth impacts associated with Sector A and Sector B are important to understand. After subtracting environmentally sensitive areas and institutional/school/government uses, these two sectors contain almost identical net developable area: 2,912 acres in "B" and 2,835 acres in "A". However, due to zoning structure, the growth impacts differ significantly across these two sectors. Sector C is not included in this analysis since individual onsite septic systems appear to be a reasonable alternative.

Development in Sector A will continue to be influenced by the access afforded via Route 322 and the New Jersey Turnpike and will consist predominantly of non-residential uses. Forty-eight (48) percent of the flows from this sector are associated with non-residential uses. Access to public sewerage in this area will permit an ultimate build-out involving 12,568 residents in 5,000 dwelling units and 7.5 million square feet of commercial/industrial space. It is anticipated that this development will generate approximately 3.0 million gallons per day (mgd) of wastewater flow. Developer interests presently account for approximately one-third (1/3) of the total anticipated flows.

Sector B will be strongly influenced by development of the GNCC tract in the southwestern part of the Township and will consist predominantly of residential uses. In fact, 84 percent of the wastewater flow generated in this sector will be from residential uses. In view of the proximity of this area to existing sewerage in Logan Township, it is anticipated that this area will receive sewerage before Sector A. Based on the proposed zoning requirements, Sector B will generate a total of 29,465 residents in approximately 12,000 dwelling units, and 4.4 million square feet of commercial/office space. The wastewater flow associated with this build-out will be approximately 3.5 mgd.

Sewerage Alternatives

Woolwich Township has several system options available relative to the provision of sewer service. Due to the complexity of this issue, it is recommended that the Township create a municipal utilities authority to coordinate the provision of sewer

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service. Expanding the present one million gallon per day capacity of the Logan Township plant would provide collection and treatment facilities for Swedesboro, Logan, Harrison, and Woolwich Townships. This idea dates back to the Beckett New Town proposal and would require the development of a sub-regional pump station. In view of the expansion capabilities of the Logan treatment plant, this facility has been designated a sub-regional facility within the Gloucester County area. The major advantage of this option is that the expansion of an existing plant offers potential savings in facilities planning and design, and regulatory approval time.

Another option is to pump the sewage from the Township to the existing Swedesboro plant, which would be upgraded. The operation of these facilities by other governmental entities presents certain administrative and procedural issues which must be overcome. Figure '2 indicates those areas of the Township which were to be serviced by the Logan Plant as envisioned in the Tri-County Water Quality Management Plan.

Another alternative is the construction of a new treatment facility along Raccoon Creek. This regional plant would be designed to meet current design criteria and would be managed by a multi-jurisdictional authority.

The Township also has the option of constructing its own treatment plant and conveyance system. This alternative has the obvious advantage of providing the Township with total control of the design and construction of the treatment works and collection system relative to future development plans. This alternative, however, has certain disadvantages with respect to economies of scale. Specifically, the initial capital investment associated with this approach would generate the greatest burden on Woolwich residents.

The construction and operation of a sewer facility by a private entity offers an additional alternative for providing sewer service in the Township. Although this option has the advantage of shifting the initial capital and operating costs to a private franchise, it may present future users of the system with inordinately high connection and operating costs. Control of sewerage facilities by a private entity would also make it difficult for the Township to reinforce the growth patterns described in its land use plan.

The areas of the Township which will have the greatest and most immediate need for sewer service include those zoning districts which permit medium density residential and mixed use development. These areas are generally located west of Swedesboro and along the Route 322 corridor.

At present, it is anticipated that wet ^ sewer service $\bar{N} \{A^f$ connections for the entire region will not be available until at $\hat{Q} \setminus y^*$

least 1994. In anticipation of the construction of central sewerage facilities, the Township shall require developers to install "dry sewers" in all new major developments, especially where new roads are to be constructed. The developer shall reserve adequate land areas to site all appurtenant sewerage facilities.

DRAINAGE AND FLOOD CONTROL

. ..": As development continues, the need to protect sensitive environmental areas becomes more acute. In an effort to maintain the effectiveness of natural drainage areas and to provide other less prominent benefits, it is recommended that the Township use flood plains, wetlands, areas of erodible soils, aquifer recharge areas, streets and similar features to separate future developments. Such boundaries can be used to separate different intensities of residential uses, and to buffer residential from industrial or large-scale commercial uses. Drainage rights-of-way should be preserved and the number of roads crossing flood plains should be minimized. Homes and other uses should not encroach upon flood plains. A minimum number of roads should cross flood plains and wetland areas to avoid costly bridge construction projects and minimize bridge and road maintenance costs. The preservation of flood plains and aquifer recharge areas offer the opportunity to generate recreation areas convenient to homes while providing open space buffers between residential development and agricultural areas. Retaining these water resources will also serve farm irrigation needs and increase opportunities to recharge underground aquifers in an area dependent upon groundwater supplies.

The management of stormwater is a serious concern which becomes more critical as development continues. Stormwater management systems serve to protect the public welfare, and control runoff to prevent or mitigate physical injury, property loss and disruption of activity which may occur after a storm. In addition to its protective function, a drainage system can enhance water supply by enabling stormwater to replenish local water resources. Given these critical functions, it is important that drainage systems be carefully planned.

In view of the problems associated with individual, site specific systems, a change in drainage design philosophy is reflected in the recommendations of much of the current literature. There is a growing recognition that drainage control is best approached within a regional management context, that a non-structural system be encouraged, and that system capacity reflect system demand.

Strategies for dealing with stormwater have been evolving over time. Today, there is greater acceptance of the need for a managed regional approach. The objectives of stormwater management have also expanded. In addition to serving its traditional protective role against storm-related dangers, the drainage system has become

recognized as an important element in water supply and quality. The state of New Jersey has issued water management manuals specifying techniques to control water quantity while protecting water quality.

Major new emphasis is now being placed on the identification and application of non-structural engineering techniques. A non-structural system is consistent with natural resources and processes, and can be designed to improve the effectiveness of natural systems. Natural overland flows, open channels, swales and large ponds are seen as important drainage control elements with auxiliary benefits which should be encouraged.

SOLID WASTE MANAGEMENT

Because the management of solid waste poses serious problems throughout the State, the "New Jersey Solid Waste Management Act" of 1975 requires that each county in the State formulate a management plan which will show how solid waste disposal needs will be met. In addition to providing for environmentally sound disposal, the plan must promote the maximum practical use of resource recovery.

Township residents presently transfer all household wastes to the Municipal Building on Woodstown Road for Saturday pick-up by a private hauler. Township officials have determined that this procedure is the most-cost-effective and efficient means for managing solid waste. Municipal waste generated by Township residents in 1988 amounted to approximately 406 tons.

In an effort to reduce the amount of refuse which is landfilled, the State adopted the "New Jersey Recycling Act" of 1981. All counties are required to reduce the amount of landfilled material by 20 percent as of November 1990. As an incentive for municipal governments to participate in a recycling program, the State offers tonnage grant awards. The amount of money refunded to a municipality is directly related to the success of their recycling program. Woolwich presently recycles newspaper, clear glass and aluminum cans. These materials are collected on a monthly basis at the Municipal Building. Separation of waste materials into combustible and non-combustible has also become necessary since the start-up of the trash incinerator in West Deptford.

OFF-TRACT IMPROVEMENTS

The Township Committee may, by Ordinance, adopt regulations requiring a developer, as a condition for approval of a subdivision or site plan, to pay his pro-rata share of the cost of providing only reasonable and necessary water, sewerage and drainage facilities, and easements therefore, located outside the property limits of the subdivision or development but necessitated or

required by construction or improvements within such subdivision or development.

These regulations shall establish fair and reasonable standards to determine the proportionate and pro-rata amount of the cost of such facilities that shall be borne by each developer or owner within a related and common area, which standards shall not be altered subsequent to preliminary approval. **f

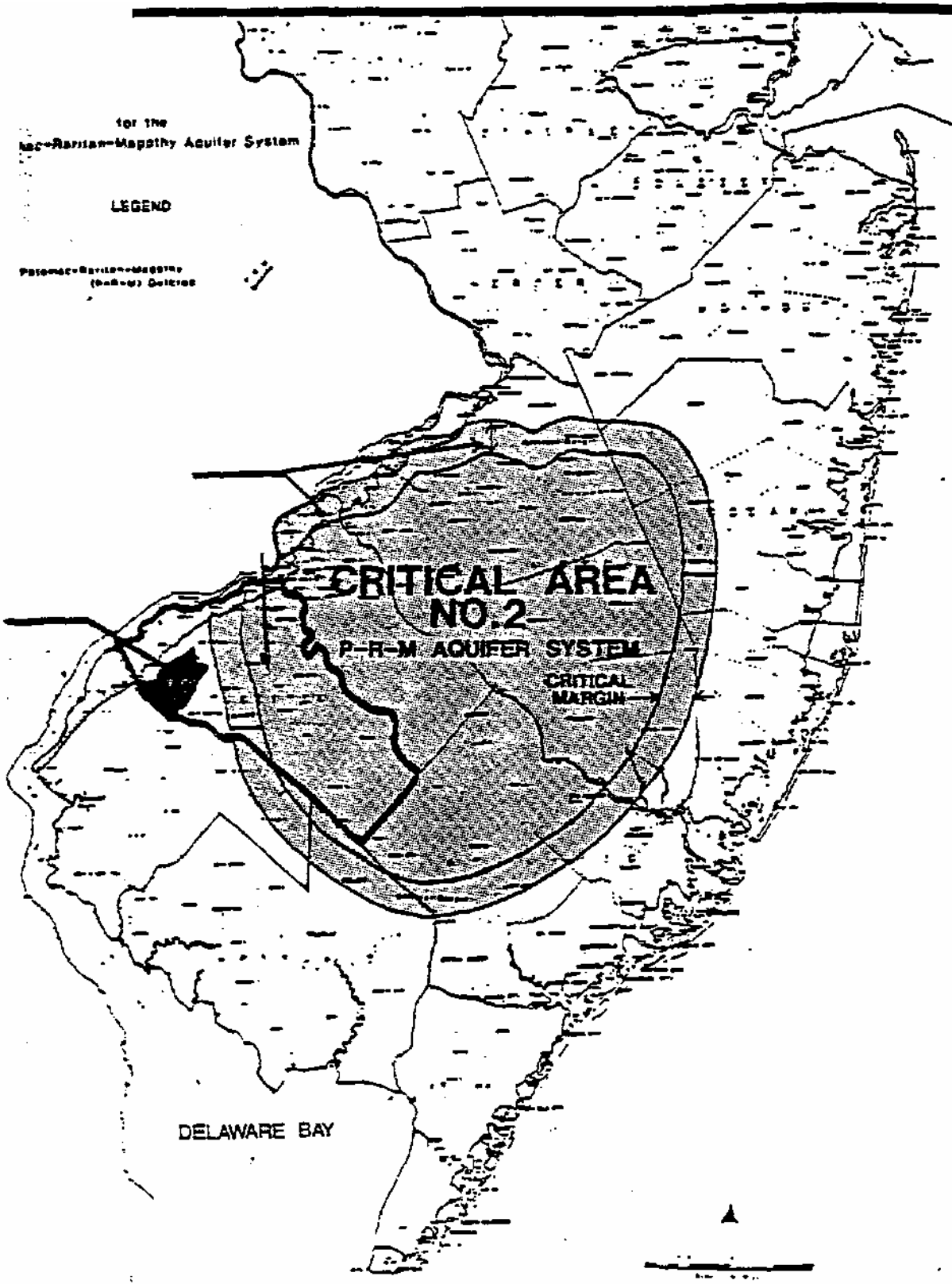
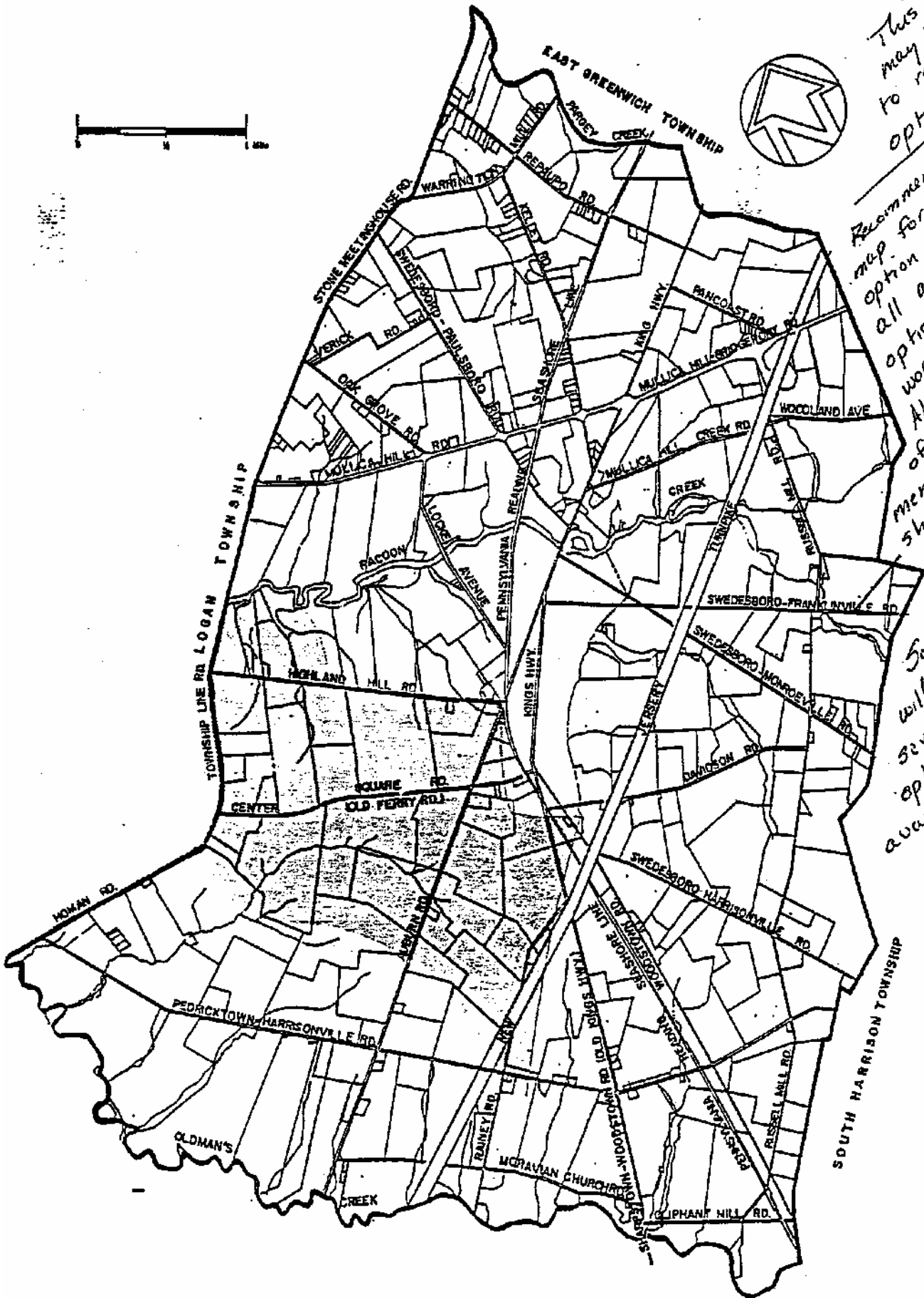


PLATE 3.1
WATER SUPPLY CRITICAL AREA NO.2



This may need to reflect options
 Recommend one map for each option & outlining all areas the option may work. Also areas of environmental sensitivity should be excluded.
 Some areas will have several options available.

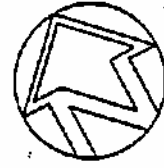
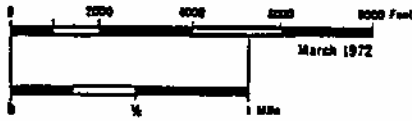
WOOLWICH TOWNSHIP

PLATE 3.2

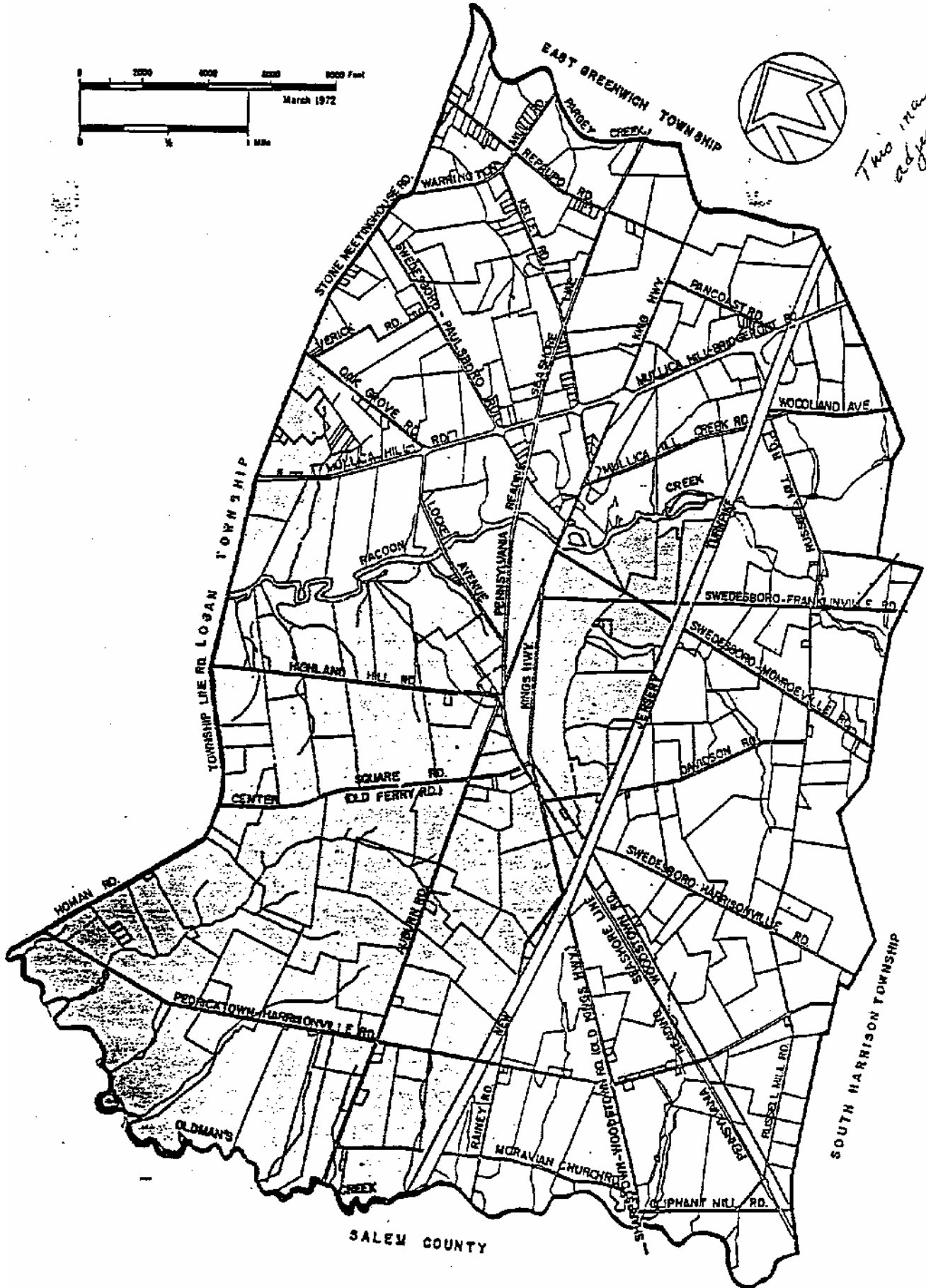
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COMPANY FRANCHISE AREA**

^SALEII COUNTY

WOOLWICH TOWNSHIP



*This may need
adjusting*



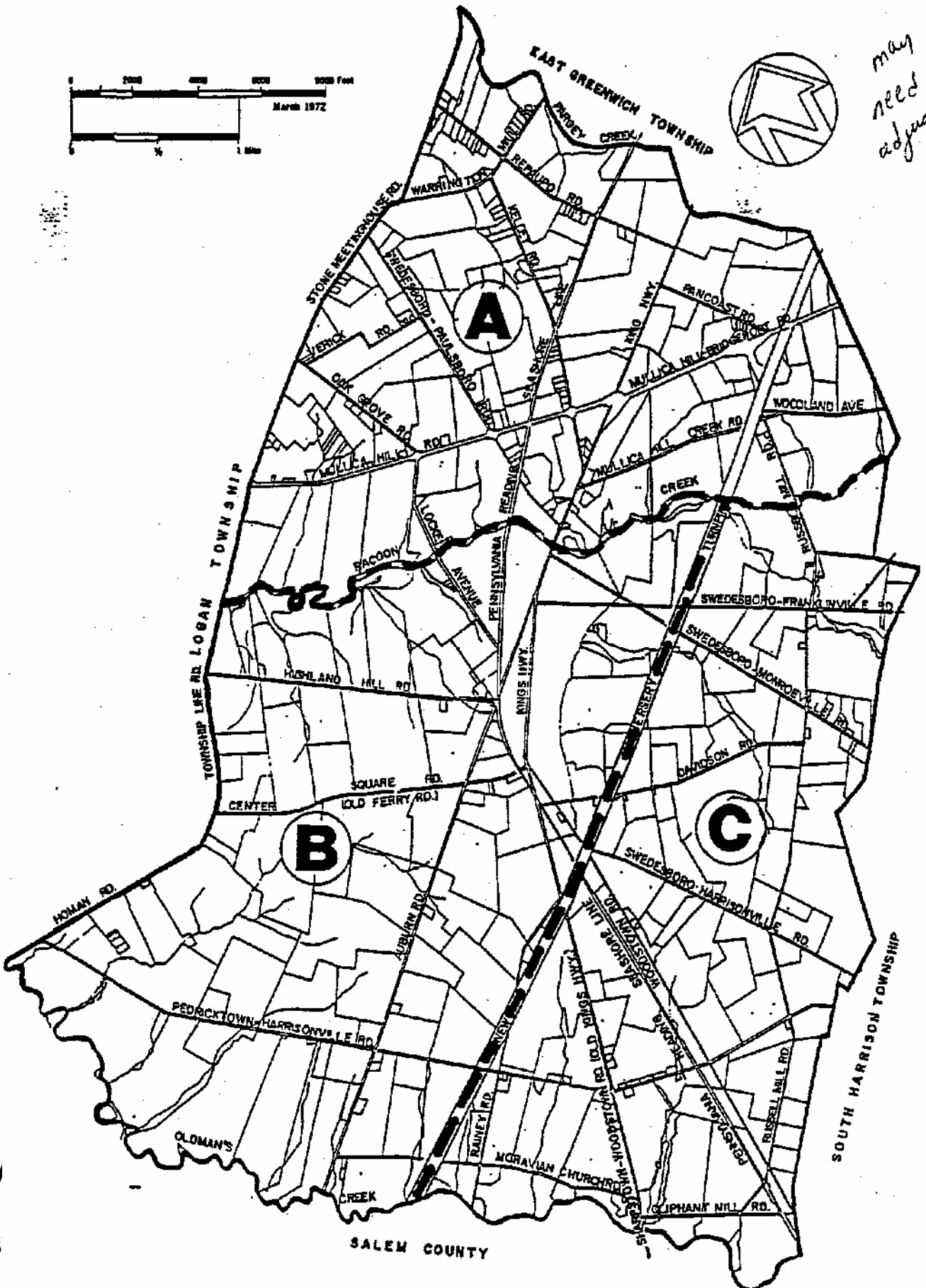
GLOUCESTER COUNTY

**_RROBOSED TRI-COUNTY
(208) .SERVICE AREA**

WOOLWICH TOWNSHIP



may need adjusting



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GLOUCESTER COUNTY

TOWNSHIP OF WOOLWICH
 MASTER PLAN AMENDMENT
 UTILITY SERVICE PLAN ELEMENT

Wastewater Protections ^

Projections Identifying the pace and scale of development, provide the Township with the data it needs to coordinate its wastewater planning with other governmental entities and to anticipate future capital Improvements. These projections must be upgraded on a periodic basis to reflect changes in the Township's zoning and planning policies, the Impact of planning by other levels of government, and emerging demographic and economic trends. In the period following the adoption of the current Woolwich Township Master Plan In 1990, New Jersey has adopted the State Development and Redevelopment Plan, the GCUA has begun work on its facilities plan for the unincorporated portion of its service area, and the Township has adopted a completely revised zoning ordinance which establishes new growth parameters for the entire community. These actions have generated a need to revise Woolwich's wastewater projections to reflect the impact they will have on the Township's sewerage treatment requirements.

The revised zoning ordinance divides the Township into the following sectors:

1. A growth core consisting of a proposed town center on Center Square Road and an area surrounding it zoned for medium density residential uses. The growth core area contains the existing sewer service area. Including the Woolwich portions of the Beckett development.
2. The 322 corridor, a belt of light Industrial, office and service uses planned for land abutting the highway. This corridor is included as a future sewer service area in the draft GCUA facilities plan.
3. The R-2 districts in the northern and southern portions of the Township west of the New Jersey Turnpike. These areas were also shown as future service areas in the draft GCUA study.
4. A rural district east of the Turnpike.- The rural area has not been included in any sewer service area and for planning purposes has been designated as an area which will be required to use septic systems. It has been zoned for low density residential and agricultural uses.

The growth core's status as the only sector currently recognized as a sewer service area and its access to sewage conveyance systems in adjoining sections of Logan Township will attract most of the communities current development. Some current growth may also occur in the 322 corridor and the R-2 districts.

The densities proposed by the zone plan can be used to estimate the future population of the Township's existing and proposed sewer service area. These calculations appear below:

SEWER SERVICE AREA POPULATION

DISTRICT	ACREAGE	PERSONS/ACRE	TOTAL POPULATION
RMD	1592	18.51	29,468
R1	501	3.69	1,845
R-2	3499	5.05	17,670
R-3	93	14.81	1,377
TC	201	3.47	697
TOTALS:	5886	8.67 (AVG)	51,060

The figures listed above provide population estimates for the current and proposed sewer service area, if development there is completed in accordance with the current zoning regulations. They do not address the question of the timing and pace of the growth they project.

potential source of data on the timing of development are the projections prepared by the Delaware Valley Regional Planning Commission, (the DVRPC) The DVRPC provides projections for population and employment growth on both a county and municipal level. Their County figures are derived through a cohort-component method, (Source: DVRPC guidelines) a method which uses survival and birth rates for age cohorts adjusted for migration to generate regional population projections. These figures are allocated to the region's municipalities by The Model 5 - Density Ceiling Extension Method of the QKM Model (Source: DVRPC guidelines) which uses " a combination of historical data projections, ratio trends and density ceilings" to produce municipal projections. The theory behind the DVRPC's adoption of this method is explained in part as follows:

For example, methods based primarily on historical data, including ratio trends, provide no guarantee that historical growth patterns will be continued into the future* Nevertheless, historical population data is the most concrete data set readily available, among all the municipalities. For the current forecasts, the average growth rate over a thirty year period, 1960-1990, was used in order to offset any extreme periods of change that may have occurred during any one decade, and it was used to provide a balance to the forecast being made for thirty years into the future. (Source: DVRPC guidelines)

The DVRPC approach works well for the overwhelming majority of the region's municipalities including stable cities and boroughs, rural towns and growing suburbs. However, by relying on historical trends it cannot anticipate the sudden surge in population which occurs when a rural community is engulfed by rapid growth. In rural communities on the fringe of the region's developing suburbs it is important to analyze regional trends to determine, if the historic level of growth will continue, or if the community will be transformed into a suburban growth area. These regional growth patterns will govern the pace of growth and the demand for sewer capacity.

An examination of census data for Gloucester, Camden and Burlington Counties reveals that recent growth in the region has been concentrated in a limited number of "growth townships" including Mount Laurel and Evesham in Burlington County, Voorhees, Gloucester and Winslow in Camden County and Washington Township in Gloucester County. The total population of Burlington, Camden and Gloucester Counties grew from 952,104 in 1970 to 1,127,972 in 1990. Together, these six municipalities accounted for 143,420 of the total increase, or over 80% of the growth in the three counties between 1970 and 1990. Similar growth surges had been experienced earlier in other area municipalities. Examples include:

- *Cinnaminson Twp. • Grew from 3,144 to 16,962 between 1950 and 1970, its 1990 population was 14,583
- Maple Shade Twp. - Grew from 6,560 to 18,464 between 1950 and 1970, its 1990 population was 19,211.

pages

Medford Twp. - Grew from 4,844 to 17,622 between 1960 and 1980, Its 1990 population 20,526.

- Cherry Hill Twp. - Grew from 10,358 to 64,395 between 1950 and 1970, Its 1990 was population is 69,348. *
- Linden wold Borough - Grew from 7,335 to 18,196 between 1960 and 1980, its 1990 population was 18,734.
- Deptford Township • Grew from 7,304 to 24,232 between 1950 and 1970, Its 1990 population was 24,137.

At any given time after 1950, growth in the tri-county area has been centered in a limited number of the region's 101 municipalities. These periods of Intensive development usually last approximately two decades. They are followed by a sharp drop in the communities population growth.

A review of the geographic location of these municipalities reveals the following patterns:

- Growth areas occur on the edge of older developed areas. This boundary has moved eastward in Burlington and Camden Counties and south and east in Gloucester County.
- Future eastward shifts in this boundary will be limited by the restrictions on development Imposed by the pinelands Commission in the eastern segments, of all three counties. This constraint will direct development to the north in Burlington County and to the south in Gloucester County along the corridor formed by Route 295 and the New Jersey Turnpike.

The recently adopted State Development and Redevelopment Plan will also shape the pattern of development in the region by encouraging growth to occur in existing or emerging centers in districts designated by the plan as Urban (PA 1) and Suburban (PA 2) Planning areas. The state agencies will now assign a higher priority to Infrastructure required to support population growth to projects in these areas. Lesser priorities for state funding and permitting will be assigned to projects in the Fringe (PA 3), Rural (PA 4) and Environmentally Sensitive (PA 5) Planning Areas. This policy will reinforce the historic trend of concentrating development in growth areas adjoining older developed areas. Together these factor will combine to determine the location of future growth sectors. Future growth townships will occur in the portions of the 295/New Jersey Turnpike corridor in municipalities adjoining existing development In Burlington and Gloucester Counties in areas designated as PA 2 in the State Plan.

As a community in the 295/New Jersey Turnpike corridor with a significant share of its land area classified as PA 2. Woolwich is poised to experience the rapid growth which has marked Washington, Mount Laurel, Eves ham, Winslow, Voorhees, and Gloucester Townships during the past two decades. The planning boards of both Woolwich and neighboring Logan have long anticipated this growth through their land use policies. Planned industrial and residential development ordinances were adopted by both communities In the 1970's in response to development proposals for the Pureland Industrial Complex and the Beckett new town. Woolwich has continued to prepare for the future through a complete revision of Its master plan

In 1990 and an updating of its zoning ordinance In 1992. The Township has also worked to maintain current plans for the utilities required to service future growth including a periodic review of the regional trends which will determine the timing and pace of future development. Three factors point to the emergence of Woolwich as a major growth area within the tri-county area:

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1:7 Population projections by the Delaware Valley Regional Planning Commission indicate that the growth of the tri-county area will continue at approximately the same level between 1990 and 2010 as it did In the period between 1970 and 1990.

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2. The Beckett area of Woolwich Township has been classified as a regional center by the Delaware Valley Regional Planning Commission, the Gloucester County Planning Board, and the State Planning Commission. The policies of these regional agencies will be tailored to concentrate future Gloucester County Development in the Beckett portion of Woolwich.

