

THE COUNTY OF SALEM

A PLAN FOR COMPREHENSIVE DEVELOPMENT

November 1970

Adopted October 1972

BOARD OF CHOSEN FREEHOLDERS

Lester Harris	Director
William J. Martin	Deputy Director
David B. Crocket	
Joseph J. Dyer	
John M. Pancoast	
George C. Pappas	
John A. Waddington	

SALEM COUNTY PLANNING BOARD

Joseph A. Hassler	Chairman
Sol L. Davidow	Vice Chairman
Bruce R. Henky	Secretary
Thomas Crossland, Jr.	
Gordon Miller	
Thomas A. Pankok	
Harry L. Symes	Engineer
Lester Harris	Freeholder
George C. Pappas	Freeholder

PLANNING BOARD STAFF

John J. Holland	Consultant Director
Gerald L. Walker	Principal Planner
Nicholas R. Brown	Senior Planner
Peter A. Pizzi	Senior Planner
Chester W. Ambler, III	Assistant Planner
Robert J. Cannell	Princ. Planning Aide
Lois B. Harris	Senior Clerk Typist
Deborah B. Keen	Clerk Typist
Galdys A. Rocktoff	Clerk of the Board

TABLE OF CONTENTS

1. Introduction	1
2. The Physical Environment	9
3. The Social Environment	17
4. Projections	27
5. Goals and Policies	31
6. Land Capabilities	35
7. Comprehensive Development	41
8. Implementation	53

REGIONAL ADVISORY COMMITTEE

ALLOWAY

George W. Bradbury, Sr.
Eugene Taylor

ELMER

William N. Brooks
Benjamin W. Timberman

LOWER ALLOWAYS CREEK

Francis H. Ayars
J. Lynn Beardsley

MANNINGTON

J. Sherwood Brown
John Catalano

OLDMANS

Edward H. Rigler
June Clark

PENNS GROVE

Charles Margerum
Eugene E. Hoff

PENNSVILLE

Benjamin Thompson

PILESGROVE

Edward C. Flitcraft
William H. Miller

PITTSGROVE

Arthur P. Schalick

QUINTON

Albert L. Blades
Leonard Hopman

SALEM

Ralph Reeves
Eugene T. Compton

UPPER PENNS NECK

William J. Delahanty
Sol L. Davidow

UPPER PITTSGROVE

Louis D. Ware
Henry Pollock

WOODSTOWN

John V. Branscome
S. Rusling Leap

TITLE: A Plan for Comprehensive Development
AUTHOR: Salem County Planning Board Staff
SUBJECT: Framework for Regional Development
DATE: November, 1970
L.P.A.: Salem County (New Jersey) Planning Board
SOURCE OF COPIES: Clearinghouse for Federal Scientific and Technical Information
Washington, D.C., Salem County Planning Board, Court House, Salem, New Jersey
HUD PROJECT NO.: N.J. P-125
SERIES NO.: N.A.
NUMBER OF PAGES: 55

ABSTRACT: Reviews alternative approaches to county development and describes method to be used; inventories existing physical and social environments; calculates the future population; sets forth goals and policies for future development; demonstrates the capabilities and limitations of the land; establishes a comprehensive framework for the development of the county; describes methods by which development will be implemented.

THE PREPARATION OF THIS REPORT WAS FINANCED IN PART THROUGH AN URBAN PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, UNDER THE PROVISIONS OF SECTION 701 OF THE HOUSING ACT OF 1954, AS AMENDED . . . THE REMAINDER HAS BEEN FINANCED BY LOCAL FUNDS AND BY AN APPROPRIATION OF THE STATE OF NEW JERSEY AS PART OF THE COOPERATIVE GOVERNMENTAL PLANNING PROGRAM.

List of Publications

Salem County Heritage
Salem County Natural Features
Salem County Population and Housing
Salem County External Influences
Salem County Land Use – 1967
The Economy of Salem County
Traffic and Transportation
Open Space and Recreation
Land Capabilities
Sewer and Water – Phase I
Sewer and Water – Phase II
Community Facilities and County Government
Mannington Meadow
The Housing of Salem County

A PLAN FOR COMPREHENSIVE DEVELOPMENT 1970

1. INTRODUCTION

One hundred ten years ago, the very founders of Western civilization were rocked with seismic impact by a small scholarly work entitled *The Origin of Species*. Down came the pristine world of Victorian thought, the logic and reason of the French Enlightenment, while in turn old and new stars of such men as Rousseau and Thoreau ascended.

At the heart of this, as with all intellectual revolutions, was a simple idea, a new interpretation of hitherto known, but uncodified, knowledge. Essentially, Darwin said this: The evolution of all life was dependent upon two things, chance and environment – the chance that a biological mutation would take place and that it would prove the living creature more able to cope with his environment. It was Darwin's contention that man's evolution depended upon the same two events but with the important added ingredient of choice. Man could shape his environment so that it would react to his choices, and indeed it has! The choices of the last century have led to staggering environmental problems now at a critical point. This happened because we have for so long believed that the environment was for our personal use, that we could do as we saw fit, that it was inexhaustible, and in the end made very little difference anyway.

The crises generated by these misconcepts are now leading us to a renewed look at our environment, both social and physical. This is so because we, like Darwin are realizing our interdependence with the environment. In a sense, we are returning to the precepts of Thoreau modified by the pragmatic realizations of modern society. Only when we become aware of all of the give and take between man and his surroundings can we realize the awesome, yet limited, potentialities of rational choice. That is the essence of planning.

Salem County has reached a critical turning point in its history. Within the next ten years, the change from a rural farming area to urban and suburban development will begin in earnest. Expanding cities and increasing population will be making unprecedented demands on the land and resources of South Jersey. Open fields and meadows will disappear to be covered by housing, industry, and roads, the most obvious products of our productive civilization. And the attraction will be that one commodity with which Salem County is yet so well endowed – open space. Presently over 90 percent of the total land of this county is undeveloped, and it is concern for the inevitable development of much of this land that is the primary purpose of this Plan.

A knowledge of the effects of development on the future of Salem County and its people is essential if we are to set forth a rational and workable regional plan. It is also essential to consider the entirety of the county; our thought processes must be adjusted to encompass larger areas. The development alternatives presented in this chapter are intended to explore this growth, along different lines. Their purpose is not to offer a choice of method or control, but to foster an understanding of the growth that will take place, and to demonstrate varying means by which this growth could be absorbed into the physical and social fabric of Salem County.

LAND USE

“The History of the world is comprised of man and his relationship to the land.” By extending this quote to include, “and it is upon this relationship that man’s future depends,” we have the foundations on which to build a plan for the future of Salem County. In order to construct realistic projections as to the future development of the county, existing conditions which have evolved through usage of the land for a period of over 300 years must be studied. To do this, a Land Use map is employed which shows specifically the existing land pattern.

The preceding 300 years have proved that residents of Salem County have had a strong awareness of their land and have used it to good advantage in many cases. The county has, for the most part, retained its rural character and will likely do so for several more years. This characteristic openness is demonstrated graphically by the Land Use map; farms, meadows, woods, and vacant land comprise about 92 percent of the total land, while the area of developed land amounts to only 8 percent. It is also important to note that in 1900, 80 percent of the county land use was used for farming, but in 1964 this figure dropped to only 50 percent. During this time, population and developed land have increased, and the continuation of this trend is inevitable.

Accepting the fact that Salem County will grow, the Land Use map may be used as a tool for the understanding of past growth and as a trend indicator of future growth. Industry has in the past located along the river near the Delaware Memorial Bridge and will probably continue to do so. Residential growth is occurring along the eastern boundaries of Pittsgrove Township, Woodstown, and the entire western border of the county. Also to be noted is the sporadic growth of housing along rural and semi-rural roads, and the commercial development along major traffic arteries.

The Land Use map is also useful in pinpointing certain physical conditions that may serve as growth inhibitors. For example, the Mannington Meadows and the marsh and meadow land along the southwestern border of the county are deterrents. The extensive woodlands of Quinton, Alloway and Pittsgrove Townships also tend to inhibit development. While these areas could be developed if sufficient population and economic pressures build up, there are only certain uses that would be tolerable from an ecological point of view. Urbanization of the meadows, for instance, would be possible, but the necessary land fill and the resulting damage to the ecology of the area would unnecessarily destroy an important and valuable resource.

The basic surface drainage network of the County is characterized by relatively short, meandering streams. These natural streams and swales will become increasingly important as more and more of the County’s land surface is covered with buildings, paving and other impervious structures. If these natural drainage ways are permitted to be filled in, blocked or encroached upon, they will no longer be able to handle surface runoff efficiently and will need to be supplemented by extensive manmade drainage structures.

The relatively small amount of public and quasi-public land is also pointed out. These holdings, made up primarily of parks and open space preserves, camps, clubs, and so forth. In addition to the scarcity of publically owned lands, it can be seen that these lands are in the outlying portions of the County, well removed from major population concentrations.

The map also provides a good overview of the extensive network of secondary roads which crisscross the County, and the way in which residential, commercial, industrial and other developed land uses are concentrated along extreme western edge of the County.

The most important function of the Land Use map is its ability to reveal and existing conditions of the entire county at a glance. We are then able to visualize the county as a whole, not as a series of pieces. It is this overview, coupled with the realization that this existing land use pattern will have an inexorable influence on future growth, that is required in order to take the next step, that of projecting future development.

UNRESTRICTED GROWTH

The Land Use map just discussed deals with specifics and past trends. By projecting these past trends we can examine future growth. Because the details of the future are by their nature unknown, the projections made in this chapter are only generalizations-schematic representations of the kind of growth that might take place.

One assumption we can make is that future growth might occur on an unrestricted basis. This projection is based primarily on the existing land usage throughout the county, and how, if left solely to the economic market, it might spread. A second important factor is external influences. To date, except for the thrust across the river from Wilmington, little outside growth pressure had been felt. However, with many new transportation, industrial and utility pressures being developed from outside, it will become increasingly difficult to contain or guide our growth. Development pressures are beginning to be felt from the inevitable growth of major metropolitan areas. Salem County is, in a very real sense, surrounded by burgeoning metropolitan areas – Philadelphia to the north, Wilmington to the west, and the Tri-City area to the east. Large companies and corporations have shown in the past that they are able to build practically anything, anywhere, usually relying on the ease of swaying local zoning and planning boards. In order to prevent this new growth from taking the same sprawling form it has taken in other suburban areas, a plan must be established, and perhaps even more important, it must be implemented.

The growth of suburban areas such as Long Island and North Jersey have fallen into what is now a quite common pattern. Families disillusioned with city life move to adjacent rural areas, either buying old farm houses or building new houses on one or more acres. Slowly at first, more families move to the area, and houses begin to sprout up all along the rural roads. The next step is for the speculative builder to buy a small farm and put up a few houses as a trial. If successful, he expands, and soon other developers move in, building ever larger subdivisions. To move this new population, more and better roads must be provided. And commercial facilities are needed to service the people. These will be located along the roads, where they are most accessible. Finally, industry moves in. Industry has three primary requisites, all of which vary with importance depending upon the nature of the industry – first, good transportation, either highway, railroad, or water; second, accessibility of raw materials and market; and third, a labor force from which to draw its employees.

