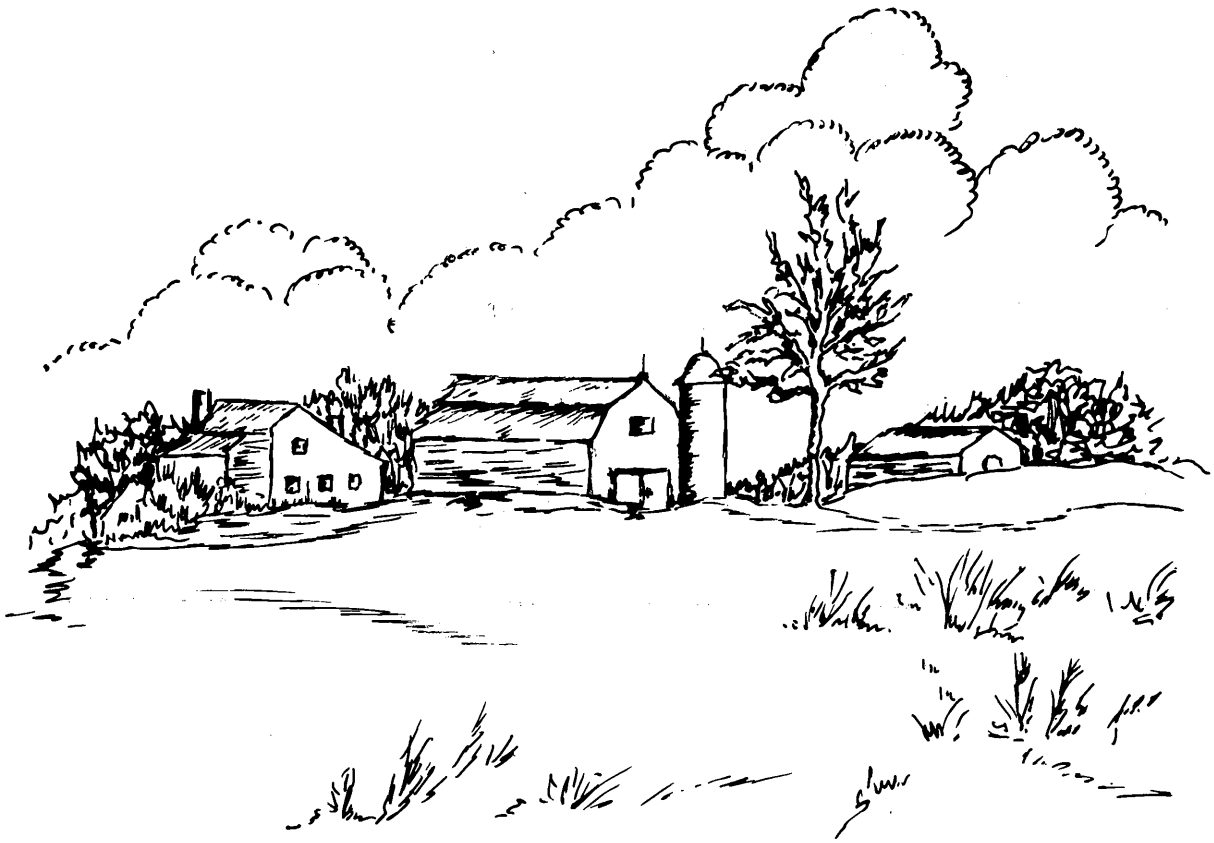

MASTER PLAN

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY

NEW JERSEY

Revised

JANUARY, 1988

THE MASTER PLAN OF THE

TOWNSHIP OF UPPER DEERFIELD

Prepared and Published by

Uppper Deerfield Township Planning Board

Seabrook, New Jersey

January, 1988

The original of this document was signed and sealed in accordance with the New Jersey Planners' Licensing Law

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New Jersey Planners' License No. 1510

TOWNSHIP OF UPPER DEERFIELD, CUMBERLAND COUNTY

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ACKNOWLEDGEMENTS

The preparation of this edition of Upper Deerfield Township's Master Plan has involved many people and organizations and has been accomplished over a number of years. I want to express my appreciation to the members of the Planning Board for their patience, cooperation and continuing support and involvement in this major planning project. In particular, I thank Board Chairman Albert Johnson, former Board Secretary Alice Jefferson, Board Solicitor Noah Bronkesh, and Township Engineer George Schock.

A number of assistants, technical and planning personnel were also involved in the preparation of the document. Of particular note were: Chesha J. Zimolzak, LeGrande Blancheau, Judith E. Scott, and Vince Spaziani. Jack Rabin of the Rutgers University Extension Program was most helpful in preparation of the Plan chapter dealing with agriculture.

The members of the community's governing body, the Township Committee, are to be thanked for the continuing support of planning and strong cooperation with the Planning Board in planning a better future for the municipality. Also the members of the Township Zoning Board of Adjustment have offered suggestions and assistance in the preparation of this Plan.

Harry R. Dare, III
Township Planner

TABLE OF CONTENTS

CHAPTER 5 - THE CIRCULATION PLAN

CHAPTER 6 - HOUSING PLAN

CHAPTER 7 - THE COMMUNITY FACILITIES PLAN

CHAPTER 8 - UTILITIES PLAN

* Chapter 13 & 14 Reserved

TOWNSHIP OF UPPER DEERFIELD MASTER PLAN

List of Tables

TOWNSHIP OF UPPER DEERFIELD MASTER PLAN

List of Figures

CHAPTER I PLANNING ASSUMPTIONS AND FUTURE GOALS

The Experience

Ten years ago Upper Deerfield Township's planners saw the community poised on the verge of a major expansion of development. It seemed the only impediment to full scale growth was the lack of public utilities. Then the energy crisis and the overall down turn in the economic situation of the nation with its accompanying high interest rates occurred. This rather drastic change in conditions curtailed development. The 1980 Census showed continued growth for the Township, but nothing comparable with the rate of growth which had occurred during the previous ten year period (1960 - 1970) or what had been assumed to be the case in the mid-70's.

The start of 1988 again finds the Township "on the brink" of major development activity and this time conditions are even more conducive to such growth actually occurring. The Cumberland County Utilities Authority has installed a sewage collection interceptor line to Seabrook providing a means for connection to public sanitary sewer for major portions of the community. Interest rates are down and the demand for housing is strong. Added to these conditions is the fact that the major landowner in the municipality, the successors to the former Seabrook holdings, is actively marketing and/or developing its 6,000 plus acres.

It is not time however, to push the panic button. The Township has planned for growth and is still in control of the community including how and where it will develop. What must be done is to recognize that new development, perhaps what can be correctly termed "major development", will occur. With this fact in mind the Township must keep up its planning effort and prepare for new growth so the community stays in the game, so to speak, and does not sit on the sidelines watching itself transform without any involvement or guidance on its own part.

The 1979 Master Plan set out three major goals:

1. The preservation of the Township's character and the physical features, both natural and man-made, from which it [the community's character] emanates and is derived.

2. Enhancement of the quality of life for all the community's residents through the improvement of the Township's ability to deal with development.

3. Innovation in and continual evaluation of the approaches and methods used for resolving the conflicts, problems and pressures in the community's evolution.

These goals are still worthy of being sought and in large measure the community seems to have come closer to these goals over the past ten years. Certainly the spirit and intent which are needed for their attainment has not diminished on the part of community leaders and planners.

The character of the community is rural with agriculture still playing a vital and vibrant role. The Township's efforts to preserve agriculture and the open, rural environment it offers have been positive. The community seems to have identified those areas to be preserved for agriculture and to be of one mind in its efforts to save farmland from development. A 1981 study on farmland preservation commissioned by the Planning Board served to focus in on the issues affecting this goal. Development regulations have also curtailed and controlled growth in farming areas admittedly however, probably because of housing market conditions over this past ten year period as much as the regulations themselves. The real test of such regulations will come as the market "heats up" and farmers, developers and would be residents vie for their share of that market.

Perhaps a stronger showing has been made in the areas of conservation with flood plains, streams and the Cohansey River having been protected from development. Fresh water wetlands, woodlands and other special areas now need consideration and protection since they provide many benefits which make up the character of our community.

In the area of the quality of life the Township is now beginning to experience considerable progress. As noted, sanitary sewer is available to much of the area that is or is proposed to be developed and the Township government is moving to provide extensions of such service. The government is also investigating the provision of public water. A property maintenance code has been adopted and will soon be going into effect which will help to improve and maintain the quality of the community's housing stock. The Township Committee has also authorized establishment of a development regulations office which should provide for more efficient operation and enforcement of municipal regulations and improve public access to local officials.

There is a need to plan for the extension of public utilities throughout areas where new development is proposed and for areas already developed. Isolated problems with on-site systems are occurring and portend future actions by the community to prevent serious problems from developing. The Township also needs to analyze its housing stock and whether all segments of the populations are being afforded sufficient and suitable housing.

The entire question of the management of solid waste disposal will be an on-going problem for the community. Upper Deerfield has a head start on this matter with its new disposal convenience and recycling center, however, costs at the new landfill and increased use of the municipal facility, now free to residents, due to increased costs may well necessitate imposition of some type of charges as well. Recycling will become mandatory in late

1988 and the community must prepare for that eventuality both through the Master Plan and local regulations.

The third goal set forth in the 1979 Master Plan referred to Upper Deerfield's historic public spirit of tackling its problems and addressing them in progressive and in many instances, groundbreaking fashion. The community has always planned ahead, spent money to prevent problems from arising, and had foresight on the part of its leadership and citizenry in doing what had to be done or what ought to be done to make the Township a better place to live and work. That goal has not been lost.

When the major industrial site of the community was offered to the Township for $1.00, the community accepted it and then sold it for $1.6 million and established two new industries which are still flourishing. When a major rail link to Seabrook was abandoned by Conrail, the Township purchased the right-of-way and helped to establish a short line railroad to operate train service on it. The already noted solid waste convenience and recycling center were established early before mandatory legislation took place. The Township also received the first leaf composting permit in Cumberland County. In short, Upper Deerfield Township has been a leader not a follower. It has not shied away from its problems, issues, or changes which necessitate action.

This spirit and willingness to experiment, take action and address those issues which arise as the community grows and develops is important and necessary if the community is retain its hold on its future. It will be needed and should be nurtured and cultivated because it sets the community apart and makes its unique in its concern and approach to municipal government.

The Expectation

It is not without justification that many in our community are heard to question whether all the development being talked about and proposed will ever really come to fruition. Obviously the past ten years have shown us that anticipated growth is affected by many forces. Many things could change and will change over the next ten years. The fact remains however that Upper Deerfield Township is an attractive place to live, it has lands which are eminently suited to development and it has a large portion of those lands which are now being actively proposed and prepared for development. Whether or not and when such development occurs is moot from a planning standpoint. What does matter is that the community is probably going to be asked to approve a number of major developments and projects.

When so asked the community is bound by law to react and within a given framework. Should it fail to act, developers are free to proceed without municipal involvement or control. Should the Township fail to act responsibly and reasonably, then the Township may find itself in long, expensive legal battles. Upper Deerfield has taken the position since 1960 when it first began to control subdivision and adopted its first Master Plan, that it would be an active player in its own development. Given these various facts and assumptions, this master plan was written and is intended to guide the community's development and its approach to development.

The possibility that large numbers of new lots and housing units may be proposed and ultimately approved over the next several years is very real. And whether or not they are built tomorrow or three, four or five years down the road is immaterial to the fact that the community can and must act, if it is to act, when they are proposed. The ability and means to control the development and guide it to the community's plans occurs during the review stage. Therefore, the community must be prepared.

Citizens of Upper Deerfield can expect that many persons will wish to settle in this municipality. New Jersey has a booming economy and development throughout the state is rampant. Conditions favor our community. It is not coastal, does not have special protected areas i.e. Pinelands, is geographically in the center of southern New Jersey and has a reputation as nice place to live.

With development will come a host of other problems. Provision of sanitary sewer collection lines, potable water, fire, ambulance, and police services, improvement of streets, schools, street lighting, recreational facilities, methods for the disposal of solid waste and a host of other services and facilities required to support the population which can be expected, will have to be addressed. Existing areas must be taken care of as well and existing problems can only be amplified or made worse as additional development occurs.

With population increases the character of the community will change. New issues will arise. Unless chaos is to reign, there must be a plan to deal with those issues and assure that what brought us all here remains and is preserved. This Master Plan attempts to offer a blueprint for allowing growth and yet conserving and preserving those aspects of municipal heritage which are worth saving.

The Intention

Basically this Plan is developed from the premise that Upper Deerfield Township is and will continue to be a planned community. The residents and their officials do not view all development as good and not wish to attract development for development sake. The Plan proposes that development will occur and provides for all types of development to occur with those areas best suited to accommodate it. There is a balance to the Plan's proposals and an attempt to assure that all have a chance to live and work in the community.

The Plan declares agriculture to be valuable, desirable and worthy of protection and preservation. A chapter of the Plan is devoted to it and as such is meant to show the importance the community attaches to this land use's continued viability.

The approach to development is that any new projects be well designed, that they address and resolve any problems or adverse impacts that they create, and that they provide the necessary services, facilities, improvements and amenities required to serve the needs of their residents or occupants. Where appropriate and reasonable they shall contribute towards such existing services, facilities, improvements and amenities and from which they

will receive direct benefit. Uniformity and adaptation to the Plan's goals and objectives shall be mandatory for any development.

The Plan is intended to be respectful of the rights of property owners and developers and is written to give them direction on how to proceed, what will be expected and required, and to explain the community's goals and objectives and planning reasoning in setting them. It is meant to be a positive statement, a guide, not a barrier or obstruction with the exception that those who are opposed to planning and refuse to be guided by its consensus as expressed herein.

The Plan proposes development and conservation, growth and preservation, a variety of land uses, a varied mix of housing types and densities, improved roadways and new roads, and expansion of services and facilities. It does not encourage indiscriminate growth which is not sensitive to the goals and objectives set out within it. The Master Plan proposes that Upper Deerfield recognize its situation, prepare for it and to continuously work to attain the type of community described and prescribed within it.

Lastly, the Plan will be viewed as being the community's intent and shall guide the Township's actions with regard to development regulations. It is subject to change as provided by law and shall be continually evaluated to assure that it accurately reflects the current situation and the community's will.

The Implementation

The goals as set forth in 1979 are still valid and are again here adopted as the major goals of this Master Plan. They are however, coupled with specific goals and objectives as specified in the various chapters of this Plan. The governing body, planning board, zoning board of adjustment, other commissions and boards and officials of the community are encouraged and requested to become familiar with this Plan. Its effectiveness will be determined by their actions in implementing it.

If followed the Plan can give coherence and purpose to the community's development. It will not solve all problems and may well not address many which will arise. But it can guide, advise, recommend and exemplify the direction the municipality will take. That is it's legislative purpose and that is how it will be utilized. Upper Deerfield has, is and will be a planned community.

CHAPTER II THE NATURAL SETTING

Introduction

The people of Upper Deerfield Township have always been concerned with their community's environment and obtaining a better understanding of that environment was commenced by the Township's Planning Board in 1974. At that time the Board commissioned preparation of a study which examined existing land use patterns and environmental characteristics in an effort to make use of the information gained in guiding future development. That study, LAND USE - Existing Patterns and Environmental Characteristics, became the basis of the Township's efforts to view all new development as well as that which already existed in terms of the land's ability to support that development. The community's Master Plan and development regulations were then designed around the information provided by this study.

Much of that information is still relevant today obviously and is again set out here as the beginning of the Master Plan because it does form the basis of how the community should and can grow. Analysis of environmental conditions is a vital aspect of land use planning and the disregard of natural features and conditions can and usually do result in future problems. The soils, ground and surface waters, vegetation, wildlife, air quality and special features of the landscape are obviously a major part of land use decisions. The quality of life is in large part determined by the blending of natural phenomena with development (man-made phenomena). These considerations must be weighed against and evaluated in terms of such factors as existing land uses, social and economic needs of the community and the region, services and facilities (including utilities) if growth is to be permitted and provide a beneficial effect. As a starting place and as a continual point of reference, environmental characteristics are a logical beginning for any master plan.

Location

The Township of Upper Deerfield encompasses 31.8 square miles or approximately 20,352 acres of the northwest corner of Cumberland County, New Jersey. The Township is situate 36 miles south of Philadelphia, 30 miles east of Wilmington, Delaware, 50 miles west of Atlantic City and 17 miles north of the Delaware Bay.

It is bordered on the north by Alloway and Pittsgrove Townships, Salem County. Deerfield Township in Cumberland County is on the east and to the south are the City of Bridgeton and Fairfield Township. Hopewell Township lies to the west. Because of its location, the Township has experienced a considerable amount of development as a growth area, both commercial and residential, for Bridgeton. Its distance from more urbanized areas such as Philadelphia-Camden-Cherry Hill, Atlantic City, and Wilmington, have tended to limit the development effect of such areas. Over the past ten years that distance has been substantially decreased by urban sprawl and new highway construction.

Climatic Conditions

The Township's location in close proximity to the Delaware Bay and Atlantic Ocean has the effect of moderating and retarding the seasons. The average growing seasons is about 193 days. Summer temperatures do not exceed 100° F. for long periods but they are frequently in the middle or upper 90's. The average annual temperature is 54° F. (12° C.) with a mean seasonal temperature variation of two to six degrees. The average monthly high temperature occurs in July (75.8° F.) and the monthly low in January (17° F.). The ground is not normally frozen throughout the Winter (approximately December 15th through March 15th).

During the period 1951 to 1980, the average annual precipitation as recorded at Millville Municipal Airport was 42.95 inches. Rainfall is generally heaviest in July and August. During this same period, the average annual snowfall is 16.5 inches with the monthly high snowfalls occurring in January and February.

Where the prevailing wind direction changes with the seasons, the yearly resultant direction of the wind is westerly. The monthly resultant directions show that in general the winds originate from the southeast through the northwest. During the late Fall through the early Spring(November - March) the winds are continental in origin and from the northwest. On the average, the duration and velocity of the wind is greatest in March. The remaining months, April through October, exhibit weather under maritime influences with the winds originating from a southerly direction. Figure 2 gives the Township's mean perceipitation and Figure 3 gives the mean high and low monthly temperatures.

Topography, Slope and Drainage Basins

Gently rolling topography is characteristic of most of Upper Deerfield. A flat area does exist east of Burlington Road and north of Landis Avenue. The highest elevation in the Township, 145 feet above MSL, occurs between Grier's Lane and Hannan's Lane in the northern end of the Township.

A low ridge ranging from 120 to 145 feet runs east of State Highway #77, in a northwest to southeast direction. This ridge forms the drainage divide between the Cohansey and Maurice River Basins. The drainage is good to excellent throughout most of the Township because of the sandy and gravelly loams. Moist soil with its saturated organic matter, forms

FIGURE 1

LOCATION MAP

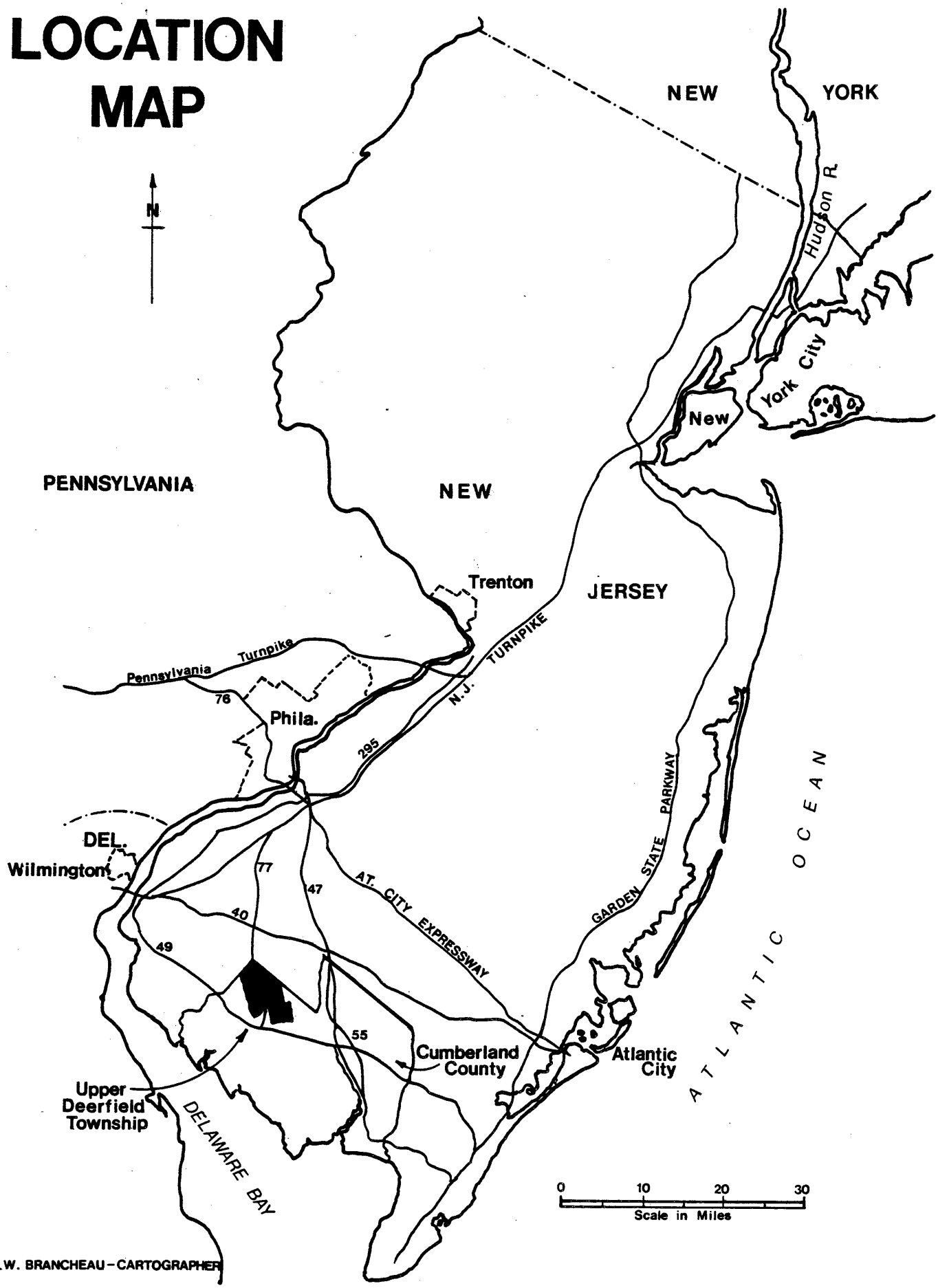
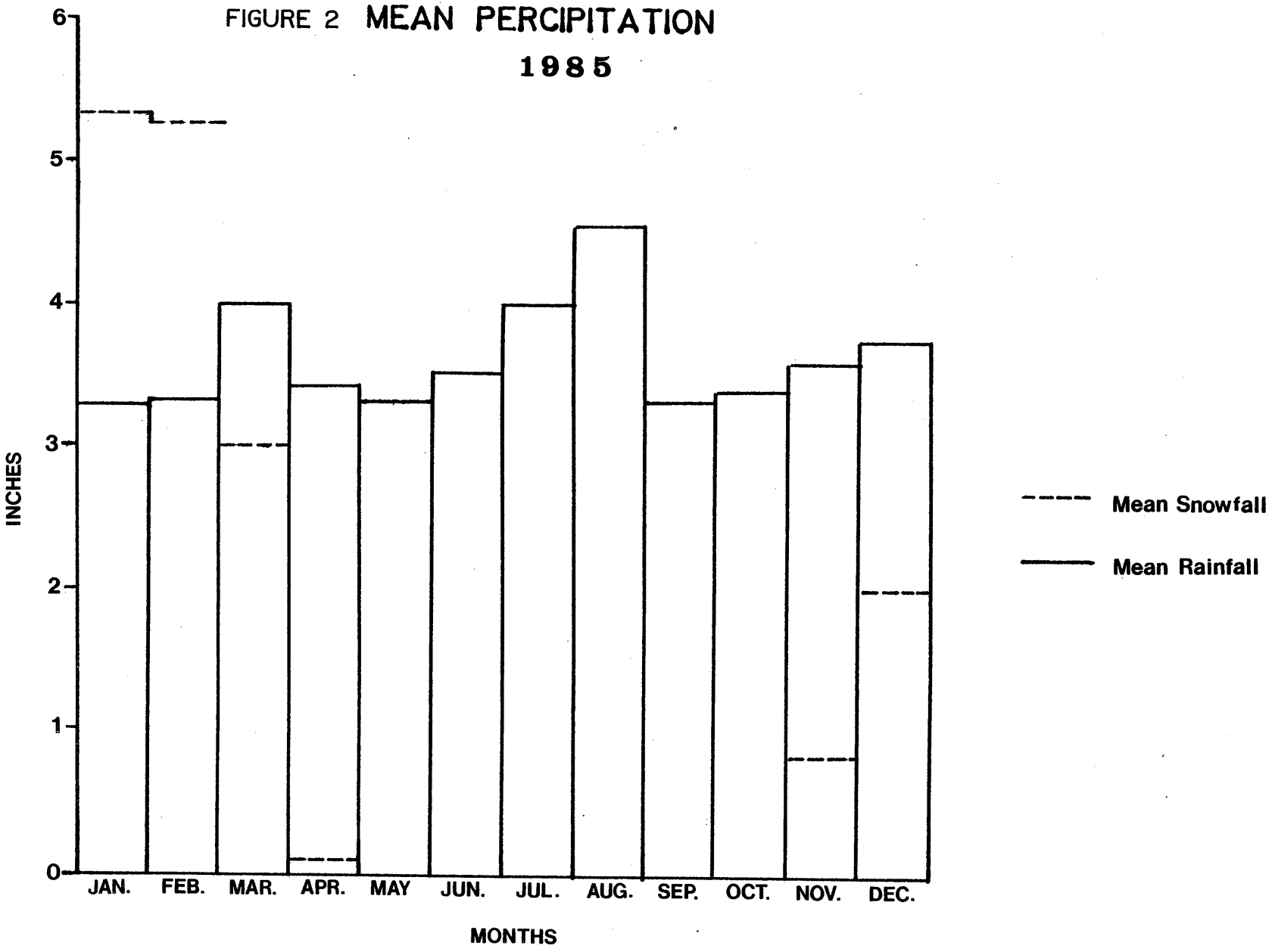


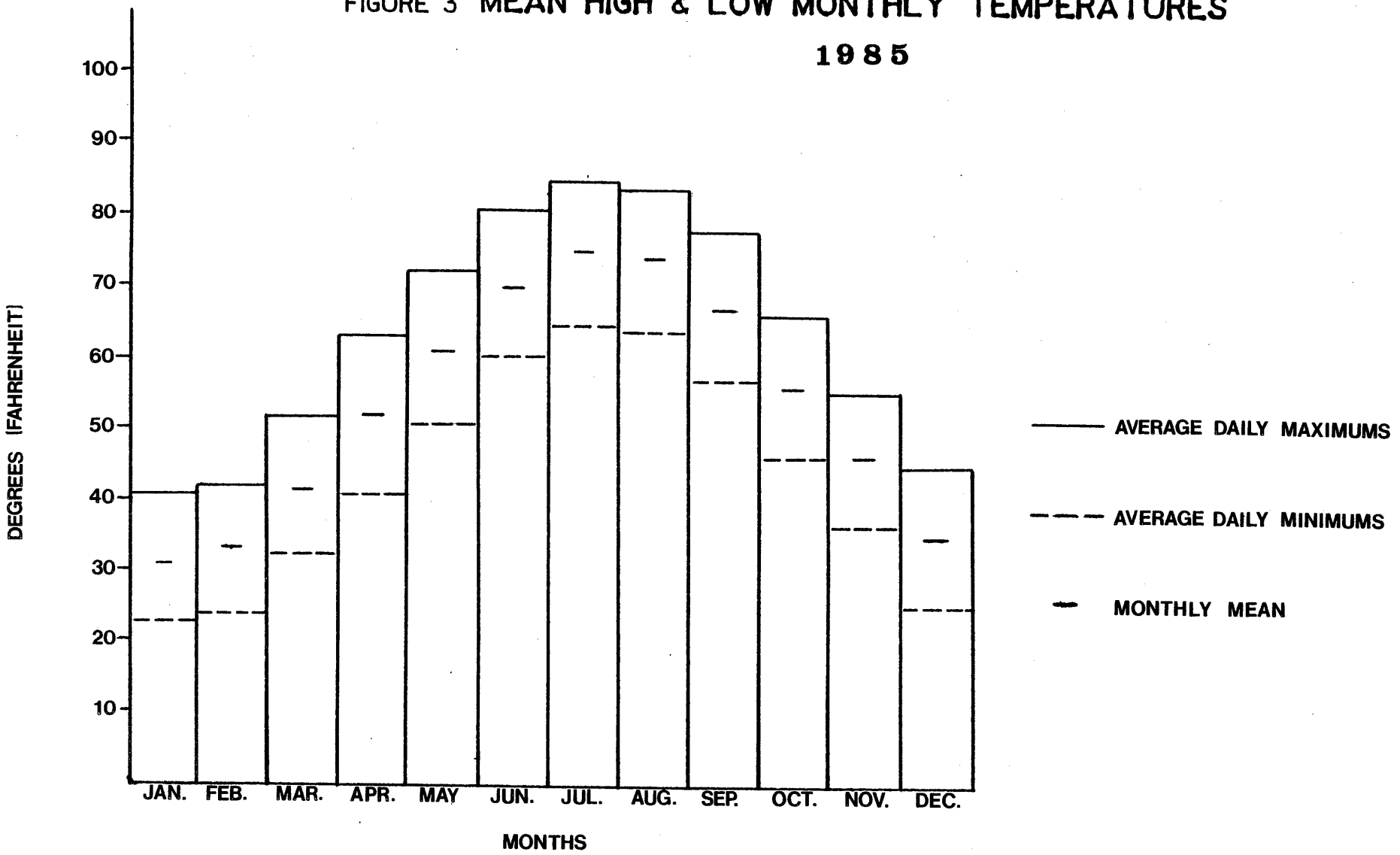
FIGURE 2 MEAN PERCIPITATION
1985



Source: Millville FAA Airport

FIGURE 3 MEAN HIGH & LOW MONTHLY TEMPERATURES

1985

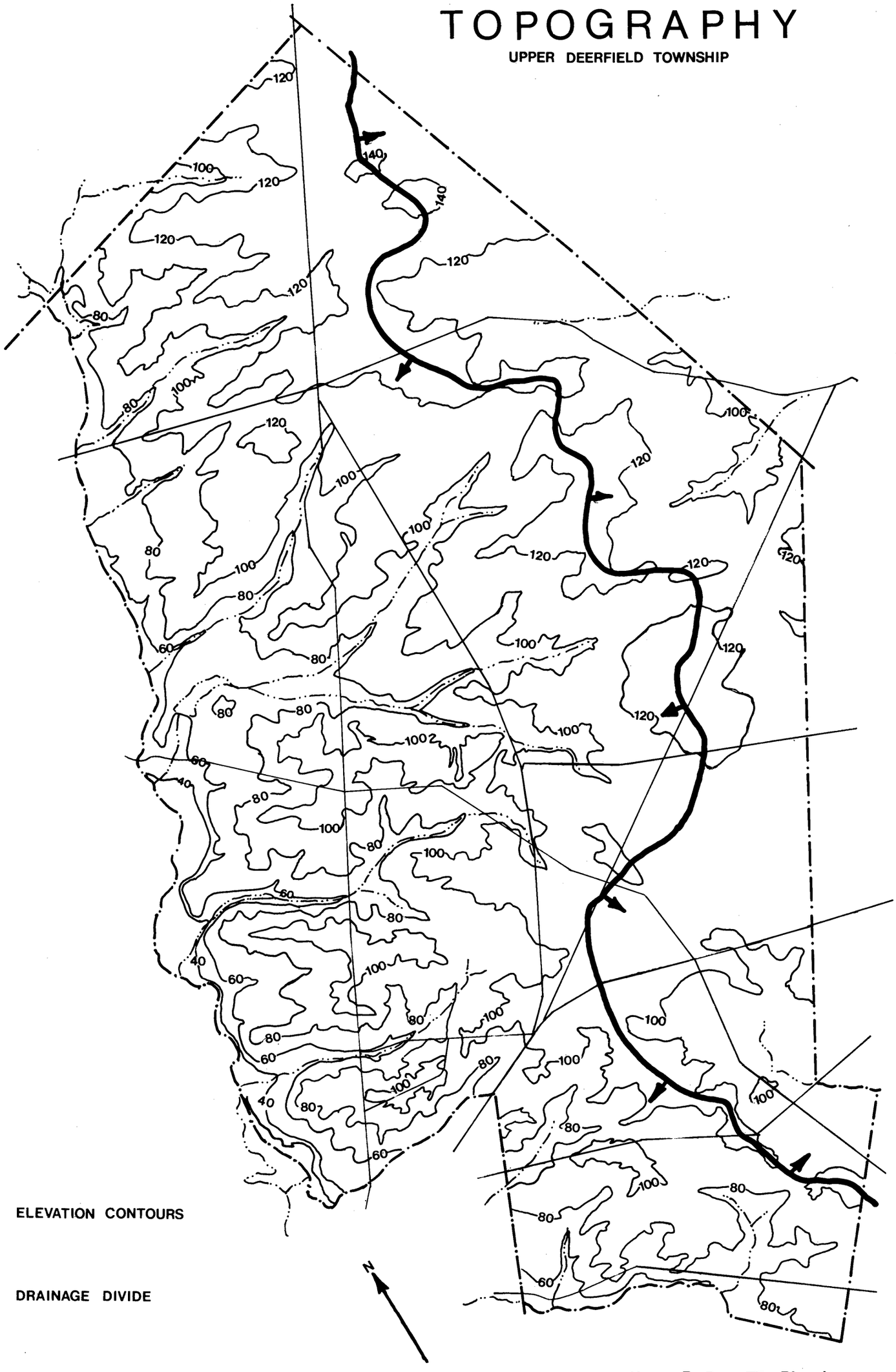


Source: Millville FAA Airport

FIGURE 4

TOPOGRAPHY

UPPER DEERFIELD TOWNSHIP



Sources: USGS Topographic Sheet, Kendree and Shepard - 1964

Harry R. Dare, III, Planning Consultant, Licence No. 1510

LeGrande Brancheau, Cartographer

swampy areas along the streams. These swampy areas can be found along the Cohansey River and its tributaries.

For the most part, Upper Deerfield is flat with few of the problems created by slopes in more hilly areas. Slopes of 10% or more do exist along the Cohansey River, south of Seeley Lake. Linear areas along the south side of Harrow, Foster, Loper and Cornwell Runs have slopes of 20%. The east bank of the Cohansey River, from Seeley Lake to Sunset Lake also has a 20% slope and increases to 25% along Sunset Lake. The steepest slope in the Township is 30% along the south shore of Silver Lake.

Geology

The Township is situate upon fourteen geologic layers, five of which are water bearing. The layers in which ground water is found are known as "aquifers" and are composed of porous, course-grained sands sandwiched between relatively impervious clay (non-porous) layers. The fourteen layers were formed over three geologic periods: Cretaceous, Tertiary and Quaternary. These periods are divided into seven units known as epochs. (See Table 1).

The Cretaceous Period consists of one epoch, the Upper Cretaceous. This epoch is subdivided into four layers. The oldest is the Polomac-RaritanMagothy group. These sediments were deposited during a marine environment. This is the deepest known aquifer, but it contains saline water in Cumberland and a large part of Salem County. At Deepwater, Salem County, this aquifer is used to store large volumes of injected fresh water. The water has been recovered during periods of peak demand without salt water intrusion. This experiment leads to the possibility of using this aquifer as a storage area for fresh water at least along the Delaware. Actually very little is known about this aquifer in Cumberland County. Deep test drilling would be needed to determine the hydrologic characteristics before maximum use could occur. This aquifer is approximately 2,200 feet thick. All of its aquifers are composed of sand and gravel.

The next layer is the Merchantville-Woodbury-Englishtown-Marshalltown which is not an aquifer. Dark silty clay acts as a confining unit to prevent leakage into the Potomac-Raritan-Magothy layer. This layer is 400 feet thick more or less.

The third layer is the Wenonah Formation and Mount Laurel Sand. This is the best future source of water for Upper Deerfield because the static water level is above sea level. Along the Delaware Bay, this aquifer becomes salty as it approaches sea level. Because of this fact, care will have to be taken to prevent salt water intrusion from intensive use. This aquifer is not presently utilized in Cumberland County, but is in Salem County. The aquifer has fine to coarse grained quartz with some mica, glauconite and shells. Again, because of its depth and limited use to date, very little is know about the hydrology of this layer. The layer itself ranges between 75 and 110 feet in thickness. It is suspected that leakage from the overlying Navesink Formation will lessen the draw down from pumping water from this aquifer.

Table 1. Generalized Geologic Section and Hydrology of Cumberland County, N.J.

System or Period	Thickness (in feet)	Series or Epoch	Geologic Units or Aquifers	Geologic and Hydrologic Characteristics
QUATERNARY	0 - 15	Holocene	Beach and steam alluvium deposits	Beach sand is generally a well sorted, homogeneous, fine to medium-grained well-rounded, quartz found along Delaware Bay. Stream alluvium occurs along present channels in intermingled layers of clay, silt and sand.
	0 - 15	Holocene	Tidal-marsh and swamp deposits	Interbedded fine-grained sand, silt, and clay and much organic material. Generally these deposits are soft and, in part, semifluid. Function primarily as large ground-water discharge areas with high rates of evapotranspiration.
	0 - 120	Pleistocene	Cape May Formation	Predominately low-level terrace deposits consisting of loose, uniform sand and silty sand generally not distinguishable from older sediments. Relatively unimportant as a source of fresh-water supplies. May contain salty water near tidal areas such as found to occur about Mauricetown.
	0 - 30	Pleistocene	Bridgeton Formation	These deposits are found capping most of the flatter upland areas and basin divides. They are generally above the water table and consist of reddish-brown, intermixed clayey silt, sand, and gravel with ironstone layers in some areas.
TERTIARY	30 - 180	Pliocene(?) Miocene(?)	Cohansey Sand and upper part of Kirkwood Formation (Cohansey-Kirkwood Aquifer-Unit 4)	The most productive fresh-water aquifer in the county. It occurs from near land surface to a depth of about 180 feet. Well yields range up to about 1,200 gpm. It consists of fine, to medium, to coarse sand with layers of clay. Materials in the Cohansey Sand could not be differentiated from materials in the upper-water-bearing sand of the Kirkwood Formation. Combined, they are called the Cohansey-Kirkwood aquifer in this report.
	30 - 90	Miocene	Kirkwood Formation (Unit 3)	Generally, a semiconfining unit consisting of gray and brown, silty to sandy, micaceous, and lignitic clay through which vertical leakage of water may occur both downward and upward, between the shallow Cohansey-Kirkwood aquifer and the lower Kirkwood aquifer.
	10 - 90	Miocene	Lower Kirkwood Aquifer (Unit 2)	Utilized mostly in the eastern half of the county and along Delaware Bay where static water levels are generally above sea level. Consists of gray, fine to coarse-grained sand with some gravel and shells.
	40 - 130	Miocene	Kirkwood Formation (Unit 1)	Confining unit consisting of dark-gray and brown silty clay. Micaceous and lignitic. Maximum thickness in the county is about 130 feet. Shells common near the middle of the unit.
	30 - 80	Eocene	Piney Point Formation	A minor aquifer presently tapped by only a few wells for domestic supplies in the western part of the county. Probably contains salty water in the southeastern part of the county where it occurs at greater depths. Consists mostly of fine to medium-grained glauconitic sand and layers of greenish-gray silty clay.
	170±	Paleocene	Vincentown Formation and Hornerstown Sand	Probably act as leaky semiconfining units in the western part of the county along with the underlying Navesink Formation. Consist of greenish-black fine glauconitic sandy clay.
CRETACEOUS	25 - 40	Upper Cretaceous	Navesink Formation	A leaky semiconfining unit northwest of Cumberland County. Consists of a glauconitic greenish-black clayey sand.
	75 - 110	Upper Cretaceous	Mount Laurel Sand and Wenonah Formation	An aquifer for possible future development for fresh-water supplies in the northern part of the county where static water levels are well above sea level. Water becomes more salty in the eastern and southwestern parts of the county along Delaware Bay. The aquifer consists of fine- to coarse-grained quartz with some mica, glauconite and shells.
	400±	Upper Cretaceous	Marshalltown, Englishtown Woodbury, and Merchantville Formations	These units of dark silty clay are primarily confining units in the county.
	2,200±	Upper Cretaceous	Magothy and Raritan Formations Potomac Group	Contain deepest known aquifers beneath the county but contain saline water. Available geologic and hydrologic data are sparse for this sequence in Cumberland County. In other areas of southern New Jersey north of Cumberland County, some aquifers in this sequence have large permeabilities and other favorable water-bearing characteristics not currently used in Cumberland County.

POSSIBLE SOURCES OF POLLUTION-SUMMER

RECHARGE

LEAKAGE

LEAKAGE

from: State of New Jersey, Department of Environmental Protection, Division of Water Resources Special Report No. 34, Ground Water Resources, Cumberland County, N.J., 1971.

The uppermost layer of the Cretaceous Epoch is the Navesink Formation. This is a 25-40 foot layer of glauconitic greenish-black clayey sand.

During the Tertiary Period, there were four epochs, the Paleocene, Eocene, Miocene and Pliocene, from oldest to youngest. Deposition consisted of alternating layers of sand, silt and clay. The layer overlying the Navesink is the Hornerstown Sand-Vincetown Formation (Paleocene Epoch) which acts in conjunction with the Navesink as a leaky, semi-confining unit. Again, this is a greenish-black glauconitic sandy clay. This layer is about 170 feet thick.

Above the Hornerstown Sand-Vincetown Formation is the Piney Point Formation, an aquifer. It is a minor aquifer presently tapped for domestic supplies in the western portion of the County. The aquifer consists of fine to medium grained glauconitic sand layers of greenish-gray silty clay. The Piney Point Formation dips to the southeast. At Stow Creek a well 90 feet deep taps this aquifer while another well tapping this layer near Millville is between 480 to 560 feet deep. The layer itself ranges between 30 and 80 feet in thickness. Tapping of this aquifer also must be monitored for salt water intrusion. Water from wells utilizing this aquifer has been potable without any special treatment necessary.

During the Miocene and Paleocene Epoch the four Kirkwood Formations occurred. Tow of the four are aquifers. Starting with the deepest, the Kirkwood Formation (Unit 1) is a confining unit of dark gray and brown silty clay. The layer ranges from 40 to 130 feet thick.

Unit 2 is the Lower Kirkwood aquifer. Presently, this aquifer is being utilized in the eastern portions of the County and along the Delaware Bay where the static water level is above sea level. The thickness is between 10 to 90 feet.

Unit 3 is another semi-confining unit consisting of gray and brown silty to sandy clay. The silt and sand allows vertical leakage of water both up and down between the tow aquifers. Thirty to ninety feet is the thickness of this layer.

Unit 4 is the Cohansey-Kirkwood aquifer which is the most productive in the County. It can be tapped from near the surface to a depth of 1890 feet and ranges in thickness from 30-180 feet. Wells in this layer have produced up to 1,200 gpm. A well recently drilled in the northeastern portion of the Township showed this aquifer to extend from ground surface to a depth of 160 feet. The Kirkwood Formation underlies this aquifer and extended from 160 to 300 feet. Below 300 feet began the Piney Point Formation.

The two water-bearing formations of the Kirkwood Formation provide 95% of the groundwater presently withdrawn in Cumberland County. The sand is fine to coarse grained in this layer and is more permeable east of the Cohansey River than it is west of the River. In Upper Deerfield, where the aquifer is overlain it is by a sandy silty clay layer about 35

feet thick, although thinner near stream channels because of the down cutting of the stream.

The stream channels and valleys are overlain by the sands of the Cape May Formation. The flatter uplands and basin divides are covered by the Bridgeton Formation. Both the Bridgeton and Cape May Formations occurred during the Pleistocene Epoch of the Quaternary Period. Fluctuations of sea level resulted in alternating periods of erosion and deposition of sediments. Surface erosion and stream action have removed the Cape May Formation, exposing either the Bridgeton Formation or the still older Cohansey Sands. Prior to the advance of the last glacier during the Pleistocene, the sea level rose and deposited the Cape May Formation, filling the eroded stream beds and covering the valley lowland. When the sea level fell, erosion had reformed the stream channels to the present level. The Bridgeton Formation will range from 0 to 120 feet in thickness. Both of these layers serve as recharge areas for the Cohansey-Kirkwood Aquifer.

The most recent deposits were during the Holocene Epoch of the Quaternary Period. These two layers consist of tidal marsh and swamp deposits and beach and stream alluvium deposits. The tidal marsh and swamp deposits consist of fine grained sand, silt and clay and much organic material. Beach sand is homogenous fine to medium grain quartz. Stream alluvium occurs along present channels in layers with high rates of evaportranspiration. These areas are also susceptible to and serve as potential sources of ground water pollution, particularly during the dry summer months when peak demand for water usage lowers the water levels.

Hydrology and Water Quality

Of the five aquifers, very little is known about the two deepest ones: the Potomac-Raritan-Magothy and the Wenonah Formation-Mount Laurel Sand. Test wells need to be drilled in order to determine the hydrology of these aquifers. Wells in Salem County tapping the Wenonah Formation-Mount Laurel Sand aquifer have yielded 300 gallons per minute of good quality fresh water. This aquifer has the greatest potential for future development in Upper Deerfield. Attempts to tap this source in the Township in 1984 suggested that well depths of 600 to 650 feet would be necessary. Where this aquifer is used in Elmer, Salem County, the water quality is generally good, but does deteriorate to the south where sodium, chloride, iron and manganese levels all increase.

Where wells have tapped the Piney Point Formation in the western portion of the County, yields have generally been in the range of 50-100 gpm or less. A test well in Buena, approximately 14 miles east of the Township, screened in the Piney Point aquifer yielded 400 gpm with a specific capacity of over 3 gpm/ft. of draw down. Water quality is reportedly good with only sodium(40-80 mg/l) generally exceeding the recommended limits. It is thought that additional 50 to 100 gpm wells could be tapped, but careful monitoring will be necessary to prevent salt water intrusion.

The Cohansey-Kirkwood aquifer is the shallowest and most important source of water in Upper Deerfield. Because it is close to the surface

and possesses a high rate of transmissibility, it is easily acceptable to contamination. The first signs of this have shown up in tests done on the water quality of residences situated near the former Township sanitary landfill. A test well dug in early 1984 found that "...no confining layers were found that would retard or prevent migration of contaminants in the aquifer." This aquifer's susceptibility to contamination requires that future planning take into account the need to provide suitable and sufficient systems to prevent pollution of this vital resource. There is also concern that along the Cohansey River development may have reached a level capable of causing some pollution and ground and surface water tests have already indicated that there has been some quality problems with this water resource.

The Cohansey-Kirkwood aquifer has the potential to yield much greater than the 150 gpm generally required for single family homes similar to many with the community. The water generally has a low pH and is corrosive and may contain objectionable levels of iron and/or manganese. Residential wells often require water treatment systems for these materials. The heavy use of this aquifer in the Township and its susceptibility to contamination may be a major problem in the future. As noted some areas of the Township where development is on relatively small lots, a half acre or less, may well experience contamination as continued use of this aquifer increases.

According to the records of the New Jersey Department of Environmental Protection, Division of Water Resources, there were records on 49 wells in Upper Deerfield Township in 1984, ranging in depth from 20 feet to 192 feet. Yields ranged from a low of 15 gpm to a high of 1,227 gpm. The former is an example of a well with a four inch casing used for home needs while the latter is an industrial well at the former Seabrook Farms site with a 12 inch casing. Eighteen of the 49 located in the Township, were below 100 feet depth. Fourteen(14) of these were test and monitoring wells and were not used for regular water supply. The largest well which yielded the 1,227 gpm has a 17 inch casing and is 156 feet deep. This well serves as an irrigation well. With over 2,400 households and numerous commercial, industrial and agricultural wells in use throughout the Township, there is cause for concern that this aquifer be properly used and protected since it serves as so valuable a source of water to the community.

On-site sanitary wastes disposal for most of the Township serves as a major threat to the ground water supplies. Only the Seabrook area and the commercial district at Carlls Corner are provided with a public sanitary sewer system. The Seabrook Brothers and Sons, Inc. processing plant reactivated a portion of the former spray irrigation area in connection with the discharge from their processing waste water. Initial estimates indicated approximately 2.8 million gallons per day of industrial waste water(water primarily used to wash and cook vegetables) will be generated.

These waters are first treated for removal of solids and then discharged, under permit from the Division of Water Resources, onto the spray field located between the Seeley-Deerfield Road and the Deerfield Pike, north of Seeley-Finley Road. Although there have been no reported

instances of ground water pollution from such activity, the odor caused by decaying vegetation on the wooded site is at times intense and very offensive. While the process shows the value of woodland for accepting such discharge and recharging it to the ground water supplies, the nuisance of odor to surrounding land uses raises questions as to its potential for future use in the disposal of waste waters.

The New Jersey Department of Environmental Protection Geological Survey sees an optimum water budget form the Cohansey-Kirkwood aquifer as 900,000 gpd/square mile in a normal year and 600,000 gpd/sq.mi. in a dry year.[1] Earlier reports had approximated the average annual hydrologic budget for Cumberland County to be nearly 1.2 billion gallons per day.[2] The optimum budget represents the amount of water that can be withdrawn from an aquifer without causing long term drawdown or depletion.