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3 As the growth potential of Winslow, Voorhees, Mount Laurel, Evesham, Gloucester and Washington wanes, new growth belts will emerge In adjoining areas of Gloucester County in Woolwich and portions of Mantua and East Greenwich Townships and in similar locations in Burlington County. The pace of growth in Voorhees, Mount Laurel, Gloucester, and Washington Townships will decline rapidly because between 80% and 90% of the developable land in these communities has been consumed. The further development of much of Winslow and Evesham will be curtailed because large portions of these communities fall under the jurisdiction of the Pinelands Commission.

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Trends from earlier growth townships also provide the data required to estimate the rate of new home construction and project future population levels; A review of building permit data from the New Jersey Department of labor for growing communities In the tri-county area reveals average annual rates of new home construction ranging from 400 to 600 over the past twenty years. Of these townships, the one which most resembles Woolwich in terms of size and its location within Gloucester County is Washington Township. During the period between 1970 and 1989 a total of 9,593 homes were built in Washington Township, Gloucester County, an average of 480 units per year. Totals for individual years vary due to economic conditions. During the recession year of 1981 only 128 homes were built while the boom year of 1987 witnessed the construction of 1,140 units. The economic downturn which has marked the beginning of the 1990's has limited the amount of new development in Woolwich. When the market recovers, home construction in Woolwich should average 450 to 500 units per year, if utility capacity is provided. If the Washington Township model of 480 units per year is used as a multiplier, a total 3 persons per household is assumed, and sewer capacity becomes available by 1995 Woolwich should grow as follows:

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PROJECTED POPULATION: WOOLWICH TOWNSHIP

YEAR	TOTAL POPULATION
1990	1,459
2000	8,209
2010	22,609

^

The current master plan and zoning ordinance and the growth projections derived above provide a basis for estimating:

1. The ultimate population of the Township's sewer service area, if developed in accordance with the current zoning and master plans.
2. The total amount of commercial, office and industrial space which would be constructed under the current zoning and master plans.
3. The projected demand for wastewater treatment in the years 2000 and 2010 based on projected residential and non-residential growth.

These calculations have been prepared by Pennoni Associates during the summer of 1993 in conjunction with sewer service studies for the Township's Wastewater Management Plan and related documents. In the narrative which follows these calculations shall be referenced as the Pennoni projections. (Source: Pennoni Associates Inc., Consulting Engineers, September 1, 1993.)

The Pennoni projections establish the following criteria for projecting service needs in the various zones within the sewer service area as proposed by the GCUA in their Water Quality Management Plan of July 1993:

1. In the R-1, R-2, R-3, RMD, and RLM zones approximately 15% of the land area will be devoted to roads and public facilities.
2. Sewer service calculations should use the DEPE standard of 3 residents per dwelling unit.
3. The R-1 zone will yield 1.23 dwelling units and 3.69 residents per acre.
4. The R-2 zone will yield 1.68 dwelling units and 5.05 residents per acre.
5. The R-3 zone will yield 4.94 dwelling units and 14.81 residents per acre.
6. The RMD zone will yield 6.17 dwelling units and 18.51 residents per acre.
7. The RLM zone will yield 1.68 dwelling units and 5.05 residents per acre.
8. The TC or Town Center zone will be developed at a ratio of 20% residential to 80% non-residential and will yield 5.81 dwelling units and 17.42 residents per acre.
9. Non-residential uses will equal 11,151 square feet in the TC zone. ^
10. In the non-residential zones which include the LIO-Light Industrial Office, SOC-Service Office Center, HC-Highway Commercial, and M-Manufacturing zones roads and public facilities will account for approximately 15% of the land area.
11. The LIO zone will yield 13,805 square feet of non-residential building space per acre.

12. The SOC zone will yield 9,873 square feet of non-residential building space per acre.
13. The HC zone will yield 9,873 square feet of non-residential building space per acre.
14. The M zone will yield 12,033 square feet of non-residential building space per acre.
15. Wetlands and other environmental constraints could reduce the land usage in all of the zones within the sewer service area.
16. The Grasso Foods Sewage Treatment Plant will continue to operate as a separate entity.
17. 95% of the population growth in the period up to 2010 will occur in the sewer service area.

On the basis of these assumptions from the Pennoni projections the population of Woolwich Township sewer service area would follow the pattern shown in the following table;

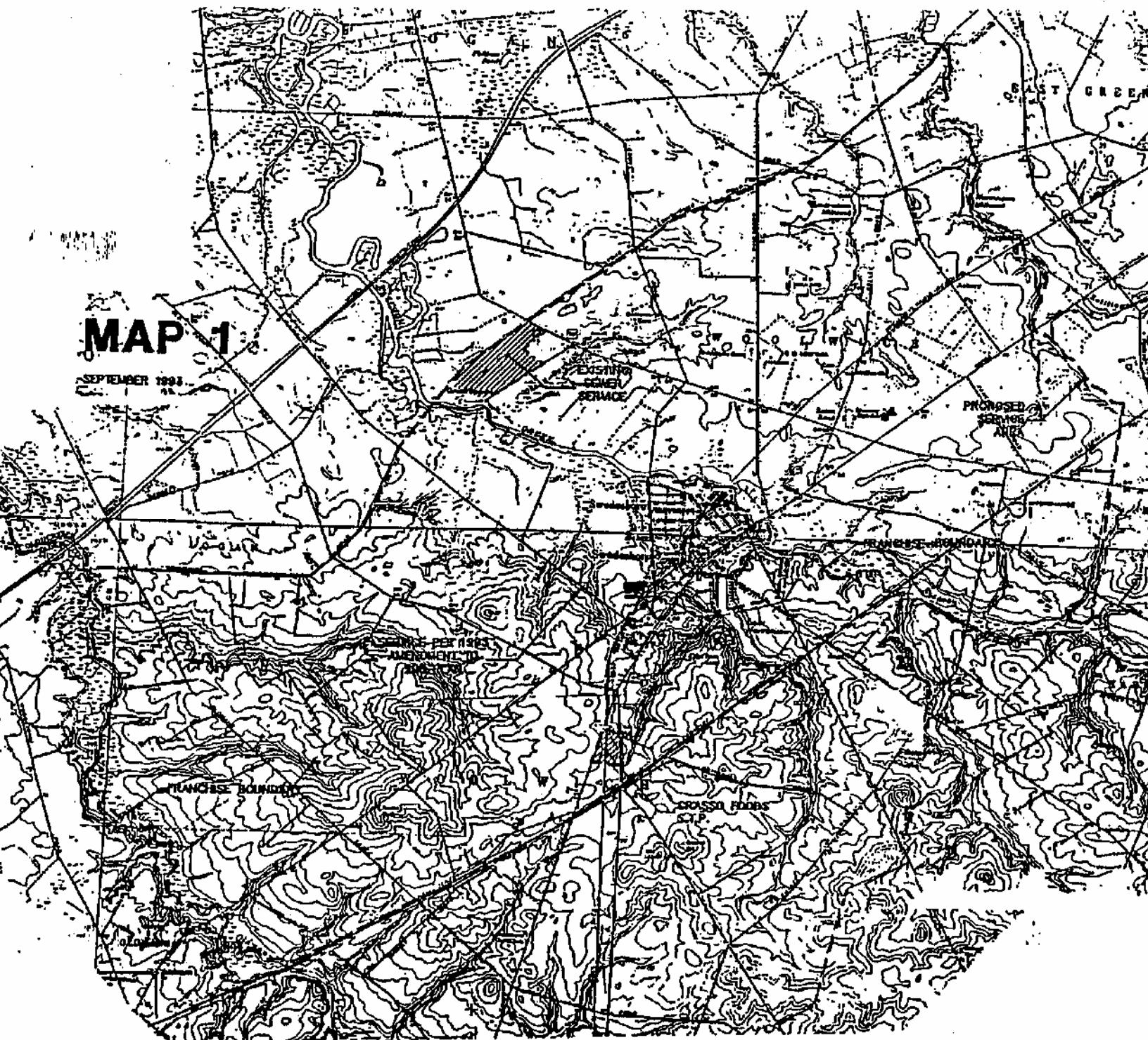
PROJECTED SEWER SERVICE AREA POPULATION

YEAR	POPULATION	SEWER SERVICE AREA POPULATION
2000	8,209	7,798
2010	22,609	21,478

In addition to residential demand projected above, the Pennoni projections predict non-residential development equal to 3,706,941 square feet by the year 2000 and 10,153,795 square feet by 2010. Applying a rate of wastewater generation for residential users equal to 65 gallons per day per person and .125 gallons per day per square foot for non-residential users, the Pennoni figures project a total wastewater treatment demand of 970,238 gallons per day by the year 2000 and 2,665,294 by the year 2010. These calculations represent the most current projections for wastewater treatment generation for the Woolwich Township sewer service area.

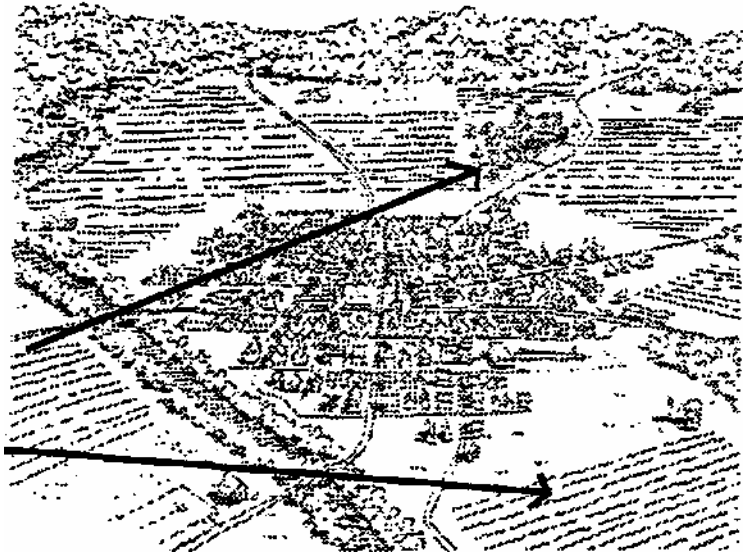
MAP 1

SEPTEMBER 1993



Revise Zoning Ordinances to refine area of each land use district uses to reflect market projections. Describe density credits for hamlet/village projects

Develop Subdivision Ord. to include compact communities & protect contiguity of ag. land



D.04

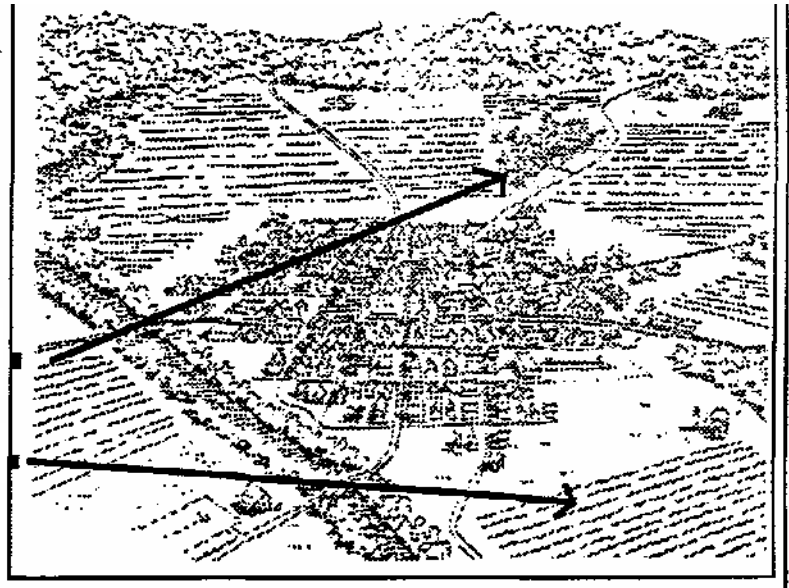
Revise Subdivision, Zoning and Site Plan Ordinances

- **COP/OF:**
MODEL MANNING AND ORDINANCE PROPOSAL
"DEFINING COMPATIBILITY WITH THE STATE PLAN"

This is a clear, thoughtful, essay that discusses the changes to municipal ordinances to accomplish the objectives of sustaining agriculture, equity, and development, in a rural context similar to Woolwich Township

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D.04
ffev/se Subdivision, Zoning and
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MODEL PLANNING AND ORDINANCE PROPOSAL
"Defining Compatibility with the State Plan"

Prepared by Cumberland County Board of
Agriculture
With Assistance From Cumberland
County Planning Office

INTRODUCTION

Beginning with the release of the Preliminary State Development and Redevelopment Plan, the issue of farmland preservation and associated concerns about land equity have been among the most controversial aspects of the planning process. Some of the concerns centered on the language of the Plan. Other concerns focused on Plan Implementation, and the manner in which the State Plan would ultimately be used.

Over the past two years, significant progress has been made in addressing many of the concerns about the language of the State Plan. Planning Area 4 has been broadened to include opportunities for more than just farming. For example, the Plan encourages rural nonfarm activities to be clustered in and around existing centers. In the environs, the Plan recommends that nonfarm land uses develop "at a density and in a manner that minimizes the potential for land use conflicts."

While these kinds of changes to the Plan have been helpful in addressing the concerns of the agricultural community, there remain some uncertainties regarding Plan Implementation. The language in the Plan may be subject to various interpretations by State and local officials. Unless the language is clarified, and the intent of the Plan is understood by everyone, implementation will be a long and difficult process.

To assist in an orderly and constructive implementation of the agricultural goals of the State Plan, the Cumberland County Board of Agriculture has prepared this Report. The objective of the Report is to offer an interpretation of the State Plan, and to seek a finding of consistency from the Office of State Planning. By seeking this interpretation in advance of final Plan adoption, the Board of Agriculture can assist the County Planning Board in preparing plans and ordinances which enable municipalities to meet successfully the farming objectives of the State Plan, at such time as the Plan is adopted.

Although this Report offers a hypothetical scenario, the statistics, regulations, and concepts represented are typical of Cumberland County's agricultural municipalities. While local plans and ordinances may vary, this Report offers- what might be considered a reasonable middle ground in the interpretation and implementation of the State Plan.

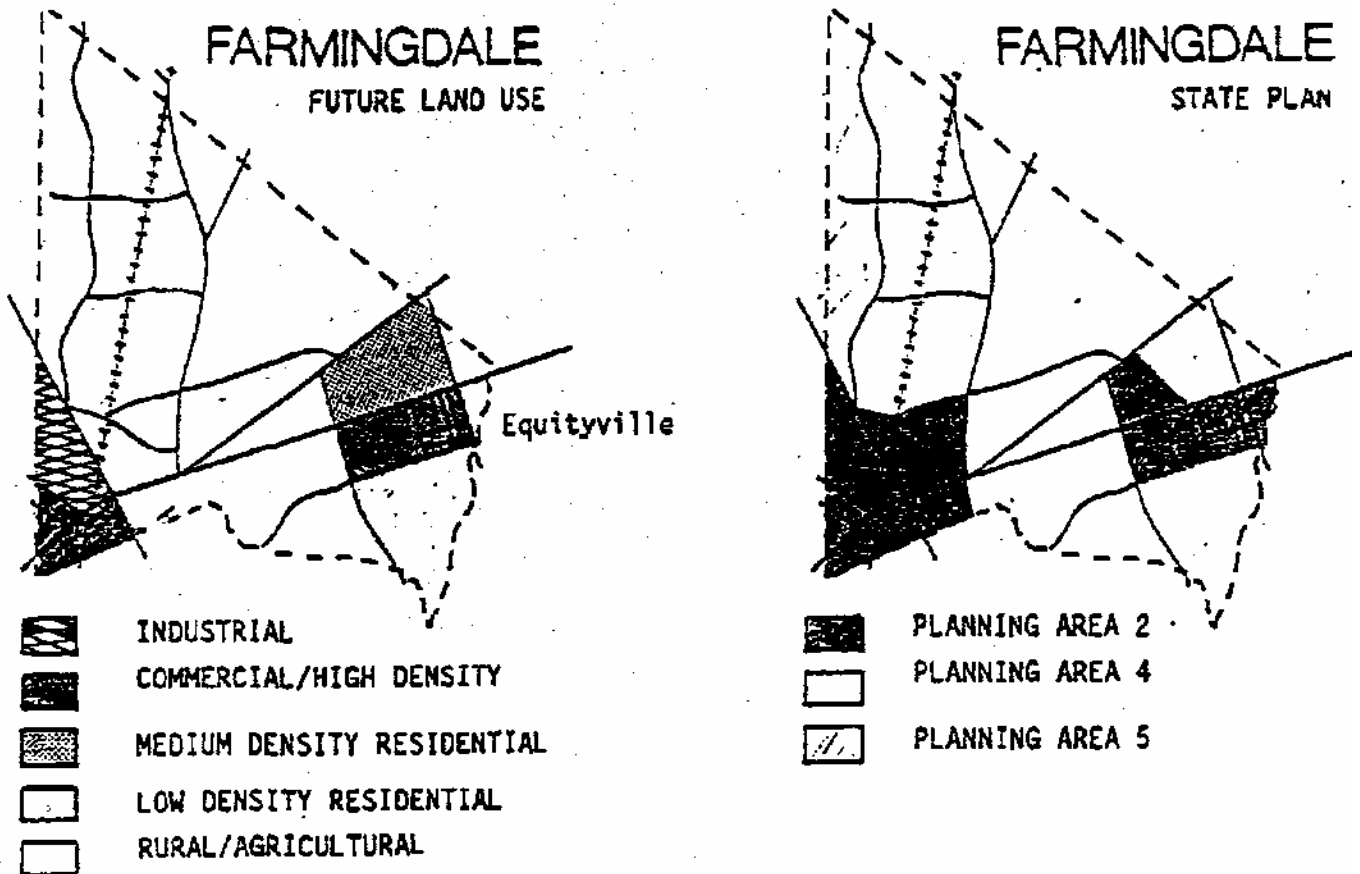
A MUNICIPAL SCENARIO

Background

Farmingdale Township, (hypothetical) , is a small, rural municipality located in Cumberland County. It has long been an important center for farming and other kinds of agri-business. Over the years, the Township has demonstrated good local planning practices, and its plans/ codes, and ordinances are all in good order.

Between 1980 and 1990, the Township experienced a modest increase in population, going from 5230 to 6007 persons. This represents a density of about 145 persons per square mile. While the population increase is only 15%, the Township feels that its proximity to the urbanizing areas of the County and recently completed Route 55 will promote added development pressure in the coming decade.

In addressing its response to the State Plan, Farmingdale Township delineated 60% of its land as Planning Area 4. The remainder of the municipality is divided between Planning Areas 2 and 5. The delineation of these Planning Areas closely approximates the current municipal plan, since the areas for higher density development shown on the Township's Master Plan correspond pretty closely to the intent of the various State Planning Areas. The maps below contrast Farmingdale's current Master Plan with its State Plan Map.



In addition to a fair degree of compatibility between the local Master Plan and the State Plan, Farmingdale has a set of land use ordinances that provides a range of development densities. There are 5 zones in the Township. One of the zones is intended to conserve agricultural land, and calls for a minimum of five acres for each residential lot. Two of the other zones provide for increasing residential densities with minimum residential lot sizes of 2 acres and 1 acre. The remaining two zones regulate mixed use/commercial development and industrial park development. The Land Development Ordinance implements well, the current Master Plan.

Seeking State Plan Compatibility

- In reviewing its Master Plan and Land Use ordinances, Farmingdale Township has proposed a number of things that it can do to promote compatibility with the objectives of the State Development and Redevelopment Plan. Some involve changes to its Master Plan. Others involve amending its land use regulations. These recommendations are described as follows.

^faster Plan Revisions

Township officials like the concept of village development described in the State Plan. They respect the need for more regional coordination and are willing to work toward that. However, they recognize that if Farmingdale's villages are ever to be developed properly, the Township will need to have additional public infrastructure. This would have to come in the form of package treatment systems, because an extension of existing sewer and water lines to the Township's villages would open up a considerable amount of land to the kinds of development that would not be in keeping with either the State Plan or the local Master Plan. In addition, the Township recognizes that this kind of infrastructure will not be permitted or funded in the short term, since State Agencies are not currently allowing this sort of infrastructure.

In reviewing their Master Plan for consistency with the State Plan, Farmingdale officials realized that although there was an area planned for future agricultural activity on the Township Master Plan, the Plan treated agriculture as a land use but not as an industry- In addition, the Plan seemed to promote large lot residential development, which did nothing to conserve the agricultural land base in the Township.

After considerable discussion and debate, the Farmingdale Planning Board recommended that the following changes be made to the Township Master Plan.

1. Show the largest village in the Township, as an area of planned future public sewer. The planned densities in this area should be increased, and the community service

boundary of the village should be enlarged to accommodate a greater amount of the Township's future population and a more diverse mix of activities, at such time as the State permits and funds the necessary infrastructure.

2. The Master Plan should be amended to recognize the value of Transfer of Development Rights as a tool for regaining the agricultural land base of the Township. The Plan should recommend that the Township undertake an analysis of the TDR concept/ and examine its applicability in Farmingdale, so that when TDR enabling legislation is passed and a TDR Bank is established by the State, the Township will be in a good position to participate.

3. The Plan should call for a complete review of the local development regulations to encourage agri-business as a primary land use in the agricultural areas of the Township. Currently, the five acre zone in the Township states that agriculture is a permitted use by right, but then goes on to promote the manner in which residential activity can occur. Township ordinances should be amended so that agriculture and its associated uses are treated as the principal and primary uses in the five acre Agriculture District, and residential uses as secondary uses.

4. The Plan also needs to promote development patterns in the Township that are more sensitive to protecting and preserving agriculture. Concepts like clustered development, better setbacks and buffers between farm and nonfarm uses should be encouraged. Greenways- should be used as natural buffers between differing land uses.

Changes -hn frfr*? Tand Use Ordinance

By adding some language to its Master Plan to encourage these concepts, and Toy taking the necessary steps to refine its development ordinances. Township officials are hopeful that Farmingdale will be deemed consistent with the State Development and Redevelopment Plan. It is anticipated that the four amendments to the Master Plan will result in a number of changes to the local ordinances. The Farmingdale Planning Board is seeking a simultaneous review of these changes by the Township Committee, and is also forwarding them to the Office of State Planning. These changes are intended to implement the newly revised Master Plan to accommodate the shared objectives with the state Plan. The proposed changes are as follows.

1. Township officials would like to see their Plan implemented in as positive a way as possible. This means that they want to rely on market incentives rather than regulation to shape the land use in their community wherever possible. They recognize that making development in the Centers more attractive will help to protect the integrity of their farming areas. To implement the Centers concept of the state Plan, and to promote greater development in and around Eguitville, the Township Planning Board is proposing a series of changes to its development ordinances.

These changes are as follows.

A. Zoning Regulations will be changed to increase the density in Equityville from a minimum of one half acre lot sizes to one quarter acre lot sizes with public sewer and water.

B. The high density development boundary around Equityville will be enlarged to accomodate future growth, it is felt that by increasing the .ability to develop at higher densities in Equityville, there will be less inclination to develop in the rural areas.

C. Ordinances will be amended so that development in the villages in the Township, including Eguityville, take on a character similar to what exists there now. This means changing the setback, front yard, maximum lot size, and design regulations to reflect current development patterns. Regulations for front yard distances will be reduced from the current 150 feet to 25 feet. Side yard setbacks will be reduced from the current 50 feet to 20 feet. The Township will explore limiting the maximum lot size in the village to encourage a tighter development pattern.

D. Currently the Township has limited provisions for mixed use zoning in its villages. The Planning Board recommends that the densities for mixed use development be examined to better implement the village concept.

E. Township Officials would like to promote the development of the agri-business industry, but would like to see the larger of these industries clustered in industrial parks, or located in close proximity to existing industrial and commercial operations. The Township will explore the creation of agri-industrial parks, and change language in its existing industrial park ordinance to define "large" agri-businesses and promote the development of these kinds of businesses there.

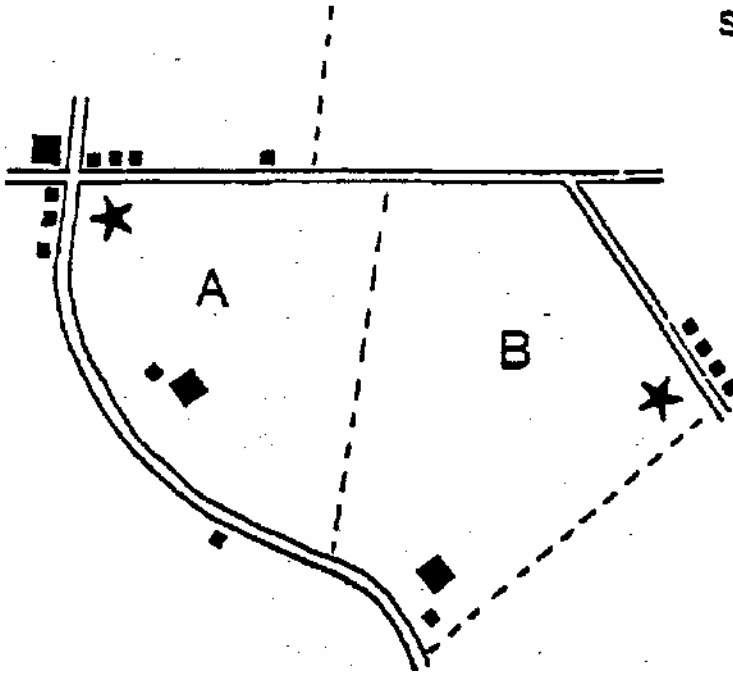
2. To implement the Waster Plan's intent to improve design regulations and development patterns, the Planning Board recommends several changes to the Farmingdale Land Development Ordinance.

A. Cluster Development. It is recommended that the Township add a provision to its development regulations to require cluster development of major subdivisions in the five acre Agricultural Zone. The intent of this regulation would be to permanently preserve the remaining farmland on the tract. The Township also wants to promote the clustering concept in such a way that development clusters are strategically located. By incorporating a provision into the land use regulations that requires the clusters to be located adjacent to or in proximity to the nearest existing development, the local ordinance would further the creation of new villages and hamlets in accordance with the objectives of the State Plan. The concept of "Strategic Clustering" is depicted in the figure on the following page. The Township would also like to explore the idea of density bonuses to encourage greater acceptance of the cluster option. For example, the way Farmingdale's regulations are set up now, the owner of a 100 acre tract in the 5 Acre Agricultural Zone would be entitled to 20 residential units on his property. The inclusion of a cluster

provision in the local ordinance could be established in such a way that the property owner would be entitled to an additional 5 units of clustered development. Township officials feel this will encourage people to accept the notion of clustered development.

The figure on the left shows two farm tracts, A and B. As can be seen from this graphic, there is scattered development throughout the area. The best locations

STRATEGIC CLUSTER ★



for new clusters of development to occur are in the vicinities of existing development, as shown. By strategically locating new clusters of rural development in this manner, the adjacent, contiguous farm fields can continue to be used.

B. Buffers and Setbacks, Any kind of development in the farming areas of the Township needs to be done in a way that is sensitive to the agricultural character of the community. It is recommended that a vegetative buffer of 75- feet be established between any new development and agricultural property. Further, the setback between new residences and offices should be setback at least 200 feet from agricultural land.

C. • Performance Standards. To enhance the farm industry, the performance standards of the land development ordinance will be changed to exempt farmers from various fees associated with development that is ancillary to the principal farming use of the property. There will be no fee for the submission of site plans for the construction of barns, sheds, outbuildings, farm markets, and other structures that are integral to farming. Where possible, all new buildings should be constructed on the less desirable farm ground. Nonfarm activities should also be conditional uses in the farm zone. They should be required to perform to a series of design and density standards that maximize their compatibility with agriculture.

D. Sketch Plat Alternatives. When a major subdivision or site plan is proposed, Township officials have discussed the possibility of requiring two sketch plat proposals. The idea is to give the Township and the developer a chance to discuss the pros and cons of alternative development designs, prior to the expensive steps associated with preliminary plat submittal. This option, it is felt, will save most developers and the Township a significant amount of time and money during the plan review process.

E. incentives for Clustering Among Adjacent Landowners. Where more than one landowner is interested in cluster development, and can foster the creation of a new village or hamlet, density bonuses will be awarded to the landowners to encourage this kind of cooperation. By providing such an incentive, a greater amount of farmland can be preserved, and municipal planning can be enhanced.

SUMMARY

Not all of the municipalities in Cumberland County are in a position to make the changes to their Master Plans and Development regulations as quickly and simply as Farmingdale Township. The intention of this Report is not to estimate the extent to which local plans and ordinances might have to be amended to conform with the State Plan, but to determine the reasonableness of the typical changes that might be necessary.

The County Agricultural Development Board recognizes that it will be some time until the State Plan is implemented uniformly throughout State government. Until such a time as the funding for infrastructure in the Centers and additional money for local planning is forthcoming, the County Board feels that the Scenario put forth in this Report represents a reasonable interpretation of the language in the State Plan, and requests a formal response from the Office of State Planning. There may well be additional ideas that are developed as model plans and ordinances are prepared, but this represents a good start.

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Cumberland County Agriculture Development Board

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13. 1S32

Mr. John Epling, Director
Office Of The State Plan 150
W. State Sweet
CN204
Trenton, New Jersey OSG25-0204

Dear Mr. Epling:

I am responding to your letter of May 6, 1992 in which you reacted to our proposal to implement the farmland preservation objective of the State Plan. We reviewed your response at our Agriculture Development Board meeting last night.

We believe that our proposal represents a positive initiative if you are likely to receive from the farm community. We also note that the middle ground between preservation and development is a difficult problem of land equity.

A two day workshop planned for later this month. I would like you to review this Initiative with your Commission, and the Commission will agree in an appropriate way to implement the agricultural objectives of the State Plan, I believe that the farm equity issue can be resolved satisfactorily.

We appreciate the effort that the State Planning Commission has made to address many of our concerns. We look forward to a positive response from the Commission.

Thank you for your continued time and attention.

Sincerely,

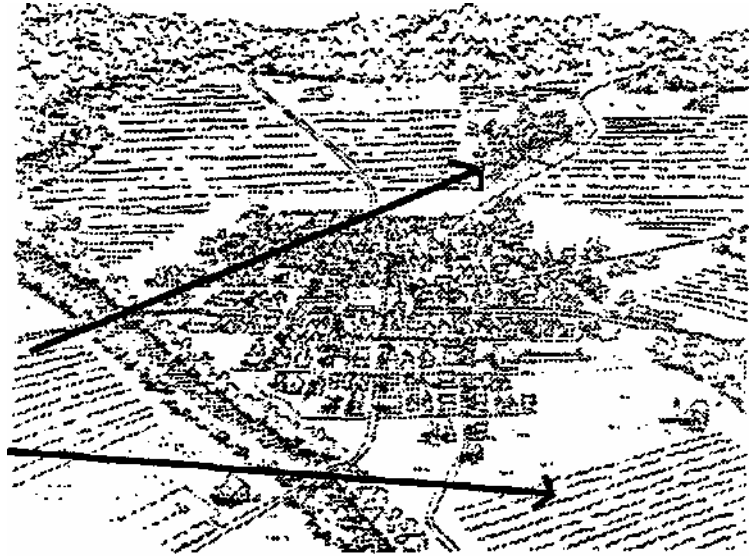
cc: Cumberland County Board of
County Board of
State Planning Commission

g Farmland in Cumberland County

D* review/revise local regulations

Revise Zoning Ordinances to refine area of each land use district uses to reflect market projections, describe density credits for hamlet/village projects

Develop Subdivision Ord. to include compact communities & protect contiguity of ag. land



D.04

ffev/se Subdivision, Zoning and Site Plan Ordinances

i ANNOTATED EXAMPLE OF ZONING ORDINANCE
(SEE AM)

i EXAMPLE OF EXAMPLE OF DESIGN GUIDELINES FOR
HAMLET/VILLAGE DEVELOPMENT

These are examples of clear, illustrated ordinances that can be understood by everyone, not just planners, developers and lawyers. Zoning regulations should be a concise expression of community values about the character of the place we would like to live.