Using this growth pattern and the existing land use as a basis, a diagram of “unrestricted” growth for Salem County was prepared. The residential pressures in Oldmans Township in the north and in Pittsgrove Township in the east are shown. Industrial growth is shown along the Delaware River in the western part of the county, because of the transportation importance of the river, US 295, and the New Jersey Turnpike, and the large labor force if the Wilmington-Pennsville-Penns Grove area.

Industry would likely develop along major limited access highways at interchange points. Commercial growth will occur as it is required, primarily along major arteries and connecting roads, thereby increasing traffic volumes and congestion. And as the population increases, large shopping centers will be built, again, along major transportation routes.

The growth demonstrated is typical. As is normal for a growing area, most thought is given to development and an expansion of the economy, while little or no thought is given to the quality of the environment or the sacrificing of possible natural assets and economic advantages. Recreation, scenic areas, and open space are usually the last items to be considered, if at all, and many times this consideration comes too late. We are rapidly learning that more care must be taken to preserve the character of the land, and to protect the natural resources that can work to our advantage before they are devoured by the blight of uncontrolled development.

ZONING

The primary tool for regulating the use of land in the future is the zoning ordinance. In 1926, the United States Supreme Court listened to a case known as Village of Euclid, Ohio v. Ambler Realty Company. In an historic decision, the Court found in favor of the Village of Euclid, and in so doing established the constitutionality of zoning as an exercise of the police power. In effect the Court held that government could and should regulate the use of land within its confines for the protection of the general welfare of its citizens. Three years later, the legislature of the State of New Jersey granted permission to municipal governments throughout the state to zone for the future use of their land.

The essence of zoning as decided in a large number of cases by the New Jersey courts is that zoning comprises a division of lands within a municipality based upon the character of the land and structures on it, and the reasonable regulation of future development so as to maintain the integrity and value of the particular district. Ideally, the power to zone offers the community the opportunity to guide its future growth. However, some strange things have happened in its application.

First of all, the very nature of zoning implies some form of plan for the future use of the land. While New Jersey law seems to require this, in practice the courts have determined that the zoning map itself fulfills the plan requirement for the purposes of zoning. This determination by the Courts seems to have been based on the practical grounds of avoiding the need to declare a vast number of existing zoning ordinances invalid. In Salem County, less than one third of the municipalities have officially adopted plans, while all fifteen units of local government have zoning ordinances.

As a consequence several municipal zoning ordinances in Salem County have resulted either from hazy growth estimates or as documents to sanctify the status quo. This lack of planning is reflected in an unrealistic amount of over zoning, in Salem County and elsewhere. In the extreme case, it has been written that the zoning ordinance for New York City could legally provide enough business and industrial space for a city of 340,000,000 people! A look at the zoning map of Salem County would seem to indicate the same case. Huge tracts of land have been zoned industrial, much of which is at best marginal, and could be used for industrial purposes only with phenomenal expenditures for land preparation. In these cases the old practice of zoning the good land for more restricted uses such as agriculture and residence and leaving what's left for industry seems to have been followed.

Zoning must take into account existing land use patterns but it shouldn't serve as an official sanction to illogical existing uses or encourage the continuation of present land misuses. This can be seen throughout Salem County with what is popularly known as strip commercial zoning along major highways. Excessive amounts of strip industrial lands have been zoned in linear areas paralleling railroad tracks. In many cases it is simply unfeasible to build industry along existing tracks because of the poor quality of the land.

Finally, the very serious problem of zoning conflicts along municipal boundaries is beginning to manifest itself in Salem County. A prime example here lies along the boundary between Mannington and Pennsville Townships. More than just the political boundary divides these two municipalities, the great expanse of the Mannington Meadows separates them physically. Mannington Township has chosen to zone its half of the meadow for conservation purposes, while Pennsville has zoned a long tract of land bordering the meadow as industrial. The two uses are simply not compatible and efforts to achieve one use will inherently subvert the other.

Obviously these problems point to the very real need for regional planning based upon thorough investigation of the area's physical resources and goals of the people of the county. This first Salem County Plan will provide a regional framework that can help to resolve some of the zoning conflicts and better relate zoning plans to our natural resources and land use needs.

DESIGNED GROWTH

The desire of every man is to protect his own personal environment. A farmer doesn't relish complaints about his farming operation from nearby lot owners just as a suburbanite doesn't want an expressway in his backyard. The physical extension of this desire is zoning, whereby a community attempts to order its growth and prevent land use conflicts. People trained in planning are well aware of this need, and their plans reflect this. Typically, industrial uses are clustered together as are residential and commercial developments. Much thought is given to the importance of open space and consequently large areas of recreation, open space, and conservation normally appear on their schemes. Formal, idealized growth patterns are recommended; ranging from linear to radial development.

Many of these idealized plans could, if carried out, create pleasant, efficient livable communities. Too often the plans are sacrificed on the altar of individual economic advantage through zoning variances and spot zoning changes. The primary mechanism for control of growth and development is zoning, although, as has been pointed out in the preceding section, it has proved to be less than completely successful. Most zoning ordinances are organized on a cumulative basis in which the more restricted uses such as residences or agriculture, and succeeding zones permit additional uses until finally almost all uses would be permitted in an industrial zone. Some efforts have been made toward exclusive use zones in which only one specific kind of use would be permitted. Such single use zoning, wherein an area of land could have only one use would lead to the type of development illustrated here. Growth takes place along a movement artery or an existing development node and spreads outward in a restricted but orderly manner. The mechanism of zoning is used to contain movement and to segregate various land uses and functions.

The plan thus evolved has a pleasing visual quality, and a sense of formality within a great deal of open space. Efficient transportation systems can be provided, property values enhanced and the rural character of much of the countryside preserved. New towns are located logically and in such a

way as not to impose on existing towns, while the growth of the existing towns is contained to maintain the openness of the county. At first glance, this approach seems to be the ideal solution for all the growing pains, present and future, of Salem County.

It is only when we study this method in depth that we begin to note its shortcomings. The most obvious flaw is that the present state of our zoning art is not equal to the task of bringing such a plan into reality. The lack of exclusive use zones, the pressures brought on zoning officials by influential property owners or prospective developers and the lack of strong community support for strict enforcement all work to break down the nicely worked out designs.

Secondly, the Designed Growth approach fails to take into account the capabilities of the land. Little or no consideration is given the question of whether or not a specific area of land is capable of supporting agriculture or urbanization. Without thoroughly analyzing physical resources there is no assurance that our limited remaining land area is being put to its best use. For example, the open space created by condensing the population may in actuality be quite capable of supporting the population while it would prove to be extremely poor recreational land. Similarly, the areas allotted to urbanization in the form of new towns might be unnecessarily usurping high quality agricultural land.

It is now clear that two important factors have not been considered in this Designed Growth example: choice of location and land capability. These factors are becoming ever more important as our remaining land dwindles, and they are factors that can best be introduced at the regional level.

NATURAL FEATURES

The preceding Designed Growth map was criticized for its lack of study with regard to the capability of the land. It is the intent of this Natural Features map to illustrate, in a very generalized way, the resources of Salem County and at the same time explain how these resources can be best put to use. Here our discussion will be limited—serving only as an introduction to the next chapter where all of the County's natural resources will be taken up in greater detail.

One of the primary resources of any area is its water supply. Although there are many streams throughout the county, the relative flatness of the land makes for poor surface water storage conditions. On the other hand, the strata of rock and sand below the surface hold great quantities of water, and these strata are being used now for the majority of the county's water supply. To preserve this resource, the geology of the area must be studied, and our development patterns and disposal procedures should be designed to avoid pollution or other contamination of this water held below the surface.

The water obtained from the subsurface, water-bearing strata mentioned earlier is supplied by seepage through the soil. Sandy soils may permit water to seep through them as fast as several inches per hour. Clayey soils, by contrast may be nearly impervious to water. Therefore, the area occupied by each kind of soil is as important as its water intake. Both factors determine how much water reaches the water-bearing layers and how much the layers will yield.

Another natural resource of Salem County is its wildlife. There are basically three types of wildlife: open land (quail, pheasants, rabbits); woodland (grouse, squirrels, foxes, deer); and wetland (ducks,

mink, muskrats). Each of these types is dependent upon the vegetation in its particular environment for its food and shelter, and destruction of this vegetation would in turn destroy the animals it supports. It is interesting to note that tidal marshes produce more total organic matter per acre than intensively managed crop lands—organic matter that is eventually transmitted to man, through a complex food chain, in the form of finfish, shell fish, birds and mammals.

Vegetation has been one of the most heavily used resources of the county. The forests have been harvested as many as six times in some areas since settlement and the agricultural industry has taken advantage of the excellent growing conditions. One of the basic factors in permitting this rapid growth has to do with soil types. As shown on the map, there are basically three types of soils: silty, sandy and loamy. These three types are generalizations of the nine soil associations, which are themselves generalizations of the many individual soils identified by soil experts, but they are nonetheless useful for planning purposes. The loamy soils around Alloway and Quinton are generally the poorest for agriculture, while the sand and silt are better, some areas being excellent. The specific soils will sustain vegetation suitable so that soil, and, if left untilled for a sufficient period will turn naturally to particular combinations of grasses, shrubs and tree species.

The growing national concern for our total environment and the urgency of dealing more effectively with the damage and pollution wrought so far by man in his development procedures underlines the importance of better understanding the physical characteristics and natural resources of our area. To date Salem County residents have exhibited an above average concern for environment. Our approach to a county plan seeks to build on this foundation and to demonstrate how it is possible to expand the population substantially yet still maintain those features that are necessary to the life and ecology of Salem County.

ENVIRONMENTAL GROWTH

We have now come in full cycle back to the beginning – chance, environment and choice. Throughout history each of these evolutionary components has had its day in the sun – individually. For perhaps the first time in the history of mankind we are now realizing the importance of understanding the interrelationship of these factors. In a broad sense, this is ecology. But understanding is not enough; we must utilize this understanding in the production of a design for the future.

This must be done in the context of regional planning. We should maximize the components into a workable program for development and conservation. Each of these components is an elusive, intangible element. We now realize that almost every time we do something to the environment, we take the chance of setting off a chain reaction. And what is this thing we call environment? It is certainly more than the four classical elements of fire, air, water and earth. Environment in its simplest form is everything that surrounds us; in its most complex form, it is the relationships between everything around us. Finally there is choice – the most human of the evolutionary components, and the essence of rational planning. All of these must form the basis of a regional plan such as we are presenting here.

Using our meager amount of knowledge about the environment, we can develop a framework for choice, but we now know that to reduce the chances of physical and social disaster in the future, the choices or options must be limited. Many choices have already been made for us by our history, and these serve as additional building blocks for our regional framework.

There are three major land uses which we must consider: urbanization, agriculture and open space. Each presents different demands upon the land. But, the land i.e. the physical environment, has its own requirements. Therefore, our task is to optimize these different demands and at the same time, produce within this optimization a range of maximum choices to be made available to the people and their local governments within the county. By defining the requirements of each of the major land uses and weighing them against those of the land, we can find areas within the county where each use is compatible with the land.

Urbanization, which here means any medium to high density development for residential, commercial and industrial uses, needs a good water supply, relatively flat land and good foundation conditions among other requirements. However, urbanization runs a high risk of polluting air, water and the land. Therefore we must find those areas of the county which maximize the requirements of urban development while minimizing the danger of polluting the environment. The same procedure holds true for agriculture and open space. Once this procedure has been accomplished and the resultant areas plotted on a map it would seem that we had a workable plan.