Rainfall is the primary source of recharge for the Cohansey-Kirkwood aquifer. In Upper Deerfield, the aquifer is a water table aquifer. In parts of the County near the Delaware Bay, it becomes artesian. Water levels in the aquifer are in a constant state of flux in response to the recharge and discharge of the aquifer. Periods of greatest ground water storage varies with each well. In general, maximum storage will occur earlier near the Cohansey River than on the east side of the Township. Also wells closer to the Cohansey River reach equilibrium between discharge and recharge much faster than wells farther away.

While there appear to be abundant supplies of ground water for the Township, the placement of future development and need for special care in protecting those supplies will become increasingly greater. More study of the geologic and hydrologic make-up of the Township will be necessary to determine the potential for development and its effect on the ground water quantity and quality. It is recommended that emphasis be placed on preventing ground water pollution through a variety of methods involving both the public and the private sector.

Development need not in and of itself be the only cause of ground water quality problems. Agriculture and lawn or gardening activities may cause considerable consequences especially in terms of nitrates. Nitrogen used in fertilizers cause nitrates to build up in the soil and get into the water supply, both ground and surface. In surface water nitrates cause algae and plant growth which starve the water of oxygen. In ground water it can cause problems for pregnant women, newborns, small children and the aged. Its effect on the rest of the population is less clear, but recently issued public health standards for potable water permit only

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1 New Jersey Geological Survey, 1974, Land Oriented Reference Data System, Bulletin 74, Department of Environmental Protection.

2 Rooney, J.G., 1971, Ground Water Resources of Cumberland County, New Jersey, Special Report #34, N.J. Division of Water Resources.

special maintenance.

Severe — Severe ratings indicate that costly soil reclamation, special design, intense maintenance, or a combination of these is required.[3]

An in depth system has also been developed by the U.S.D.A. to classify different soils. This system is call capability grouping and its purpose is to show the suitability of each soil for various kinds of field crops. The capability system is broken down into three parts: the Capability Class, the Subclass and the Unit. Capability classes, according to the soil survey, are signified by Roman numerals I to VIII, ranging from little or no limitations of use to severe limitations. For example, Class I soils have few or no limitations which restrict their use. Class II soils have slightly more limitations which reduce the amount and types of crops grown on a certain soil. Class III & IV soils have more severe limitations which reduce the choice of plants and require careful management. Class V and VI soils have limitations that are generally impractical to eliminate and vary in severity. At the worst end of the scale are Class VII and VIII soils, which have limitations that preclude most kinds of development, especially agriculture.

Capability subclasses define what limitations, if any, each capability class soil has. Subclasses are designated by a small case letter added to the Roman numeral, either e, s, or w. The letter "e" signifies that the main soil limitation is related to erosion problems. A designation "w" indicates a problem with periodic or continual wetness which interferes with plant growth and agricultural development. An "s" indicates limitations of soils due to shallowness, prone to drought or stoniness.

Capability units break the subclasses down into compatible groups of soils. Soils within a capability unit are similar enough to grow the same crops, require the same conservation measures. These units are designated by adding an Arabic numeral to the Class and Subclass symbols. Here is an example of a capability grouping based on a sloped Chillum silt loam in Upper Deerfield Township - IIIe-4.

Below is a listing and brief description of the fourteen soil types found in Upper Deerfield Township. Included is the capability grouping as discussed in the agriculture section.

Atsion - Atsion soil are sandy with a seasonal high water table which drops two or three feet in summer. It is frequently found along streams and is dark due to high organic content. The Atsion soils are not good for farming and have severe limitations for development. Their capability classification is Vw-26.

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[3] Pg. 39, U.S.D.A. Soil Survey of Cumberland County, New Jersey, issued April, 1978.

10 ppm of nitrates. Throughout the municipality this figure is regularly exceeded. In some cases it is seasonal and in many others the drilling of a new deeper well and/or installation of water treatment equipment eliminates the problem.

Less chemical use in both farming and by homewowners would be wiser and go far in reducing contaminantion problems. Chemical lawn spraying now quite popular due to their ease of application have also been found to cause pollution related problems. Indiscriminate disposal of cleansers, solvents and other chemicals and compounds in the residential setting can and are just as threatening to ground water supplies as are site specific industrial discharges. No doubt that the installation of public sanitary sewer or water systems will be required in the future for major development concentrations and where development has or will experience pollution problems.

It is recommended that all applications for development involving ten or more lots or residential units and all commercial or industrial developments provide as part of their application for review, an analysis of water quality impacts of the development including whether quality problems already exist which be detrimental to the project. In all such cases, the community should seek to have a public or quasi-public water system installed or at least water lines for future connection to a public system at a later date. The intent of this recommendation is to assure that increased water demand and development activity will not create to the greatest extent possible, water supply problems in the future

Soil Description and Characteristics

The following information is taken from the Soil Survey of Cumberland County, prepared by the United States Department of Agriculture, Soil Conservation Service. Located in this soil survey are the soil types' characteristics: texture, depth of layers, natural fertility, permeability to rainfall, flood hazard and other pertinent information. Also provided in the survey are detailed maps indicating the approximate location of soil types and groupings.

Upper Deerfield Township has fourteen of the twenty soil types found in Cumberland County. These soils are classified by the U.S.D.A. in a variety of ways, one of which classifies them according to their limitations in relationship to respective land uses. For a number of major uses such as engineering, suburban development and agriculture, the limitations presented by soil type are rated in terms of degree: slight, moderate or severe. The interpretation of these ratings as defined by the U.S.D.A. are:

Slight — Slight ratings indicate that soil properties are generally favorable and limitations are so minor that they can easily be overcome.

Moderate — Moderate ratings indicate that soil limitations can be overcome or modified by either planning, design or by

Aura - Aura soils are well drained and gently sloping. They consist of a dark greyish brown sandy loam, with a hard clayey substratum which slows permeability. This increases the amount of surface runoff and if improperly managed, erosion can become a problem in the Aura soils. These soil types are good for both argriculture and development with moderate limitations for septic tanks. Their capability classifications are: IIs-9 and IIIs-10.

Chillum - This soil series is a well drained, silty soil over a gravelly sand loam substratum. Chillum soils are generally level to slightly sloping. They are extremely well suited to both agriculture and development, although there are moderate septic tank problems. The capability classifications for Chillum soils are I-4 and IIe-4.

Downer - Downer soils consist of level to sloping, well drained loamy sand. They are greyish brown and in Upper Deerfield Township they occur mainly on 5-20% slopes. Permeability is moderately rapid and erosion hazards are present on the greater slopes. The soil is best suited to vegetable and fruit production. The capability classification is IIIe-6 for Downer soils.

Evesboro - Evesboro soils are excessively drained due to rapid permeability. They are not suited to most types of agriculture or development and severe septic tank problems are characteristic of this soil. This is due to the high possibility of ground water pollution. The capability classification is VIIs-8.

Fallsington - This soil type is poorly drained and consists of a sandy layer over a gravelly sand loam substratum. The water table drops three to five feet in summer. Fallsington sandy loam has severe limitations for development but is suitable for some agriculture. The capability classification is IIIw-21.

Fort Mott - These soils are well drained, consisting of a dark greyish brown loamy sand. permeability is moderately rapid and this soil is low in natural fertility. It is suitable for most development uses. The capability classification is IIIs-7.

Hammonton - Hammonton soils consist of a brown sandy loam which is moderately well drained to somewhat poorly drained. The water table is high in Winter and Spring and it presents considerable limitations on potential development. The capability classification is IIw-14.

Matapeake - This soil series consists of well drained silty loams. Most of this soil type found in Upper Deerfield Township is used for agricultural purposes. Permeability is moderately slow and water capacity is high. Matapeake soils are well suited to both urban and agricultural uses. The capability classification for these soils are: I-4, IIe-4 and IIIe-4.

Mattapex - These soils consist of moderately well drained, silty loams. Permeability is moderately slow and there is a seasonably high water table. This presents moderate to severe limitations on development due

to septic tank problems. They are generally good as agricultural land. The capability classification is IIw-13 for Mattapex soils.

Pocomoke - This series of soil consists of level, very poorly drained sandy loams. They are susceptible to flooding in Upper Deerfield because they are low lying and receive much runoff from higher areas. Pocomoke soils are moderately fertile and have a high organic matter content. If drained, these soils are suitable to agriculture, but have severe limitations for development. Their classification is IIIw-24.

Sassafras - These soils are moderately sloping, well drained, sandy loams. Classification of these soils for fertility varies depending on slope e.g. Class I (0-2% slopes), Class II (2-5% slopes), and Class III (5 -10% slopes). Most Sassafras soils in Upper Deerfield fall into either Class I or Class II. This soil is suited to both agricultural and development purposes. Its U.S.D.A. classifications are (in order of decreasing fertility): I-5, IIe-5, and IIIe-5.

Woodstown - Woodstown soil is gently sloping and moderately well drained. It often has a mottled grey brown appearance which indicates prolonged wetness. The water table rises 2 to 3 feet in Winter and drops to 5 feet or lower in Summer. It is generally good farmland, but has limited potential for development due to the seasonally high water table. Capability unit is IIw-14.

Soil Analysis

By analyzing the soil characteristics and properties as were described above, it is possible to determine the suitability of the soils to various land uses. Mapping of soils indicates where certain types of land use activities can or cannot be supported by the soils to varying degrees of limitations as discussed. This method of analysis is an excellent beginning point for reviewing a proposed land use or in planning for future development of any given area.

Soils represent only one, although a major one, of a number of natural considerations which must be analyzed and evaluated when making land use decisions. It is important to note, however, that soil properties should not be the sole measure for determining whether or not a certain use is suited to a particular site. Other factors need to be weighed.

Location, accessibility and availability of utilities, use of advanced design or development techniques which negate or lessen the limitations inherent in soil properties, economic and social needs (housing and jobs), and of course, existing use of adjacent lands must also be considered. Soil analysis utilized in most mapping of this scope, including the maps in this Plan, are generalized, which means on-site investigations might prove a site or portion of a site does not fall into the general category shown on the map. This is not to say the maps presented herein are to be considered erroneous, useless or incorrect. Rather they were developed to show the general conditions and limitation categories for areas of the community. They are a guide and

an attempt to visually document what Planning Board members may have instinctively or empirically known about their community.

Soils Associations and Predominate Vegetation

Certain of the major soil types occur in association with each other. This means that one to three of the major soil types will dominate large acreages. Within such areas, minor pockets of different type soils occur. Upper Deerfield has five major soil associations. Each association is divided into its major and minor soil types. Table 2 shows these associations.

TABLE 2

MAJOR SOIL ASSOCIATIONS
TOWNSHIP OF UPPER DEERFIELD

Association	Soils	
	Major	Minor
1. Mettapex-Metapeake-Chillum	1. Mattapex 2. Matapeake 3. Chillum	1. Sassafras 2. Downer 3. Fort Mott
2. Fort Mott-Downer-Sassafras	1. Downer 2. Fort Mott 3. Sassafras	1. Evesboro 2. Chillum
3. Aura-Sassafras	1. Aura 2. Sassafras	1. Woodstown 2. Hammonton 3. Chillum 4. Downer
4. Sassafras	1. Sassafras	1. Woodstown 2. Aura 3. Matapeake 4. Fallsington
5. Muck	1. Muck	1. Pocomoke 2. Fallsington 3. Atsion

Figure 4A, Soil Associations & Predominate Vegetation, delineates where the soil associations outlined in Table 2 occur in Upper Deerfield and gives the type of timber vegetation which can be expected to predominately occur within such areas. Although not located with the officially designated Pinelands area, most of southern New Jersey including Upper Deerfield Township, are considered from a botanical and naturalist viewpoint to be pinelands. Thus the vegetation and wildlife found there are similar as well.

FIGURE 4A

SOIL ASSOCIATIONS & PREDOMINATE VEGETATION

UPPER DEERFIELD TOWNSHIP
CUMBERLAND COUNTY, N.J.

VEGETATION

A. Atsion
1. Pitch Pine
2. Red Maple
3. Atlantic White Cedar

B. Aura
1. Upland Oaks*
2. Virginia Pine

C. Chillum
1. Upland Oaks
2. Yellow Poplar

D. Downer
1. Upland Oaks

E. Evesboro
1. Pitch Pine
2. Black Oaks
3. White Oaks

F. Fallsington
1. White Oak
2. Willow Oak
3. Sweetgum
4. Pitch Pine
5. Red Maple

G. Fort Mott
1. Upland Oaks
2. Pitch Pine

H. Hammonton
1. Upland Oaks

I. Metapeake
1. Upland Oaks
2. Yellow Poplar

J. Mettapex
1. Upland Oaks
2. Yellow Poplar

K. Muck
1. Atlantic White Cedar
2. Pin Oak
3. Red Maple
4. Sycamore

M. Pocomoke
1. Willow Oaks
2. Pin Oaks
3. White Oaks
4. Pitch Pine
5. Sweet gum

N. Sassafras
1. Upland Oaks

O. Woodstown
1. Red Oak
2. White Oak
3. Black Oak

*FURTHER DELINEATIONS

Upland Oaks
Black Oak
Blackjack Oak
Chestnut Oak
Red Oak
Scarlet Oak
Post Oak
White Oak
Scrub Oak
*Pin Oak
*Willow Oak

Lowland Oaks
Bur Oak
Swamp White Oak
*Pin Oak
*Willow Oak

*Wide range

Source: From data prepared by the National Cooperative Soil Survey, Soil Conservation Service, USDA in cooperation with Rutgers University, College of Agriculture and Environmental Science, March, 1972.

PREPARED BY THE CUMBERLAND COUNTY PLANNING BOARD FOR THE UPPER DEERFIELD TOWNSHIP PLANNING BOARD

Since Upper Deerfield has relatively moist, well drained soils, the predominant family of trees is oak. The Genus Querqus is divided into two groups: upland and lowland. Upland oaks include Black Oak, Blackjack Oak, Chestnut Oak, Red Oak, Scarlet Oak, Post Oak, White Oak and Scrub Oak. Two other varieties, the Pin Oak and Willow Oak, can often be found among the Upland group. These two varieties have a wider range and also will be found under wetter soil conditions with the Lowland Oaks. The Lowland Oaks consist of the Bur Oak and the Swamp White Oak.

The stream bed vegetation is consistent throughout the Township. The predominant species are Atlantic White Cedar, Pin Oak, Red Maple and some Sycamores. Virginia Pine can be found along the streams in the eastern portion of the Township. South of Seeley Lake, Pitch Pine occasionally occurs. North of Seeley Lake, Yellow Poplars can be found along the streams.

East of State Highway #77, Virginia Pine is found in association with the Upland Oak. In the southwest section of Upper Deerfield, south of Foster Run and west of the former railroad right-of-way dividing the Township, Pitch Pine is in association with the Upland Oaks. Pockets of Sweetgum, Pine Oak and Willow Oak occur on Pocomoke soils within the latter association mentioned above. Two other pockets of Sweetgum trees and Lowland Oaks occur in the Township. One is near the former railroad right-of-way at Husted Station and the other is along the Cohansey River, south of Bostwick Lake.

The variety of ornamental trees throughout the Township is of course, growing with the residential development that occurs. The community has a legacy of ornamental trees along many of the major roadways in and north of Seabrook which were planted by Seabrook Farms for both aesthetics and to serve as wind breaks to protect the fields. The effect is quite impressive especially along State Highway #77 from Polk Lane south and through Seabrook. It is a man-made natural feature which deserves protection and preservation.

Wildlife

Wildlife found in Upper Deerfield is indicative of the natural habitats which exist there: woodland, open fields and wetlands. Woodland species include ruffled grouse, opossum, raccoon, white tailed deer, red and gray squirrel, gray or red fox and birds such as thrushes, vireos, scarlet tanagers, towhees, finches, woodpeckers and owls. The deer population in Upper Deerfield was reintroduced to the area by the release of three deer a year from the Cohansey Zoo in Bridgeton. Deerfield currently live throughout the Township and can often be seen throughout the year in the fields feeding early in the morning or just before dusk. The deer population have even developed migratory path along the woods and hedgerows which are prevalent throughout the Township. They become a nuisance feeding on the crops and frequently causing accidents when crossing roadways.

Open field wildlife include birds and mammals that normally frequent cropland meadows, lawns and areas overgrown with grasses, herbs and shrubby growth. Examples of the wildlife to be found include: quail,

TABLE 3

WILDLIFE IN UPPER DEERFIELD TOWNSHIP

ENDEMIC SPECIES

MAMMALS

Uplands	Lowlands
Eastern Chipmunk	Star Nosed Mole
White Footed Mouse	Several Species Bats
Raccoon	Southern Flying Squirrel
White Tailed Deer	Rats (O. Palustris)

BIRDS

Uplands	Lowlands
Blue Jays	Towhees
Common Crows	Song Sparrow
Great Crested Flycatchers	Wood Thrushes
Doves	Brown Thrashers
Downy	Cat Birds
Woodpeckers	Cardinals
	Oven Birds
	Kentucisy Warblers
	Robins
	Red Shouldered Hawks

"Ruffled Grouse"
Bobwhite Quail

ANIMALS COMMON TO BOTH ENVIRONMENTS

Opossums	Gray Squirrels
Short Tailed Shrews	Red Squirrels
Eastern Moles	Cottontails

TABLE 4

ADDITIONAL MAMMALS FOUND IN UPPER DEERFIELD TOWNSHIP

White-tailed deer	(Odocoileus virginianus)
Eastern Chipmunk	(Tamias striatus)
Grey Squirrel	(Sciurus carolinensis)
Red Squirrel	(Tamiasciurus hudsonicus)
Southern Flying Squirrel	(Glaucomys volans)
White-footed Mouse	(Peromyscus leucopus)
Red-backed Mouse	(Clethrionomys gapperi)
Meadow Vole	(Microtus pennsylvanicus
Pine Vole	(Pitymys pinetorum)
House Mouse	(Mus musculus)
Meadow Jumping Mouse	(Zapus hudsonius)
Norway Rat	(Rattur norvegicus)
Muskrat	(Ondatra zibethicus)
Star-nosed Mole	(Condylura cristata)
Eastern Mole	(Scalopus aquaticus)
Masked Shrew	(Sorex cinereus)
Short-tailed Shrew	(Blarina brevicauda)
Red Fox	(Vulpes fulva)
Grey Fox	(Urocyon cinereoargenteus)
Opossum	(Didlphis marsupialis)
Raccoon	(Procyon lotor)
Striped Skunk	(Mephitis mephitis)
Mind	(Mustela vison)
Long-tailed Weasel	(Mustela frenata)
Eastern Cottentail	(Sylvilagus floridanus)
Little Brown Myotis	(Myotis lucifugus)
Big Brown Bat	(Eptesicus fuscus)

Source: Division of Fish, Game and Shell Fisheries, Department of Environmental Protection.

pheasant, rabbit, woodchucks, field mice, corn snake, Pine snake, and chipmunk. Birds that like this type of habitat include the red winged blackbird, meadowlarks, jays, bobwhites, sparrow, black birds, crows and recently predatory birds such as the smaller hawks and owls. Most of this wildlife can adapt to residential development when large lots and lawn area is available.

Wetlands wildlife can include mink, muskrats, beavers, wood ducks, black ducks, several species of goose and swan, heron, egret, snapper turtle, and several species of snake. Most of this type of wildlife is naturally found along the Cohansey River and its tributaries and the various lakes or ponds formed along its course.

Both the open fields and wetlands draw migratory birds on their annual trips north and south. Seagulls are often times found in these areas as well during various periods of the year being driven inland from coastal areas by weather or in search of food.

On the whole, the Township has quite a variety of wildlife and seems to be assured of maintaining the various species populations unless development becomes too intense and crowds out the natural habitats. Deer are probably the most migratory of the existing wildlife, however, they seem to be maintaining and multiplying their numbers. Care should be taken to maintain some of each of the habitats within the community and some progress has been made in that effort by the public ownership of lands along the Cohansey River. Several large tracts of land have been dedicated to the Township and have been tentatively left in their natural state. It is recommended that the conservation of these areas and others along the Cohansey River and its tributaries be encouraged and formally established as a permanent home for the area's natural wildlife.

Soil Limitations

In reviewing the soils of the Township as was noted earlier, it is possible to determine the suitability of different types of soils to various activities or land uses. In 1974, the Planning Board did have maps developed which delineated the location of soils throughout the Township on the basis of various limitations or special features. Two very important ones in relation to future development are problem areas for septic systems and potential flood areas.

Since there is not Township-wide public sanitary sewer available, septic tanks will probably remain the only solution available for sewerage disposal. To work properly septic tanks require certain soil conditions and this is monitored by law and regulation i.e. the percolation test required by the County Health Department. The mapping of areas of the Township which because of the existing soil characteristics cannot support septic systems without potential pollution of ground water supplies, can be most useful in determining where development can be accommodated. This is not to say that natural conditions cannot be overcome through placement of additional fill or specialized systems such as waterless toilets or package treatment facilities. Table 3, Septic Tank Limitations, identifies the various soils found in the Township by by category of limitations for the placement of on-site

septic tanks . Problem areas for septic tanks are classified into three (3) categories: slight limitations, moderate limitations and severe limitations.

TABLE 5

SEPTIC TANK LIMITATIONS

Slight	Moderate	Severe
Downer 0-5%	Aura	Atsion
Fort Mott	Chillum	Downer, clayey substratum
Matapeake 0-5%	Downer 5-10%	Evesboro
Sassafras 0-5%	Hammonton	Fallsington
	Matapeake 5-10%	Landfill
	Sassafras 5-10%	Matapeake, clayey substratum
	Woodstown	Mattapex
		Muck
		Pocomoke

Soils in the severe limitations category are there for the following reasons. Muck and Pocomoke flood. Atsion, Fallsington and Mattapex have high water tables. Some Downer and Matapeake soils have clayey substratum which causes slow permeability and subsequent standing water on the surface. This can be overcome by deep excavations to allow proper drainage. Landfill, which is not a natural soil type, but a man-made phenomenon, obviously has severe limitations. Landfill will not stabilize for several years after discontinued use as a disposal site. As the wastes decompose, gases and liquids are formed which create uneven settling and a potential health hazard can develop.

Moderate septic tank limitations of soils include such things as seasonal high water table (Hammonton and Woodstown), slow permeability (Aura and Chillum) and slopes greater than five percent (Downer, Evesboro, Matapeake and Sassafras). Steeper slopes require special filter fields while slow permeability requires deep trenching. Both of these corrections create additional costs.

Another limitation which can be delineated vis a vis soils characteristics is the potential for flooding. This characteristic is very closely related to septic tank limitations as can be easily understood. The Soil Conservation Service has determined that there are four soil types which are indicative of flood hazards. They are: Tidal Marsh, Berryland, Pocomoke and Muck. The structure of these soils causes them to hold large quantities of water. Because of this fact, additional flood waters cannot be immediately absorbed and the excess water flows over the surface of these soils.

Upper Deerfield has only two of these four soils. One, Muck, is the most predominate and subject to frequent flooding and is located along all the stream beds in the Township. The other, Pocomoke, prone to

occasional floods, associates itself with Muck only along the branches of the tributary streams in the southern portion of the Township.

While not extensive and located basically along the streams, these soils are a clear indication of lands which should not be developed. In most instances such areas are or have been delineated as flood hazard areas and development is controlled thereon by State statute and federal regulations. They do and can serve a useful purpose in their natural state. Often times, considering their proximity to the streams, they serve as natural spillways for storm water runoff or if severe enough a storm, flood waters and as recharge areas for ground water supplies. Pastures and passive recreational areas are uses which can be accommodated within such areas.

Upper Deerfield's Development Capability

After having look at the natural setting of the municipality with its soils characteristics, it becomes possible to make some assumptions as to how and where additional development can occur. The Township's planners first effort at this analysis of development capability was in conjunction with the 1974 land use and environmental analysis. In 1985 this analysis was updated to reflect current understanding of the environment.

Figure 5, "Development Capability Map," shows the areas of the Township where development should be able to be handled based on soil characteristics and generalized mapping of the soils. Thus flood plains, soils with severe slope or soils unsuitable to on-site septic systems are rated according to their capability to support development. There are three catagories of capability utilized on the map: high, moderate and low.

This classification is based solely upon natural conditions and does not take into account methodologies or technologies which would make a given piece of land capable of supporting development. Public sewer, additional fill or a waterless toilet would be examples of such technologies overcoming the limitations of the land. The map simply presents where in the Township generalized soil conditions indicate the land is capable of supporting development. The converse of these assumptions is obviously, that specific sites and conditions may show that the site cannot support development. Any development should therefore, be judged in relation to this map only as a reference point.

Unfortunately, prime agricultural soils have little, if any limitations for development and therefore, are often considered ripe for development when demand dictates. Thus from a purely environmental capability standpoint, high yield, fertile soils do not in themselves preclude or diminish the potential for development. In Chapter III this will be discussed along with the need to set up other planning criteria if farming is to be preserved and protected.

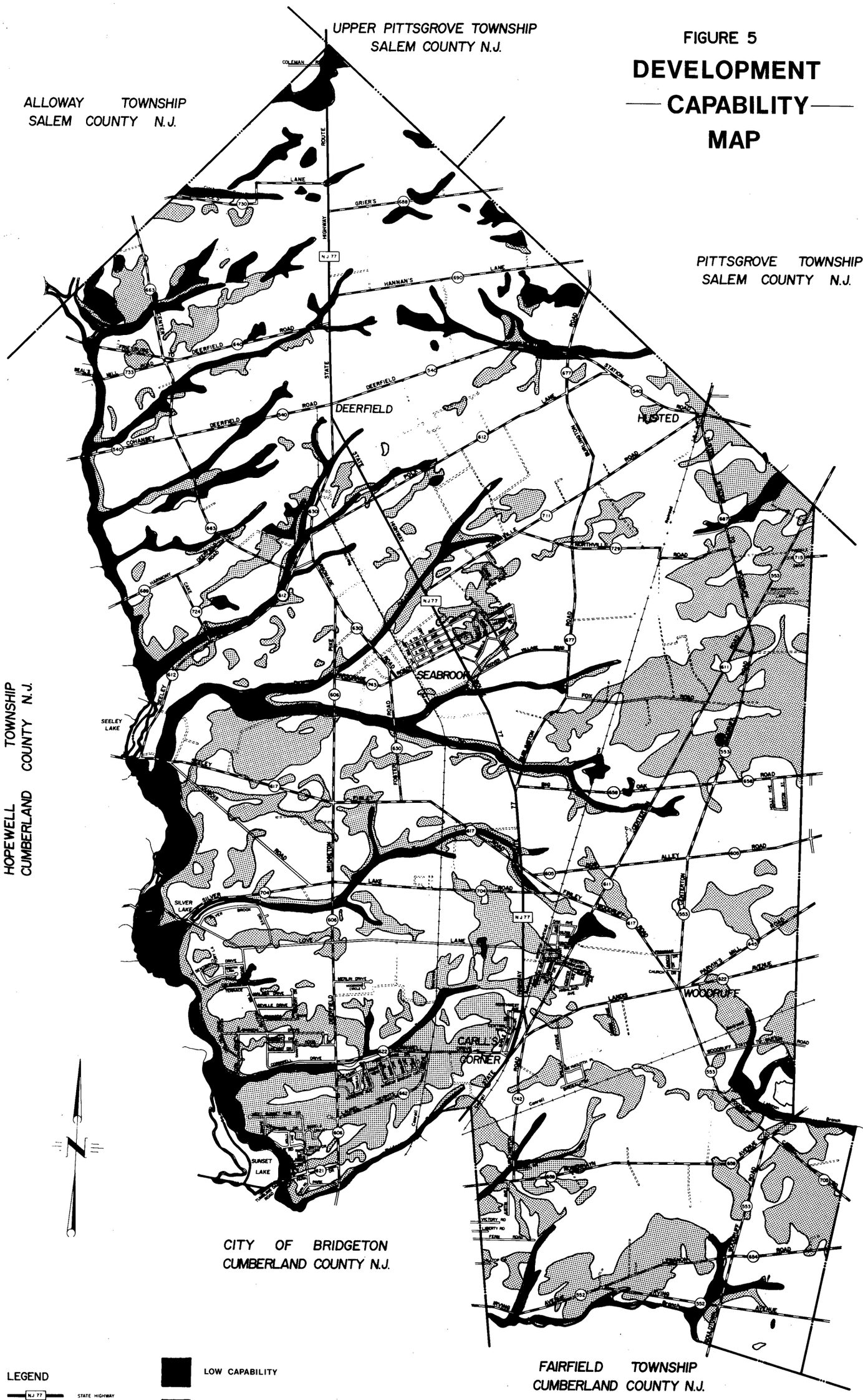
In Upper Deerfield as seen in Figure 5, most of the unsuitable areas for development are located along streams and natural drainageways as might be expected. Many of the areas showing moderate limitations have in fact been developed thereby indicated the ability to overcome natural

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

FIGURE 5

DEVELOPMENT CAPABILITY MAP



Harry R. Dare III, Planning Consultant, Licence No. 1510

LeGrande Brancheau, Cartographer

Base Map: George A. Schock P.E.

impediments to development. The map does serve a purpose in delineating where development can be channeled with least environmental obstacles or problems when such development is not supported by expensive or more advanced technologies to overcome natural conditions. As a planning tool the map offers reasonable justification for land use decision aimed at preventing the development of unsuitable areas.

Surface Waters

The major body of surface water in Upper Deerfield Township is the Cohansey River which is the western boundary of the municipality. The river originates just north of the Township line in Salem County and becomes a stream sized running flow within the Township. It is fed by a number of tributaries along its course. The river becomes tidal and navigable south of the Township in the City of Bridgeton.

A series of lakes have been formed by the damming of the River and its tributaries. Bostwick Lake is the first such body and is owned jointly by the Townships of Upper Deerfield and Hopewell in Cumberland County and Alloway Township in Salem County. The lake and lands around it are administered as a recreational facility overseen by commission composed of one representative of each of the three municipalities.

The next body formed by damming the river is Seeley Lake which is in private ownership. The river was initially dammed in most instances to obtain power for mills that were established. Only the ruins of any of these mills remain. Fishing and some boating are the main recreational activities provided by this body of water.

One of the River's tributaries, Parsonage Run, has two ponds located along its course. One is at the streams intersection with Parsonage Road and the other at its intersection with State Highway #77, north of Seabrook. These two ponds are very shallow and tend to dry up during the Summer. Parsonage Run itself empties into the Cohansey River south of Seeley Lake.

Another of the River's tributaries, Loper's Run, was dammed to form Silver Lake, a rather shallow, long body of water entirely surrounded by residential uses. It too is in private ownership. There is a serious problem with eutrophication of this lake due to its pollution from fertilizer runoff. The dam is designed so that water is released from an opening located at the base of the dam instead of a spillway at the top. This design has been considered to contribute to the build-up of plant material and algae in the lake and preventing better flow of water across the lakes surface.

The final lake along the Cohansey's course through the Township is Sunset Lake, which is also partially located with the City of Bridgeton. This the largest body of water along the River's course and is used for recreational purposes, especially in Bridgeton where the Lake's shores are within the City Park. In Upper Deerfield the Lake is surrounded by residential development. In the late 1970's tests at the lake showed high fecal collaform counts without a determination of the cause. The

Lake also has a problem with eutrophication, but not as severely as Silver Lake.

Many of these bodies of water are used as a source of bulk water for irrigation or the filling of fire trucks. Irrigation ponds have been dug along the River and adjacent to several of the ponds or tributaries mentioned above. Many of the River's tributaries are intermittent or seasonal in flow.

The only other watercourses within the Township are Indian Field Branch which forms part of the border between Upper Deerfield and Fairfield Townships; Lebanon Branch, which flows east to the Maurice River and Thorn Branch in the northeastern portion of the Township.

The protection and preservation of these surface waters will become more important as time progresses, not only for their aesthetic and recreational uses, but for their value as sources of water. Many of the ponds or streams are fed by springs which mean a continuous supply of water. Already as noted we are seeing considerable use of these sources for irrigation purposes. They also serve as wildlife habitats which makes them valuable as well.

Air Quality

There is little data available on air quality in Upper Deerfield. Since most of the land area is used either for agriculture or residential development and industrial development is quite limited, particulate emissions are greatly reduced. Probably the major problem with air quality concerns auto emissions at the intersections of the Township busier roadways such as Carlls Corner and along Deerfield Pike from the Bridgeton boundary north to Cornwell Drive.

Recommendations

Overall Upper Deerfield has several environmental problems which it will have to address in the not too distant future. Paramount among these is ground and surface water quality. Development and agricultural use of chemicals and fertilizers are serious threats to maintain clean waters. Efforts should be made to educate the public to the threat and ways to eliminate or reduce the adverse effects of homes, farms and business on these vital assets. What contamination of ground and/or surface waters exist will have to be monitored and contained to prevent further spread. In some instances, this may well be out of the reach of the community's resources.

A complete and detailed environmental analysis of the community is recommended to provide a data base for understanding the natural state and the effect proposed development might have on it. The establishment of an environmental commission with sufficient funding to carrying out such a study is recommended.

Finally, development regulations should address environmental issues and provide standards which will maintain and preserve valuable environmental assets. Future development should be compatible with its natural

surroundings and not detrimental to it. Specifically, development applications must address environmental affects and suitability of the proposed project. Such analysis must be used as a realistic and reasonable tool to assuring good development and not as a barrier or device to stop growth without warrented justification.

CHAPTER III AGRICULTURE

Present State of Agriculture

Agriculture and its related industry played such an important role in the making of Upper Deerfield Township's cultural and economic character that it cannot and should not be ignored in the planning process. Upper Deerfield has traditionally been agrarian in nature probably owing to its soils considered to be some of the most productive in the eastern United States. In addition to this sound environmental base, Upper Deerfield has had a history of progressive and successful management of the land, including the development of a local agricultural industry and support services. Currently, agriculture is relatively stable and economically viable within the municipality and while faced with threats,- its continued existence seems a good possibility. This is a good position to be in from a planning prospective because it allows action to be taken before the situation gets out of hand.

As the earliest and most basic of land use activities, it was the Planning Board's intent that agriculture be given primary consideration in the formation and development of the master plan update. Thus this chapter's position immediately following the discussion of the municipality's natural environment. Afterall, agriculture depends on natural phenomena such as soils and water. This chapter attempts to analyze the current state of agriculture in Upper Deerfield and identify goals to be sought in maintaining its viability for the future.

General Characteristics of the Township's Agriculture

Farming in Upper Deerfield accounts for approximately 10% of Cumberland County's gross farm income, roughly $4 million out of $40 million(1985). This amount comes primarily from high value vegetable crops and other assorted field crops, both being the primary types of agriculture in the Township. Out of the municipality's 20,352 acres, the 1985 Farmland Tax Assessments show approximately 13,200 in agricultural usage. Without deeper analysis, this number seems to indicate an increase in farmland acreage from 1974-1985. A generalized breakdown of this shows 9,200 acres in active cropland, 760 acres of permanent and temporary pasture, 831 acres vacant or idle, 80 acres in homesteads and 2,386 acres in woodland, wetland or wasteland associated with farms.

From these numbers we can estimate that about 10,000 acres (on the average) are currently used for agricultural production. The data taken from the Farmland Tax Assessments is not 100% accurate, but provides a useful indication of the condition of Upper Deerfield's agriculture in 1985, and it also provides a method to track trends in the area's agriculture.

In 1985, the three most widely grown crops accounted for more than half of the crop acreage in the Township (4,716 acres). These were, in order from high to low, corn(for grain), soybeans and snap beans. The next most commonly grown crops accounted for another 2,800 acres of cropland, each having approximately the same acreage. They were, in order from high to low: wheat, potatoes, trees and shrubs, and barley. The remaining cropland acreage was devoted to various other field and vegetable products.

Also in the Township were approximately 700 acres devoted to the pasturing of dairy and beef cows, swine, sheep and horses.

From the previous information it seems that agriculture is varied in Upper Deerfield Township Township, but primarily consists of field crop agriculture. Husbandry and other forms of farming such as lumbering and orchards take a much lesser role and these are usually found on the poorer and less productive soils. There has been some fluctuation over the past decade concerning the type of crops grown in Upper Deerfield. Although exact acreages are not yet known, it seems that both soybeans and corn have fluctuated up and down while nursery stock has seen a steady increase in acreage. This is because they are a high value crop well suited to the area's soils and climate.

When the Township undertakes another detailed land use inventory exact data concerning agricultural/non-agricultural acreage will be available. This would aid in determining how much agricultural land has decreased and to what other land use(s) is it losing acreage.

The continued viability of Upper Deerfield Township's agriculture depends much upon its proximity to a huge urban market, mainly Philadelphia and New York. This positioning is for the moment a stable one, but threatens to become a problem as development encroaches further southward into rural Salem, Gloucester and Cumberland Counties. The completion of New Jersey Route #55 is probably the biggest threat to the continued viability of agriculture as it will provide a direct and quick route from the heavily urbanized area of Cherry Hill and Camden into southern New Jersey. Ironically, the closeness of Upper Deerfield to this market is one of the major reasons for agriculture's prosperity here. For the Township to achieve its goal of preserving productive farmland, sufficient advance planning will be needed to reconcile this dichotomy of the effects of close proximity.

The urban influence has brought and continues to bring about many changes in local and regional agriculture. Most of the trends in the Township's agriculture are the same as those found on the state level. These include: the loss of overall farm acreage, fewer and larger farms, fewer farmers, increasing productivity per acre, and increasing income

per farm. These trends are happening virtually everywhere in American farming, regardless of whether or not there is approaching development. Historically, much of this change has been due to technological advances which have made farming more productive and accessible. The initial change came with advances in fertilization, soil conservation, irrigation management practices, in addition to the mechanization of farms. In this area especially, improvements in both the transportation network and farm commodity marketing facilities have forever changed agriculture by tying it more closely to urban areas. Now that the "friction of movement" has been eased by state and interstate highways, farm commodities can be brought great distances quickly and profitably.

This ability has its advantages and disadvantages. While it creates new markets for farm goods, it also creates intense regional competition and the ability to flood one market with cheaper farm products shipped from another region before local farms have a chance to take advantage of the market conditions. Generally, though, Upper Deerfield Township benefits from this proximity to market and ease of transportation.

Another effect of the expanding northeast megalopolis on the area's agriculture is the increasing value of farmland, both in the assessed and the sales values of the land and in the price received for crops grown on it. This increase happens some distance away from the leading edge of development, long before loss of farmland to urban/suburban uses becomes a problem. As of 1984, New Jersey had the highest value per acre of farmland of any state. This presents problems for farmers wishing to expand, because land is often too expensive to buy. This is a problem in Upper Deerfield which forces many farmers to rent or lease land.

Recent trends in agriculture and farm conditions again bode change in farming. Farm prices have generally been low nationwide, but due to bad weather conditions in many portions of the country, south Jersey farms have benefitted from lack of competition in the marketplace. This condition is, of course, cyclical and subject to chance weather conditions and cannot be counted on in the long run.

Another recent national trend is the health and natural food consciousness of today's younger buying public. Freshness and variety are very important to the young urban shopper as well as the suburban housewife or husband. There seems to be an increase in smaller farms and a proliferation of roadside stands selling fresh, "home-grown" produce. As such conditions are right to let smaller farms become profitable and allow younger and new people into agriculture. Additionally, the emphasis on freshness has hurt the canning industry, but is not affecting frozen food operations which are very important to the Township's economy.

The picture looks relatively bright for Upper Deerfield farmers. The markets are available, the diversity of product is present and development has not yet taken its toll on the farmland. Natural conditions have always been good in the area for agriculture with excellent soils and a long growing season. The trick will be to preserve this farming legacy into the future and balance it with the development which will inevitably occur.

Soil Suitability For Agriculture

Soil quality plays one of the most important roles, if not the most important role, in any agricultural area. Without suitable quantity and quality, it is close to impossible to develop a viable farm community. This is especially true in New Jersey where land values are at an average of $2,500 to $6,000 per acre and development pressure is heavy. Improvements and reclamation of poor soils are extremely costly and rarely give economic returns to the farmer. This is one reason why county and local governments should try to encourage continued farming and upkeep of prime soils where possible.

Determining the location of prime agricultural soils is necessary for communities attempting to preserve farmland. It allows planners to base their decisions on concrete geographic information about the distribution of excellent to poor soils. As referred to , the U.S.D.A. Soil Conservation Service has developed a system correlating soils and agricultural usefulness. This system is called "Capability Grouping" and its purpose is to aid in showing the suitability of each soil for various kinds of field crops.

Class I and II soils are in agricultural production presently. Some Class III soils are also being used. One of the soils, Pocomoke, tends to flood frequently and is seldom cultivated in Upper Deerfield. Class V and VI soils are relatively rare and are not cultivated where they do exist. Of the two Class VII soils, Evesboro is rare and Muck is found only along streams.

There can be little doubt that the soils in Upper Deerfield Township are extensively well suited to agriculture. Visual inspection of the community would reveal the farming activity being carried on here as well as a review of the history of the area. The soils are a valuable resource and agriculture a viable, important industry. Because soils well suited to agriculture have few limitations for development, areas where they are found are often times under development pressures. Striking a balance between farmland preservation and development becomes a crucial and difficult decision.

Upper Deerfield has no soils in either Class VI or Class VIII. Figure 6 shows the prime agricultural lands within the Township. This mapping is generalized and should be verified for a specific site against actual Soil Conservation Service maps.

Soil Suitability For Various Crops

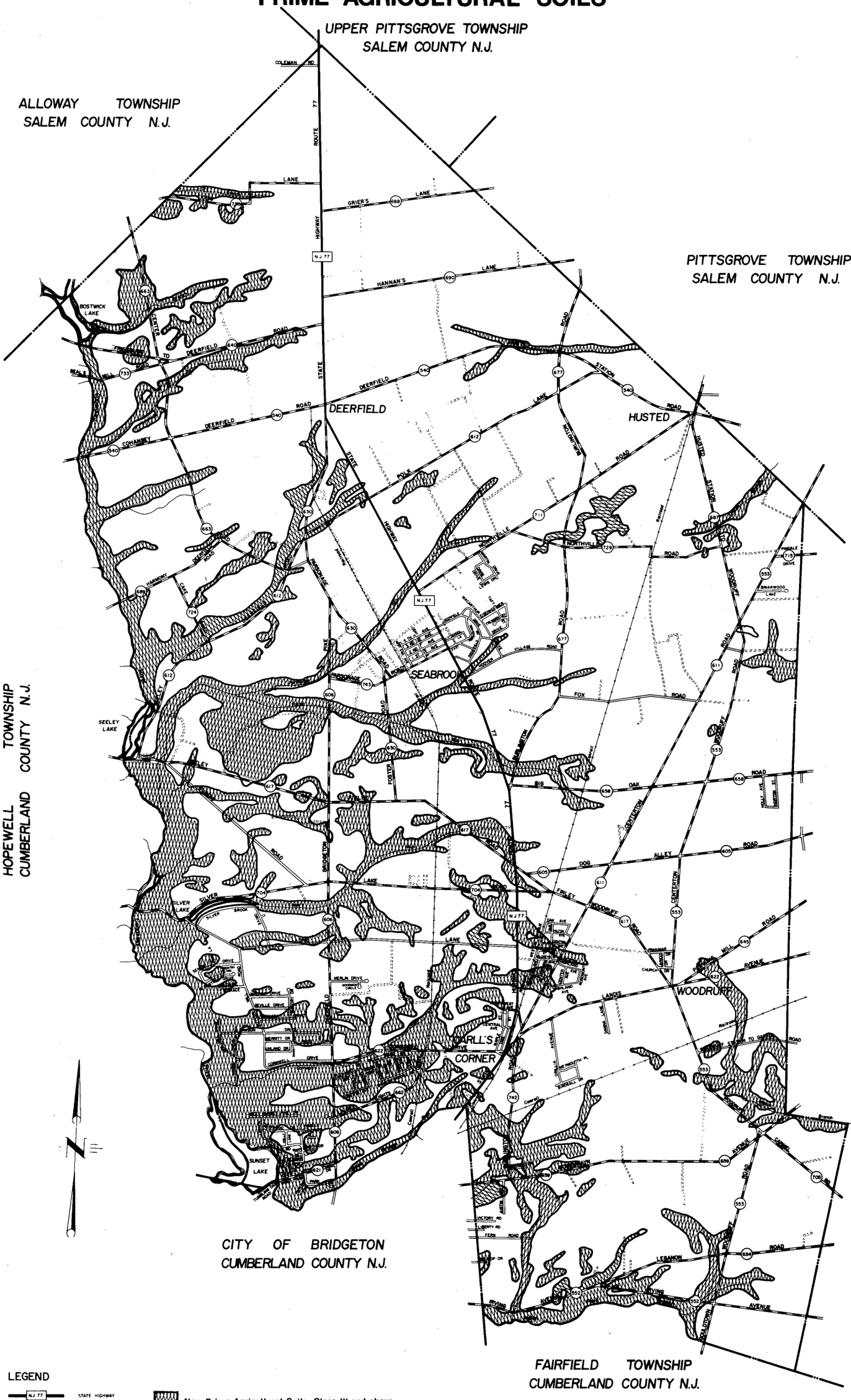
Within Upper Deerfield Township there are a variety of crops grown. Most of these crops grow best in certain soils and only a few types of agriculture are suited to all soils. An example of the latter is corn, which will grow in all but a few soil types.

This list does not take into account various levels of soil management, fertilization, irrigation and other techniques used by farmers to

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

PRIME AGRICULTURAL SOILS



LEGEND

- STATE HIGHWAY (NJ 77)
- COUNTY ROADS (553)
- TOWNSHIP ROADS
- PRIVATE ROADS & LANES

Non-Prime Agricultural Soils - Class III and above

Prime Agricultural Soils - Class I and II

1982

SCALE IN FEET

Source: U.S.D.A. Soil Conservation Service - Soil Survey

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LeGrande Brancheau, Cartographer

Base Map: George A. Schock, P.E.

TABLE 6

U.S.D.A. CAPABILITY GROUPING OF SOILS FOR AGRICULTURE

Soil	Map Symbol[1]	Capability Grouping
Atsion sand	Ac	Vw-26
Aura gravelly sandy loam, 0-2%	AgA	IIs- 9
Aura gravelly sandy loam, 2-5%	AgB	IIs- 9
Aura loamy sand, 0-5%	AmB	IIIs-10
Aura sandy loam, 0-2%	ArA	IIs- 9
Aura sandy loam, 2-5%	ArB	IIs- 9
Chillum silt loam, 0-2%	ChA	I - 4
Chillum silt loam, 2-5%	ChB	IIe- 4
Downer loamy sand, 0-5%	DoB	IIs- 6
Downer loamy sand, 5-10%	DoC	IIIe- 6
Downer sandy loam, 0-5%	DrA	I - 5
Downer sandy loam, 2-5%	DrB	IIe- 5
Evesboro sand, 0-5%	EvB	VIIs- 8
Evesboro sand, 5-10%	EvC	VIIs- 8
Evesboro sand, 10-20%	EvD	VIIs- 8
Fallsington sandy loam	Fd	IIIw-21
Fort Mott loamy sand, 0-5%	FrA	IIIs- 7
Hammonton sandy loam, 0-2%	HaA	IIw-15
Hammonton sandy loam, 2-5%	HbA	IIw-14
Hammonton loamy sand, 0-5%	HbB	IIw-14
Matapeake silt loam, 0-2%	MoA	I - 4
Matapeake silt loam, 2-5%	MoB	IIe- 4
Matapeake silt loam, 5-10%	MoC2	IIIe- 4
Mattapex silt loam, 0-2%	MrA	IIw-13
Mattapex silt loam, 5-10%	MrB	IIw-13
Muck	MS	VIIw-30
Pocomoke sandy loam	Ps	IIIw-24
Sassafras gravelly sandy loam, 0-2%	SgA	I - 5
Sassafras gravelly sandy loam, 2-5%	SgB	IIe- 5
Sassafras gravelly sandy loam, 5-10%	SgC2	IIIe- 5
Sassafras sandy loam, 0-2%	SrA	I - 5
Sassafras sandy loam, 2-5%	SrB	IIe- 5
Sassafras sandy loam, 5-10%	SrC2	IIIe- 5
Woodstown sandy loam, 0-2%	WmA	IIw-14
Woodstown sandy loam, 5-10%	WmB	IIw-14

[1]As shown on soils maps prepared by the U.S. Department of Agriculture, Soil Conservation Service.

TABLE 7

UPPER DEERFIELD TOWNSHIP
SOIL SUITABILITY FOR VARIOUS CROPS

Aura - fruits, vegetables, general crops, mainly peaches, apples, tomatoes, cabbage, corn and soybeans.

Chillum - high value vegetables, nursery plants, corn, wheat, barley, hay or pasture.

Downer - vegetables and fruits, fertilizer leaches rapidly.

Fallsington - (when drained) corn, soybeans, hay, and late planted vegetables. Plants must be water tolerant.

Fort Mott - deep rooted perennial crops such as peaches, grapes, sweet potatoes, pumpkins and cantaloupes.

Hammonton - vegetables and fruit (short term water tolerance needed).

Matapeake - corn, small grain, soybeans, hay, pasture, vegetables, nursery plants and sod.

Mattapex - corn, small grain, soybeans, hay, pasture, vegetables, nursery plants and sod.

Pocomoke - (if drained) corn, soybeans, hay, pasture, blueberries, limited summer planted vegetables.

Sassafras - vegetables, fruits, general crops, nursery plants, hay, and pasture. Nearly all high value crops are irrigated.

Woodstown - (if drained) vegetables, fruits, sod, nursery plants and general crops. High value vegetables are general irrigated.

increase the yields of soil types. It assumes average management practises.