SECTION 1270 OPEN SPACE REQUIREMENTS *

1. General Requirements for Open Space
 - A. Graphic illustration of open space requirements are set forth in Appendix C to this Article.
 - B. Open space within a Village Extension may consist of four types: (1) A Village Square, (2) a Neighborhood Park, (3) an Agricultural Buffer, and (4) a Residential Commons.
 - C. A Village Extension shall provide at least one Village Square, at least one neighborhood park, and an agricultural buffer. A Village Extension may also provide interior open space on a residential commons block. This open space shall be called a Residential Commons.
 - D. Open space shall be provided within every Village Extension for the open space and recreational needs of the residents. Such open space shall reinforce the identity, form, and character of the community.
 - E. The location of open space within the Village Extension shall be coordinated with the adjacent existing village community, and, if appropriate, shall connect with, expand, or enhance adjacent open space or recreational areas.
 - F. All public open space shall front on, or have access to, a public street on at least one side, and shall be accessible to residents within the Village Extension.
2. Open Space Types
 - A. Village Square

A Village Square shall meet the requirements as provided in Section 12673.A.
 - B. Neighborhood Park

A neighborhood park shall have two of its sides, which need not be contiguous, front on two streets, or a street and a buffer.
 - C. Agricultural Buffer
 - (1) Agricultural properties located adjacent to a Village Extension shall be protected and buffered from residential encroachment to the maximum extent possible.

- (2) An agricultural buffer shall be established on the perimeter of any Village Extension that adjoins a farm.
- (3) An agricultural buffer shall be at least fifty feet wide and shall be planted with native varieties of deciduous and evergreen trees, shrubs, and hedges.
- (4) The agricultural buffer shall constitute part of the open space of the Village Extension and may be traversed by pedestrian or bicycle paths.

D. Residential Commons

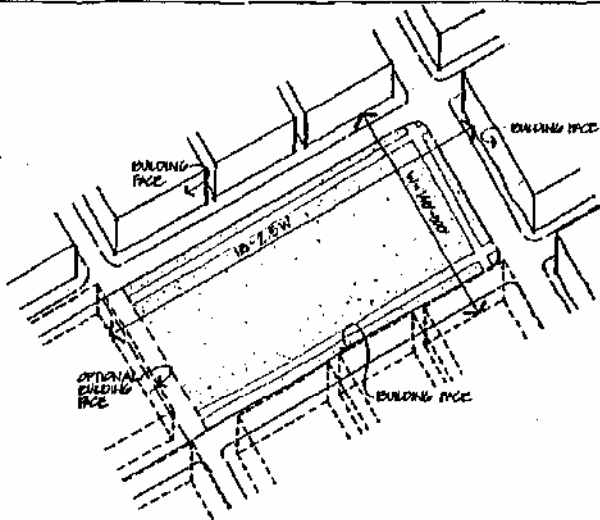
- (1) A Residential Commons shall be located on the interior of a Residential Commons Block.
- (2) The commons shall be designated for use in common for residents of that block. The perimeter of the commons may be defined through a fence or natural vegetation. Design standards, ownership, and maintenance of the commons shall be included as part of a homeowners* association agreement.

i

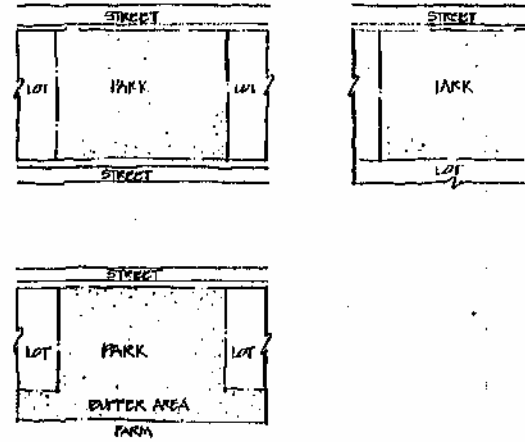
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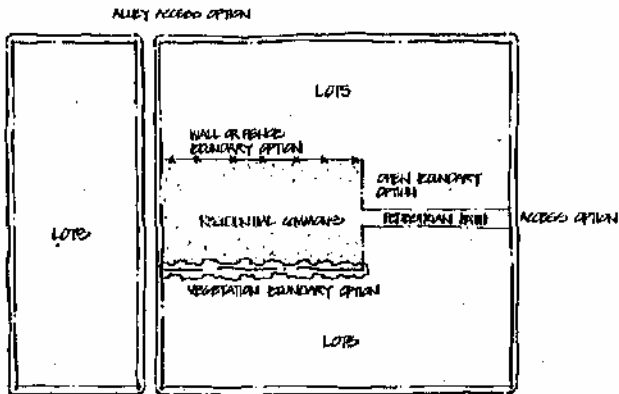
Open Space Requirements



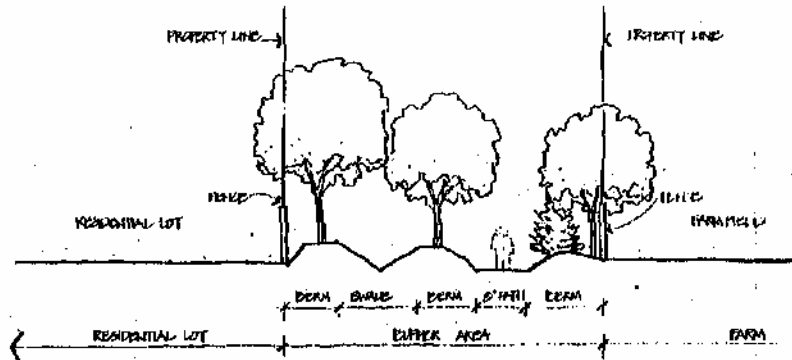
Neighborhood Park



Commons



Buffer Edge



Residential Buildings and Lots Detached Types

	SINGLE FAMILY			ACCESSORY	COT
	East-West Street	North-South Street	Zero-Lot Line	All Streets	All S

Visions for a New American Dream

SECTION 12. BLOCKS WITHIN PLANNED SMALL COMMUNITY

1. **BLOCK SIZE** The street shall be designed to create blocks that are generally rectilinear in shape, a modified rectilinear shape, or another distinct geometric shape. Amorphously shaped blocks are generally discouraged, except where topographic or other conditions necessitate such a configuration. To the greatest extent possible, blocks shall be designed to have a maximum length of 480 feet. Lanes shall be permitted to bisect blocks. Refer to Illustration 23.

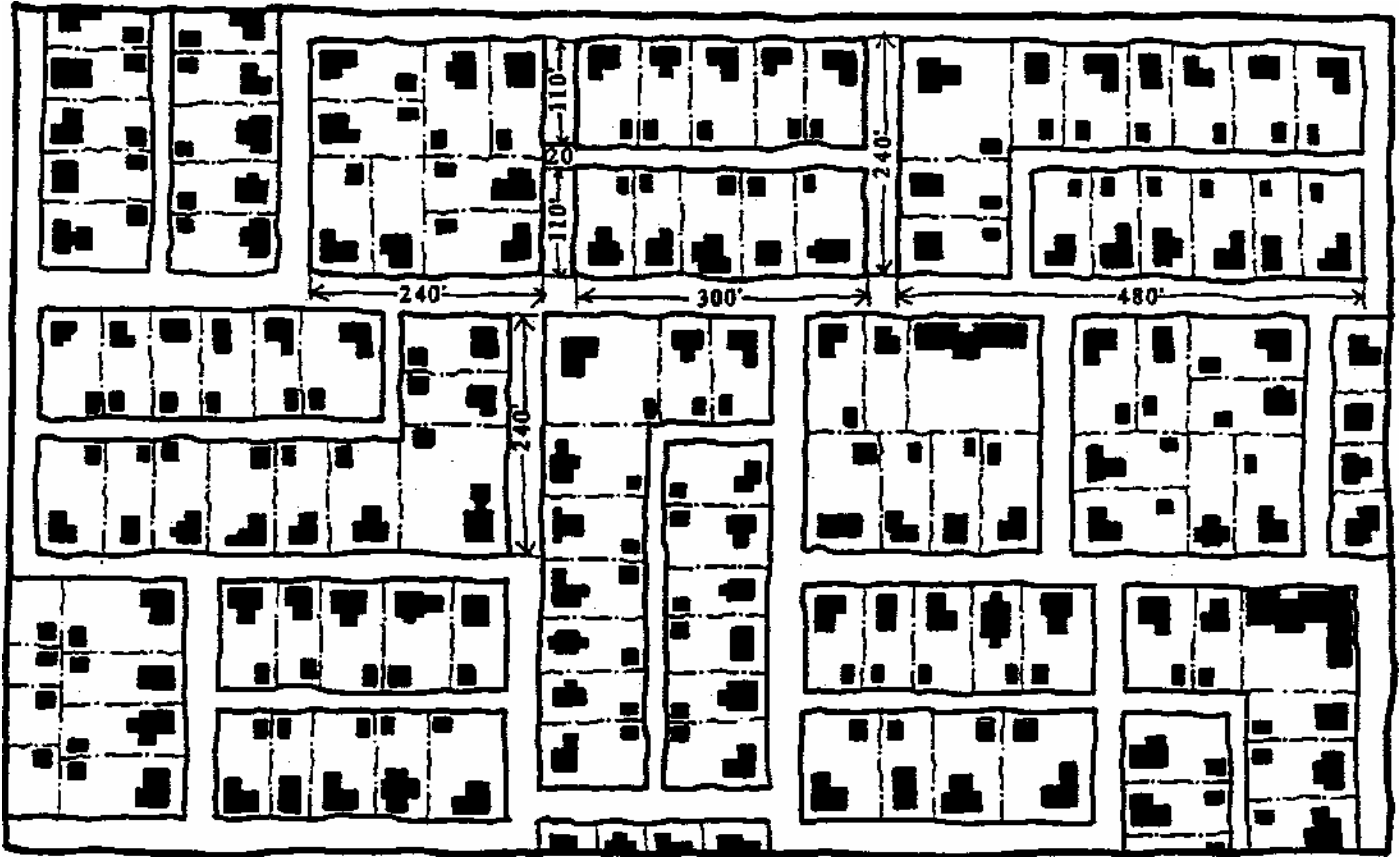


Illustration 23 *Diagram of a street defining geometrically shaped blocks a basic street block diagram must be prepared for each small community.*

2. **BUILD-TO LINE** Each block shall be designated with a build-to line which shall establish the front yard setback for the lots on the block. The build-to line shall fall between the minimum and maximum front yard setbacks for the proposed uses (refer to Section 18, Area and Bulk Regulations). A minimum of 80% of all buildings on the block shall conform to the build-to line, with the remaining 20% allowed to vary by being further setback no greater than 75% of the distance from the right-of-way to the build-to line for residential or no further than the maximum setback for commercial uses. Buildings shall be allowed to come forward of the build-to line by no greater than 25 % of the distance between the right-of way and the build-to line for residential structures.

3. **VARIATION OF LOT WIDTH AND AREA** Lot areas and lot widths shall vary at random to the greatest extent possible, in order to eliminate the appearance of a standardized subdivision. To the extent possible, no more than two lots in a row shall have the same width. Lots shall vary by a minimum of five foot increments.

4. A maximum of five percent of all lots for single family detached dwellings may be flag lots. Refer to Illustration 24.

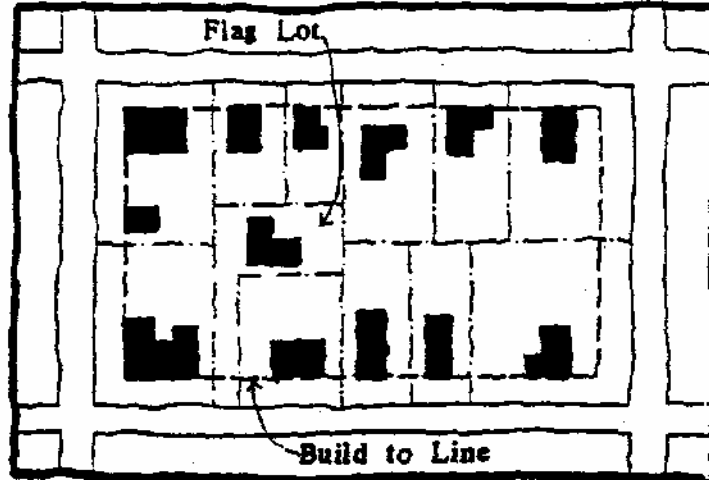


Illustration 24 Diagram of varied lot sizes, including a flag lot. Front yard setbacks must conform to a build-to line.

SECTION 13. STREETS WITHIN PLANNED SMALL COMMUNITY

1: The street layout shall be a modified grid street pattern adapted to the topography, unique natural features, environmental constraints of the tract, and peripheral open space areas. The street layout shall take into consideration the location of a community focus, other internal open space areas, gateways, and vistas. Refer to Illustration 25. A minimum of two interconnections with the existing public street system, rated as an arterial or collector, shall be provided where possible. Linkages to adjacent developments and neighborhoods with pedestrian and bicycle paths are recommended where possible.

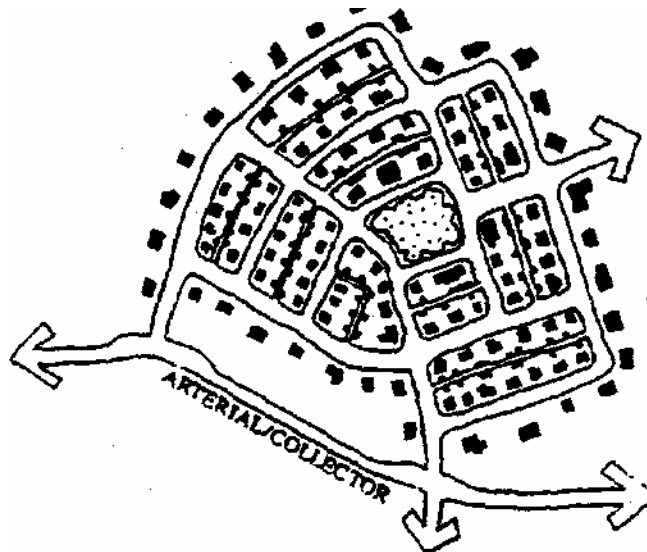
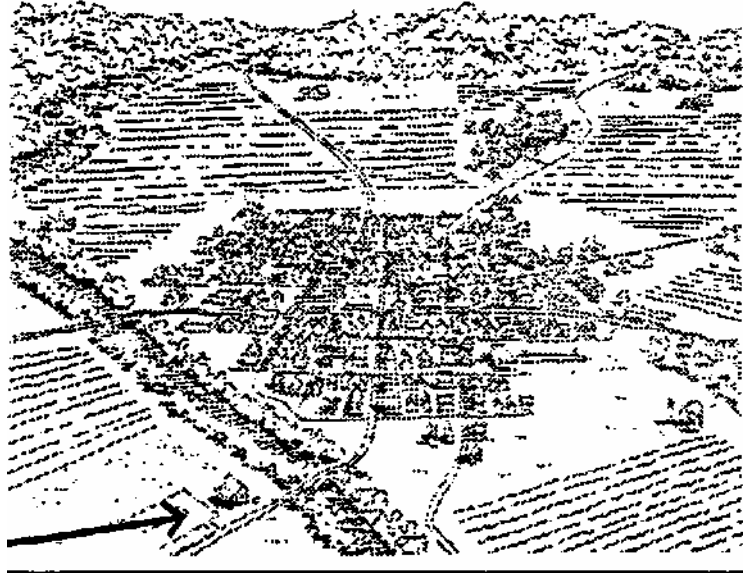


Illustration 25 Diagram of a modified grid street pattern with three connections to the surrounding street system. Each small community must have at least two peripheral attachments.



ReWse Right-to-Farm Ord. on fomw's markets to protect farmer's right to sell agricultural products

D.05

Revise R/a&f to farm Ordinances

ANNOTATED WOOLWICH RIGHT-TO FARM ORDINANCE (NOT YET INCLUDED)

The municipal Right-to-Farm Ordinance can be more specific regarding specific practices that are acceptable and necessary. It can also support a public information policy that would notify new home-buyers of the provisions of that ordinance. This lays the groundwork for the necessary compromises that will be required on the part of farmers and home-owners if they are to co-exist amicably as residential and mixed-use development occurs in the future. Municipalities can craft local legislation that supports a broad range of activities, including direct marketing of farm-related products.

zated, which parcel was under one ownership on November
, 1992, when the owner thereof owns no adjoining land,
be used as a lot for any purpose permitted in the
zone other -than multiple dwellings, provided that all
j other regulations prescribed for the zone by this
Ordinance are complied with.

SECTION 310 - PROHIBITED USES

- A. Extractive industries shall not be permitted to operate in any of the zones established in this Ordinance. Such industries include mining or alterations in the earth surface for the purpose of extracting minerals or soils of any type for use or sale off site. The Ordinance now in effect concerning the removal of soil is not repealed by this Ordinance, but is still in full force and effect.
- B. Trailers or camp cars shall not be permitted to be parked, installed, used or occupied for living purposes in any of the zones established in this Ordinance; provided, however, that this section shall not prohibit the owner of any trailer from storing not more than one (1) trailer on premises owned by him if the said trailer is not used for living purposes..
- C. The use of a lot in any zone primarily for the storage of bulk oil or gasoline above the ground.
- D. The business of selling defunct motor vehicles or parts or used lumber or building material or the storage thereof.
- E. No building may be erected, altered or used, and no lot or premises may be used, for any trade, industry or business that is noxious or offensive by reason of odor, dust, smoke, gas, vibration, illumination or noise, or that constitutes a public nuisance or hazard whether by fire, explosion or otherwise.

SECTION 311 - RIGHT TO FARM

- A. The right to farm all land is hereby recognized to exist as a natural right and is also hereby ordained to exist as a permitted use everywhere in the Township of Woolwich, regardless of zoning designation and regardless of specified uses and prohibited uses set forth elsewhere in this Ordinance, subject only to the restrictions and regulations applicable to intensive fowl or livestock farms, Article VII, Section 700.9 of this Ordinance, and to Township Health and Sanitary Codes. The right to farm, as this term is used in this section, includes the use of large irrigation pumps and equipment, aerial and ground seeding and spraying, large tractors, numerous farm laborers and the application of chemical fertilizers, pesticides and herbicides; all for the purpose of producing from the land agricultural products such

as vegetables, grains, hay, fruits, fibers, wood, trees, plants, shrubs, flowers and seeds. The right to farm shall also include the right to use land for grazing by animals, subject to the restrictions for intensive fowl or livestock farms. The foregoing uses and activities included in the right to farm, when reasonable and necessary for the particular farming, livestock or fowl production, and when conducted in accordance with generally accepted agricultural practices, may occur on holidays, Sundays and weekdays, at night and in the day, and the noise, odors, dust and fumes that are caused by them are also specifically permitted as part of the exercise of this right.

B. It is expressly found that whatever nuisance may be caused to others by such uses and activities, so conducted, is more than offset by the benefits -from farming to the neighborhood and community, and to society in general, by the preservation of open space, the beauty of the countryside, and clean air, and by the preservation and continuance of farming operations in Woolwich Township and in New Jersey as a source of agricultural products for this and future generations.

C. The Zoning Board, in the exercise of its authority to interpret this Zoning Ordinance and to hear appeals from decisions or actions of the Zoning Enforcement Officer, may decide what farm uses and activities are reasonable and necessary for particular farming, livestock or fowl production and whether or not they are conducted in accordance with generally accepted agricultural practices. Before deciding such questions, however, the Zoning Board shall first solicit and consider the opinions and conclusions of the Gloucester County Agricultural Agent as to the reasonableness and necessity of the particular farming use and activity and whether or not it is a generally accepted agricultural practice. It is expressly ordained that the use of carbide guns after sundown and before sunrise, is not an accepted agricultural practice and is hereby prohibited.

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I D. All farms subject to the regulations of this section
I shall meet the requirements of N.J.S.A. 54:4-23.1 et
f seq.

312 - LOT DEVELOPMENT

No lot shall be so reduced that more than one (1) detached single-family dwelling

B. No lot area shall be so reduced that the area of the lot or the dimensions of the open spaces shall be prescribed.

Any lot proposed for development must contain developable land

E N V I R O N S

Develop site plan and subdivision review procedures to expedite service area applications community treatment facilities

Work with local sewer service authorities to develop administrative procedures that are responsive to state guidelines

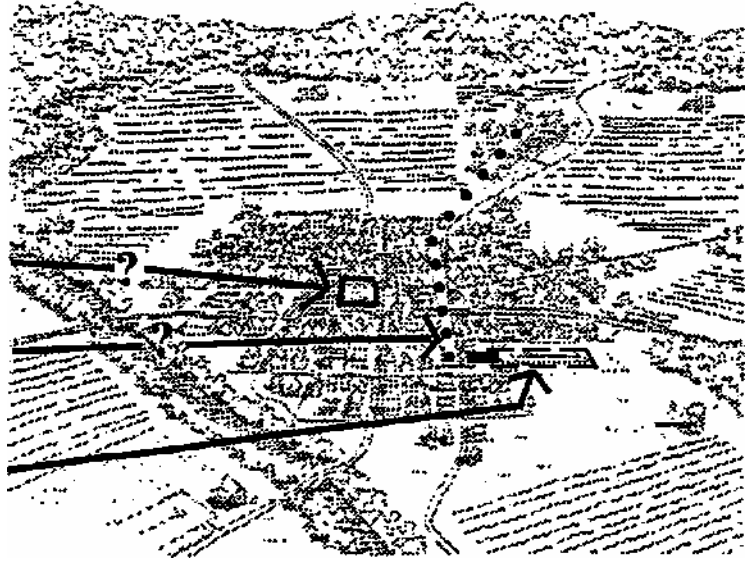
Evaluate technical and administrative feasibility of community soil absorption system (common area as drainfield?)

Consider potential for shared utilization of interconnected community treatment facilities

Evaluate technical and administrative feasibility of small community treatment "package units"

Amend Utilities Element of the Master Plan

t* evaluate utility service options



E.01 Site Plan and Subdivision Review

**ANNOTATED ORDINANCES
(SEED.03)**

E.02 Administrative Procedures and Oversight

**SEWAGE DISPOSAL, from Chapter 13 Rural by Design
by Randell Arendt**

IETJERTODEP UTTER

FROM GCUA

**BACKGROUND MATERIAL from:
APPLIED WASTEWATER TECHNOLOGY INC.**

E.03 Community Soil Absorption System

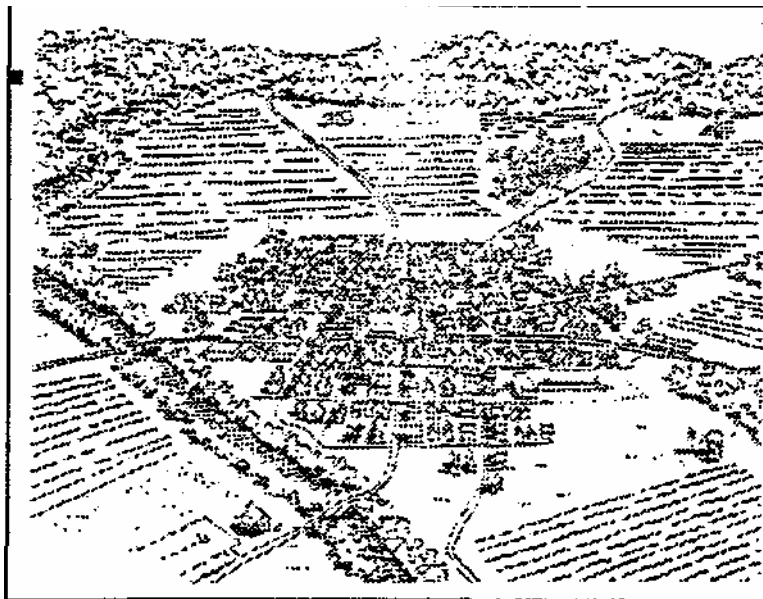
GROUNDWATER DISCHARGE PERMITS

E.04 Community Sewage Treatment and Collections Systems

see "SEWAGE DISPOSAL" above (section E.02)

E N V I R O N S

*Develop site plan and subdivision review
procedures to expedite service area applications,
community treatment facilities*



£02
*Administrative Procedures and
Oversight*

***SEWAGE DISPOSAL, from Chapter 13 Rural by Design by
Randell Arendt***

Ihh provides a simple straightforward description how various community-scale wastewater treatment alternatives **work**. (Included with permission of the publisher)

LETTER TO DEP

This is the beginning of a "correspondence file" to document future collaboration with the NJDEP on the special requirements of community facilities for Hamlet/Village development in the Rural Development Overlay District. NJDEP is supportive of a change in policies and procedures to enable local wastewater treatment facilities, however, the time-frame and process to get the new policies into practice have yet to be established.

LETTER FROM GCUA

This is a memo from Bob Dixson (GCUA) addressing one of the concerns voiced by NJDEP—quality control and management. Note that his recommended number of houses (300) assumes conventional biological treatment facility - other types of systems (Community Soil Absorption for example) can be economically viable for 30 or so houses.

***BACKGROUND MATERIAL from:
APPLIED WASTEWATER TECHNOLOGY INC.***

More useful information and resources

Sewage Disposal

The issue that most frequently dominates discussions of creatively designed development proposals in unsewered rural areas concerns the treatment and disposal of human wastes. Recognizing the importance of this subject, the scarcity of factual information readily available to local decision-makers, and the incomplete understanding among municipal and county officials about reliable alternatives to standard individual septic systems, this chapter has been included to provide insight regarding many lesser known but viable approaches to dealing with sewage disposal. Further details about many of the systems described below are readily available through the National Small Flows Clearinghouse at West Virginia University in Morgantown, West Virginia (1-800-624-8301).

Nationwide, nearly one-quarter of all homes depend on individual septic disposal systems, and the number is growing by about 500,000 per annum. When they fail the reasons most often cited are inappropriate soil conditions, inadequate site evaluation, poor design and/or installation, disposal of improper items or substances by system users, and insufficient maintenance. Indeed, preventive maintenance is necessary for the longevity of even well-designed systems that have been properly installed. Operational life can be substantially lengthened by periodically pumping septic tanks (every three to five years for a "typical" family of four using a 1,000 gallon tank, for example). Such pumping removes the accumulated solids and greases from the septic tank where they settle when first entering the system. When these solids are not pumped they can eventually fill the tank and begin to overflow into

the subsurface drainage field, biologically overloading and clogging the pores in the soil.

Although this procedure is relatively simple and inexpensive, it is rarely performed until problems manifest themselves, and irreparable harm has been done. Local health authorities and management districts in some parts of the country have begun to mandate periodic pumping for systems located in particularly sensitive areas, such as along lakefronts or riverbanks, near wetlands, or over aquifers. Preventive maintenance is worth the political effort and individual cost for public authorities to require it, and the reluctance of local governments to take such action is an expensive choice in the long run, considering the very large costs involved in correcting situations of widespread system failure.

OPEN SPACE DESIGN AND SEPTIC DISPOSAL

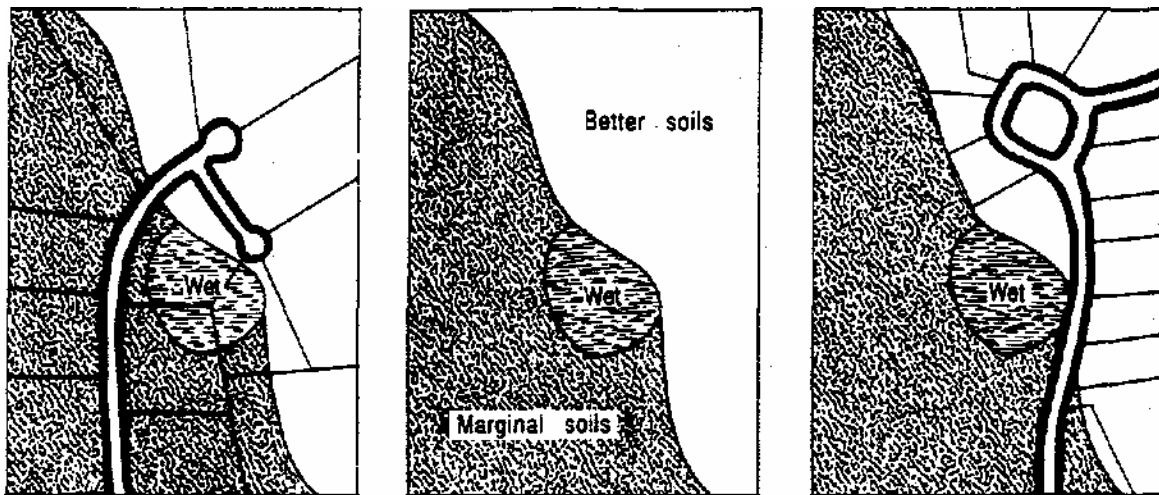
When addressing themselves to potential sewage disposal problems that may be created by new development, municipal and county officials typically express deep concern about "clustering" homes closer together to preserve open space. However, unless soils are uniformly poor across the entire parcel (shallow bedrock or restrictive layer, seasonal high water table, steep slopes, or excessively fine or coarse soil texture), the variations in soil conditions that typically occur within a parcel offer an opportunity for clustering to produce *better* systems than would be possible following a conventional approach with standardized lot sizes in a checkerboard layout.

The reason is that a truly *flexible* approach to the location of houselots allows one to "design with

nature." drawing the lot lines carefully to include the best available soils on the site for septic system locations (and their reserve areas as well). As shown in Figure 13-1, a conventional approach produces larger lots but in many cases these are located on soil that is only marginally suited for subsurface disposal areas. When the choice is between unsewered lots of 60,000 to 80,000 square feet with soil conditions that are at the lower end of legally acceptable limits, and lots that are 30,000 to 60,000 square feet where the systems can all be installed in the best available soils on the site that are deeper and better drained, it is difficult to justify the former.

In fact, progressive regulations could begin to rethink such layouts, coupled with an added level of protection calling for wells and septic systems to be located 150 feet apart (or farther, if practica-

ble). The nearly universal *minimum* separation distance (100 feet) between these installations has in fact become a regular design *standard* that is rarely exceeded, even when doing so would be easy and sensible. Failing to see the logic of having a "one size fits all" approach to these separation distances when their soil conditions varied so greatly within individual subdivision parcels, several communities in coastal Maine have instituted a sliding scale approach for house lots within 250 feet of the shoreline or major watercourses. In York, for example, the separation requirement varies from 100 feet on the best soils, to 175 feet on those soils that barely manage to qualify for septic system approval. Even on unsewered 30,000 square foot lots, separation distances of up to 200 feet are achievable, assuming 100 foot x 300 foot dimensions. When water is supplied through a



Thirteen two-and-one-half acre lots
Six on marginal soil

Thirteen one-acre lots
All on better soil

Figure 13-1. Reducing lot size can sometimes help subdivision designers locate all homes on the better soils contained within a development site. On the left, six of the thirteen 2.5-acre lots would have septic systems on marginal soils, barely meeting minimum legal requirements, because these lots contain nothing better. By decreasing lots to one acre in size, all thirteen can be laid out to contain deeper, drier soils (with all wetlands in the open space preservation area, a tree island at the end of the street, and a future street and/or trail connection to adjoining properties). Sometimes such arrangements require a few "flag lots" with a relatively narrow strip of land providing driveway access, a very useful design approach that should generally be allowed, subject to certain safeguards to prevent abuses (such as the infamous "rat-tail" subdivisions with numerous lots having long, snake-like appendages connecting the lots to a distant public road—all to avoid the cost of providing internal streets).

central system (public or private), the lots may be much smaller—in the range of 12,000 to 15,000 square feet—provided that the soils are above average for septic disposal.