However, the land is much more versatile than we may have thought. Much of the land in Salem County is capable of supporting more than one type of use with minimum danger to the environment. Because of this, we have a choice. On those more versatile lands, we can decide which use we want; or, through careful planning, we can have several uses as long as they are compatible with each other.

And so a framework for development evolves in which we have a choice of the kind of development we want as long as we do not endanger the environment. Those areas shown on the Environment Growth map are the type of guidelines needed as a framework for regional development. In some areas, our choices are limited to one use. For example, the meadowlands cannot seriously be considered for urbanization or farming without serious ecological consequences. On the other hand, some parts of the county can support different uses with almost equal ability.

This is the nature of the method which we shall follow. The primary goal is to provide a maximum of social choice within a framework of environmental protection and preservation.

2. THE PHYSICAL ENVIRONMENT

The preceding chapter presented characteristics of Salem County in a generalized way in order to illustrate some of the mechanisms involved in planning. An effort was made to show, through an evolutionary process, the method that will be used to present the Salem County Plan and the basic reasoning on which the method rests. A clear understanding of the planning concept and mechanism is essential to a full comprehension of the plan itself. It is also necessary to understand the quality and character of the county in order to preserve as much as possible of its environmental advantages as growth takes place in the future.

While it is important to capture an intuitive feeling about our surroundings, this will not supply us with enough detailed information about the land to make the kind of decisions necessary for guiding the future of Salem County. This detailed inventory must consist of a set of usable facts about such elements as geology, soils, groundwater, woodland and wildlife. Operating on and through all of these is the climate. Climatic ingredients such as temperature, wind, precipitation and humidity have changed the composition and conformation of the soil, which in turn dictates the kinds of plants that will grow, the paths of streams and the wildlife of the area. It is important to realize that the elements which constitute the physical environment are all parts of a single system – interacting with one another. Therefore, the presentation of the information in a sequential style dictated by a book form, is really a limitation. As we deal with each element, we shall try to relate to all of the others where the relation seems to be important. Undoubtedly, some of the subtle interactions will be missed. For example, it is impossible to study the ground water supply without knowing the geologic structure, and the growth of forested areas makes no sense unless we understand the nature of the soil. In brief, it is as important to realize the interaction of elements of the physical environment as it is to understand the nature of the elements themselves.

In essence, this is the beginning of a study of ecology, the interaction of living things with their environment. It can and must be the guideline of the future, both philosophically and pragmatically. Ian McHarg, an eminent landscape architect has said: “In the quest for survival, success and fulfillment, the ecological view offers an invaluable insight. It shows the way for the man who would be the enzyme of the biosphere – its steward, enhancing the creative fit of man-environment, realizing man’s design with nature.”

And so we must inventory the physical environment, and later the social environment. This chapter and the following one will present a summary of the background studies which form the basis of the plan. It is from this basic raw information that guidelines can be developed for it is only by the rational application of these known conditions that a plan for the future use, and not misuse, of Salem County can evolve.

GEOLOGY

Salem County lies in the great eastern Coastal Plain, a physiographic province which took approximately 450 million years to form. This province is divided into two major areas, the Inner and Outer Coastal Plains, and the dividing lines runs through the heart of Salem County. The Inner Coastal Plain, covering the western half of the county, was formed during the Cretaceous Period, 135 million years ago. The sea moved over the area in a series of advances and declines, forming the deepest deposits of Salem County, a series of unconsolidated sand, gravel and clay layers. These

include the sand-clay layers of the Raritan-Magothy formation, the Merchantville clay, Woodbury clay, the Marshalltown Formation (primarily clay), the Mount Laurel and Wenonah sands and the Navesink Marl.

The order of their deposition can be seen in the geologic cross section of Salem County. Each of these was laid down in turn by a successive invasion of the sea over the Coastal Plain. Consequently, the oldest formation in the area, the Raritan-Magothy, lies at the greatest depth and outcrops in the western most portion of the County. Each successive layer is more shallow and outcrops farther to the east.

During the Tertiary Age, some 70 million years ago, the Outer coastal Plain formations were laid down, again due to various invasions and withdrawals of the sea. This series produced the Hornerstown Marl, the Vincentown Sands, the Kirkwood Sands and the Cohansey Sands.

About a million years ago, the final major series of the Quaternary Age were laid down in Salem County. These are the Bridgeton and Pennsauken Formations that resulted from extensive river depositions of sands and gravels over all of South Jersey.

Following this came the great age of the glaciers. During the last inter-glacial stage, the sea level rose some thirty feet and covered the lowland of the Delaware Valley. This era marked the deposition of the marine deposits, the Cape May Formation. As the last glacier melted, great deposits of outwash material flowed down over the Delaware Valley. The outwash consisted of primarily silt and sand, and was deposited along the Delaware River portion of Salem County. These silt deposits are presumed to have been eroded by strong northwest winds when the water lowered. The winds blew much of the silt over large portions of central Salem County where today the silt mantle in some places reaches depths of thirty inches or more.

The primary cause for variation in topography is the order in which various geologic formations were laid down. The lower sections of Salem County lie along the Delaware River where the first formation, the Raritan-Magothy, was deposited, and where the effects of erosion have had a longer time to operate. The western part of the county is generally a flat plain five to eight miles wide, ranging in elevation from ten to forty feet above sea-level. In the center of the county, the elevation ranges from 50 feet to about 140 feet in gently rolling hills. From here to the eastern edge of the county, the surface is generally level, sloping eastward about three feet per mile.

Throughout the county, the range in slope is almost negligible, 94% of the land having less than a five percent grade. Of the remaining six percent, 4.1% slopes from 5-10 percent, 1.3% of the land slopes from 10-15 percent, while a scant 0.6% has a slope greater than 15%. Most all of the steeper slopes occur along streambeds, particularly along sections of Oldmans Creek.

SOILS

The relationship between soils and geologic formations is an important and striking one. Of the five determinants of soil structure – climate, parent material, relief, biological action, and time – the most important for Salem County's soils has been the parent material, i.e. the geologic formations. As we have seen, the formations which comprise the foundation of Salem County consist of clays, silts, sands and gravel. Since soils are the surface layer of the geologic substructure, we must

naturally turn to the most recent depositions, those of the Quaternary Period and the silt deposits which followed the period of the glaciers.

Silty soils cover well over one half of Salem County, and today these cover almost identically the same area as the original wind deposits. Sandy soils comprise the remainder of the county, and these have been formed primarily from Cape May and Bridgeton Formations. There are, of course, other types of soil in Salem County, such as the loamy soils located around Alloway, but these are not extensive.

There are almost one hundred different soils in Salem County classified according to parent material or by slope. This group has been subdivided into nine different soil associations. The "Soil Survey of Salem County" has defined a soil association as a portion of the landscape which has a distinctive pattern and proportion of soil. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. Soils in one association may occur in another, but in a different proportion or pattern.

To understand the structure of a soil association, let us examine one in detail, the Mattapex-Othello-Woodstown Association. It is dominantly silty, moderately well-drained to poorly-drained, nearly level to gently sloping and located along the Delaware River. This association is a nearly level plain that extends from Penns Grove and Pennsville southward to a point beyond Salem City. Nearly all of it has been cleared for crops. The areas are low lying from ten to thirty feet above sea level. Surface drainage is primarily through the sluggish winding river and by estuaries.

Mattapex soils make up about 35% of this association. They occupy high positions of the landscape that are moderately well-drained silty soils that are underlain at about thirty inches by sand and gravel. Othello soils comprise one fourth of the association. They are gray, poorly drained silty soils in low positions. Another 20% of the association is composed of Woodstown soils. They occupy intermediate or high positions, and are more sandy than Mattapex and Othello soils. They are moderately well-drained, and have a loamy subsoil that can hold a moderate supply of water for plants. Minor soils make-up about 20% of this association.

With this kind of information, coupled with engineering and soil analyses, we are able to make important observations about the use of the various associations. Some will be better than others for agriculture; some will have superior structural characteristics for supporting buildings and facilities of various kinds: while one association will support different types of woodland than others. We will be able to tell what reaction the soils will have to various kinds of treatment, not only in an agricultural context, but also for different types of community use. In a later chapter, this information will be put to extensive use for determining the capability of the land to support different uses such as urbanization, agriculture, open space and recreation.

GROUND WATER

The study of ground water inevitably leads us back into the geological sections examined previously. Each of the major deposits that were laid down over the centuries has varying properties which relate to the capacity of the deposits to hold or give up water. Those formations which are capable of holding and transmitting large amounts of water are called aquifers; those that discourage the passage of water are called aquicludes.

The aquifers in the Raritan-Magothy formation are considered to be the most important hydrologic unit in the lower Delaware Valley. By far, the major part of the water from the Raritan-Magothy is of excellent chemical quality and suitable for most uses. However, at a considerable distance down dip from the intake area, the aquifers contain salt water. Along the fresh water portions of the Delaware, in some areas heavy pumping in or near the intake areas of the aquifer, the normal flow pattern has been reversed so that the Delaware River now supplies much of the water drawn from these wells. In such areas the quality of the river water controls or strongly affects the quality of water from wells, and in Salem County, this means that threat of salt water encroachment.

The aquifers of the Raritan-Magothy formation are recharged by precipitation on intake areas; by induced infiltration from bodies of surface water that lie on the intake areas (mainly the Delaware River) and by leakage from neighboring sand formations. The major source of the recharge of this formation is precipitation on its outcrop area.

The Mount Laurel and Wenonah sands formation outcrops in a comparatively narrow band extending northwestwardly from the vicinity of Salem City. These sands function together as one aquifer. In their capacity to store and transmit water, they are inferior to the Raritan-Magothy and Cohansey Sands. Geologists have pointed out that it is quite probable that this aquifer contains salt water not too many miles down dip. In this event, if the head near the intake area were lowered (by a substantial lowering of the water table or excessive withdrawal), wells located closest to the salt water front would quickly be salted.

The Vincentown Sand is a minor source of water. It serves as one of the sources of supply for the City of Salem, and is used elsewhere as a source of domestic and farmstead water supply. Geologists have concluded that its usefulness as a major source of ground water is quite limited.

The Kirkwood Sands comprise a large area but limited source of water. So far, it has been developed only for domestic and farmstead supplies. The major source of recharge is from precipitation on the permeable parts of its outcrop area. Since the sands are fine grained and of relatively low permeability and near the outcrop area, it is unlikely that many large wells can be developed in this aquifer.

The Cohansey Sand is potentially the most productive aquifer in the New Jersey coastal Plain. It is composed of highly permeable and generally well sorted sands and gravel, and is thus able to store and transmit huge quantities of water. It outcrops over an area of 2,350 square miles more than the outcrop areas of all the other aquifers in the Coastal Plain combined. It is thus exposed to and able to absorb massive quantities of precipitation.

Aside from the waters of the Delaware River, (which pose the threat of induced salt encroachment in the upper levels of the Raritan-Magothy) the waters of the Cohansey Sands are probably the most readily available major supply for our region. The quality of water in the Cohansey is largely dependent upon local conditions at the surface. This is true since the aquifer is recharged directly by vertical percolation of precipitation. Because of this, the aquifer is susceptible to damage from surface pollution and along with the Raritan-Magothy, will need to be protected if its greatest potential is to be realized in the future.