The three Class I soils, Chillum, Matapeake and Sassafras 0-2% slopes, are similar enough to have the same crops grow equally well on each of them. All three soils grow high value vegetables, corn, and nursery plants. Also grown are wheat, small grain, barley, sod and other grains. The best and largest areas where these soils are found is north of "Deerfield Street" and east/southeast of Seabrook. They are all silty loams and are by far the most productive land in the Township.

The five Class II soils within Upper Deerfield Township are Aura, Hammonton, Mattapex, Sassafras 2-5% slopes, and Woodstown. The crops most commonly grown in these soils are vegetables and other general crops. Some fruit is also grown here, primarily peaches and strawberries. Since there is relatively little acreage devoted to fruit production within the Township, most of these soils are in vegetable production. High value vegetables generally need to be irrigated when grown in either the Sassafras 2-5% or Woodstown soils. In addition, crops grown in Hammonton soils need short term water tolerance because of seasonal wetness.

The five Class III soils in Upper Deerfield are Downer 5-10%, Fallsington, Fort Mott, Pocomoke and Sassafras 5-10% slopes. The types of agriculture suited to these soils varies considerably according to the specific limitations of each. For example, plants cultivated in Fallsington soils without sufficient drainage must be extremely water tolerant because of a year-round high water table. Fort Mott soils are best suited to deep rooted perennial crops such as peaches, sweet potatoes, pumpkins and cantaloupes because of a high drought prone surface layer. The area containing most of these soils in Upper Deerfield was used for orchards during the 1930's but has since either been developed or changed over to more competitive vegetable production. Downer soils are most productive with either vegetable and fruit crops, but frequent fertilization is required. There is very little Pocomoke soil in Upper Deerfield and none is currently used for agriculture. Sassafras 5-10% slope soils are considered excellent soils by area farmers.

Planning For Agriculture Preservation

Before discussing the methodologies and objectives of this Plan for the preservation of agriculture, it would be helpful in understanding the policies proposed if the reasons for such preservation were discussed. Agriculture as can be seen from the facts thus far presented, represents a very important part of the Township's environmental and economic make-up. The soils and climate of the area are well suited to farming and are capable of producing high yields of profitable, needed crops. Agriculture is therefore, in a way of speaking, an environmental asset worth recognizing and protecting. Once farmland is lost is very rarely, if ever, reclaimed.

In addition, farmland serves as open space and habitat (many times not appreciated by the farmer) for many species of wildlife. The

openness of the land, its control of water if properly conserved and used, and the effect on air quality all amount to environmental assets worth considering when viewing the possible alternative- development. Many residents were and continue to be drawn to the area because of the fact it is a farming community although they themselves are not farmers or work in farm related industries. It is the curse of agricultural areas that many want the openness they offer which ultimately leads to suburbanization and the loss of the very openness sought. Therefore, it can be both a social and environmental desire to preserve farmland. The social reason justified by the fact that the farmland to protected is "prime farmland" truly worthy of preservation for its natural value.

From an economic standpoint, farmland preservation makes sense as well. As noted earlier, farming is big business in Upper Deerfield. Farming and the businesses it supports in being supporting itself create an economy which brings considerable employment and income to the area. Seabrook Brothers and Sons, Inc., the frozen food processing operation, employs over 150 persons year round and over 400 during the growing season. Farm equipment supply and maintenance, agricultural supply stores, food processors, packaging firms and a host of other businesses are dependent upon agriculture. The decline or loss of agriculture as a business in the area has in the past and would in the future mean serious economic problems. Replacing that economic generator would not be easy.

Recognizing these facts the Township's planners have consistently sought to preserve agriculture through the planning tools available to them. Since the start of planning in the Township in 1960 they have been relatively successful. However, much of that success has been more the result of economics than specific land use policies. The boom economy of the early 1970's saw considerable development within the Township and the loss of considerable farmland. More recently the Township has seen a continual erosion of farm acreage to development although incremental in nature. While land use policies have helped to slow development within the prime agricultural areas, again economics has been the big factor in retarding development.

For the most part, zoning has been the primary tool used to preserve agriculture in the Township. Of course, farmland assessment, a State-wide program, can be considered a major inducement and aid in preserving farming, it cannot, however, prevent development. Planning policies and programs can.

In 1976, Upper Deerfield through its Master Plan delineated those portions of the Township wherein were found the prime agricultural soils and "set them aside" to be preserved. The Township zoned the areas for agriculture and rather severely curtailed the types of development which could occur therein. Minimum lot size was set at five acres. It became public policy that development would not be allowed within these areas to the greatest extent possible and capital improvements were to be curtailed to areas where development was being encouraged to locate.

These policies have been somewhat successful in discouraging indiscriminate development throughout the Township. Unfortunately one device developed and implemented to help farmers with the effect of such a land

use policy has been misused, although not by the farmer. The "rural residence" was established as a conditional use within the A Agriculture districts to permit unusable pieces of farmland to be sold off or developed. Too often landowners who have no interest in farming or preserving the land have used this device to subdivide small lots for housing. This methodology has also be exploited by the policies of the Farmers Home Administration which limited the size of lots for which it would provide financing. Fortunately, those policies have been changed to address the issue of prime farmland.

Another problem which has and will continue to plague farming is conflict over its practices with neighboring development. While many love the idea of looking out the front picture window at green fields of grain or vegetables, nonfarming residents detest early morning plowing, crop spraying, the noise of pumps irrigating and many of the other activities necessary to make that field grow and be profitable. Upper Deerfield Township has always had an unofficial position that farming was here first, it is important to the area's economy, and requires its own special activities to be viable. Conflicts have always been mediated wherever possible without putting undo pressure on farmers. The "right to farm" was taken as a given although never officially articulated in an ordinance as was done in many municipalities. The right to farm was incorporated in State statute recently and now is the law of land. No doubt complaints of health and environmental nuisances will continue to arise between farming and development however.

Another planning tool enacted but so far unused is the farm conservation plan. When in 1976 the Township adopted regulations setting forth soil erosion and sedimentation standards as part of its development regulations, there was a requirement that within five years of the effective date of the law, all agricultural or horticultural uses were required to have a currently acceptable farm conservation plan prepared and approved by the Cumberland County Soil Conservation District. Each year the District was to provide the Township with a list of all agricultural operations within the Township that were being carried out according to a currently acceptable farm conservation plan. To date the District has never provided such a list and though discussed on several occasions no progress has been made in implementing this program. That is not to say the area farmers and the District are not working under such plans. It was hoped that by cooperating in this way, both the District and the Township could encourage all farmers to practice conservation and preserve the farmland. Many (especially nonfarming landowners) have not done so and the land has suffered as a result.

County Preservation Program

Recently the Cumberland County Agricultural Development Board adopted a program designed to encourage the retention of farmland considered to be the best for future production agriculture. Since the passing of the "Agriculture Retention and Development Act" in January of 1983, which allowed counties to set up agricultural development boards, Cumberland County's Board has been busy developing criteria for agricultural development areas(ADA's) the land they think is successful or

potentially successful farmland. These are divided into statutory criteria and "locally developed" planning criteria.

According to the Cumberland County plan, there are three statutory criteria that determine where agriculture will be "the preferred but not necessarily the exclusive use of the land." The criteria for land to be in an ADA is that it:

1. Encompasses productive agricultural lands which are currently in production or have a strong potential for future production.

2. These areas should be reasonably free of suburban and commercial development.

3. The land cannot comprise an area greater than 90% of the agricultural land in Cumberland County.

The Cumberland County Agricultural Development Board's planning criteria for ADA's are:

1. Lands shall be eligible for Farmland Tax Assessment.

2. Not have final municipal or county planning board approval for non-agricultural development.

3. Be at least 25 contiguous acres minimum size.

4. Not include land zoned for industrial use by municipalities nor land owned by governmental agencies.

5. Be consistent with adopted municipal land use plans.

6. Consist of economically productive and viable soils [not limited to U.S.D.A. Class I, II and III soils.]

7. Not be within the service area of publicly funded water or sewer systems nor be in proximity to a limited-access highway interchange.

Specifically to be included in such determination will be nursery, greenhouse, salt hay and equine centers if they meet the other criteria. Upon appeal or after review, the Cumberland County Agricultural Development Board may determine that a parcel of land will contribute to the success of agriculture in the county or municipality in which it is located.

It seems obvious that the Board recognizes the extensive variety in types of agriculture within the County. Thus it has established criteria which will include as much economically viable and potentially viable land as possible. It is important to note that the criteria also takes into account non-agricultural development needs, realizing that farmland in areas either adjacent to existing development, close to limited access highway interchanges, or areas with public water and sewage hook-up

usually does not have much chance of continued success due to development pressure.

The creation of an agricultural development area may be created only by voluntary landowner sign up. The Farmland Preservation Program is an agreement between the CCADB and the landowner who agrees to retain the land in agricultural production for a minimum of eight (8) years and thereby receives the benefits. The benefits include eligibility to apply for soil and water conservation funding and assurance that farm structure designs from land grant colleges and approved by the State Agriculture Department Committee will meet local code standards.

It is the intent of the program is that benefits of cost-sharing would provide added support to farmland preservation by allowing farmers to make their land more profitable. It is hoped that if a farm is more profitable to the farmer, he is less likely to sell off the land to developers or even to individual buyers intending to build single-family houses. The County does not see an immediate need for other farmland preservation programs such as deed restrictions (development easements) and exclusive agricultural zoning. The current plan is for economic support and short term development restriction to be the effective force behind farmland preservation.

Upper Deerfield probably because of its considerable farming community is lucky because it therefore has considerable citizen involvement, and although this could be improved to some degree, it is an advantageous point in favor of agricultural preservation. Without the awareness and action on the part of the Township's farmers, an agricultural development area would have little or no chance of succeeding. As mentioned earlier, the Cumberland County Agricultural Development Board has voluntary sign-up as one of its criteria for an agricultural development area. This places much of the responsibility and initiative on individual landowners, knowing that his farmland will not be included in an ADA without his permission or acknowledgement.

This voluntary basis could also be a hindrance to the creation of such areas. Education and public relations will be required to explain the program to farmers and to encourage them to participate. Too often voluntary measures fall far short of the intended goals sought. Upper Deerfield now has three parcels under this program and a number of additional applications pending.

Balancing Agriculture and Other Development

In discussing and planning for the preservation of agriculture it is important not to forget that farming is also a form of land use, man manipulating the natural environment. As such, it is not free of real nuisances, adverse environmental impacts, health risks(to both the farmer and his neighbors) and the creation of its own social and economic problems. It is therefore, necessary to be sure that agriculture is carried out in a manner which respects the land and the people who live adjacent to it or can be affected by it. Fortunately most farmers are responsible citizens and neighbors who recognize the value of their land and care for it properly. But this is not always the rule.

Many times farmers have financial problems which force them to utilize or employ methods which cause environmental damage or nuisances for neighbors. Soil erosion, lack of water control, careless use of chemicals, unsafe practices or structures and shortcuts create many problems for a community. Therefore, regulation is necessary to protect against such abuses and to encourage and where necessary, require safe and proper farm practices.

Farming today is highly technical with considerable use of a vast array of equipment, machinery, chemicals and procedures designed and intended to maximize crop yields and quality i.e. profits. There is a considerable cost to such use in terms of health, environment and and farm economics. Chemicals are perhaps the most worrisome of the technilogical advances in terms of their long term effects. Often times touted as necessary for larger and more appealing (to the consumer) crops, their use is quite expensive and can cause health and environmental problems. Nitrates from fertilizers, insecticides, herbicides, and even antibiotics in livestock can have devastating consequences off the fields and farms. Many farmers around the country are beginning to abandon heavy use of chemicals and are returning to age-old techniques long considered outdated by the "modern" farmer.

The U.S. Department of Agriculture estimates that 30,000 of the nation's 2.1 million farmers are raising crops without chemicals or are close to eliminating their use. Other experts believe the number ranges from 50,000 to 100,000.[1] Rotating crops, use of manure and compost and other "natural" methods are rapidly becoming standard practise. Such methods would hold special promise for making farming's coexistence with development and would vastly improve the environment.

Often times new procedures result in serious problems to both farmers and the residents of a farming community. One such incident in Upper Deerfield concerned the application of sludge on farm fields within the community. The sludge was composted material from Philadelphia's sewage facilities which was not being properly supervised and which severely curtailed the future use of the crops grown upon the fields where it had been applied. If not properly applied in a timely fashion there were also nuisances from odor emanating from the stockpiled sludge. County Health Department regulations were finally enacted in an effort to control this problem.

Leased farmland or farmland owned by absentee landlords also can result in uncaring farm practices by tenants. Soil depletion and erosion are often times the major problems resulting from such circumstances. This type of activity will not preserve agriculture, but will rather hasten its demise. Regulation and/or government intervention will not necessarily solve such problems or even improve adverse situations such as absentee ownership of farm land which is improperly managed. What is important however, is to balance control and regulation with the freedom to permit agriculture to prosper and evolve. Soil erosion and sedimentation control regulations, standards for proper drainage design, health

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[1] New York Times, "Farming Without Chemicals: Age-Old Technologies Becoming State of Art," Schneider, K., August 23, 1987.

regulations and the zoning controls are necessary for agriculture as they are for any other land use.

Farmers alone cannot be expected to save farming or cure all of its negative atrributes. If we as a community value its existence then we must collectively help to preserve agriculture as not just a way of life, but a viable income producing enterprise in our modern, developing world. Residents and their governments at all levels must work with the farming interests to enhance, protect, encourage, permit, advance and adapt agriculture to make it profitably fit in to the overall plan for the community. If farming ceases in Upper Deerfield Township, we stand to loose much more than the crops previously grown. Farming must be seen as an industry with its own unique experiences, needs and values. As such it is intertwined with all the decisions made within the community whether economic, environmental, land use related or social.

Recommendations

There is little doubt that Upper Deerfield Township's soils are an natural asset with high fertility and that agriculture still thrives upon them. It is also clear that agriculture is still vitally important to the area's character and social and economic make-up. Thus the preservation of agriculture must still be considered a primary goal although there is concern and disagreement over the methodologies best suited to attain such a goal. The following recommendations appear appropriate and useful in that pursuit.

1. Prime agricultural soils should be preserved wherever agriculture remains viable. Limits to development's spread should be set based on these two factors.

2. Agriculture should be recognized as a primary industry deserving of protection and regulations should seek only to control its improper activities which create environmental, health or safety problems or risks.

3. Township policy should be directed to enhancing the continued viability of farming in the area by encouraging the expansion of markets for farm products and promoting diversity in the local economy which will reduce the effects of cyclical trends in agriculture.

The following specific objectives should be sought:

a) Lot sizes in agriculturally zoned areas should be increased to a minimum of six(6) acres. This would continue the policy that any lots created would meet farmland assessment standards and make purchase of land within these areas less attractive to the person just wishing to build a single-family home.

b) The rural residence conditional use procedure should be tighten to eliminate its use for circumvention of the Master Plan's goal and intent to preserve prime agriculture lands from development.

c) An effort should be made by municipality to work with the Cumberland County Agricultural Development Board in making farmers aware of the Agricultural Development Area program and to encourage their participation therein.

d) Areas where prime agricultural soils are found and which are either currently being farmed or are still viable for productive agriculture should be zoned for agriculture and all other development severely curtailed within those areas.

e) The requirement that farms operate under approved soil conservation plans should be enforced at least to the extent that local planners are advised which farms do have such plans. In this way efforts could be undertaken to reach those who do not have such plans and monitor the effectiveness of the plans in use in terms of preserving the good farmland.

f) Economic development activities within the community should account for farming and agriculture considered equally, if not more valuable than industrial or commercial not related to it.

g) Begin immediately to investiage methodologies and ways of financing them to permanently preserve major agricultural tracts either through outright purchase, purchase of development rights, or any other means which would preserve such parcels. This would include identifying such sites and possible funding sources (Green Acres, foundations, development tax or fee) and planning for such parcels future use if purchased.

CHAPTER IV EXISTING LAND USE AND DEVELOPMENT CAPABILITY

Introduction

The last detailed land use inventory was undertaken in 1974 by the Township Planning Board and was performed under contract by the Cumberland County Planning Board. It has not been formally updated and is its findings are again presented here since it serves as a base. In 1985, the Planning Board had a generalized existing land use map prepared using aerial photos, spot site inspections and development regulations records to pinpoint current land use. Although not entirely accurate, the map does provide visual representation of development patterns since the 1974 study was done. For this reason it is valuable and a useful tool for the Township's planners in making future land use decisions.

A new land use study is needed which would utilize the same methodology employed in 1974. This would provide a more detailed and accurate picture of land development throughout the community during the intervening years. When the land use data is coupled with the information gained on the environment it provides a base of reference in determining the goals and objectives as well as the specific recommendations for the master plan. Such a survey is costly both in time and money, but well worth the expense and should become a priority for the Planning Board within the next several years.

The 1974 Land Use Study

The study undertaken by the Cumberland County Planning Board in 1974 on behalf of the Township was entitled: EXISTING PATTERNS AND ENVIRONMENTAL CHARACTERISTICS - UPPER DEERFIELD TOWNSHIP, and was published in July of that year. In surveying the land use activities within the Township the County planners utilized a classification system involving 113 categories. The land use codes for industrial uses were compatible with the Standard Industrial Classification (SIC) Divisions and therefore, enable the data to be related to the U.S. Census which clarifies economic data according to SIC Divisions. The classifications were also adapted to computerization although the data was never entered into a functional program.

All field work was done on tax maps of which there were 33 at the time, there are now 34. The tax maps were used because:

1. Each parcel is shown, thereby allowing greater detail than

U.S.G.S. sheets.

2. Dimensions and acreage, although not always accurate, are already shown on the tax maps. Thus faster calculation of acreage involved in each type of land use is permitted.

3. Easy and rapid conversion of information to a numerical and/or letter code is made possible.

4. Street names are already given on tax maps which are helpful for orientation of map users in the field.

5. The system can be expanded so that another survey would become unnecessary, if an ongoing maintenance program of the data is undertaken and adhered to by local officials.

Unfortunately, the 1974 study was not continually updated as was recommended and planned. In reality, it is probably unrealistic to think that a general update would not be necessary given the passage of a significant amount of time i.e. over ten years. The 1978 Master Plan had recommended that the land use information be updated through zoning permit applications' surveillance. Such surveillance was begun, but with changes in staffing not continued. It also became apparent that to make sure that all land use activity within the Township were duly recorded, more than zoning permits would have to be monitored. Building permits, subdivisions and tax records would also have to be watched if the records were to be kept up to date.

The information collected in 1974 was used by the Township's tax assessor when his records were computerized, but since the data was not easily retrievable or useable due to programming capabilities the data was again not kept current. The '78 Plan's call for the computerization of the land use data is still valid and would provide a means of ongoing land use survey. Recent computer purchases by the Township should make possible the computerization of the land use data should a new survey be undertaken. What will be required is a new system of updating that information using the various sources of land use information available to the local planners. This will mean a high degree of cooperation between various Township officials which should not be difficult or impossible to achieve since all the officials involved would stand to benefit from the information thus made available. Any new computer equipment or programs to be purchased by the Township should take into account this proposed need to computerize land use data.

The 1974 Data

Table 8, "Land Use 1974" gives a comparison of the 1974 land use computations with the 1964 figures from Cumberland County Planning Board's LAND USE - 1964, published in October, 1965. The 1978 Township Master Plan noted that "...there had been some significant further changes[in land use patterns], but the economic slump and recession of 1975, in effect, curtailed development." While rapid growth was curtailed as result of economic conditions, the attractiveness of Upper Deerfield did cause continued development.

TABLE 8

TOWNSHIP OF UPPER DEERFIELD

LAND USE 1974[1]

Township Area: 31.8 square miles or 20,352 acres

Township Population:	1960	1970	Change
	6,040	6,648	+608

	1964		1974		
DEVELOPED	Acres	Percent In Use	Acres	Percent In Use	Increase or Decrease
Residential	848.1	4.2	1,615.0	7.9	+ 766.9 acres
Commercial-Service Wholesale	60.6	0.3	188.1	0.9	+ 127.5 acres
Transportation-Utilities Communications & Ind.	240.2	1.2	435.1	2.2	+ 194.9 acres
Public & Quasi-Public Buildings	84.4	0.4	167.5	0.8	+ 83.1 acres
Roads and Streets	629.8	3.1	1,364.0	6.7	+ 734.2 acres
Total	1,863.1	9.2	3,769.7	18.5	+1,906.6 acres
PUBLIC OPEN SPACE					
Parks and Playgrounds					
Total	64.7	0.3	83.2	0.4	+ 18.5 acres
AGRICULTURE					
Rutgers Research Farm	---	---	242.5	1.2	+ 242.5 acres
Other Agriculture	13,880.6	68.2	12,503.9	61.4	-1,376.7 acres
Total	13,880.6	68.2	12,746.4	62.6	-1,134.2 acres
UNDEVELOPED					
Woodland	4,078.8	20.0	2,710.8	13.3	-1,368.0 acres
Wetland	131.6	0.7	131.6	0.7	0.0 acres
Misc.-Vacant-Other	333.2	1.6	910.3	4.5	+ 577.1 acres
Total	4,543.6	22.3	3,752.7	18.5	- 790.9 acres
MUNICIPAL TOTAL	20,352.0				

[1]Upper Deerfield Township Tax Maps used as reference for lot acreages.

As note in the '78 Plan, the increase in residential development had a corresponding effect in increasing other forms of development which normally follows new residential development. Churches, stores, services and new roads all showed an increase during the 1964 to 1974 period. Likewise, agricultural and wooded lands showed a marked decline to this development. The loss of woodland was especially high since most of the new residential development occurred in wooded areas of the Township. The fact that agricultural and wooded areas from an environmental standpoint are usually quite capable of supporting development, as shown from the information in Chapters II and III, results in those areas being picked by developers. The preservation of these areas therefore, must rely on other considerations than the ability of the soils to sustain development.

The 1978 Master Plan noted the ownership of large tracts of land within the Township by one land development corporation as a result of a series of events emanating from the breakup of the old Seabrook holdings. While a considerable amount of that land holding is still in one company's possession, there has been considerable divestiture of land by the company and much of it to the consternation of planners. Especially irritating to the Township's planners has been the attempt to avoid development regulations and the burden of providing for development's needs by subdividing only along existing roadways which in most instances were classified as major collector roads. Such a pattern of development poses a real threat to the traffic handling capability of the roads involved, results in undeveloped interior tracts of large acreage with little, if any, planning for future access or development, and basically avoids the concept of overall planning of orderly growth.

The recent sale of these holdings has resulted in the new owners undertaking a very aggressive campaign to market these lands for development. Their development potential is being extensively touted with the result that a number of substantial tracts (parcels in excess of 100 acres) are now being sold. The Planning Board has adopted an approach requiring complete planning for the various tracts thus sold and has to date resisted efforts for zoning changes or accommodation of would-be development where detailed overall plans have not been presented and approved. This policy must continue if the suburbanization of Upper Deerfield is to be controlled and the ill effects of development minimized.

The planners' outlook on the existing land use patterns in 1978 have not been as bright as expressed however. Upper Deerfield has become much more of a a bedroom community than was originally thought with a large number of person working outside the municipality. Industrial development has not kept pace in the Township with residential development which means that new jobs have not been created. The completion of Route 55 into Pittsgrove Township will increase substantially the attractiveness of Upper Deerfield for residential development.

Another observation made in the '78 Plan that the wooded areas and agricultural lands lost to the development surge of the 60's and early 70's were not too detrimental because the agricultural lands were only marginally productive and the woodlands were basically preserved for shade and aesthetic reasons, has not continued. The land use map shown in Figure 7

shows that development has encroached into the areas of the Township with some of the most productive soils. The continued development of woodlands has meant the loss of wildlife habitat and loss of recharge areas for ground water supplies. The beginning of problems with development not taking into account natural conditions was foretold in the earlier Plan.

Finally the 1978 Plan made a strong plea for siting development where the land was most capable of accommodating it. Soil characteristics and natural conditions of a given site were recommended as the elemental basis to be used in making land use decisions. This is still valid and even more important as so-called "marginally useful" lands are used up and more farmland, woodland and wetland are eyed by developers. The intensity of development and the demand for land among competing activities will make the planners' job much more difficult. As noted, the balance and compatibility of agriculture and natural lands with development is tenuous at best. As development moves further into the Township, conflicts will multiply and serious, long term decisions will have to be made about the community's future.

The Current Picture

As was noted earlier, unable to undertake a full land use survey of the Township, the Planning Board had a generalized land use map prepared showing development as ascertained from observation, aerial photos and development records. This map shown as Figure 7, clearly shows the effect of indiscriminate placement of residential uses throughout the Township as was discussed earlier. Much of the development has occurred along the existing road system creating either spot or pockets of development throughout the agricultural areas. Some of this development is related to agricultural activities i.e. farm houses or the homes of farm personnel. Too often it is single-family homes on one acre or smaller lots with no relationship between the owner and agriculture.

The pattern of this type of development can be seen quite clearly along DuBois Road and Seeley Road(Seeley-Deerfield Road). Residential development has more or less occurred in a strip along these roads leaving considerable acreage behind the development. While not landlocked by the development, the land use activity does not appear to have been "planned" with the future development of the interior land in mind.

The map also shows that most of the development is in the lower end of the Township with a considerable amount situated along the Cohansey River and State Highway #77. Carlls Corner and Seabrook are the two developed "centers" in the Township having a variety of land uses.

There is still considerable undeveloped land both wooded and farmland which as noted in Chapter III, means there is still a chance of preserving these valuable areas. Although acreage figures are not available, a view of this map surely indicates the loss of additional woodland and farmland since 1974. Still when compared to the map detailing prime agricultural soils in Chapter III, the areas where farming is still productive have not been intruded upon by new growth.

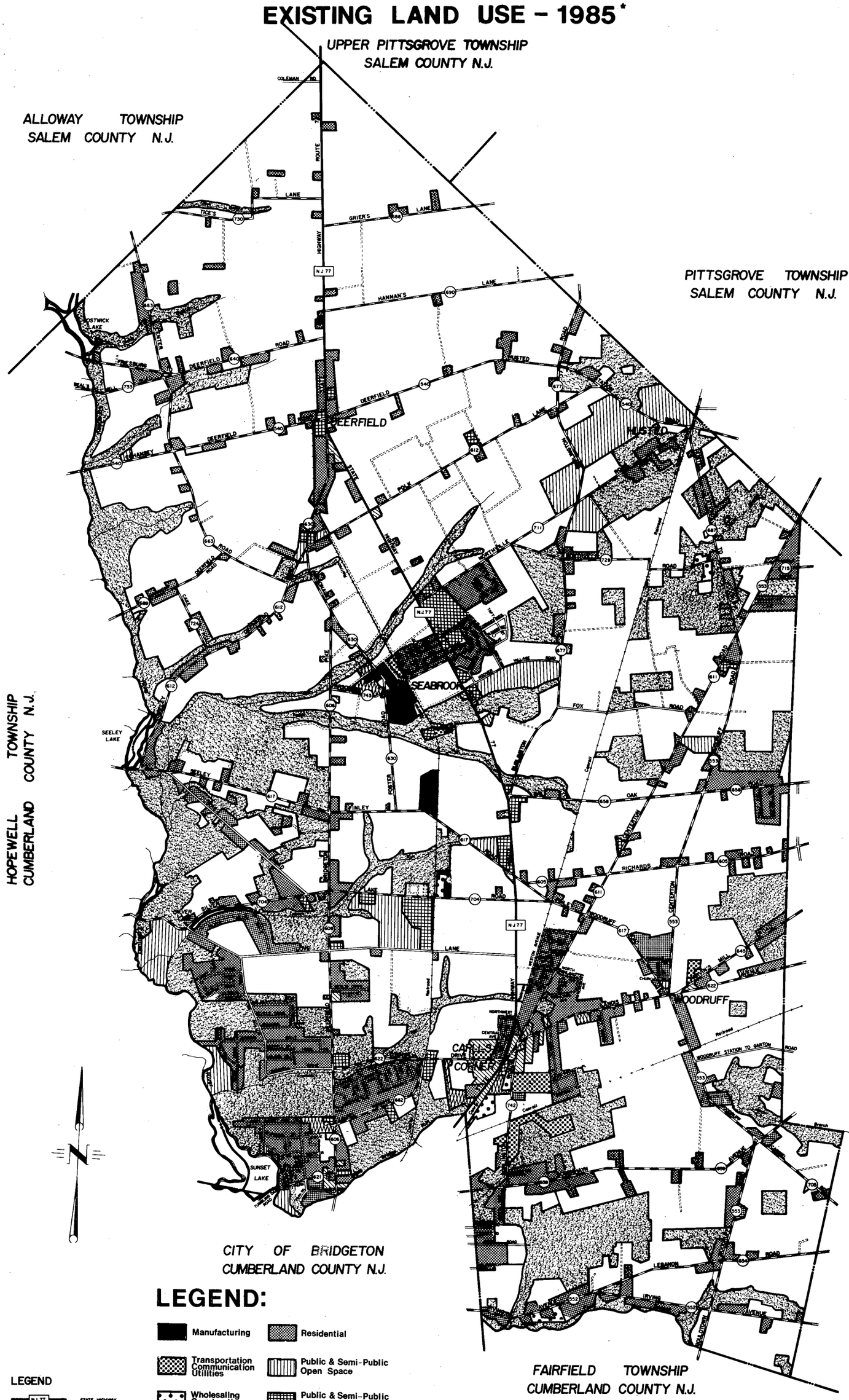
Although this map was prepared before the rail line abandonment was formally announced, the Conrail line between Bridgeton and Glassboro has been removed. The right-of-way is still owned by Conrail although the Township has made several offers to purchase it. Its use, if publicly owned, would probably be for utility lines and/or a new roadway. The abandonment and its future use will no doubt have an effect upon adjacent land. The Township had in its '78 Plan proposals for developing commercial and industrial activities along this rail line which, of course, is now less desirable as a location. Depending on the ultimate use of the abandoned right-of-way, land use activities could be greatly affected.

The installation of a new public water supply system in the Husted Station, Centerton and Big Oak Road areas may also affect the development of that area. Spill over growth from Pittsgrove Township could well be attracted to this area of Upper Deerfield. It would also be the obvious area of first contact with development emanating from the completion of Route #55 into Pittsgrove Township. Resolution of the contamination problem in this area should first be accomplished before any major new development activity is allowed to occur in this area.

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

EXISTING LAND USE - 1985*



LEGEND:

- Manufacturing
- Residential
- Transportation Communication Utilities
- Public & Semi-Public Open Space
- Wholesaling Construction Storage
- Public & Semi-Public Structures
- Service
- Woodland
- Retail
- Agriculture

LEGEND

- NJ 77 — STATE HIGHWAY
- 553 — COUNTY ROADS
- TOWNSHIP ROADS
- PRIVATE ROADS & LANES

1982

SCALE IN FEET

Harry R. Dare III, Planning Consultant, Licence No. 1510

LeGrande Brancheau, Cartographer

Base Map: George A. Schock, P.E.

* Generalized according to tax maps and aerial photos

CHAPTER V THE CIRCULATION PLAN

Introduction and History

The roadway system in Upper Deerfield Township has its origins in Colonial times when the area was covered with virgin forests traversed by Indian trails. One of those trails in the late 17th Century became the "Burlington Road" and was the main thoroughfare between the settlements in Fairfield and Burlington, then the seat of government for West Jersey. This roadway still in active use today, meandered through Upper Deerfield and became the stagecoach route to the north. The stage would stop at the Carllsburg Hotel in today's "Carlls" Corner then head north to "the Pole Tavern."

In 1768, the Bridgeton-Deerfield Pike was first opened and was reconstructed as a straight road some thirty years later. Eventually this roadway became a "turnpike" or toll road in the middle of the 19th Century and its toll gate house still stands today perched upon the shoulder of the Old Deerfield Pike, as the road is known today. This turnpike was used by farmers bringing their produce and livestock to market and short-cuts across the fields and woods to the Old Burlington Road in the vicinity of the toll gate were soon made by the farmers in order to avoid the nickel toll for a wagon. Perhaps Cornwell Drive and Laurel Heights Drive have their origins in this circumvention of road taxes.

As development increased and farming became the major business of the area, so grew the road system to provide a means of moving produce and livestock from the farms to market and bringing the goods needed to sustain those farms. The largest majority of the roads in the Township today are those so-called farm roads.

In the 1930's, State Highway 77 was constructed largely to serve the agricultural industry in the area i.e. Seabrook Farms. This was at a time when the internal combustion engine was beginning to replace the railroad as a major mover of goods and supplies. The railroads had been in the Township for some time with lines running from Bridgeton to Deerfield Street, Bridgeton to Glassboro and from Bridgeton to Vineland. Many locality names within the Township derived from the railroad stops e.g., Husted Station, Finley Station and Woodruff.

Today, the railroad still operates on two of the three former lines. The so-called Deerfield Running Branch which is approximately 3.3 miles of track from Bridgeton to Seabrook (the extension into Deerfield Street was

abandoned by the railroad) was purchased by the Township in 1983 and is now operated by the major shippers on the line as a short line railroad. The line was rehabilitated in 1984 and will continue to operate so long as the shippers find it economically feasible to ship by rail.

The Glassboro to Bridgeton line was totally abandoned in 1985 and disposition of the former right-of-way is being considered by its last operator, Conrail. This right-of-way bisects the Township on a north-south axis and abuts approximately 66 separate property owners lands along its total distance. Although the Township has indicated its interest in purchasing the right-of-way and preserving it for future use as a roadway or utility easement, a purchase price has not yet been agreed to by both parties.

The Bridgeton to Vineland line is now operated by the Winchester and Western Railroad which acquired it when it was abandoned by Conrail in 1985. At the time of that abandonment, most of Conrail's rights-of-way in Cumberland County were abandoned and in turn a coalition of shippers, private and public interests and the County spent a considerable amount of time and money to continue railroad service. So far such service is continuing with improvements to the lines being made. How long such service will continue is difficult to estimate, but rail service is a very valuable asset and a vital tool in attracting new industry to southern New Jersey.

There are approximately 108.61 miles of roads in the Township today composed of 9.44 miles of state highway, 65.82 of County roads and 33.35 miles of local or Township streets and roads.

State Highway 77 is still the major vehicular traffic route north from the entire western portion of Cumberland County. This roadway which begins in Bridgeton where it intersects State Highway 49, bisects Upper Deerfield and continues north crossing Route 40 in Pole Tavern and then continuing north to Mullica Hill where it joins State Highway 45. Route 45 crosses Route 322, a major east west highway connecting the Commadore Barry Bridge with Atlantic City, and continues north to the Philadelphia Camden vicinity and their extensive roadway network.

The Township also has another State roadway known as State Highway 56, and locally as Landis Avenue. This roadway has been improved with new paving and widened shoulders, but is still only a two-lane road. This road begins at its intersection with State Highway 77 at Carlls Corner and proceeds west intersecting State Highway 55 and then 47 in the City of Vineland. Route 55 is the new limited access, four lane highway currently in use from Maurice River Township (Port Elizabeth) north to Route 40 and then from Pitman north to its intersection with Route 42. The State is currently working on the connection between Route 40 and Pitman and it is expected to be completed in a couple of years. This new roadway will have a major impact on all of southern New Jersey and Upper Deerfield has already begun to feel that impact.

The remaining roads in the Township are former farm roads, in many cases, two rods wide (approximately 33 feet), or relatively new streets 33 to 60 feet wide, constructed in connection with new residential

developments and primarily serving those new neighborhoods. The responsibility for maintaining, upgrading, reconstructing and the overall planning for the future of these roadways is dependent upon a number of agencies at all levels of government. This fact made the planning of a cohesive and comprehensive circulation plan difficult to attain and implement. Over the past ten years however, there has been a much greater coordination of effort in regard to transportation planning which has brought about closer cooperation between the State Department of Transportation, the County and the Township.

The Problems

The movement of traffic into, around and out of the Township has shifted somewhat in the last ten years since the last Master Plan was put forward. As noted, Landis Avenue is now a State Highway which has probably upgraded the status of the Carlls Corner intersection still after 20 some years the most pressing transportation problem facing Cumberland County. The State Department of Transportation had put forward a plan for its redesign and reconstruction which with the abandonment of the Bridgeton to Glassboro rail line is now under revision. Present schedules call for this intersection to be reconstructed sometime in the early 1990's.

Traffic through this busy intersection only seems to increase and recent development in the Carlls Corner area of the Township, primarily commercial and industrial, has served as the impetus to much of that increased traffic. The reconstruction of the intersection is still the most pressing transportation problem facing the Township.

Most traffic in the Township is still being handled by the old farm roads which are in most instances, County roads. As development occurs, both within and without the Township, traffic increases along these roadways. The Old Deerfield Pike (County Road #606), Big Oak Road (County Road #658, the Seeley-Finley-Woodruff Road (County Road #553 and 617), Burlington Road (County Road #611), Irving Avenue (County Road #552), Cornwell Drive (County Road #622), Laurel Heights Drive (County Road #662), Park Drive (County Road #621), and Silver Lake Road (704) have and will continue to increase in traffic. Already there are problems with their various intersections, the speed of traffic along them and their ability to handle the increased traffic. Several local streets have experienced similar difficulties. Love Lane and DuBois Road have both seen increased development along their rights-of-way and increased traffic.

These problems, obviously affecting State Highways as well, need to be addressed at the time development occurs. Failure to do so will render any circulation plan developed useless within a very short period of time. Planners and those in charge of making land use decisions will need to pay much more attention to roadway classifications, design of developments, and the movement of new traffic along existing roadways, if the problems are to be abated or avoided. Planners will have to require developers to submit much more detailed information on trafffic at the time they apply for approval of their development. In addition, the Township will have to be prepared to review such analyses and require that appropriate and sufficient measures be taken, both on-site and off-site, to handle increases in traffic volume and movement.

Another problem facing the Township is the movement of traffic across and through it. As noted above, most traffic is using the State Highways which as also noted, converge in Carlls Corner. As development occurs in other areas of the Township and areas outside the Township, traffic patterns will change and should be planned for now while it is still possible to do something to meet the increased demand. It should also be recognized that Carlls Corner will only become more congested if all traffic is made to pass through it. The completion of Route 55 to the northeast of the Township will increase traffic into the Township from this direction. Additionally increased development along the roadways leading to Route 55's interchanges will also create problems and increase traffic flows along these existing roadways.

Major residential developments as well as industrial development planned and proposed between Carlls Corner and Seabrook will put real pressure on the Township to handle the increase traffic through the community. Alternate routes should be considered and this will place more emphasis on utilizing other crossings of the Cohansey River than are generally now be utilized. It is suggested that the Seeley Lake crossing is ideally suited to handle additional traffic flows in an east west direction.

Public transit is doing quite well in the Township although more local input and care should be given to planning routes and stops to better serve existing land uses and traffic patterns.

Still a major problem is the lack of pedestrian walks or ways and/or biking trails throughout the community. When development was sparse and separated by large, open fields, this was not as much of a problem. As development increases however, the need or desire on the part of residents to walk or ride a bike will greatly increase. If met and planned for, it could do much to reduce vehicular movements throughout the Township. Such activity can also provide a recreational opportunity and develop a sense a community (not just a place to drive to for sleeping, working or shopping).

A major problem with transportation in Upper Deerfield is a lack of good traffic data with which to work. A detailed study of traffic movement into, around and out of the community is needed. There is only a small area of the Township within the Cumberland County Urban Area Transportation Study area where data is much more readily available and kept current. While useful and important in transportation planning, more data will be needed to address the problems which will occur in other areas of the Township.

Two problems still exist which were noted in the 1976 Plan and for which specific proposals were put forward. They are provision of new connectors providing for easier and more direct movement of traffic moving from Bridgeton and points south along Burlington Road to Carlls Corner and for traffic moving from west to east across Park Drive to Carlls Corner. In both instances, new roadways are proposed which are still needed and still viable. A third proposal for traffic moving between Landis Avenue west across the Township was to connect Big Oak Road to the Seeley-Finley Road. Again this proposal still has merit and should be pursued. Two new proposed roads seem appropriate as well. One would be to connect

Laurel Heights Drive from Cornwell Drive north along the Deerfield Running Track to the above referenced extension of Big Oak Road where it would intersect the Seeley Finley Road. The other would be to provide another outlet for Birdsall Drive southwest to Burlington Road. Both of these two additional roadways would only become necessary should the land around them become the subject of development proposals.

Less serious, but equally important concerns exist over the numerous streets and roads with like sounding or duplicating names. They cause confusion which could lead to serious problems in the event of an emergency. Another concern planning for adequate mass transit although it is well provided for considering the community's population and sparse development pattern. Growth and the diversity in the population it may well bring will require that mass transit become another alternative. As such it should be considered as major development occurs and land use decisions are made.

The Circulation Plan

The Circulation Plan for Upper Deerfield Township is composed of the Plan Map shown in Figure 8 and text along with the descriptive and explanative diagrams and tables contained in this Chapter. The mere provision of a plan map is insufficient for successful implementation of the proposals shown. The policies and concepts behind those map markings are just as important and as shown will make them functional when acted upon in the course of development regulation. Planning decisions must be reflected in public and private actions if a plan is to be a useful tool in guiding the development of a municipality. This is especially true in the area of traffic and transportation.

The Circulation Plan (Figure 8) shows all roads existing or proposed and indicates the classification of the road. The classification of a roadway denotes the type of traffic the road will serve and the standards for the roadway's design. There are five (5) roadway classifications designated and described below:

Areterial - Streets and highways which will be used primarily for high vehicular speeds and heavy volumes of traffic.

Collector - Streets which will carry traffic from minor or local streets to the major system of arterial streets, including the principal entrance streets of a residential development and streets for circulation within such a development.

Local[1] or Minor Street - The local street is designed to serve as a

---

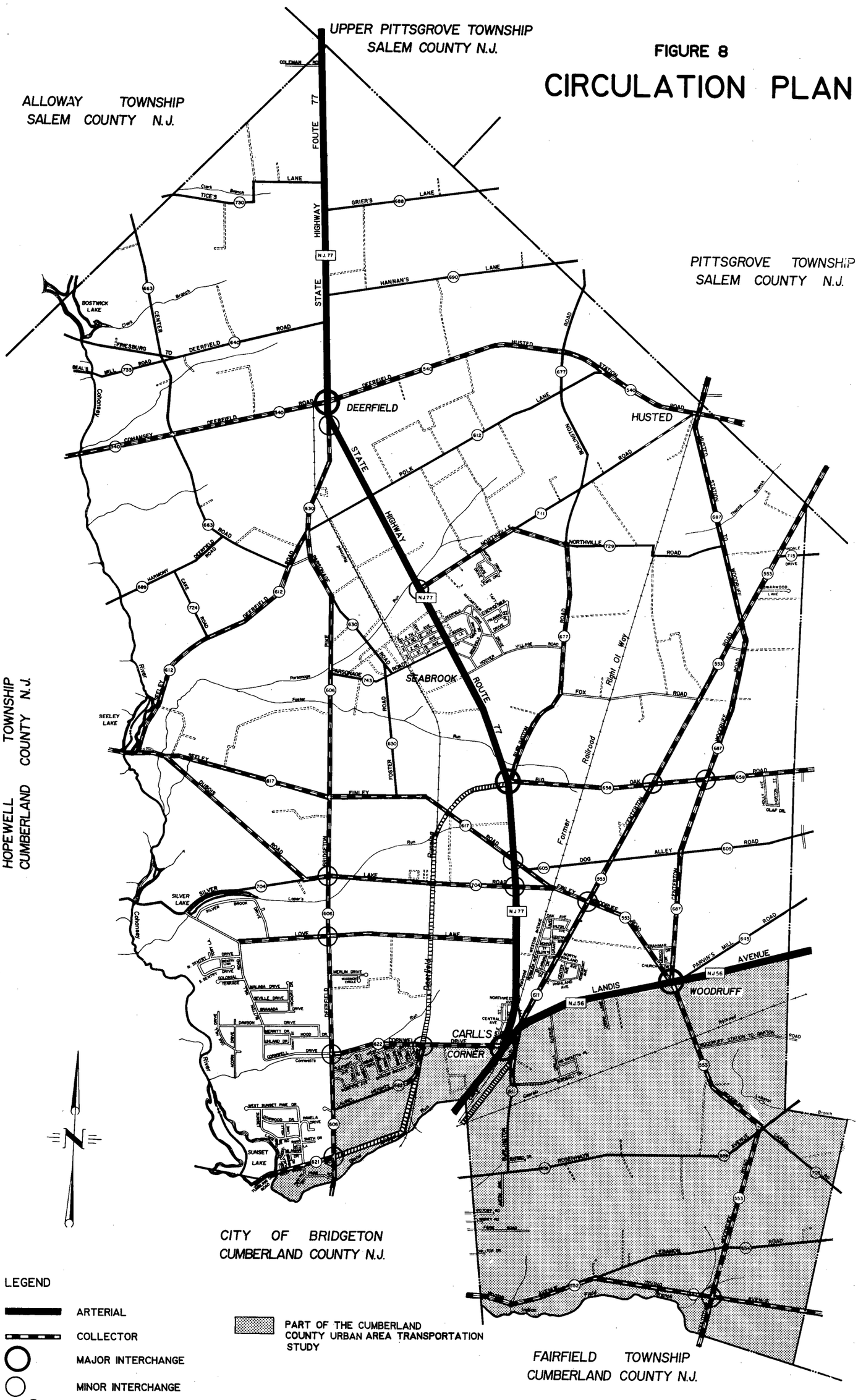
[1]The local street shall be determined by the Planning Board based upon its intent in terms of traffic movement. The minor street shall be the cul-de-sac or loop street where it is primarily designed to serve residential properties.

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

FIGURE 8

CIRCULATION PLAN



LEGEND

- ARTERIAL
- COLLECTOR
- MAJOR INTERCHANGE
- MINOR INTERCHANGE
- COUNTY ROADS
- TOWNSHIP ROADS
- PRIVATE ROADS
- PROPOSED ROADS

PART OF THE CUMBERLAND COUNTY URBAN AREA TRANSPORTATION STUDY

SCALE IN FEET

Harry R. Dare III, Planning Consultant
Licence No. 1510

Drafted by : Chesha J. Zimolzak
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711 EAST MAIN STREET
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means of access to properties to which it abuts and are not intended for through traffic movement although such is not precluded by the classification itself. Thus streets ending in a cul-de-sac, loop streets or existing through roads may all be considered local streets when they are intended to serve primarily adjacent properties. Marginal access streets are considered local or minor streets.

Alleys - Alleys are designed and intended to solely provide service access to the rear of properties.

The right-of-way and cartway widths for the roadway classifications are:

Classification	Required Width Right-of-way	Cartway
Alley or service street	*	*
Minor Street	40 ft.	24 ft.
Local Street	50 ft.	30 - 34 ft.
Collector Street	60 ft.	40 ft.
Arterial Street	80 ft.	50 ft.

* To be determined by the volume and type of traffic it is intended to serve.

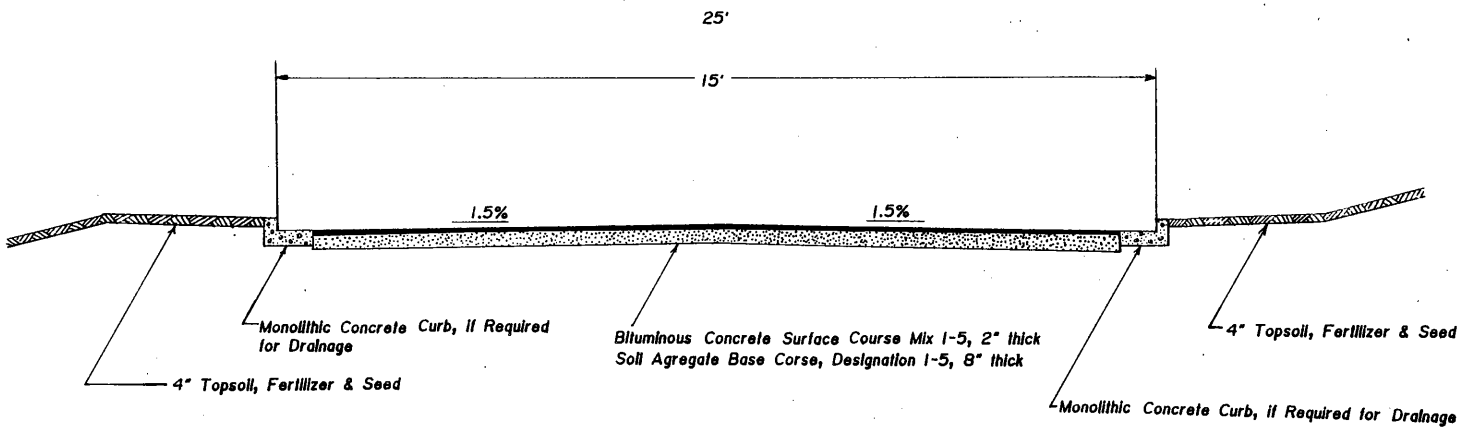
Typical cross-sections for the various streets classifications are given in Figures 9 through 13. These diagrams represent the design standard to be required in connection with any new development or reconstruction of these roads in the future, and reconstruction or extension of existing streets.

The Circulation Plan as presented is consistent with the County plans and roadway classifications and continued close cooperation between the County and Township is strongly recommended so as to coordinate transportation and traffic policies and concerns in the future.

The Plan proposes that only two arterial roads be designated, the two State highways. They are and will continue to be the major routes of transit into, through and out of the community. Land use activity will naturally gravitate to them and therefore, decisions concerning any development or land use planning should recognize their importance as roadways. As noted earlier, many of the so-called old farm roads are now being utilized as to move Township traffic and have thus been designated as collector roads in most instances. There current use seems to dictate their classification.