COMMON SEPTIC SYSTEMS

A more cost-effective, and potentially superior, approach can be achieved by combining individual septic leaching areas into larger absorption areas that are jointly owned and maintained. Because there is growing evidence that large rectangular disposal "beds" do not allow for sufficient exchange of carbon dioxide and atmospheric oxygen in their centers (causing anerobic conditions that prevent proper sewage treatment), researchers in this field recommend that large disposal areas be laid out in a series of parallel subsurface "trenches" (an unfortunate term, as it wrongly implies open ditches). These covered "trenches" must be far enough apart to allow CO₂ gases to escape from the soil, and for oxygen to penetrate into disposal areas to promote aerobic treatment of the waste. Trench systems also provide some additional absorption capacity, per cubic foot of gravel, as the lower parts of side walls also absorb effluent. For example, in deeper soils, a two-foot wide trench with 18 inches of gravel has an effective absorption area of 3.5 square feet per linear foot.

The other main component of these systems—the septic tank—may be handled either through individual tanks owned and maintained by each homeowner, or through larger jointly owned tanks. Such systems have been operated successfully for decades by a variety of users, including apartment complexes, shopping centers, laundromats, hospitals, schools, and restaurants. The technology for designing and constructing what the U.S. Environmental Protection Agency calls *large oil absorption systems* (referred to hereinafter as simply *LSA* systems, for brevity), has existed literally for generations. To avoid problems, some jurisdictions require that each dwelling have its own individual septic tank (as a primary collection point for inappropriate items and substances, such as disposable diapers and cooking grease). When such tanks are pumped regularly (once

every three to five years) by a homeowners-association or by the municipality, system life is greatly extended.

The reluctance of many county and state health authorities to allow LSA systems in subdivisions stems from their concern about the long-term maintenance responsibilities where ownership is divided among a number of individual homeowners. This very real concern can be addressed quite easily, however (please see item 5 under "Maintenance of Common Systems." below). It is, therefore, puzzling that more jurisdictions have not adopted this approach, unless part of their reasoning is based upon growth limitation considerations. Such prohibitions are ill-conceived because they necessitate a multiplicity of individual systems, which may not be installed as carefully, pumped as regularly, or monitored as often. In addition, as separate systems, not every one could occupy the best sites in the subdivision for septic disposal.

There are a number of essential steps to assuring that LSA systems will perform at least as well as—if not better than—a larger number of smaller systems. Conditions of approval should include the following items, recommended by the USEPA, for systems designed to handle up to 30,000 gallons per day (approximately 100 dwelling units).

Design of Common Systems

1. In addition to meeting minimum statutory criteria for acceptability, soil types under proposed LSA systems should be shown to be the best available on the site, and their septic suitability should also be above average among soils on which septic systems are legally permitted. A professional soil scientist or hydrogeologist (experienced in such facilities) should evaluate the soils down to at least six feet below the infiltrative surface, with special attention to both the horizontal flow potential of the site and the vertical permeability characteristics.
2. Sites should preferably have convex ground contours and should not be in locations that receive substantial runoff from the surrounding terrain. The base of the filter bed should be at least three feet above the seasonal high water table (some states require four feet); this will

sometimes require that carefully graded fill material be placed on the site prior to disposal area construction to elevate the system. Curtain drains may also be used upslope to divert the flow of surface water and groundwater away from the disposal area.

3. Septic tank effluent should be pumped, under pressure, into the filter fields two to four times per day, to create alternating cycles of system operation and "rest." At least three field systems should be built, with each capable of treating 50 percent of the average daily flow.

Maintenance of Common Systems

1. Septic tanks should be pumped at regular intervals, at a frequency determined by the design engineer based upon the size of the tank and the contributing population. Pumping operators should be required to send confirmation notices to the local health authority, which could monitor their receipt and contact the LSA system ownership if such notices are not received on schedule. Pumping reminder notices could also be mailed to system owners by local health officials, along with regular municipal mailings (such as property tax bills). . 2. Absorption units should be inspected monthly to detect surface ponding problems or "breakouts"; if they occur the unit should be rested and expanded (if there is a capacity problem) or replaced. Another option would be to provide some prerreatment of wastes, such as with a sand filter, to improve the quality of wastewater going into the absorption field. In all cases, the volume of effluent pumped into the absorption field should be carefully recorded. 3. During its first year of operation the LSA system should be monitored quarterly for BOD (biochemical oxygen demand), TSS (total suspended solids), TKN (total Kjeldhal nitrogen), NO_3N (nitrate nitrogen), and pH (a measure of acidity/alkalinity)- These reports should be sent to the local health authority and/or to the state environmental agency that licenses these systems. Thereafter these parameters should be examined annually (with groundwater monitoring being done semiannually).

4. The LSA system should be owned by a homeowners' association (HOA), in which membership should be mandatory for owners of all dwelling units connected to it. The HOA should be vested with the authority to place liens (with interest penalties) on the properties of owners who fail to pay their annual dues or special assessments. Annual dues should be divided into two subaccounts: one for year-to-year operational costs (pumping, monitoring, etc.), the other for long-term capital repairs/replacement. Dues shall be structured so that system replacement can be financed every ten years (a conservative estimate), accounting for inflation. In the event that the cost of repairs, exceeds the amount of dues collected, the HOA may borrow the difference from a lending institution, or may levy a special assessment on its members, or do both. According to the National Small Flows Clearinghouse, properly maintained absorption fields, designed with 50 percent reserve capacity for biannual resting, could last as long as 50 years. Absorption area size might also be reduced if systems were designed to include sand filters to provide pretreatment, so that effluent reaching the fields would be of a higher than normal quality to begin with.

5. In the unlikely event that a HOA cannot act quickly enough to undertake needed repairs, the local health authority may hire a private contractor to perform such essential work and then bill the individual homeowners accordingly, also placing a lien against their homes until payment is received. This is essentially the same procedure followed in cases of individual systems that are not fixed promptly.

As is evident in these rules, the number of safeguards provided for LSA systems far exceeds those a community normally enjoys with smaller, individually owned systems. They are usually required to be installed more carefully (typically with engineering review), are monitored more thoroughly, are provided with sensible and straightforward institutional arrangements to ensure their regular maintenance and eventual repair, and they are located on the best soils available on the development parcel (among those meeting state

criteria for septic systems). Regular monitoring should prevent any wholesale system failure by providing early warning signals. Even in a "worst-case" scenario, the municipality would still be able to correct any malfunction by authorizing a private contractor to perform all the necessary repairs and passing the costs directly along to the system owners (as is normally done when individual septic systems fail and are not promptly fixed). An excellent summary description of this approach is available in a free government leaflet entitled "Large Scale Absorption Systems: Design Suggestions for Success" (U.S. EPA., June 1986).

"CONTOUR SYSTEMS"

An innovative variation on the theme of the L5A systems described above has recently been developed and tested in the Canadian maritime provinces. It was devised in response to the widespread failure of individual systems built in outlying rural villages before the importance of soil suitability was generally appreciated. Although this approach was developed to correct existing problems, it is certainly applicable to system design for new developments as well.

Put simply, "contour systems" are elongated versions of LSAs, designed to follow ground contours in a linear formation (Pask, 1988). The principle underlying this design is based upon field research findings that rectangularly shaped absorption areas located on sloping terrain were not distributing the effluent very evenly. Filter beds that were 40 feet x 50 feet in area tended to concentrate the effluent in the ground across a 50-foot wide band of ground, downhill from the system. In other words, the filtered effluent was tending to travel laterally in the direction of the ground slope, rather than vertically. Better treatment could be achieved by redesigning the bed into a trench system measuring 10 feet x 200 feet, which would spread the underground infiltration out along 200 feet of hillside. The length of the system would be directly proportional to the number of dwellings served; 50 to 220 feet of trench length per dwelling unit would be a preferred range, according to the Nova Scotia Department of Health and Fitness. Dimensions would be smaller or larger depending on the suitability of the soils for septic disposal. To ensure even distribution of the effluent throughout the entire length of the system, pressurized "dosing," in which waste-

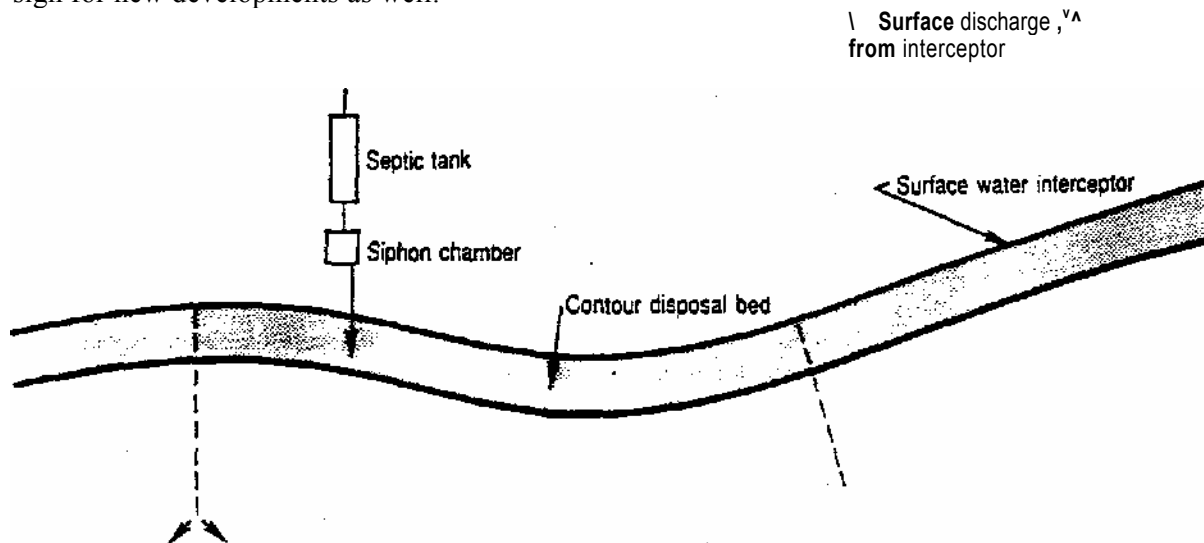


Figure 13-2. Septic systems that follow the contours of a sloping site provide better treatment than standard rectangular filtration beds, and cause considerably less site disturbance. They have been used very successfully for retrofitting rural villages in the hills of Nova Scotia where previous systems on individual lots have failed.

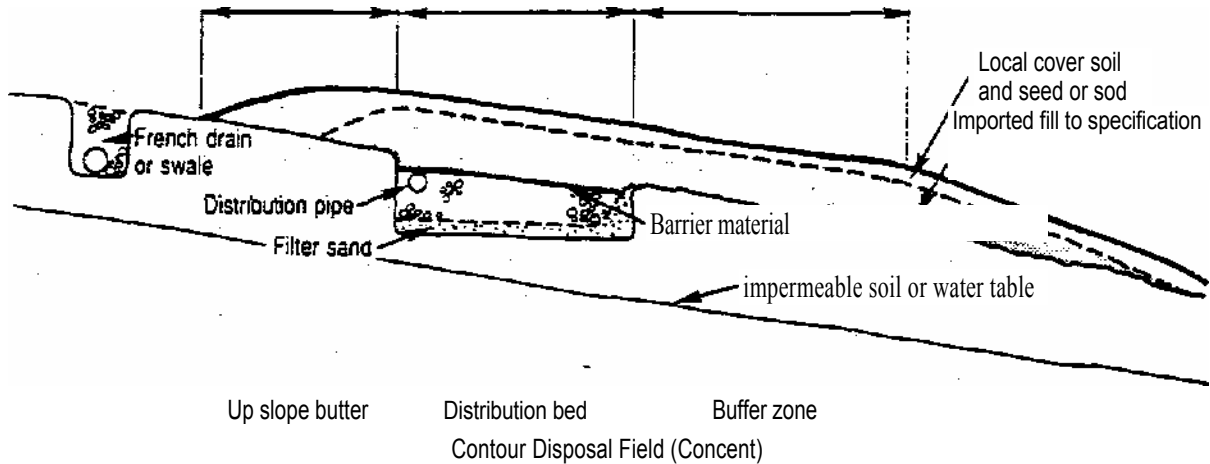


Figure 13-3. This cross-sectional view of a "contour system" shows the upslope diversion for surface drainage,, the narrow distribution bed, and the downslope fill. *Source:* Adapted from Pask, 1989.

water is pumped into the perforated pipes, is recommended.

This approach was developed for sloping terrain in the comparatively harsh Canadian climate, making it particularly applicable for steeper terrain typical of our northeastern states. It could also be applied in warmer and/or flatter areas, however, where greater dilution is a goal.

INTERMITTENT SAND FILTERS

Another variation on the LSA system is the *intermittent sand filter* (ISF), which consists of a septic tank, a large filter bed composed of graded sand two to three feet deep, and an underdrainage collection system that carries the filtered effluent to a final chamber for disinfection via chlorination or ultraviolet irradiation (Anderson et al., 1984). After settling occurs in the septic tank, the effluent is applied intermittently to the filter bed surface, where it percolates down through the sand and drains into the disinfection chamber. The highly treated waters are then discharged to infiltration basins, absorption fields, or watercourses. The disinfection stage may be omitted, provided that the effluent is conducted to subsurface absorption trenches or fields.

There are many variations of ISFs, which may be described as exposed, buried, recirculating, or

nitrifying. The type focused on in this section is one of the most basic and reliable, and has a very good track record of performance when properly designed and maintained. It is recommended that ISFs for neighborhoods or small communities be designed with sand filters that are either open or fitted with removable covers. This will ensure easy access for periodic visual inspection. Routine maintenance, such as surface raking, to prevent an impermeable layer of organic matter from forming on top of the sand, is also facilitated. For the natural treatment processes to work properly, it is essential that the sand remain unclogged, so that the effluent may drain through it easily, pulling oxygen down into the filter behind it. When an even higher level of treatment is desired, the effluent can be recirculated for a second pass (or more) through the sand filter. (Some recirculating filters use coarser media, such as pea gravel.)

The final disinfection stage with chlorine or UV treatment is designed to allow these systems to be installed in locations where in-ground discharge of partially treated wastewater would not be legal, due to adverse soil conditions (shallow bedrock, high seasonal water table, etc.). Different arrangements of ISF components can also be created to reduce potential nitrate pollution. For over a century, intermittent sand filters have been a favored technology in riparian or coastal locations where

the fully treated effluent can then be discharged into rivers or the open ocean.

This approach was, in fact, frequently used by small communities at the turn of the century (Anderson et al., 1984). However, as these communities grew their wastewater volumes increased, while new land available for disposal areas became scarcer and more expensive. Most of these early systems were gradually replaced by mechanical sewage treatment plants, but the escalating costs of the newer mechanical systems (which require continual monitoring by skilled staff) are focusing attention back, onto the simpler and time-tested ISF, especially in small rural communities where land is still relatively cheap and abundant. Reduction of federal cost-sharing programs for conventional treatment plants has provided an additional stimulus to reexamine this older approach, which holds considerable promise for new rural development projects. The simplicity and reliability of this technology also meets the needs of many small communities, according to the National Small Flows Clearinghouse.

According to the EPA, these filters "are ideally suited to rural communities and small clusters of homes. They can achieve advanced secondary or even tertiary levels of treatment consistently, with a minimum of attention— Concentrations of BOD and TSS equal to 10 mg/l or less, and nitrification of 80 percent or more of the applied ammonia, are typically achieved. They are also relatively inexpensive to construct and have low energy requirements." (Anderson et al., 1984). Being almost automatic in their operation, their greatest advantage is that they do not require continual monitoring by trained technicians. Another reason many engineers favor ISFs is that they can be repaired relatively easily. By contrast, once conventional drain fields fail, replacement is necessary.

The U.S. EPA has published performance data on a dozen ISFs serving entire villages or small towns, ranging in size from 49 in Glover, Vermont to 1,500 in Hanover, Illinois (Anderson et al., 1984). Most of these systems appear to be municipally owned and operated. However, with monitoring requirements, and institutional arrangements for ensuring regular maintenance similar to

those described for LSA systems, there is now no reason this technology could not be applied to new rural developments where ISFs would be jointly owned and managed by homeowners' associations (or by special sanitary districts or small utility districts). These systems are fairly simple and run virtually on their own, with only periodic management/operation personnel.

ISFs for individual homes in coastal Maine have been approved by the state for several decades. Towns such as York have, since the late 1970s, required homeowners to contract with local engineering firms to change the chlorine tablets monthly, analyze effluent samples for BOD counts quarterly, and inspect the sand filter triennially, with reports sent to the town offices confirming the work performed and the results obtained. Septic tank pumping is also required on a triennial basis. Other communities that have not established such reporting procedures have found that individual homeowners cannot always be counted on to maintain their own systems properly. The lesson is clear: the technology works well when sensible arrangements for monitoring, periodic pumping, and so forth, are institutionalized.

LAND TREATMENT

While different "land treatment" processes have been designed, this approach has been broadly defined by the U.S. Environmental Protection Agency (USEPA) as "the controlled application of wastewater onto the land surface, to achieve a designed degree of treatment through natural physical, chemical and biological processes within the plant-soil-water matrix" (USEPA et al., 1981). •

It is important to emphasize that, before it is applied to the land, this wastewater has typically experienced a "secondary" level of treatment already, usually in aerated lagoons. This is the level that is commonly provided by conventional sewage treatment plants prior to discharging into a water body.

Because of this, the track record of land treatment systems is extremely impressive. Studies cited by the EPA have shown no increase in harmful contaminants, no increased health risks, and there have been no reported disease out-

breaks from any of these facilities. Nevertheless, many nontechnical people respond negatively to the idea of applying treated wastewater to the land surface. Recognizing the multiple advantages offered by this approach, which has operated very successfully in other parts of the state, the New Castle County (Delaware) Public Works Department has published a 15-page booklet written in a user-friendly manner to provide objective facts and to answer common concerns about land treatment systems (Tatman and Lee, 1992).

Land treatment systems differ from conventional plants in one very significant way: instead of discharging their treated wastewater into a river, lake, or ocean, they apply it to a designated area of land. While conventional systems pass large quantities of nutrients, such as nitrogen and phosphorus, into water bodies or watercourses, where they act as fertilizer or pollutants, many land treatment systems recognize these substances as "resources out of place" and utilize them for plant production (Chester County Planning Commission, 1990). Consider the fact that the daily effluent from a conventional sewage treatment facility serving a community of 10,000 persons with a wastewater flow of 1.0 mgd dumps the equivalent nutrient load of 375 fifty-pound bags of fertilizer each day into its receiving waters (Sheaffer and Sellers, 1994). This is not unlike dumping more than 15,000 such bags into the local river every year. One might ask whether there is a practical way to turn this negative into a positive? Besides using these nutrients as fertilizers for various crops (from turf to trees), the land treatment method returns renovated water to the local aquifer, rather than exporting it many miles downstream. Over the long-term, this can have profoundly beneficial effects upon local water supplies.

Land treatment sites range from woodlands (which can be selectively harvested every ten years) to turf farms, agricultural fields, golf courses, and even residential yards. The ability to consume nutrients productively is the basis for the nickname "living filter," used by researchers at Pennsylvania State University to describe land treatment. Because of the nature of their opera-

tion, they require that rather extensive land areas be set aside for their use, certainly more than many in-ground disposal systems require. For this reason, traditional wastewater planners consider them to be most appropriate where land is abundant and available at a reasonable cost, although they have been successfully incorporated into large suburban developments containing parks and natural open space.

Land treatment processes fall into three broad categories: *slow rate*, *rapid infiltration*, and *overland flow*. To absorb both moisture and nitrogen, the slow rate approach utilizes vegetation, such as perennial grasses, trees, or food crops. This process is also particularly effective in removing BOD, TSS, phosphorus, pathogens, metals, and trace organics (USEPA, 1981). The top inch of soil removes bacteria and reduces organics substantially through filtration, adsorption, and biological oxidation. Most viruses are removed in the first four inches, and phosphorus reduction is achieved through fixation processes in the soil, for example, adsorption and chemical precipitation. However, because soils differ in their ability to treat wastewater, as measured by cation exchange capacity, the importance of expert soil evaluations cannot be overstated.

The expected quality of wastewater treated with the "slow rate" approach is very high: 2-5 mg/I BOD, 1-5 mg/I suspended solids, 3-8 mg/1 total nitrogen (depending on crop), 0.1-0.05 total phosphorus, and 0-10 fecal coliform bacteria per 100 ml, as it enters the groundwater. In slow rate systems the treated effluent can be used to irrigate and fertilize crops in both arid regions (where the moisture value is critical) and in more humid areas (where the benefit is primarily nutritional). Application rates should vary between one and three inches per week. In Muskegon, Michigan, where 5,000 acres of cornfields are irrigated with such treated waters, crop yields are reported to be 25 percent higher, compared with non-wastewater farming in the same locale (USEPA, 1981). However, when sprayed on parks or golf courses, additional polishing or treatment is required. This is usually achieved through natural processes in treatment or storage ponds, maintaining a chlo-

rine residual for further pathogen reduction when the water is going to be irrigated in these heavily visited public places.

Natural woodlands provide another opportunity for land treatment, and can in fact offer some advantages because of their typically lower land cost, higher winter soil temperatures, and superior filtration as compared with farmland. However, farmland benefits more from the nutrients that this process provides. Steeper slopes (up to 20 percent, with "spray irrigation") can also be used when they are forested. Among the states where slow rate systems are operating are Pennsylvania, Illinois, Delaware, Colorado, Texas, New Hampshire, Vermont, Maryland, Michigan, Washington, Oregon, North Carolina, Florida, Georgia, and California. This approach to wastewater treatment must be balanced with the characteristics of the crops, soils, geology, and climate. When forested areas are irrigated, installation of stationary sprinklers are required, which increases the cost of irrigation. Because young trees take up more nitrogen than mature ones, some selective harvesting is often advisable.

Spraying has taken place in some forested areas during periods of subfreezing temperatures. For example, the very large system at Pennsylvania State University operates year-round, with ice at ground level gradually melting and infiltrating into the soil. However, because biological activity in the soil is nil when ground temperatures fall

below 40° F, nitrogen problems can build up over the colder months.

A reference publication available to the non-technical reader. *Utilization of Spray Irrigation in Wastewater Treatment*, prepared by a county planning agency outside Philadelphia, documents experience with 14 spray irrigation systems in its service area, and four other sites in neighboring locations (Chester County Planning Commission, 1990). It describes a wide range of such facilities, which are often located only several hundred feet away from residential uses. The schematic diagram in Figure 13-4, from the above-mentioned report, illustrates the basic components of a spray irrigation wastewater treatment system.

Because these systems require relatively large areas for their operation (typically one acre of land application area for every 10 to 30 equivalent dwelling units, depending upon soil type), they are usually appropriate only in rural or outlying suburban locations where land costs are not nearly as high as they are in more urbanized places. In addition to cropland, suitable receiving areas can include golf courses, parks, school playing fields, and residential yards.

Where drinking water supplies are very limited, as in arid regions or built-up areas where growth is seriously depleting groundwater reserves, recycled wastewater is even being used to water residential lawns (several Florida cities have dual water distribution systems for this purpose).

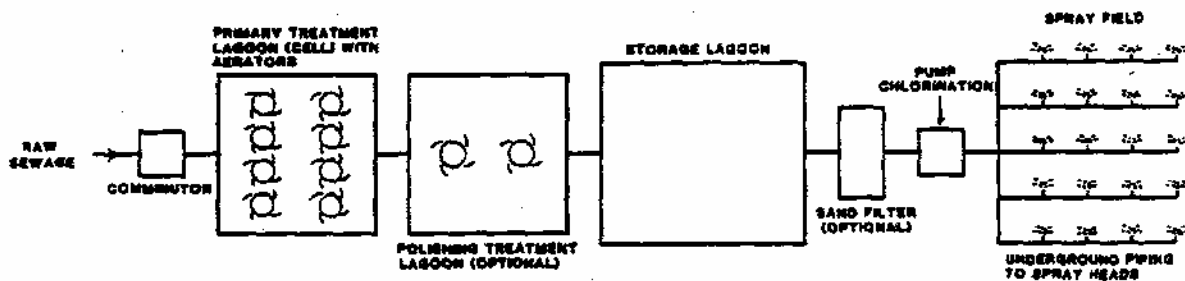


Figure 13-4. "Land treatment" or "spray irrigation" relies on simple, proven technology, consisting of multiple steps basically involving heavy aeration, lagoon storage, and carefully controlled distribution to farm fields or woodlands. Sand filtration and/or chlorination are optional features not normally required except when used on lawns, golf courses, and public parks. This approach has been used extensively in Pennsylvania, Delaware, Florida, Illinois, and California. *Source:* Chester County Planning Commission, 1990.

In some townships in Bucks County, (Pennsylvania), spray irrigation is the preferred method of treatment partly because the land it utilizes for spraying is designated as permanently protected open space (Chester County Planning Commission, 1990), and also because it helps to recharge local groundwater supplies. Studies funded by the EPA have found that homes located next to spray sites do not experience lower property values. In fact, the opposite is frequently true, as these sites constitute permanently 'protected open space, typically farm fields, woodlands, or golf courses (Tatman and Lee, 1992). Numerous examples exist in southeast Pennsylvania and southern Delaware where people reside contentedly in expensive homes adjoining spray sites serving their development. (See also the "Residential Case" of The Fields at Long Grove in Chapter 20.)

Because subfreezing temperatures hamper the spraying of treated wastewater, larger holding lagoons are typically required in northern states (capable of holding effluent for 150 days in Muskegon, Michigan, for example, compared with as little as 15 days in Sussex County, Delaware). Being heavily aerated, these lagoons do not create odor problems, and they do not have to be located at any great distance from dwelling units.

A second approach to land treatment, known as *rapid infiltration*, typically utilizes highly permeable soils (such as sands and loamy sands), and can provide excellent levels of treatment. In contrast to slow rate applications measured in inches per week, rapid infiltration systems often handle a foot of effluent per day, over a three-day application period, typically followed by 9 to 12 days of drying (depending on soil hydraulic capacity). Very little effluent is taken up by crops or other vegetation in this approach. Fecal coliforms, suspended solids, and BOD are almost completely removed; nitrogen and phosphorus removal averages 50 percent and 70 to 90 percent, respectively, through proper dosing and resting patterns (USEPA, 1981). The residual nitrogen, phosphorus, and potassium are relocated into the groundwater. In some areas, such systems are often used to recharge aquifers. (In Phoenix, Arizona, for example, renovated water is pumped back up for crop irrigation).

Overland flow (OF) is the term used to describe the third land treatment process, wherein filtration, sedimentation, and biological oxidation are used to cleanse the sprayed wastewater as it trickles down carefully graded, sloping terraces planted with water-tolerant turf grasses (such as reed canary grass and fescue) planted on relatively impermeable soils. The treated runoff is collected in drainage channels or ditches at the toe of the slope, from which it is usually piped to subsurface disposal areas. As with all land treatment systems, pretreatment is necessary, and could range from primary clarification to one day of aeration in a containment cell.

OF typically removes 50 to 70 percent of phosphorus through soil adsorption and precipitation, and 75 to 90 percent of nitrogen through crop uptake and denitrification (USEPA, 1981). Over 20 municipal OF systems are operational around the country. They can be designed to work successfully in cold-winter climates, as has been demonstrated in Hanover, New Hampshire.

The three types of systems can also be designed to operate in combination. For example, overland flow can be followed by rapid infiltration or, alternatively, the effluent treated through rapid infiltration can be pumped via recovery wells and applied to the land through the slow rate (USEPA, 1981).

WASTEWATER RECLAMATION AND REUSE

A much refined variation of the "land application" method is called "wastewater reclamation and reuse." Unlike "land application," it does not depend on soils or plant vegetation to provide necessary additional treatment. It is distinguished by significantly higher levels of treatment of the wastewater before it is recycled. This treatment is achieved in deep aerated "cells" with a residence time of 14 to 40 days. Aeration rates vary with climatic conditions, but typically far exceed those occurring in conventional secondary sewage treatment plants.

As in typical "land treatment" processes, wastes are macerated or pulped before being introduced near the bottom of the first cell, and they do not

come into contact with the atmosphere until after rising up through 10 to 20 feet of heavily aerated wastewater. By that time, odors have been virtually eliminated. In the classic three-cell system the effluent stays in the first cell one day, the second cell four days, and remains in the third cell for nine more days. The macerated solids accumulate at the bottom of these cells. Over time, the organic matter (up to 90 percent of the solids) breaks down into carbon dioxide, methane, and water. Space is provided at the bottom of the cells to accommodate solids that do not decompose in the supraerated wastewater. Due to this minimal sludge accumulation rate, cells can typically accommodate this material for 10 or more years before removal is necessary (Sheaffer and Sellers, 1994).

A distinguishing feature of such systems, which they share with "land treatment," is their much larger storage capacity, which is designed to hold the reclaimed wastewater during cold or rainy periods when crops cannot make effective use of the nutrients (up to 150 days of storage in northern locations such as Michigan, but just 1/10 that in southern Delaware). In some states, no further treatment is required when the effluent is used for crop watering. In Northglenn, Colorado, this type of system (14 days of aeration in deep lagoons, followed by storage) is used to turn household sewage into nutrient-rich irrigation water. In annual city reports from Northglenn, BOD and TSS levels are listed as having averaged 7.9 mg/l and 5.3 mg/l, and fecal coliform counts as having averaged 15.2 per 100 ml between 1983 and 1989 (Sheaffer and Sellers, 1994). These results are surprisingly low for systems without slow sand filters, and without any form of disinfection.

Additional "polishing" by sand filtration is recommended by some leading officials at the USEPA. When wastewater is filtered, particulate matter is removed. These particulates are actually tiny bits of organic matter that cling to, surround, and would otherwise protect viruses from biological processes and chlorination. Table 13-1 shows the water quality levels reported by the Wheaton, Illinois, engineering firm of Sheaffer and Roland for various stages of their system design for wastewater reclamation and reuse at Hamilton Lakes, in Itasca, Illinois, involving a closed loop of storm water, wastewater, water facilities, and reuse for irrigation purposes (Sheaffer and Sellers, 1994). Treatment is provided by a two-cell deep aerated lagoon, storage, and intermittent sand nitration. Chlorination is available if needed to destroy fecal coliforms. The performance data were recorded at the Hamilton Lakes system. The figures are considered to be unusually low by other water quality engineers.

The irrigation water contains essentially no fecal coliforms per 100 ml. When the reclaimed water is to be used to irrigate and fertilize golf courses, public parks, or landscaped areas around buildings, filtration and disinfection should be included in the system design. In St. Petersburg, Florida, the city has installed a secondary water supply system to pipe reclaimed wastewater to public parks, golf courses and other open spaces, and to private properties for lawn watering purposes.

Living proof that this technology performs very well can be seen at many of the 50 such systems in the greater Chicago area designed by the Wheaton, Illinois, firm of Sheaffer and Roland. Perhaps one of the most convincing is the one now in operation

**Table 13-1. Hamilton Lakes System Water Quality:
February 1983 to May 1989**

Location	BOD	SS	NH ₃ -N	NO ₃ -N	TKN	TOTAL N
Influent	236.0	215.8	23.5	0.5	34.2	34.7
Aeration Cells	23.9	44.9	8.0	4.8	11.3	16.1
Storage Lagoons	8.6	25.6	4.1	1.4	6.6	8.0
Sprinkler Head	3.7	9.5	3.1	3.8	3.5	7.3

Note: All values in milligrams per liter.

at an upscale residential development known as The Fields of Long Grove, which received the 1988 "Best in American Living Award" from the National Association of Home Builders, Better Homes and Gardens, and Professional Builders. This project is further described in Chapter 20, "Residential Cases."