SURFACE WATER

The characteristics of the surface water in Salem County are primarily determined by three factors: topography, soil structure and precipitation. We have already examined the first two factors, while precipitation will be taken up in a later section.

For the most part, surface drainage is not a major problem. The vast quantities of coarse sand and gravel which cover so much of the county negate potential flooding problems which are characteristic of flat terrains. The sands here serve as large sponges, absorbing great quantities of water. Only when extremely heavy downpours occur in short periods of time, or when surface soils are frozen or saturated, will flash flooding take place.

The two exceptions to this general description are the area around Alloway and that land which borders the Delaware River. We have seen from the soil map that a rather large segment of land around Alloway consists primarily of clayey loam. The topography is so arranged that there are many perched water areas that remain wet the year around.

The other problem area is the long stretch of land running from Pennsville south through Lower Alloways Creek Township bordering the Delaware River. Here the water table is very high because of low elevation and the proximity of the river, resulting in large fresh and salt water marshes and meadows.

The direction of natural drainage in the central and western parts of the county is generally westward; in the eastern and southern sections water flows south. In all cases, the surface water flows to the Delaware River and Bay. Five major drainage basins exist wholly or partially within the county. Streams in the interior upland sections of the county are generally narrow and rather short. A large number of lakes have been formed by man-made dams either on the tributaries or on the major creeks themselves.

As the major creeks fall in elevation into the flatlands of western and southern Salem County they broaden abruptly and begin to meander rather sluggishly through the landscape. Finally they reach the river and bay estuaries with their high water tables and tidal ebb and flow resulting in large expanses of tidal marshes which characterize so much of the western and southern parts of the county. These marsh and meadow lands cover almost 35,000 acres or about sixteen percent of the county.

Numerous small creeks intertwine throughout the meadows, and in many cases, the actual channel of the major creek is indefinable. Because of the constant tidal inundation, land forms in the meadows slowly but surely change. Adjacent to the developed areas of Salem City and Pennsville, constant pumping is needed to maintain important dry land. Many sections of the meadows have been drained or diked for flood protection. Notable examples are Town Bank and Silver Lake.

Along the upland streams floodplains are not very wide, but as the streams broaden and begin to meander in the western and southern lowlands, the floodplains widen rapidly and become of major importance. While no systematic survey of the County's floodplains has ever been made, their general location is easy to pick out on aerial photographs as they are characterized by banks of trees and undergrowth along the creek banks. Finally, these floodplains become the large tidal plains of the Delaware River.

Today, floodplains are given very little attention because of the sparse development of the county. However, as urbanization continues and more and more of the moisture absorbing sands are paved

over and built upon, the chances of serious flooding will increase, and adequate protection of floodplains will become of paramount importance.

ECOSYSTEMS

The interdependence between wildlife and vegetation is so complex that the two must be treated as a whole. Wildlife of a given area is directly determined by the vegetation in that area – and the vegetation is dependent upon soil structure, which, we have seen, is the result of geology, topography and climate. A geographic area which supports a particular range of plant and animal species is called an ecosystem. Within these systems a balance between species has been achieved and competition between species occurs to an extent adequate for survival. In effect, a perfect cause and effect chain exists with every creature serving some community function. Superfluous species are either eliminated through the process of evolution or they interrupt the chain with harmful effects generally resulting.

Within Salem County there are many minor and several major ecosystems. One of the major groups is the woodland system. Originally, all of the upland portions of Salem County were entirely covered with a rather dense stand of forests. In the south-central and eastern sections of the county, the woodlands consisted of pitch pine, oak, chestnut and hickory, with Atlantic white cedar, red maple, black gum and sweet bay magnolia located along streams and in swamps. Throughout the western part of the County, the forest was predominately mixed hardwoods.

The great majority of woodland today consists of pine, pitch and short-leaved, and mixed oaks. While the quality of these strands has been reduced by repeated cuttings, these trees and their accompanying undergrowth support a great variety of wildlife. Along with commonly seen birds such as sparrows, blue jays, robins, etc., there are ruffed grouse, thrushes, vireos, scarlet tanagers and towhees. The most common animals are gray and red squirrels, gray foxes, white-tailed deer, and raccoons.

The meadows and marshlands provide the second important group of ecosystems in Salem County. These are the most unique lands in the area for vegetation and wildlife. While seven different types of wetlands have been identified in Salem County, two important sub-systems prevail; the coastal shallow fresh marshes such as the Mannington Meadow, and the salt meadows. In the fresh water meadows the soil is always waterlogged but supports reeds, big cordgrass, cattails, threesquares and maidencane. The salt meadows support cordgrass, saltgrass and threesquares.

Thousands of waterfowl use these areas in migration periods and many birds remain to nest. The Mannington Meadow is the most important habitat area in the State for king rail and Wilson's snipe. They also support black ducks, wood chucks, herons, shore birds, mink, muskrats and beavers. In addition to these more obvious types of wildlife are the extremely important micro-organisms which flourish in the tidal estuaries. These provide food for a great variety of shell and fin fish in the Delaware River and Bay. We are now just beginning to realize the dependence of commercial and recreational activities upon these life producing meadows. Other important ecosystems involve the lakes, streams and rivers, with their unique flora and fauna.

Finally it's important to note the drastic environmental changes that can be brought about by man's activities and improvements. Today's farms and open lands were once a part of the natural woodland ecosystems and would still be so, had the land not been cleared for agricultural pursuits.

The crops, shrubs, and grasses of these areas support animals which cannot live well in any other type of system. Birds; include quail, pheasants, meadowlarks, field sparrows and redwinged blackbirds; while such animals as cottontail rabbits, red foxes, woodchucks and even field mice are much in evidence. It's important also to recognize that man's impact on the delicate balances that exist within any of these systems is increasing at an accelerating pace as the population expands and his methods for altering natural conditions become more powerful.

CLIMATE

According to long term records kept at the Wilmington Airport, Salem County can be characterized as having a mild climate. In January, temperatures range from a low of 25 degrees to a high of 41-42 degrees. The average monthly temperature in January is 33 degrees. In July, the average monthly temperature is 76 degrees, ranging from a daily minimum of 65.8 degrees to a maximum of 86.2 degrees. On a yearly basis, the average temperature ranges from 44 degrees and 63 degrees. This, of course, is not to say that there are not extended periods of higher or lower temperatures. These temperatures do not appear to be extreme in either direction; however, humidity in this area can either make or break a day, and it is usually the latter which prevails. On a yearly basis, humidity at 1 a.m. is 80%. This falls only one percentage to 79 by 7 a.m. It drops to its low point of 55% at 1 p.m. and rises again to 68% at 7 p.m.

Those muggy summer days, which force so many people to take shelter in air conditioning, are generally caused by a relative humidity that ranges from 56% at 1 p.m. to a high of 87% at 1 a.m. These extremes occur mostly in the month of August. The very biting cold in the winter is also due to the high humidity; for example, the range in January is from 74% at 1 a.m. to a low of 61% at 7 p.m. In brief, the air which envelopes us is usually always saturated with a high percentage of water.

The normal total of precipitation for a year in Salem County is 44.56 inches. This ranges from a normal low in February of 2.95 inches to a high in August of 5.59 inches. This, too, is subject to extremes. One of the largest rainfalls witnessed in recent decades occurred in July of 1952, when 6.24 inches of rain fell in twenty-four hours. We have a mean total of 23 inches of snow and sleet a year, with the largest amount occurring in January with a mean total of 6.4 inches. Snow and sleet are usually confined to the months of November through March, although on rare occasions snow has fallen as late as April and occasionally a small trace in October. In 1966, 17.2 inches of snow covered Salem County in January, while in December of the same year another 21.5 inches fell. The largest twenty-four hour snowfall in recent history occurred in March of 1958 when 15.6 inches of snow covered the ground.

Winds in Salem County generally come from two different directions. In the winter, the prevailing direction is from the northwest or the west-northwest, while in the summer this shifts to southerly direction. The mean hourly speed for the entire year is 8.9 miles per hour. March definitely is the windy month with a mean hourly speed of 11.2 miles per hour and the lowest mean hourly speed only 7.3 miles per hour, this coming from the south.

On the yearly average, Salem County has more cloudy and partly cloudy days than it has clear ones. 159 days out of the year, or almost half of the year, is cloudy, another 110 days are partly cloudy, and only 96 days out of the year are clear. 117 days out of the year have some precipitation. Snow or sleet of one inch or more occurs only six days out of the year. Thirty days out of every year have

one or more thunderstorms, and 41 days have heavy fog. In summary, the climate of the Salem County area is characterized by a relatively moderate range of temperatures, exceptionally high humidity, mild winters and a generally dependable and sufficient rainfall.

3. THE SOCIAL ENVIRONMENT

Geologic formations, soils, water, plants, animals, climate – these are the physical environment. All are interconnected, dependent upon one another. In short, these factors constitute one large ecosystem. But the ecosystem we have defined it is incomplete; the major element has been left out. Only two of the components of evolution are operative within the system which has been described, chance and environment. The third component, choice, enters the system in the form of man.

We have studied the nature of nature, but the nature of man is more elusive. Indeed, it is presumptuous to assume in a work such as this that we can study the nature of man. Yet, we cannot legitimately or realistically plan for the future of man without knowing something about his nature. Because man is such a powerful element within the total ecosystem we must make an attempt to understand his relationship and interdependence with the physical environment.

Whether man is different from other animals has been the subject of debate from the dawn of civilization. Every conceivable argument, pro and con, has been put forth from Aristotle to Freud. We cannot resolve this debate. However, the very fact that human beings can debate their own essence seems to indicate that man is different in some way from other living beings.

Human groups live in social systems. They use tools to create new environments and alter old ones. But this is not specific to man; social systems are common to many animals. Ants live in sophisticated colonies and chickens have elaborate pecking orders. And, more than one species of animal has mastered the use of crude tools. The major difference seems to be that human beings have the ability for rational thinking, which in turn produces the power to choose. Concomitantly, if choice is to be rational and meaningful, not simply the instinctual or rote learning of other animals, man must have a basis for his choice.

The basis for rational choice lies in time. Man is the only living creature in which time has a conceptual meaning. We have a known past and predictable future. It is because of these temporal elements providing us with information that we can choose among alternatives. This need for information is a primary motivating source for the creation of social systems, culture, religions, art and science.

Physically, man is not well adapted to any environment. Indeed, we would lose in the competition of nature if it were not for our ability to think, which has produced our social systems. From this unique survival mechanism man has produced a multitude of ways of dealing with his environment. They are manifested in cultural traditions such as history, language, art, economics, government, and education.

It would seem that this phenomenal power possessed by human beings would eliminate the chance and environmental factors. Indeed, the industrial and technological revolutions of western civilizations seem to have come close to doing just that. But this idea is a negation of the universal laws of evolution. We are irrevocably a part of a greater ecosystem. We interact with the

environment in untold thousands of ways. While it would be impossible to list and understand all of these interactions, major ones can and must be identified.