Street Design and Integrity

The design of streets and roadways should be consistent with the purpose they will serve tempered by existing conditions. A proposed street in a small, ten lot residential subdivision is intended to serve



NOTE:

ALL CONSTRUCTION TO CONFORM WITH NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJ DOT) " STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" , 1983 EDITION

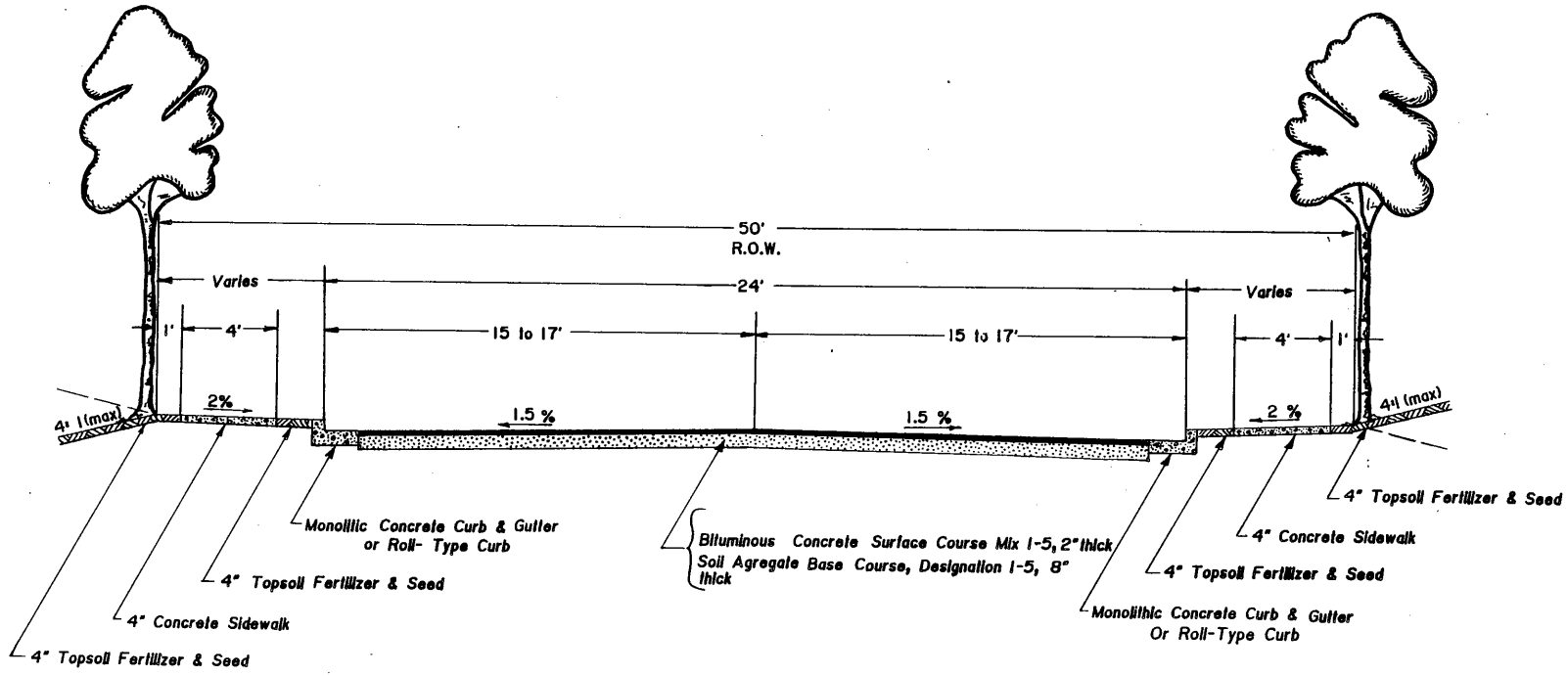
FIGURE 9

Township Of Upper Deerfield
Cumberland County New Jersey

Typical Section
Alley or Service Street

PREPARED BY GEOGGE A. SCHOCK & ASSOCIATES, ENGINEERS, PLANNERS & LAND SURVEYORS
711 EAST MAIN STREET, MILLVILLE, NEW JERSEY

CZ



NOTE :

ALL CONSTRUCTION TO CONFORM WITH NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJ DOT) " STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE SONSTRUCTION ", 1983 EDITION

FIGURE 10

Township Of Upper Deerfield

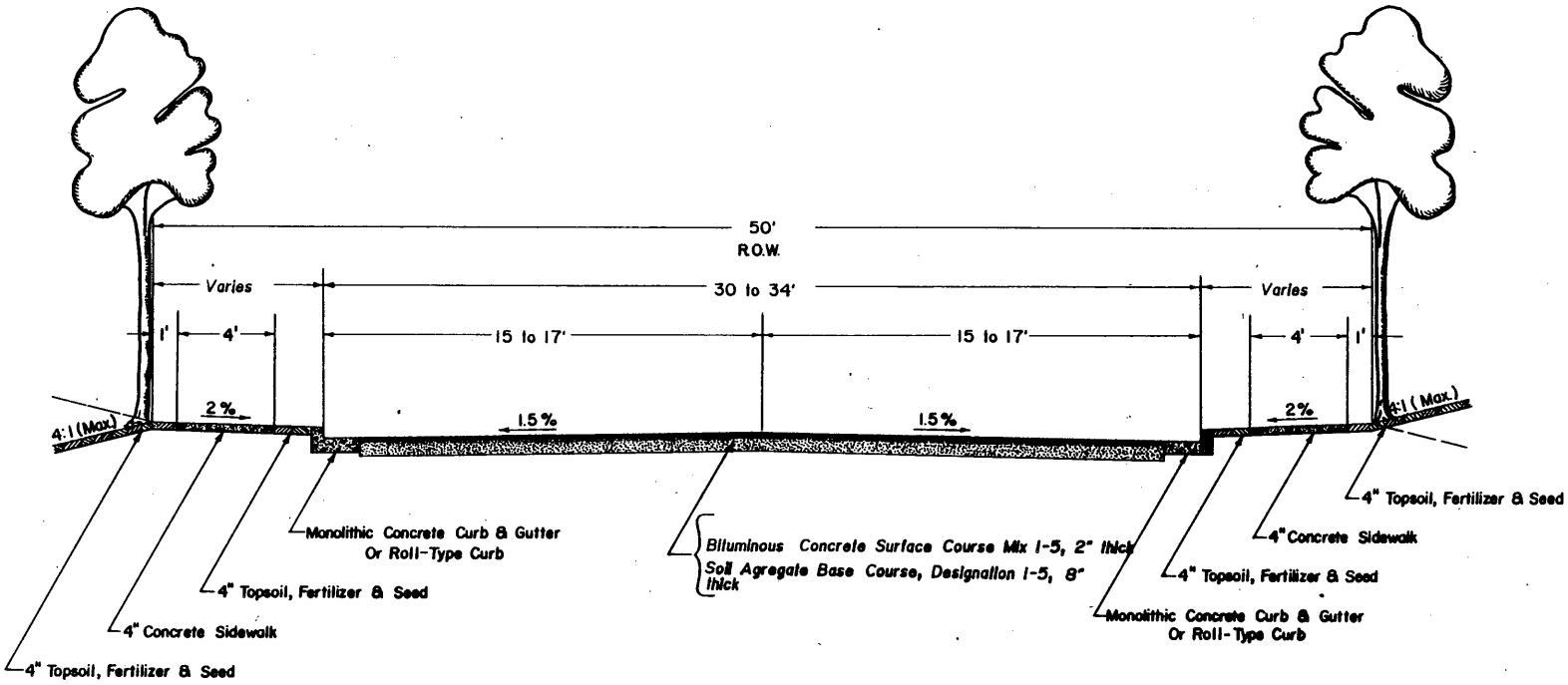
Cumberland County New Jersey

Typical Section

Minor Street

PREPARED BY GEORGE A. SCHOCK & ASSOCIATES, ENGINEERS, PLANNERS & LAND SURVEYORS
711 EAST MAIN STREET, MILLVILLE, NEW JERSEY

CZ



NOTE :

ALL CONSTRUCTION TO CONFORM WITH NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJ DOT) " STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," 1983 EDITION

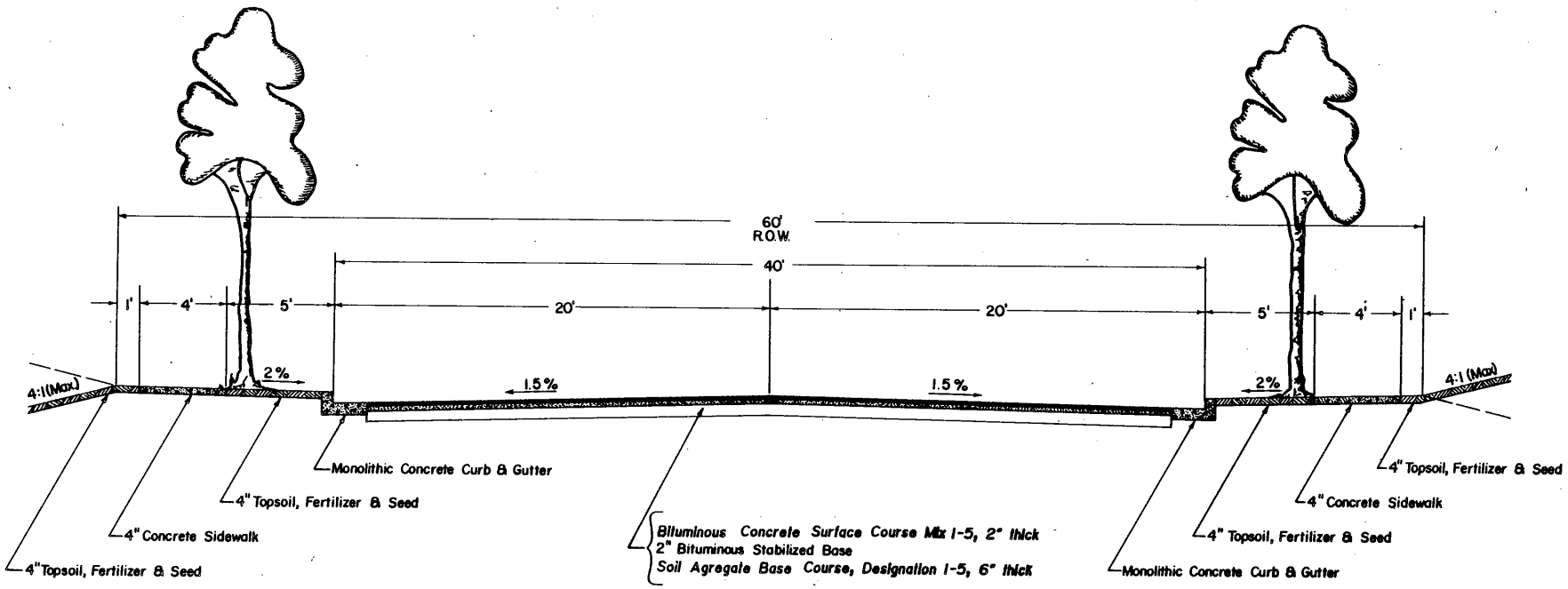
FIGURE II

Township Of Upper Deerfield

Cumberland County New Jersey

Typical Section
Local Street

PREPARED BY GEORGE A. SCHOCK & ASSOCIATES, ENGINEERS, PLANNERS & LAND SURVEYORS
711 EAST MAIN STREET, MILLVILLE, NEW JERSEY



NOTE :

ALL CONSTRUCTION TO CONFORM WITH NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJ DOT) " STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", 1983 EDITION

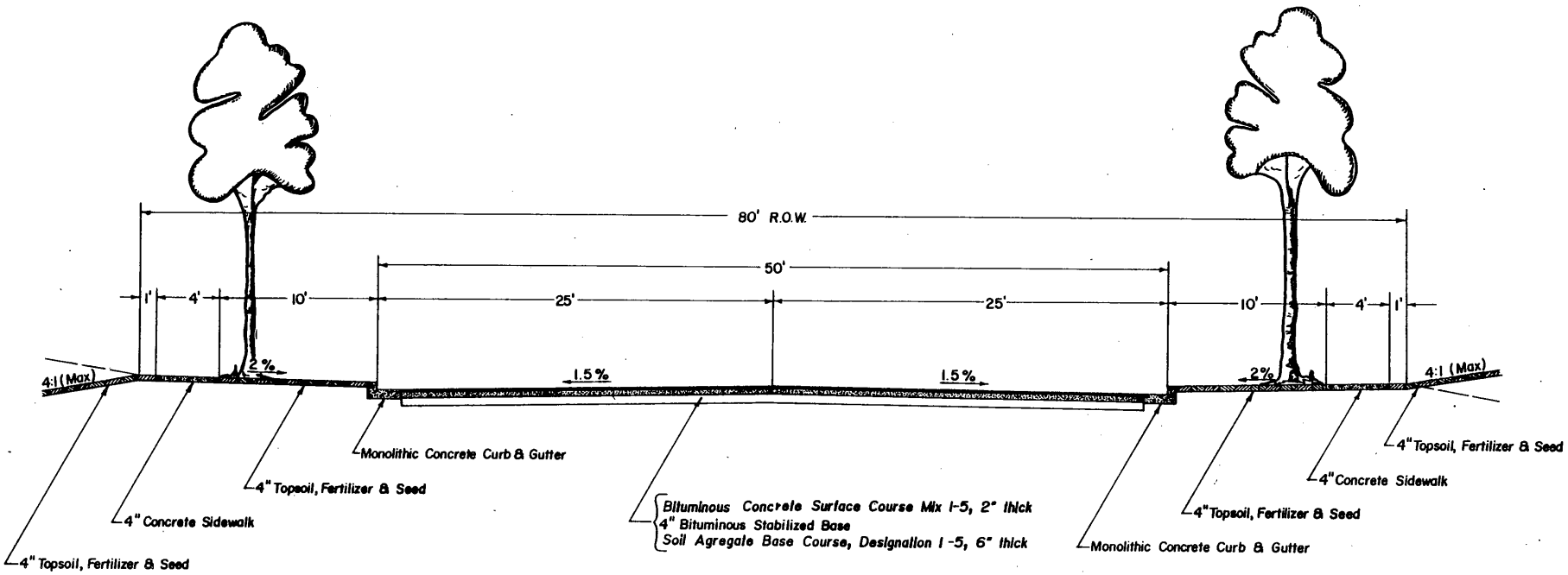
FIGUERE 12

Township Of Upper Deerfield

Cumberland County New Jersey

Typical Section

Collector Street



NOTE :

ALL CONSTRUCTION TO CONFORM WITH NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJ DOT) " STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," 1983 EDITION

FIGURE 13

Township Of Upper Deerfield

Cumberland County New Jersey

Typical Section

Arterial Street

RB

the lots which will abut it. The primary use of the street will be residential traffic. Such a street's design and construction will obviously be different than a street serving a subdivision or planned development of 100 residential units or one which will serve an industrial park. Therefore, in implementing the circulation plan and its classification system intent and conditions become critical.

It is recommended that the Township establish requirements for all new streets to be properly and completely improved including paving, curbs, gutters, sidewalks, shade trees, street furniture e.g. signs, and street lighting. No structure or use should be allowed on any parcel or lot which does not abut an improved, public street. In the case of planned development where streets are to be owned and maintained by an approved entity which will own and maintain them as common facilities, public ownership need not be required. That such streets are improved however, should be required.

The waiving of specific roadway improvement requirements should be judiciously applied and only where it can be reasonably demonstrated that the need for such improvement(s) does not exist or will be detrimental to other equally important considerations of development review and approval. Flexibility should be available and guided by set policies. For example, curbing is necessary for drainage control, and the delineation and protection of the pavement edge. In some instances, these needs may be met by monolithic curb and in other roll-type curbing. In the case of subdivisions of large lots (one acre or more in area) curbing becomes less critical and desirable. Therefore, the approving authorities should evaluate the situation on a case by case basis and be flexible enough to permit the most economical way of meeting the demonstrated needs or to allow a developer to utilize more expensive means i.e. Belgium block when requested for marketing or aesthetic considerations.

Likewise, discretion is needed in the case of sidewalks. More consideration must be given to pedestrian and bicycle traffic needs and concerns which, as mentioned earlier, are now almost totally ignored. Sidewalks or pedestrian paths within residential areas or near schools, recreational facilities and commercial establishments are warranted. That the community's school age population is served by bus transportation is not in itself cause to ignore or waive the requirement that sidewalks be installed. Again large lot (one acre or more) subdivisions often times do not need sidewalks and are not desired by residents who wish to preserve their privacy. Yet when children will be walking to school bus stops or could be walking to school, stores, playgrounds or friends' homes, they are very necessary.

Lot size and proximity to pedestrian traffic generators are essential factors to be considered when determining the need for sidewalks. Whenever lot size is less than one acre, the development is likely to generate pedestrian traffic especially children or the aged, or is located with one mile of a school, playground, recreational facility or commercial retail facility, then sidewalks should be required and waivers denied. All apartment or townhouse developments, and all commercial, public, institutional or recreational uses located within a minimum distance of one mile from a residential development should have sidewalks.

Alternatives to sidewalks (in the conventional sense of being located within the public right-of-way and parallel to the street) might be pedestrian ways or paths which wind through developed or non-developed areas and which would offer safe and convenient movement of pedestrian traffic to its logical destinations. Such "sidewalks" might be constructed of crushed stone, cement, macadem or other stone or masonry. Through natural open space areas or in wetlands areas, boardwalks, gravel paths strewn with wood chips, mulch or other natural materials would be acceptable.

Bicycling is a popular pastime of young and old alike and bike trails or ways should be considered when new developments are planned. Cyclists should be afforded safety from vehicular traffic and separated from pedestrian traffic. The type of development and street constructed to serve can determine where and how both pedestrian and bicycle traffic should be handled.

Street signs, furniture (benches, litter abatement facilities, street lighting stanchions, etc.), and street lighting should be required and meet the need of the development. Uniformity of design, durability of construction and cost are important factors since in many instances it is the community which will end up maintaining the improvements. That they be considered, required and planned for in the planning and review process is essential.

Many of these decision become extremely difficult if adequate information is not provided during the review process. Detailed traffic studies should be required for all major subdivisions involving 40 or more lots or residential unit development and any commercial, industrial, public, institutional or recreational facility on land abutting an arterial or collector roadway as designated in the Circulation Plan. It should address the scope, nature and volume of traffic to be generated by a site, the probable trips and their destinations, the methods proposed to meet the need anticipated or expected, and how such will interface with existing conditions. The detail required for small scale development should be flexible so as not to create undue or substantial costs to a developer when the proposed development does not warrant such concern.

Preserving the integrity of the existing roadway system is of paramount concern and should be given the highest priority by the approving authorities. The major roadways, arterials and collectors, within the community are the major routes and are vitally important for the efficient and safe movement of traffic. Congestion and/or hindrance to maintaining the current or improved (when undertaken) capacity of these roads must and can be avoided or reduced. Development has already encroached upon these thoroughfares and pressure will continue to increase, understandably so, recognizing the link between land use and transportation.

To deal with the situation, the policy of the Circulation Plan is to separate traffic and to promote land use standards which will eliminate or greatly reduce the ill effects of development on roadways. Any use proposed on property adjacent to an arterial road or a major collector road, as defined in this Plan below, must obtain access to said arterial or major collector by means of one of the following:

1. If the property involved has 500 feet of continuous frontage on the arterial roadway, then one (1) access drive will be permitted. Additional access drives will be permitted on a one drive per each 500 feet of continuous on the arterial road basis.

2. If the property involved does not have 500 feet of continuous frontage on the arterial roadway, then access to the property must be from:

   a) a minor or collector road which abuts the subject property or from which a service roadway might be constructed to the property in question, or

   b) a marginal access or service road.

Where these requirements are not reasonably feasible or possible in the opinion of the Township's planning and engineering staff, based on traffic volumes to be generated, size and location of the property involved or other equally valid reasons which would render such policy impractical or impossible; then access to the site should be limited to one entrance per site.

This policy should also apply to those major collector roadways which are considered already under heavy traffic demands and which serve as major roadways for the movement of traffic through the community. Such collectors hereby defined as major collectors are:

Burlington Road (County Road #611) from Rosenhayn Avenue to its intersection with State Highway #77
Cornwell Drive (County Road #622)
Old Deerfield Pike (County Road #606)
Park Drive (County Road #621)
Irving Avenue (County Road #552)
Silver Lake Road (County Road #704)
Seeley-Finley Road (County Road #617)
Laurel Heights Road (County Road #662)
Cohansey-Deerfield-Husted Station Road (County Road #540)
Love Lane

Deceleration and acceleration lanes should be required whenever and wherever feasible and necessary. When there is insufficient frontage to permit such construction, easements should be required for their later construction when abutting properties are developed. Where reasonable, easements are recommended to be required to be dedicated for future construction of marginal access or service roads.

Reverse frontage should be required along arterial and collector roadways. Setbacks should be measured from proposed rights-of-way including sufficient area to construct a reasonable and adequate marginal access or service road when said construction is postponed until further development.

Sign size and location should be strictly controlled as should the placement or planting of any plants, shrubs or other items along the

rights-of-way of arterial and collector roads. This will cut down on impairments to roadway safety by reducing distractions or obstructions.

In the case of residential development, buffering and addition setbacks should be required from arterial or collector roadways. Such buffering should include setbacks, landscapping and/or fencing or other suitable barriers to noise, intrusion and the negative impacts of the land use on or from the major roadway. When abutting local streets then care must be taken to prevent obstructions or problems with layout or design which again would impair movement on the roadway or cause safety hazards.

The overall objective of such policies is to maintain the integrity of the roadway system's traffic carrying capabilities. Development review decisions should be based upon a thorough investigation of the effect of the development upon the municipality's roadways, arterials in particular. Standards or requirements aimed at achieving this objective should only be reduced when, where and how such attainment is not diminished by such action.

When reviewing street design and layout within a new development emphasis should be place on interesting and functional design. Upper Deerfield's relative flat, open landscape would be enhanced with more innovation of design. Developers should be encouraged to make greater use of natural topography, loop streets, cul-de-sacs, court and curvilinear designs in the layout of streets. This would enhance appearance and in many cases reduce costs since the length of the street is less. Thus the street's construction cost is reduced as is the cost of installing services. Clustering is another approach which lends itself well to such street design. Most development within the Township has been gridiron or linear in pattern which does not provide for interesting subdivision design as a rule.

The naming of streets within the Township must be given more consideration than it has in the past. There are approximately 136 streets or roads in Upper Deerfield Township. there are, however, eighteen streets which have an alternate name. There are a number of streets in the Township which have duplicate or sound-alike names. A list of these streets is given in Table 9.

Such duplication or similarity in names is confusing to persons seeking an address and can cause serious consequences in connection with calls for emergency assistance such a police, fire or ambulance. The Township Planning Board should require that street names in new subdivisions not duplicate or be similar in sound to names of streets or roads in the Township or surrounding municipalities. The Township should consider renaming some streets in order to avoid any confusion which might result from this situation.

The Planning Board should also encourage developers to give street names which begin with letters of the alphabet that are infrequently used. Another possible approach is to prepare a list of possible street names from which developers could choose. In all cases, the use of North, South, East and West should be discouraged in street names. Another problem with street naming involves alternate name roads. Although the

naming seems a simple matter, one can see that confusion and problems can arise when forethought is not applied.

TABLE 9

SOUND-ALIKE OR DUPLICATE STREET NAMES IN UPPER DEERFIELD

Center Avenue	Center Road
Centerton Road	Centerton to Bridgeton Road
Central Avenue (2)	
Danna Lane	Danny Street
Davis Drive (2)	
Deerfield Drive	Deerfield-Bridgeton Pike
Old Deerfield Pike	Deerfield-Husted Station Road
Deerfield to Seeley Road	"Deerfield Street"
Finley Road	Finley-Woodruff Road
Hildreth Avenue	Hilton Avenue
Hilltop Avenue	
Husted Station Road	Husted Station-Woodruff Road
MacArthur Drive	McArthur Place
North Highland Avenue	North Pearl Street
Northville Road	Northwest Avenue
Oak Avenue	Oak Street
Oak Hill Drive	
Park Road	Parkview Drive
North Park Drive	
Sentry Drive	Sentry Link
Seeley-Finley Road	Seeley-Deerfield Road
West End Avenue	West Sunset Pine Drive
Weston Avenue	Westward Drive
Woodruff Road	Woodruff-Carmel Road
Woodruff-Centerton Road	Woodruff-Gouldtown Road
Woodruff Station to Garton Road	

The Other Transportation Systems

Bus service in the Township is very good considering the community's population. Because of the two State highways there are two NJ Transit routes which pass through the Township. One originates in Bridgeton and follows State Highway 77 north to Camden and Philadelphia, the other begins in Carlls Corner then goes to Bridgeton, Millville, Vineland and on to Atlantic City. The latter route is the fastest growing bus route in New Jersey Transit's schedule. Since Atlantic City's casinos have become major employers to county residents the route has grown considerably.

Local bus service is provided through the Carlls Corner retail area then west to the professional center on the Old Deerfield Pike from Bridgeton. The County Office on Aging also provides the so-called Senior Bus which conveys senior citizens to site specific destinations upon request.

There is no taxi service operating within Upper Deerfield, however, service is available from companies operating in Bridgeton.

Rail service is strictly freight and as discussed earlier is provided vis-a-vis a short line, the Winchester and Western Railroad operating on former Conrail lines. Rail traffic is delivered to and received from Conrail at its switching point in Norma to the east of the Township. The Township should continue to support the provision of rail service to the area as it can be an inducement for industrial growth. Once lost it is almost impossible to reestablish.

The Township does have a small privately owned, public use airfield which serves a crop dusting concern and private small craft aviation. The field is located in Woodruff and has a grass strip runway with some lighting. The airfield is open to all aircraft able and desiring to use it. It is a valuable asset since many industries today use small aircraft in transporting their staffs. The Future Land Use Plan identifies the airport, Bucks Airfield, and establishes air safety hazard areas. Again the community should protect and preserve this asset with a possible thought of its expansion to serve local needs in the future.

There is small regional airport in Millville which handles some air freight and did for awhile in the 70's and early 80's have commuter service to Philadelphia International Airport which provides major air passenger service for most of southern New Jersey.

Plan Goals and Objectives

There are two major goals of the Township Circulation Plan. The first is safe and efficient movement of traffic into, around and out of the community. The second is to encourage good street design and preserve the integrity of the Township's street and roadway system. Emphasis is place on vehicular traffic recognizing that it represents the primary and predominate means of transportation to and from the Township for people as well as goods.

Specific objectives include:

1. Establishment of specific standards for street and road improvements which can be adjusted to meet need and conditions.

2. Encourage developers to use innovative design techniques when laying out new projects.

3. Set minimum standards access to properties adjacent to arterial and major collector roads.

4. Promote and preserve both rail and air service to the Township as a vital inducement to economic development.

5. Require the provision of pedestrian and bike traffic in development design and construction.

6. Evaluate new development in terms of transportation on the basis of its effect on the existing system and how it can be accommodated with the least detriment or ill effects.

7. Address all issues of roadway design including signs, lighting and furniture in both regulation and development review with aim of economics and maintenance by the municipality.

If these goals and objectives are met then the Township's system of transportation will have a chance of providing efficient and safe movement. The Township is fortunate in that it is just now beginning to experience high density development and it already has good planning tools in place to deal with this development. The approach that: "If the development is to occur then it should occur right!" must be adopted by the municipal officials and adhered to stringently.

Housing Element

Township of Upper Deerfield
Cumberland County, New Jersey

August, 1988

TOWNSHIP OF UPPER DEERFIELD

CUMBERLAND COUNTY, NEW JERSEY

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TABLE OF CONTENTS

FIGURES

Upper Deerfield Township
Housing Plan Element
August, 1988

The document represents an addendum to the Master Plan of January 1988, and has been developed in accordance with the requirements of the Council of Affordable Housing as mandated by the New Jersey Fair Housing Act and the Mt. Laurel Decision.

The municipal land use law, 40:550-310 and the Fair Housing Act 52:270-310 now requires that a municipality's master plan must include a Housing Plan Element that is designed to achieve the goal of access to affordable housing needs in a community.

A total of 159 low and moderate income units have been allocated to Upper Deerfield Township, as determined by criteria and formulas included in the Fair Housing Law. Credit for Seventy (70) units are being claimed under the rules of the Council on Affordable Housing (COAH), even though a total of 325 units are to be rehabilitated under section 8 Moderate Rehabilitation Program guidelines. Rehabilitation credits are capped at and credited to the municipality's indigenous need. If approved, this would have a total of 89 low/moderate income units for which provisions must be made during the next six years. Recommendations on the mechanisms to achieve this number with due regard to suggested mix of rental and owner occupied units, as well as the financial capabilities of a wide range of families, are among the goals of this Housing Plan.

BACKGROUND FOR THE HOUSING PLAN

The general objectives expressed in the Master Plan provides the broad policy framework for the Housing Plan. These objectives are included in the Appendix of this report.

Housing in New Jersey has been given new prominence by a series of events which can be traced back to a local zoning case in Mt. Laurel Township in Burlington County. In 1970, Ethel Lawrence sought approval from the local planning board to erect a house on a small lot in the Township. Her family had lived in Mount Laurel for more than 100 years, and the new home was intended to replace an existing substandard dwelling in which she then lived. The lot on which she intended to build the new home was too small to meet the standards established for the zoning district in which it was located, so the planning board denied the application.

In response to this, the Burlington County NAACP brought suit against Mt. Laurel Township, arguing that the Zoning Ordinance required the development of larger homes than she was able to afford, and that the township was unlawfully excluding the low and moderate income persons from living in the Township. Her case was carried all the way to the New Jersey Supreme Court by 1975. The decision, which has become known as Mount Laurel I, held that municipalities could not discriminate against lower income households by virtue of the standards contained in its land use regulations. The township was given ninety (90) days to amend its ordinances, but could act on their own cognizance.

Since then, the Mount Laurel type litigation continued to increase. Some felt that all municipalities were not doing as much as they could to open up their land use regulations to insure that housing could be built which was affordable to low and moderate income persons. The Supreme Court consolidated a number of cases in January 1983, and issued another landmark decision, known as Mount Laurel II. It stated that all municipalities have a constitutional obligation to create a realistic opportunity for their fair share of the regional need

for low and moderate income housing. The Mount Laurel decision, also stated that municipalities must provide for an opportunity for decent housing for at least some fraction of their indigenous poor living in deficient housing. Additionally, municipalities which have been designated as part of the States Development Guide Plan's growth area, have an additional responsibility to provide a fair share of the regions excess present and prospective need for low and moderate housing.

The Mount Laurel II decision defined households earning fifty percent (50%) or less of the area's medium income as low income, and households starting between fifty percent and eighty percent (50-80%) of the areas medium income as moderate income. The current income standards as they apply to Upper Deerfield Township residents are contained in Figure 1 below.

Figure 1

AFFORDABILITY LIMITS FOR LOW AND MODERATE INCOME HOUSEHOLDS

Hshld Size	Upper Limit Low Income	Max. Mnthly Hsg Pymnt	Max. Mnthly Rent	Upper Limit Moderate Income	Max. Mnthly Hsg Pymnt	Max. Mnthly Rent
1	$9,555	$223	$239	$15,288	$357	$382
2	$10,920	$255	$273	$17,472	$408	$437
3	$12,285	$287	$307	$19,656	$459	$491
4	$13,650	$319	$341	$21,840	$510	$546
5	$14,505	$338	$363	$23,208	$542	$580
6	$15,355	$358	$384	$24,568	$573	$614
7	$16,210	$378	$405	$25,936	$605	$648
8	$17,063	$398	$427	$27,300	$637	$683

Affordable housing has come to be defined as 30% of a household's monthly income for rental units, while sale housing is limited to no more than 28% of the monthly household income. These costs exclude utilities and, in the case of sale housing, mortgage interest and principal, taxes and insurance. The maximum payments for a household at the upper limits of the low and moderate income categories is also shown in Figure 1. The total purchase price of affordable sale housing will depend upon other factors to be considered but, for a household of 4 persons, it is equal to approximately $44,000 for the moderate income household and $30,000 for the low income household.

The Fair Housing Act of July 1985, established a comprehensive planning and implementation process for this municipal constitutional obligation. The act established the Council On Affordable Housing, COAH for short, and charged them with the responsibility fo define housing regions and estimate the present, and prospective need for low and moderate housing at the state and regional level. The COAH was assigned the responsibility to:

1. Develop criteria and guidelines for each municipality to determine their own fair share obligations.

2. To adjust that number where applicable with eligible credits of housing units provided after 1980 or with documentation substantiating environmental constraints.

3. To structure a fair share plan to meet the specific need of each municipality.

In order to respond to the COAH guidelines a municipality must prepare a Housing Element and Fair Share Plan. A timetable for submission of the documents to the COAH has been established. A municipality may continue to regulate development pursuant to a zoning ordinance that predates the Fair Housing Act until August 1, 1988. After that date, to have a valid zoning ordinance a municipality must have adopted a housing element as a component of its master plan. The housing element must address the low and moderate income needs of the municipality and contain the information requested by the Fair Housing Act. According to the timetable, review and acceptance of the municipal Housing Element and Fair Share Plan by COAH, offers substantive certification. The filing of the Element with COAH is not a requirement of Act, but does afford the municipality access to COAH's administrative process of review and mediation, in the event of subsequent litigation. A municipality that has not filed prior to a lawsuit is within the jurisdiction of the Superior Court.

By petitioning and receiving substantive certification, a municipality will gain a presumption of having validly met its fair share obligation for a six year period. A reassessment of the municipality's Fair Share Plan is required every six (6) years to insure that the present low and moderate housing needs of the municipality are being met. Other reports and documentation may also be required by the COAH from time to time.

The components of the Housing Element are explicitly outlined in The Fair Housing Act.

"A municipality's housing element shall be designed to achieve the goal of access to affordable housing to meet present and prospective housing needs, with particular attention to low and moderate income housing and shall contain at least:

a) An inventory of the municipality's housing stock by age, condition, purchase of rental value, occupancy, characteristics and type, including the number of units to low and moderate income households and substantial housing capable of being rehabilitated.

b) A projection of the municipality's housing stock, including the probable future construction of low and moderate income housing, for the next six (6) years, taking into account, construction permits issued, approvals of applications for development and probable residential development of lands.

c) An analysis of the municipality's demographic characteristics, including but not necessarily limited to household size, income level and age.

d) An analysis of the existing and probable future employment characteristics of the municipality.

e) A determination of the municipality's present and prospective fair share for low and moderate income housing and its capacity to accommodate its present and prospective housing needs, including its fair share for low and moderate income housing.

f) A consideration of the lands that are more appropriate for construction of low and moderate income housing, including a consideration of lands of developers who have expressed a commitment to low and moderate income housing.

The Fair Share Housing Act further states that "In adopting its Housing Element, the municipality may provide for its fair share of low and moderate income housing by means of any technique or combination of techniques which provide a realistic opportunity or the provision of a fair share number. The Housing Element shall contain an analysis demonstrating that it will provide such a realistic opportunity, and that the municipality shall

establish that its land use and other relevant ordinances have been revised to incorporate the provisions for low and moderate income housing.

INVENTORY

Population and Housing Growth

The latest official estimates of population released by New Jersey Department of Labor estimated that Upper Deerfield had a population as of July 1, 1987 of 6,921 persons. The Township showed a gain of 111 persons, or an increase of 1.6% over its 1980 census population of 6,810. By contrast, Cumberland County as a whole showed similar gain of 3,587 persons or an increase of 2.7%, during this same period.

Upper Deerfield Township's population growth during the 1980's indicated a continuing trend of growth as it has occurred for decades but at a deaccelerating rate. The Townships population was 6,040 in 1960, 6,648 in 1970, 6,810 in 1980, and 6,921 (est.) in 1987, representing a growth rate of 10% during the 1960's, and 2.4% during the 1970's, and an estimated 1.6% during the 1980's. During this period, the County also showed a slowing down of growth. The County's population was 106,850 in 1960, 121,374 in 1970, and 132,866 in 1980, representing growth rates of 13.6%, 9.5%, and 2.7% respectively.

Figure 2

POPULATION GROWTH

Year	Upper Deerfield Township Pop.	% Change	Cumberland County Population.	% Change
1960	6040	-	106850	-
1970	6648	10.10%	121374	13.60%
1980	6810	2.40%	132866	9.50%
1987	6921	1.60%	136453	2.70%

Source: 1960, 1970, 1980 US Census; New Jersey Development of Labor.

At the time of the 1980 census, Upper Deerfield had a total of 2,346 housing units. This represents a 13.2% increase over its 1970 census figures of 2073 units. According to the Township's records and those of the Department of Labor and industry, 196 building permits were issued in Upper Deerfield between 1980 and 1988 for single family houses.

Figure 3 provides details of the changes to Upper Deerfield's Housing stock since the 1980 census.

Figure 3

RESIDENTIAL BUILDING & DEMOLITION PERMITS ISSUED IN UPPER DEERFIELD

Year	Total	Single Family	2-4	5 or more	Demo	Net Gain
1980	19	19	0	0	2	17
1981	20	20	0	0	0	20
1982	19	19	0	0	2	17
1983	21	21	0	0	3	18
1984	23	23	0	0	0	23
1985	24	24	0	0	1	23
1986	40	40	0	0	0	40
1987	30	30	0	0	6	24
Totals	196	196	0	0	14	182

Source: Upper Deerfield, verified by New Jersey Department of Labor.

More than 60% of Upper Deerfield's housing stock was built in 1950 or later. Figures 4 and 5 display the age of the Township's housing stock. The 1980 census established the total year-round number of housing units in Upper Deerfield at 2,346.

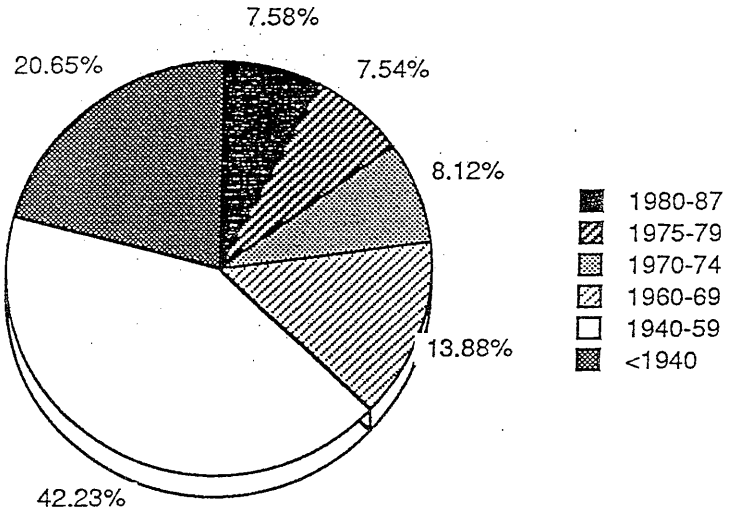
Figure 4

UPPER DEERFIELD'S AGE OF HOUSING STOCK

Year	Number of Units	% of Total Units
1980-88	196	7.58
1975-79	157	7.54
1970-74	210	8.12
1960-69	359	13.88
1950-59	592	22.93
1940-49	500	19.30
1939 & Prior	534	20.65
		100.00

Figure 5

UPPER DEERFIELD'S HOUSING STOCK BY YEAR OF CONSTRUCTION

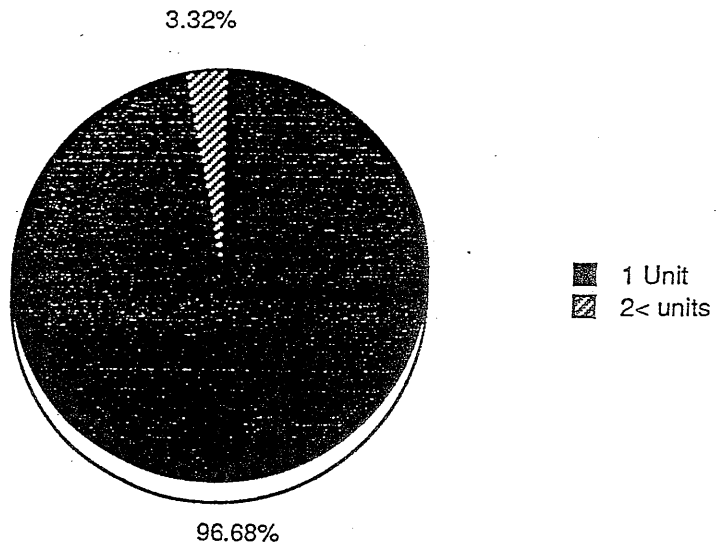


Source: 1980 U.S. Census of Housing and Population.

Upper Deerfield continues to remain a single family home community with single family houses numbering 2,242 or 96.7% of the entire housing stock. As shown in Figure 6 the remainder was made up of structures containing from 2-10 of more units per structure.

Figure 6

COMPOSITION OF HOUSING STOCK BY UNITS IN STRUCTURE



The census listed 1,582 units as owner occupied homes. There were 673 renter occupied units. A comparison of Tenure is shown in Figure 7.

Another important factor to consider in reviewing housing within a community is the vacancy rate. Simply put, it is the number of available uninhabited dwelling units expressed as a ratio to the total number of housing units available in a market.

Typically, a vacancy rate less than 4 to 6% indicates that an area may be a good market for new housing. A normal vacancy rate of 4 to 6% will depend specifically on the occupancy or the type of unit that has been built. If vacancies are increasing, this may be a sign of overbuilding, which means a future decline in prices and rents. If the vacancy rate decreases, prices and rents should increase.

FHA identified the following about vacancy rates.

1. Large localities tend to have higher vacancy rates overall than small localities.
2. Fast growing areas have higher vacancy rates than slower growing communities.
3. Areas which have a high proportion of rental property and multi-family structures have higher vacancies than areas with a high rate of owner occupancy.
4. Vacancy rates tend to be higher in the lowest and highest rent or price classes.
5. The smaller the number of rooms for rent, the higher the vacancy rate tends to be.

The vacancy rate for year round housing was 3.5% which is a relatively low vacancy rate and indicates a strong demand for housing in the community.

Figure 7

OCCUPIED HOUSING STOCK BY TENURE

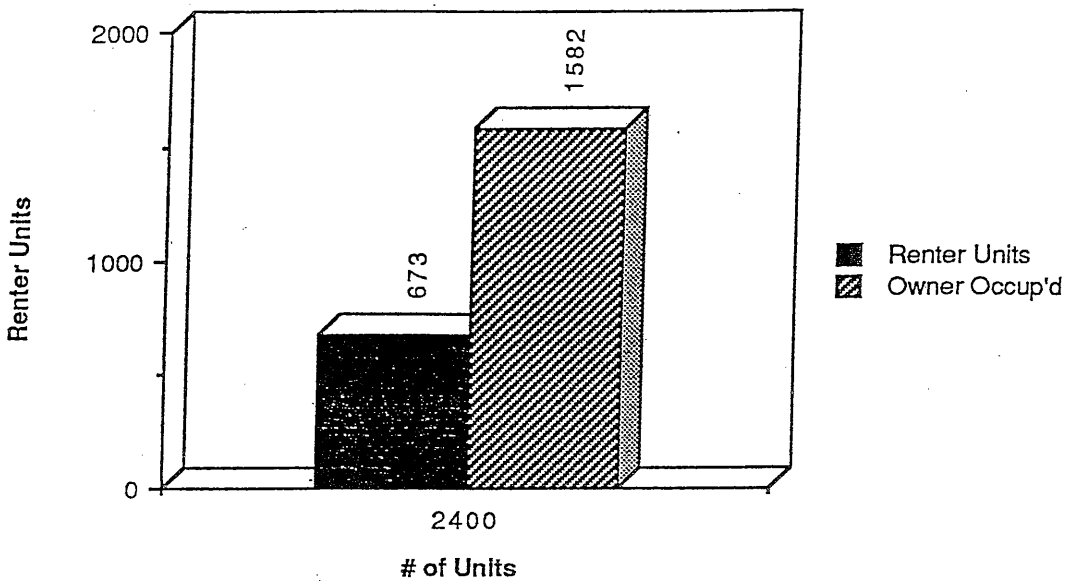


Figure 8 illustrates the value of Upper Deerfield's owner occupied housing. All the data is based upon information reported in the 1980 census but has been adjusted to current levels using the changes in the housing component of the Consumer Price Index.

The value of Upper Deerfield's owner occupied housing indicates a substantial number of moderately priced housing units currently existing in Upper Deerfield. 25.8% of the owner-occupied homes have values equal to a current worth of less than $35,000. Although these units represent a valuable housing resource for the community, they can not be counted towards the township's fair housing obligation under COAH regulations because they were created prior to 1980 and most do not have affordability controls in place. The units built prior to 1980 are accounted for in the census data which was used to determine need. Affordability controls are restrictions placed upon a unit to insure that in the future it will only be resold or rerented to a low or moderate income household. The median 1980 value of all owner-occupied homes in the township was $39,600.

Figure 8

ADJUSTED VALUE OF OWNER OCCUPIED HOUSING

4/80 Hsg Value	Comparable 12/87 Value			# Units	% of Total
< $20,000		<	$28,939	114	8.32%
$20-24,999	$28,939	-	$36,172	106	7.73%
$25-29,999	$36,173	-	$43,406	134	9.77%
$30-34,999	$43,408	-	$50,641	172	12.55%
$35-39,999	$50,642	-	$57,876	172	12.55%
$40-49,999	$57,877	-	$72,345	263	19.18%
≥$50,000		≥	$72,346	410	29.91%
$39,600			$57,298	MEDIAN HSG VALUE	

Among households who owned their own home, and had a 1979 income of less than $10,000, (equivalent to approximately $15,000 today), 74% of all households within that category spent more than 30% of their income towards housing costs. Approximately 18.5% spent more than 30% of their income whose annual incomes were from 10,000 to 20,000 per year. This data is displayed in Figure 9.

Figure 9

OWNER HOUSING COSTS AS A PERCENTAGE OF ANNUAL INCOME

	Household	-15%	15-24%	25-29%	30%	N/C	Med.
Less than 10,000	177	-	35	11	131	-	38.9
10,000-19,999	405	129	148	53	75	-	19.5
20,000 or more	817	515	243	44	15	-	13.1

There are a significant number of moderately priced rental properties as shown in Figure 10. 53.2% of all rental units had a 1980 gross rent of less than $250 which is equal to less than $350 in current dollars. The median rent of all units was $236 in 1980. 67% of all the rental units reported were single family dwellings.

Figure 10

GROSS RENTS IN UPPER DEERFIELD

'80 Contract Rent	Comparable 12/87 Value	# Units	% of Total
< $100	< $145	-	-
$100-149	$145 - $216	25	3.71%
$150-199	$217 - $288	98	14.56%
$200-249	$289 - $360	235	34.92%
$250-299	$362 - $433	117	17.38%
≥$300 or None	≥ $434	198	29.42%
$173	$250	Median Contract Rent	

As Figure 11 shows, lower income renters spend a substantial amount of their monthly income towards rental housing. Among those who had annual incomes of less than 10,000, 79.5% spent more than 30% of their monthly income towards housing and the median cost was in excess of 45.6% of their monthly income. 24% of the households with annual incomes of between $10,000 and $19,999 spend more than 30% of their income towards rent.

Figure 11

RENTAL HOUSING AS A PERCENTAGE OF ANNUAL INCOME

	Household	-25%	25-29%	30-34%	35%	N/C	Median
Less than 10,000	332	34	45.6				
10,000-19,999	250	158	32	51	-	9	22.7
20,000 or more	91	69	5	-	-	17	16.6

Source: US Census of Housing.

Substandard Housing Indicators

The census of housing contains several indicators which can be used to estimate the extent to which there is deficient housing in a community. Six of these indicators were used as criteria by the Council of Affordable Housing to identify units that were deteriorating or dilapidated, and likely to be occupied by low and moderate income households. They included: persons per room, exclusive access to the unit without passing through another unit, lack of complete plumbing, kitchen or central heating facilities, and the lack of elevators in large buildings.

At the time of the 1980 census, 74 dwellings were occupied by more than 1.0 persons per room. This standard is used to indicate that a unit is over-crowded.

15 units lacked complete plumbing facilities. This meant that one of more of the following plumbing facilities were missing in a unit: hot or cold piped water, a wash basin, a flush toilet, or a shower or tub for the occupants.

30 units lacked complete kitchen facilities. This was defined to include an installed sink with piped water, a range, or, cookstove and a mechanical refrigerator.

58 units were listed as not having adequate means of providing central heating.

Upper Deerfield's population growth has not occurred evenly among all age groups, although most age groups showed increases between the 1970 and 1980 censuses.

Figure 12

POPULATION BY AGE GROUP 1970 AND 1980

	1970	1980	Change	%	% of 1980 Pop.
Under 5	618	436	-186	-30.1	6.4
5 - 19	1934	1871	-63	-3.3	27.5
20-34	1262	1402	140	11.1	20.6
35-54	1635	1666	31	1.9	24.5
55-64	638	683	45	7.1	10.0
65 and over	561	756	+195	34.8	11.1
Total	6648	6810	162	2.4	100.0

Sources: US Census 1980.

SOCIOLOGICAL DEMOGRAPHICS

Age groups showing the most significant growth during the decade were the 20-34 age group and the 65 and over group. The growth of each of these groups hold particular ramifications for Upper Deerfield. The large growth of 20-34 age group may indicate a large in-migration of persons in their family forming and peak child-bearing years, therefore, increased demands on the Township's school facilities can be expected. The large increase in the 65 and over age group can be explained in part due to longer life expectancy. Part of the increase is due to an experiencing of a net in-migration of persons in this age group. Increased health care and socially related services can be expected as the number of persons in this age group increase.