Another region where this approach is currently being applied by many institutions and municipalities is southeastern Pennsylvania, where the Brandywine Conservancy, the Brandywine Valley Association, and the Red Clay Valley Association have been enthusiastic advocates for many years. One of the long-term goals of these groups is for all sewage treatment facilities in the Delaware River watershed to employ this technology, so that most of the wastewater produced in the region will be renovated and recycled on lands permanently dedicated to agricultural, recreational, or other open space uses. The objective is to make this watershed the first area in the country to attain the national goal of eliminating pollutant discharge into navigable waters.

When applied to cropland, sprinklers in a wastewater renovation, reclamation, and reuse system administer the recycled water typically at a rate of $\frac{1}{8}$ to $\frac{1}{4}$ inch per hour, for 8 to 20 hours a week, but only when the soil temperature an inch below ground level is above 40° F, when soils are not wet, when it is not raining, and when wind speeds are low. Spray rates are typically adjusted by system operators, who monitor site conditions. In areas where the natural groundwater is high, horizontal site drainage must be designed to avoid surfacing of partially treated wastewater. Another more costly alternative is to install underdrains to keep the upper soil layers from becoming saturated from below. Well-engineered systems will also include monitoring wells both upslope and downslope from the irrigation areas.

Land treatment systems of these types have been installed in Itasca, Illinois; Northgienn, Colorado; Pot Nets, Delaware (inland bays); and The Fields of Long Grove, Long Grove, Illinois. In Muskegon, Michigan, public officials rejected plans for a costly conventional treatment plant when the engineers admitted that it would only

prevent further degradation of the quality of the water in Muskegon Lake, which was then almost as murky as pea soup. Since the installation of the innovative wastewater reclamation and reuse system (which contains underdrains because of high groundwater conditions), lake water has become clear again, with visibility down to 15 feet. Formerly unusable for recreation, the lake is now the second most popular location for the sale of three-day out-of-state fishing licences (Sheaffer and Sellers, 1994). Although less expensive to build than conventional treatment plants, the Muskegon system is still more costly to create than many small rural communities could easily afford, unless the irrigation value of its treated effluent (about 5150 per acre, per year) can be realized. When its relatively low annual operating costs are taken into consideration, this system is less expensive than package treatment plants offering comparable performance.

This approach, and similar "land treatment" systems, are conceptually different from the others described in this chapter as they reuse, rather than dispose of, the wastewater generated by new development. The environmental engineers who design these systems view pollutants essentially as "usable resources out of place." As in "land application," this approach provides nutrient-rich irrigation water, recharges groundwater, and enables development to be designed in a more compact manner to preserve farmland, scenic landscapes, and the rural settings of historic properties.

IMPLICATIONS OF PRIVATE SEWAGE FACILITIES

Rising concern about the negative effects of low-density rural sprawl caused by large-lot zoning requirements (which are themselves a crude attempt to achieve "pollution dilution"), and the presumed impacts on housing affordability, led nine Massachusetts state agencies to evaluate the environmental impact of allowing much wider use of small, privately owned sewage treatment facilities (PSTFs) in the Commonwealth. The prospect of the state significantly liberalizing its hitherto very conservative position regarding new PSTFs literally struck fear in the hearts of many

municipal officials who envisioned the new technology acting as a "can opener," allowing developers to subdivide large tracts of land that were otherwise legally unbuildable under existing requirements for individual septic systems.

The nine agency sponsors hired engineering and planning consultants to collect and interpret the best available hard data and verbal information from a wide range of experienced practitioners and officials in Massachusetts and 11 other states. After a long series of public meetings, a preliminary and a final "generic environmental impact report" (or "GEIR") were printed and distributed, in which all voiced concerns were addressed.

Acknowledging that some problems have been occasionally experienced in other states, the sponsors pointed out that actual results logged by the several dozen PSTFs operating in Massachusetts were very respectable in terms of BOD₅ and TSS. This success was attributed to the higher standards set in Massachusetts for several measurable criteria of water quality and the introduction of an additional standard for total nitrogen reduction.

After reviewing all the data and listening to numerous public comments, the sponsors concluded that "there is no reasonable environmental public health basis for prohibiting PSTFs outright everywhere in a community" (Final GEIR, Nov. 1990). However, two classes of areas were identified as warranting restrictions on PSTFs. "Off-limits" areas would include floodways, rare and endangered species habitats, restricted wetlands, and "Zone I" of public drinking water supplies. Other environmentally sensitive areas require "special care" in permit review: 100-year floodplains, and land within one-half mile of public water supplies or adjacent to rare/endangered species habitats. Rather than continuing to rely upon archaic regulations on septic tank installation as a crutch to compensate for inadequate zoning, the sponsors felt that towns should be encouraged to link PSTF use with progressive land-use planning. PSTFs can be viewed as a tremendously positive opportunity to implement real growth management, enabling village centers to become development nodes even if they have only relatively small areas of good soils. Development rights transfers

(TDRs) could also be implemented to protect rural farmland, scenic vistas, and outlying habitat from low-density sprawl development on septic systems, by deflecting that growth to revitalized village centers outfitted with PSTFs.

In comments submitted to the sponsors, the Center for Rural Massachusetts strongly urged that permits for PSTFs be tied to a requirement that the resulting development be designed in such a way that significant open space would be preserved as a consequence. In addition to TDRs, the use of compulsory open space subdivision design techniques was also urged to accomplish this goal. It was widely felt that PSTFs should not be allowed to become a technological solution enabling developers to subdivide otherwise mostly unbuildable land in the conventional checkerboard fashion, with little or no open space provision (other than wetlands or steep slopes).

The only remaining issue is not a technical but an administrative or legal one: Massachusetts laws will need to be amended to ensure long-term enforceability of state health regulations against multiple-ownership entities, such as homeowners' associations. The Massachusetts Department of Environmental Protection has identified six conditions it feels are necessary to guarantee accountability for jointly owned PSTFs. Because this issue frequently arises in many other states, and because it is so fundamentally important, these conditions are listed below.

1. To ensure that a single entity, fundamentally identical to the users of the facility, is responsible for the operation, maintenance, repair and replacement of the facility
2. To ensure that all the users share the financial and operational responsibilities the above obligations entail, that record notice of the responsibilities is given to all prospective purchasers, and that no user can avoid these responsibilities
3. To ensure that the entity has the authority to institute a user-charge system capable of generating adequate revenues
4. To ensure that the entity maintains a "ready fund" to finance emergency repairs and a "capital fund" adequate to replace the system and key components at the end of their useful lives

5. To ensure that the entity could not alter these arrangements without prior written approval of the Massachusetts Department of Environmental Protection

6. To ensure that the entity owns or has a legal easement to the land on which the PSTF is situated

In North Carolina, the state Department of Environment, Health, and Natural Resources comprehensively addressed issues of operation and maintenance relating to large septic systems in 1991 amendments to its *Laws and Rules for Sanitary Sewage Collection, Treatment, and Disposal* (ISA NCAC ISA .1900). For example, septic systems handling more than 3,000 GPD (about 12 dwellings) are classified by the state as "Type V," and are required to obtain an operating permit from the state, which is reviewed annually. All system owners must also contract with "certified management entities," which are required to inspect the facilities regularly and to report their findings regarding certain variables to the local health department at specific frequency intervals. Required inspection frequencies vary from monthly for systems handling between 3,000 and 10,000 GPD, to weekly for larger systems. Reports must be filed every six months.

In Pennsylvania, state officials require municipal governments to be co-permittees of all new community septic systems, as a way of ensuring that there will always be a responsible authority to perform repairs promptly in the event of a system failure. In Delaware, "trust indentures" assign system responsibility to a chain of governmental bodies, from municipalities to counties to state agencies.

SEPTIC SYSTEM DESIGN INNOVATION

In Maine, a fresh approach to subsurface septic disposal system design has relevance to other rural areas where the majority of soils are rated poor to very poor for this purpose. In that northern state, 81 percent of the mapped land acreage is classified into these two categories on the basis of slow permeability, shallow bedrock or restrictive hardpan, or seasonally high water tables.

After extensive field checking in the early 1970s, that state's health engineering officials found per-

colation testing to be unreliable under the above-described conditions. Many unsuitable areas had been (in effect) illegally developed with conventional systems that were not designed to compensate for the difficult soil conditions, and these ultimately experienced high failure rates. As a result, Maine's site evaluation methods and system design criteria were extensively revised in 1974.

After the new rules had been in effect for a decade, state officials reviewed the track records of the 64,000 new systems and found that failure rates had decreased dramatically, to 0.1 percent, 1.0 percent, and 5.0 percent for systems in place for one, five, and ten years respectively (Hoxie and Trick, 1984). Newer design techniques, using concrete chambers over disposal beds, posted the same success rate even though their bed areas covered only half the land area required for conventional systems.

Another significant finding was that decreasing the required vertical separation distance between the bottom of the disposal bed and the bedrock, hardpan, or seasonal high water table from 48 inches to 24 inches may not adversely affect system performance. It has long been documented in the engineering field that nearly all the bacterial treatment of septic wastes occurs in the first 12 inches of soil around and under disposal beds, by soil adsorption, so that the bacterial population that is found more than a foot below the bottom of the bed is "about the level of the population in the control soil" (USEPA, Sept. 1978).

In addition to using concrete chambers to reduce bed area and the minimum required vertical separation distances, Maine authorities also abandoned percolation testing in favor of pits dug 48-inches deep (or until bedrock is encountered), into which "licensed site evaluators" enter to determine the depth of the seasonal high water table. These evaluators are trained, examined, and licensed to make such determinations based upon visual and tactile inspections of factors such as soil texture, color, and rooting depth. Soil is then classified according to three categories of depth to bedrock, four categories of depth to seasonal high water, and eleven soil profiles based on textural

differences at various depths. Although more complex than pouring water into a hole and timing its seepage into the earth, Maine's test pit evaluations have proven to be a very-effective way of determining a soil's ability to filter and treat septic effluent. Such testing has the additional advantage of being able to be performed at any time of the year when the land is accessible (while many jurisdictions limit "perc" testing to a 6 to 8-week period in the spring).

CONSTRUCTED WETLANDS

The use of artificial wetlands for domestic wastewater treatment is gaining wider acceptance as experimental systems around the country are being refined. No fewer than 120 such systems were installed at individual homesites in Kentucky during 1991. Other states where this technique is being applied, at least on a trial basis, include Virginia, West Virginia, Arkansas, Louisiana, Alabama, and Colorado. Seen as a supplement rather than as a substitute, constructed wetlands are being designed as intermediate components providing further treatment of septic tank effluent before it is conducted to drainage fields.

Based on standards developed by the Tennessee Valley Authority (TVA), these systems typically outperform conventional designs in the reduction of solids and biological oxygen demand (Schutz, 1992). Depending on their design, all or some of the effluent they produce is still disposed of in filtration fields, but its finer quality reduces the risk of soil clogging (and also makes artificial wetlands very suitable as replacements for failed conventional systems located on marginal soils).

The newer designs for constructed wetlands for individual homes are typically shaped like volleyball courts 300 square feet in area, with plastic membrane liners and 12 or more inches of gravel on which cattails and bullrushes are planted. In the dense mat formed by their roots, biological, physical, and chemical processes occur, purifying the wastewater. In the new TVA model, a second cell contains gravel topped with layers of loam and mulch, in which ornamental wetland species such as iris, arrowhead, and elephant ear are planted.

In addition to their use in residential applications, such wetlands are beginning to play a role in treating agricultural animal wastes, such as milk-house wastes and effluent from animal waste treatment lagoons and aquaculture ponds. Cost sharing in this experimental program is available to farmers from the Agricultural Stabilization and Conservation Service of the United States Department of Agriculture.

ALTERNATIVE SEWER SYSTEMS

A novel idea for simplifying sewer design could achieve significant cost savings for private centralized and municipal sewage systems. Called "septic tank effluent drains," this approach has been widely used in South Australia since 1961.

Briefly stated, effluent drains are small-diameter gravity lines that can potentially be installed inexpensively with simple trenching machines. As their name implies, they conduct liquid effluent from septic tanks, which collect the settleable solid wastes (that must be pumped out periodically). The fact that effluent drains carry no solids, grease, or grit allows them to be designed with smaller bores and to be installed without a continuously downward-sloping gradient, as minimum flow velocity normally needed for self-cleansing is not necessary. According to the USEPA, "Excavation costs could be reduced substantially since these drains could follow the natural topography more closely than conventional sewers and avoid most obstructions within their intended path" (Otis, 1983). Five other advantages also characterize these innovative systems, as described by Otis:

1. Material costs are lower because septic tanks absorbing surges from peak flow periods allow pipes to be downsized (to 2 inches), and man holes may be replaced by less expensive clean-outs or flushing points.
2. Operation and maintenance costs are lower because unskilled labor can perform the few necessary tasks of septic tank pumping and drain flushing.
3. Compared with conventional sewers, groundwater infiltration is lessened because the drains are smaller in diameter and can be installed at shallower depths.

4. With no solid wastes to push along, minimum flows are not required, and much less wastewater is therefore needed, reducing loads on the treatment facility and avoiding concerns that wide use of water-saving devices or fixtures could create blockages in the lines.

5. Treatment plants can be built more simply as it is not necessary to provide screening, grit removal or, sometimes, even primary sedimentation, as settleable solids are collected in septic tanks at each dwelling.

Construction costs of effluent drains can range up to 50 percent lower than conventional sewers. However, despite three decades of very successful use in South Australia, officials in the United States have generally not permitted effluent drains to vary substantially from the design of conventional sewers, citing "uncertainty in their long-term performance" [!J (Otis, 1983). The USEPA reports, however, that an effluent drain system installed in Westboro, Wisconsin, in 1977, serving 200 people with 85 connections, "has had an excellent record of operation, only requiring pumping of septic tanks every three years" (Kreissl, 1984).

When these innovative systems are allowed to be designed less elaborately, more in line with the actual character of the liquid effluent they convey, significant savings will become possible. This is because drainage pipes typically absorb 60 percent to 80 percent of the total construction budgets for new sewage collection and treatment facilities. Because of their lower residential density, the average length of sewer pipe per user in small rural communities can be up to five times greater than the national average (15 feet), meaning that savings in piping could dramatically reduce total project costs in such places (Otis, 1983).

The potential for retrofitting existing villages experiencing widespread septic system failure, and encouraging compactly designed village extensions (based on historic settlement patterns), offers new opportunities to creative planners, enterprising developers, and alert officials. When combined with "open space development design" (described in Chapters 14 and 15), effluent drains can help resolve current sewage disposal problems, promote traditional neighborhood design.

preserve open space, and lower costs (through less expensive facilities and expanded user populations, among whom costs would be shared).

Effluent treatment need not be restricted to conventional plants, but may occur through a variety of alternative facilities described in this chapter, including large soil absorption systems, contour systems, land treatment (or "spray irrigation"), and water reclamation/re-use systems. Some of these systems already utilize alternative wastewater collection technology, such as *low pressure sewers* (minimum 2-inch diameter, with grinder pumps) and *vacuum sewers* (minimum 3-inch diameter, with pneumatic valves at each connection). However, with virtually no mechanical components, effluent drains are simpler and less expensive, although they are limited to locations where very modest gravity flow is physically possible. Nevertheless, low-pressure and vacuum systems have generally performed well, and also represent a viable engineering alternative to conventional sewer construction (Kreissl, 1984).

WASTEWATER VOLUME REDUCTION

Treatment system size, cost, and land requirements can be reduced through a variety of simple techniques that lessen the volume of wastewater that is generated. This can be especially important in locations where the areal extent of soils suitable for subsurface disposal is rather limited, owing to generally unfavorable site conditions. Four broad approaches are described below: eliminating unnecessary water consumption, installing water-saving devices, recycling water for re-use, and employing waterless toilets.

Most households waste water on a daily basis, some much more than others. Examples of "non-functional water use" include flushing cigarette butts, running dishwashers half full, and allowing the taps to run while brushing teeth or shaving. Surprisingly, a steadily dripping faucet could double the water consumption of a typical family of four, wasting as much as several hundred gallons per day (Schmidt, Boyle et al., 1980). Leaking toilets and "sweeping" asphalt driveways with garden hoses are other common sources of waste.

Achievable reductions in water use range from 4 to 8 percent for "dams" or plastic bottles inserted into toilet tanks; 6 to 10 percent for low-flush toilets; and 6 to 15 percent for gadgets that convert conventional toilets into "dual-flush" toilets (making it possible for users to select a "low-flush" mode for liquid wastes). Row restrictors and reduced-flow shower heads can cut normal 4 to 10 gallon per minute usage to 1.3 to 3-gallons per minute.

Wide variations exist in the water consumption of different clothes washers. Front-loading models can save 40 percent, and even greater reductions can be achieved in models that store and reuse the soapy wash-cycle water (fresh water is, of course, still used for rinsing). Water recycling has been taken much farther in home systems that reuse sink, bath, shower, and laundry water for toilet flushing, and sometimes for lawn irrigation, too. These systems typically involve storage tanks, filters, and chemicals.

In addition, unnecessary strains on wastewater treatment systems can be avoided by improved user habits, such as not flushing disposable diapers or sanitary napkins, not washing cooking fats or grease down the sink, and not using garbage disposals (which add significant quantities of BOD=; and suspended solids, increasing sludge and scum accumulation (Schmidt et al., 1980).

Much has been written about "waterless" toilets (sometimes called "biological" or "composting"

toilets). Originally designed for use in seasonal cabins in Scandinavia, these units have had to be extensively redesigned for year-round household usage there and elsewhere. Most modern units utilize ventilation fans, electric heating elements, and mechanical mixers to speed the evaporation of liquid wastes and to promote bacterial action and biological decomposition.

Because liquids account for 90 percent of total human body wastes, the importance of heaters and fans in evaporating this moisture cannot be underestimated. These heaters and fans add significantly to operating costs, as they typically consume about 6 kWh daily in households of five people (Kreissl, 1986). Because of their high operating costs, high capital costs (starting at \$1,000), the need to empty humus residues every 3 to 4 months, and their limited capacity to deal with overload situations during social occasions, such units will probably not enjoy widespread popularity.

Another drawback is homeowners' continued need to treat their greywater adequately. Greywater typically comprises two-thirds of total household wastewater and contains pathogens (Kreissl, 1986). Field studies conducted for the USEPA indicate that standard septic tanks and soil absorption systems still offer the most reliable method of greywater treatment. Most of the alternative methods of dealing with greywater have "failed to perform their functions successfully" (Enferadi et al., 1986).



State of New Jersey
DEPARTMENT OF THE TREASURY
BUREAU OF STATE PLANNING
CN-204

THODD WHITMAN
Director

BRIAN W. CLYMER
State

MEMORANDUM

**TO: Dan Van Abs, Assistant Administrator
Bureau of Environmental Planning
Department of Environmental Protection**

FAX 2-2XJ87

FROM: Charles P. Newcomb, Assistant Director

DATE: March 19, 1996

RE: PLAN for the ENVIRONS of a center - Woolwich Twp., Gloucester County

This is a request for some guidance on what the Department would consider acceptable from a municipality to advance wastewater and potable water supply approvals. These are in cases where it is utilizing the centers form as advocated by the State Development and Redevelopment Plan.

My reason for posing the question has evolved out of the study that the Department, represented by Larry Schmidt, OSP, Gloucester County Planning Department and Woolwich Township have been conducting on how to plan for the environs of a center. This study you are somewhat familiar with in that you were kind enough to meet with Mark Keener of Brown & Keener, the study consultants, Larry Schmidt and Dave Hojsak in December, 1995 to discuss wastewater planning issues. As a result of that meeting the study has been successful in getting Gloucester County Utilities Authority to commit to contract with the Township to operate and maintain any wastewater facilities it develops.

At the last steering committee meeting the Township was confronted with the fact that they wanted some assurances from the State that if they went through the process of pursuing wastewater management approvals from the Department that they would have some success of gaining approvals. This is based on the facts that they would be planning in accordance with the policies of the State Plan and that they had received a denial previously from the Department for a Water Quality Management Plan amendment within the last two years.



State of New Jersey

DEPARTMENT OF THE TREASURY

OFFICE Of STATE PLANNING

CN-204

TxucrONNJ08625-204

CHRISTINE TODD WHITMAN
Governor

BRIAN W. CLYMEK
Sut_f Treasury

Attached are a few sections of the draft report which will provide some you some of the language that is found in the draft report and which addresses the wastewater and potable water issues that will be faced by Woolwich and other communities that pursues this approach.

I will follow up with a phone call within a day or so to discuss this matter with you.

Thank you.

Attachment" c: Larry
Schmidt

FACSIMILE TRANSMISSION SHEET

TO: Brown
ATTN: Mark Keener
FROM; Bob Dixoa Executive Director
DATE: Febniary 29.
RE: Villae Concept for Woolich Twp.
FAX NO.: 215-561-6S07
NO. OF PAGES: 2 {including this cover

OUR FAX NUMBER IS (609) 423-5563

**IF YOU DO NOT RECEIVE THE COMPLETE MESSAGE, PLEASE CA
THE SENDER AS SOON AS POSSIBLE.**

MESSAGE:

TO: Mark Keener
Brown and Keener Urban Design

FROM: Bob Dixon, Executive Di

DATE: February 29, 1996

RE: VILLAGE CENTER/HAMLET CONCEPT FOR WOOLWICH TOWNSHIP

I have reviewed the packet of information you provided on the above cited concept. In an overall sense, the concepts are "doable" from a utility provider's point of view as noted below.

- Effective Wastewater collection, treatment and disposal can be achieved provided the technologies are carefully selected to match the scale of the developments).
- I would suggest that a development scale of 350 units (i.e. generating \pm 100,000 gallons/day of sewerage) would be necessary to support a conventional biological treatment facility and its collection/conveyance system.
- For the long term effectiveness of a conventional system and other sewerage treatment/disposal technologies selected for developments of a smaller scale, there *is* a need for firm institutional and financial commitments to properly operate and maintain the technology.
- As we discussed previously, the GCUA is receptive to the potential of providing contract operating and maintenance services *for* wastewater facilities. The Authority's preference is that contract for services be with a public entity who would own the facilities.
- A final suggestion is that you first develop a preliminary design of a Village Center and/or Hamlet applying the various design criteria you propose to insert in the Township's land development ordinances. Next, I would suggest that you develop a financial road*i* costing all aspects of development, the end product being the cost of units in the market place. Last, I would suggest you bring in an experienced developer of projects to critique the design/modeling effort to advise if all aspects are realistically "doable" and the units can be brought to the market place at a competitive price.

Nothing kills a concept faster than the harsh light of real world economics.

RFD:dmt

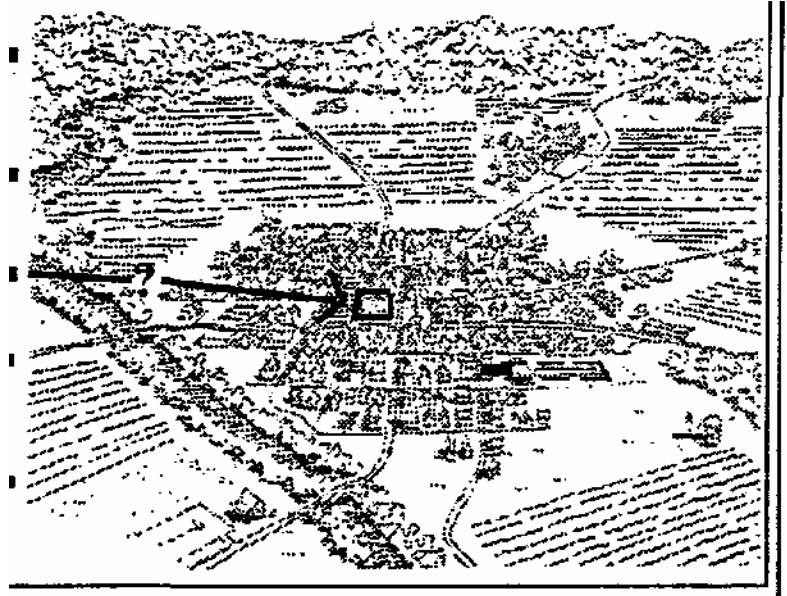
cc: Chuck Newcomb, Office of State Planning (w/enc.)

t. evaluate utility service options

Evaluate technical and administrative feasibility
of community soil absorption system (common
area as drainfield?)

£03

Community Soil Absorption System



GROUNDWATER DISCHARGE PERMITS

This is a straight-forward description of various systems that discharge into the ground (not into rivers/streams) and the associated level of preliminary engineering and review for each type of system.

In general, state policy will favor groundwater discharge because it returns water directly to the underlying aquifers.

GROUNDWATER DISCHARGE PERMITS

JANUARY 1991

,1. GENERAL

Changes in development patterns and environmental regulations have greatly affected the procedures and requirements for development of wastewater disposal systems. These changes affect every wastewater system from the simplest individual septic system for a single family house through large industrial and multifamily systems.

Whereas in the past, sewage treatment facilities normally discharged to surface waters, the discharge allocations have been utilized such that the new allocations are very difficult to achieve. It also seems that there is a general feeling that recharging water back to the aquifer . will provide better long range environmental protection. This being the case, most new systems utilize groundwater discharge permits. Groundwater discharge permits consists of any wastewater which is treated and discharged in a manner other than directly to a surface water. Spray irrigation, subsurface recharge and infiltration percolation ponds are all variations on groundwater discharges.

This trend will create numerous small discharge points and for the most part, will preclude regional type systems.

The environmental authorities are rightfully concerned that numerous groundwater discharges pose a potential problem if not properly managed and regulated. To accommodate this new trend, the New Jersey Department of Environmental Protection has introduced new procedures to help control and monitor groundwater discharges. These new procedures require more State level design review, permitting and enforcement and also greater local involvement and responsibility.

II. WASTEWATER MANAGEMENT PLANNING

To assure that all systems are properly authorized and controlled, the State Department of Environmental Protection has required that each municipality prepare a Wastewater Management Plan which outlines the preferred wastewater system types, the proposed location of various treatment systems, the service area of proposed wastewater systems and the method of local control.

The Wastewater Management Plan must address the zoning of the municipality and how the zoning will be served with wastewater systems. The plan must consider soil characteristics, geological formations, wetlands and other environmentally sensitive areas.

III. REGULATORY AUTHORITIES

In Hunterdon and Sussex County for example, the local health authorities consist of the County Health Department and Municipal Board of Health. Most individual septic system designs are reviewed and approved by the County and local health departments.

The Wastewater Management Plans will require the input of the elected municipal officials, the municipal planning board and sewage authority where one exists. Each of these entities has certain areas of expertise which relate to the Wastewater Management Plan and how it will be effectively administered.

At the State level, the New Jersey Department of Environmental Protection, Division of Water Resources regulates all groundwater discharges. Within that division are the Bureau of Planning and Standards and the Bureau of Industrial Waste Management.

The Bureau of Planning and Standards is the entity which reviews and approves the Municipal Wastewater Management Plan and also reviews all future projects for consistency with the various municipal and State planning documents as they relate to wastewater treatment facilities. A project must be approved by the Bureau of Planning and Standards for consistency before it is passed on to the other agencies for technical review.

The Bureau of Municipal Wastewater Management consists of engineers and environmental specialists which review each project for technical merit and issue the following permits:

- A. Treatment Works Approval Permit (TWA) - This consists of an engineering review of the mechanics of the system and how the system will function. The permit is issued in three (3) stages. For the Stage I permit, the proposed treatment facility is reviewed to determine its ability to provide an effluent that complies with the Discharge Permit. The Stage II permit authorizes the construction of the facility in accordance with the approved plans and specifications. The Stage III permit authorizes the operation of the facility. The Stage I & II review can only begin after the Discharge Permit is issued, and the Stage III permit can only be issued after the facility is constructed.
- B. Sewer Extension Permit - This is a technical review of the collection system which will collect and transport the wastewater to the treatment facility. The Sewer Extension Permit is often combined with the Treatment Works Approval Permit (TWA) for completely new facilities. The Sewer Extension Permit can be obtained independently if a project is built in stages and any future stages are, not included in the original construction but are located within the service area of the treatment facility.
- C. New Jersey Pollution Discharge Elimination System Permit (NJPDDES) - This permit is a technical review of the discharge and water quality parameters that the discharge must operate within. This permit sets the effluent quality, groundwater quality, operator licensing, sampling and monitoring, reporting, and enforcement mechanisms under which the treatment system will operate.

The Bureau of Industrial Wastewater Management performs many of the same functions as the Bureau of Municipal Wastewater Management but only for systems that relate to industrial facilities. Industrial facilities do not normally require sewer extension permits.

IV. TYPES OF GROUNDWATER DISCHARGE SYSTEMS

There are essentially five different types of systems which can be permitted for groundwater discharges. The review and approval path is outlined in the attached flow chart. Even though the wastewater from each of these different configurations may be of very similar quality, the

different regulations are mostly with regards to the system sizes and number of users. The following is a brief description of each type of system:

- A. Conventional Design - Individual Dwelling or Commercial Unit - These systems are essentially the only systems which may be approved solely on a local basis. This consists of an individual septic system serving an individual dwelling or an individual commercial unit. There is some thought that in the future, individual commercial units will require State review and only individual dwelling units will be approved on a local basis. Presently, a project that includes 50 or more individual units (such as a 52 unit residential subdivision) requires State review even if all of the systems are conventional individual systems.
- B. Alternative Design - Individual Dwelling or Commercial Unit - Any system which does not conform to local ordinances or the State "Standards for Individual On-Site Septic Systems" requires an alternative design review by DEP.

The alternative design must have local health approval first and endorsement for the CP#1 (Standard DEP transmittal form) prior to submission to the State authorities. The NJDEP would issue a Treatment Works Approval Permit for the approval of an alternative system.

With the current State "Standards for Individual Subsurface Sewage Disposal Systems" N.J.A.C. 7:9A, fewer systems fall into this alternative design category.

- C. Community System - More Than One Unit, Less Than 5 Units - These systems involve connection of more than one unit into a common septic system. It is generally recognized that four or less units grouped together do not require a special treatment system but do require a State review and permits. The local health authorities would have to first approve the system and endorse a CP#1 form prior to DEP reviewing the project. A resolution allowing the municipal government to serve as co-permittee is also required.

The DEP would issue a Treatment Works Approval for a project of this size.

The co-permittee must be a governmental entity whose purpose is to provide long term accountability in the operation and upkeep of treatment facilities. Co-permittee agreements commonly require the developer to

provide bonding, letters of credit, escrow accounts or other forms of monetary safeguards so that the government entities can minimize their financial liabilities, should they have to assume responsibility for the system.