A study of the social environment will reveal many of these ways. History is our greatest and most underused teacher. The history of Salem County is an excellent source of understanding man and nature relationships. To a great extent, the way our ancestors treated the land has produced the way we live today. And even more important, the decisions and actions of today will shape our future. Therefore, it is time that we look at society – past and present – in Salem County so that we may complete this limited understanding of our ecosystem and then make our decisions for tomorrow.

The history of Salem County can be interpreted as a story of man and environment. When Fenwick's colonists arrived here in 1675 all land but the tidal marshes was covered with woodland. The most important thing they brought with them was the knowledge gained from traditional English society. Their first decision was to find a suitable place to settle, and to make that decision they turned to the land. Salem was chosen no doubt because of its flat land, its nearness to the Delaware River, and the confluence with that river of the Salem River, and because of the relatively protected harbor.

Immediately the old ecosystem of woodland and Indian began to give way to a new man-land relationship. Woodland began to be cleared in favor of agricultural pursuits, and it was soon found that the richness of the land was capable of growing a varied abundance of crops. As a corollary to agriculture, mills were established along the many creeks in the area, and the tide was put to work as the driving force of several of them. Since livestock was also directly associated with agriculture, tanning became an early specialization.

The other major industry of early Salem County was also land oriented. Because of the great strands of timber, lumbering became an important activity. Large tracts of woodland were felled around Alloway and in the Pittsgroves. Lumber mills were established at what is now Parvins Park, Elmer, Avis Mill, Sharptown and Alloway – all located on major creeks which were used to float the logs to the mill.

Timber was in demand for a variety of needs. Tanning required a large amount of wood, as did the everyday making of farm implements and in-town houses. The important oak strands provided wood for shipbuilding which flourished at one time or another in Quinton, Alloway, Sharptown, Auburn and Penns Grove.

The meadows too were utilized to a great extent. Salt hay farming was carried on for years on the Mannington Meadow and in the marshes of Elsinboro and Lower Alloways Creek. The drier parts of the meadows were also used for cattle grazing. In fact, farms which included meadow lands were much more prized than those without them.

The quality of the soil was directly responsible for one of the historically most important industries in the County. The quality and quantity of sand available for making glassware was put to great use at Wistarburg. Founded by Caspar Wistar in 1738, the glass plant became the largest of its kind in the American Colonies. It has been estimated that over one thousand people worked at the plant near Alloway and that workers from Wistarburg were the chief founders of the glass plants that sprang up throughout South Jersey.

Originally these pursuits were linked together physically by water transportation. Practically every early settlement in Salem County was situated on a major creek. Most of these creeks were navigable much further inland than they are today. Trade was carried on as far upstream as Auburn on Oldmans Creek, Alloway on Alloways Creek, Sharptown on the Salem River, and Canton on Stowe Creek. Many of the existing colonial houses in Salem County face the creeks which were at that time the sole arteries of transportation.

In 1681 work began on the first major highway which would connect Salem with Burlington, the two major centers of Western New Jersey. After this, roads began to radiate from Salem City to Quinton, Alloway, Hancock's Bridge, Greenwich and Pennsville.

While we have little concrete evidence of social attitudes about the Salem colony, we are safe in assuming that it was not much different from the rest of the American Colonial society. Major social events centered around agricultural fairs, mills, and taverns. The society was relatively self-sufficient and industrious. Indeed existence required diligence. That a thriving society existed here is evidenced by Salem's becoming an official port of entry in 1682 and remaining so for seventy-five years. Animal pelts, cedar posts, shingles, bolts, staves, wheat, corn, beef, pork, tallow, glass and ships were among the traded goods.

In 1676, the proprietors of West Jersey issued a governmental document containing various "concessions and agreements." Basically this remarkable document gave the inhabitants of the Province the right of self-government. The County of Salem was created by the General Free Assembly in 1682. At that time Salem County consisted of present-day Gloucester, Salem, Cumberland, Cape May and Atlantic Counties. However, by 1748 Salem had been reduced to today's boundaries.

The existence of an abundant supply of food was the major cause of the County's participation in the Revolutionary War. The search for food for the Colonial Army at Valley Forge brought a foraging party to this area, quickly followed by the British. The clashes between these small groups at Quinton's and Hancock's Bridges were the extent of battle for Salem County, and the countryside soon returned to its rural pursuits.

The end of the Revolutionary War, the coming of independence, and the establishing of a stable federal government might have been expected to herald a fruitful, serene era of Salem County. Unfortunately, this was not the case. The land began to show the effects of 150 years of intense agricultural use. The soil began to give out because of little or no conservation knowledge and practice. Extreme weather conditions consisting of little rain and cold temperatures compounded the problems. During the early decades of the 1800's many farmers packed their belongings and moved westward.

Agriculture was in a depressed stage until the discovery of marl in the 1830's in Pilesgrove Township. This local marl contained lime and potash and served as an excellent fertilizer. Around the same time, the tomato was found to be an extremely rewarding crop. As a result, the agricultural economy began an upswing. Farms became larger and more specialized. Agricultural societies were formed and farmers' pairs were re-introduced. Roads were improved, canals built, the economy flourished and the Civil War left its mark at Finns Point and Fort Delaware.

With the end of the Civil War, major economic forces were at work which would change the course of history for Salem County. In 1863 the railroad reached Salem City. While large areas of the county continued to be farmed, a broader economic base was introduced in the form of relatively large-scale, permanent industries. However, industrialization during the late nineteenth century did not harm agricultures. The improved transportation facilities, roads and railroads, made it easier to send Salem County crops to the increasingly urbanized eastern seaboard. Local farmers found it advantageous to grow a narrower range of crops. At the same time, they were able to clear and farm more acres of land through the use of better farm machinery.

Glass making again became an important part of the economy. Salem Glass works, founded in 1862, became one of the largest hollow glassware makers in the world. Gayner Glass was begun in 1874, and from 1863 to 1908 Quinton boomed as its glassworks turned out some of the finest French plate glass in the nation.

In 1890, DuPont bought land at Carneys Point and announced plans to manufacture smokeless gunpowder. During world War I, more than 25,000 men came to the Penns Grove area to help produce huge quantities of gun powder. After the war, the facility switched to chemicals, and together with the DuPont Chambers Works, it grew into one of the largest chemical plant complexes in the world. Along with these plants, vegetable processing began in earnest, taking advantage of the nearness of its raw materials.

Actually, a surprisingly small number of people had effected this vast change in the direction of Salem County. Census figures show a county population of 11,371 in 1800. In the next sixty years, the number of people doubled. Although the period between 1860 and 1900 was one of great industrial growth, the population growth rate actually slowed. During that forty year period the total population increased by only 3,072 people. It may be assumed that as more people were released from farms by mechanization, they filled the newly created manufacturing jobs. Thus, the influx of people; it merely caused a realignment of the existing population.

With one exception population growth in Salem County has been slow but steady in the twentieth century. In 1900 the county boasted a population of 25,530. Ten years later, the population had reached 26,999 an increase of only 5.8%. The decade from 1910 to 1920 saw what could be considered a virtual population explosion. The 35.5% increase reflected the war production of the DuPont plants. We have already seen that some 25,000 people were employed making gunpowder. After the war, many of these workers left the county; however, the 1920 census recorded a remaining population of 36,572.

From 1920 to 1960, the population grew, but at a fairly slow pace. Per decade growth from 1920 to 1930 was minimal, .7%; from 1930 to 1940, 14.8%; 1940 to 1950, 17.1%; and from 1950 to 1960, 18.6%; producing a total population in 1960 of 58,711. The fact that during each decade the percent increase was greater than the previous one indicates a relatively constant birth and death rate, and a slowly increasing migration rate. It also indicates this county's somewhat unique geographic position within the east coast megalopolis.

This band of cities stretching from Boston to Washington has grown to the largest, most densely populated urban area in the world. Yet this tremendous growth has, until recently bypassed Salem County. This can be attributed to the county's location with respect to the Delaware River. The major land route, originally US Route One, circumvented Salem County by way of Baltimore,

Wilmington, Philadelphia and Trenton. Until 1953 there was no convenient river crossing on the Delaware until one reached Philadelphia. Since urban development usually follows transportation arteries, high density growth took place on the opposite side of the river. The flight to the suburbs began with the automobile and was accelerated after World War II by low interest, government sponsored mortgage insurance programs. It followed the path of least resistance. In South Jersey this meant a spilling of homes and traffic across the river into Camden County.

The lack of population growth so far in Salem County has not meant that we have been isolated from the burgeoning influences of megalopolis. Rural Salem County has profited from its surrounding city neighbors. There has been a constant demand for the tons of fresh food produced on the farms of the area. Many of the agricultural traditions of Salem County have been perpetuated by the proximity of ready markets for vegetables, milk and meat. Conversely, we have felt the unpleasant effects of this urban leviathan. The Delaware River has been polluted, the air has been fouled, prices and taxes have risen in a direct response to the cost of goods and services produced in nearby cities.

From 1950 to 1960, Gloucester County increased its population by 47 percent; and recent estimates place the 1960 to 1970 growth rate at close to 60 percent. This represents a population increase in Gloucester County of almost 80,000 people from 1950 to 1969. Similarly, New Castle County has grown from a 1950 population of 218,879 to an estimated 1970 population of 410,000 people, an increase of just less than 100%. Population growth to the east is only slightly less rapid. The urban complex of Vineland-Bridgeton-Millville has more than doubled its population in the last twenty years; the combined estimate for 1969 is almost 100,000 people.

On all sides of Salem County the population is expanding; in certain areas at an alarming rate. The county, however, has not been static during the sixties. Important events have taken place which can be seen as significant indicators of the future. The Delaware Memorial Bridge has doubled its capacity, a new bridge is under construction at Chester-Bridgeport and a third major crossing downriver is in the active planning stage; Interstate 295 through Salem County has been completed; a huge nuclear generating plant is under construction at Artificial Island; B.F. Goodrich is building a multi-million dollar plastics plant in Oldmans Township.

Moreover, taxes have soared; schools have become obsolete; not only the Delaware River, but Salem River and Alloways Creek are being polluted; highways are overcrowded; welfare cases have skyrocketed; racial tensions have flared, valuable farmland is being eaten by housing developments; crime has increased out of proportion; the land is being misused.

Salem County can no longer be considered the idyllic rural community it once was. Today it faces all of the problems of twentieth century American life. However, its history has given it an advantage. We are at a turning point, one which will irrevocably shape our future. But, we cannot maintain the valued qualities of the past if we do not carefully plan for the future. Remember in 1810 when the soil gave out. Wrong decisions today could not only destroy the soil, but indeed the entire environment – social and physical.

POPULATION

An understanding of the population characteristics of Salem County is essential, for it is the people who must be accommodated within the environment. Information concerning the composition of

the population is necessary to planning for future needs. Since the size and overall growth has already been reviewed in the previous section, it need not be reconsidered here. However, characteristics of the population that have determined recent growth should be reviewed, as they will be essential to the projection of the future population.

Since so many socio-economic factors are directly or indirectly related to age, we shall first examine this important element of population composition. For most analytical observations, the population can be divided into three major groups: the dependent children, the active population, and the dependent aged, as shown in the graph. In many sources, the first group includes children aged fourteen and under. However, since the vast majority of children are dependent upon their parents through high school, we shall consider dependent children as being nineteen years old and under. The active population is considered to range from the ages twenty through 64, and the dependent aged as over 65.