Figure 13

AGE AND SEX DISTRIBUTION FOR 1980 POPULATION

	Male	Female	Total	%
Under 5	202	230	432	6.3
5-19	960	911	1871	27.5
20-34	655	747	1402	20.6
35-54	827	839	1666	24.5
55-64	309	374	683	10.1
65 and over	331	425	756	11.1
Total	3284	3526	6810	100.0

Source: US Census 1980.

The age distribution can also have important implications for the housing plan. Communities that have a large proportion of children have a greater need for larger family units, while those with higher proportion of seniors may have some need for units restricted to that age group. Upper Deerfield age distribution is shown above in Figures 12 and 13.

11.1% of the Township's population was age 65 or older. Males outnumbered females slightly among the age group of up to 19 years old. But females dominated age groups of 20-34, 35-54, 55-64 and 65 and older. 1,843 of the Upper Deerfield's 2,255 households were families. 1,543 or 83.7% of these families had children under 18 years old.

Race

Of the township's total 1980 population of 6,810, 5,768 or 84.7% were white, 590 or 8.7% were black and 492 or 6.6% were of some other race.

A comparison of the changes between the 1970 census and 1980 census provided the following analysis:

The white population decreased by .7% while the non-white population increased by 3%.

Figure 14

RACIAL COMPOSITIONS OF THE POPULATION

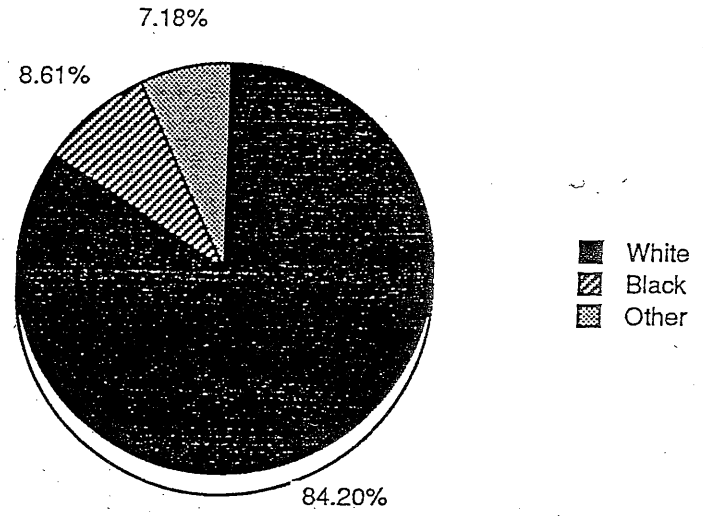


Figure 15

POPULATION BY RACE

	All Races	White	Black	Japanese	Other
1970	6648	5678	510	422	38
1980	6810	5768	590	276	176
Change	+2.44%	1.59%	15.7%	-34.6%	363.2%

Figure 16

CHANGE IN RACIAL COMPOSITION FROM 1970 TO 1980

Percent of Total

	1970	1980	Change
White	85.4%	84.7%	- .7%
Black	7.7%	8.7%	+ 1%
Japanese	6.4%	4.1%	-2.3%
Other	.6%	2.6%	+2%

FUTURE POPULATION AND HOUSING STOCK

The Township population during the 1970 and 1980 increased at about the rate anticipated. In the 1978 plan, a population of 10,000 was projected for 1985. The Census Bureau reported in 1980 a population of 6,810. Recent population studies conducted by New Jersey Department of Labor estimated the Upper Deerfield population at 6,998 as of July 1, 1985, and a provisional estimate of 6,921 as of July 1, 1986.

Based on net building permits, (permits issued less then demolished units) one can estimate the population by multiplying the building permits issued by the average unit size and add that number to the 1980 census of population. In the case of Upper Deerfield, we would expect a present population around 7,321 persons. For the Housing Element and Overall Master Plan purposes, it is important to make short term projections of future housing growth. For the ten (10) year Census period 1970-1980, 273 units were added to the housing supply. From April 1980 to December 1987, 182 net units were constructed, bringing the total to 455 new units during a seventeen year period or an approximate average of 2.23 units per month or 26.7 per year. Current factors, such as the increase in housing construction based on lower interest rates and the continued desirability of the area as a place to live, work and raise a family, and the availability developable land in Upper Deerfield, make it reasonable to assume a growth rate at least as high as that experienced recently. Therefore, it is estimated that by 1993,based on past trends, Upper Deerfield's housing stock should increase by 342 dwelling units bringing the constructed total to 2,688 dwelling units.

This would correlate with the data supplied by the Department of Labor that indicated the population of Cumberland County which had increased by 9.5% from 1970 to 1980 is projected to increase by only 7.2% from 1980 to the year 2020. This compares to a statewide 1980-2020 population increase of 24.6%.

Although most of the former Seabrook holdings have been kept intact and remained predominantly undevelopment farming areas and wooded parcels, recently, the current owners have been marketing the land holdings in the Long Island area for development. If these holdings are developed, this in itself could affect population projections significantly.

If markets remain strong, and the general economy continues to grow at a steady pace, the Township is likely to see continued development at a higher pace than is anticipated by the above census data and estimates.

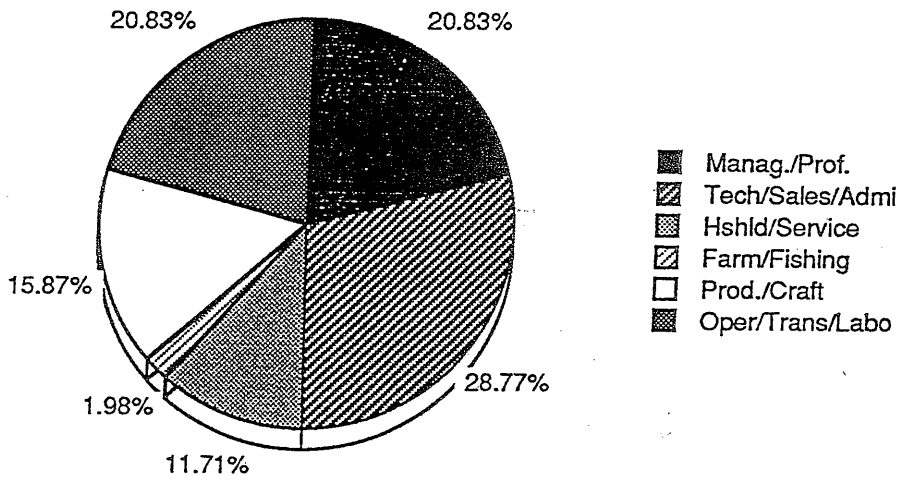
EMPLOYMENT

The census taken in 1980 indicated that Upper Deerfield had an employed labor force of 2,931 persons 16 years and over. Of this total, 1,648 were male and 1,283 were female. The largest proportion of the labor force were employed in the "Technical Sales and Administration" category, followed closely by "Managerial and Professional". The Township's proportionate distribution of employment by occupation was generally similar to the County's distribution. The State showed higher employment that the township or the county in the occupations of "managerial and professional specialty" and technical support and related sales.

The occupation of Upper Deerfield residents are shown in Figure 17. "Technical Sales and Administration" make up the largest category of the local work force with 29% of the local work force. "Managerial and Professional" and "Household and Service" occupations makes up the next largest group (21%) followed by Production and Craft (16%)

Figure 17

EMPLOYMENT CLASSIFICATION OF UPPER DEERFIELD RESIDENTS BY OCCUPATION



Source: 1980 Census

Employment by industry shows a relatively heavy reliance in Manufacturing and Retail Trade. Nearly three out of every 10 persons employed were employed in manufacturing. Professional and Related Services ranked second and Retail Trade ranked third.

Township residents are highly dependent on employment outside the Township. The 1980 Census reported that 2,509 of the 2,931 in the labor force worked outside of the Township. Some Township residents are highly dependent on employment outside county and the State. 325 of the workforce work outside the county and 32 work outside the county and 32 work

outside the state as well. Clearly, Upper Deerfield is influenced by economic conditions that occur beyond its borders.

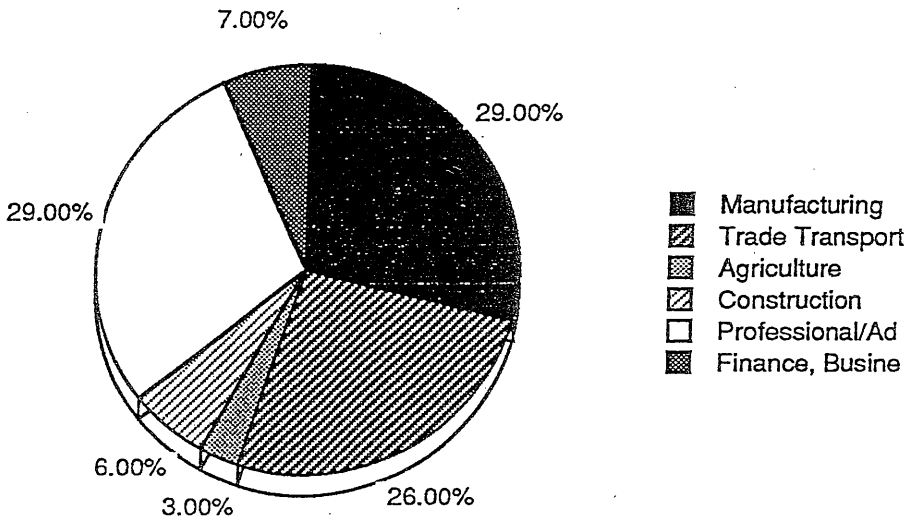
About all Township residents travel to work by car,truck or van and most drove themselves. The 1980 census showed that 2,166 drove alone to work and another 525 used carpools. According to the census, 13 used public transportation, while 85 walked and 55 worked at home.

Industrial

Employment classification by industry can be viewed on Figure 18. Three classifications including manufacturing, wholesale and retail trade and Professional and Public Administration account for 84% of the residential work force. Although agriculture is still an important industry it only accounts for less than 3% of the work force.

Figure 18

EMPLOYMENT CLASSIFICATIONS BY INDUSTRY



PROBABLE FUTURE EMPLOYMENT CHARACTERISTICS

The major employing industries in the county are glass manufacturing, retail trade, services and government. Also farming plays an important role in the economy.

Overall, Cumberland County's economic experience has been very different from the States. While the State's economy has expanded the County's non-farm employment has continued to decline.

During the 1977-1986 span, manufacturing employment was at its highest level of 19,400 in 1977, and by 1986 had declined to 15,100. The most seriously affected industry was stone/clay/glass which declined from 9,700 in 1977 to 6,500 by 1986. Food processing employment fell from 2,700 in 1978 to 2,400 in 1986. Additionally, the apparel industry has also shown a serious loss in employment form 2,600 in 1977 to 1,500 in 1986.

Although no individual local employment projections or county projections have been developed, they have been completed for the southern three counties of Salem, Gloucester, and Cumberland Counties. The Department of Labor projects a 7.6% growth rate within the nine year span from 1982 to 1990.

Employment is expected to advance modestly with the trade, finance/insurance/real estate and service industries. Also, as the casino industry grows in Atlantic City, its importance will grow for Cumberland county job-seeking residents.

The manufacturing base could be further aided by the Bridgeton and the Vineland/Millville Urban Enterprise Zones. It should also be helped with the sturdy expansion of the Vineland Industrial Park opened in 1977.

FACTORS INFLUENCING AND CONTROLLING DEVELOPMENT

Future residential growth depends on many factors including development regulations, the availability of developable land, jobs and employment, availability of utilities, the location of schools, streets, taxing, and market demand. The factors affecting residential growth over which officials have some control, and for which they provide policy to guide future development include the following:

A. Township Development Regulations

The township regulates new development through its Township Development Regulation Ordinances which include Zoning, Subdivision and site plan regulations; the statewide Uniform Construction Code, BOCA existings structures code, health and sanitation regulations, and the Site Plan Review Ordinances.

The development regulations Ordinances make provision for the full range of uses essential to a thriving economically viable community. Upper Deerfield's residential district classifications provide the full range of dwelling types and densities including single family and two family, multiple family or apartment dwelling and townhouses. Densities range from dwelling per 6 acre in the A-agricultural zoning district to 8 units per acre in the R-3 Residential Zoning District.

B. Environmentally Sensitive Areas

The Conservation Plan identifies environmentally sensitive areas which should be considered and respected as development occurs. Included are prime agricultural soils, flood channels, flood ways, and other areas in which development would create a hazard to health, or would cause a disruption of natural functions. All proposed development within environmentally sensitive areas are required to submit environmental impact statements to be reviewed by the planning board.

C. Utility Availability

The two utilities which are essential to residential development at densities which exceed one dwelling unit per acre are sewer and water. Upper Deerfield's current sewerage system is proposed for expansion to serve the proposed areas of higher density residential uses within the township two-area and within the township are currently served by public water supplies. One area located in the former Seabrook area and the other within the vicinity of the Township's former sanitary landfill.

COMMUNITY GOALS RELATED TO THE PLAN

The basic community goals that have guided the planning board in its ongoing planning functions and in the design of this plan are:

To preserve the Township's character as a rural community and the physical features both natural and man-made;

To enhance the quality of life for all the residents through improvement of the township ability to deal with development;

To preserve agriculture and to control growth according to environmental conditions by limiting residential development on prime agricultural soils and in areas where farming is still viable.

To provide housing to meet the need to the extent that environmental and good planning standards permit.

To provide for safe and efficient movement of traffic into, around and out of the Community, good street design and preserve the integrity of the street systems.

To provide for open space and recreational area and facilities sufficient to meet the needs of the Community and Community's share of the region.

UPPER DEERFIELD'S FAIR SHARE HOUSING OBLIGATION

Upper Deerfield has an obligation to make provisions for Affordable Housing Units.

The Fair Housing Act established general guidelines for calculating municipal fair share obligations but the specific regulations were promulgated by the Council of Affordable Housing. The fair share obligation is the number of dwelling units affordable to low and moderate income households, for which provision must be made by each municipality during the 6 year term of its housing plan. The Upper Deerfield plan will cover the period 1988-1993.

The housing obligation has several component parts. Indigenous need is one of the components and it refers to the need to provide housing for current lower income residents who are living in substandard housing. The calculation of this number is based upon census indicators, adjusted by Sub-regional need. Upper Deerfield's indigenous need is 70 units.

Some municipalities have a large indigenous need but no municipality is required to provide for an indigenous need in excess of the regional average.Those deficient units which exceed this cap are placed in a regional pool and reallocated among other municipalities in the region. Upper Deerfield's share of this reallocated present need is 17.

Municipalities are also required to provide for prospective need - affordable units for households not now living in the community but who may wish to do so. The extent of prospective need which a community must provide for is affected by its regional share of such factors as current employment, changes in employment during the period 1977-84, aggregate per capita income, and acres of land in the growth area defined by the State Development

Guide Plan. Upper Deerfield's assigned prospective need is 89 units.

The sum of these three factors is 176 units and represents the total need. This number is further modified, however, by a number of factors keyed to the local situation.

A total of 6 units are added to the township obligation to account for the estimated number of dwelling units, affordable to lower income households, which will be lost through demolition during the six year period of the plan.

"Filtering" is a process by which housing becomes available to lower income households. An adjustment to the housing obligation to account for the process. Upper Deerfield has been credited for 14 units and therefore these 14 units have been subtracted from the obligation.

Another adjustment is made to account for lower income units that will be created through the process of converting large single homes to multi-family dwellings or non-residential structures to residential use. Upper Deerfield has been credited for 3 units.

Finally, an adjustment is made for the number of deficient lower income units that will be brought up to code standards by private efforts, regardless of whether any government programs are instituted. This is known as spontaneous rehabilitation and the township's obligation is reduced by 6 units for that process.

The result of these adjustments is to yield a pre-credited housing obligation of 159 units as summarized in Figure 18 below.

The pre-credited need number can be adjusted to account for a drastic alteration in the character of the community; if inadequate land remains after exclusions are made for environmental, historic, agricultural, and recreation lands, or if there is inadequate utility infrastructure. The extent of these adjustments is prescribed in the regulations, but Upper Deerfield does not qualify for any of these adjustments.

Figure 18

SUMMARY OF UPPER DEERFIELD'S HOUSING OBLIGATION

Indigenous Need	+70
Reallocated Present Need	+17
Prospective Need	+89
Total Need	176
Demolitions	+6
Filtering	-14
Residential Conversions	-3
Spontaneous Rehabilitation	-6
Pre-Credited Need, per COAH	159 units
UNMET NEED	159 units

HOUSING RECOMMENDATIONS

This plan seeks to provide housing opportunities for households of varying economic levels, with attention to the needs of both families and senior citizens so that the township may comply with the Fair Housing Act mandates. To fulfill the township's responsibility to make provision for low and moderate income housing units within the next six years, the plan contained herein relies upon a continued rehabilitation program and enactment of a mandatory inclusionary provision to apply to all residential districts. Additional credits may become available through creation of rental units. The program is described below.

A. Rehabilitation Component

The township has a rehabilitation component to its fair share obligation of 64 units. The COAH regulations set forth the calculation of the rehabilitation component. It is arrived at by subtracting out 6 units that will probably be spontaneously rehabilitated from the indigenous component of 70 units. Upper Deerfield must rehabilitate a total of 64 units.

Recently, Seabrook Associated Limited partnership purchased 326 units of multi-family apartments that had been built to house former Seabrook Farms company employees. This housing was in need of rehabilitation. CDC Financial Institution, a partner of Seabrook Associated Limited Partnership, had applied to the Department of Community Affairs for Section 8 - Moderate Rehabilitation Funds to rehabilitate the substandard apartments that needed major repairs. Besides rehabilitating the units, the program is designed to provide rental income to an owner that will repay rehabilitation costs as well as provide rental subsidies to lower income families. Sign-off or the issuance of a Certificate of Occupancy will only be made if units are brought up to code standards.

CDC Financial Institution has received a commitment to rehabilitate 326 units. They intend on preforming major replacement of kitchens, bathrooms, asbestos removal, as well as external repairs. It is anticipated that it will cost about $15,000 to rehabilitate each unit. The contract, between the New Jersey Department of Community Affairs and the applicant, in this case CDC, obligates the bureau to pay a rent subsidy for 15 years. This makes the units affordable to low and moderate income persons thus meeting the guidelines set up by COAH.

It is the intent of Upper Deerfield that the rehabilitated units will be counted as completed units towards the rehabilitation component of the unmet need for low and moderate income housing, but these units will only be counted and accepted by Upper Deerfield if units meet minimum housing code standards.The Township is also encouraged to investigate funding for balanced housing to provide funding for the developers of the above units or other developers within the town who may choose to rehabilitate housing,

It should be the express policy of the Township's Housing Plan and Master Plan to investigate and cooperate in making applications for rehabilitation funding and code compliance.

B. Inclusionary Zoning Component

The other part of the housing allocation mandated by the Fair Housing Act is the inclusionary component which includes new housing to be built within the township. Upper Deerfield must provide for a plan to include at least 95 units of new low and moderate income housing within the next 6 years.

The planning board wishes to specifically address the following particular needs:

1. The need to provide housing opportunities for low/moderate income senior citizen residents.

2. The significant need to provide new housing opportunities for the Township's young low and moderate income families, many of whom may be now living in with their parents.

3. The need to provide housing opportunities for persons employed in the Township who must commute to their place of employment.

It is proposed that all residential areas of the township be subject to an inclusionary requirement of 10 percent low and moderate income housing units for sale or rental developments. In instances of townhouses, a density of 6 dwelling units per acre would be permitted and for apartments, a density of 8 dwelling units per acre would be permitted. Areas now classified in the R-3 residential zoning district have been analyzed for such factors as environmentally sensitive lands, availability of utilities and other public services, highway access, accessibility to commercial districts, and existing land use patterns to determine suitability. All of the R-3 districts which would be subject to the inclusionary requirements are included in the high density classification in the Land Use Plan of the Master Plan and allow for at least the minimum six units per acre as required by COAH regulations.

The mandatory set aside requirements has a potential yield of approximately low and moderate income sale or a yield of 518 rental units. The calculation for these areas is identified below.

Figure 20

SET ASIDE ESTIMATES

District	Acres	DU/Acre	Total DU	Low/Mod@10%
R-3	647.33	6	3884	388
		8	5179	518

All municipalities with an obligation of 125 units or more must attempt to insure that at least 20% of its affordable housing obligation are rental units and not for sale. Specifically the rental requirement is equal to 20% of the pre-credited need, less credits adjustments, and indigenous need. It is recognized that lower income households have a difficult time qualifying for mortgages and obtaining down payments. It is often more economical to a developer to build sales units. To overcome these disincentives and to encourage a good mix of sale and rental units, this plan proposes to reduce the set-aside requirement to 8% for rental development.

COAH has granted an incentive of its own for the provision of rental units. All such units count as 1 1/3 sale units so that the provision of three rental units would reduce the fair share obligation by a total of four units. The credit applies for all rental units up to 20% of the total obligation less adjustments, credits and indigenous need. In Upper Deerfield's case, its unmet

need is 159 and its indigenous need is 70. Thus 89 units remain, of which 20%, or 18 units are eligible for rental credit.

C. Summary of the Housing Plan.

The Upper Deerfield Plan for meeting its housing obligation, is summarized below. The sum of the set aside programs is capable of producing a minimum of 388 to 518 low and moderate income units.

Figure 21

SUMMARY OF THE HOUSING PLAN

Rehabilitation (326)	64 Units
Maximum Inclusionary Requirement	518 Units
Total Program Units	582 Units
Unmet Housing Need	159 Units
Rehabilitated Housing (326 Units)	70 Units
Targeted Housing Need	89 Units

It should be noted that these numbers are in excess of the unmet need for developing affordable housing, but the Township felt that it was more desirable to encourage affordable housing to be built and rehabilitated throughout the Township.Specifically, the Township is very much opposed to designing or providing for areas that are less than desirable just to accomodate developers' set aside requirements for affordable housing that may be stigmatized as a "low income housing area. This may not always be possible but the primary policy of the board will be to select the most suitable location whether it be within a particular development or elsewhere within the Township. The selection will be at the discretion of the Township.

D. Special Requirements of the Housing Plan.

In addition to the 20% rental unit requirement noted previously, the housing plan must consider and provide for a number of requirements mandated by COAH's regulations. These include the following:

1. Affordability Mix.

   Developments must be occupied by 50% low income households and by 50% moderate income households. Within those ranges specific guidelines have been established in the COAH regulations as to the number in each income range which must be accommodated.

For every 20 low and moderate income units:

Number of Households		Income as % of Media
Low}	1	40.0% - 42.5%
	3	42.6% - 47.5%
	6	47.6% - 50.0%
Moderate}	1	50.1% - 57.5%
	1	57.6% - 64.5%
	1	64.6% - 68.5%
	1	68.6% - 72.5%
	2	72.6% - 77.5%
	4	77.6% - 80.0%

2. Bedroom Mix

At least 35% of all low and moderate income units must be two bedroom units. No more than 20% may be efficiencies.

3. Provision of Low and Moderate Income Units in Inclusionary Development

In a set-aside project, no low and moderate income units need to be provided until the first 25% of the total project is completed. Thereafter, 10% of the low and moderate income units must be provided before the next market priced unit is built. Half of the affordable housing has to be completed when half of the markets are complete and all of the low and moderate housing units must be complete when the project is 90% complete.

4. Age Restriction

No more than 25% of the units in an inclusionary development may be age restricted, such as units reserved for senior citizens.

5. Affirmative Marketing

The municipality has primary responsibility to insure that developers and sponsors affirmatively market the development to representative groups. Initially no more than 50% of the units may be offered to individuals who currently live in the community or who work in the community but live elsewhere.

E. Housing Plan Implementation

Implementation of the housing plan recommendations will require amendments to the Development Regulations Ordinance to mandate an inclusionary or set-aside requirement to provide for low/moderate income units in all of the residential districts or any planned developments. For single family developments, the developer will be required either to provide within a development his fair share or elsewhere to acquire a unit elsewhere in town that may need rehabilitation and make it suitable for occupancy. He will then be required to fill it with an eligible low or moderate income person.

The board will determine the specific location based on economic conditions and other considerations. When the board has determined that the location should be off tract, it will be guided by the proper integretion of housing within the Township.

A draft of these amendements is found in the Appendix of this chapter.

F. Code Enforcement.

Maintenance of existing housing stock minimizes the occurance of substandard housing, a major component of COAH's allocation formula. It is therefore strongly recommended that the Township institute a vigorous campaign of code compliance and housing code enforcement.

In addition, funding is now available from the Department of Community Affairs to award grants to municipalities in order that they may rehabilitate existing substandard housing.

It is therefore again strongly recommended that Upper Deerfield make application for this grant in order to prepare for 1993 COAH review and allocation.

APPENDIX A

Draft Amendment to Upper Deerfield Township Zoning Ordinance To Require Inclusionary Development in All Residential Districts

1. Amend Article II Definitions 98-3, Terms defined added the following:

INCLUSIONARY DEVELOPMENT, A residential development in which a proportion of all units are reserved for low income households as defined by New Jersey Council on Affordable Housing and in which an equal proportion of units are reserved for moderate income households as defined by New Jersey Council on affordable housing. For developments in which the units are sold by fee simple, condominium, cooperative, or similar form of ownership, the sum of low and moderate income units shall be 10%. For developments in which the units are rented, the sum of low and moderate income units shall be 8%.

2. Amend Article IV District Regulations, by adding the following as Section 98-7.1:

Provisions for Low and Moderate Income Housing Units:

a. New developments within all residential districts which include 20 or more dwelling units or a cumulative total of 20 units within a three year period must be inclusionary developments as defined in section 98.3 herein.

b. All new units constructed in inclusionary developments shall include affordability controls in the form of a deed restriction or similar covenant acceptable to the Township which shall restrict low and moderate income units to occupancy by income qualified households, as described below, for a period of not less than twenty (20) years.

c. The developer of an inclusion development shall submit for approval by the Planning Board, a program for the affirmative marketing, screening, and selection of occupants of the low and moderate income units. This plan shall conform to the regulations of the New Jersey Council on Affordable Housing and shall at the minimum contain the following elements:

i. Identification and marketing of units to representative groups operating in the Township and its housing region, to be initiated at least 90 days before occupancy.

ii. For initial occupancy, and until such time as 50% of the units have been rented or sold, no more than 50% of the units shall be made available to individuals currently residing or working in the Township. After the first 50% of the units are allocated, all remaining income eligible applicants shall be pooled and offered contracts.

iii. Within each round, random selection of eligible applicants shall prevail.

iv. No more than 50% of the units in any single structure shall be reserved for low and moderate income households.

d. The cumulative total of all low and moderate income housing units which shall be restricted by minimum age of adults may not exceed 25% of the Township"s fair share obligation, as determined by the housing element of the master plan.

e. To the greatest extent possible, the average price of low and moderate housing units shall be affordable to households with an annual income equal to 57.5% of the regional

median, assuming a standard of 28% of qualified income for purchased housing and 30% for rental housing. To the greatest extent, the range of affordability for purchased housing shall conform to the following schedule for every 20 low and moderate income units:

1 Unit between 40.0% and 42.5% of the median
3 Units between 42.6% and 47.5% of the median
6 Units between 47.6% and 50.0% of the median
1 Unit between 50.1% and 57.5% of the median
1 Unit between 57.6% and 64.5% of the median
1 Unit between 64.6% and 68.5% of the median
1 Unit between 68.6% and 72.5% of the median
2 Units between 72.6% and 77.5% of the median
4 Units between 77.6% and 80.0% of the median

For initial occupancy, priority shall be given to households within a particular income category with flexibility based on New Jersey Housing and Mortgage Financing Agency affordability controls criteria.

f. At least 35% of all low and moderate income housing units must be two bedroom units. At least 15% must be three bedroom units. No more than 20% may be efficiencies.

g. In inclusionary development projects, no low and moderate income units need to be provided until the first 25% of the project is completed. Thereafter, 10% of the low and moderate income units must be provided before the next market priced unit is built. Milestones are set for parody of low and moderate income units with the total job at 50% and 75% of completion, but all low and moderate income units must be built when the job is 90% complete.

h. No more than 50% of the units in any single multi-unit structure shall be reserved for low or moderate income households unless the requirement is specifically waived by the Planning Board as a condition of site plan approval. Regardless of whether this requirement is waived as to any specific structure, it is the intent of the ordinance that low and moderate income housing units shall be evenly dispersed throughout the entire development in as uniform a fashion as is practical.

CHAPTER VII THE COMMUNITY FACILITIES PLAN

Introduction

With the growth of the Township has come an increase in the demand for the provision of public services and the administration of government. The facilities in which these services are provided or from which they eminate include schools, fire houses, office buildings and a number of other structures and sites. The Community Facilities Plan Map shown in Figure 14 denotes the location of these "community facilities". Not all of the facilities are publicly owned or operated, however, they all have value to the community as a whole and are recognized here in the Plan for that value. A brief description of the facilities, their purpose and value is given below. Some recommendations for new facilities are set forth as well as proposals for the enhancement and improved utilization of existing ones.

Fire Protection

There are three fire companies located within the Township:

Upper Deerfield Volunteer Fire Company #1 (See #2 on Map),

Seabrook Volunteer Fire Company (See #9), and

Upper Deerfield Volunteer Fire Company #3 (See #20).

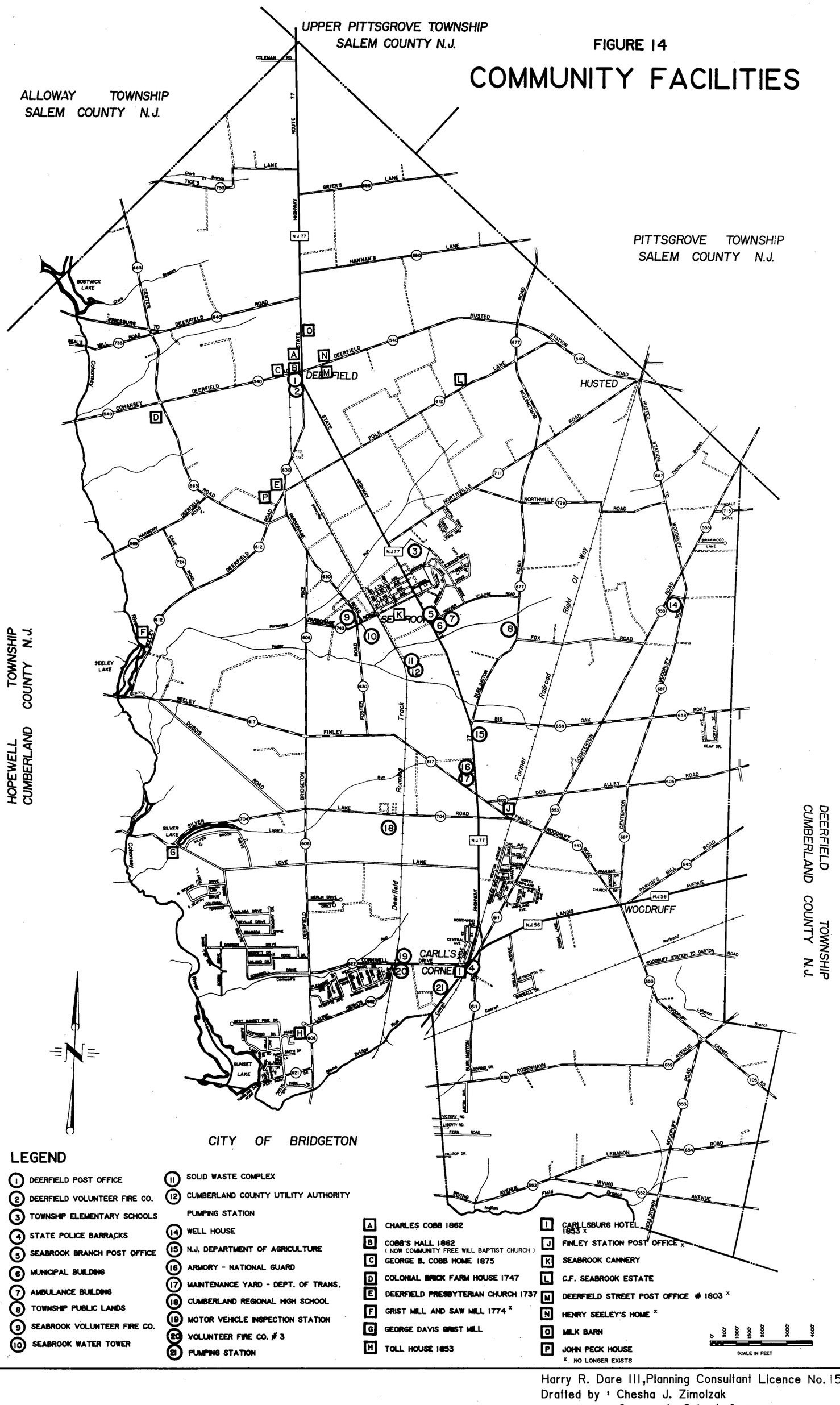
As their names clearly indicate, all three companies are volunteer associations and each is governed and manned according to its own bylaws and State law and regulations. The Township does provide each company with operating expenses and capital funding for the purchase of new equipment which is owned by the Township of Upper Deerfield. With the elimination of the special police force in 1986, the Township also ended the centralized emergency dispatching and communications system at the Township Municipal Building. The Township now utilizes the services of the County Communications Center for all its dispatching and the handling of emergency call. The Township still maintains equipment and communication tower facilities as part of the County-wide communications system.

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

FIGURE 14

COMMUNITY FACILITIES



LEGEND

1. DEERFIELD POST OFFICE
2. DEERFIELD VOLUNTEER FIRE CO.
3. TOWNSHIP ELEMENTARY SCHOOLS
4. STATE POLICE BARRACKS
5. SEABROOK BRANCH POST OFFICE
6. MUNICIPAL BUILDING
7. AMBULANCE BUILDING
8. TOWNSHIP PUBLIC LANDS
9. SEABROOK VOLUNTEER FIRE CO.
10. SEABROOK WATER TOWER
11. SOLID WASTE COMPLEX
12. CUMBERLAND COUNTY UTILITY AUTHORITY PUMPING STATION
14. WELL HOUSE
15. N.J. DEPARTMENT OF AGRICULTURE
16. ARMORY - NATIONAL GUARD
17. MAINTENANCE YARD - DEPT. OF TRANS.
18. CUMBERLAND REGIONAL HIGH SCHOOL
19. MOTOR VEHICLE INSPECTION STATION
20. VOLUNTEER FIRE CO. # 3
21. PUMPING STATION

- A CHARLES COBB 1862
- B COBB'S HALL 1862 (NOW COMMUNITY FREE WILL BAPTIST CHURCH)
- C GEORGE B. COBB HOME 1875
- D COLONIAL BRICK FARM HOUSE 1747
- E DEERFIELD PRESBYTERIAN CHURCH 1737
- F GRIST MILL AND SAW MILL 1774 x
- G GEORGE DAVIS GRIST MILL
- H TOLL HOUSE 1853
- I CARLLSBURG HOTEL 1853 x
- J FINLEY STATION POST OFFICE x
- K SEABROOK CANNERY
- L C.F. SEABROOK ESTATE
- M DEERFIELD STREET POST OFFICE # 1803 x
- N HENRY SEELEY'S HOME x
- O MILK BARN
- P JOHN PECK HOUSE

x NO LONGER EXISTS

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George A. Schock & Assoc.

The Upper Deerfield Volunteer Fire Company #1, so named since it is the community's original fire company, owns its existing fire hall. The Company is now completing a new three-bay fire hall which is leased to the Township for five years. The $40,000 per year lease was entered into since the facility houses the Township's equipment, i.e., the fire engines. The new masonary structure will serve the Company for many years to come. Use of the former fire hall is now undecided.

The Seabrook Volunteer Fire Company, also known as Fire Co. #3, is housed in Seabrook at the juncture of Parsonage and Foster's Roads. The Company was given title to its hall and land by Springs, Inc., successor to the former Seabrook Farms, which started the company originally. In 1984 the Company turned ownership of the property to the Township which then renovated the masonary structure and fire hall portion of the building. .Approximately two-thirds of the space within the fire hall building is unfinished and used primarily for storage. The Company has expressed an intent for use as a community hall. Since the structure was once a repair garage for heavy equipment, it is a very well-built structure capable of various uses.

Volunteer Fire Co. #3 has a relatively new fire hall built and owned by it. The hall is also masonry in construction, and along with the Municipal Building, is one of two polling places within the Township. The three-bay structure houses three pieces of fire fighting apparatus all owned by the Township.

As has been noted, the Township owns all the fire fighting equipment used by the municipality's three companies. Much of that equipment is relatively new. In recent years there has been an effort to encourage a community-wide analysis of equipment needs so as not to duplicate trucks and equipment. Due to the high cost of new equipment this becomes more and more necessary where there are three companies to be equipped.

All companies are volunteer and work together to coordinate service and cover for each other's districts (See Figure 14). With an increase in development and the diversity of it, e.g., industrial, high density residential and office complexes, the need for full-time, paid firemen may become necessary. At present the Township's fire fighting service is well-suited and capable of meeting the need.

Municipal Government

The Township's Municipal Building (See #6 on the Community Facilities Plan) is located at the intersection of State Highway 77 and Hoover Road in Seabrook. The Georgian style, brick structure sits on 6.74 acres and has two full floors (a basement and first floor) fully accessible to the handicapped. The second floor space is not handicapped accessible and is now primarily used for storage. The structure has an emergency generator which was installed when the building housed the special police force and emergency dispatch.

The structure houses the Municipal Court and all administrative and executive offices of the Township. It is also a polling place, although anticipated use of floor area in the Building basement may well

necessitate moving of the polling place for one of the two currently located there.

With the expansion of government activities additional office space was necessary. The Municipal Building basement is now almost exclusively utilized by municipal offices or activities. Any further expansion of municipal operations will mean additional space will be necessary. Two government activities, in particular, are good possibilities for such need arising. The first involves the Township's maintenance operations which entail utility operations, street and roads maintenance, grounds maintenance and recreation. At present the Township has two bays of the four bay, masonry structure located on the same property as the Municipal Building. It is owned by the Township and is partially leased to the Township Ambulance Association and Rescue Squad for a nominal fee.

The "municipal garage" portion of this building is insufficient to house all of the Township's equipment. It may well become necessary to erect a new municipal garage or purchase an existing facility for such use. Such a facility would need office space as well as storage area. The equipment to be stored or garages ranges from trucks, tractors and road repair equipment to water meters, chemicals, tools and road supplies. The ideal location for such a structure is at the municipal complex site in Seabrook. In this way all Township government facilities could be centrally located and in close proximity to each other.

If a new structure were built at the complex site, care should be taken to assure its location and architectual character blend or harmonize with the existing structures.

The other municipal government services which would require additional space would be a police department. Before the special police were disbanded, space was a serious problem. There was no prisoner holding area, office space was limited, there were no changing facilities and storage space for gear, equipment, records and supplies was very minimal. The establishment of a Township police department would definitely necessitate new space, i.e., a new structure or purchase of an existing structure and renovating it to suit the need.

The Township is very fortunate to have a municipal complex of such superior design and quality. It is highly recommended that every effort be made to preserve and protect this valuable asset which says much about the community that built it.

Ambulance Service

Also located on the 6.74 acre parcel and adjacent to the Municipal Building, as noted, is the so-called Ambulance Building (See Item #7) which houses the Upper Deerfield Township Volunteer Ambulance Association. Most of the building is leased to the Association by the Township. In addition, the Association also receives a contribution from the Township each year towards the cost of its operation. The Association owns two ambulances. The Association is autonomous from Township government and is not a part of it. It is a volunteer organization. The County Communication Center serves the Association as

well. The Association has recently reorganized itself and begun a campaign to attract new members and educate them as EMT's (Emergency Medical Technician). Hopefully this effort will be successful and prevent the need for full-time, paid ambulance service.

Township-Owned Lands

Besides the 6.74 acres where the Municipal and Ambulance Buildings are located, the Township owns two parcels on Old Burlington Road (See #8). One parcel contains two acres of land and is situated amidst the Township park and recreational area purchased with Green Acres fundings. The parcel will provide an area for the construction of recreational related or support facilities, perhaps a municipal garage.

The other parcel contains 11.99 acres and was purchased at the same time the recreational area was purchased. The use of this land has not been determined, however, since it is adjacent to the recreational area it should provide a protection against an incompatible land use.

Proposed Township Maintenance Garage

As was noted earlier, the activities of municipal government have increased to the point that a Township maintenance garage is now a very real need. Equipment, vehicles, supplies and materials need housing. The Township could purchase an existing facility and adapt it to its needs. This option is limited to the number of structures available and suitable to such public use.

The other option involves constructing a facility on existing Township property. Possible sites include the existing municipal complex, one of the two Township-owned parcels on the Old Burlington Road, or the recycling center lands south of Seabrook. The recycling center site is probably less suitable due to its remote location. The other sites would be much better for such a facility.

Planning for such a facility should begin now so as to provide sufficient time to weigh the options and needs fully. The fine municipal complex the Township now has is the result of careful and early planning. Since development seems destined to occur throughout the Township, increasing the services to be provided, plans for a garage will no doubt be needed, perhaps sooner than expected.

State Facilities

The State of New Jersey has several structures within the Township and most of them pertain to traffic and roads. The Division of Motor Vehicles maintains an inspection station on Cornwell Drive (See #19). The Department of Transportation has a maintenance yard (See #17) on Highway 77 which is adjacent to the National Guard Armory (See #16). The New Jersey State Police currently lease barracks (See #4) at Carlls Corner. Rutgers the State University has an 242.5 acre experimental farm station located northeast of Seabrook on the Northville and Old Burlington Roads. The site is delineated on the existing land use plan as public lands.

The State Department of Agriculture (See #15) has an office building on Highway 77 and the New Jersey Department of Labor and Industry has leased space in the Carlls Corner Shopping Center for an employment service office.

Postal Service

The U. S. Postal Service has two post offices in Upper Deerfield Township. One is the Deerfield Post Office (See #1) located on Main Street in Deerfield. This office services Zip Code Area 08313 which primarily covers the northern section of Upper Deerfield Township (above Seabrook). The Seabrook Post Office (See #5) is a substation of the Bridgeton Post Office (Zip Code 08302).

Educational Facilities

The Township's elementary schools, three in number (See Item #3 in the Community Facilities Plan) are centrally located in Seabrook. These facilities serve as schools and community facilities, to a much greater extent than in many communities as a result of the Community Education-Recreation (CER) Program jointly sponsored by the Township government and the Board of Education. The program seeks to maximize the use of all Township or public facilities for a wide range of educational, recreational and social activities. Through its own Board, the CER program provides day care, senior citizen lunches, field trips, child and adult educational programs and other community-related activities.

The Township's three schools are located on just over 38 acres of land. The site is centrally located and is served by public sanitary sewer and water supply systems. All pupils from grades K through 8th who attend public school in the Township go to one of these three schools.

The Elizabeth F. Moore School, often referred to as the Moore School, was constructed in 1922 with additions made in 1946 and 1955. A modernization and renovation of the facility, which included installation of a new heating system, was undertaken in 1975. The school houses the District's fourth and fifth grades.

The school also had a media center and modern administration offices, teachers' rooms and storage areas. An auditorium with a seating capacity of 569 is located in the school and was renovated in 1984 with a grant from the Township government and Board of Education funds. The auditorium serves the District for general assembly school needs and the community as a meeting facility.

The school also has a well-equipped cafeteria which serves the school's pupils and is available for general community functions as well.

Although the structure is old, it has been well maintained over the years and is entirely functional under all standards for its use. It has a functional capacity of 425 pupils. The school building is not, however, suited for use by physically handicapped students because of its multi-floor construction without elevators.

Built in 1955, the Charles F. Seabrook School was added onto in 1956. A tornado ravaged approximately one-third of the structure in 1975 and reconstruction was accomplished in that year. The 22 classroom school has a library, teachers' rooms, administrative and health offices, kitchen, boiler room, storage rooms; all constructed on one level. The school houses the District's kindergarten through 3rd grade classes. There is also a library and all-purpose room. The school has a functional capacity of 550 students.

The newest of the District's three schools is the Woodruff School, constructed in 1976. It is a modern, carpeted, air conditioned and well-equipped facility providing space for grades 6, 7, 8 and special education.

Besides a special science room, the school has a large media center, shop, home economics area, health suite, special classroom, administrative offices, kitchen, cafetorium, art room, music room, and a full-equipped gymnasium with showers and locker rooms. A well-equipped boiler room, which includes an emergency generator, completes the structure.

All common facilities of the structure were built for a capacity of 800 pupils with only classroom additions being necessary to raise the functional capacity from 495. Space is available for such future expansion.

Outside recreational facilities include athletic fields (hockey, soccer and baseball) and six fully lighted tennis courts. Parking facilities are provided and have proved sufficient to meet demand.

The one level facility easily provides for access by handicapped students and the location of the school as part of a three school complex permits and assures no duplication of facilities within the District. The structure has a cafetorium which can seat 410 and meals are prepared and served within the facility. The cafetorium is often used by community groups for special functions.

The Township school system is only now beginning to fill up excess capacity which began in the late 70's. The school district's master plan projected growth in the 1980's which would appear to be occurring. No doubt new facilities will be needed within the next ten years. The Board of Education is prepared and able to handle the increases unless such growth is inordinate.

It is recommended that the community as a whole investigate expansion of school property to continue the District's centralized approach for the educational plant. Careful planning, prudent use of resources and exemplary cooperation between the Board of Education and Township Committee have developed one of the finest school systems in southern New Jersey. The District's fine administration has established a high quality of education. The future may offer challenges, but the Township's land use policies should prevent unmanagable growth in school populations.

As for secondary education, Township students attend the Cumberland Regional High School, constructed in 1974. The school, providing classes for grades 9 through 12, is located within the Township (See Item #18). The region included in this District consists of seven municipalities which all had formerly been sending districts of Bridgeton. The municipalities include the Townships of Deerfield, Fairfield, Greenwich, Hopewell, Stow Creek and Upper Deerfield and the Borough of Shiloh. The school currently has a student population of 1,530.

The new high school also has a number of outdoor recreational facilities including football fields, running track, soccer fields and four tennis courts. The school is now building a new gymnasium and auditorium.

Based on a State Department of Education formula, the budget of the Regional District is support in excess of 40% by Upper Deerfield Township taxpayers. It is not anticipated that that degree of support should increase substantially.

Historic Structures and Sites

A community which recognizes the value of its heritage and seeks to preserve the mementos of its past, provides a continuity and understanding of its growth. History should not be overlooked when discussing future land use and these structures and sites of historic significance must be recognized as valuable community assets. The study and recognition of the past depict the cultural and economic evaluation of today's land use patterns. This premise is clearly demonstrated in the case of Upper Deerfield wherein a rural, agrarian community is emerging into a developing municipality seeking to balance farming with residential, commercial and industrial growth. The historical buildings, sites and ruins which have been "discovered" are visible evidence of the past and the on-going change.

In 1725, Banjamin David bought 1,000 acres of land from the Proprietors of West Jersey, as today's southern New Jersey was known in Colonial times. His lands became known as "Deerfield" and were situate along the east banks of the Cohansey River. The settlement of the area was by farmers. It was not an easy existence and insect-borne diseases descimated the population. Records from the Deerfield Presbyterian Church show that 22 parishioners died per year between 1772 and 1880 which was a considerable percentage of the population.

The Deerfield Presbyterian Church is situated on probably the earliest side of settlement (See E on Figure XIV). The first church and school were constructed of logs in 1737, south of the existing stone church which was built in 1771. Two of the church's most influential ministers, the Reverends Enoch Green and John Brainard, were buried under the floorboards of the church. Renovation of the Church in 1947 included the installation of a stone floor with hot water pipes. At that time, the graves were removed to the churchyard cemetery. The Church is listed on the National Register of Historic Structures.

The first house south of the Deerfield Presbyterian Church on the North end of Seeley-Deerfield Road was the mid-18th Centry home of John Peck, a friend of the noted diarist, Phillip Vickers Fithian (See P). They were classmates in the Latin School at the Presbyterian parsonage and John Peck replace Fithian as a tutor at the Carter Plantation near Williamsburg, Virginia. While he never returned to Upper Deerfield Township, he became influential in Virginia after marrying into the Carter family.

As noted earlier in Chapter 4, in 1768 the first road was cleared from Bridgeton to Deerfield. This road was east of the present day Deerfield Pike and it wound through the woods until it came to the existing site of the Seabrook Water Tower. From there, it followed the present day roadway, Parsonage Road, from the Tower to Deerfield. Thirty years later a direct route was built following the present day Deerfield Pike. In 1853, a Toll House (See H) was built with a gate across the Turnpike to help pay for the first hard surface road. Tolls ranged from 1¢ to 5¢, depending on the distance traveled.

The Toll Gate House is listed on the National Register of Historic Places and is one of the few remaining examples of such structures in southern New Jersey. This simple, modified saltbox structure served as the Toll Gate keeper's residence. The structure is owned by a descendant of Benjamin Davis. The structure represents the beginning of the Township's evolution as a farming community closely interrelated to the industrialized City adjoining it. The goods produced in both moved along this route thereby linking the two. The structure warrants preservation as a visible monument to the on-going relationship of rural and urban Cumberland County.

The House's continued existence is seriously in doubt. The structure is in need of major repairs and has suffered serious damage from fire, vandalism and the weather. A proposed widening of the Old Deerfield Pike by the County would necessitate moving or the demolition of the Toll Gate House which, of course, in either case, would remove the structure from the National Register. It is recommended that the Township seek to preserve the structure if possible.