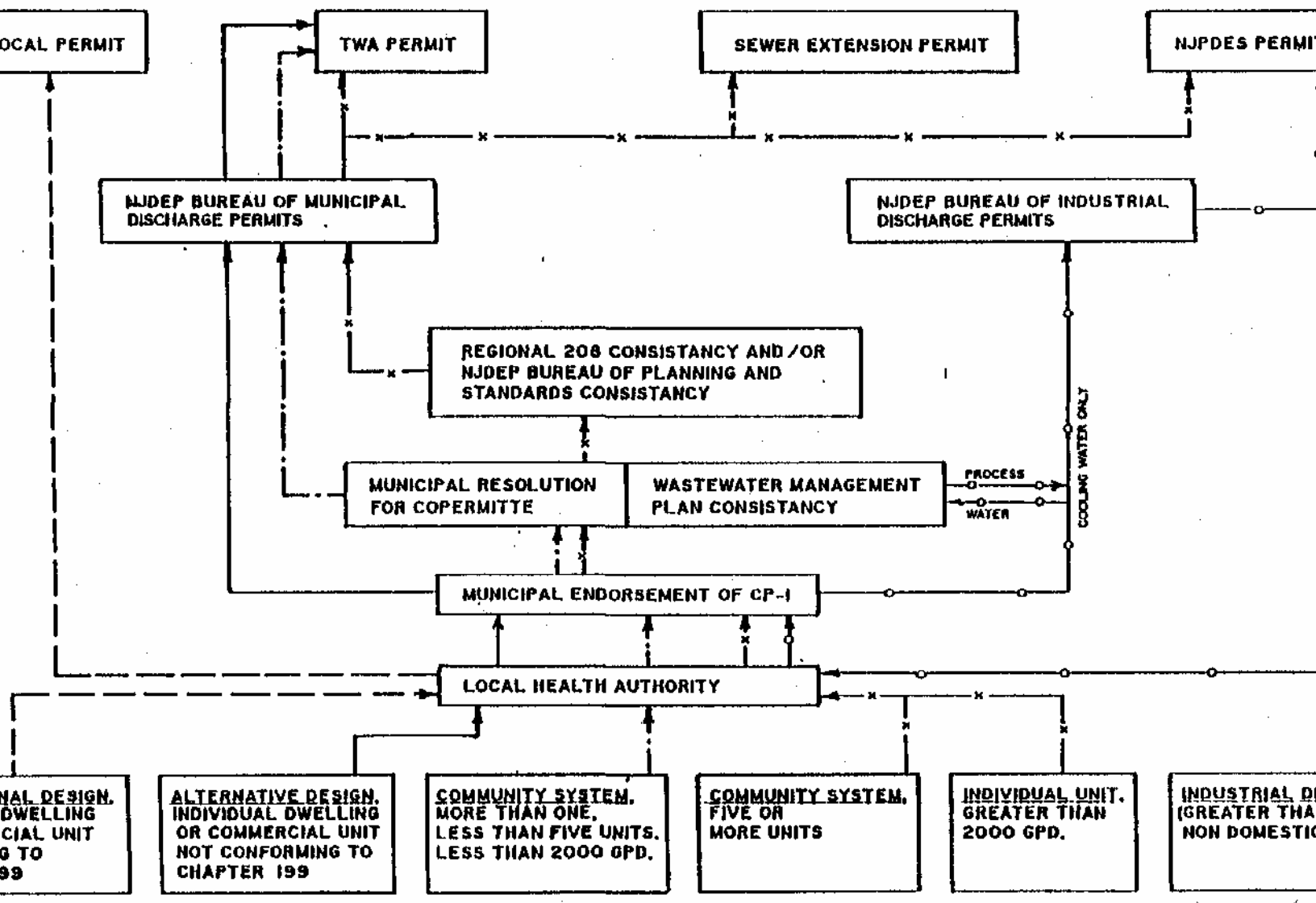
- D. Community Systems - Five or More Units - It is generally recognized that a system with more than five units has a discharge which is greater than 2,000 gpd and would require specialized treatment mechanisms so that the discharge does not degrade the groundwater quality.

A system such as this would require local approval and endorsement of the CP#1 form as well as a resolution for municipal co-permittee. The project is then submitted to the Bureau of Planning and Standards for determination of consistency with the Wastewater Management Plan and then on to the Bureau of Municipal Wastewater Management for technical review and the issuance of the Treatment Works Approval, Sewer Extension and NJPDES Permits.

- E. Individual Units Greater Than 2,000 gpd - Any system with a discharge in excess of 2,000 gpd is required to go through the full regulatory process for issuance of the Treatment Works Approval, Sewer Extension Permit and NJPDES Permit. The review and approval process is as outlined in "D" above.
- F. Industrial Discharge - Industrial discharges, regardless of the size, are regulated through a NJPDES Permit. The local health authority must review and approve the project and it must be endorsed to NJDEP. In the past, it has not been traditional for industrial discharges to the groundwater to be referenced in Wastewater Management Plans.

At this time, the NJDEP does not necessarily perform a consistency determination but the municipalities are encouraged to include known industrial discharges into the Wastewater Management Plan for future regulatory consideration.

GROUNDWATER DISCHARGE PERMIT APPROVAL PROCESS



III. EXISTING COMMUNITY WASTEWATER SYSTEMS

A. HISTORY

Broadly classified, on-site wastewater systems are termed land-treatment systems. Land-treatment systems have, historically, throughout the world and in-the U.S., included sewage farming, irrigation, and rapid infiltration (1). These types of systems date back to the 1860's and 1880's. More recently (1970's) creation and use of the assimilating capacity of wetlands and aquaculture, show promise for future wastewater treatment systems.

Large scale soil absorption systems have been in use in the U.S. for many years (2). Since that time many systems have been constructed and are in operation. Typically, these on-site community wastewater systems have been constructed as septic systems with septic tanks that discharge directly into the leach system. Systems of this nature are generally termed community septic systems.

B. LARGE SOIL ABSORPTION SYSTEMS IN THE U.S.

According to reference (2), a survey of 33 state regulatory agencies was conducted. As of 1981, all had at least a few large soil absorption systems (LSAS) in operation, (refer to Table 1)

Regulatory structures, design restrictions, state attitudes and policies vary from state to state.

It is intended herein to briefly review the experience level of large soil absorption systems existent in the U.S.

C. COMMUNITY SYSTEMS IN NEW JERSEY

Numerous on-site community wastewater systems have been operating in New Jersey for several years. Existing community septic systems have been operating effectively. However, these older systems are providing only minimal treatment prior to discharge. As one example, a 48 unit office condominium complex (Montgomery Knoll) located in Montgomery Township in Somerset County utilizes a series of three community septic systems servicing 11, 18 and 19 units respectively. Fully occupied since 1983, these systems have been properly maintained and have not experienced any problems.

Since 1983, the regulations have changed so that all such multiple user systems require State approval.

The New Jersey DEP now requires discharges to meet stringent limits on the nature and amount of discharge to subsurface systems. As a result, to meet these limitations, new community systems with flow capacities greater than 2,000 gallons per day must include advanced level wastewater treatment facilities prior to discharge.

New treatment plants are typically designed not only for wastewater treatment objectives, but also noise, odor and aesthetics. Structures can be readily sound insulated. Odors can be checked rather than discharged to the atmosphere. Treatment building architecture can be designed such that the building will be an asset to the community. There are numerous on-site wastewater community systems now in operation, under construction, and recently permitted.

Five examples of existing systems are outlined below:

1. Fawn Run, Borough of Bloomsbury, Hunterdon County, N.J.

52 single family residences with a design flow of 20,000 gpd consisting of a biological treatment facility and subsurface pressure dosed recharge beds. This treatment system is located adjacent "to residential units within an accessory type building. The system began operation in early 1989 when the first few homes came on-line. As of January 1991, approximately 30 homes are utilizing the wastewater treatment and disposal system.

2. Arrow Mill Plaza, Clinton Township, Hunterdon County, N.J.

53,000 sf shopping center with a design flow of 6,600 gpd which consists of a supermarket, pizzeria, pharmacy, bank and other small retail stores. Wastewater is treated through a biological treatment facility located within a small accessory building on the site, prior to discharge through subsurface recharge fields. This system began operation in June 1990.

3. Spruce Hills, Glen Gardner, Hunterdon County, N.J.

Previously a community septic system servicing 324 units at 58,000 gpd, the subsurface disposal beds have performed well to date. A new treatment system has been installed in order to bring the discharge of the community system up to the more stringent DEP requirements. Presently operated by Applied Wastewater Services.

4. Hunters Glenn, Tewksbury Township, Hunterdon County, N.J.

52 units on a community septic system. In operation since 1986, presently operated by Tewksbury Township. Contact Mr. Welsh Harlan, Township Clerk, Secretary, Board of Health.

5. Bald Eagle Village, West Milford Township, Passaic County, N.J.

In operation since approximately 1983, this 250 unit community will be generating a wastewater flow of 100,000 gpd. Effluent disposal is through pressure dosed recharge beds.

This system is located adjacent to residential units and at the entrance drive to the community. Barn style buildings house the treatment equipment and augment entrance and sales area aesthetics.

Township Health Department Officials were pleased with this system and look forward to this method of wastewater management for other varied types of projects.

Additional DEP approved community systems are listed below:

1. Huntersfield, Township of Union, Hunterdon County, N.J.
130 units, 33,750 gpd.
2. Jackson Square, Township of Union Hunterdon County, N.J.
39 homes, 15,600 gpd.

IV. SUMMARY

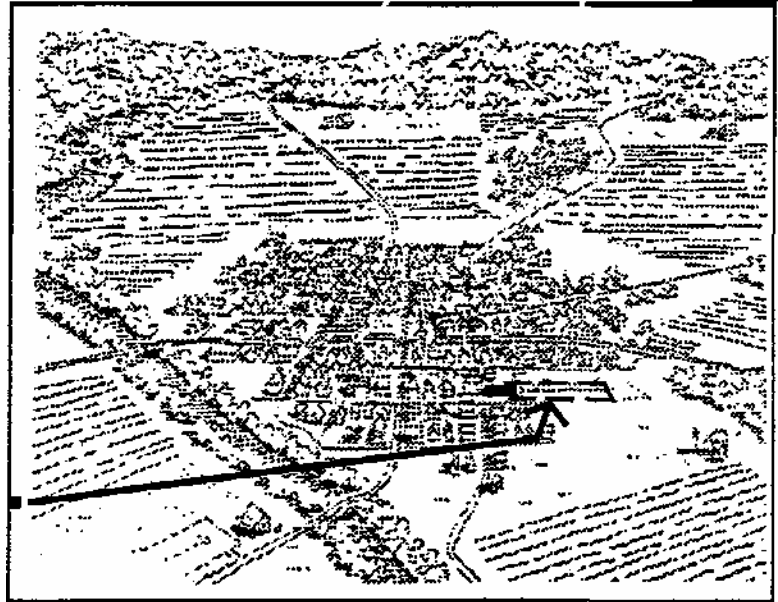
Use of wastewater treatment technology and large soil absorption systems for on-site wastewater management is an environmentally sound method for addressing wastewater disposal needs.

High levels of engineering, operation, management and regulation ensure protection and preservation of groundwater resources throughout New Jersey.

Technology for design of individual septic systems has also improved. These systems continue to adequately serve the areas where individual site conditions are favorable.

E N V I R O N S

Evaluate technical and administrative feasibility of small community treatment "package units"



t. evaluate utility service options

£.04
Community Sewage Treatment and
Collections Systems

see "5£W4G£ DISPOSAL" above (section £.02)

E N V I R O N S

r. define the open space network

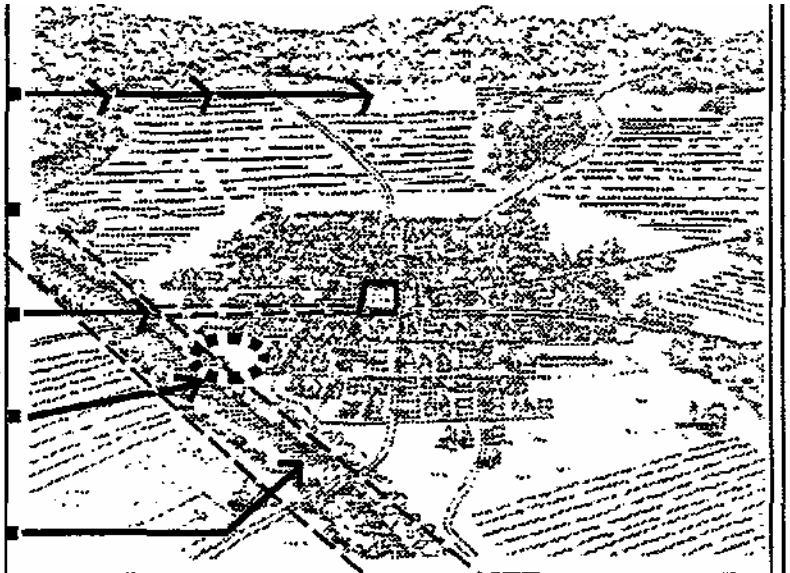
Coordinate County Open Space and Farm/and¹ Preservation Programs, resources from foundation grants and non-profit conservation programs with comprehensive rural/ development overlay plan

Calculate future open space and recreational land requirements (based on probable growth and balanced land use method)

Make connections from green spaces within the community to the regional open space network

Dedicate County preservation tax funds for purchases that will provide recreational opportunities for adjacent planned development

Inventory environmentally sensitive lands and map locations for new development to become interconnected by a planned open space network



Coordinate Conservation and Farmland Preservation actions with Rural Development Overlay Plan

MEMO FROM COUNTY EXTENSION OFFICE

**ECONOMICS OF BIRDING:
A NATIONAL SURVEY OF ACTIVE BIRDERS**

F.02

Calculate Future Open Space Needs

- COPY OF 1994 NEW JERSEY OPEN SPACE AND OUTDOOR RECREATION PLAN

F.03

Connect community green spaces and recreation sites with the regional Open Space Network

"LINKING OPEN SPACE IN FUTURE DEVELOPMENTS"
Chapter 6 from Designing Open Space Subdivisions by
Randell Arendt

F.04

Inventory environmentally sensitive lands and new development interconnected by planned open space network

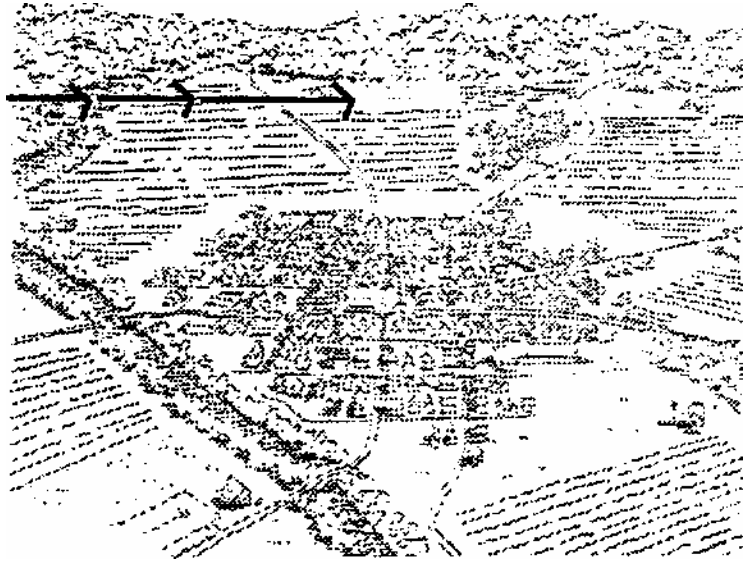
- SEE F.02 AND A.02

E N V I R O N S

f. define the open space network

Coordinate County Open Space and Farmland Preservation Programs, resources from foundation grants and non-profit conservation programs with comprehensive rural development overlay plan

f.OI
Coordinate Conservation and farmland Preservation actions with Rural Development Overlay Plan



MEMO FROM COUNTY EXTENSION OFFICE

Overview of the Gloucester County Open Space and Farmland Preservation Program.

ECONOMICS OF BIRDING:

A NATIONAL SURVEY OF ACME BIRDERS

This article is included to add another dimension to the discussion of the open space network and its potential to add value to land in the township. Although not much of a presence in the township now, farm-theme activities, birding, and other forms of "eco-tourism" may be more of a factor in the future (Stecher's is one example). Just to give another example that demonstrates to the economic influence of eco-tourists: in one recent year, birders visiting Cape May New Jersey spent six million dollars.



COUNTY OF GLOUCESTER
STATE OF NEW JERSEY
**Cooperative Extension Agriculture,
Open Space and Farmland Preservation**

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FREEHOLDER

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(609) 863*0110

Fax (609) 881 ^1191

TO: **MARK** KEENER, BROWN & KEENER URBAN DESIGN
FR: JANET EISENHAUER, GLOUCESTER COUNTY AGRICULTURE EXTENSION
DT: JANUARY 17, 1996
RE: WOOLWICH STUDY

As per your request, here is the overview as to how the County open Space and Farmland Preservation Program can play a role in the Woolwich Township Town Centers Plan.

County Open Space and Farmland Preservation Plan Explanation:

In November of 1993, 2/3rds of Gloucester County voters expressed their support for land preservation when they voted for the adoption of a County Open Space and Farmland Preservation Tax. At 1 cent/\$100 valuation/ this tax will generate about \$1 million a year for use in the County Open Space and Farmland Preservation Program. In order to implement this program, the State legislation requires that an Open Space and Farmland Preservation Plan (County Plan) first be developed. In addition to guiding the use of these funds, the plan will prioritize what areas of the County are most appropriate or are critical areas for preservation, and will describe a broad range of strategies for reaching those preservation goals. The County is now in the process of developing such a plan and anticipates completion in late 1996. Many factors will be considered in the plan development process including but not limited to water preservation, farmland preservation, stream corridor protection, aquifer recharge area conservation, local need and desire for recreation and preservation areas, and consideration of development pressures. There will be an emphasis on creating contiguous swaths of preserved lands or greenways in order to optimize the preservation benefits. During the development phase there will be several opportunities for public comment and input as well.



Gloucester County
Utino Park

Woolwich-2

County Plan and Woolwich Town Centers Plan Integration:

The County Open space and Farmland Preservation Program will be a useful tool in promoting the Woolwich Town Centers Plan strategy through the following venues.

1) The County Plan will develop policies to determine areas considered significant for preservation including but not limited to farmland/ environmentally sensitive lands, and recreational areas. Delineation of these areas will support the Woolwich Plan emphasis on encouraging thoughtful development i.e. locating development on a parcel with consideration for proximity to preservation areas or greenway corridors and locating development in concentrated hamlets;

2) The possible use of County preservation tax funds for fee simple and or easement purchases of critically important preservation areas may enable preservation of some key areas and again help to support the concept of concentrating development within hamlets;

3) The utilization of creative preservation options (i.e. foundation grants, Green Acres grants, nonprofit conservation organization programs) for properties not preserved through County tax funds can play a supportive role. The existence of the Woolwich Town Centers Plan should act as a draw to these various funding entities who see the value in investing where there is the potential for creation of a significant mass of open space. In addition to regional and state wide organizations and programs, there are already two existing local organizations who are actively working in Woolwich Township, the Racoon Creek and Oldman's Creek Watershed Associations.

4) The availability of open space preservation information and resources on the County level to create, promote and help carry out open space preservation projects will also serve as a support for the Woolwich Town Centers Plan.

Although these strategies may seem somewhat vague, the options available for implementing open space projects are numerous and specific strategies are determined on more of a case by case basis and by the individual characteristics and location of the property being considered. It should be noted that the creation of the Woolwich Town Centers Plan should serve to encourage conservation efforts not only by government, but by a large array of land conservation organizations. Once the County Plan is in place a more specific set of strategies and guidelines will be available.

I hope that the above information will be useful. Feel free to contact me if I can be of any further assistance.



Economics of Birding: A National Survey of Active Birders

*David Wiedner and
Paul Kerlinger*

IN 1981, EXPENDITURES BY UNITED STATES birders exceeded 20 billion dollars (U.S. Department of the Interior 1982). These funds were spent on a myriad of bird-related activities and paraphernalia from optical equipment to travel and bird seed. For example, the amount spent at the most popular birding sites amounts to many millions of dollars. At Point Pelee, Ontario, the net economic value of birding amounted to more than 6 million Canadian dollars in 1987 (Hvenegaard, Butler and Krystofiak 1989) while at Cape May the actual spending by birders in 1988 totaled about 6 million U.S. dollars (Kerlinger and Wiedner, unpublished manuscript). In the present article, we consider the economics of birding on a national scale. Specifically, we examined the demographics and determined the annual expenditures of "active" birders (called "committed birders" by Kellert 1985) in the United States.

Our rationale for conducting economic studies of birding and birders is that through these types of studies birders can become a stronger lobbying force. Other outdoor activities such as hunting and fishing have been extensively re-searched. Studies have documented the number of participants in these activities and the economic contributions of those participants through direct spending, as well as through sales taxes and excise taxes generated. For example, there is a Sport Fishing Institute that conducts economic studies of sport fishing in the United States. The results of such studies are used to lobby for legislation that will benefit both the businesses that profit from sport fishing and the fishermen.



Birdwatcher wood engraving by Ben Kohnnas

"We considered the economics of birding on a national scale; we examined the demographics and determined the annual expenditures of "active" birders...birders must be made aware that they constitute an important economic and political force."

In the 1980s or 1990s, now numbering more than 61 million (Hail and O'Leary 1989), continue to grow at a rapid rate. Their economic importance has seldom been studied, although the International Council for Bird Preservation has been interested in this topic for several years. In 1986, the International Council for Bird Preservation sponsored a symposium and workshop on *The Value of Birds* (Diamond and Filion 1987) as part of the XIX World Conference of the International Council for Bird Preservation. Several of the papers in that symposium outlined the economic importance of birding and birding tourism, but few presented the results of actual economic studies. Before economic arguments can be made for the importance of open space for birding tourism, studies such as the present one are necessary. Further, birders must be made aware that they constitute an important economic and, therefore, political force.

METHODS

For this study we operationally defined "active birders" as those individuals who participated in National Audubon Society's 89th Christmas Bird Count. We mailed questionnaires to the compilers of 350 randomly selected 1988 Christmas Bird Counts in the continental United States. Compilers received ten questionnaires, which they were asked to distribute to the first ten birders they encountered while conducting their count. Enclosed with each questionnaire was a self-addressed, stamped envelope in which compilers were requested to return the questionnaires after completion. About 60% of the 1,033 questionnaires (response rate = 29.5%) that were completed were returned in these envelopes. Respondents returned surveys from 308 counties in 48 states. We also received forms from birders visiting from Great Britain, Sweden, and Canada. Each questionnaire consisted of 38 queries and included instructions for participants to remain anonymous and not answer questions they deemed invasive. Seven items on the questionnaire were not related directly to birding demographics or economics.

Because we were interested in determining how much active birders spend on their pastime we asked questions

pertaining to travel, optical equipment, artwork, books, magazines, and miscellaneous birding paraphernalia. The questions focused on lodging, mileage driven, car rental, and airplane flights taken in the year for birding trips. Questions on optical equipment included specifics about binoculars, scopes, and tripods. We also queried people as to the type and amount of artwork and books they purchased, birding magazines or journals to which they subscribed, membership in conservation and birding organizations, and the type and amount of miscellaneous equipment (photographic supplies, clothing, backpacks, etc.) they purchased. Determination of total expenditures per birder was made by itemizing all expenditures and calculating an average. As in our unpublished study, we refrained from using a multiplier (multiplying the final figures by 2 or 3 to show the total economic value of expenditures).

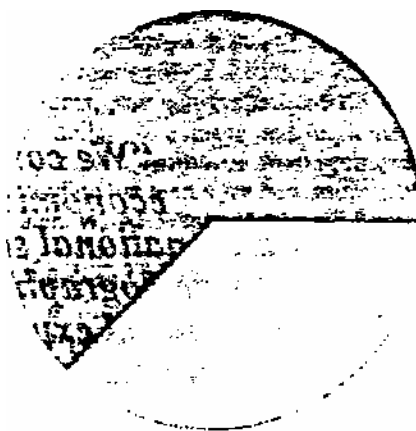


RESULTS

Demographics of American Birders

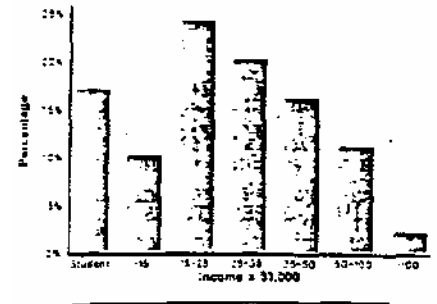
In general, the birders we surveyed were middle-aged, highly educated

Male = 63%



Female = 37%

and had incomes that were higher than the national average. The average birder was 46 years old, although women were slightly older (average = 51 years) than men (average 45 years, Fig. 1). Respondents had been birding for an average 19 years with men birding for 20 and women for 18 years. In our sample men outnumbered women by a substantial margin (62.9% male, 37.1% female).



Excluding students (17.1% of the sample), birders' annual incomes average between \$25,000 and \$35,000, well above the national per capita average (less than \$20,000, U.S. Department of Commerce 1989; Fig. 21). This is surprising because 25.7% of all those queried were retired. Those having incomes of less than \$25,000 accounted for 41.3% of the sample, whereas those having incomes greater than \$50,000 accounted for 16.0%.

As a group, birders may be the most educated group of outdoor "sportsmen." More than 98% of respondents graduated from high school and 74.4% from four-year colleges. Of those surveyed, 38.1% held graduate degrees and 8.2% had degrees from two-year colleges (Fig. 3).

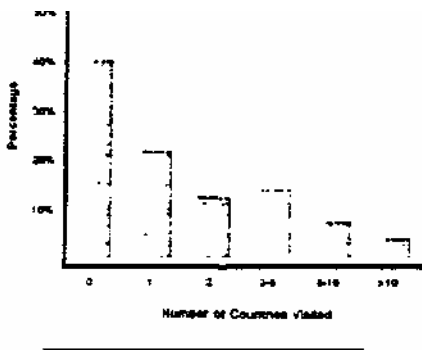
Birding Activity and Travel Characteristics

The average respondent spent 93 days birding in 1988. Retirees birded more frequently than those who were



;- employed, and a .omen birded. cr. average, more Ja>b than men (10- days for women. 87 days for men. Of interest is the fact that young ^men birded less than men. but as increased they birded more than men.

The amount of travel by birders is staggering. They drove automobiles an average of 2.763 miles in 1988 for birding trips. Although both sexes averaged eight trips of more than 100 miles per year, males ^5.190 miles) averaged > 1.000 more miles per year than females (2.044 miles). Respondents averaged 0.59 airplane flights to birding sites in 1988, and averaged 2.53 flights in the last five years. Birders rented cars for birding an average of 0.50 times in 1988, which is slightly less than the number of times they flew, indicating that when they arrive at birding sites by air they relied on rental cars for local travel. This practice impacts local communities through purchases of gasoline and by distributing the amount spent on lodging and food over a wide area. Sixty percent of respondents indicated that they had birded in foreign countries. A total of 6 i foreign countries was listed. On average, respondents that had birded outside the United States had traveled to two countries, but the number varied greatly with a subset of birders



accounting for the majority of international travel. The three foreign countries visited most were Canada (32% of respondents who had birded outside the country), Mexico (21%), and Great Britain (12%). These statistics do not reflect repeat visits to individual countries.

When asked about their five favorite North American birding sites, respondents listed 910 different sites! "My back yard" was listed by many people, but these sites are not included

Table I. Summary of economic expenditures by birders.

Expenditure	Calculation	Total Dollars Spent Per Birder Per Year
Travel		
Airplane Flights	0.59 nights x \$250 per round trip	\$ 148
Automobile Car Rental	2.763 miles x \$0.30 per mile	\$ 829
Hotel/Motel	0.50 rentals x \$75 per rental	\$ 38
Campsite Both	119 nights x 21.7% of birders x \$5.00 per night	\$ 99
Campsite and Motel/Hotel	12.9 nights x 38.3% of birders x \$510 per night	\$ 28
Meals	119 nights x 22.6% of birders x \$515 per night	\$ 44
	13 days x 82% of birders x \$515 per day	\$ 160
Total for Travel		\$ 1,108
		SUIT
Birding Tour Expenses	28% of birders x \$150 to tour group	\$ 42
Miscellaneous Items		
Books	4.2 books per birder x \$18.40 per book	\$ 77
Magazines	1.6 magazines per birder x \$20 per year	\$ 32
Conservation Organizations	3.1 organizations x \$20 per year	\$ 62
Artwork	average per birder	\$ 56
Other Paraphernalia	average per birder	\$ 172
Optical Equipment		
Binoculars	average per birder	\$ 53
Scopes	average per birder	\$ 30
Tripods	average per birder	\$ 10
Total Optical Equipment		\$ 90
Christmas Bird Count (fee)	\$4 per participant	\$ 4
Total Annual Expenditures Per Birder		51.852

in the 910 favorite places to bird. Many of the most popular places to bird are already preserved as national, state, and county parks, although a large number are unprotected (Kerlinger and Wiedner, in prep.).

Itemization of Birder Expenditures

Expenditures for birding were partitioned into categories associated with travel, optical equipment, artwork, books, magazines, membership in conservation/birding organizations, and miscellaneous birding paraphernalia. Each category is examined separately (Table 1).

On birding trips away from home 26% of respondents stayed in campgrounds, 45% stayed in hotels or motels, and 27% reported using both types of accommodation. During birding travel 82% patronized restaurants, whereas 15% did not and 4% did so some of the time. Birders averaged 13 nights away from home in 1988. A trend that is now increasing in the

birding world is birding tours led by professionals. From our sample, 27.7% of birders paid to bird with a leader or a tour group in 1988. The estimated cost per person is \$150 not including airfare and meals (the latter are included in the travel section). From this we estimated that the average amount paid to tour companies and leaders per birder is \$42 per year.

A majority of respondents (72.1%) owned more than one pair of binoculars. 67.3% owned spotting scopes, and 66.4% owned tripods (a small number preferred shoulder mounts or window mounts). From the array of brands and models of these types of equipment listed by respondents, we estimated that the average birder spends approximately \$53 per year for binoculars, \$30 per year for scopes, and about \$10 per year for tripods. We assumed a life-expectancy of about 5 years for these items.

Other expenses we considered were the costs of magazine subscriptions and

"Our most important finding was that people who watch birds spend a lot of money on their favorite pastime!"

books. The average birder subscribed EO 1.6 birding magazines, and purchased 4.2 bird-related books in 1988. Books and magazine subscriptions cost an average of \$18.37 and \$20.00, respectively.

Because birding is done in a variety of weather and physical settings, special equipment is often necessary. Seventy-four percent of the birders we queried indicated that they had purchased camera equipment, film, recording devices, rain gear, packs, vests, insect repellent, sunscreen, etc.. The average amount spent on special equipment in 1988 was \$172.12.

Birders also spent a considerable amount on bird-related art. Expenses averaged \$55.51 per person on an array of artwork including prints, paintings, sculpture, posters, photographs, and calendars (listed in descending order of popularity). Most respondents purchased several types of artwork.

Encouragingly, respondents listed 460 different birding and conservation groups to which they belonged; on average, each person was a member of three organizations. International, national, and local conservation and Motels = 45%

birding associations were represented, totaling \$62.00 (minimum) per year per birder in membership dues.

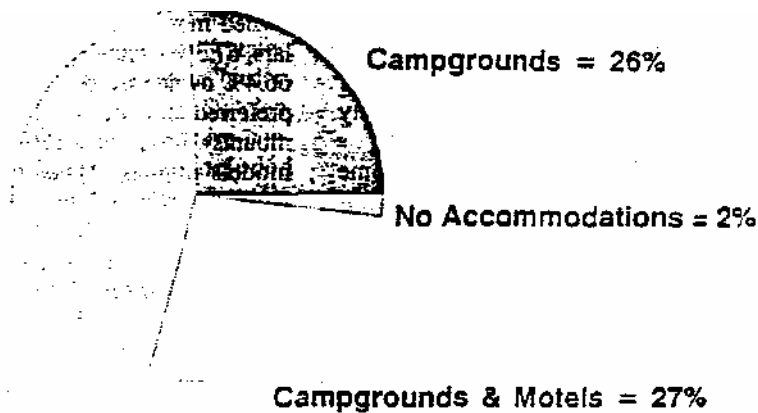
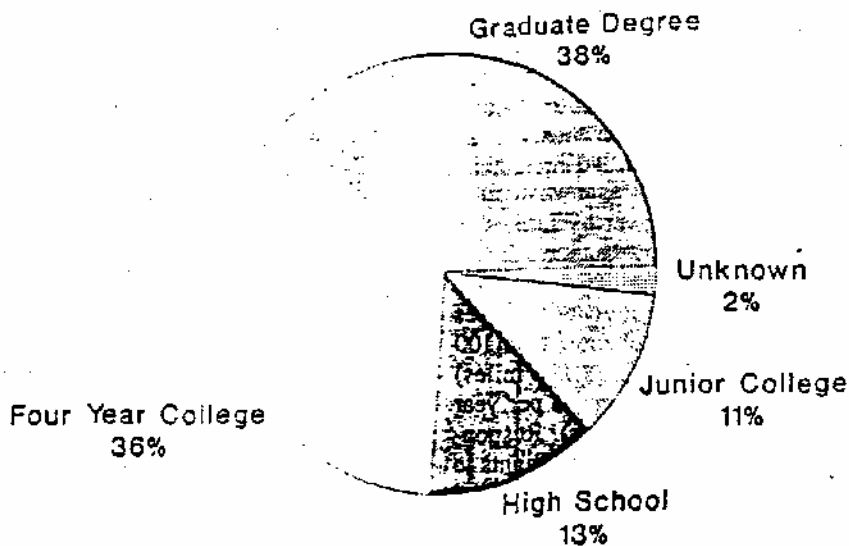
Calculation of Individual and Overall Expenditures

Using the percentages and averages from the survey with conservative estimates for such things as travel expenses, hotel and campground costs, magazine subscription rates, organizational membership, optical equipment, and other items in our survey (Table 1), we calculated the average yearly amount spent per birder as \$51.8*52 (Table 11). To determine the total amount spent by "active" or "committed" birders, we multiplied the average yearly expenditure per birder by 43,000 (the approximate number of Christmas Bird Counts participants in 1988). This calculation yields a total of \$2.19 billion spent in 1988 by birders who participated in the 89th Christmas Bird Count.