In 1960, dependent children comprised 38.9% of this county's population. This group not only continues to grow in number, but also in proportion, rising steadily from 33.6% in 1940 to 34.9% in 1950 to today's estimated 40 percent. It continues to grow even though the fertility rate has dropped during the mid-sixties due to family planning. This is so because the large number of children born following the second world war are now coming into the child bearing age, and the sheer size of this group producing new children more than outweighs the decline in the fertility rate. The other dependent group, those sixty-five and older also continues to grow because of the reduced mortality rate in the aged and infant groups. That is, the age of death is becoming older, and lessened infant mortality means that more children survive to become older citizens. The dependent aged have increased from 7.1% of this county's population in 1930 to 8.3% in 1960.

The largest of the three groups is the active population age 20 through 64. As is obvious, the active population in Salem County is decreasing proportionately to the increase in the dependent groups; 59.2% in 1940, 57.4% in 1950, 52.8% in 1960. This demographic change is brought into sharper focus by a dependency ratio, defined as the number of dependent children and aged per 100 persons in the active population. The index has risen steadily since 1940 when it was 68.91. In 1960, the dependency ratio was 89.39. In other words the production activities of each 100 people in the active population supports roughly 89 dependent people. This dependency ratio would be considerably higher if we eliminated all those in the 20 to 64 year population who are not economically active such as housewives, college students, the unemployed and those on welfare.

The implications of these demographic changes have been clear. Since both dependent groups have grown, the active population supports more and more people. Additional facilities and services for the aged have been required, as well as more schools for the children and new housing for families with children.

Another major factor in the composition of the population is the sex ratio. The number of single males and females is of particular importance with respect to marriage formations and childbirth. The ratio of single males to single females of marriageable age in 1960 was 147.2 compared to a national ratio of 123.4. This clearly indicates that a sizable number of single females is migrating from the county. This trend could be a result of lack of opportunity for females in the county's male oriented industrial and agricultural economy. The loss of single females is reflected in the marriage rate, which has been consistently lower than the national average. The male oriented situation of

the county is further reflected in the overall 1960 sex ratio of 101.9 compared to a national ratio of 97.1.

The amount of education is also an important index in population composition. The educational attainment of the population 25 years or over is used since in most cases formal education is completed by this age. In 1960, median school years completed for Salem County was 10.0 years. In other words, in that year over half the 25 year old and over population had not completed high school. This was the lowest median of the four geographical areas compared, Salem County, the Wilmington Metropolitan Area, New Jersey and the United States. This rather low level of education is reflected in the accompanying graph which shows this county as being higher than the state in the lower years of completion and lower in the more advanced years.

This low educational attainment can generally be attributed to the state of the economy. Both major segments of the county's economy, agriculture and heavy industrial manufacturing have traditionally not depended on education. Initially, the agricultural segment placed more emphasis upon actual manpower than upon education. We have seen earlier that the age-sex characteristics of the population did not appreciably change when industry became a dominant element. This was also true of educational requirements. Most of the industries of Salem County provided employment in which the employee could more easily receive on-job training rather than in-school training. Moreover, the male oriented economy provided little incentive for educational attainment among women. The seasonal nature of agriculture and related food processing, coupled with the lack of real necessity for education in the manufacturing industry have been major contributors to the large dropout rate still existent in Salem County.

More recently, the needs of both agriculture and industry have advanced to the degree where a high school diploma is usually mandatory. This change is reflected in the education graph by Salem County's high percentage having completed high school. However, a relatively slow increase in demand for individuals with higher education, keeps down the number of county residents with more than high school education. Yet, the number of county high school graduates going on to college, technical, or business schools has increased from 28.5% in 1954 to 52.3% in 1967. A large proportion of these young people have, therefore, been forced to leave the county for job opportunities.

The three components of population change are deaths, births, and net migration. As previously noted, Salem County has followed the national trend of gradual decline in infant mortality and annual probabilities of death. With a slowly increasing proportion of aged in the population, Salem County's yearly death rate has remained near 10 persons per 1,000 total population since the 1950's. The number of births in the county in a year fluctuates as the number of women of child-bearing age changes, subject to an overall trend of slight decreases due to family planning. During the years from 1950 to 1960, the rate of births per 1,000 total population varied around 23. Thus, natural increase, the excess of births over deaths, was 7,197 or 14.5% for the 1950-1959 decade.

The third component of population growth, net migration, is not a result of steady influences and stable rates as are births and deaths. In addition, there is a wide variation between areas in net migration, so that special attention to this characteristic of the population is necessary. From 1950-1959, net migration was 2,006 or a 4.1% increase over the 1950 population. This increase is significantly less than the state percentage of 12.2 and accounts for Salem County's low growth compared to neighboring counties. It has been noted that this county's slow past growth was due

primarily to its location in and transportation connections with the east coast megalopolis. However, net migration is significantly influenced by a complex of variables also including opportunities for employment, living conditions, leisure time attractions, and availability of services. The low net migration of Salem County shows that it has compared poorly in some of these areas also.

LAND USE

Land use is the particular function that a specific area of land is fulfilling. These functions have been categorized and grouped into the broad associations of developed land (all land to which man has added his improvements) and undeveloped land (open land which is yet susceptible to man-made improvements).

In Salem County, 8 percent of the total land area is developed, while 92 percent is undeveloped. This means that there are almost 3-1/2 acres of unused land for every person in the County, an unusual fact when we consider that Salem County is located nearly at the mid-point of the Boston-Washington Megalopolis and also in the most urbanized state in the United States.

When only developed land is considered, the average residential density is 2-1/2 families per acre, or 14-1/2 acres per 100 persons, throughout the County, assuming an average family size of 3.4 persons. This density ranges from less than 2 families per acre in the more rural parts of the County to more than 3 families per acre in the more urbanized areas. Business and commercial uses occupy 1-3/4 acres per 100 persons, as a county-wide average. In more urban areas, this number tends to drop, as these uses require proportionally less land area.

Industrial uses account for approximately 2-1/4 acres per 100 persons, while public uses require 3-1/4 per 100 persons. There is more land devoted to roads and streets, the final category of developed land, than there is public uses – almost 3-3/4 acres per 100 persons.

Salem County's largest land user is agriculture – classed as undeveloped land. As can be seen on the earlier land use map, this land forms a horseshoe shape across the center of the County. Because of the good soil conditions, gentle slopes, and good drainage, this land is also excellent for development, and, if proper safeguards are not instituted, will be among the first to disappear under the onslaught of streets and houses.

Among developed land uses, residential of course is the largest, accounting for 57.1%, practically all of which is devoted to low density single family housing. The second largest user of developed land in the county is streets and roads, accounting for 14% of the total developed land area. The more heavily populated western section of the County uses its roads more efficiently, requiring less than 9% of its developed land. In the eastern part of the County, however, more than 21% of the developed land is used for streets and roads. In relating this to population, the urbanized areas show a low of about 1.76 acres of roads per 100 persons, while in the rural areas, 7.28 acres of roads exist for every 100 person.

The higher proportion of roads to people leads to a costly maintenance situation. Currently, more than \$700,000 is spent annually in Salem County on its road system. Although many of these roads are used for the vital process of moving goods to and from farms and factories and thus must be maintained, they do constitute an expensive maintenance problem and also pose the additional

planning challenges of transforming many of them into suitable future arterials and protecting them from unnecessary congestion resulting from poor land use regulation.

While it is evident that the per capita cost of maintaining the county road system in the more urban areas of the County is lower, and that even here there are many county road sections under used; it is also evident that it is in the western urbanized area where aggravated spots of congestion are first appearing. Speed is slowed, on-street parking is a hindrance, and the mixed uses of through automobile and truck traffic and local traffic all combine to create congestion and delay. So far, a majority of the overloaded road sections involve state highways, but several county roads and intersections are nearing the point where expensive reconstruction will be required. Presently almost all of US 130 is above the satisfactory traffic capacity standard as are several sections of Route 49, especially within the urbanized areas of Pennsville and Salem, portions of Route 40 in Woodstown and Elmer, the section of Route 48 lying within Penns Grove, and the section of Route 45 lying within Salem City.

The lack of public transportation in Salem County has caused the number of automobiles to rise much faster than the population might suggest. Presently we have relatively less convenient public transportation in Salem than existed in the heyday of the railroads and for that matter, even in the days of the steamboat and horse-drawn carriage.

ECONOMY

The economy of Salem County is basically bilateral – a combination of industry and agriculture. When the Census of Industry was taken in 1963, manufacturing employed a total of 11,540 people, or almost 50% of the total labor force. Of these, 68% were employed by the manufacturers of chemicals and allied products, 15% were employed by the glass industry, and the remaining 17% are divided among food processing, apparel manufacture, and a variety of small industries.

The number of industries in the County remained relatively constant in the period from 1947 to 1963, growing from 48 in 1947 to 59 in 1963. While industry forms an integral part of the process of urbanization (witness the highly developed western edge of the County) there are several factors that work to disrupt the orderly development of residential and industrial uses side by side and at the same pace. DuPont got its start on the east side of the river as a gun powder facility, precisely because the location was then remote and undeveloped, just as we have recently witnessed the establishment of the nuclear generator at Artificial Island. Since its establishment, the gun powder aspect of the DuPont operation has withered and it has been transformed into the County's highest paying, and more widely diversified industrial complex. When urbanization occurs in the reverse order (especially under the New Jersey property tax system), i.e., dwellings coming first in large numbers, it is extremely difficult if not impossible to interest industrial uses in locating in the area, simply because of inflated tax rates.

Although the number of manufacturing establishments in Salem County is lower than the surrounding counties, the annual wage is much higher. In 1963, the average annual manufacturing wage was \$7,180.00, almost \$1,000 higher than Gloucester County, and nearly \$3,400 higher than the State average and needless to it is much higher than this today.

The computation of the "value added" to finish manufacturing products gives a measure of the volume of manufacturing activity. It is derived by subtracting the cost of the material produced

from the value received for the products manufactured and shipped. After other slight corrections have been made, the value added figure is obtained. Salem County has consistently led the region in value added by manufacture, growing from \$85.6 million in 1947 to \$190 million in 1963, an increase of 121%.

The other major element of the economy of Salem County is agriculture. It occupies over 50% of the total land area of the County and was responsible in 1964 for the sale of \$16.1 million of farm products which is additionally responsible for generating a portion of the "value added" in manufacturing described above. The average price for farms in Salem County, established by the current market value at the time of the census, is \$45,372. This is well below the State average but on a par with the rest of South Jersey. As urbanization and sub-urbanization continue to increase, and land comes to be more in demand, this price can be expected to rise. The average size of farms has risen from 102.3 acres in 1959 to 138.5 acres in 1964. The total number of farms decreased from 1959 to 1964 with the total number in 1964 being 796 farms.

An examination of industrial construction in the period from 1958 to 1964 shows that almost \$14 million was spent in Salem County. However, during this period only eleven new industries were started. This then indicates that although there was not much activity with regard to new industry, the existing industries were very healthy and were expanding at a quite rapid rate.