By 1774, "Deerfield Street", as the community of Deerfield had become known, had a church and classical school (what we would refer to as a Prep school), mastered by Reverend Enoch Green in his home. Henry Seeley, a member of the Greenwich Tea Party, had located his home on the northeast corner of the intersection of Main Street (Highway 77 and the Seeley Road (See N). His father, "Henry" Seeley, maintained a Tavern in his home, but its exact location is not known.

On the southeast corner of the same intersection, Noah Harris built his home (See M). Harris was a member of the "Revolutionary Committee for the Safety of Cumberland County". The location of Harris' home became the site of the post office in 1803.

Southwest of Deerfield, a grist mill and a saw mill were built by the "new dam" on the north end of Seeley Lake in 1774 (See F). The peach and apple orchards, plus the village flax kiln represented the

economy of Deerfield. As time passed Deerfield became a commercial center for surrounding farms, but the steam train running through Husted Station and Finley Station removed Deerfield from the main traffic arteries. Finley Station also rated a post office (See J).

By the late 1800's Deerfield had three wheelwrights and a blacksmith. George B. Cobb, a master carriage maker, built his house in 1875 (See C). His brother, Charles, had built his house around the corner in 1862 (SEE A). Cobb's Hall (1862) presently houses the Community Freewill Baptist Church (See B).

Carll's Corner, originally Correll's Corner, was the site of the Correllsburg Inn, later known as the Corllsburg Hotel (See I) in 1853. It was located along the Old Burlington Road, the stagecoach route.

A grist mill (See G) was located below the dam at Silver Lake. During the early 1800's it was owned by one, Daniel Moore who sold it to Samuel Rommel. During the 1800's George Davis became proprietor and repaired the building and machinery. The night before it was to reopen it caught fire and burned (October 29, 1883). The raceway, remains of the building and parts of mill machinery are still hidden in the undergrowth today. The Township Historical Commission had a site plan and architectual renderings of the old mill made since the structure is fact deteriorating.

In 1922, what is Upper Deerfield Township separated from Deerfield Township. During the 1930's, Charles F. Seabrook, one of the pioneers of the frozen food industry and a local farm boy, developed the area of Seabrook with one of the first large-scale agricultural industries (See Sites K and L). This industry has had a great impact on the development of Upper Deerfield Township and his descendants (grandsons and great-grandsons) opened a new processing plant in 1978 which represents a renewed faith in the future of agriculture in southern New Jersey. The former Seabrook Farms plant is now home to Clement Pappas and Co., Inc. and the Cumberland Cold Storage Company.

Other sites exist which have no known history or which have not been "discovered" yet. A colonial brick farmhouse bearing the date (in its chimney) of 1757 (See D) is situate west of Deerfield. A fine example of rural architecture created in the 1920's is the milk bar in Deerfield (See). Many other sites have not yet been recognized such as early schools, railroad stations, mills and homes. Extensive native American artifacts have also been found in the Township, but few, if any, professional archeological digs have been undertaken.

A survey of historic sites and structures was undertaken in 1979 and needs to be reexamined in light of current knowledge. The pace of development threatens t obliterate many places of historic and archeological significance. The Township created a Historical Commission in an attempt to oversee and undertake the preservation of historic sites. Such action is to be commended as it demonstrates the community's recognition of its heritage and the value of it. The Commission published a history of the Township entitled: This Place Called Home

in 1985. Written by local historian and resident F. Alan Palmer, the book is being used to teach local history in the Township elementary schools and has been widely distributed to many libraries, universities and historical organizations. This publication not only documents the community's history, it also creates a sense of "community" and establishes pride in young people about their home.

CHAPTER VIII UTILITIES PLAN

Introduction

Utilities when referred to in planning jargon mean such public services as sewers, both sanitary and storm; water supply and solid waste disposal. They represent essential governmental services and their costs, capital and operating, are considerable. No municipality which expects to sustain growth, protect the environment and assure the safety and health can ignore these services or their efficient operation.

State and federal regulations largely govern utilities and because their cost is so high, often times requiring State and Federal funding, the State is able to control the planning decisions made in connection with them. This fact was made very clear to Upper Deerfield Township in connection with its application in the early 1970's for funding to construct sewage collection lines, and again in the early 80's in connection with the Township's sanitary landfill and its probable contamination of ground water supplies. In both cases, State Department of Environmental Protection policies were influx making decisions difficult, if not impossible, to make and local plans and monies wasted in the process of getting approval and/or direction.

Since the 1976 Master Plan much has transpired in terms of utilities, conditions and existing land use. The pumping station and interceptor line are sufficient in size to handle the development anticipated. New collection lines and lift stations may well be necessary to get sewage flows to the pumping station that serves this area. The interceptor line is under high pressure thus requiring pumping stations whenever it is tapped into along its route.

In 1987 the Township finalized purchase of a private collection line which had been constructed by Seabrook Bros. & Sons, Inc. at the time of the construction of their processing plant (See Item #4 on the Utilities Plan Map) just south of Seabrook. This line was a gravity main which carried the plant's sanitary waste north to the CCUA pumping station. Industrial wastes are disposed of under a Department of Environmental Protection permit by spray fields onto lands owned by the firm north of the Seeley-Finley Road and west of Deerfield Pike. The industrial effluent is primarily wash water resulting from the vegetable processing.

The Township purchased the private sanitary sewer collection line in order to have control of all sewer lines within the Township. The

Township's service agreement with the Cumberland County Utilities Authority provides that the Authority will enter into no third party agreements with the Township. Therefore, all billing and accounting for sewer treatment is handled through the Township. This is very important if the Township is to be effective in the rate making procedures for sewage treatment. It also provides a greater degree of control over what is flowing through sewer lines within the Township and thereby effecting treatment costs. It also gives the municipality more flexibility in permitting or undertaking future connections or extensions without having to deal with third party contracts and ownership of sewer facilities.

The second area which will be sewered is the Carlls Corner area, the site of the Township's commercial hub. The Township has constructed and will operate sanitary sewer collection lines within this area and has worked in cooperation with the McDonald's Corporation in the construction of a second pumping station which will provide the connection to the County Utilities' Authority interceptor at its intersection with Cornwell Road and Deerfield Running Track rail line. This new pumping station which is expected to go on line by 1988 is located behind the McDonald's Restaurant and will be sold to the Township upon its start-up.

This pumping station is sized along with the force main, leading from it behind the Carlls Corner Shopping Center to the connection with the Authority's interceptor, to accept all effluent anticipated to be generated in the Carlls Corner area and the lands northeast of it along Centerton Road and Landis Avenue, State Highway #56. The existing service area for the collection lines currently installed is shown on Figure 15. Lands both north and south of Cornwell Road and along the Burlington Road, north of the Conrail rail line will also be able to be served by this pumping station. Again lift stations and new collection lines will be necessary.

It is highly recommended that the Township install new collection lines within the entire Carlls Corner intersection area, most notably, the area proposed reconstruction as part of the State Department of Transportation plans. This would assure a connection for future extension of sewer lines out Centerton Road or Landis Avenue without having to disturb the newly constructed intersection.

The third and final area which is scheduled to be connected to public sanitary sewer is the Cumberland Regional High School which is proposing to change from on-site disposal to connecting to the Utilities Authority's interceptor line which runs right along side the school lands. The existing pump station located near the school's stadium is to be converted into a facility which will inject the effluent into the pressurized interceptor. It is not anticipated that this pumping station or the collection lines and force mains leading to and from it will be of much use in providing sewer service to areas other than the school. Areas south, east and north of the school grounds when developed will have to provide another pumping station to provide connection to the County Utilities Authority interceptor.

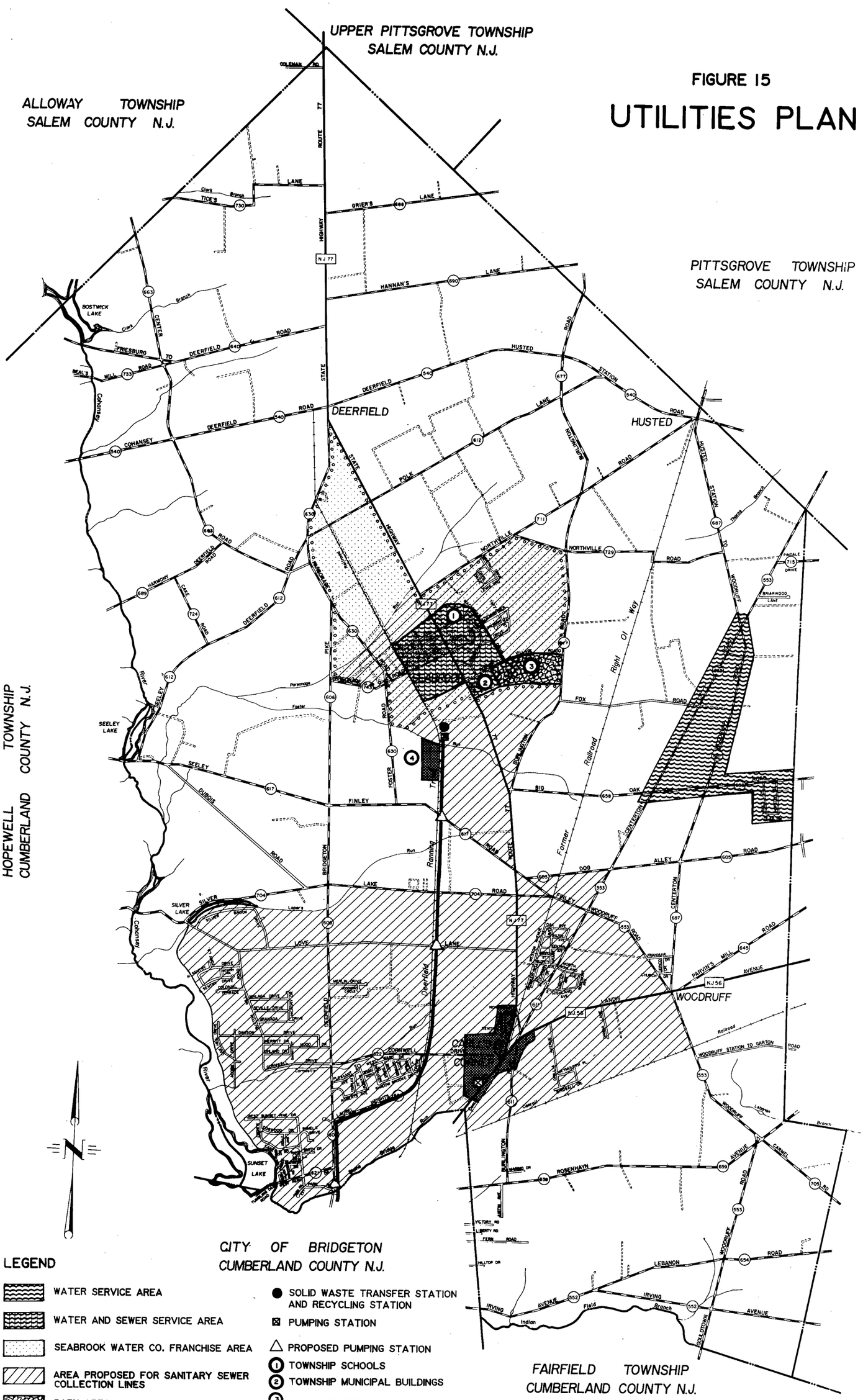
It should be noted that when the Authority's interceptor was installed, there were four connections provided for besides the pumping station at Seabrook constructed at the same time. Two of the four have now been utilized i.e. Cornwell Drive and Love Lane (See Figure 15). Two

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

FIGURE 15

UTILITIES PLAN



LEGEND

- WATER SERVICE AREA
- WATER AND SEWER SERVICE AREA
- SEABROOK WATER CO. FRANCHISE AREA
- AREA PROPOSED FOR SANITARY SEWER COLLECTION LINES
- PARK AREA
- SANITARY SEWER COLLECTION LINES
- FRANCHISE AREA BOUNDARY
- CUMBERLAND COUNTY UTILITY AUTHORITY INTERCEPTOR LINE
- SOLID WASTE TRANSFER STATION AND RECYCLING STATION
- PUMPING STATION
- PROPOSED PUMPING STATION
- (1) TOWNSHIP SCHOOLS
- (2) TOWNSHIP MUNICIPAL BUILDINGS
- (3) TOWNSHIP PARK
- (4) SEABROOK BROTHERS & SONS PLANT

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remain - Seeley-Finley Road and the municipal boundary on Deerfield Pike. This does not mean that additional connections cannot be made, but simply notes that these sites were planned for as logical and expected connection locations at the time of construction.

Because all three sewered or soon-to-be sewered areas are distinct and separate, charges and rates for them are separate. It is recommended that when areas coalesce, then restructuring of the rates should be undertaken to reduce confusion and provide a broader base for the costs incurred. It has been and is highly recommended as part of this Plan that the Township governing body continue its policy that services be paid for by those who benefit from them only. This is currently the case and should continue.

The Township Committee is currently planning the installation of sewer collection lines in the so-called "Park area," the area west of Deerfield Pike and south of Cornwell Drive. This is one of the older residential neighborhoods and most of the lots are smaller than a half acre (in some cases substantially smaller). Many residences do not have area for new septic fields or tanks and are pumping their tanks on a regular basis. Ten years ago an informal questionnaire of the neighborhood indicated over 45% of the residents in the area wanted public sewers. It is assumed that number is higher now. The on-site system failure rate also would indicate a possible health threat if public sewers are not installed.

It is recommended that the Township begin planning now for the provision of sanitary sewers existing residential neighborhoods north of Cornwell Drive and west of Deerfield Pike and south of Cornwell Drive and east of Deerfield Pike i.e. Shadow Brook and Pleasant Acres. In addition, the residential areas along Centerton Road and Landis Avenue will also require sanitary sewer. All of these areas are delineated on the Utilities Plan (Figure 15) as "areas proposed for sanitary sewer collection lines."

Another area proposed for sanitary sewer collection lines surrounds the existing sewered area at Seabrook. Since much of this area's developed lands are already served by sanitary sewer lines (Ott Acres is the most notable exception); this area is seen as being sewered when and if development should occur. In this respect it is recommended that at a minimum, all new developments of ten lots or greater or commercial, industrial or public use projects be required to provide connection to public sanitary sewer systems. Wherever feasible and reasonable or when environmental effects would warrant, any development within these areas should be connected to public sewer systems.

The areas designated as being proposed for sanitary sewer line installation are so noted due to the availability of the County Utilities Authority interceptor line. Other areas of the Township may be proposed for development which would necessitate the installation of utilities. Those cases would have to be considered when proposed. It is not the intent of this Plan to "sewer the Township" and it is particularly important that the area north of Seabrook and in the eastern part of the Township where agriculture is currently viable and soils are considered prime soils for agriculture, that sewer extensions not be made into these area as it will induce development to follow.

In those areas of the Township not proposed for public sanitary sewer line installation, it is important that new development be carefully evaluated to assure proper handling of waste and to assure that such handling will not cause environmental degradation. Environmental impact analyses should be performed in all cases involving ten or more lots or non-residential development. In addition, specialized agricultural activities requiring waste disposal such as processing plants or dairies should be required to properly provide for treatment of waste from their activities. It is not recommended that on-site spraying of effluent be allowed since it can cause odor problems which are unacceptable.

It is recommended that the Township undertake an educational campaign throughout the municipality to alert residents and businesses to the dangers of indiscriminate disposal of chemicals, solvents, cleansers and other waste waters into on-site septic systems. Such action can cause ground water contamination. Homeowners therefore, need to be educated to the risks involved in such actions. When reviewing a new development it becomes important to justify the need and reasoning behind requirements being imposed. This is especially important in connection with improvements which are expensive such as utilities. Approving authorities of the Township should require sewer connection whenever public sewer lines are currently available or will be within a reasonable period of time (within three years) or whenever required because of a development's size or character and/or wherever existing conditions warrant such connection. It is also recommended that the Township adopt a policy of working with a developer to assure uniformity in sanitary sewer design, planning, construction and compatibility with existing systems operations. Such cooperation between the public and private sector should include a willingness on the part of the community to accept new lines and pumping stations once built and found acceptable. It should also include a willingness to participate with a developer in the construction of a sewer line extension when such will benefit other areas in need of sanitary sewer. All new development should pay its own way in terms of sanitary sewer facilities necessary because of such development.

Water Supply

There are two areas within the Township currently being provided by public water supply systems. The Seabrook area is provided with potable water from a public water system owned and operated by the Seabrook Water Corporation. The Corporation requested and receive a 50 year franchise from the Township to establish a public utility for the provision of water. The franchise which was granted is non-inclusive and permits the holder to utilize municipal streets for the installation and maintenance of lines for water supply. The franchise area is shown on Figure 15. The area currently being provided with water by the Seabrook Water Corporation is shown as well. The Corporation owns its wells, lines, pumps, and treatment facilities and bills its customers under Board of Public Utility regulations.

The Seabrook water tower which provides storage and pressure for the water corporation's water supplies is owned by the Township. This tower also provides water for the fire fighting systems in the former Seabrook Foods' plant structures which now house two separate companies. These two

companies and the water company have entered into a ten year agreement on use of the water tower. The cost of the tower's refurbishing and future rehabilitation when necessary are being assessed to the three major users over the ten year period of the agreement. It is not assumed that the tower can provide storage capacity for much more development than now being served by it. Some modification could probably be made which would allow some additional development. The water tower is viewed as being a very important asset to the Seabrook community providing water to the Township schools, municipal complex, major industrial plants and a large portion of the community's residences. It was therefore, deemed appropriate that the Township own and maintain the facility which was ceded to it by its former owners, Springs, Inc., the successors to Seabrook Foods, Inc.

The other potable water supply system in the Township is located in the vicinity of the Township's former sanitary landfill. This system was built in 1985 with a loan from the New Jersey Department of Environmental Protection, Division of Water Resources under its Contaminated Wellfield program. The system was designed to serve approximately 250 residential units although at present, it serves about 90 homes. It was installed after a number of wells in the area were found to be contaminated with mercury which is presumed to have come from the landfill. The landfill was closed in December, 1986 and is awaiting closure plan preparation. The system does not provide enough pressure for fire hydrants but can be used to refill fire trucks under the system's pressure. There is no above ground storage of water. Until the cause of the contamination is discerned and the landfill permanently closed, development in this area should be discouraged even though good water is available from the system.

As noted, the system was installed because of the contamination, but the area had not been designated for development and is still not viewed as an area which should be extensively developed. With the installation of the public water supply system, there is however, an attraction for development to be located here. This is a perfect example of the ability of public utilities influencing where and when development occurs.

Although not available for provision of potable water supplies, there is another public water supply system within the Township. It is the City of Bridgeton's water main and well located in Carlls Corner. The Township, upon granting permission for these facilities to be located within the Township, was granted the right to use said lines and the hydrants on them for fire fighting purposes. Individual homes and business which are located along the line cannot, as stated, connect to the line. While there was a "gentlemen's agreement" that such connections might occur, to realize such would require the two municipalities to enter into interagency agreements to permit the City to sell water and/or collect rents for same. Such activity would probably be subject to Board of Public Utility regulation.

Provision of potable water is probably one of the most pressing of municipal concerns for the future. Although the installation of public sanitary sewers in many of the existing developed areas of the Township will lessen or eliminate potential contamination problems from on-site septic systems; it will not address the other forms of contamination as discussed in Chapter III. The historical and ongoing farming activity within the Township has resulted in considerable build-up of nitrates in

the soils which is leached into the ground water supplies. In addition, use of strong or concentrated fertilizers and herbicides on lawns in non agricultural settings also poses threats to these water supplies. State Department of Health guidelines for potable water now declare that greater than 10 ppm of nitrates is unacceptable. There have been a number of reports that many residential wells in the Township do or have not met this standard.

Other problems can or do occur which can deplete or contaminate ground water supplies and make provision of potable water difficult for individual property owners. For this reason and to avoid future problems, each new major development i.e. subdivision of ten lots or more, multi-family dwelling projects of five or more units, industrial developments and all projects involving ten or more acres or substantial use of water should be required to undertake environmental impact analysis of their project with particular attention to ground water supplies. It is recommended that the Township adopt a policy of requiring public water supply whenever such major developments are proposed. When proposed, the Township should be prepared to provide details on design of such systems including their adequate sizing to permit their integrating use in community-wide service area i.e. provision of water to areas outside the development.

This will require the municipality to be prepared to: 1) plan for the provision of potable water vis-a-vis a public system when and where needed; and 2) accept responsibility for such systems once constructed and intended to serve more than a specific development or to prevent the proliferation of a number of independent water companies throughout the Township. While New Jersey and southern New Jersey in particular, is extremely fortunate in having an abundant supply of clean, useable ground water which is readily replenished, that supply does have a limit. All water resources are monitored and controlled by the State and the Delaware River Basin Commission. It cannot therefore, be assumed that although the supplies are there today, they will be tomorrow. Other areas are developing and making demands on those same supplies. It therefore, behooves the Township to anticipate and plan for its water resources into the next century.

There are three main areas of concern when planning for water supply. The first concerns "system demand" which refers determining water supply needs. The need for water must account for all users: residential, commercial, public, industrial, institutional, agricultural and others. Added to this is the water necessary for fire protection. Finally there must be a consideration for peak nature of water use. This is particularly so in the case of residential use where the unevenness of demand i.e. morning and dinner time, requires that sufficient quantities of water be available to meet this demand when it occurs.

To determine the system demand of a new development, water consumption must be estimated. One approach to this is to multiply a per capita consumption rate by the anticipated development's population. Another method would be to project water consumption for each component of a

TABLE 10

WATER AND SEWER DEMAND/GENERATION BY TYPE/SIZE OF HOUSING UNIT*

HOUSING TYPE/SIZE	NUMBER OF RESIDENTS	RESIDENTIAL WATER DEMAND[a] (daily)	SEWER FLOW[b] (daily)	PEAK SEWER FLOW[c] (daily)
Single Family Detached				
2 bedroom	2.13	215	140	560
3 bedroom	3.21	320	210	840
4 bedroom	3.93	395	255	1,020
5 bedroom	4.73	475	310	1,240
Garden Apartment				
1 bedroom	1.57	120	100	400
2 bedroom	2.33	175	150	600
3 bedroom	3.56	270	230	920
Townhouse				
1 bedroom	1.69	125	110	440
2 bedroom	2.02	150	130	520
3 bedroom	2.83	210	185	740
4 bedroom	3.67	275	240	960
High-Rise				
Studio	1.07	80	70	280
1 bedroom	1.34	100	90	360
2 bedroom	2.14	160	140	560
Mobile Home				
1 bedroom	1.73	130	115	460
2 bedroom	2.01	150	130	520
3 bedroom	3.47	260	225	900

NOTES:

a. Based on 100 gallons per day (gpd) per person for single-family detached units and 75 gpd for other housing types (rounded).

b. Based on 65 gpd per person (rounded). Note: These figures do not include allowance for infiltration/inflow. Determination of infiltration/inflow should be made and added to the sewer flow figures shown in this exhibit.

c. Based on four times daily sewer flows (rounded).

* Note: The New Jersey Statewide Water Quality Management Plan applies different demographic figures for type/size of housing units (for sewer flow) as shown in Table ___. The NJDEP also applies a 100 gpd per person value for all units (water consumption), not just single-family detached housing.

Source: U.S. Census, Public Use File - New Jersey (units built 1975 - 1980) and monitored by 1980 Census).

TABLE 11

NON-RESIDENTIAL WATER DEMAND

NONRESIDENTIAL USES (SELECTED)	EXPECTED WATER CONSUMPTION		
COMMERCIAL - INSTITUTIONAL[a]	Parameter	Mean Annual (million gallons)	Peak Hour
Office building	square foot	0.093	0.521
Medical office	square foot	0.618	4.970
Retail	square foot	0.106	0.271
Hotel	square foot	0.256	0.433
Motel	square foot	0.224	1.550
Restaurant	seat	24.200	167.000
Drive-in restaurant	per stall	100.000	547.000
School, elementary	student	3.830	37.400
School, high	student	8.020	79.900
Service station	inside sq.foot	0.251	4.890
Theater	seat	3.530	3.330
INDUSTRIAL[b]	Parameter	Mean Annual (million gallons)	Peak Hour
Bakery	employee	220	NA
Textile finishing	employee	810	NA
Home furniture	employee	122	NA
Basic chemicals	employee	2,744	NA
Drugs	employee	457	NA
Agriculture chemicals	employee	449	NA
Petrolium refining	employee	3,141	NA
Plastic products	employee	527	NA
Cement	employee	353	NA
Engines	employee	197	NA
Metalwork	employee	196	NA
Electronic components	employee	203	NA
Motor vehicles	employee	318	NA
Scientific instruments	employee	181	NA
Medical instruments	employee	506	NA

NA = Information not available

a. Source: Michael Greenberg et al., A Primer on Industrial Environmental Impact, (New Brunswick, NJ: Center for Urban Policy Research, 1979).

b. Source: Hittman Associates, Inc., Forecasting Municipal Water Requirements (Columbia, MD: 1969).

particular development e.g. residential, commercial, and industrial - then add them.[1]

Estimates for residential water use vary from 100 to 125 gallons per day per capita. Other methodologies become more complex like the Linnaweaver method which uses a regression equation or another method which uses anticipated population added by different type and size of housing units. Determining commercial and industrial water consumption also as several approaches. The New Jersey Department of Environmental Protection standard formula for determining non-residential consumption is 400 gallons of water per day per employee (400 gallons/day/equivalent unit) One advantage of this method is that the high per capita quantity covers water consumption for all needs including cooling and heating. NJDEP also has a standard figure of .125 gpd per square foot of nonresidential facility. There is also a method of deriving industrial and commercial water use based on coefficients derived by Hittman Associates.[2]

Tables 10, 11 and 12 give a guideline to be utilized in determining water usage for proposed developments. These tables discuss various methodologies for determining the demand for and probable use of water within various types of land use activities. Analysis of any proposed development should include a careful study of the water needs of the proposed development and how those demands are to be met.

TABLE 12

POPULATION DENSITY PER HOUSING UNIT PROFILES APPLIED BY THE NEW JERSEY STATEWIDE WATER QUALITY PLAN

HOUSING TYPE	BEDROOMS			
	1	2	3	4
Single Family Residence	NA	2.6	3.4	4.6
Garden Apartment	1.4	2.1	3.4	NA
Townhouse	1.4	2.3	3.4	NA
High Rise	1.5	2.1	3.4	NA
Mobile Home	1.4	2.3	3.4	NA
Duplex, Triplex Fourplex	1.6	2.6	4.0	NA

NA = Information not available

[1] Listokin, David and Baker, Carole W. Model Subdivision and Site Plan Ordinance. op.cit.

[2] Hittman Associates, Inc. "Forecasting Municipal Water Requirements." In Robert W. Burchell and David Listokin, eds., The Environmental Impact Hanbook. New Burswick, NJ: Rutgers University Center for Urban Policy Research, 1975.

As for the meeting the needs for fire protection the American Insurance Association and the National Board of Fire Underwriters recommend the minimum fire flows shown in Table 13.

Since it would appear from developer interest and the recent sale of lands throughout the community that a considerable amount of new development is soon to occur; it is recommended that the Township give careful consideration to assuring adequate fire protection. This Plan recommends that for safety and welfare reasons, fire protection should be furnished for any development numbering 50 or more dwelling units and for any development connected to a municipal or public water supply system. Minimum fire flows should be provided in addition to the daily per capita consumption requirements shown above in Tables 10 through 12.

The second factor affecting the water supply system is the peaked nature of water use, with the result that the peak demand for water is considerably greater than the hourly average. One standard cited in the New Jersey Department of Community Affairs' Model Subdivision and Site Plan Ordinance, to assure that sufficient quantities are available to meet peak

TABLE 13

FIRE FLOWS

Population	Flow gpm*	Duration of Flow (hours
Under 100	500	4
1,000	1,000	4
1,500	1,250	5
2,000	1,500	6
3,000	1,750	7
4,000	2,000	8
5,000	2,250	9
6,000	2,500	10
10,000	3,000	10

*gpm = gallons per minute

demand, local reservoirs generally contain roughly one full day's capacity to maintain both pressure and quantity during peak periods. To do this the water supply system is recommended to be designed to carry peak-hour flows and be capable of delivering the following peak hourly demands:

Obtaining potable water can be accomplished in one of several ways and this is what is referred to as "system strategy." The Township or any given development could install its own pumps and storage and treatment facilities i.e. a public or quasi-public water supply system . Or the water to be provided could be purchased from someone else, another water company either public or private. For instance, the City of Bridgeton could sell water to the Township which in turn would distribute the water to the individual users and bill them accordingly. Another possibility is that the Cumberland County Utilities Authority could get into the water business and provide water to the Township. In either case, agreements

Total Houses Served	Peak Hourly Rates gpm per house
5	8.0
10	5.0
50	3.0
100	2.0
250	1.3
500	0.8
750	0.7
1,000 or more	0.6

would have to be reached. If Bridgeton were to sell water to the Township, it would be subject to Board of Public Utilities regulation, the County Utilities Authority would not. Several prospective developers within the Township have discussed the possibility of purchasing water from one of these two sources. Of course, the final possibility is individual, on-site wells for each lot.

What should be required of the developer when the application comes before the Planning Board - a public system or individual wells? It is recommended that the Planning Board establish a policy which will be based on distance to a public water supply system and the size and nature of the development. If a public water service is available within the following distances than connection should be required: 200 feet for one unit, 400 feet for two units, 600 feet for three units, 800 feet for four units, and 1,000 feet for five units to 15 unit developments. For developments of greater than 15 units which are within one mile from an existing public community water system, adequate justification should be provided as to why the development should not provide a connection to the existing public community water supply system. The Township should study each case carefully and determine the best water supply strategy taking into consideration the density of the development, economic considerations, and ground water availability and quality.

If a public water supply system is to be provided to the area within a six year period as indicated in some official documentation i.e. master plan, official map or municipal capital improvement program; then the Township should consider requiring installation of a capped system or "dry lines" (mains, only) within the road right-of-way; or alternatively, the Township should consider requiring a payment in lieu of the improvement.

The third and final issue involved in water supply concerns system design. The actual pipe sizes, main locations, hydrant spacing and the details of the other components and factors involved in the development and installation of a potable water supply system. These matters are addressed in the Township's Development Regulations Ordinance. Adherence to these standards is important in assuring uniformity of systems design and their ultimate compatibility.

Potable water is now and will continue to be a vital commodity and as the community develops or problems arise with existing water supplies, the public will be turning to the Township for answers and solutions. Two concerns seem to be paramount in this analysis - cost and control. Obviously the cost of providing water is of great concern. Equally important is control of so vital a resource as water. Testament to this fact is abundant in the West or wherever water is scarce or in great demand. Being able to control or at least effect the cost of water and its supply could become very important to the Township's future development and continued economic well-being.

It is therefore, highly recommended that the Township commission a study of this question and the preparation of a master plan for water resources. In addition, it is recommended that the community adopt a policy of working with developers to establish potable water supply systems which will meet the needs of proposed developments and, be compatible with an overall community water supply system when established and perhaps provide water for existing developed areas as well. This policy should include a willingness to accept such systems when offered and to then operate and maintain those systems as a public utility recognizing that the basic staffing and administrative mechanisms for such are already in place.

For many portions of the Township public water supply systems will not be feasible, necessary or practical for quite some time yet, if ever. In these cases, the Township should establish an educational program aimed at reducing unwitting or uncaring contamination of ground water supplies. It may well be necessary to also adopt regulatory procedures which assure that ground water supplies are protected. Voluntary public or private random sampling of wells may also be required to assure safe drinking water and prevent future health hazards. Such a program is not now recommended or thought to be needed in any particular area of the community, but eventually might be prudent as conditions warrant.

The protection of ground water supplies and the provision of safe, plentiful potable water should be given the highest priority by the municipal government. Too often municipal history has shown cities and communities devastated by inadequate planning in regard to provision of this vital resource. As a developing community with a progressive record for planning its future, the issue of water should be a top priority. The Model Subdivision and Site Plan Ordinance recently published by the New Jersey Department of Community Affairs states:

> Provision of clean water has been a responsibility of municipal government since at least Roman times. Today it is estimated that public water utilities in the United States deliver more than 30 billion gallons of water daily of which approximately 19 billion gallons are used for residential purposes. Residential uses of water include washing, transporting wastes, drinking, food preparation,

heating and cooling, and watering lawns.[3]

Storm Water Management

The U.S. Geological Survey estimates that one inch of rain falling evenly on one acre of ground is equivalent to about 27,154 gallons of water. Statistics like this clearly demonstrate the concern which must be given to storm water management. In the past drainage facilities were primarily involved with roads, that is curbs, inlets, pipes, culverts and bridges. But as development increases and land uses prevent natural runoff or percolation, more attention must be given to providing methods to disperse and dissipate surface water runoff.

A drainage system transports storm water, surface water, street wash and water from other sources to appropriate receiving water bodies.[4] In his The City in History, Lewis Mumford notes that a drainage system is made up of numerous natural and man-made elements. Everything from swales - continuous depressions which direct and divert water; ditches, which carry water; retention and detention basins, which hold and slowly release water; curbs which direct the water flow; and inlets which catch the open surface water flow and direct it to a closed conduit system such as storm sewer pipes. The final destination of storm flow is a stream, river, or lake.

Storm water management seeks to design drainage systems which will protect public welfare and health by channeling storm water to natural bodies of water thereby preventing or reducing the risk of flooding. Such a system can also encourage and induce ground water recharge. In order to undertake such management one must utilize storm frequency which is a way of describing the intensity of a storm. Thus a storm of a ten year frequency is less severe than one of a 20 year frequency. Such frequencies are expressed as ratios and used to determine storm water runoff.

Historically, engineers and planners used their technical skills to design systems which sought the quickest removal of storm water from a given site. This obviously caused havoc downstream and endangered aquifers. Today's approach is geared to drainage basins and uses non-structural mechanisms - natural storage, percolation and channeling techniques. While this can result in some short term local inconvenience, the lessening of both long-term and short-term peak rates of runoff and ground water recharge are the benefits which can result.

In order to determine the type of system necessary to handle a given watersheds runoff the runoff peak rate of discharge and runoff volume must

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[3]Hittman Associates, Inc. "Forecasting Municipal Water Requirements." In Robert W. Burchell and David Listokin, eds., The Environmental Impact Hanbook. New Burswick, NJ: Rutgers University Center for Urban Policy Research, 1975.

[4]Mumford, Lewis, The City in History (New York: Harcourt Brace Jovanovich, Inc., 1961), p. 214.

be determined. Peak rate of discharge calculations are typically used to determine the configurations and sizes of pipes, channels, and other routing or flow control structures. Runoff volume calculations are typically used to determine the necessity for, and storage of, detention and retention facilities. Both parameters are used in the comparison of pre-development and post-development conditions.[5]

Formulas have been developed for determining runoff and Upper Deerfield has and will continue to use the rational method. This methodology was introduced to the United States in 1889 by Emil Kuichling. This formula evaluates and utilizes surface characteristics, soil characteristics, time of concentration, rainfall intensity and drainage area to determine runoff volume.

Much emphasis is placed today on evaluating each site on a case by case basis in order to determine the best way of handling storm water runoff. The type of development, natural conditions, the capacity to store on-site runoff and other conditions all play into how the storm water management program is developed and implemented. It is recommended that the Township continue such an approach assuring to the greatest extent possible that all proposed developments handle or provide facilities to handle (including off-site improvements or contributions therefor, if necessary) storm water emanating from the site. No site should dump or drain its storm water on to an adjoining property unless such is by means of a natural feature or man-made facility which is intended to receive and handle such flows.

Very closely related to the question of storm water management is the need to prevent or reduce storm damage to the soils. Soil erosion and sedimentation can be most devastating and is of course, made more likely whenever land is disturbed as in the case of development or agriculture. In 1976, the Township adopted regulations aimed at preventing soil erosion and controlling sedimentation. These regulations were approved by the the New Jersey Department of Agriculture and mirror, equal or exceed those imposed by State statute. The Township because of these regulations oversees their enforcement and is exempted from Soil Conservation District control of the statutory provisions.

These regulations have been followed and have greatly reduced soil erosion or sedimentation problems within the community. There has been disagreement with the local Soil Conservation District over the Township's enforcement of the regulations, but the Township is firmly dedicated to its continued implementation of the regulations. There is concern that some farming operations are not doing all that could be done to reduce agriculturally induced erosion and sedimentation generation. More work needs to be done in this regard and District cooperation would be helpful to this end. Many area farmers have availed themselves of the District's services in implementing soil conservation plans for their farms.

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[5]Listoken, David, and Baker, Carole W. Model Subdivision and Site Plan Ordinance. op.cit., p. 336.

The Utilities Plan does show any specific sites of surface drainage problems or anticipated projects. The Township has not yet undertaken the Municipal Land Use Law required storm water management study. Numerous projects have been undertaken like the major retention pond developed at Franmar Drive to solve a major storm water runoff problem which had flooded many homes in that area. Several other areas of the Township which have experienced flooding will be addressed in the next couple of years. By carefully scrutinizing each new development and assuring proper storm water management design and planning for them, future problems can hopefully be avoided.

Solid Waste Disposal

Solid waste is another of the major issues of the 80's and 90's which we has a society must face up to and which like water involves a need service very much intertwined with environmental issues. It is estimated that the average American household produces 3.08 lbs./day/per person. This equals 290,000,000,000 lbs. (two hundred ninety billion pounds) or 146,146,000 tons per year of residential trash. Most of that waste is dumped into landfills although more and more of it is being incinerated or recycled. Where to site such landfills or incinerators is serious social and political problem which must be faced.

Like all municipalities Upper Deerfield had two methods of trash disposal- burning and a dump. The dump had been a "dump site" which final became the "town dump." As has been noted earlier, the Township sanitary landfill was located between the Husted Station - Woodruff and Centerton Roads. It was closed in December, 1985 due to its purported contamination of area drinking wells. The facility had been utilized as a municipal landfill since the early 1950 and before that as a dump by the Seabrook Foods company. Due to the contamination problem, the former landfill was listed on the Superfund list published by the U.S. Environmental Protection Agency which is now undertaking an 18 month remedial study of the landfill and how to deal with the contamination problem and the landfill's ultimate closure.

The landfill had always been free to individual citizens, although private trash haulers had been charged a fee under Board of Public Utility regulation. With the closing of the landfill, the N.J. Department of Environmental Protection redirected Upper Deerfield Township's solid waste to the Bridgeton City landfill. All solid waste in the county is now directed to the County landfill located in Deerfield Township.

When the Township's landfill closed, the Township opened a convenience center just south of Seabrook (See Figure 11). Also at this site is located the Township's recycling center. The Township has installed a trash compactor and the facility is open and free of charge to all Township residents (vehicle identification stickers are issued annually). The facility is intended to serve only household waste for residential users and commercial haulers or non-residential users are not permitted. The Township contracts for the hauling of the compacted waste from the center to the County landfill.

The Cumberland County Improvement Authority's new landfill in Deerfield Township opened in October, 1987. The cost for dumping at this new facility will be $40.00 per ton. This tipping (or drop off) fee does not include transport costs i.e. getting the trash there, which are estimated to cost between $9 to $15 per ton.

Many residents within the community utilize private waste haulers, however, with the higher rates being charged since the new County landfill opened, more and more residents appear to be using the convenience center. Increased use of the center could force a reevaluation of whether to charge a fee for its use. The County's landfill will charge $2.00 per car and $10.00 per pickup truck. There is a concern that fees would deter legal dumping and increase litter and other refuse problems. A substantial increase in the use of the convenience center could also strain the facility and cause problems in handling the volume of users.

The question of whether or not to establish regular trash collection has been reviewed several times in the past. At the time the landfill was closed, the Township Committee analyzed door-to-door pickup and determined that due to the spread of residential development throughout the Township, the cost would be too great. Providing trash collection only in areas where higher densities exist was not acceptable under Upper Deerfield's long standing tradition and policy of not providing a service to some residents at the expense of others. As costs at the convenience center increase however, trash collection may become more cost effective and realistic.

To understand the math of the situation, it is necessary to know what to expect in terms of solid waste generation in the future. Unfortunately there is no method to determine the exact amount of total tonnage or residential tonnage for the Township. During the Summer of 1987, the Township planning staff used a standard statistical method to determine reliable figures on solid waste generation.

The Cumberland County Source Separation Feasibility Study (1977. p. 80), gives a national statistical average to estimate residential waste production. This figure of 4.1 pounds per person per day when multiplied by the Township's estimated population of 6,939 would mean a waste generation of 5,192 tons annually. A second figure offered by the Cumberland County Improvement Authority estimated a 1986 waste generation for Upper Deerfield of 4,741.1 tons. A third estimate also derived from reports prepared by the Improvement Authority uses the 3.08 pounds per person per day figure mentioned earlier which would mean a total waste production of 3,900.4 tons.

Not sure which figure was most statistically accurate and needing to get a better grasp of this very important issue, the Township planning staff jointly worked with Elwell's Trash Service, Inc. to sample the household trash generation in order to develop a statistical model capable of estimated yearly residential waste figures. The results are shown in Tables 12.

TABLE 14

SOLID WASTE GENERATION ESTIMATED
UPPER DEERFIELD TOWNSHIP

Weekly Household Estimates		Total Township Estimates	
Average amount per week	63.4 lbs.	Average amount per year	3,693.2 tons
Average amount per year	1.6 tons	Yearly high estimate -	4,801.9 tons
		Yearly low estimate -	2,584.7 tons

The sample used to develop these estimates was quite varied. The lightest weight found was 9 lbs. and the heaviest was 251 lbs. Also the statistical estimate indicated that 68% of the weekly amount of trash had a range of 5.9 to 120.9 lbs. The remaining 32% of the weekly household trash amounts fell into two categories. The first equalled 27% ranged from 0 to 5.9 lbs. per week and the second, totally 5% was above 178.4 lbs. per household per week. To obtain these figures statistical models were used using two sets of sample trash weights. The first was taken at the Township's drop off center where trash was weighed during one day of a random sampling of those using the Center. The second involved the weighing of a sample of household weights on one of Elwell's Trash Service routes within the Township. Households were chosen with the help of John Elwell based on their representative nature as typical households.

Analyzing the results of this sampling against the four estimates of trash generation, discussed previously, it is possible to develop a more representative, reflective figure of the Township's yearly residential trash output. The four estimates are listed from highest to lowest order in Table 15.

TABLE 15

ANNUAL SOLID WASTE TONNAGE ESTIMATES FOR
UPPER DEERFIELD TOWNSHIP

	Annual Total	Based On	Source
1.	5,192.1 tons	4.1 lbs./capita/day	Cumb.Co.Imp. Authority
2.	4,741.7 tons	-	" " " "
3.	3,900.4 tons	3.08 lbs/capita/day	" " " "
4.	3,693.2 tons	63.4 lbs/household/week	UDT Sampling

Estimate #1 is considered to be outdated since waste output has somewhat decreased. Whether this is due to economic recession, more efficient packaging methods, or a lack of proper estimating techniques is not sure, but Estimate #1 is less recent and not preferred accordingly.

Estimate #2 is not felt realistic for two reasons. First, it is assumed that many non-residents had used the Township drop-off center (the residents only policy did not commence until late Summer, 1987) and this estimate had been partly based on figures tonnage received at the drop-off

center. This would have caused the figures to be too high even though there had been a conscious effort to deny non-residents use of the facility. This estimate also accounts for all waste generation in Upper Deerfield including commercial.

While Estimates #1 and 2 were useful in looking at this question of solid waste generation, Estimates #3 and 4 are more valuable because they are recent and are based on reasonable methods for tonnage projection. Estimate #3 uses more recent data in terms of pounds per day per capita than Estimate #1. The County Improvement Authority also views it as being more current and therefore, more reliable.

Estimate #4 is felt to be even more accurate than Estimate #3 in determining residential trash output. The method used to develop the estimate is a widely accepted statistical method. Furthermore, the figures used are actually based on a sampling of Upper Deerfield households. Therefore, this method is more accurately reflects the Township's practices or generation of waste characteristics than just using a national average or some other average that was not specific to a given area of the country. In effect, Estimate #4 is not a basic generalization, but a statistically correct picture of the Township.

Based on these considerations the Township planners have chosen 4,000 tons per year of residential trash generation and 5,000 tons per year for a total residential and commercial figure. It is now possible to consider future projections of solid waste generation. According to the Cumberland County Improvement Authority, solid waste generation for the County as a whole increased 8.5% form 1983 to 1985 and from 1985 to 1986 by 5%. The 5% figure is probably more accurate since reporting figures were more standardized by 1985.

If the estimated residential trash for Upper Deerfield for 1987 was to grow by 5% per year for five years, then the residential output would reach 5,105.1 tons in 1992. Table 16 illustrates the five year residential solid waste production using a 5% increase per year.

TABLE 16

FIVE YEAR RESIDENTIAL SOLID WASTE PROJECTIONS
UPPER DEERFIELD TOWNSHIP

Year	1987	1988	1989	1990	1991	1992
Total tons	4,000	4,200	4,410	4,630.5	4,862	5,105
Total recyclable EPA percentage	2,200	2,310	2,425.5	2,546.8	2,674.1	2,807.8
Required Recycle State mandated			661.5	1,157.6	1,215.5	1,276.3

In addition, if the estimated total Township waste for 1987 (residential and commercial) was also to increase by 5% over a five year period, then the total solid waste output for 1992 would be 6,381.4 tons. Table 17 gives these figures.

TABLE 17

TOTAL WASTE PROJECTIONS FOR UPPER DEERFIELD TOWNSHIP

Year	1987	1988	1989	1990	1991	1992
Total tons	5,000	5,250	5,512.5	5,788.1	6,077.5	6,381.4
Total recyclable EPA percentage	2,750	2,887.5	3,031.9	3,183.5	3,342.6	3,506.8
Required Recycle State mandated			826.9	1,447	1,519.4	1,595.4

The recycling figures are developed from the facts concerning recycling as discussed in Chapter XI of this Plan. These figures in Tables 16 and 17 do not take into account major new development which may occur during this time period. But even without those considerations, these figures clearly indicate that the Township is going to be faced with a serious challenge for handling solid waste in the next five years.

The Economics of Solid Waste Management

In 1986 the Township spent $58,205.05 for solid waste handling i.e. hauling and tipping fees. From January to June in 1987, the Township spent $18,332.00 with the total probably being about $40,000.00. Costs were less due to the compactor and a new hauling firm.

In terms of costs to residents, the drop off center is free. Those who use a service however, must pay for it. Prior to the opening of the County's landfill, Elwell's Trash Service was charging $9.75 per month for residential trash hauling service. In mid-1987, Elwell was servicing approximately 900 households. After the opening of the new County landfill the household charge will increase to at least $11.50 per month, not allowing for inflation. With a $40.00 tipping fee at the landfill, many are predicting residential pick up may double in cost. The question for the Township will be: "What happens when the cost of residential service increases?" and "How will recycling effect the cost?"

Using the $40.00 per ton County landfill tipping fee, the cost for tipping fees alone based on Township waste generation would go from approximately $168,000 in 1988 to $204,200 in 1992. This does not account for the cost of operating the convenience center or the cost to residents who choose private hauling service. There are also costs involved in connection with the recycling center (See Chapter XI) which are not even covered here. Obviously, the Township must consider all options for handling solid waste at these projected figures.

Possible Alternatives

It may be too soon to recommend a course of action or determine which method of solid waste management is best suited to the Township's needs and is economically and politically expedient. There appear to be two basic methods of handling solid waste with a number of variations on each. They are resident choice, here meant to reflect the existing situation of either taking your trash to the convenience center or choosing to hire a private hauler, and municipal pick up. The Township is only concerned with residential (individual residences, not projects) waste since all other waste is to be handled by the generator.

According to the County Solid Waste Management Plan, there are two major factors in determining collection efficiency:

1) Payload density (larger trucks are more efficient than smaller ones); and

2) Travel distance (vicinity of landfill or convenience center)

In terms of travel distance, the new County landfill is located in Deerfield Township, approximately four to five miles from Upper Deerfield. The convenience or drop-off center is located in Seabrook. It is currently free and centrally located for all residents within the community.

The possibility of municipal pick up or a total pick up system must be considered since costs at the convenience center may soon justify it. Maurice River Township currently has total residential collection for a population of 5,231 people. The contract amount for 1987 is $26,640. The Township will soon be faced with the County's new tipping fee which may well increase costs substantially.

In Upper Deerfield there are approximately 2,400 households spread out over 31+ square miles. The trash from theses residences at the convenience center cost the Township $58,205.05 in 1986 and approximately $18,332 for the first six months of 1987. If the Township were to pay a $12.00 per month fee (probably high) for all Township households for a contractor to make door-to-door pick up, the annual bill would be $322,560. Of course, vehicle modification and inflation are not added to this figure.

If the Township were to incorporate its own municipal trash department, the cost of initial start up would run into hundreds of thousands of dollars. Expenses such as trash vehicles, a base of operations, staff, maintenance costs would be expensive and a very time consuming job. For this reason, should the economic ever be right, it is not recommended that the Township set up its own department, but rather use private contractors. Operating expenses would be too great when coupled with the initial capital costs. Private haulers are already established or willing to take on the set up costs, maintenance and supervision would not be the Township's responsibility and the vehicle and base of operations (garage and staging yard) would not have to built, financed and maintained by the Township.

The current system of handling solid waste seems to offer the best solution although it is recognized that mandatory recycling and the new

County landfill will change the current operations somewhat. Currently Elwell's Trash Service picks up approximately 900 residential homes in the Township including the Seabrook Housing projects. The Suthard Trash Service mainly picks ups businesses and institutions within the Township. Both services will have to make accommodations for managing solid waste because of recycling requirements (See Chapter XI). But the routes are established and at present seem functional.