DISCUSSION

What did we learn from our study and why are our findings important? We learned that American birders, at least the active ones, are very well educated, earn incomes that are above the national average, range widely in age between 25 and 65 years, are more likely to be male, and belong to at least three conservation or birding organizations. Our most important finding was that people who watch birds spend a lot of money on their favorite pastime. On average, the birders we surveyed spent \$51,852 per year. Altogether, the 43,000 participants or the 89th annual Christmas Bird Counts spent nearly \$80 million dollars on birding related activities in 1988. Most of this was spent on travel, both foreign and domestic, with a lesser amount spent on optics, books, magazines, artwork, miscellaneous equipment, and contributions to conservation organizations. Our estimates are probably conservative because we did not take into account such expenditures as bird feed, bird houses, bird baths, and several other items that many birders purchase.

The numbers reported above are impressive, but how representative are they of American birders? We sampled Christmas Bird Counts participants, a group that we considered to be active birders. But, how many active birders are there in the United States? Hall and O'Leary (1989) used the 1985 National Survey of Fishing, Hunting, and Wildlife Associated



*"Until
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conservation policies
we endorse"*

Recreation (conducted by the U.S. Census Bureau. U.S.D.I. 1989) data set to determine that there were nearly 61 million birders in the United States. Kellert (1985) concluded that only 0.5% of birders could identify more than 100 species and that about 3% of birders could be considered "committed" to their pastime. Thus, there are between 300,000 and 1.5 million active or committed birders in the United States.

Statistics published in the 1985 "National Survey of Fishing, Hunting, Wildlife-Associated Recreation" (U.S.D.I., 1989) show that birders outnumber other wildlife "user" groups such as hunters (16.7 million Americans) and fishermen (46.6 million). In marked contrast to hunting and fishing, women are better represented among birders, which may account for the greater number of participants. Using our economic statistics and the number of American birders it is obvious that birding contributes billions of dollars to the national economy each year. Because we are not sure what proportion of the American birding population we sampled, we cannot make accurate estimates as to the total expenditures by this user group. As of 1980, the total spent by birders in North America was recognized to be greater than \$20 billion by the United States Fish and Wildlife Service (U.S.D.I. 1982). Future studies should focus on the expenditures of those birders who are less active than the group we sampled so that we can learn about the economic contributions of American birders as a whole.

How can this information be used? Enough birders comprise a large and

growing segment of the population. We do not have a unified voice. This is because we were not aware of the size of our ranks, the need for a common agenda, or the amount of economic leverage at our command. For these reasons, it is imperative that birders learn more about themselves and their economic contributions because this information can be used for both conservation and for improving birding opportunities. By publishing this report and by sponsoring symposia on birding economics such as the 1986 symposium (Diamond and Filion 1987) and the symposium at the 1990 International Council for Bird Preservation meeting in New Zealand, the International Council for Bird Preservation is encouraging economic research and is helping to disseminate this information to the birding public. More research and broad distribution of information from studies such as this one will promote the idea that good conservation policies can be economically beneficial.

It is unfortunate that a great many of the officials who make policy often do not appreciate aesthetics or conservation. Instead, they take polls to learn public opinion and they assess the economic bottom line. Until policy makers realize that birders are a large and economically important group they will continue to ignore us and the strong conservation policies we endorse.

On both local and national levels, birding and conservation organizations should make powerful economic arguments to legislators and planning boards, who decide how a region will develop. In addition to land-use planning, local groups might use similar tactics to convince managers of public and private lands to consider alternatives to development, or to the management of selected game species. By preserving and managing open land for a variety of wildlife-associated recreation (including consumptive and nonconsumptive uses), some regions can realize a sustained economic benefit without the tax burden that is associated with home development.

Economic arguments are rarely used in the arsenal of conservation tools, nor are they taught to wildlife or natural resource managers. Resorting to economic arguments in appropriate

situations, may be more persuasive than the standard conservation dialogues that use emotional, aesthetic and scientific arguments. Without a knowledge of the demography and economics of the American birding populace, birders will not be an effective advocacy group. With imagination and planning, however, we can use our influence to promote conservation, balanced land management and creation of more facilities for birders — all of which mean better birding.

3

ACKNOWLEDGEMENTS

We thank the Christmas Bird Count compilers who distributed our questionnaires and those who took the time to complete the questionnaires. S. Senner made helpful comments on a draft of this manuscript. The study was funded, in part, by Humphrey Swift of Swift Instruments, Inc. and by the generous contributions of members of the Cape May Bird Observatory.

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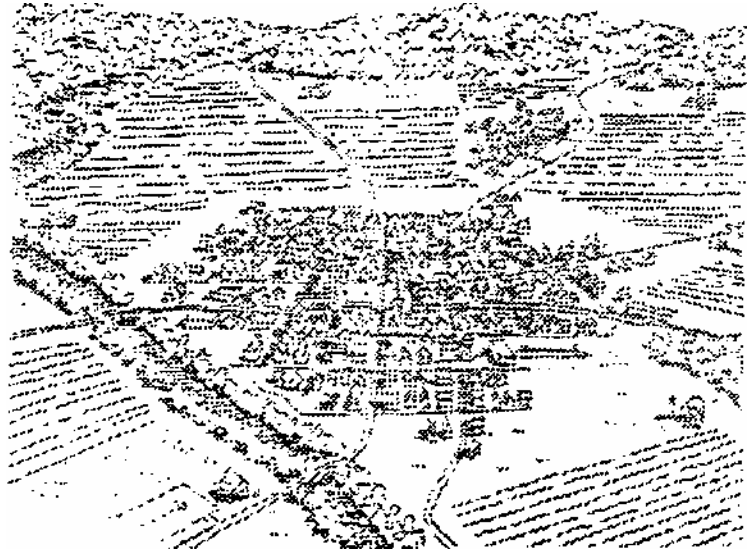
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---Cape May Bird Observatory!
New Jersey Audubon Society
P.O. Box 3, 707 East Lake Drive
Cape May Point, NJ 08212

h define the open space network

Calculate future open space and recreational land requirements (based on probable growth and a balanced (and use method)

F.02
Calculate Future Open Space Needs



• **COPY OF J 994 NEW JERSEY OPEN SPACE AND OUTDOOR RECREATION PLAN**

This provides a more detailed description of the overall structure and purpose of the State's Open Space and Outdoor Recreation Plan.

1994 NEW JERSEY OPEN SPACE AND OUTDOOR RECREATION PLAN

STATE OF NEW JERSEY

CHRISTINE TODD WHITMAN
GOVERNOR

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ROBERT C. SHINN; JR.
COMMISSIONER

GREEN ACRES PROGRAM

1989 and 1992 Green Acres bond issues which received strong voter approval to spend \$430 million for open space and outdoor recreation purposes.

RECREATION OPEN SPACE NEED DERIVATION

The diversity of open space functions and the inability to quantify open space requirements for certain uses, have kept New Jersey from precisely defining its overall open space preservation requirements.

For purposes of estimating the amount of open space required for recreation purpose, an approach referred to as the Balanced Land Use Concept has been determined to be the most appropriate for New Jersey, The approach Uses the guidelines presented in Table 9 to calculate the recreation open space requirements for the state, federal, county and municipal levels of government. In contrast to the other widely used method for calculating recreation land requirements, . the Acres Per Population technique, the Balanced Land Use approach incorporates land as a finite resource for which there are other legitimate competing uses. Basically, the Balanced Land Use requirements represent the recreation open space needs that will result from existing and new development. The Acres Per Population method, on the other hand, generates higher recreation land requirements as the population increases and land becomes more scarce.

The need figures obtained through the Balanced Land Use guidelines are long term goals for public recreation land acquisition based on the extent of New Jersey's developed, developable and undeveloped land resources and the need to accommodate competing land uses (e.g. transportation, commerce, housing). Using developed and developable land as the calculation basis for counties and municipalities takes into account the fact that the demand for county and recreation land is generated by development.

TABLE 9

Balanced Land Use Guidelines

Municipal Level	3% of the developed and developable area of the municipality.
County Level	7% of the developed and developable area of the county.
State Level	10% of the area of the state.
Federal Level	1% of the area of the state
Developable Areas	excludes acreage of slopes over 12%, wetlands, low density areas of the Pinelands, and federal and state-owned open space.

The Balanced Land Use Guidelines are a means of estimating the amount of recreation land that should be set aside by the various levels of government in New Jersey to provide recreation opportunities for the existing and future residents of the state. The figures produced represent only minimum goals for recreation land acquisition programs. In order for public open space areas to be considered as supply toward meeting the Balanced Land Use goals, the areas must be environmentally suitable for the recreation activities generally provided by the particular level of government. Additionally, one level of government may compensate for another less active or inactive level of government by providing appropriate recreation lands.

in addition, this approach recognizes that, in many instances, municipal and county park agencies are competing with other legitimate local uses for the same developable lands. Environmentally sensitive lands are usually unsuitable for tennis courts, ballfields, basketball courts, golf courses and other typical active day-use facilities provided by local levels of governments. The recreation responsibilities of the state and federal levels of government are broader, ranging from active day use areas to wilderness oriented activities like hunting and hiking that are generally compatible with environmentally sensitive areas. Reflecting this broader responsibility, the state and federal guidelines are applied to the total land area of the state. Because the functions performed by federal and state recreation open space areas in New Jersey are very similar, and the fact that the State has little control over federal acquisition policies, the federal and state guidelines were combined to produce a single recreation open space goal figure.

Specific adjustments in calculating the recreation land requirements within the one million acre Pinelands National Reserve were made to take into account the region's special planning and land use regulation programs. The state and federal recreation land goal has been increased by 71,000 acres over what was derived through the guidelines to reflect the Pinelands Commission's recommended acquisition program for the region. In recognition of the low intensity development called for in much of the Pinelands, the local recreation need for the Pinelands sections of Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Ocean counties are based on the Pinelands Comprehensive Management Plan's acreage figures for towns, villages and developable land.

It is important to keep in mind that need figures derived by the Balanced Land Use method represent the amount of land that should be permanently dedicated as public open space and available for appropriate direct public recreation uses. Open space that is protected for environmental or agricultural purposes through conservation easements, land use regulation or other means that do not provide

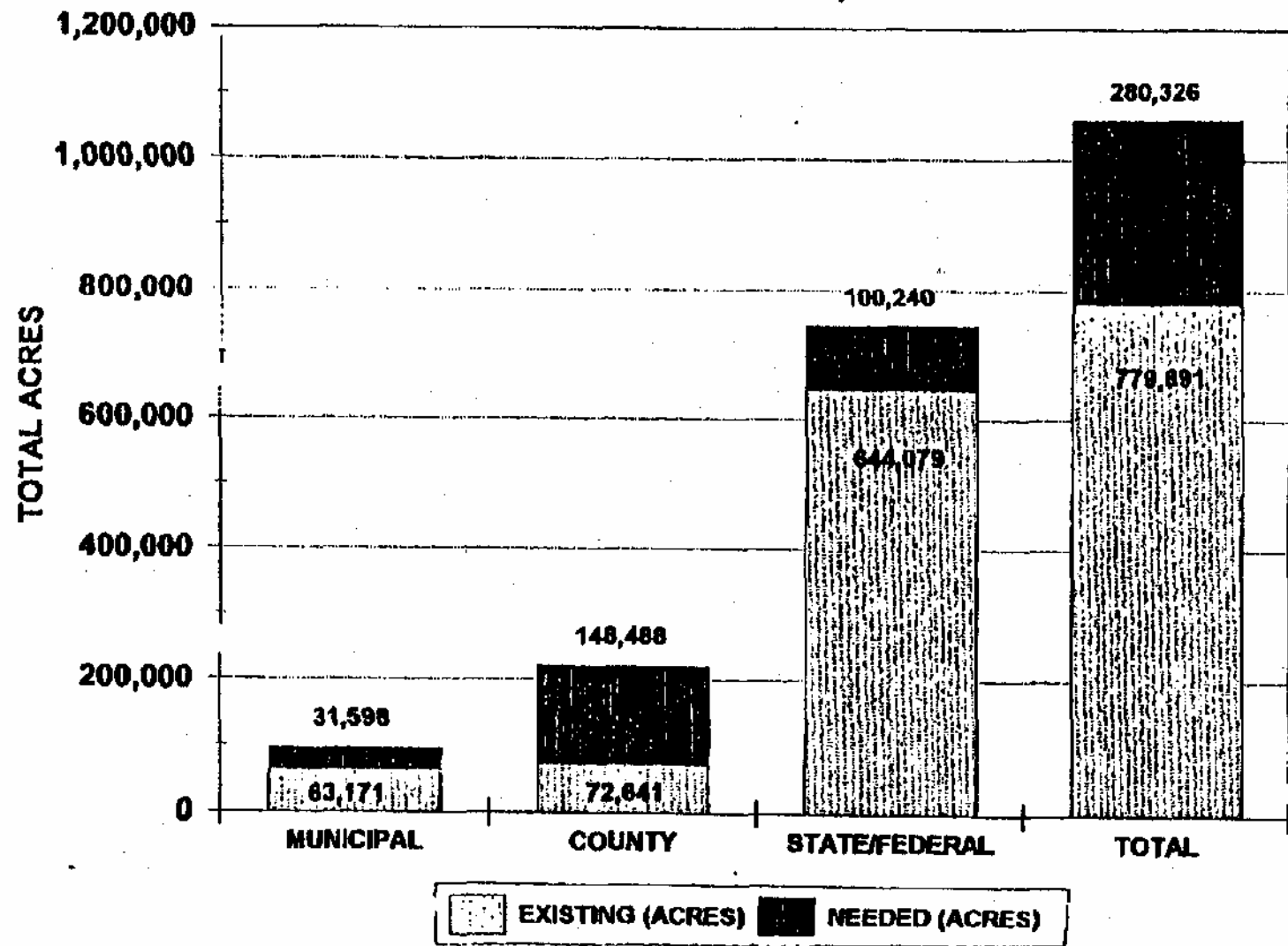
for direct public use is not considered as part of the public recreation land supply. These lands are, however, of considerable outdoor recreation value because they protect important natural and cultural resources that are essential in maintaining an environment that is conducive to high quality recreation experiences. Also, these protected areas will be available in the future for public land acquisition if direct public recreation access is needed and environmentally appropriate.

RECREATION OPEN SPACE NEEDS

As shown in Figure 1, New Jersey needs to increase its supply of dedicated public recreation open space by 280,326 acres to meet the Balance Land Use derived goal of 1,060,217 acres. It is important to note that these need and goal figures reflect the amount of land that should be made accessible for public recreation use, and does not include open space lacking public access, preserved through deed restrictions, subdivision open space allocations and state land use regulations. New Jersey's progress toward reducing the land deficit and reaching the recreation open space goal also should be recognized. Since publication of the first SCORP in 1966, New Jersey's parkland has increased by over 440,000 acres. In fact, since publication of the 1988 SCORP, the statewide recreation open space deficit has been reduced by over 50,000 acres. This increase can be largely attributed to the success of the Green Acres Program, the land acquisition financial assistance provided by the Land and Water Conservation Fund Program, federal land purchases for the Delaware Water Cap National Recreation Area and a number of existing and new national wildlife refuges.

All levels of government share responsibility for providing the additional recreation open space that is required. Additionally, nonprofit conservation and recreation organizations receiving matching grants through the Green Acres

FIGURE 1
RECREATION OPEN SPACE NEEDS
AS OF JULY 1, 1993



Nonprofit Acquisition Program, established by the 1989 Green Acres bond issue, are expected to contribute large amounts of public recreation open space toward meeting the identified needs. Based on the Balance Land Use guidelines, the federal and state governments should acquire 100,240 acres of additional recreation open space, and counties and municipalities should increase their park systems by 150,170 acres and 31,598 acres, respectively. It is expected that nonprofit organizations will purchase lands that will assist all levels of government to reach their goals.

In terms of the distribution of the recreation open space needs, the greatest local park deficits occur in the state's larger counties: Cumberland (21,931 **acres**), Hunterdon (18,242 acres), Salem (16,882 acres) and Burlington (16,044 acres) (See Table 10). Several counties appear to have surpluses of either municipal (Cape May and Morris counties) or county (Essex and Union counties) parkland. These county wide totals are misleading for a number of reasons and need to be carefully evaluated before drawing absolute conclusions. First, countywide figures are not necessarily representative of the situation in a given municipality or section of a community. Morris County's municipal parkland surplus, for example, is attributable to several municipalities having large amounts of municipal parkland. Secondly, the municipal and county recreation open space inventory information did not permit analysis of the useability of the reported open space sites for the recreation activities provided by municipal and county levels of government. (This problem is expected to be addressed in the future through Geographic Information System analysis of computer mapped open space and environmental factors.) Finally, the lack of state and federal recreation lands to complement the local park systems is not considered. Essex and Union counties, combined, contain less than 200 acres of federal and state recreation land and their residents must turn toward the larger county parks for many of the recreation opportunities traditionally provided at federal and state parks.

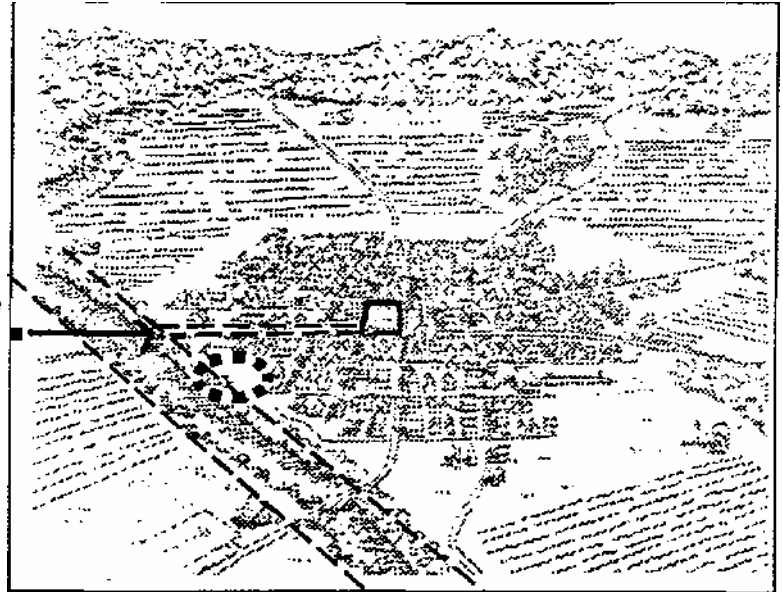
TABLE 10
1991 RECREATION OPEN SPACE NEEDS

COUNTY	MUNICIPAL			COUNTY			LOCAL		
	SUPPLY	GOAL	DEFICIT	SUPPLY	GOAL	DEFICIT	SUPPLY	GOAL	DEFICIT
ATLANTIC	5,353	5,153	(200)	3,379	12,024	8,645	10,732	17,177	6445
Bergen	1,684	3,914	2230	9,310	9,133	1,823	11,794	13,947	1253
BURLINGTON	1,856	6,074	2,118	247	10,173	13,926	4,203	20,247	16044
CAMDEN	2,741	2,941	200	1946	6,863	4,917	6,187	3,804	5617
CAPE MAY	3,498	2,841	(657)	1503	6,623	5,120	1,001	5,169	4334
COMBERLAND	1,680	7,133	5,453	165	16,443	16,278	1,353	23,704	21931
ESSEX	2,385	2,231	154	5,729	3,285	(2444)	7,105	7,636	531
GLOUCESTER	2,305	4,385	2,080	1,612	11,631	10,019	4,517	16,614	12097
HUDSON	140	761	621	612	1,784	1,172	452	2,340	1688
SURFERSBORO	982	6,703	5,721	2,114	13,639	12,525	4,100	22,342	18242
KENNES	3,487	3,976	489	4,622	9,277	4,655	8,109	13,253	5144
MIDDLESEX	4,350	5,599	1,249	5,155	13,045	7,890	9,505	14,464	4959
MORMOUTH	6,084	8,185	2,101	8,583	19,091	10,508	15,467	27,284	11817
MORRIS	6,196	5,070	(1,126)	10,361	15,715	5,354	10,775	19,553	8778
OCEAN	4,915	6,351	1,436	7,620	14,821	7,201	7,535	21,172	13637
PASSAIC	1,817	1,826	99	1,933	4,243	2,310	3,350	6,007	2717
SARSO	753	3,213	2,460	60	12,392	12,332	823	17,703	15402
SOMERSET	2,039	4,631	2,592	4,642	10,405	5,763	7,321	15,436	7915
WARREN	2,512	4,357	1,845	1	10,167	10,166	2,513	14,524	12011
WINDHAM	1,806	1,923	117	5,600	4,486	(1,114)	6,606	6,409	(197)
YARLEN	882	3,591	2,709	304	9,312	8,008	1,104	13,303	12117
SUBTOTAL FOR LOCAL LEVELS	63,171	94,769	31,598	72,641	221,129	148,488	135,812	315,894	180,084
		SUPPLY	GOAL	DEFICIT					
STATE AND FEDERAL SUBTOTAL*		641,079	744,319	103,240					
STATE TOTALS-ALL LEVELS OF GOVERNMENT**		779,891	1,060,217	280,326					

* State-owned easements totaling 10,458 acres that do not provide for public access were excluded from supply.

** Deficit figures would be increased by 34,100 acres if the public watershed lands considered to be protected regional public open space are developed for other purposes.

Make connections from green spaces within the community to the regional open space network



F. define the open space network

F.03

Connect community green spaces and recreation sites with the regional Open Space Network

"LINKING OPEN SPACE IN FUTURE DEVELOPMENTS"
Chapter 6 from Designing Open Space Subdivisions by
Randell Arendt

Discusses the economic and environmental benefits of creating an **area-wide** map of conservation and development to guide the **guide** the incremental creation of an interconnected network of conservation lands

Linking Open Space in *Future* Developments

A Greener Vision

Area-wide Maps for Conservation and Development

From the standpoint of people who are interested in how their township or county will look and feel in 10 or 20 years—as a place in which to live, raise families, and conduct business or vacation—*possibly the most important aspect of the development approach known as Open Space Design is the opportunity it offers to create an interconnected network of conservation lands.* Rather than simply preserving isolated pockets of greenery here and there, which do little to protect water quality and which are of relatively little use to wildlife, people in your community have within their reach the chance *to create a true fabric of open space that flows among any number of new subdivisions, as more and more properties are converted from fields and woodlands to residential developments.* Without such a comprehensive approach, wildlife habitat will continue to dwindle and become increasingly fragmented and non-functional, opportunities to connect informal neighborhood trails into an area-wide greenway system will be lost forever, and water quality could be jeopardized over the longer term.

Open space connections will not be automatically preserved simply by following the general design approach described and illustrated in this handbook, on such a site-by-site basis.

The *critical missing element*, one that can be readily created by paid professional staff working together with planning landowners, and state agency -wide map of developers, conservationists, and state agency officials, is a tool called an *area development conservation and*.

This tool is essentially a composite map that brings together all the published information and the data that are readily available from state and federal agencies, pertaining to factors that should be avoided natural features and other broad "footprint" of future limiting when first sketching properties. Although all this the development on record and is freely available to individual task of "designing around" such information is on the public those who are interested, the elements would be made considerably easier if these data were collected and charted on a series of area-wide maps that together would ultimately cover one's entire township. Whether the appropriate geographical divisions for these maps

should be based upon watershed "divides", the convenient grid that is the basis for U.S. Geological Survey maps, or some other factors, is not important to decide here.

The information that should be recorded on these area-wide maps include the following items:

1. Wetlands (tidal and fresh)
2. 100-year flood plains (high velocity zones and areas with only slow-moving shallow water)
3. Steep slopes (25 percent or greater)
4. Habitats of species that are endangered, threatened, or considered by state or federal agencies to be significant at the state or county level, and other ecologically unique or special areas
5. Historic, archaeological, or cultural sites listed on the National Register of Historic Places, or on state or county inventories
6. Active farmland with soil rated as prime or of "state-wide importance" by the USDA Soil Conservation Service
7. High-yielding aquifers
8. Woodlands of a size that makes them locally significant, and mature woodlands of one acre or more in extent.

All these items should be mapped separately (including related resources grouped together above, such as fresh and tidal wetlands, which are typically regulated in different ways).

The usefulness of this tool to site designers would be greatly increased if these maps also showed existing tax parcels, so that potential development sites could be easily located with respect to the natural features and other constraints mapped on them. *Although area-wide maps cannot show all the features that are important for site designers, they would provide a basic understanding of the most critical elements existing on each site, especially as they relate to similar elements on adjoining parcels that may also become developed with open space*

designs in the future. In addition to these elements, others that should be considered by site designers—but which cannot be incorporated into area-wide maps—include (as mentioned in earlier chapters) views into and out from the subject property, and the landowner's own knowledge of the land, including the location of areas that are special to him or her on a local or personal level, even though they might not show up on county, state or federal maps and inventories.

After the ten data layers listed in Chapter 5 have been compiled, the broad outlines of an *open space system* should begin to emerge. Since 50% of the buildable land on any development site can often be conserved simply by grouping new development in a more compact, efficient and neighborly manner—without reducing overall density or profitability—at least half of each potential development parcel could be shaded green on the new Area-wide Maps of Conservation and Development without adversely affecting landowners or developers.

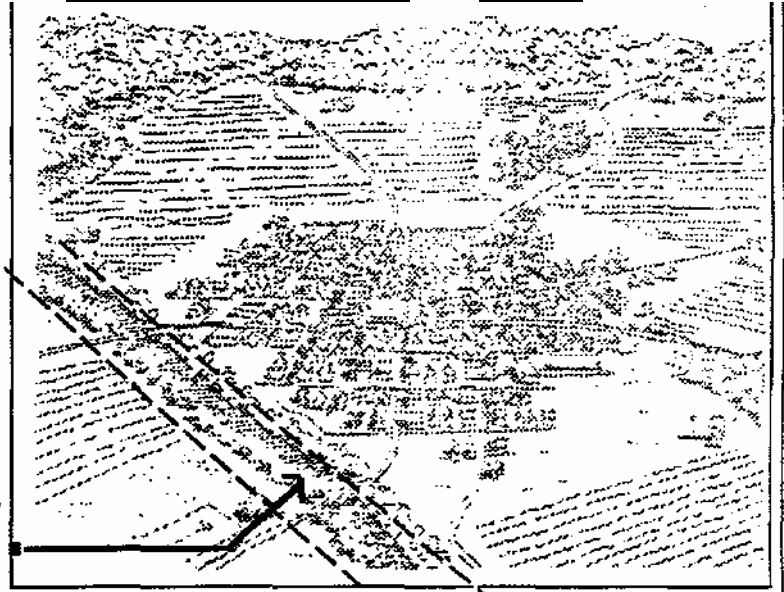
The great advantage of taking a broader view of future patterns of development and conservation is the opportunity it offers to pre-identify the most logical and fruitful ways of connecting open spaces in new subdivisions and PRDs. From the perspective of maintaining functional habitats, which include travel corridors for native wildlife as they move from nests or burrows to areas where they hunt, feed, or breed, it is essential that natural areas be linked together to the greatest extent feasible. The resulting greenways frequently offer an additional benefit that is potentially very useful to realtors and residents alike: the creation of informal walking trails through woodlands, or alongside meadows, creeks, or other natural features. The demonstrated sales advantage of homes which are located adjacent to or near open space—including greenways—constitutes convincing evidence that this is a

development pattern that is sound economically as well as environmentally. (Please see Appendix F, "Sample of Real Estate Ads Mentioning Proximity of Homes to Greenways.")

While the creation of such area-wide maps would benefit both developers and conservationists, the site design principles of this handbook can certainly be implemented before they are compiled. Site designers and township or county staff members should both look at the larger picture of what is happening ecologically in the vicinity of each development as the open space within it is being determined.

f. define the open

ce ne fwork



Inventory environmentally sensitive lands and map locations for new development to become interconnected by a planned open space network

F.04

Inventory environmentally sensitive lands and new development interconnected by the planned Open Space Network

SEBF.03ANDA.02

E N V I R O N S

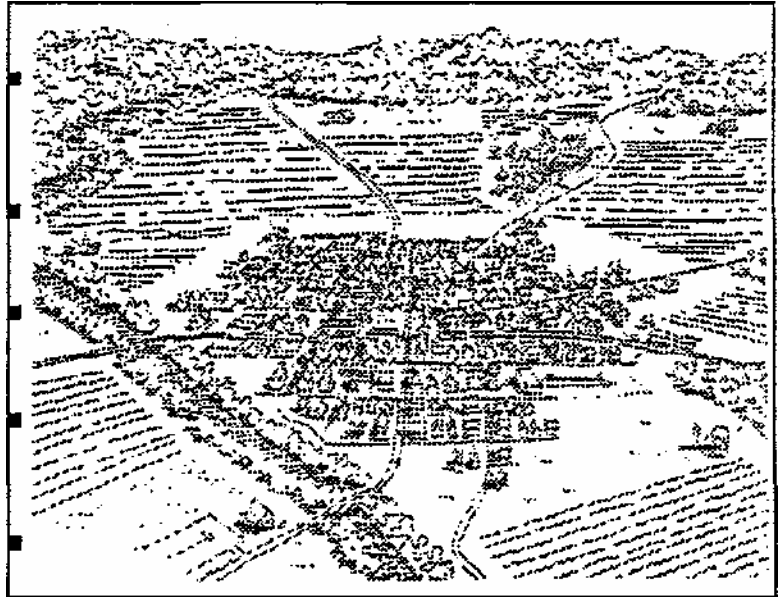
Establish a Places Task Force that includes (the Planning Board and representation from the county to draft a Resolution that evaluates and endorses the plan for the RDO district (the environs) and then spearheads efforts to:

Amend municipal Master Plan, Zoning and Subdivision Ordinances for the RDO

Coordinate proposed amendments for Rural Development Overlay district with County Open Space and Farmland Preservation Programs

Work with County Office of Economic Development to interest sophisticated developers

Establish liaison contacts with OSP, DEP and DOT and local utility authority to address regulatory and funding impediments to the provisions of the Rural Development Overlay



G. create a "places" task force

G.01

Establish a Places Task Force

- POTENTIAL ACTIONS BY GOVERNMENT AGENCIES

« PUBUC INVOLVEMENT AND EDUCATION PLAN

G.02

Amend municipal Master Plan, Zoning and Subdivision Ordinances

¹ SEED.01, D.02, ANDD.03

- COPY OF "RURAL DEVELOPMENT OPTIONS UNDER THE GENERAL DEVELOPMENT PLAN CONCEPT"

G.03

Coordinate proposed amendments with County Open Space and farmland Preservation Programs

« MEMO FROM COUNTY EXTENSION OFFICE

G.04

Work with County Office of Economic Development to interest sophisticated developers

- PROPOSAL FOR APPLYING THE DENSITY CREDIT CONCEPT TO OPEN SPACE PLANNING AND PRESERVATION

G.05

Establish liaison contacts with OSP, DEP and DOT and local utility authority

EXAMPLE OF A "DEVELOPMENT PACKAGE" SIMILAR TO ONE THAT COULD BE PUT TOGETHER AND MADE AVAILABLE THROUGH THE COUNTY OFFICE OF ECONOMIC DEVELOPMENT

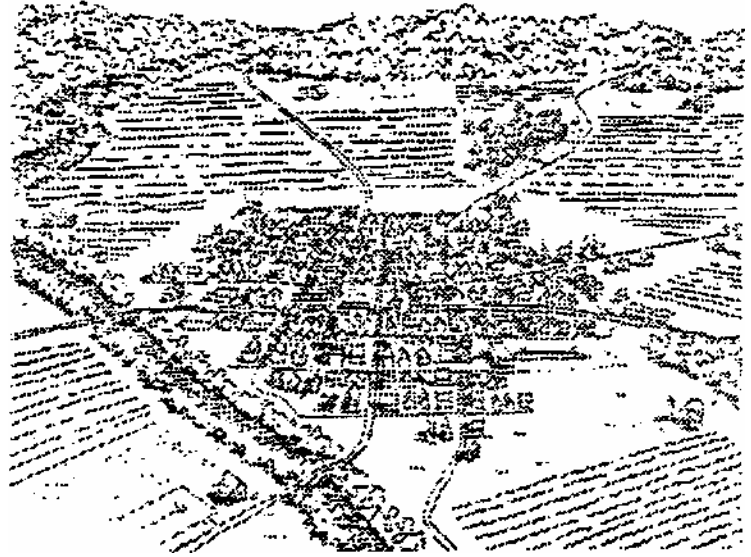
DIRECTORY OF RESOURCE PEOPLE

E N V I R O N S

Establish a Places Task force that includss the Planning Board and representation from the county to draff a Resolution that evaluates and endorses the plan for the RDO district (the environs)

G.01
Establish a Places Task Force

create a "places" task force



POTENTIAL ACTIONS BY GOVERNMENT AGENCIES

Table that identifies important actions to be undertaken at the level of Township, County and State

PVBUC INVOLVEMENT AND EDUCATION PLAN (NOT YET INCLUDED)

The township, with help from the county and the state will need to involve residents, landowners and developers in an education process so that so that everyone understands what the objectives and opportunities are. Some additional may need to be completed so that questions related to Future impacts on roads, schools, taxes, property values and quality of life in the township can be answered with some specificity. The Public Involvement and Education Plan will probably rely on several public workshops, classroom workshops in the public schools, news releases, and a general mailing or newsletter. A guided bus tour with local officials, residents, and landowners might be a good technique to help everyone envision the outcome and benefit of the Rural Development Overlay and the related proposals outlined in Plan for the Environs of a Center.