Important changes have taken place in agriculture relatively recently. Mechanization has become increasingly prevalent, and consequently the number of hired hands and migrants has decreased. Even in the short period from 1964 to 1967 the number of workers dropped from 3,731 to 2,860. Also, the irrigation of approximately 30% of the land in agricultural use helped to free the farmer from his dependence on rainfall alone for water. As pointed out in an earlier section, there is evidence that many of those workers replaced by farm machines have found their way into the County's industrial payroll.

The most drastic change, however, has taken place in the crops themselves. Vegetable, horticultural and forest products have increased in production while field crops and fruits have declined. Poultry and poultry products have also declined, while dairy products have remained relatively stable.

Another important part of Salem County's economic structure is its commercial services. In 1963, retail sales totaled \$74 million. More than 25% of this was food stuffs, while the sale of new cars and trucks accounted for 23.3%, or \$17.26 million. In order of decreasing sales, gasoline service stations, eating and drinking establishments, lumber and building materials, furniture and home appliances, apparel and accessories, general merchandise, drug stores and other sales made up the remaining 51.5% of the retail sales in the County. These figures indicate that central business and regional shopping needs for many Salem County residents are being filled by Wilmington. In 1963, the wholesale trade was responsible for the sale of \$19.86 million. The accompanying bar graph pictures the relative volumes of the various components of the economy. While these figures do not represent the relative worth of the particular activities to the County, they do present comparative dollar volumes.

The selective service groups in Salem County have showed a decline in the number of establishments, but a rise in total receipts. In this group, the receipts in 1963 for hotels, etc., was \$364,000, for personal services \$1,336,000, for miscellaneous business service \$480,000, auto repair

services \$953,000, miscellaneous repair services \$218,000 and amusements and recreation \$843,000 for a total of \$4,194,000.

Another measurement of the economic activity of an area is through the volume and growth of bank deposits. In Salem County, the increase from 1950 to 1960 went from \$35.36 million to \$46.29 million, or an increase of 30.9%. In 1964, the total deposits rose to \$57.55 million for an increase from 1960 of 23.8%.

GOVERNMENT

Following British practice, American colonists tended to think of the county as part of central government. This continuing view of the county as a mere arm of state government had a depressing effect on the progress of county government throughout the 1800's, and has continued to stand in the way of county government structural reform in the present century. Another significant trend of the early 1800's further weakened county government structure. This was the establishment of many independently elected officials by state constitutions and laws, which tended to weaken the power of the county governing board.

Since World War I, there has been a significant change in the nature of county government and the demands make upon it. Most notable has been the growth in the number of new services in which the county participates, not as an administrative arm of the state, but as an independent and regional form of local government. These service activities have included recreation and open space programs, county libraries, airports, hospitals, health services, utilities systems, mosquito control activities, solid waste disposal projects, traffic safety programs, county-wide planning and others. As a practical matter, county government has gradually changed from the status of a quasi-municipal corporation as it was in the colonial times to one more nearly resembling a municipal corporation having independent authority to act in those areas for which enabling acts have been passed by state government.

Changes in the organizational structure of counties have come about more slowly than changes in functions. A recent National Association of County Officials (N.A.C.O.) research foundation survey disclosed that 13 states have authorized some kind of home rule authority for counties within their boundaries. Among our neighbors, Delaware, Maryland, Virginia, and New York have made either general or special grants of power to their counties that consist of, or approximate, home rule charter powers. So far there are a total of 36 home rule counties, and practically all of them provide for an elected executive, or appointed administrative officer, or both.

From the lists of states offering county home rule organizational reform, New Jersey is notably absent. New Jersey counties still operate generally under the same organizational structure arranged for them several centuries ago: a structure that has no single strong executive; that requires many functions to be funded by the County, but over which it has no control; that includes many independently elected or state appointed officials; and that normally includes a welter of autonomous or semi-autonomous boards, commissions, and authorities.

But there is a light on the horizon: since 1966 the New Jersey County and Municipal Government Study Commission has been reviewing the weaknesses and exploring possible reforms for New Jersey County government. The commission found that a county must have broad legislative powers if it is to respond to local needs. By the same token, its leaders and citizens should be free

to adopt the structure which is best suited to the county's special needs. In effect, the commission proposes that New Jersey counties be provided with a similar degree of self determination concerning the form of their county government, as has long been afforded municipalities in New Jersey under the Falkner Act, as well as the counties of many other rapidly growing states.

Salem County, along with other New Jersey counties, is becoming big business – it had an operational budget for 1968 of 4-1/4 million dollars and employed about 350 persons – but it is run quite differently from modern private corporations, in that policy making and administrative functions are not separated. Its effectiveness also suffers greatly due to the array of state mandated programs over which the Board of Freeholders has little management control; the large number of independent, state appointed officials; the number of quasi-independent, elected department heads; and a sizable number of autonomous boards and commissions.

A close perusal of the organizational chart of Salem County's government will demonstrate the complex nature of our county government organization. The chart depicts several of the organizational short-comings described above.

The most important agency of county government, the Board of Chosen Freeholders, has been legislative and administrative responsibilities. Through the adoption of resolutions (and ordinances, the case of providing for bond issues), the Board of Freeholders may take various forms of action. The board can create new county agencies that are authorized by state legislation, and it may regulate them to some extent through appointments of board members and through annual budget appropriations, the activities and policies of such agencies. The board may also adopt certain regulatory measures; is empowered to issue bonds up to a state imposed debt limit; it may purchase land for various construction and open space purposes; and it may construct a wide variety of public improvements. Probably the most important legislative function of the Board of Freeholders is the adoption of the annual county budget. Through this instrument, the Board of Freeholders has probably its most important means of exercising recurring control over departmental activities.

An accompanying table provides a picture of present day space and personnel needed to carry on the various functions now provided by the county. In a later section, these existing requirements are placed side by side with projected future needs in order to determine county governmental departmental growth that may be expected over the planning period.

The fact that Salem County has just completed a new court house has enabled many of its departments to be gathered together for the first time. It has also placed Salem County in a much better position with respect to existing space requirements than most of its neighboring counties.

The principal source of revenue for Salem County, as for other New Jersey Counties (accounting for slightly more than 75% of all county revenues since 1958) is the property tax. Salem County is substantially less dependent on revenue sources other than property tax than are all other Southern New Jersey counties.

The total of assessed real estate and personal property in Salem County was just less than 384 million dollars. This ranks well below the total taxable assessed valuation in other Southern New Jersey counties.

The more urbanized counties collect a much larger percentage of the total tax resource and keep it for use at the local level than do rural counties. Also, as a general rule, the more densely populated an area becomes, the greater proportion of its revenues will need to be used for municipal services. Salem County ranks fifth in the state with respect to the percentage of its local tax revenues it is willing to spend on education. The percentage of local revenue sources which must be spent at the county level depends heavily on highway, welfare, and court expenses (all of which have low efficiency co-efficients due to their low density service areas) and thus rank all southern counties near the top of the list.

4. PROJECTIONS

The preceding chapters have described the major elements of our environment, both physical and social. And a point so obvious that it could easily be overlooked is that all of these investigations are concerned with an environment oriented towards the needs and demands of man. When we speak of land use, we speak in terms of the use of land by man, open space in terms of open space for man, and natural features and land capabilities in terms of what the natural environment can provide for man.

Thus all elements of planning concern the choices made to determine how the resources of the environment will be best used to support man. The task with which we are faced is that of determining how we can plan, develop and enhance the use and adaptability of our resources to achieve the greatest satisfaction of our present and future needs and desires. But our choices are becoming more limited. This is so because we are finally learning that physical resources are not endless; that man cannot continue to act with complete disregard of natural laws and processes and that the costs of society's housekeeping cannot be put off indefinitely.

Because the job of providing for our future requirements will become more difficult and exacting, it will be necessary to constantly improve our planning technique, an important part of which is to forecast as accurately as possible what the magnitude and character of the future population will be.

Thus the need for projections is evident. For if we determine that there are going to be sizable population increases we can then begin to think about where it is desirable to locate the new families and zone accordingly. We can estimate the extent of added transportation needs and delineate future road locations. By knowing in advance what areas will be required for urbanization we can take measures to protect valuable open space areas that would otherwise be swallowed by development. And we can determine in advance what public services will be required, where they should be located and what steps will be required to finance them.

Finally it is essential to forecast, since the needs and problems of an expanding population do not increase proportional to the growth of the population, they increase at an accelerating rate. It becomes more costly, in terms of resources demanded or required, to support each additional person. As a result we do not depend on our projections for numbers alone but as means of determining the magnitude of problems and needs as well as special requirements that will result from unusual population characteristics or composition.

There are several methods of projecting populations, the accuracy or reliability of each varying according to the setting in which they are applied, the validity of assumptions made to establish constants, and the techniques and attitudes of the individual who makes the projections. Despite the limited efficiency of the methods available, the resulting data can be most helpful in establishing future goals and policies by recognizing future needs.

A series of four population projections are illustrated at the left. They were developed by the use of the cohort-survival method, a method which involves an analysis of the entire population by five year age groups with a series of birth, death and migration rate constants which apply to each group. They were based on national projections done by the Bureau of the Census. Birth and death rates were adjusted by using the actual rates for Salem County for the years 1959, 1960, and 1961, while the net migration Rate was based upon projections for the Wilmington Standard Metropolitan Statistical Area and designated Salem County Enclave which included Penns Grove, Upper Penns Neck and Pennsville. The net migration rate for the decades 1950 to 1959 and 1960 to 1969 was calculated as 4.1% per decade while for the decades 1970 to 1979 and 1980 to 1989 it was assumed to be 8.2% per decade. Of the four projections, Series B was chosen as being most realistic, based on research by the County Planning Board and by comparison with projections done by other agencies.

Since birth, death and migration rates are the sole basis for making projections, a brief review of the problems involved in deterring each can lend some explanation to the validity of the projections. Birth rates, determined in terms of births per thousand females of child-bearing age, have generally remained constant, though a decreasing trend presently exists and is expected to continue. They have only been drastically influenced during times of extreme economic depression and to lesser degrees in war and post-war periods when there is absence or return of large numbers of husbands and fathers. The general decline in the last 20 years has resulted from the improvement of methods of birth control and a greater dissemination of educational information regarding these developments. Another factor is increasing prosperity. Historically, families with larger incomes have been smaller in size. Undoubtedly, a growing awareness of the rapidly expanding population and its demands and effects on the limited resources of our environment have encouraged many families to limit their size.

Death rates have generally been just as consistent and similarly there has been a declining trend which can be expected to continue with improved medical technology. Because of the consistency of these two factors, methods of projecting net population changes resulting from births and deaths have been found extremely reliable.

On the other hand, it is much more difficult to determine constants of migration. Particularly in a region as relatively undeveloped as Salem County, where the appearance of one new industry can be felt by the entire economy, migration rates go through extreme fluctuations. It is quite difficult, therefore, to establish a migration rate for coming decades, and since immigration can have an overwhelming effect on population growth as a whole, the reliability and validity of all methods of projection are greatly weakened.

By viewing the population in five year age groups, it is possible to observe past trends and future direction. For example, by knowing the size of the 10 to 14 year and 15 to 19 year female age groups it is possible to make an accurate estimation of the addition they will make to the total number of child-bearing females in the ensuing decade. Thus in turn accurate projections of population growth can be determined by applying birth rates which have been found extremely reliable. The illustration at the left represents such a breakdown and illustrates the projected distribution throughout the various age groups. In the 1960 distribution, an indentation of the graph appears at the 20 to 24 and 25 to 29 year age group. It can be explained by noting that this segment of the population is that which was born in the depression years of the 1930's. This indentation occurs since the preceding and following periods birth rates were higher. Directly below

this is an increase in the 15 to 19 year age group of the war years and then an extremely large increase due to the post-war "baby boom".