Should rate increases and recycling, change the private hauling routines of many residents and thereby increase disposal at the convenience center, then the community might want to consider a charge at the convenience center. It is actually premature to try and determine which way will be best or should be followed, because it is not yet known what the public will do once recycling takes effect. Furthermore, an active recycling program can greatly reduce the cost of disposing of solid waste and thereby offset cost increases resulting from changes in collection. If increased use does result in more costs for the convenience center's operation (this is not just hauling charges, but maintenance, personnel, new equipment and other expenses associated with it); then a small fee might help defray the cost, if door-to-door pick up is still too expensive.

To keep cost down in the area of solid waste disposal, recycling and reduction of the solid waste stream is extremely important. Recycling is discussed in detail in Chapter XI, and it appears to offer the best method of lowering the amount of waste to be carted to the landfill and disposed of at considerable cost. The Township is very far advanced in its recycling efforts and can further act to decrease the waste stream. Leaf pickup has been ongoing for a number of years with much of that collected being deposited at local nurseries. In 1987, the Township obtained a composting permit which will enable it to begin composting leaves and then distributing them those wishing the compost.

The Township is also seeking to purchase a chipper to use in connection with yard waste and cuttings which are quite bulky and costly to disposal in landfills. The chips are in demand by nurseryman, homeowners and others who can use them in various processes. Again, the proximity and vitality of farming within the community can help to resolve a serious public problem in this case, waste disposal.

Any new development which may wish to occur within the municipality must be reviewed with a concern for solid waste disposal just as it is for street design and construction, sewer and water provision and the other factors relative to development review. Adequate provision for the collection and disposal of solid waste can and should be addressed at the time of development.

Other options which might be considered include additional convenience centers or partial pick up of trash on a community-wide basis. Neither of these two alternatives is advised based on the Township's policy of not providing services to portion of the population and given the greater costs for additional centers. The best solution when justified and warranted is municipal pick up. When and if implemented, it is advised that the convenience center be kept operational for special situations such as not wanting to wait to pick up day or having missed the municipal pick up. It

is a situation which will require considerable monitoring over the next couple of years to determine public attitudes and response to the changes about to take place within the County in terms of solid waste handling.

It is recommended that the Township take the following actions in regard to solid waste management:

(1) Encourage and actively support recycling as a means of reducing the waste stream.
(2) Institute municipal trash collection only on a community-wide basis and at such time as deemed necessary and cost effective.
(3) Continue to operate the convenience center even if municipal trash collection is instituted, to offer a legal dumping site and to help prevent litter.
(4) Institute an ongoing education program concerning recycling and litter abatement.
(5) Establish a policy for solid waste management which governs how waste is collected and disposed of within the community based on land use.
(6) Include solid waste management as an area of review and approval within Township development regulations.
(7) Adopt anti-litter regulations which will encourage legal waste disposal and severely penalize those found deliberating littering the landscape..
(8) Actively participate in regional solid waste management planning and policy making activities.

Utilities Plan Goal and Objectives

The primary goal of the utilities plan section of this Master Plan is the effective and efficient of provision of sanitary sewer, potable water supply, storm water and solid waste management. Such provision must address the need for these utilities by existing development and plan for them in connection with new development. To meet this goal several objectives must be attained:

First is the development of plans which adequate determine the community's needs and provide a workable framework for meeting them. This includes viewing the municipality as a whole and in the context of the region of which it is a part.

Secondly, the Township must adopt and enforce development regulations which assure that new growth meets the community's plans and bears its fair share in implementing them. A corollary to this objective is the need to encourage and promote public and private cooperation in attaining both of these two objectives.

The third object is to educate the public to be an active participant in not only the planning activities for the provisions of such utilities, but in assuring that they do the job they are intended to and to prevent unnecessary future problems or more costly solutions than might otherwise be necessary. This includes the prevention of contamination problems, the proper and continued function of utility systems, and public recognition of

the cost of utilities and the ways that residents can adapt to such systems.

Fourth, the Township must seek to be an positive force which acts to prevent problems and address issues of public health and safety in connection with the provision of such public services like utilities before it is forced to react to a serious and/or costly dilemma. The interrelationship of individual and collective actions within a given municipality has been sadly demonstrated to us over the past twenty years as our environmental conscious has awaken. We need not repeat history's mistakes, but can and should have learned from them. Expediency, irrational frugality and neglect have no place in this area of municipal service. The quality of life within our community may be more greatly effected by these issues than any other.

Fifth, the provision of public utilities must coincide and be utilized to determine where, when and how development takes place. By allowing higher densities through the installation of public utilities in portions of the community, the Township can reserve other areas from development or at least retard its advance.

In conclusion, Upper Deerfield is fortunate that the planning of the past has given the community a chance to address its growth from a standpoint of preparedness. Community leaders need to continue their forward approach and prepare the municipality for the last decade of this century, a decade which will more and more see environmental questions and problems directly related to provision of water and waste disposal becoming increasingly prominent and of concern to citizens and their governments alike.

mismanagement, encroachment, and misuse. Often times such is well-meaning and sometimes the response to other pressures such as real estate values or other community values thought to be of genuinely higher concern. Thus an effective open space and conservation policy must be constantly able to deal with the ever-changing challenges to its goals and objectives.

Up to this point in the municipality's development, planning efforts have been most effective in controlling development. There has, however, been a lack of cooperation and coordination between all levels of planning and land use control which threaten the character of the Township and its ability to conserve its natural resources. This must change if the Township is to be successful in preserve these items so necessary to a good living environment.

This Chapter attempts to identify those areas or features of the community which deserve protection and conservation. It then offers methodologies for such and standards for their accomplishment. It is not too late for Upper Deerfield, far from it. But the time has come for the community to define its goals and objectives and seek their attainment. It will require progressive thought, innovation of purpose and cooperation of the public and private sector; but it can be done.

Open Space Defined

For the purposes of this Master Plan, the term "open space" has two aspects. The first is conservation, the protection and preservation of valuable natural resources usually for both practical as well as aesthetic reasons. For instance, flood plains are natural spillways or overflow areas of watercourses during periods of excessive rains. The primary reasons for preserving them in their natural state is to dissipate flood waters and to prevent the loss of life or property damage (if developed and a flood occurs then loss of life and property damage are possible). Flood plains do obviously, occur along streams and rivers and are lush with vegetation, abundant with wildlife and visually quite attractive. The conservation of them therefore, provides flood protection and pleasant landscapes (aesthetics) and possibly passive recreation.

The recreational and aesthetic benefits is the second aspect of open space when discussed in a planning sense. The recreational value can be passive as with the case of the flood plain wherein pastoral beauty and natural settings are enjoyed in conjunction with their practical conservation value. Open space can also provide active recreational benefits. Playgrounds, picnic areas, badminton and volleyball courts, bridle path and hiking or biking trails might all be permitted within a flood plain with detriment to the area's natural value or beauty. There is however, a question of degree since active recreation usually requires an alteration or man-made enhancement to the landscape in order to permit the activity while passive recreation minimizes man's intrusion or involvement with the countryside.

Therefore, open space has two aspects. Conservation with its value or benefit derived from its natural conditions and recreational based on its ability to provide aesthetically to the quality of life and either active or passive recreation from its existence. These two aspects weigh

heavy in any decision to conserve lands for open space or in their natural state and in how those lands are used once "saved." Building structures and/or facilities for recreation within a flood plain could well negate their natural value for controlling flooding and preventing damage or loss of life.

The interrelationship of these two aspects of open space must not be forgotten for the value of one to the other changes with the stage of development of a community. The density of development as well as the quality of development depends on the proper balance of these two aspects of open space. A planner's analysis as well as the citizens' prospective on a community also depend upon the relationship of these aspects of open space. The inner city inhabitant often times sees the value of a "clump of trees" much more readily than the country dweller used to trees and/or interested in new development which might enhance his/her rural setting.

A further consideration is that at some stage of development, conservation is no longer relevant or feasible. Protection of flood plains, once the structures are in, is just not possible. Why close the barn door, once the horse is gone. To continue our flood plain analysis, to buy the land to get back the flood plain would mean considerable costs if possible since the landscaped has probably been changed by the development. To provide the flood protection that had been naturally afforded, would probably require considerable drainage work and flood prevention or protection projects also quite expensive and maybe not as good or sound as Nature's way.

A community when planning its future, must be aware of its natural assets and their value, and be prepared to protect these assets for the good of all. Upper Deerfield Township is faced with decisions concerning its future open space. The rural, farming community is developing and land use decisions are being made everyday which effect these very conservation consideration. Recognizing the two aspects of conservation and the fact that one often times helps to promote or enhance the other is important in making these decisions.

Development must be balanced, natural resources must be protected and the quality of life within the community preserved and enhanced, not abruptly and irretrievably changed. The long time resident and the new suburbanite each chose the rural, open setting which has been Upper Deerfield Township, each wants services, facilities and amenities of the technological, urbanized society which has made life easier and more comfortable. There is no reason that one must preclude the other if careful planning is carried out and a balance is struck. Trade-offs will have to be made with those here accepting and adjusting to those wishing to settle, and those wishing to develop or live here learning that there is a cost for such settlement.

Conservation of the area's natural resources and the preservation of the open space which identifies and gives a character to the community can be achieved. Once we as citizens recognize what must be preserved and then work through the planning process to achieve that preservation, the protection of the resources and natural environment will provide open space for future generations.

The Need

There are three basic natural resources providing open space and special benefits within the community which are very important and in need of preservation and protection. Chapter II dealt with the natural setting and in large measure identified these assets. The foremost one, the prime agricultural soils of the community, were even given their own Chapter as an indication of that importance. Most of these soils are still being farmed and should be protected by encroachment from development. These lands are north of Seabrook and along the eastern border of the Township. While there has been some loss of good farmland and spots of development have occurred within such areas, by and large they remain intact. Its value increases daily and more and more of it disappears under subdivisions and shopping centers or succumbs to the bureaucratic controls placed upon it.

It value to the Township and in the larger scheme of things is clear. The very nature of Upper Deerfield is farming and it has provided the community an identity, a rural, open character. In addition, it has created jobs and continues as a major industry within the community. It represents a way of life for a number of residents. It is a risky business however, with crops being subject to sudden and unpredictable economic and weather conditions. There is even a global concern that good, productive farmland is being lost to too great an extent in the face of ever increasing populations and the unpredictable nature of farming itself. Food production is fast becoming as critical an industry and facing many of the same crises as the energy industry. We do not need to become dependent on other areas of the country or other countries altogether for our food supply.

Farmland also represents another important asset. Its very openness and close relationship to nature make it attractive and a pleasant setting for a home and a community. Farming is often therefore, taken for granted as being a guaranteed, public right. Too often the public assumes that farms were always there and will continue to be so. They forget that farms are privately owned, represent a huge investment of capital, and are business, today industries (perhaps the only real industry as Benjamin Franklin noted two centuries ago). If not protected and nurtured, agriculturally rich soils will be lost to development. We cannot simply plan them into permanence.

Preserving the currently estimated 10,000 acres of farmland now under plow is doubtful and not desirable. The continued viability of many parcels is questionable in terms of economics, existing development patterns and the quality of the soils being farmed. Careful land use planning should be able to identify areas worthy of preservation and/or protection thereby stabilizing the farmland acreage figures and stop, or at least substantially reduce, the rate of its demise.

Many things threaten the agricultural soils prominent of which is new development. Farmers themselves however, can be a threat to the continued viability of their farms by their practices and activities. The expansion of roads and utility lines into farming areas can also serve to bring trouble to the farmland by thus encouraging new growth. Within Upper

Deerfield, the prime farmland is in the direct path of new development which is sure to follow the completion of the new Route 55 to the north and east of Upper Deerfield.

A second and as earlier noted, equally valuable resource, is the Township's woodlands. For the most part, they are confined to those areas along or adjacent to streams. They serve a variety of purposes in the ecology of the area. The woodlands have a high capacity to percolate surface water into the ground water supply and thereby replenishing it. This capacity far exceeds that of crop lands which loses much of the water which falls on them in runoff and evaporation.

The woodlands also form natural buffers between land uses and serve as windbreaks reducing erosion of valuable soils. They offer sanctuary and habitat for animals and they represent the skeleton of a Township park system which would connect and conserve these natural resource areas with areas used for more man-made, active recreational areas.

The initial protrusion of development into the community's wooded areas has not abated although damage is fortunately minimal (given the fact that homes now sit amongst the trees). The remaining woodlands may be less vulnerable due to existing regulations although wooded tracts are most desirable to home builders. Much of the Township's woodland is located along the streams which will mean protection through flood plain regulations. Thought needs to be given to preserving more woodland in its natural state, not just in accommodating new development among the trees. Parks and woods are very valuable open space and recreational resources and publicly owned and protected ones are scarce in this Township.

As noted, the flood plains coincide with much of the woodland area. These areas' value and purpose in the natural setting is to serve as a holding tank or relief valve for swollen streams. Protection of them means natural insurance against flood damage.

Other areas worthy of protection include bodies of water not already in public ownership like lakes and ponds, areas of steep slope such as along the Cohansey River and its tributaries, and areas between major development projects and existing development in order to lessen urban sprawl unsightly appearance. Open space and trees are extremely important if one considers the fact that much of southern New Jersey is a flat coastal plain.

Upper Deerfield has one natural asset which was the result of man's work and which has set Upper Deerfield apart from other areas. As windbreaks and hedgerows as well as for aesthetic purposes, C.F. Seabrook planted sycamore trees along the roadway edges of many of his fields especially in the Seabrook area north to Deerfield Street. This legacy gives the State highway and other roads in these areas a planned, avenue or boulevard look. The effect is quite noticeable and makes for a beautiful landscape. There function has not diminished, but has been expanded with their maturity giving so enjoyable a sight to motorist. They are a signature or symbol of the Township for one knows where he is when he comes upon them. They deserve to be protected and preserved. The entire concept should be expanded throughout the community.

If properly managed and protected, these assets would provide food, jobs, recreation, water, flood and erosion protection, buffers between land uses and scenic beauty for years to come. They are recognized for what they are and what they are worth in terms of natural, aesthetic and economic values. There is no reason for ignoring them or disregarding their usefulness when considering the Township's future development. They cannot be replaced once lost and the services or benefits they provide will be much more costly to provide if they cease to exist. The farmland, woodland, flood plains and special features noted above are all natural resources which deserve considerable attention in terms of planning. They must be preserved and protected.

The Plan and Its Goals and Objectives

The Conservation and Open Space Plan map is shown in Figure 16. The Plan map identifies two specific types of areas within the Township recommended for preservation. The first and foremost is agricultural soils areas. As noted earlier, these areas are currently being farmed and new development should be prevented from encroaching on these soils. Other steps are necessary as well.

Agricultural Preservation.

Development within the community must be channeled into areas suited for it and away from or well buffered from agricultural areas. In this way the Township is providing a place where houses, business and industries can be established and thus not taking an exclusionary approach to its zoning plan. Within the prime agricultural soils areas minimum lot size should be six acres which is sufficient to permit a home and still have land enough to qualify for farmland assessment (five acres). Residential development should be excluded from these areas except in connection with farming operations e.g. the farmers homestead, migrant labor housing or rural residences as a conditional use on lands not suited to farming and if permitted, not detrimental to farming which is naturally adjacent to it.

Zoning regulations should also seek to permit uses which will enhance farming and agriculture. This includes new innovations and technological advancements in agriculture which might not be the traditional barn or chicken coop, but which represent a means to keep farming alive, the fields productive and open to farming.

The community must adopt a different approach to farming viewing it as business and then help to nurture it. Again farms are private property which will be farmed as long as profitable and feasible. The public cannot expect or should not assume that farms a given right or that the farm has a responsibility to provide the open, green fields which are so pleasant to see and desirable to live near. Conversely, the farmer cannot expect to be protect and aided to continue farming and then when he no long can or wishes to farm the land, assume he has a right to sell to the highest bidder for whatever type of development will command the highest price. He like any other landowner is subject to the zoning plan and must fit into the scheme of things in what he may do with his land.

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

FIGURE 16

CONSERVATION PLAN

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It is recommended that the Township's economic development policies accurately reflect the importance of farming and more attention be paid to assisting and assuring that this "industry" stay viable and profitable. Efforts should be made to encourage new types of farming such as high intensity farming (use of smaller acreages to grow speciality or high cash crops similar to what farmers in the East Vineland area are doing), or expanding already profitable and needed farming interests such as nursery stock. Allowing new farming techniques including special structures would also help. Providing a market for the farm products through commercial or industrial outlets is very necessary and could make farming much more attractive.

The community at large should be prepared to make trade-offs to allow farming to continue in one portion of the Township while other areas develop. This may involve the establishments of some form of transfer of development rights which would permit a developer to purchase the development rights to farmed ground and use those rights in another area of the Township thereby getting higher densities. Such a mechanism offers a very real possibility for assuring that every one gets to share in the economic pie created by development. The transfer can only work however, when there is a place to transfer the rights to which means the land must be ready to support the type of high density development sought. Thus sanitary sewer and potable water supply must be ready and available.

The overall intent of the conservation plan would be to concentrate development within that portion of Township able to handle it and thereby preserve the farmland. It is an approach which rightly assumes that land is not a renewable resource and is limited (especially when considering prime agricultural lands). Communities in New Jersey are much like communities in Great Britain, Europe or Japan. They have limited space in which to expand and therefore, must concentrate development in order to preserve and perpetuate farming. If truly dedicated to this goal, then Upper Deerfield must take this approach and change its attitude about land use and implementing its collective thoughts i.e. plans for how the community is to grow and evolve.

Therefore, the Plan's goal is the preservation of valuable natural resources and obtaining maximum benefit from their existence through the careful, purposeful use of their economic, aesthetic and recreational attributes. The objectives are:

* To concentrate development and avoid its intrusion into prime agricultural soils areas.

* To discourage and preclude residential uses within agriculturally productive areas and maximize agricultural uses and techniques which will promote and foster continued farming of prime agricultural soils through zoning regulations.

* To develop a policy of economic development which will truly consider agriculture as a business and industry which should be preserved, protected and enhanced or made to grow.

* To change the outlook of the public on farming and its value to the

community beyond the economic impact i.e. open space and municipal character.

* To consider new approaches to farmland preservation when appropriate such as the transfer of development funds and to cooperate in efforts to assure the continue viability of farming.

These goals and objectives may be impossible given the many variables at work in our free market economy. The price of land, the uncertainty of crop production and prices, the impact of development and the demand for new housing, jobs and services, and general public apathy all work against the continued presence of farming on the scale we have and do know it today within the Township. But as noted above, the reasons and results are too important to not try. Failure will be permanent loss!

Flood Plain Protection.

As for conservation of the Cohansey River watershed and its natural setting, the major goal of the Plan is preservation of these lands through outright ownership or deed restrictions on their use. A 500 foot setback along the Cohansey River and 100 feet along its tributaries is shown as valuable area which should not be developed, altered or encroached upon in any way which would reduce its natural value. The 100 foot protection should be required along all streams within the Township and as shown on the Conservation Plan (Figure 16).

In addition flood plain regulations must be rigorously enforced and in this way assure that development does not encroach upon these valuable natural assets. An objective of this policy should be land use planning which permits only those activities which will not detract or impinge upon the ability of the area to serve as flood plain or natural recharge areas. Limited open space and recreational activities, primarily passive, can and should be permitted. The Township, its adjoining sister communities and the County should adopt a policy of cooperation and coordination of preserving these areas through easements, public dedication and/or outright purchase where necessary.

Woodlands and Shade Trees.

For the most part, the woodlands of the Township are very closely related to streams and thus should be protected through flood plain preservation efforts as outlined and proposed above. There are however, several major areas of the Township where sizeable wooded areas exist which might be considered for preservation. The Plan's objective in this regard would be to preserve and protect the forests and woods again through recreational and/or conservation areas within specific projects which must provide open space, protective easements or covenants, dedication to the community or possibly outright purchase. Areas of specific concern include the wooded lands north of the Finley-Seeley Road between the Old Deerfield Pike and Seeley Road, the woods north of the Recycling Center access road south of Seabrook, and the lands west of DuBois Road north of Silver Lake Road.

Another major goal of this Plan is the protection and extension of the shade tree planting lining the roadways in and around the Seabrook area. Along State Highway 77 from Foster's Run north to Deerfield Street, along Polk Lane, Parsonage Road and Parsonage Road Extension, and the Deerfield Pike, the shade trees/erosion barriers represent a unique and special asset which deserves preservation. The effect of this man-made asset is both beneficial in protecting the large land areas of which they form a protective border and in giving a distinct and aesthetic character to the area.

It is recommended that the Township establish a shade tree commission which should be charged with protecting this asset through protective covenants, maintenance and when and where necessary, replacement. The commission could also extend this planning concept to other areas of the Township. In addition, the adequate provision of shade trees would be assured in new developments and existing development provide with this amenity where necessary, appropriate and advisable. Plans should be developed which would spell out a landscaping plan incorporating this intent and give the details i.e. regulations which would guide its accomplishment. Care should be given to assuring that energy conservation considerations are addressed in the location and type of shade trees to be planted.

Open Space.

Developments must provide for open space considerations when they are planned and not considered as an afterthought. The character of Upper Deerfield is rural, agrarian and the landscape encompasses broad vistas of flat fields which change with the seasons in their color and texture and are broken with woods and hedgerows of varying heights and densities. The Plan has as a major objective the blending of new development into this picture without jarring or incongruous views or settings. From a site or project specific standpoint, the Plan recommends development regulations which require that open space be viewed as important for the preservation of valuable natural resources and the good health and environment being created for the people who will inhabitant the man-made structures or uses proposed.

Open space must be viewed as a blending of conservation and recreation for the betterment of the living and natural environment. As such land use policy must be aimed at assuring a balance of each in any proposed development. Each development should provide for conservation of valuable natural resources including the aesthetic and recreational aspects of conservation. This is probably most self-evident with residential developments where questions of open space usually result in serious disputes between the public and private sectors.

Regulations should give incentives and bonuses where more open space is provided and permanently dedicated. Furthermore, open space standards must require that open space be provided, balanced and useful. Twenty acres of marshland, while critical and valuable, does not make a nice play to picnic or walk (unless boardwalks are to be provided). The marsh deserves preservation of and in itself and any open space or recreational value from it should be incidental. Conversely, twenty acres of tennis

courts, swimming pools and/or playgrounds or playfields does not necessarily represent or meet open space standards- the preserved, natural setting. Therefore, there must be required a mixture and balancing of the two aspects of open space, conservation and recreation.

Sufficient and suitable open space must be provided. It must be a blend of special environmental or natural features being preserved primarily because of their natural characteristics and/or attributes and active recreational open space intended for the enjoyment and use of the projects residents. It must be preserved, protected and maintained through easements, cooperative maintenance associations, or outright public dedication.

New developments should be encouraged to avoid encroaching upon delicate environmental areas and be designed to assure their preservation and maximum functioning as a natural feature while permitting their use up to the point such use impinges upon this functioning. Review of developments should require careful and detailed consideration and evaluation of projects' effects on these sensitive areas and how open space will be provided.

Environmental impact analysis will be very important tools to both the developer and the approving agencies i.e. the Planning Board or Zoning Board of Adjustment for this reason. Such impact analysis must be required whenever such areas are within or adjacent to a proposed development site. It is recommended that review procedures require that environmental impact analysis be done early at the concept stage so that all parties involved- developers, future inhabitants of the project, the approving agencies and the interested public, can determine whether sensitive areas will be effected or impacted by a proposed project. Such analysis once the actual development plans are prepared is putting the cart ahead of the horse.

The approving authorities must be prepared to determine when and to what extent an impact statement must be undertaken. Development regulations should set forth guidelines in this regard although some room for discretion is advised to accommodate various situations. Likewise, approving authorities should be prepared to grant waivers, adjustments and in some cases where justified, variances to permit protection of sensitive areas without unduly barring development on a given parcel. A house in the middle of a flood plain is not feasible or reasonably valid. A house on a lot which contains a flood plain, but where the house could be built outside of the flood plain with bulk requirements waived, might be found reasonable and justified.

Finally, the Township must be willing to actively obtain lands of high open space value to the community when such are threatened with eminent encroachment or construction. For the most part, this can be accomplished through development regulations and the implementation of the Master Plan. Where such is not the case and the lands involved represent major natural assets which should be preserved or made a part of a park or public open space area, then municipal action should be undertaken to so preserve them. This could mean the expenditure of municipal monies.

Conservation is a group effort which relies on individual concern. Recognition of the value and purpose of conservation is a first step and will do much to promote it. The commitment to preserve, protect and maintain open spaces and natural areas is everyone's responsibility.

CHAPTER X THE RECREATION PLAN

Introduction

We have already discussed recreation in Chapter IX at least from the standpoint of conservation and open space. We have shown both the natural value of certain areas of the community and their value in providing open space and aesthetic benefits beyond their natural functions. From a purely recreational aspect we would normally refer to the "non-natural" benefits of such as areas as their passive recreational benefits. This infers recreational pursuits or activities which can be defined as a use of nature for recreational pleasures with little, if any, man-made facilities necessary or human involvement to make them possible. Such things as canoeing or boating on streams, lakes or rivers, fishing, hunting, hiking and nature trails are perfect examples.

Little or minimal involvement of man is necessary to permit such activities. From a purely planning prospective, passive recreation is the the open space aspect of land conservation whether for open space, park land or to preserve a natural asset such as a flood plain or area of steep slope. Some refer to recreation being developed or undeveloped. The passive recreational pursuits are considered undeveloped.

If we use a more "liberal view" of passive recreation, man can derive additional recreational use from such areas than the mere conservation of it whether for open space or natural benefit. Not necessarily, but sometimes by constructing or installing some structures or facilities, you make possible greater recreational use of such areas. Bath houses and beaches permit greater recreational use of a lake, river or stream; fencing, signs and/or trail preparation makes a bridle path or natural walk; and picnic tables and barbecue pits make picnic areas. Thus open spaces value can be greatly expanded and they can be utilized for recreational activities without diminishing their conservation or aesthetic value (within limits).

The opposite of passive recreation is active or developed recreation. Ballfields, playgrounds, tennis, volleyball and basketball courts, swimming pools (man-made), and skating rinks are good examples of recreational uses requiring structures, facilities or other land improvements. Upper Deerfield has a good start in this category of recreation.

In 1974 there were 83 acres of recreational area (parks and playgrounds) and this had increased to 250 acres by 1978. This is publicly owned recreational areas and facilities. Private or common facilities

designed to serve the needs of a given development or neighborhood and not owned by a public entity, are less visible. Such quasi-public facilities or areas are important in providing for the recreational needs of a community because often times densities are such that open space and play areas are difficult to find. The whole concept of open space from the the standpoint of planning and development regulations stems from the need to assure air, sunlight, openness, and recreational area where development occurs. The urban setting requires a concern with adequate open space not necessary in the rural setting with fields, woods and open meadows.

There is a need for both public and private recreational areas and uses. Large public parks and recreational facilities are necessary to assure a community's open character and provide for the overall good of the population. Private open space and recreational uses make possible higher densities by meeting the needs of their tenets or residents. Therefore, as the density of development increases so does the need for open space and recreational areas. Multi-family housing projects (apartments, townhouses and other multi-family structure developments), planned and clustered developments should all be made to provide permanent open space and recreational areas and uses in exchange for the higher densities they would permit.

It is here that a developing community gets into trouble if it does not understand the importance of planning for provision of adequate open space and recreational facilities early. It is always difficult to determine how much open space or play area is enough. But it is much easier to plan and provide such areas when developing than trying to obtain them after the fields, woods and meadows are gone. Obviously the economics, location, design, intent and development of such areas is better met before the need arises or no later than as it does. Plans for recreation are, therefore, quite important even if the need seems remote or even unrealistic. The quality of life in the community can be determined by the open space and recreational plans and their implementation.

Once planned or requiring their provision is only one aspect of the picture however. Also important is how much to provide, who will use them, their composition, maintenance, and ownership. These questions must be answered when setting development regulations and standards for new projects.

The Township's Existing Recreational Plant

Upper Deerfield Township has made a very good beginning in acquiring new recreational areas and developing new facilities. Both the Township and the Township's school district have been actively involved in increasing both land and facilities. In 1976 the Township owned one small playground located off North Park Drive and a one-third, undivided interest in the 20 acre Bostwick Lake recreational area which is jointly owned and managed by Upper Deerfield and Hopewell Townships in Cumberland County, and Alloway Township in Salem County. In 1977 the Township submitted an application for Green Acres funding to purchase approximately 66 acres of land on Hoover Road between State Highway 77 and Old Burlington Road, and adjacent to the Township Municipal complex. The tract, partially farmed, had been owned by the C.F. Seabrook Company which had leased about a third

of it to the North Cumberland Little League. The property was owned by Land Holders, Inc., a large land management and development company which had gained ownership of much of the former Seabrook properties.

The League had developed five baseball fields and a number of support facilities and structures on the land. There value to the community was obviously important. The Township application was approved and titled to the entire tract was acquired in July, 1978 with Green Acres funding, Township monies and a donation from the property owner. The property is abutted by Foster's Run and the wooded area adjoining this stream. This property is now known as the Township Park.

The League has developed one additional ballfield bringing the total ballfield to six. A tot lot has also been developed, a picnic shelter developed and new parking area provided. A full fledged maintenance program is ongoing and keeping all park facilities in excellent condition. The ballfields are made available for use by other organization based on a scheduled plan of use.

The Cohansey Soccer League has developed in conjunction with the Township Recreation Commission two soccer fields at the park. The Soccer League has a full Spring and Fall schedule. The Township provides assistance and support for maintenance and upkeep of these fields as well.

The Township school district in the late 1970's worked closely with the Township to develop local school properties into first class recreational facilities. In 1977, the Township governing body transferred $55,000.00 of unappropriated surplus to the Board of Education for recreational site development on the school grounds. In that same year, the Township Committee allotted $80,000.00 in Federal funding, a portion of its share of the Local Public Works grant, to the Board of Education for the construction of six tennis courts. In 1978, the Township made another transfer of unappropriated surplus, making possible the lighting of the tennis courts. Today, the school grounds contain six lighted tennis courts, a softball diamond, a combination soccer/football field, and a combination hockey/soccer field. In 1986 the Township paid for installation of new basketball equipment on paved courts existing at the school grounds.

To assure maximum use of all Township recreational facilities, the Township Committee and Board of Education, as noted earlier, entered into an agreement for joint sponsorship of a community education and recreation (CER) program. A full-time director for the program was hired to establish and implement an educational and recreational program which fully utilizes all school buildings and recreational areas during non-school hours. Programs and activities are designed for all age groups and have met with considerable success. Activities are also scheduled for Township owned facilities when available. Costs of all program activities are equally borne by annual appropriations from each sponsor, users' fees and other grants or program income.

The Township also owns a small playground as noted earlier, at the intersection of North Park Drive and Sunset Lake Road. The Township has not actively pursued obtaining additional playgrounds since they are difficult to maintain, create liability problems and tend to cause

neighborhood concerns since there are frequently problems with different age groups of youths competing for the "turf." Teens chase out the little kids and then the playground becomes a "hang out." Recreational property owned and operated by the Township should always be specific in its use and design in order to avoid such problems.

The Cumberland Regional High School, located between Silver Lake Road and Love Lane, has a considerable recreational area within its 140 acre site. A football field, track, baseball diamonds, hockey and soccer fields, and four (unlighted) tennis courts can be found on the school grounds. The tennis courts have been made available to the public and an adult education program has made the gymnasium available to more residents. The voters of the District approved the construction of a second gymnasium in 1986 and work should begin soon on it. A regional high school, these facilities must be looked upon as serving an inter-municipal or county open space function. But, since the school is located in Upper Deerfield, it is convenient and most easily utilized by Township residents.

Based on State plans as outlined in 1979, the Township was well provided for in terms of recreational facilities. Using a approximate population of 7,000, the Township was found to have had 56 acres of local open space broken into 35 acres of parks, 10.5 acres of tot lots and 10.5 acres of play fields. With over 200 acres of recreational area in local control the Township far exceeded State guidelines. This area represented 1.5 times as much recreational area as called for by those guidelines. This was based on a population which is only now being realized. Clearly the basis for a good recreational plan had been established.

But where do we go from here? How much is enough and what does the Township expect and/or want in terms of open space in the future? Planning now can help to achieve the answers to these questions.

How Much Park and Playground?

In order to determine what is required to provide future residents with sufficient park land or play areas, we must first make several assumptions. First is that when considering a recreation plan we must also take a look at the conservation and open space plan since that as noted, clearly implies that preserved lands may have a recreational value and use. We must also look at proposed density patterns for the community and how they will affect providing residents with open space and recreational area. Again as noted earlier, if the community will remain or will try to remain open and rural in character, then that will assure some measure of open space although if the openness is to be achieved through the preservation and continuation of agriculture, the recreational value of such open lands will be practically nil. You can grow crops and play ball in a field.

The Conservation and Open Space Plan and the major emphasis on the preservation of agriculture stipulated earlier, are recommending such preservation through the concentration of development within specific areas where conditions and facilities will permit high density development. Such concentration will mean decidedly more urban appearance to these areas and thereby increase the need to assure open space and recreational opportunities for those residents who will live there. Therefore, developments must

considered and be required to provide for open space as they are planned. The community likewise needs to consider how such open space fits into the overall open space plan for the municipality and assure that sufficient types and amounts of open space are available to all residents.

Standards on how much open space is necessary or desirable have been developed and State guidelines in this respect were cited in the 1979 Master Plan and alluded to earlier in this Chapter. In the recently published model subdivision and site plan ordinance prepared by the Rutgers Center For Urban Policy Research the authors have cited standards which have been developed to assist in determining how much open space is required. For example, the National Recreation and Park Association (NRPA) recommends a total of 6.25 to 10.5 acres of developed open space per 1,000 population, to be divided in a system of parks of varying sizes and distances from residences. Ratios of so many parks or specific recreational facilities or amenities like tennis courts per 1,000 population are quite common and often used. An alternative approach would be to do a survey of given areas or neighborhoods to determine interests and apply it to the community as a whole.

Standards are also provided for determining how much open space is recommended for a given neighborhood or subdivision. The NRPA recommends 1.25 to 2.5 acres per 1,000 population. Other standards recommended are more specific like Michael B. Brough's in his A Unified Development Ordinance which provides:

> "2.5 acres of recreational space/1,000 persons expected to reside in the development (if 5 percent or more of the residents are children under 12 years of age, at least 15 percent of the open space must be in "tot lots").
>
> PLUS
>
> Five percent of total area of development for usable open space (left undisturbed or landscaped for ball fields or picnic areas)."

These standards are accompanied by a methodology for computing how many residents can be expected to reside in a proposed development as this is central to the calculation.

Applying pat formulas or national standards is difficult and often unrealistic when considering regional or local conditions and preferences. The municipality through its planning and zoning process must determine densities to be obtained and maintained. It must also take into account existing conditions i.e. existing open space, character of development, rural to urban nature of area or community. It must also look at the type and density of development to occur or being allowed to occur. A five acre lot size subdivision obvious is less dense and has more open space within it than townhouse or apartment project. Once the community as analyzed these considerations, it can than begin to plan and zone i.e. develop regulations aimed at achieving the open space character deemed appropriate and reasonable give these considerations.

Upper Deerfield Township is still a rural municipality with large amounts of vacant, undeveloped land. Much of that open land is

agricultural land which is deemed worthy of preservation and protection. To preserve these agricultural lands a land use policy is recommended which will permit development to occur in specific areas of the community which can accommodate such activity and which will interfere or impair the continued viability of agriculture.

There are also areas within the community worthy of protection for their natural beauty and value such as flood plains and the recharge areas along the streams and Cohansey River. These areas must be considered in our deliberation on recreational and open space areas as well.

Given these two considerations, which if carried out through land use regulations requiring their preservation and protection, the overall density and open character of the community can be accomplished. The only other consideration necessary is the recreational and open space needs of specific neighborhoods and proposed developments. Such developments should be required to provide an amount of open space appropriate to maintain the density to be permitted and to assure that that open space is divided between developed and undeveloped areas. Within existing neighborhoods the same consideration must be made and action taken to assure those needs are met either through private or public actions.

The Plan, It's Goals and Objectives

Figure 17 is the Recreation Plan for Upper Deerfield Township. It shows areas proposed for open space which logically have recreational potential; existing, public owned recreational facilities; and areas which are recommended for recreational development in the future. This Plan is predicated on the Conservation and Open Space Plan being substantially met as shown since as noted above, the openness it would provide within the community has a direct bearing on the community's density patterns and therefore, the need for open space and recreational area.

The major goal of the Recreation Plan is the provision of open space and recreational areas and facilities sufficient to meet the needs of the residents and the community's share of the regional recreational need. A secondary goal is to coordinate conservation and open space planning with recreational planning and relate it to overall density control as determined by land use policies. As objectives, the Plans seeks:

* To attain a balance of recreational areas and facilities geared to meet various levels of need e.g. community, neighborhood, development or project, and developed versus undeveloped recreational activities.

* the requirement that new developments plan and provide for satisfying the recreational needs they will create and which will make them fit into the land use plan of the community.

* To maximize recreational use of areas of special natural benefit without detriment to their character or continued natural function.

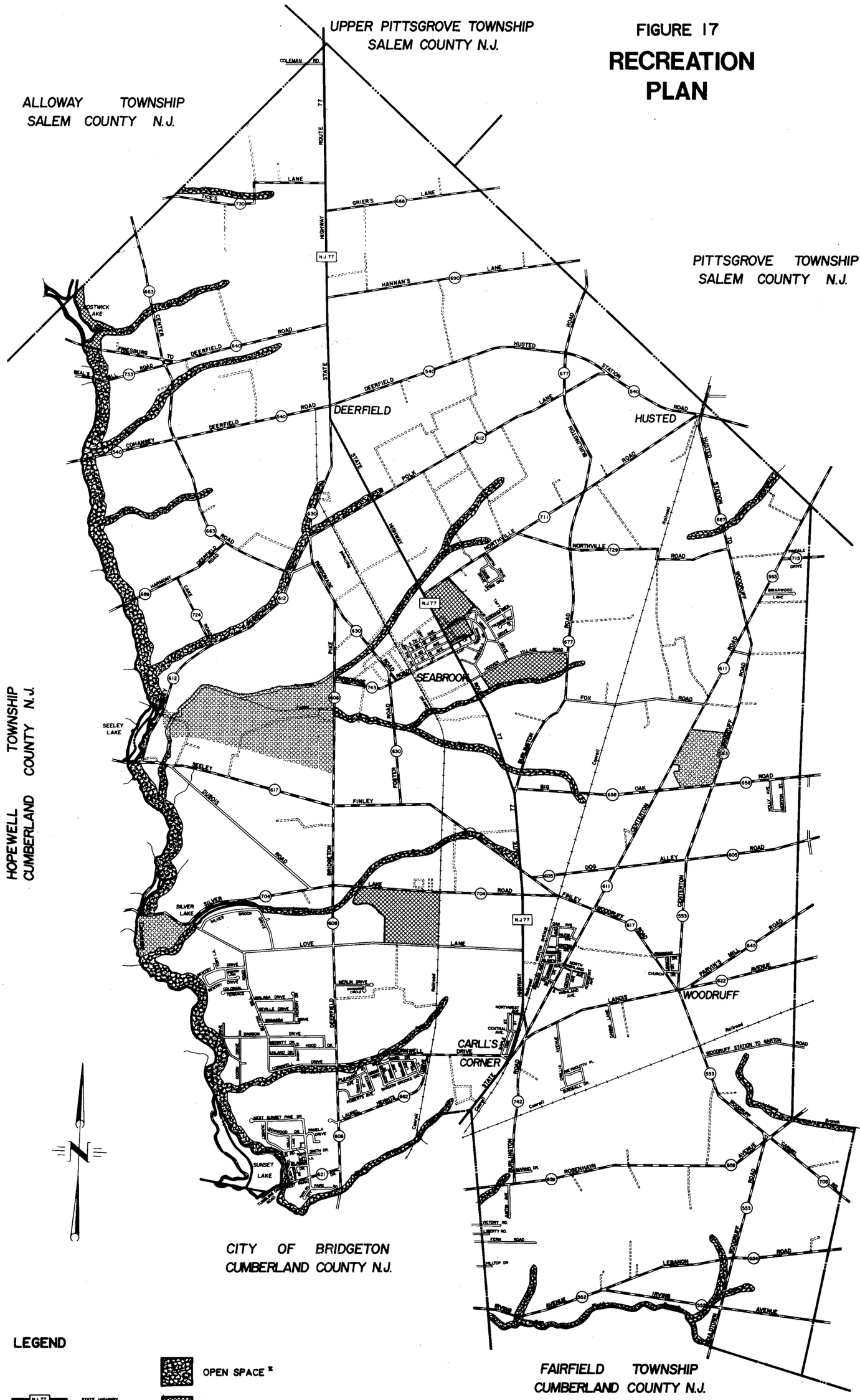
* To require that open space provided in connection with a proposed development be:

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

FIGURE 17

RECREATION PLAN



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(a) balanced between developed and undeveloped recreation,

(b) designed to reasonably meet the needs of those it is intended or expected to serve,

(c) required to make provisions for the ongoing maintenance and operation of any open space or recreational areas planned or required.

* To fully developed publicly owned lands for recreational uses and activities to the degree suitable to the site and surrounding conditions.

* To provide a variety of recreational facilities and activities aimed at all segments of the population being served.

* To develop a community park system which will also relate to regional efforts and open space or recreational facilities and/or plans.

* To initiate steps to obtain public open space and recreational areas including allocation of public monies or seeking funding and grants to this end.

In reviewing the Recreation Plan (Figure 17) it is important to consider its dependence upon natural conditions. Streams, the Cohansey River, the flood plains and woodlands are integral parts of the recreational network proposed. They are naturally logical areas to be preserved and enjoyed by all residents and will provide the interconnection necessary for a future overall "parks system" for the community.

Three sites are shown on the Plan as proposed recreational areas. Two of these are currently in public ownership - the former Township sanitary landfill and the woodlands south of Silver Lake. The existing conditions at these sites, one natural and the other induced by man, make them better suited to recreational and open space uses. The other site is privately owned and is used as a spray irrigation system for food processing waste waters. The lands are wooded and untouched by development and not likely to be encroached upon as long as the spray operation continues. The property's central location and undisturbed condition make it a possible site for future recreational use. It blends with the Township's "buffer line" between agriculture and development.

Lands currently owned by the community should continue to be developed for recreational use and the Township's Recreation Commission should develop a detailed plan for such development to help guide the community's recreational program.

It is also recommended that the Township closely watch the condition of farming within the community and to act when necessary to preserve sufficient and suitable open space should it appear that agricultural activities will cease. There are specific tracts of prime farmland that deserve preservation and public action in support of such preservation may well be necessary to maintain the open space such sites currently afford.

The purchase of development rights and institution of a transfer of development rights program (at the right time) should be considered and seen as part of an overall recreational and open space program to be undertaken.

In conclusion, Upper Deerfield Township has a strong foundation for its recreational plan and has progressively and earnestly sought to develop a true park and recreational network. It is an extremely important part of the overall planning process as it will in large measure determine the quality of life for future generations. Unfortunately recreational planning is an ongoing process which requires difficult decisions on land use, finances and community-wide needs and desires. To many it is a luxury capable of being deferred or foregone. In truth it is an investment in a municipality's future which time and again has been shown to be worth every penny it cost.

CHAPTER XI POPULATION

Introduction

Population is an important key to understanding the growth and development of an area, whether on a national or worldwide basis or on a regional or local level. On the municipal level it is vital to making intelligent land use decisions and planning a community's future development. Knowing how many people live and work in a municipality and how many may eventually live in the municipality is the only way one can sensibly prepare and plan for the services and facilities necessary to support them.

Population can also be determined by the land use decisions which are made. Density, the number of persons in a given area, is a primary function of planning and zoning. Where and to what degree people are permitted to congregate and live within a community determines to a large degree the ultimate population of a municipality. In authoritarian societies, such centralized planning tightly controls the movement of people and movement is strictly controlled and curtailed. In a democratic society, freedom to move and locate is guaranteed and control of such location (where people will live) only limited largely by market conditions. Zoning, based on the police powers of a municipality, attempts to set up standards and controls on where and how people can live. But such controls must be based on reasonable goals and objectives.

In New Jersey, control of development for environmental purposes has been upheld. The Pinelands, coastal, and wetlands regulations and flood plain zoning have all been found justifiable reasons for curbing development. In the Mt. Laurel decisions, the New Jersey Supreme Court found that zoning had and is used by municipalities to deny or restrict housing for low and moderate income persons. This was deemed unacceptable and municipalities are now required by law to plan for meeting their "fair share" of their own housing need and that of their region. This requires detailed data on population and the characteristics thereof to accomplish.

In Upper Deerfield Township population growth is a major concern because the Township is a developing municipality. Large tracts of land are being purchased by developers and plans for various types of housing and commercial or industrial development are being prepared at a rapid pace. It is therefore, important to gain a perspective on who lives here now and what may be the population ten, twenty or thirty years down the road. Knowing these facts and estimates can help us plan to meet the demand.

The Current Population

The most recent population estimate for Upper Deerfield as of July, 1987 (N.J. Division of Planning and Research) was 6,924 persons, as opposed to 6,810 in the 1980 Census. The area of Upper Deerfield is 31.8 square miles and averages a population density of 217.7 persons per square mile. The population has increased an estimated 1.7% from 1980 to 1987 as compared 2.4% from 1970 to 1980.

If one looks at a comparison of population statistics for the County and a neighboring community, one gets a perspective on the Township's population. Table 18 gives population change for several areas.

Overall, Cumberland County had a population increase in the past two decades as did Upper Deerfield Township. More developed (urbanized) areas such as Bridgeton and the locality of Seabrook within the Township itself showed a population decline. This would seem to coincide with the urban to rural movement occurring nation-wide. The changes in population also reflect the economic conditions of the times involved. The energy crisis and high interest rates occurred in the late 70's into the 80's. Thus changes in growth or decline were tempered by such conditions.

TABLE 18 POPULATION COMPARISON

Locality	1960	1970	1980	Percent Change 1960-70	Percent Change 1970-80
Upper Deerfield	6,040	6,648	6,810	10.1%	2.4%
Bridgeton	20,966	20,435	18,795	-2.5%	-8.0%
Seabrook	1,798	1,569	1,411	-12.7%	-10.1%
Cumberland Co.	106,850	121,374	132,866	13.6%	9.5%

Source: U.S. Census

In terms of people per square mile, Upper Deerfield Township can be compared to Cumberland County on a whole. The County with 502.4 miles went from an overall density of 249 in 1970 to 264.5 in 1980 compared with Upper Deerfield which went from 209 (1970) to 214.6 (1980). This was a 2.7% increase for Upper Deerfield and a 9.3% increase for Cumberland County.

The range of population density for Cumberland County begins at 33 persons per square mile in Downe Township and extends to a maximum of 2,892 persons per square mile in Bridgeton, according 1980 U.S. Census data. The total percentage of people of the County's population residing in Upper Deerfield was 5.5% in 1970 and dropped to 5.1% in 1980. Table 19 illustrates the percentage of County population for each of the fourteen municipalities.

Age groups within the population are statistics useful in the planning process. They indicate coming trends i.e. a large number of children entering primary or secondary schools, senior citizens needing housing and services, a declining work force or aging work force. These predictions on future populations can be discerned by studying the age groups which exists within a given population. Decisions on building new schools, housing, increasing jobs or providing any number of new services or facilities can

be effected by what the population statistics on age groups foretells. Table 20 lists the sex and age distribution of Upper Deerfield's population. The population is grouped in varied age intervals and the percentage of age groups in ratio to the total population is also given.

TABLE 19 PERCENTAGE OF COUNTY POPULATION BY MUNICIPALITY - 1980

Rank	Municipality	Percentage of County Population
1	Vineland City	40.5%
2	Millville City	18.7%
3	Bridgeton City	14.1%
4	Upper Deerfield Township	5.1%
5	Fairfield Township	4.3%
6	Commercial Township	3.5%
7	Maurice River Township	3.4%
8	Hopewell Township	3.3%
9	Deerfield Township	1.9%
10	Lawrence Township	1.6%
11	Downe Township	1.4%
12	Stow Creek Township	1.0%
13	Greenwich Township	0.7%
14	Shiloh Borough	0.5%

Source: U.S. Census

Two important conclusions can be derived from Table 20. The Township's population in 1980 could be grouped into four (4) age groupings. Under 5 to 14 years of age encompasses 25.5% of the Township's population. Approximately 22.1% of the population was from 15 to 29 years of age. From age 30 years to 59 years or a very large segment of the working population represented 31.8% of the total population. Those who were or would soon be of retirement age, 60 years and over, equalled 15.5% The second conclusion noted from Table 20 was that greater than 50% of the total population of the Township in 1980 over 30 years of age.

TABLE 20 SEX AND AGE DISTRIBUTION FOR UPPER DEERFIELD TOWNSHIP

Age	Male	Female	Total	Percent of Total Population
under 5	202	230	432	6.3%
5 - 9	293	295	588	8.6%
10 - 14	353	335	688	10.6%
15 - 19	314	281	595	8.7%
20 - 24	235	243	478	7.1%
25 - 29	196	232	428	6.3%
30 - 34	224	272	496	7.3%
35 - 44	454	462	916	13.5%
45 - 54	373	377	750	11.0%
55 - 59	178	205	383	5.6%
60 - 64	131	169	300	4.4%
over 64	331	425	756	1.1%
Total	3,284	3,526	6,810	100.0%

Source: U.S. Census 1980

Table 21 lists total percent of population for each age group for the the past three decades and the percent change from 1960 to 1980.