Potential Actions By Government Agencies

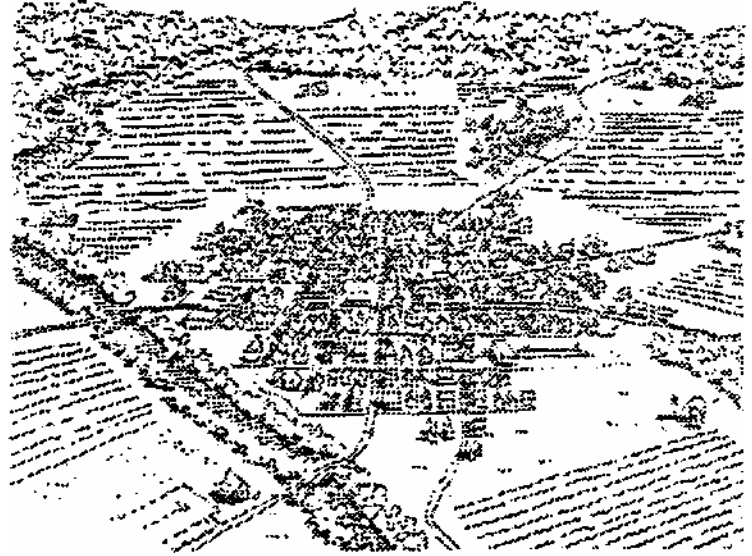
State	County	Township
<p>OSP: Continue to assist with advice and technical help- especially with: coordination w/ other state agencies, "Demonstration Project" for community wastewater treatment facilities permitting for Woolwich Township, and with background information to help people understand implications /impacts of proposals outlined in <u>Plan for the Environs of a Center</u></p>	<p>Coordinate Farmland Preservation Program, County Open Space Plan and efforts of private conservation foundations with Plan for the Environs of a Center</p>	<p>Revise Master Plan, Zoning Code, and Subdivision Ordinance to support intentions outlined in <u>Plan for the Environs of a Center</u>. creating an atmosphere that is conducive for both development and farming. Guide development of The Center. Encourage Hamlets, Villages (and Open Space Subdivisions) in The Environs {RI and R2 areas). (Rural Development Overlay)</p>
<p>DEP to expand agenda of Wastewater Trust to provide initial financing for establishing package units at specific locations under jurisdiction of regional authority</p>	<p>Pursue "Demonstration Project" for community wastewater treatment facilities permitting for Woolwich Township</p>	<p>Refine Right-to-Farm ordinance to protect farmer's opportunity for direct marketing of agricultural products and thematically related businesses.</p>
<p>OSP: Reassess the Logan / Swedesboro/Woolwich Regional Center Designation Application: this is an opportunity to create a constructive forum for inter-jurisdictional "place based" planning.</p>	<p>Assist with administration of density credits and landholder's development compacts</p>	<p>Develop Municipal Access Management Plan that supports intentions outlined in <u>Plan for the Environs of a Center</u></p>
<p>Dept of Agriculture: give additional weight to farmland in environs of developing centers in scoring for preservation applications.</p>	<p>Develop County Corridor Access Management Plan that supports intentions outlined in <u>Plan for the Environs of a Center</u></p>	<p>Initiate Public Involvement and Education Program to gauge support of residents, landowners and developers for proposals outlined in <u>plan for the Environs of a Center</u></p>
<p>Dept of Agriculture: Equity Insurance Pilot Program</p>	<p>Assist in Public Involvement and Education Program to gauge support of residents, landowners and developers for proposals outlined in <u>plan for the Environs of a Center</u></p>	<p>Reassess the Logan / Swedesboro / Woolwich Regional Center Designation Application: this is an opportunity to create a constructive forum for inter-jurisdictional "place based" planning.</p>
<p>DEP and DOT to review and support necessity for "Cross Creek Boulevard" early in development process of the center</p>	<p>Utilize the County Office of Economic Development to gather and provide information about Woolwich Township's plans for the future and opportunities</p>	<p>Work with utility authority and DEP to develop a simple review and permitting process for local community treatment facilities for Village/Hamlet development</p>
<p>Work with non-profits to make strategic purchases of some land.</p>	<p>Control access locations on county roads. Obtain ROW for scenic high-ways</p> <p>Pursue Open Space Planning, especially along Oldman's Creek and Raccoon Creek.</p>	

E N V I R O N S

create a "places" task force

*Amend municipal Master Plan, Zoning and
Subdivision Ordinances for the RDO*

G.02
**Amend municipal Master Plan, Zoning
and Subdivision Ordinances**



SEED.OID.02ANDD.04

- **COPY of "KURAI DEVELOPMENT OPTIONS UNDER THE
GENERAL DEVELOPMENT PLAN CONCEPT"**



JAMES A. MILLER, A.I.C.P., P.P.
planning consultant

December 13, 1995

Woolwich Environs Study Steering Committee
P. O. Box 67
Woodstown Road

Swedesboro, New Jersey 08085


Re: Development Procedures

Dear Committee Member:

I have attached a copy of a paper, "Rural Development Options Under the General Development Plan Concept", which I prepared in 1992. This paper has been extensively revised to adapt it for use in the Woolwich Township regional center environs study. These revisions include the addition of a draft general development plan ordinance. The text of this ordinance has been taken from the draft I submitted during the review of the proposed subdivision and site plan ordinance earlier this year.

I hope the analysis it contains will contribute to the overall success of the environs study.

Sincerely,

vC' 

James A. Miller, AICP.PP

RURAL DEVELOPMENT OPTIONS UNDER THE
GENERAL DEVELOPMENT PLAN CONCEPT

PREPARED BY:
JAMES A. MILLER, A1CP.PP
AUGUST 7, 1992
REVISED:
DECEMBER 11, 1995

RURAL DEVELOPMENT OPTIONS UNDER THE GENERAL DEVELOPMENT PLAN CONCEPT

INTRODUCTION

The equity of rural landowners is in constant jeopardy. In addition to the uncertainties of the real estate market, rural land values face the threat of diminution by environmental standards, land use regulations and planning programs which limit development potential. The current study, "Dealing with the Environs of a Proposed Center, " is wrestling with these issues as it strives to develop planning and zoning recommendations which will provide opportunities for capturing the development potential of the agricultural lands in Woolwich while protecting their rural character.

Providing an administrative framework for implementing the environs study will become a key factor in achieving the study's objectives. Development options calling for density transfers and extended buildouts in areas where market absorption rates may be slow will require a method of protecting the integrity of the planning vision through long term vesting of developer entitlements. New Jersey's Municipal Land Use Law contains a provision, the general development plan procedure, which provides a method for addressing this issue. The essay which follows will examine the potential of this concept for providing the long term vesting which will become a key factor in the implementation of planning programs dealing with the proposed centers rural environs.

THE ENABLING LEGISLATION

The general development plan provisions of the Municipal Land Use Law originated in an amendment to the law which was adopted in 1987. The bill's original purpose was to provide enabling legislation for developer agreements, a planning technique that allows a municipality to enter into a contract with a developer which governs land use controls and development entitlements on a site by site basis. A development agreement permits a municipality to exchange governmental controls for developer contributions or community amenities. Although this practice occurs on an informal basis during negotiations for site approvals, New Jersey legal precedents such as *Houston Petroleum Co.v. Automotive Products Credit Assoc.* [9 N.J. 122, 87 A.2d 319, (1952)] leave any land

use control which can be construed as contract zoning, vulnerable to a legal challenge. At the direction of the Governor's office the language referring to developer agreements was converted into language establishing a development approval process.

The key provisions of the general development plan process include the following:

1. Adoption of general development plan procedures by the municipality is discretionary.
2. The statute requires the developer to present a "general development plan" which sets forth the proposed density, floor area ratio, number of units and time schedule for his project. The authority to review and approve the general development plan is assigned to the planning board.
3. The term of approval for a general development plan can be as long as twenty years. When compared to the typical term of a subdivision or site plan approval of three years this extended vesting becomes a key incentive for the developer to use this process.
4. The contents of the general development plan parallel those listed by the Municipal Land Use Law for a Municipal Master Plan. They include:
 - a) A general land use plan.
 - b) A circulation plan.
 - c) An open space plan.
 - d) A utility plan.
 - e) A storm water management plan.
 - f) An environmental inventory.
 - g) A community facilities plan,
 - h) A housing plan.
 - i) A local service plan for public services. j) A fiscal report including projected demands on municipal services and projected tax revenues.

- k) A proposed timing schedule.
- 1) A municipal development agreement "which shall mean a written agreement between a municipality and a developer relating to the planned development."

These documents combine to form a master plan subplan for the development which will often be more complete and comprehensive than the municipal master plan. It may also be more expensive.

5. The general development plan option is limited to developments containing 100 or more acres.

6. The planning board has 95 days or "such further time as may be consented by the applicant" to approve or deny the general development plan. The complexity of the plan documents will normally mean that the developer will be pressured into granting a time extension for the municipal review.

7. Amendments to the general development plan may only be initiated by the developer. Amendments require planning board approval.

8. The municipality may revoke the approval of a general development plan, if the developer violates his time schedule or his agreement with the municipality.

9. Individual sections of the project must obtain subdivision and site plan approvals. The developer has five years from the time he receives his general development approval to file for either subdivision or site plan approval.

The general development plan process creates a means for a developer to secure a long term vesting of his development entitlements. In exchange the municipality gains a comprehensive plan detailing the fiscal, social, public and environmental implications of the project. The general development plan can be viewed as a method of privatizing municipal comprehensive planning cost.

USING THE GENERAL DEVELOPMENT PLAN PROCESS

The widespread use of the general development plan concept is limited by a number of factors. The preparation of the documents required by the general development plan statute includes significant expenses for engineering, surveying, legal and planning experts equalling between \$1,000 to \$3,000 or more per acre. This money must be risked with no guarantee that the approval will be granted. New Jersey real estate is often divided into small parcels. This pattern restricts the developer's ability to assemble the large tracts of land needed to support a general development plan. The funding for planning and land acquisition is difficult to obtain. The extended time frames governing the general development plan require long term market projections which usually prove unreliable. The availability of waste water treatment, water supplies and other infrastructure is limited. Expansion cost for these facilities usually become the developer's responsibility and create further demands for funding.

A number of conditions must combine to permit the general development process to go forward. These include a receptive municipality, a supply of developable land, a reliable market for the developer's product and a well financed developer. Only a few locations on the suburban fringe exhibit these characteristics. The result has been limited use of the general development plan concept.

One example which can be studied is the Wilton's corner project in Winslow Township, Camden County, New Jersey. This development, which received a general development plan approval in 1988 and is now in its initial stages of construction, illustrates the complexity of this procedure. A compilation of the approval documents extends over several hundred pages and includes a master plan amendment, zoning amendment, developer agreement, planning board resolutions, county approvals, state approvals for wetlands and sewer extensions, road opening permits, maps models and renderings. In addition to these public documents the developer has also completed market and financial studies for the project and a host of legal agreements related to acquiring the land.

The cost of the documents needed by a project like Wilton's Corner must be recaptured through a per unit increment in the value of the residential or commercial space which is sold. This increment must be generated by savings in (1) site development costs realized through design standard concessions or density bonuses or (2) marketing advantages derived from amenities and community values in the development. The developer of a general development plan project must be careful to control his front end cost. If cost become too high, the developer risks placing his project at a competitive disadvantage with competing smaller projects which have not incurred the same level of expense for entitlements while obtaining conventional subdivisions and site plan approvals.

APPLICATIONS

Despite its complexity and cost, the general development plan concept has the potential to serve as an element in the implementation of the Woolwich environs plan to achieve the joint objectives of compact development and agricultural retention. One option would combine the - general development plan process with cluster development. Using the underlying zoning to determine the number of units which will be permitted, a portion of the site is chosen for development while the balance is retained for farming. This scenario would resemble the traditional practice of selling frontage lots to generate cash flow. However, the lots sold for development would be concentrated in a location chosen to minimize its impact on the active portion of the farm. Once the farmer has secured his general development plan approval his development rights will be protected for up to twenty years.

This option could be expanded to include a group of farms and more intensive development in a series of hamlets, subdivisions or villages. Density bonuses or other incentives could be used to encourage projects that preserve farm lands and open space, create concentrated development forms, and achieve a sense of community. Implementing these more complex development schemes would probably require the involvement of a real estate development professional to oversee the design, planning and marketing aspects of the project. A development entity would have to be created through either an option agreement, consulting contract, partnership or joint venture.

The twenty year term of approval is the provision of the general development plan process which permits these options. It provides the long term vesting required for the development of a hamlet or village. Risks incurred through investment in planning and infrastructure are offset by the security of a long term development approval. The backers of the project will be free from the worry that the zoning will be changed before they can recover the costs for project design, sewerage, roads and water systems.

Combining the general development plan concept with a farmland retention program provides a variety of additional advantages not available to a conventional development. Farmland preservation has broad based support among environmentalist planners, and government officials. It is a primary goal of New Jersey's state plan. This creates a variety of opportunities for public/private partnerships. Public money could be used to write portions of the planning documents through the use of government agency planners or grant programs. Municipal master plan documents could be tailored to provide some of the information needed to apply for the general development plan approval. Fees for engineering and planning reviews could be waived by the Township or paid through county or state funds.

The scenarios described above rely on existing laws and government programs. Some additional measures could be adopted which would enhance the applicability of the general development plan concept for rural equity protection. They include:

1. Streamlining the wastewater management plan and sewer main extension procedures. Any form of concentrated development requires public sewer. By permitting a prototype treatment facility or completing stream capability analysis in advance of development demand the State could encourage development patterns it favors while reducing private sector cost.
2. Modify the general development plan statute by providing extended vesting rights to agricultural areas.

3. Simplify the general development plan process by requiring less documentation from the developer. The attendant reduction in the cost of following the procedure will create additional incentives for using it, and the municipality will benefit from a more comprehensive development plan. A simplified general development plan will still entail a higher level of planning than the alternative of conventional development.
4. Extend developer and landowner access to the process by making it a mandatory option for most or all municipalities which adopt site plan and subdivision controls.

The recommendations listed above could be implemented without major changes in the Municipal Land Use Law or the New Jersey Administrative Code. As tools for implementing the State Development and Redevelopment Plan, they could be supported by referring to the equity protection and farmland retention policies of the State Plan. Even if no new legislative measures are adopted, the general development plan statute has the potential to provide a variety of options for rural development planning.

A draft general development plan ordinance has been attached as an appendix. It provides model which could be used to establish this process in Woolwich Township.

APPENDIX: PROPOSED GENERAL DEVELOPMENT CONTROLS FOR WOOLWICH TOWNSHIP

Wore: The above subsection is derived from the language in the statute.

E. A general development plan may include, but not be limited to the following elements:

1. A general land use plan at an appropriate scale indicating the tract area and general locations of land uses to be included in the planned development. The general land use plan shall include estimated totals of the following:
 - a. Number of dwelling units.
 - b. Total floor area of nonresidential uses.
 - c. The proposed types of residential and nonresidential uses.
 - d. The land area devoted to each type of use.
 - e. The density and intensity of uses for the entire development.
 - f. The residential density and nonresidential floor area ratio.

Note: This subsection condenses the language in the statute, in part, by converting the statistical requirements to a formal list for the sake of clarity.

2. When appropriate, a circulation plan, open space plan, utility service plan, storm water management plan, environmental inventory, community facilities plan, housing plan, local service plan, a fiscal report, proposed timing schedule, and municipal development agreement as set forth in P. L. c. 129 (40:550-45.2) may be included as elements of the general development plan.

Note: The statutory language has been simplified by deleting the descriptive language in the municipal land use law for individual elements.

3. The scale, scope, and mixture of uses for the proposed development shall determine the elements to be included in the general development plan. The applicant will be required to provide all of the information required to relate the proposed general development plan to the Woolwich Township Master Plan.

Note: This section has been inserted to reinforce the flexibility found in the statutory language making the various elements of the general development plan optional. The size and nature of a project should dictate the form and content of the general development plan submittals. It also contains a passage which encourages the planning board and the developer to relate the general development plan to the policies in the Township's master plan.

F. The planning board shall grant or deny general development plan approval within 95 days after submission of a complete application to the administrative officer, or within such further time as may be consented by the applicant. Failure of the planning board to act within the period prescribed shall constitute general development plan approval of the planned development.

Note: This language has been taken from the statute.

G. The general development plan may be modified, and variations in the location and intensity of uses and the timing of development may be permitted, only upon application by the developer and approval by the planning board as provided below. The planning board's decision to grant or deny the modification of the general development

plan shall consider prevailing economic and market conditions, anticipated and actual needs for residential units and nonresidential space within the Township and the region, and the availability and capacity of public facilities to accommodate the proposed development. A developer may, in undertaking any section of the planned development, reduce the number of residential units or nonresidential floor space by no more than 15% or reduce the residential density or nonresidential floor area ratio by no more than 15%; provided, however, that a developer may not reduce the number of residential units to be provided pursuant to P. L. 1985, c. 222 (C. 52:270-301 et. al.) without prior Township approval.

- H. When the developer has acquired a certificate of occupancy for every structure for any section of the development, the developer shall notify the planning board secretary by certified mail as evidence that his obligations under the approved plan have been fulfilled. If the Township does not receive such notification at the completion of any section of the development, the Township shall notify the developer, by certified mail, in order to determine whether or not the developer has complied with the terms of the approved plan.
- I. If the developer does not complete any section of the development within eight months of the date provided for in the approved plan, or if at any time the Township has cause to believe that the developer is not fulfilling his obligations pursuant to the approved plan, the Township shall notify the developer by certified mail, and the developer shall have 10 days within which to give evidence that he is fulfilling his obligations pursuant to the approved plan. The Township thereafter shall conduct a hearing to determine whether or not the developer is in violation of the approved plan, if, after such a hearing, the Township finds good cause to terminate the approval, it shall provide written notice of same to the developer and the approval shall be terminated 30 days thereafter.
- J. In the event the developer who has general development plan approval does not apply for preliminary approval for the planned development which is the subject of that general development plan approval with five years of the date upon which the general development plan has been approved by the planning board, the Township shall have cause to terminate the approval.

Note: Subsections G through J parallel the language in the statute. The enabling legislation creates a rigid framework for municipal oversight of approved general development plans which needs to be included in the local ordinance to provide the proper structure for the process.

- K. The general development plan approval shall terminate upon completion of the development and when the developer has fulfilled all of his obligations under the terms of the general development plan approval.

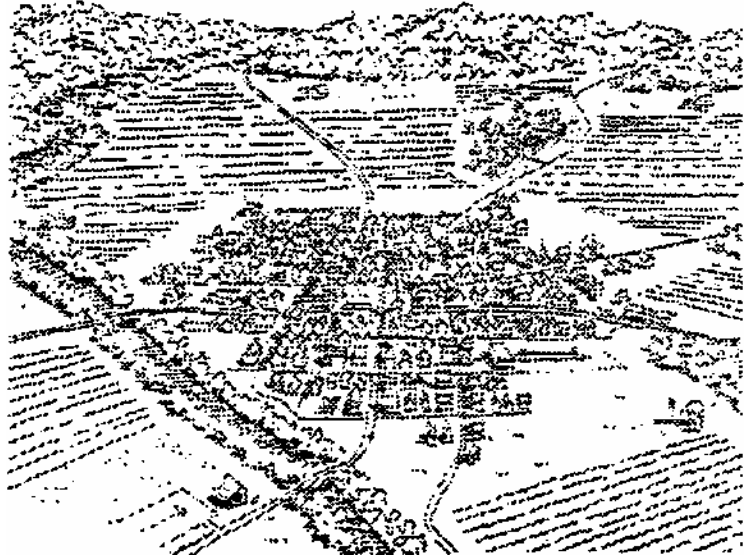
Note: The language regarding the completion of a project with general development plan approval in the statute has been simplified while retaining its intent.

create a "places" task force

Coordinate proposed amendments for Rural Development Overlay district with County Open Space and Farmland Preservation Programs

G.03

Coordinate proposed amendments with County Open Space and Farmland Preservation Programs



MEMO FROM COUNTY EXTENSION OFFICE

More specific strategies for a coordinated approach to open space preservation planning and new development

PROPOSAL FOR APPLYING DENSITY CREDIT CONCEPT TO OPEN SPACE PLANNING AND PRESERVATION: (AN OPEN SPACE CREDIT CORPORATION

From Jim Harding of Urban Partners



**COUNTY OF GLOUCESTER
STATE OF NEW JERSEY
Cooperative Extension Agriculture,
Open Space and Farmland Preservation**

JAMES ATKINSON
FREEHOLDER

12QON. Delsea Drive
Clayton, New Jersey 08312
(609) 863-0110
Fax (609) 881-4191

TO: MARK KEENER
FR: JANET EISENHAUER, ENVIRONMENTAL PROGRAM
DT: NOVEMBER 3, 1995
RE: WOOLWICH TOWN CENTERS PROJECT

Following our recent meeting, Chuck Romick and I spent some time discussing some additional strategies which might be worth considering to promote local acceptance of a viable plan for Woolwich Township. Our concern is that a mandatory transfer development credit program will very probably be rejected by the powers that be in the Township. A more acceptable alternative might be to create several layers of options for landowners and developers that will hopefully accomplish the town centers goals.

Please consider the following strategies for possible further discussion at our next meeting.

1. Develop mandatory open space set asides of 75% of total parcel size throughout the Township.
2. Allow clustering or 1 1/2 acre or possibly larger lots as zoning options throughout the Township with the quantity of units being limited by the open space set aside requirement.
3. Designate where within the boundaries of a parcel, cluster development must be situated (if clustering is chosen by the builder as the development option for that parcel). The purpose of this designation being to create contiguous cluster developments which can utilize the same expandable package plant, and to hopefully create a limited number of hamlets.
4. Create a program that allows several options for the disposition of the open space set asides including the following:
 - builder auctions off open space for farming (as is done by



State in the Farmland Preservation Fee Simple Acquisition Program);

-builder subdivides open space parcel with one development unit and sells to residential buyer with conservation easement in place; or

-builder donates open space to responsible entity with conservation easement, ie. town, county, state/ private nonprofit land conservation organization, or homeowners association.

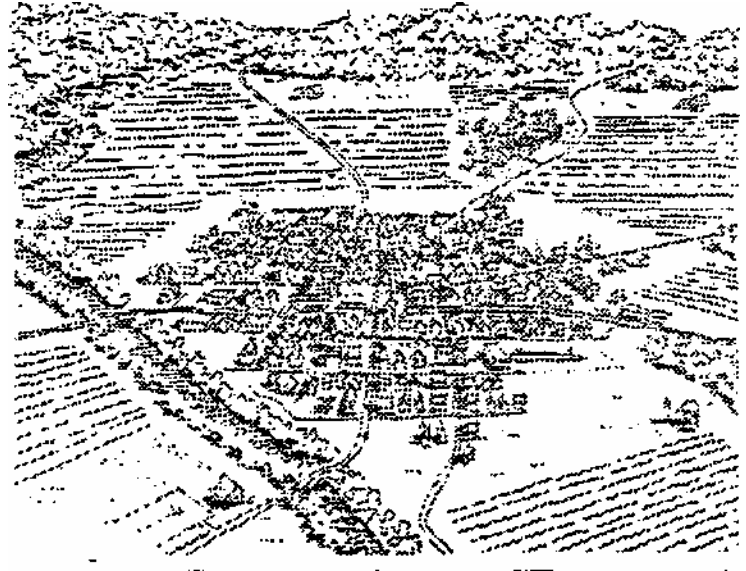
5. Create a voluntary density transfer credit program whereby a sending zone and a receiving zone is created. Give landowners the option to negotiate the sale of all or part of their density transfer credits to developers resulting in greater density in the receiving zone and less development in the sending zone.

Although complex, the benefits of such a plan may outweigh the difficulties. Landowners within the Township are on an equal playing field. Developers have several strategies to choose from. Open space preservation is guaranteed through set asides. And farming is encouraged through the farmland auction option and through the density transfer option. Please feel free to give me or Chuck a call prior to our next meeting if you would like to discuss these ideas further.

5. Open Space Credit Corporation

The County or the Township could participate actively in shaping residual open space through an Open Space Credit Corporation (OSCC). The OSCC could buy and sell density credits in the Rural Development Overlay District, using this vehicle to target key open space and to support village and hamlet development.

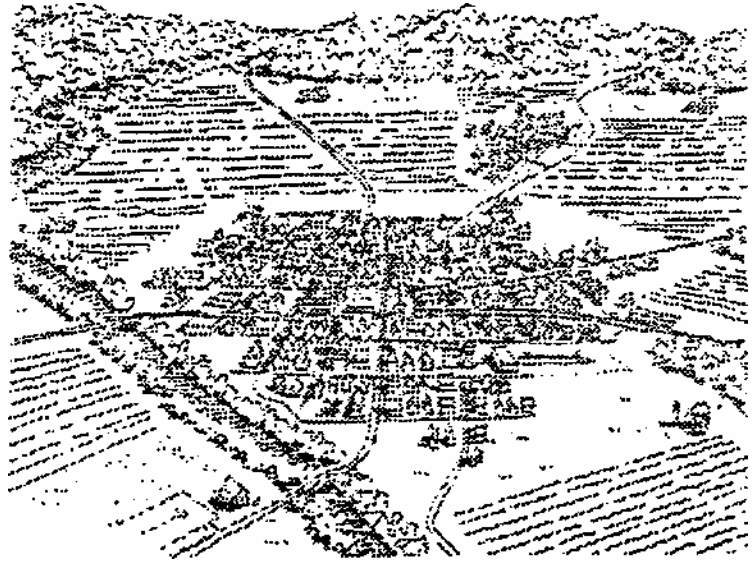
Work with County Office of Economic Development to interest sophisticated developers



0.04
Work with County Office of Economic Development to interest sophisticated developers

EXAMPLE OF A "DEVELOPMENT PACKAGE" SIMILAR TO ONE THAT COULD BE PUT TOGETHER AND THAT COULD BE MADE AVAILABLE THROUGH THE COUNTY OFFICE OF ECONOMIC DEVELOPMENT (NOT YET INCLUDED)

Should describe the township's strengths, plans, and philosophy about the pattern or future development and indicate the scope of present and future opportunities. May contain descriptions of available properties and projects recently completed, started and on-the-boards. The package will also need to let the reader know where to go for more information.



Establish liaison contacts with QSP, DEP and DOT and local utility authority to address regulator/ and funding impediments to the provisions of the Rural Development Overlay

G.05

Establish liaison contacts with NJOSP, NJDEP, NJDOT, the Gloucester County Department of Planning and local utility authorities

DIRECTORY OF RESOURCE PEOPLE

The task force should probably have a core membership of no more than about four people, but they will need to involve many others. Here is a partial list of individuals that may be useful to contact at some point as the effort proceeds.

Directory

Revised September 11, 1995

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Acting Director FAX 609 863-1069
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Coordinator for Farmland Preservation

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Jack Fisher TEL 609 863-6661
Administration

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08625

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Donald Applegate TEL 609 984-2504
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OSP GIS Mapping

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pop models

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DVRPC GIS
Mike Ontco WiU
Stevens

Tel 592 1800

Woolwich Township:

TT
Mayor

Charles A. Bellale
Twp. Committee

TEL 609 858-7505

Joseph Garozzo Twp.
Committee

TEL 609467-0792

Sam Maccarone
Twp. Committee

TEL 609467-1575

Pat McCaffrey Twp.
Committee

TEL 609467-8545

Karen Jones
Township Clerk

TEL 609 467-2666

Albert C. Stecher Jr.
Planning Board Chairman

TEL 609 467-0039

Susan Osborn
Sec. to the Planning Board

TEL 609467-1151
FAX 609 467-5487

Logan Township:

John Wright
Mayor

TEL. 609 467-3424

Thelma Davis
Deputy Mayor

Swedesboro:

Edividi (David") Azzari
Mayor

TEL. 609 467-0202

Consultants

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2401 Locust Street
Philadelphia, PA 19103

Urban Partners TEL 215 627 6703
James Hartling FAX 215 627 2140
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Phila. PA 19106

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NJ 08611-1717

A Tech Corp. TEL 609692-2984
Deborah Ayars FAX 609 794-9541
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Jim Miller TEL 609 778-9799
Planning Consultant 222 Nickolson Drive
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The Middlesex-Somerset-Mercer Regional Council

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870 Mapleton Road
Princeton NJ 08540-9538

I
Dianne Brake, Director TEL (609) 452-1717

New Jersey Builders Association
101 Morgan Lane, Suite 111
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Patrick O'Keefe, Executive Director
Joanne Harkins, Director, Land Use and Planning

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j
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American Farmland Trust

Association fo New Jersey Environmenlai Commissions (ANJEC)
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Abbie Fair

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Arthur R Brown Jr
Secretary of Agriculture
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Donald D. Applegate
Executive Secretary
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