TABLE 21 AGE DISTRIBUTION BY PERCENTAGE 1960 - 1980
UPPER DEERFIELD TOWNSHIP

Age Grouping	1960	1970	1980	Percent Change
under 5	10.2%	9.3%	6.3%	- 3.9%
5 - 9	10.5%	9.9%	8.6%	- 1.9%
10 - 14	10.5%	10.6%	10.8%	+ 0.3%
15 - 19	8.7%	8.6%	8.7%	0.0%
20 - 24	5.4%	6.8%	7.1%	+ 1.7%
25 - 29	6.2%	6.0%	6.3%	+ 0.1%
30 - 34	6.5%	6.2%	7.3%	+ 0.8%
35 - 44	14.6%	12.5%	13.5%	- 1.1%
45 - 54	12.4%	12.5%	11.0%	- 1.4%
55 - 59	4.9%	5.3%	5.6%	+ 0.7%
60 - 64	3.7%	4.3%	4.4%	+ 0.7%
over 64	6.6%	8.4%	11.1%	+ 4.5%
Totals	100.0%	100.0%	100.0%	

Again it becomes clear from the statistics that the below 30 years of age showed major declines while the above 30 years of age increased substantially. Another fact discernible is the most frequently occurring age groups which were the 35 - 44 and 45 - 54 groupings. This is probably a correlation of the so-called "baby boomers" and the fact that Upper Deerfield is largely a suburb of Bridgeton with many residents who have purchased homes and begun families after getting settled in a position. The "baby boomers" also account for the age of 32 years being the median age of the population of the Township based on the Census figures.

Ethnicity and Population

According to the 1980 Census data, the racial composition of Upper Deerfield's population is composed of 84.7 percent white and 15.3 percent non-white. Table 22 lists the number of residents by ethnicity for the Township. Approximately 56% of the total non-white population was black

TABLE 22 PERSONS BY RACE AND ETHNICITY
UPPER DEERFIELD TOWNSHIP

Race or Origin	Total	Percent of Total Population
White	5,768	84.7
Black	590	8.6
Japanese	276	4.1
Asian Indian	23	0.34
American Indian	21	0.3
Korean	10	0.15
Filipino	1	0.01
Other	121	1.8
Total	6,810	100.0

and 26.5% of the non-white population was Japanese. There were approximately 276 citizens of Japanese ancestry still living in the Township out of the 3,000 person labor force recruited by Seabrook Farms during the 1940's.

According to the 1970 Census data, blacks had accounted for 510 persons in the Upper Deerfield population in 1970. As a percentile, the black population for 1970 was 7.8% which means there was smaller increase in the black population than the total population for this same period. The black population increase by only 0.8% from 1970 to 1980 while during the same period the overall population increased by 2.4%.

Table 23 gives persons by age and race/ethnicity based on 1980 Census data for Upper Deerfield Township.

TABLE 23

TOWNSHIP OF UPPER DEERFIELD
PERSONS BY AGE AND RACE/ETHNICITY

	Under 5 years	5-17 years	18-64 years	65 years and over
White	328	1,374	3,411	655
Black	81	180	301	28
Asian and Pacific Islander	8	57	177	68
American Indian, Eskimo and Aleutian	0	3	15	3
TOTALS	432	1,670	3,952	756

Source: U.S. Census 1980

Over half of the Japanese-American residents of the Asian and Pacific Islander grouping are in the 18-64 years of age category. There are also only 8 Asian and Pacific Islanders under the age of 5 years. This clearly indicates many couples have moved from the Township and that those who remain are not having children. This is unfortunate as the cultural diversity afforded the community by the presence of the Japanese-Americans has been welcomed and unique for so small a community.

Marital Status of Population

Another very important aspect of population statistics is marital status as it helps planners to determine trends in the population such as the single parent household, non-married persons and married households. In turn such trends indicate the need for housing of varying types and sizes, possible increases or decreases in school children, and special services which may be necessary such as day care facilities for the single parent households which may be apparent from marital statistics. Table 24 lists the marital status of Upper Deerfield residents 15 years of age and over as determined by the U.S. Census for 1980.

For the most part Upper Deerfield residents seemed to be following national trends in terms of marital status. Marriages are occurring at a marginally later age while divorce and separation are more prevalent than in past decades. As a result more people are remaining single for a greater time span compared to past trends. This could well effect the type

of housing desired and/or necessary for the single person versus the married couple.

TABLE 24 UPPER DEERFIELD TOWNSHIP
PERSONS 15 YEARS OF AGE AND OVER BY MARITAL STATUS

	Male	Female	Percent of Total
Married, ex-separated	1,576	1,572	62%
Single	623	507	22%
Divorced	107	156	5%
Separated	69	103	3%
Widowed	61	328	8%

Source: U.S. Census 1980

It is significant to note that 389 persons are widowed since it can be inferred that a large percentage of them live alone and are older. They too could have special housing needs not currently being met by the housing market in the Township.

Trends Affecting Future Population

Probably the most significant factor which will affect population in Upper Deerfield in the next five to ten years concerns the land currently be promoted for development. The largest landowner in the Township, the successors to the former Seabrook holdings, having 6,000 plus acres of land within the community are currently actively marketing this land and preparing plans for its development. A number of planned developments, major subdivisions, a mobile home park, industrial park and commercial developments have been proposed to the Planning Board and are currently in the design process.

Should market conditions hold, interest rates remain relatively low, and the general state of economy stay healthy, the Township will see much of this development occur. The Township has a favorable tax basis, a good school system, the ability to provide infrastructure necessary to support development and a reputation as a well run, pleasant place to live and work. In other words, the real estate is valuable and the price of land for both development and agriculture has been steadily increasing. Houses sell relatively fast and for the asking price or better.

Another trend which could well effect Township population is the overall upward swing in New Jersey's economy and development. Throughout the State a number of factors have produced substantial growth along the Hudson River waterfront (the so-called Gold Coast), the Route 1 corridor, the suburbs of both New York and Philadelphia, and the Atlantic City and all of the shore areas. There is a strong feeling that the New Jersey Turnpike and Interstate 295, both located to the west of the Township, could serve as the impetus for development, a sort of corridor of development. As such they would facilitate development making its way into southern New Jersey. The completion of Route 55 south to Vineland and Millville will also make Upper Deerfield much more accessible to the Philadelphia-Camden-Cherry Hill urbanized area. Although the new highway

will not enter Upper Deerfield, interchanges will be located in Pittsgrove Township and Vineland which are both close to the Township.

Most of these factors are, however, mere supposition and subject to considerable variation in terms of their affecting Upper Deerfield's future growth. The sheer number of housing units and/or building lots being proposed and planned could greatly depress the market or overwhelm it if people are not forthcoming to purchase them. A down turn in the nation, State or regional economy could also severely impact future growth as it did in the 70's. But it is the assumption of this Plan that growth will occur at a steady pace within the Township with the very real possibility that that growth will be substantial given the seeming intent of the developers and existing conditions which would permit such growth to occur.

For this reason, the community's Master Plan and development regulations ordinance must expect and assume the possibility of major development taking place and be designed to address the issues it will raise. The Township should also give careful consideration to other areas of the State which have been experienced major development booms to gain firsthand knowledge of the experience and then apply it for its own benefit. The new State Development and Redevelopment Plan should be carefully considered and evaluate in terms of its ability to further the community's planning goals. The municipality should take an active role in this planning process and not assume a "it doesn't affect us" attitude since it most certainly can and will.

The 1976 Master Plan projected a population of 10,000 by the Year 1985. Obviously, this did not occur and the primary reason was the economic downtown and energy crisis of the late 70's and early 80's. But once again the forces and conditions exist and are moving again to effectuate major development. The '76 Plan also recommend that the community not exceed an overall density of two persons per acre, a goal still worthy of being attained at least through the turn of the Century.

Actual density with the so-called "developable portion" of the Township - the area roughly described as south of Parsonage Run and Northville Road, then south along the former railroad line between Bridgeton and Glassboro to the Seeley-Finley Road; then east along said road to the former Conrail line between Bridgeton and Vineland; and southwest along said rail line to the Township boundary; then along said boundary to the Cohansey River and then north along the River to Parsonage Run - will be considerably higher in order to preserve agricultural lands and the woodlands and/or flood plains along the Township's streams.

Estimates of future Township population vary greatly due to the very factors and trends noted above. Such estimates use a straight line projection developed using Census statistics and estimated population figures and tempered with development proposals which have been approved for the year 1987 and which are proposed for approval in the next five years. They are strictly estimates (guess-timates), but do offer some insight into what could theoretically occur over the next 20 to 30 years.

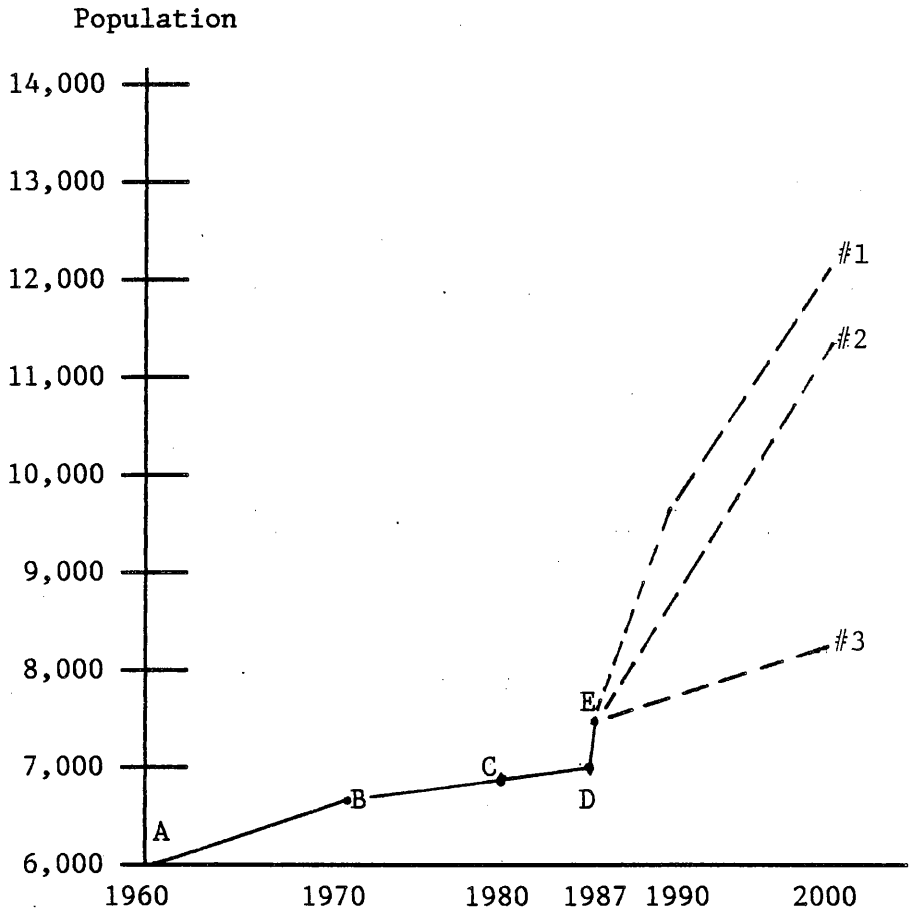
Figure 19A shows the estimates graphically. The two high estimates, #1 and #2, are based on the assumption that the population will not quite

double by the year 2000. Given current conditions it is not inconceivable that the figures could be higher, much higher. The middle estimate, #3, is strictly a projection of the growth pattern which occurred between 1960 and 1970, the Township's last major spurt of development.

Estimate #1 is the highest projection with jump from 7,200 people in 1988 to 9,700 in 1990, and 12,200 in 2000. Estimate #2 assumes a slightly less growth factor with a range of from 7,200 in 1988 to 11,500 in 2000. Estimate #3 as noted, utilizes the same growth trend that occurred from 1960 to 1970, the Township's last notable growth period showing a population of 8,350 in the year 2000. It is very possible that somewhere between Estimate #2 and #3 could occur by the year 2000 when one considers the various forces affecting population as discussed earlier.

The one sure fact in this rather imprecise and difficult exercise in population forecasting is that Upper Deerfield Township will be growing. The Township can expect an increase in children in the school systems, new housing, an increase in senior citizens (based on the aging population generally and the interest in housing developments aimed at senior citizens being proposed), and the increased need for all municipal services from provision of sanitary sewers and potable water, to police protection and new roads. The Township seems braced and targeted for growth. It is therefore, imperative that development regulations and municipal plans prepare for it and address it's ramifications to lessen its economic, social and physical impact on the community. A doubling of the Township's population by the turn of the century is quite possible.

FIGURE 18 POPULATION ESTIMATES FOR UPPER DEERFIELD TOWNSHIP



Key:

Solid line represents population growth based on Census figures.
Broken lines are population projections.

Points: A 1960 Pop. 6,040 (Census)
B 1970 Pop. 6,648 (Census)
C 1980 Pop. 6,810 (Census)
D 1987 Est'd pop. 6,924 (State)
E 1988 Estimated pop. 7,200 (Township)

CHAPTER XII ENERGY CONSERVATION

The Reason Why

The 1972 energy crisis caused Americans to become more aware of how dependent they are on imported oil. Most of the oil that Americans consume is not from America. It comes from the Middle East or Latin America. America will no doubt experience another energy crisis since the cheap oil prices of the eighties have again lulled us as a people into a false sense of plentiful supplies.

Oil, natural gas and coal are not renewable but finite. Some day the world's supply of these resources will be completely depleted. While efforts to find renewable energy sources continue, we must be concerned with prolonging the world's energy reserves. And there is a lot of energy for Americans to save. In the late seventies it was a well-known fact that the United States consumed approximately one-third of all of the world's energy. The Northeast United States (of which we are a part) is 62% energy dependent on oil and 63% of the oil is imported.

There are other reasons for conserving energy--it saves money. The economic benefits can be felt on a national level (trade balances) and the personal level lower energy costs (something everyone can agree on). So there are strong reasons to conserve energy use. But how? To answer that one must first understand the use of energy.

Energy Consumption

The energy that Americans consume is broken into four categories: residential, commercial, industrial and transportation (See Figure 18). In a community like Upper Deerfield, residential and transportation activities are major users of energy. Figure 19 shows the use and percentage of consumption of energy in connection with residential uses, i.e., the home.

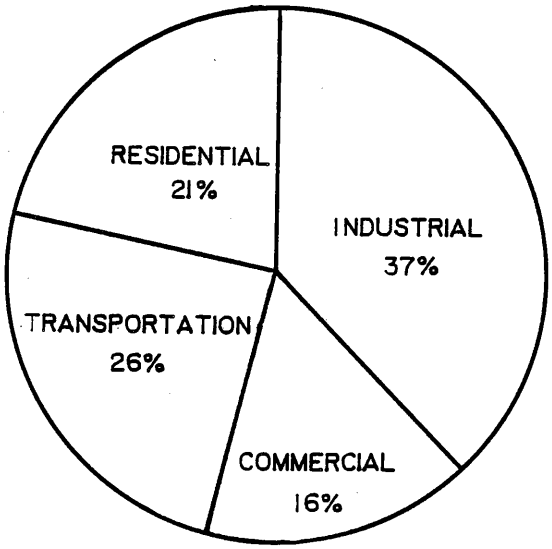
Figure 19 Consumption of Energy by End Use Sector

Figure 19A Residential Energy End Uses

Water heating, miscellaneous appliances' use, air conditioning and lighting use a lesser amount of energy within the Northeast than space

FIGURE 19

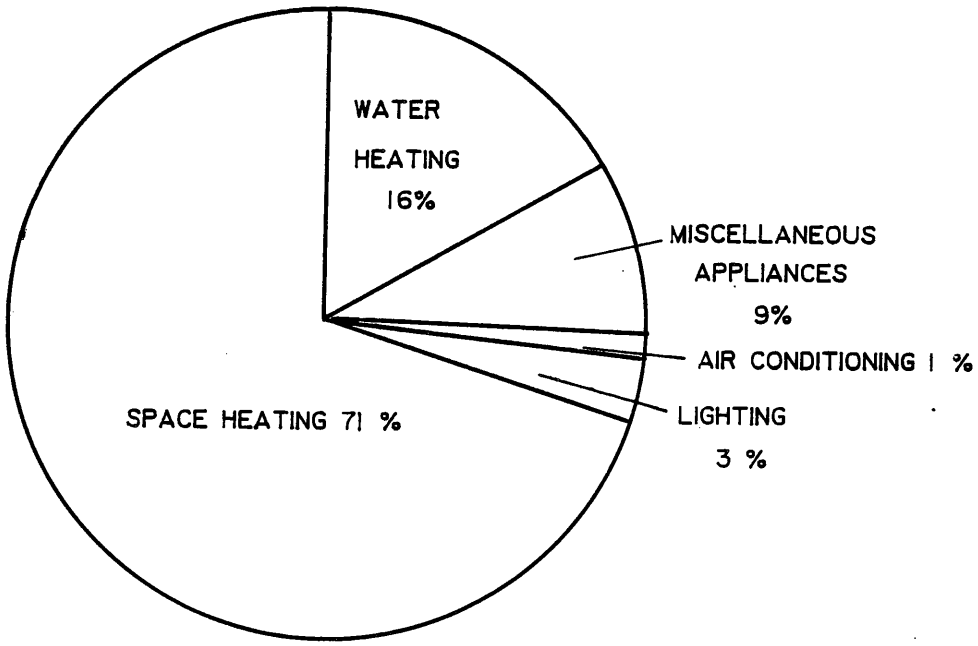
CONSUMPTION OF ENERGY BY END USE SECTOR
UNITED STATES



SOURCE : DERIVED FROM STATE ENERGY DATA REPORT, DOE 1979

FIGURE 19 A

RESIDENTIAL ENERGY END USES
NORTHEAST REGION



SOURCE : RESIDENTIAL AND COMMERCIAL ENERGY USE PATTERNS 1970-1990
ARTHUR D. LITTLE, INC., PROJECT INDEPENDENCE (1974)

heating. Space heating is simply the heat required to warm the living space of a home and it is an area of home energy that can be made more efficient!

Inadequate insulation has been cited as the single greatest cause of energy waste in most homes. This problem can be addressed with significant results from both new homes (now mandatory) and existing homes.

Another cause of energy loss for home heating is terrain. Homes that are not in line with the sun do not benefit from winter heat gain from solar radiation. The use and placement of trees and shrubbery will also effect heating and cooling capacity of a home. This sort of "natural insulation" occurs because vegetation around a house actually does insulate against cold weather and deflects high winds in winter. While in the Summer vegetation around a home absorbs the sun's hot rays to prevent or reduce overheating.

Shadows can cause a heating loss problem too. In the Summer shadows or shade can deflect or block the sun's hot rays, but in Winter this effect prevents solar radiation from warming the home. Houses built in such a manner as to block the sun to or cast shadows on other structures create this problem. Not using deciduous trees which loose their leaves in Winter can also contribute to this problem. The evergreen, natural to and popular in our area, can thus, if improperly placed, reduce solar gain to a home.

According to Planning the Energy Efficient Community, published by the Cumberland County Planning Board, heating efficiency of homes in the United States is divided into three groups. They are:

(1) The Energy Efficient House - This home is completely insulated including walls, windows, doors, floors and ceilings. The home is heated 90% by conventional fuel and 10% by direct solar gain, which is when the length of the house faces South to absorb as much heat from the sun as possible. Solar gain is energy absorbed from the sun.

(2) The Sun-Tempered Home - This home is completely insulated, its length faces South, but there is also the addition of large South facing windows. The windows let more sunlight into the house thereby warming the interior much more. The sun-tempered home is heated 75% by conventional fuel and 25% by solar gain.

(3) The Passive Solar Home - This home is equipped with everything that the sun-tempered home has plus a built in feature known as: thermal storage mass. Thermal storage is simply day heat which is stored in the home. During construction, elements of the home such as the foundation and walls or the floors are built more massive. More weight and mass help retain more day heat just as a sidewalk stays warm even after the sun goes down in the evening. Sometimes water can be used to store such day heat. A passive solar home is calculated as using 25% conventional fuel, 50% thermal storage and 25% direct solar gain for its heating.

Obviously some amount of discretion rests with the homeowner in how far he or she wishes to go in making their home energy efficient. From a municipal planning standpoint the focus must be on giving as much leeway as possible to the property owner to accomplish energy conservation. In addition, the community should encourage energy conservation as mandated by the Municipal Land Use Law.

Energy consumption of commercial and industrial users are in most instances subject to the same effects as homes in terms of structural considerations. But, of course, additional factors come into play. One such factor is lighting which can be managed to reduce energy consumption and provide heat as well as light. Excessive lighting for advertising purposes is unnecessary and unsightly and should be discouraged. Where internal lighting is required reliance should be on natural light and the heat generated from artificial lighting utilized in the overall space heating plans for the structure.

Besides the value of solar access for commercial and industrial buildings' locations, the location of the structure to other uses, parking facilities and the roadways which serve them have a strong influence on energy consumption. Distance means movement which probably means vehicular traffic. Thus land use patterns and development regulations can greatly effect energy use within a community.

Clustering homes reduces distance reducing driving time and permitting walking or bicycling (renewable energy locomotion methods). The prevention of urban sprawl and leap-frog development (this is where development jumps considerable distance over vacant land to locate in new undeveloped areas) will reduce use of motor vehicles to service or patronize such development. Concentration of development with homes near jobs, shopping and businesses will reduce the need for long distance travel and can encourage and/or permit walking or bicycling as well as mass transit.

Alternatives For Energy Conservation

There are a number of ways of conserving energy and some of those begin with a municipalities' outlook on development. Upper Deerfield has since the 1976 revision of its development regulations ordinance adopted a more flexible approach to development which has, will or could help save energy if utilized. These alternative include:

1. Increasing existing residential area densities and the clustering of residential development near jobs, services and facilities.

The location of residential development within existing developed areas and clustering such homes reduces the use of energy both for space heating and transportation. Tighter densities for barriers to wind since wind will absorb heat much faster from any object than air. Such clustering must not, however, be to the extent solar access is reduced or eliminated.

Such clustering of development reduces driving time and might aid in promoting walking or bicycling. Living close to jobs and stores

reduces driving time and expense. Mass transit is more feasible when development densities are higher, and mass transit is much more energy efficient than individual cars.

2. Promotion of multi-family housing.

When homes are attached wind and cold have less access to them and shared warmed walls will reduce heat loss. Heating costs can be reduced.

3. Allow mixed use developments.

The planned community clusters housing with services and facilities intended to serve those homes. Mixed use, the clustering of residential, commercial and/or industrial uses, also cuts down on transportation costs since everything is centralized.

4. Discourage noncontinuous or leap-from development.

This concept should be self-evident and was discussed earlier. It also preserves lands from development by reducing urban sprawl. And remember, while you might enjoy living in "splendid isolation" individual actions cost a municipality energy efficiency reduction. School bus routes, trash collection, snow removal, police patrols and mail delivery are all reduced in terms of distance and, therefore, energy consumption. In addition, by requiring development to logically expand as opposed to scattering, municipal services and utilities can more easily be extended.

5. Encourage the use of alternative modes of transportation.

Most of American society is predicated on and planned around the car. Promoting and in some instances forcing provisions which will encourage walking, bicycling or the use of public transportation are ways to reduce use of the family car. Most people do not car pool or consciously cut down on trips to the store or try to consolidate car use. Walking and biking cost very little in terms of energy and are also excellent forms of exercise. In fact, doctors recommend them as the safest forms of exercise physiologically speaking. Public transit, of course, is a more efficient way to move people from one place to another (provided the numbers are right in terms of people to be served). Requiring sidewalks, pedestrian paths and/or bicycle ways, bus shelters and stops to serve new developments can reduce their use.

6. Maximize the natural energy conservation and energy potential.

Use of natural conditions to preserve non-renewable energy sources is very important. The energy production potential of the sun, wind and water (hydro) can be considerable and are all renewable. Use of trees and shrubbery can also maximize energy conservation as noted earlier. Development regulations should encourage the conservation of energy through natural sources of renewable energy.

7. Home design, location and maintenance.

As has been noted earlier, the siting of a home or structure is very important when planning towards energy conservation. The length of the structure should ideally be on an east-west axis so the bulk of the structure has a southern exposure. Trees and shrubbery must be deciduous to assure shade in Summer, but sunlight for warmth in Winter. Evergreens are best suited for the North facade to shield against cold winds.

Placement of part of a structure underground or into a hill will provide a cooling effect in Summer and insulation from the earth in the Winter.

All homes must have adequate sunlight and should not be blocked by other structures in obtaining maximum solar access. This may well necessitate flexibility in zoning regulations in order that such can be achieved where structure design is intended to so use solar gain for energy.

As for home maintenance, municipal codes should encourage energy conservation. Improving and maintaining a home is one of the easiest and most cost effective ways of saving energy. Sample savings from such actions are listed below:

	Reduction In:	
Retrofit Measure	Heating Load	Cooling Load
Improved ceiling insulation	9%	2%
Insulating glass (or storm windows and doors)	20%	0%
Improved sealing and caulking	11%	8%

Source: Project Independence, Federal Energy Administration, Arthur D. Little, Inc., November, 1974, p.166, quoted in Planning and Efficient Community, p.98.

Enforcing construction and maintenance codes can, therefore, do much to assist the property owner achieve energy conservation and assure maximum effort by the community in this regard.

Another simple and basic way to serve energy concerns the automobile. As noted, transportation accounts for 26% of energy use in the United States and much of this could be conserved. Car pooling is one way to reduce the number of vehicles going to a major employment center. For example, four people each driving their car to the same work place would use one quarter the gasoline they are using if they drove there together. Of course, car pooling requires that companies or other major employers be required to coordinate and plan for car pooling.

Staggered opening and closing times for major traffic generators can also be helpful in reducing energy consumption. Delays and lines of cars idling while trying to enter roadways is a waste of gas. Good efficient

traffic movement could eliminate such activity or greatly reduce the time involved. The Township may need to adopt regulations mandating traffic management.

On the individual bases, people can conserve energy simply by keeping a car in good repair with periodic maintenance. Engine tune ups, wheel alignment and transmission checks and repairs all help a vehicle run more efficiently.

Plan Goals and Objectives

It is the goal of this Chapter to encourage energy conservation through land use policies, the entire comprehensive planning process and development regulations. Specific goals include:

- Encourage clustered development and orderly growth.
- Encouragement of energy conservation through flexible design standards enabling maximum use of renewable energy resources such as the sun and wind.
- Planning traffic patterns and movements which decrease use of the automobile or when necessary make its use as efficient as possible.
- Support "recycling" of materials, structures and facilities which have a considerable energy value in them.
- Encourage and promote citizen awareness of energy conservation.

It should be noted that the Township's development regulations have long provided for energy conservation in project design and in attempting to control growth patterns to prevent energy costly sprawl. Waivers to specific setback requirements have been available where strict adherence to ordinance provisions would have prevented maximum and necessary solar access.

What is necessary now is closer scrutiny of development and public decisions about development to promote energy conservation. In this way the Township will be able to make a real contribution in this important national issue.

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CHAPTER XV THE FUTURE LAND USE PLAN

Introduction

The Future Land Use Plan for Upper Deerfield Township is shown in Figure 20 and utilizes nine land use classifications just as the 1976 Plan did. This Plan also continues the 1976 Plan's aim to preserve agricultural lands and insure their continued viability, to protect natural areas, provide for various residential densities and to carefully mix and integrate the various land uses to reduce and minimize adverse impacts.

In order to fully comprehend the intent and purpose of the Plan, however, one must realize that it is composed of both text as set out here and the Plan element (map) itself, shown in Figure 20. Mere land use patterns on a map mean little without the interpretation of what those patterns represent.

The Plan is a composite the stated goals and objectives of this Master Plan and the various Plan elements of which it is composed. The preservation of agriculture through the concentration of development is probably the overriding goal of the Plan. It is a balancing of development versus agriculture which as noted earlier effects every aspect of the Master Plan just as agriculture has set the character and growth patterns of the community. Ordered growth necessary to maintain a viable community is permitted, but in the context of the rural setting that exist.

There is a conscious attempt to accommodate various densities of residential development and assure adequate commercial and industrial use areas to provide a strong, diverse economy and healthy tax base. The densities proposed and the areas designated for growth are sufficient to meet the known needs of the community, its residents and landowners, and the region in general. Conditions change, unfortunately faster than we can anticipate and therefore, plan, so care must be taken to see that the Plan keeps pace with such change. But any change in the Plan must not be at the expense at the overall goals and objectives stated, nor to satisfy economic gain through loss of natural resource, undue burdens upon other land uses and their residents, or beyond the ability of the community to handle the change.

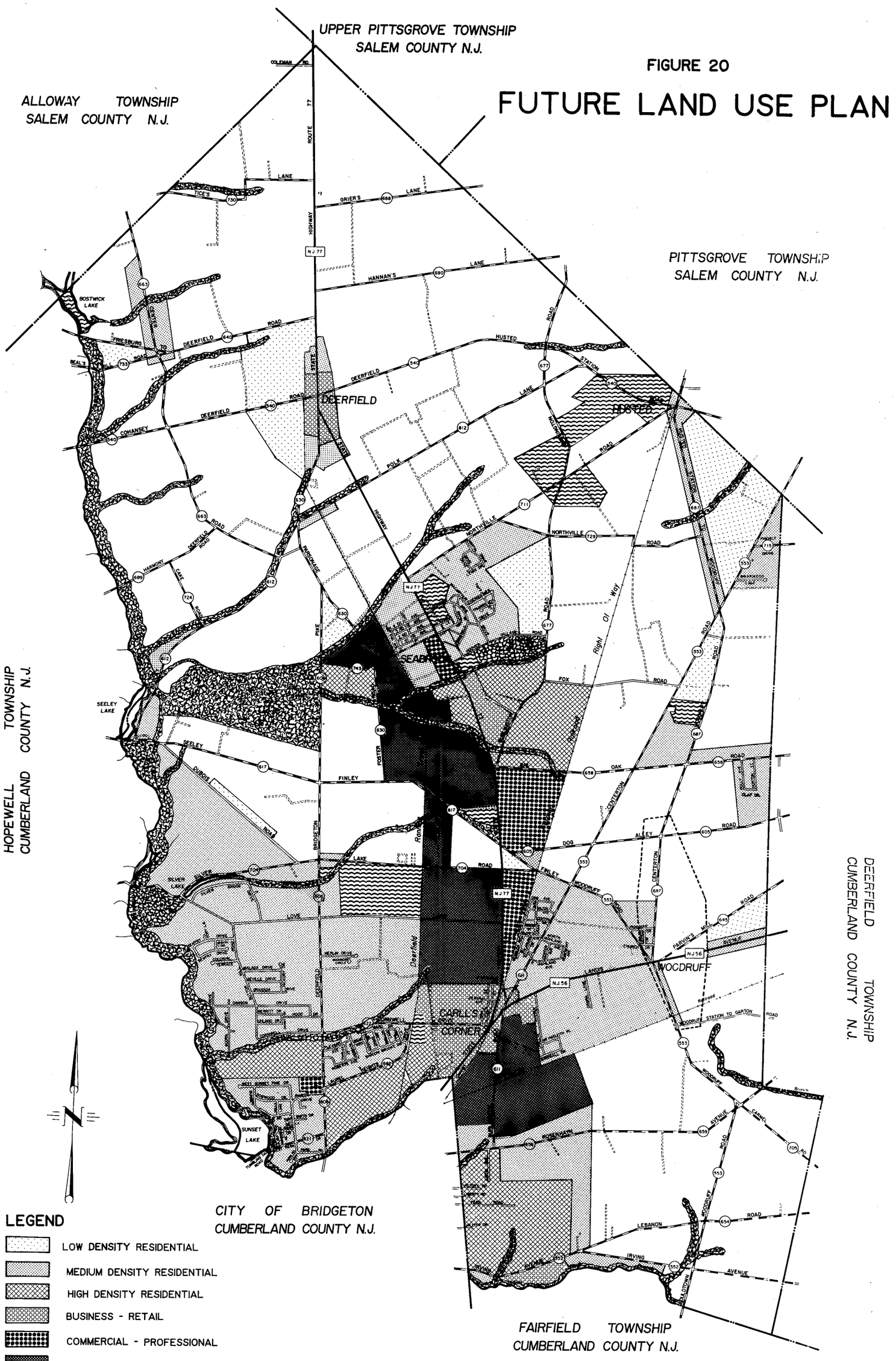
New development must be self-sufficient in terms of the burdens it places on the land; the impacts it has on existing systems for handling drainage, traffic, waste disposal, water supply, open space, conservation of natural resources, public safety and recreation; and the way it blends

UPPER DEERFIELD TOWNSHIP

CUMBERLAND COUNTY NEW JERSEY

FIGURE 20

FUTURE LAND USE PLAN



Harry R. Dare III, Planning Consultant

with the existing natural and man-made environment. Failure of development to meet the standards established to implement this Plan will result in problems, expense and the lost opportunity to have controlled growth. As a development community Upper Deerfield can affect its future, not by closing its gates in isolation and retrenchment, but in actively participating in the process before and as it occurs. Change will occur, sooner or later, this Plan is premised upon that fact and strongly recommends that the municipality prepare for it.

The Land Use Designations

The Future Land Use Plan can be described as being divided into three categories of land use classification: special lands, residential development and commercial/industrial development. They are described in detail below:

Special Lands - This category refers to and is concerned with natural resources, conservation and public service areas. These classifications, of which there are three, are based on the idea that these land uses have special value and importance to the community and must, therefore, be protected and enhanced for those reasons. In their own way, each of these classifications or designations serves a "public" purpose as has been noted in the earlier chapters of this Master Plan.

Agriculture This designation requires that the preservation of farmland be the first and foremost objective of land use regulations. It is recommended that development except that necessary for public health, safety and welfare; that which permits or promotes continued agricultural activity; and that which is directly related to farming; be excluded from areas so designated. To discourage the breakup of lands which is not conducive to farming within such areas minimum lot sizes should be six (6) acres which will assure that sufficient land can be had after building a home to qualify for farmland assessment.

Provisions should be made to permit use of non-farmable parcels based on quantifiable data, but such use should be limited in terms of density and type to prevent incompatibility with adjacent agricultural uses. No parcels should be permitted below one (1) acre in agricultural districts unless part of planned development.

Planned developments should be allowed conditionally and with sufficient area and buffering standards to also avoid conflicts with agricultural activity. Planned developments may offer the best way to permit development within farming areas when and if they should ever become unable to be continued in farming.

Most of the areas designated "agriculture" on Figure 20 are located in the northern and eastern portions of the Township. They are currently being farmed for the most part and by soil types and historical use are suitable to agriculture. Any permitted uses should be compatible with farming and/or be well buffered and situated to avoid conflicts. In addition, non-agriculture uses permitted should be also reflect the "open space aspect" of agriculture or provide a planned open space concept in their design and development.

Open Space Woodlands, flood plains, recreational areas and other sites of natural value fall into this classification. In some instances and as noted earlier in the Plan chapters on conservation and recreation, such uses may overlap agricultural lands since these lands can be viewed has have natural and open space value worthy of notation and preservation. Lands so designated must be protected against undue or adverse encroachment by development and whenever threatened, protected through buffering, setbacks, reduced densities and when appropriate based upon their natural or social value, the outright banning of development.

Where found, no development or uses which will destroy their natural character should be permitted. Flood plain regulations, open space requirements, setback requirements, design standards, easements and public purchase should be utilized to accomplish these objectives. Such regulatory measures should however, permit maximum use of such lands to the extent permissible without detriment to their natural value or in keeping with their social and recreational value.

Public Any lands acquired by the public for the provision of specific services or location of a public facility and intended to serve the public good and benefit would fall into this classification. As shown on the Future Land Use Plan these lands are already in public ownership and utilized for various public purposes including education and governmental activities.

Development regulations should permit public use activities and facilities within all districts provided, however, care is used in relation to the type of public use to be implemented is compatible with surrounding uses or is made so through sufficient land area, buffering and special design features to minimize or eliminate adverse impacts therefrom.

Residential Lands - This category of land use classifications as shown on the Future Land Use Plan is designed to identify those areas of the community wherein residential development should take place and at what density. The site chosen and classification of residential density proposed is directly related to natural conditions of the land, proximity to public services capable of handling the development, and existing land use patterns. Their are only three (3) classifications shown - low, medium and high density residential.

Low Density Residential Lands which have few natural barriers to development and will not be expected to receive or require public services would be deemed suitable for low density residential development. Chapter II The Environment shows where areas are suitable for handling development including on-site disposal of septic waste. Most of the areas are related to existing development of a similar nature, or on the periphery of the areas developed or recommended for

development, and are adjacent to agricultural lands. Thus they are considered to be transitional areas.

Densities should not exceed two units per acre and minimum lot be sizes should one acre. Zoning regulations should provide suitable setbacks and buffering to assure minimal conflicts with agricultural activities which may well be adjacent to them. In many instances such areas have been designated since the land involved was found to have marginal use for continued agriculture due to either soils characteristics or other uses such as existing land use patterns would justify such a transition.

Where public services can be provided lot sizes are recommended to be reduced to as low as one third of an acre and clustering and/or planned development are encouraged since both emphasize and provide open space which would facilitate the transitional nature of such districts.

Again uses should be limited to residential, agriculture and those uses which have a bona fide public benefit such as hospitals, schools and parks.

Medium Density Residential The majority of the existing singlefamily, detached dwelling, residential areas fall into this classification. Medium density infers that standard, conventional development occur at a density of two units per acre when not more then ten (10) units are proposed. Higher densities or more than ten (10) units are recommend to be permitted where planned or clustered growth is proposed and public sanitary sewer and potable water supply systems are available.

In no case should lot sizes dip below a quarter of an acre even with public sewer and water available and open space being provided. This classification is considered the standard residential designation and is interspersed through out the Township again based on existing natural conditions, proximity to services and facilities, and existing land use patterns.

High Density Residential The high density classification is very similar to that of the medium density residential designation, but would allow much higher densities in connection with planned, clustered and/or special designed developments. It would also provide for a wide variety of housing types including apartments, townhouses, tri or quadriplexes, mobile homes, and specialized housing such as congregative care facilities. In all cases, public services must be available and provided, open space designed into the development and permanent established, and the development be designed as a whole neighborhood or project.

Conventional, single-family, detached development is still recommended to be limited to two units per acre for up to ten units. Higher densities or projects involving in excess of ten units are recommended to provide public sanitary sewer and water supply. Dependence upon on-site, individual facilities for these two important services could well lead to problems in the future.

Any development to take place within such areas should be well planned and designed in order to reduce the adverse effect of the higher densities to be permitted. Bonuses for even higher densities should be provided for developers willing to establish housing within a project for low and moderate income households.

It is recommended that more than one such district may be required to adequately meet the needs of the community. If mobile homes parks are to be permitted as recommended in Chapter VI, then their location should be delineated within a given high density residential district so to not overwhelm and preclude, or at the best have undue advantage over other types of housing. Such districts can always be expanded when and if the need becomes apparent and beneficial to the Master Plans goals and objectives.

Within all areas classified for residential development, non-residential uses should be curtailed and strictly limited to avoid future conflicts between such uses. In addition, such development within residential areas should be self-contained and well buffered from highways and majorroadways as noted in Chapter V. Limited access and landscaped buffers from heavily travelled is recommended.

Commercial-Industrial Lands - The Future Land Use Plan provides for commercial and industrial development to occur along major traffic arteries such as railroad lines and major roadways. In addition, such designations are predicated upon availability of public services and facilities and the existing land use patterns within the community. There have been changes made from the 1976 Plan since conditions have changed e.g. the Conrail line abandonment from Bridgeton to Glassboro. More changes may be warranted in time and depending upon future development patterns such as planned developments occurring on commercial or industrially designated parcels.

These land use classifications are considered to be the most intense of uses and to have the most impact on the community, its environment and facilities, roads and services. There has been conscious attempt to separate them from residentially and agriculturally designated areas although this is not always possible. Where such uses will coalesce or join up, development regulations must require sufficient buffering and other design measures which will minimize and reduce adverse impacts. Again and as with major residential developments, it is strongly recommended that any commercial or industrial project or development be self-contained, designed as a whole, limited in its access to major roadways, and harmonious with its adjacent land uses.

Commercial-Professional This "business" classification is intended to be a transitional one which would permit unobtrusive land uses and use of lands not suitable for residential and/or between residential use areas and more intense business and industrial classifications. Land uses intended for inclusion in such areas include: professional offices, banks, real estate, insurance and financial offices, mortuaries, clubs, halls, lodges and assembly facilities, and again the public benefit type uses.

Such uses would not generate high traffic volumes, large signs, excessive lighting, and be designed to blend with adjoining residential uses with minimal adverse impact. Excessive night time activity would also be assumed to be precluded with such uses as opposed to normal business retail operations. Integrity of existing traffic facilities is encouraged with limited access and careful planning to assure safe and efficient blending with the Circulation Plan's goals and objectives on a case by case basis.

This classification is utilized along a number of the community's major roadways including State Highways 77 and 56 (Landis Avenue) and the Old Deerfield Pike, and/or wherever existing land use patterns have created business activities too close to residential or special value areas. The intent is to reduce the impact on such roadways and prevent "strip development" of type and nature similar to State Highway 77 from the Bridgeton City Line north to Carlls Corner. It is also intended to prevent the deterioration of residential neighborhoods and values. A stabilizing technique which permits continued residences to remain without the harsher aspects of business activities.

Business-Retail This designation refers to stores, shops, large retail establishments, offices, banks, food establishments, and commercial recreational facilities. Density should be reflective of the use proposed and again design standards should distinctly and specifically require limited access, buffering and provision of other amenities or facilities which will lessen impacts on adjoining areas not used for business or roadways used as major arterials or collectors in the Circulation Plan (Chapter V).

In both the Commercial-Professional and the Business-Retail classification, planned developments should be permitted.

Industrial This classification is self-explanatory and designed to utilize lands necessary and desirable for industrial growth and development. Access to rail, major highways, public services and utilities all influenced this designation. Here too uses will influence the appropriate densities and lot sizes to be permitted. Care should be taken to assure that uses permitted are compatible with surrounding uses, the environment and local goals and objectives.

Such designation is intended to include the commercial-professional and business-retail land use classifications as well. Again planned developments should be permitted within such areas. Design of any such use must address its appropriateness to the area and blending into its surroundings. Access to major roadways must be limited and buffering of sites is necessary.

Environmental Considerations

Within all of these areas as shown on the Future Land Use Plan, specific uses must address their impact on the environment and conceptual plans presented to the Planning Board should provide natural resource inventories sufficient to determine issues of concern requiring further

study and attention in the design of the proposed project. Given the state of development within the community and concerns which have been raised throughout the nation on various environmental issues, it would be foolish to permit any land use which poses a serious environmental threat or which if not properly designed and constructed could create problems in the future.

Development which is well planned and which meets the Township's development standards as expressed in this Plan and any development regulations adopted to implement it, is what is sought and what should be approved. This will not guarantee that problems will not arise in the future, but will assure that the community's growth is being carefully monitored with an eye to potential problems and adaptation to existing conditions.

Bucks Airfield Hazard Areas

In 1985 the State Legislature adopted the Air Safety and Hazardous Zoning Act which in effect mandated that municipalities revise their master plans and development regulations to reflect the requirements of this law. The law provides:

> "No person shall build, rebuild, create or cause to be be built, rebuilt or created any object or structure, or plant, or cause to be planted or permit to grow any tree or vegetation, which will interfere with, diminish, change or obstruct the airspace or landing and take-off area available for the landing and take-off of aircraft at public use airports."

To comply with this statute the Bucks Airfield Hazard Areas have been determined using Department of Transportation promulgated regulations and so designated on the Future Land Use Plan. Specific standards governing these areas will be included in the Township's development regulations as well and as required by law and regulation of the Department of Transportation. The law is premised on airfield safety and those who do or might live or work near such a facility.

Conclusion

The Future Land Use Plan is a slight retrenchment from the 1976 Plan in that it has scaled back some proposed areas for development based on changes in conditions and growth patterns which have occurred over the past eleven years. Primarily, growth has been further curtailed north of Seabrook (the area north of Parsonage Run and Northville Road) and in the eastern portions of the Township where agriculture is still viable, development is limited and the extension of public utilities is unlikely. The first goal of the Plan is to preserve agriculture and the character of the community which derives from it. The second goal is related to the first in that it seeks to provide for a variety of development - residential, commercial or business and industrial - within a portion of the Township suitable and capable of supporting it and in the hopes of taking development pressure off the farmlands.

A third goal is to address the community's development based on the entire Master Plan's proposals and to encourage a recognition that development pressures will continue to affect the community thereby requiring that they be addressed. To attain these various goals the Plan seeks to:

1. Reduce conflicts between land uses and encourage good design of new development.

2. Force development to be environmentally sensitive to the community's natural and man-made state.

3. Set realistic and attainable density patterns and permit a variety of residential housing types.

4. Require that development be complete in terms of reducing its impacts and meeting the needs it creates for utilities, traffic facilities, open space, buffering and recreation.

Compatibility With Surrounding Municipalities' Plans

Alloway Township, Salem County - Alloway Township's zone plan shows an agricultural district with minimum lot sizes being one (1) acre although in reality it appears that existing farms on the border are well in excess of this minimum area. At the southern edge of the municipal border there is a low density residential district near Bostwick Lake. Lots are permitted at a minimum size of one (1) acre. There are no known major residential developments proposed and the land use patterns along the border appear to be compatible. The Bostwick Lake could pose a threat to continued agricultural use of lands along the border as the value of land increases and the two municipalities should share data and information in their planning activities.

City of Bridgeton, Cumberland County - The City of Bridgeton has a boundary, which for the most part, is indistinguishable with the boundary of Upper Deerfield. There is unfortunately urban sprawl along State Highway 77 and North Laurel Street, which becomes the Old Deerfield Pike in Upper Deerfield. This causes confusion for residents and visitors to the area alike since it is almost impossible to discern when one leaves one municipality and enters the other. Little can be done to change these situations although they should serve as a warning for other municipal boundaries.

In terms of zoning along the area of Bridgeton's boundary with Upper Deerfield Township. From Sunset Lake to Route 77 the City's zoning begins as flood plain area which changes to 900 feet of industrial district and finally to low density residential (approximately a mile). From the highway commercial zoning exists along Route 77 south. Along the boundary to Fairfield Township there are two zoning classifications: industrial from Route 77 to Rosenhayn Avenue and Rosenhayn Avenue south to Irving Avenue residential. The area from Sunset Lake to Route 77 seems to be the only area where conflict occurs since the Township has high density residential development proposed along the border from the Old Deerfield Pike east to the existing business district south of Cornwell Drive and along State Highway 77.

It does seem as though this necessary will cause serious problems since the area capable of development is limited and public utilities are available. The City and Township should cooperate along the entire border since they are both clients of the Cumberland County Utilities Authority and the City has water lines and pumping facilities within the Township. Thus cooperation on public utilities will seem prudent as they are developed and extended into the Township.

Deerfield Township, Cumberland County - The land use plans for the area adjoining Deerfield and Upper Deerfield Townships' border are very compatible with each other. Deerfield Township proposes keeping the boundary between the two townships in as much open space and or low density residential as possible. The zoning is mainly two (2) acre residential. The remainder of the boundary is zoned for agriculture. Although split from Deerfield Township in 1922, our land use goals seem well matched.

Fairfield Township, Cumberland County - Medium density residential and industrial land use designations are proposed along the Township's boundary with its southern neighbor. This is not incompatible with Upper Deerfield's plans and Indian Branch which separates the two municipalities should form a natural buffer between them.

Hopewell Township, Cumberland County - The Cohansey River forms the boundary between Upper Deerfield and Hopewell Townships. Both municipalities seem to want to preserve the River and its flood plains as an open space buffer between them and giving a definition to the municipal boundary. The area on the Hopewell side from Sunset Lake to Silver Lake and between Beebe Run Road and the Cohansey Road is zoned "light residential. The other side of Beebe Run Road is zoned for agriculture.
The area from Silver Lake to Seeley Lake along the eastern side of Holding Road is also zoned light residential while the western side of the road is zoned agriculture. North of the Seeley Lake to Bostwick Lake is zoned agriculture. It should be noted that within this area adjacent to Seeley Lake there is a 1,000 acre by a large land development company.

Although Hopewell Township does not appear to be threatened with any major developments adjacent to Upper Deerfield at the present, there is concern about the continued viability of agriculture within Hopewell. Upper Deerfield will need to watch closely across the River to determine whether land use policies there could or will effect its own efforts to preserve agriculture.

Pittsgrove Township, Salem County - When contacted in 1987 the Pittsgrove Township Planning Board was in the midst of revising its own Master Plan. At that time proposals called for zoning large portions of Pittsgrove along the border with Upper Deerfield as a large lot agricultural district. From the border of Upper Pittsgrove Township to Husted Station-Woodruff Road and along the Upper Deerfield abutment, the area is zoned for one and half acre minimum size farm lots. From the border of Husted Station-Woodruff Road to Centerton Road (Rt. 553) the land is zoned for low density residential on one acre lots. This is not inconsistent with Upper Deerfield's proposed land use planning in this area.

Upper Pittsgrove Township, Salem County - At the very pinnacle of Upper Deerfield Township on Route 77 begins the border with Upper Pittsgrove Township and it ends about a mile southeast of the highway. The Plan for this area across the border is to have the area remain agriculture. The farm lots permitted would be a minimum size of one and half acres with at least 200 feet of frontage. The agriculture designation is compatible, but it would be helpful if lot sizes were increased.

Both Pittsgrove and Upper Pittsgrove Townships, like Upper Deerfield, face a threat from the completion of Route 55 south. It is likely that these prime farmlands will be much coveted by developers hoping to sell lots and build homes for those who would use this new transportation north. Perhaps discussions with the Planning Boards of these two Salem County communities would be order to coordinate our plans for the future since a common threat seems to exist.