It was mentioned that birth rates were decreasing and would continue to decrease, but this fact is no reason for relaxed concern over the probable population explosion. The decrease of birth rates is in terms of births per thousand females of child-bearing age. Should this segment of the population remain constant in absolute terms, perhaps the rate of population growth would also decrease or remain constant. But this is not the case. As the great number of females born in the post-war years are now reaching child-bearing age, the child-bearing segment of the population is experiencing tremendous growth, which is expected to result in a massive overall expansion of the entire population and the number of young children in the population. In short range terms this means a sharp increase in family formations and resultant housing needs for these families.

In the last several decades, there has been an increased awareness of the growing aged segment of the population. The expansion of this segment has occurred because the size of the overall population has continuously grown and thus there are more people reaching the upper age brackets. But just as significantly, decreasing mortality rates resulting from advances in medical technology have been producing longer and longer life expectancy. The added size of the aged population coupled with large birth rates forms a segment of dependent population in proportions which this county has never before experienced. Given the age groups which are considered to make up the dependent segment of the population. 0-19 years and 65 years plus, it can be seen that in 1990 these groups will represent over 52% of the entire population, compared to 39.6% in 1960! Consequently, all levels of government must somehow be prepared to provide the additional schools, medical care and social services these groups will require. At the same time it means that less than half of the entire population will be available to support the whole.

The pyramid graph showing population distribution also demonstrates another significant trend. In the past there has consistently been a higher percentage of male population than female. In recent decades this difference has gradually been decreasing. While there is no reason to necessarily assume that the trend will not eventually stop at a point of even distribution, it can probably be expected to continue to the point where the female portion of the population is increasingly larger than the male. This tendency exists both nationally as well as in Salem County.

That segment of the entire population which is considered the labor force is normally defined as the age group from 14 years to 65 years. In 1960, the size of the labor force was determined to be just over 22,000. In 1965 and 1970, it was estimated to be approximately 24,000 and 26,500 and by 1990 it is projected to reach nearly 42,000. A breakdown of occupational categories, as could be expected, indicates the County's heavy dependence on manufacturing for jobs, with government, agricultural and trade occupations also being predominant forms of employment. It is not expected that the percentage-wise breakdown of jobs by occupational category will change significantly in the next twenty years, though manufacturing and agriculture will make relatively moderate declines as sources or types of employment. Services, as an occupational category, is projected to increase, the attributing factors being higher standards of living, more leisure time and general urbanization which in itself demands extensive and specialized services.

Economic growth can inevitably be expected to accompany the population increase that has been projected, though it is difficult to determine whether new jobs result in population growth or population growth results in new jobs. The number of individuals employed will increase, but

whether the number of jobs available will keep pace with the growth of the labor force is questionable. If it does not, the result will be an increased rate of unemployment despite an absolute growth in the employed labor force. The ability of the County to provide jobs for the growing labor force will have a great deal to do with determining continued rates of population growth plus the health of the economy. Should the County be unable to provide these jobs it can be expected that the increasing numbers of young people reaching the age where they would normally be joining the regions labor force will be leaving for other parts of the country where opportunities are greater. Such out-migration of course, would not be limited to young people, but to all segments.

Normally industrial development has been encouraged because it is a source of municipal tax ratables. Recognition of the possibilities discussed above is a prime motivation for efforts in industrial and economic development which are oriented toward achieving economically rewarding employment for all segments of the County's labor force.

5. GOALS AND POLICIES

A thorough understanding of the planning process reveals it to be what its name would suggest a "process", whereby the facts and projections that have been previously gathered are put to actual use. Planning tools are at our disposal that enable us to manipulate these facts and figures and from them develop many workable alternatives. The process becomes somewhat computer-like in its method. Facts and figures are plugged in and, by applying various planning theories and criteria, results are obtained. However, unlike a computer, the planner must select the most logical of many alternatives and arrive at the correct choices as he manipulates his data. To do this he relies on two added inputs, his own professional knowledge, and the needs and wants of those he is planning for. From this, he is then able to select and present the most desirable alternatives within a given geographical and time frame, which may vary widely from compacted high-rise developments to rural conservation projects.

Understanding the process of planning and acting on its proposals is becoming increasingly important. The speed and intensity at which development is now occurring require that a plan or course of action exist for all areas so that development can be properly channeled and related to workable, over-all patterns. Planning enables us to structure our future, so that the environment that most people desire can be permanently established. But in order to evolve a plan, it is important to agree on a set of goals which will describe the desired future environment. These goals will serve to guide the efforts of planners in proposing the most logical solutions to the problems of the County, both present and future.

For a plan to be meaningful, it must satisfy local goals, otherwise it will have no relevance, rather to the existing problems or to the desires of the community. These goals will necessarily be of two kinds, and they must represent a consensus of County-wide thinking if the plan evolved to meet them is to be successful. First, there must be several general goals which will govern all basic planning decisions. Second, goals that are more specific in their treatment of both the physical and social aspects of our environment must be set forth.

As a complement to the goals, policies should be enunciated. Lofty ideas in themselves are meaningless, and it is necessary to suggest examples of the means or actions by which these goals

may be achieved. These policies, with respect to the goals with which they are associated, will provide a framework within which researched facts and figures may be applied toward a solution. If at first they do not do so, the goals and objectives must be amended until they truly represent the desired of the people of Salem County.

The first question to be asked, which would in turn lead to the most basic goal is: "Why is it necessary to have a plan for the growth of Salem County"? The answer, like the question, is elemental. It is the desire of everyone living in or associated with Salem County to maintain an environment suitable for human habitation. Most of the county presently meets this requirement, but if the development trends that have taken place in and around our major cities are an indication of what may be expected to take place in Salem County, drastic measures may be required to withstand this pressure and to assure an orderly growth process that will not permit the total destruction of the County's existing amenities. This is the primary goal, and as such, the primary purpose of the plan.

The following pages enumerate the more specific goals and policies, the topics covering the categories of the physical environment, such as soils and water, and the social environment, including housing, welfare, education, etc. Together with the data presented in the preceding chapters, these goals and policies will combine to produce a plan for the future of Salem County.

6. LAND CAPABILITIES

The inventory of the physical and social environment is now completed. Perhaps the most important fact learned from the preceding descriptions is that both environments are the result of continuous processes. The present state of the land and people of Salem County is a result of a multitude of forces working simultaneously over a long period of time. We obviously cannot conclude that the processes have stopped. The land continues to change, albeit slowly; social change is accelerating. This chapter is devoted to determining the implications for future growth based on the analysis of the existing environment.

The case is this: we know that Salem County is going to grow, and that growth will require land. Furthermore, the land which we have is a finite quantity. We can't get any more. We must, therefore, use what we have cautiously and wisely, and to do this, we must first determine the natural capabilities of the land. If we can regard anything which is necessary for sustaining and enhancing our lives as social values, then the processes which form our physical environment should be regarded as such, for land, air and water are indispensable.

In the whole spectrum of land uses, three major categories are most important for our consideration – urbanization, agriculture, open space and recreation. Each of these use classifications has some differing physical requirements while, at the same time, they may have some physical requirements in common. For example, both agriculture and urbanization require reasonably flat land, while open space and recreation can use almost any terrain. Further, marshes and meadowlands are simply not compatible with urbanization, while they make ideal open space preserves. In brief, the physical environment enjoys certain distinct characteristics, which, when looked at as a system of values, can intelligently be put to work for us in determining the more desirable areas for future land uses.

To enable us to use these characteristics, it is necessary to define the desirable physical qualities for each of the three land use categories, and then to show where in Salem County these qualities exist. This we have done along the lines developed by Ian McHarg, drawing a separate map for each quality. On these maps, each characteristic of the physical environment required for a particular use is weighted as to its desirability or its degree of limitation of that use.

As an example, a desired physical feature for urbanization is flat land, preferably with a slope less than five percent. Therefore, a map of the land slopes of Salem County was prepared, on which areas of slight slope were shown in a very light shading, the greater slopes shown as darker tones, and the steep slopes shown in still a darker shade. This was done for each characteristic of the land and then the maps were overlaid. Those areas which showed up lightest on the composite overlay have the best characteristics for the particular land use under investigation. Similarly, the darker areas were considered to be undesirable for that land use.

The results of this process were three maps – one each for urbanization, agriculture, open space and recreation – which show in gradations from light to dark, those lands in the county which are most suited for each particular use. With the completion of these maps, it was quite obvious that there was indeed a great amount of land in Salem County which was suitable for more than one type of use. Therefore, it was necessary to combine all three major maps to determine what land is capable

of supporting different uses. By converting each of the shaded gray maps into a different color, and then overlaying them, we were able to determine such areas.

This final map is, then, a synthesis of all land capabilities. It is not a plan, and to regard it as such would be fallacious. It is merely a map which indicates those areas where certain land uses, both single and multiple, would be best suited to the physical characteristics of the land. If the land is put to a use which is most compatible with the physical characteristics necessary for that function, we will have achieved the greatest social good for the least amount of cost and effort.

URBANIZATION

In the search for land in Salem County which is intrinsically suitable for urbanization, eight criteria were used. Each of these was mapped separately with a maximum of three gradations corresponding to either the limitations or desirability of the land for urbanization. The eight factors were slope, flood plains and tidal plains, aquifer recharge areas, foundation conditions, permissible water pollution, marshes and meadowlands, navigable channels, and natural scenic features.

One of the most important criteria for urbanization is relatively flat land. The scale used for rating the land slopes in this county was as follows: Land with slopes ranging from zero to five percent was considered most suitable for large scale development; slopes ranging between six and ten percent, while less desirable, were considered qualified when more care is exercised in construction, siting, drainage, etc., finally, all lands with slopes over ten percent were considered to be undesirable for general urban development.

A variety of factors had to be considered with respect to the land's capability for supporting foundations. Here we relied heavily upon the Soil Survey of Salem County, and the soil associations as presented in that publication. Three major factors were taken into account in order to map foundation limitations. These were the depth to the water table, surface drainage, and the compressive strength of the soil. The limitations developed were for buildings with common loading conditions such as houses and commercial establishments. As with the slope map, three classifications were used: slight, moderate or severe limitations. The presence of adverse conditions in any one of the criteria of surface drainage, compressive strength of the soil, or depth to the water table was enough to place the soil in the moderate classification, while the presence of adverse conditions in two or more characteristics classified the soil as having severe limitations.

All of the flood and tidal plains in the county were considered to be unsuitable for most types of urban development. Considering the importance of ground water for the future of Salem County, outcrop or recharge areas of major aquifers were also rated. The outcrops of both the Raritan-Magothy and Cohansey formations were classified as particularly unsuitable for urban development as high density land coverage would drastically inhibit the natural recharge of the aquifers. The outcrop areas of the Mt. Laurel, Wenonah and Kirkwood sands were considered to have moderate limitations as these aquifers are of lesser importance. Finally, surface formations composed of clay were considered to have no limitations for urban development since no appreciable recharge takes place in these areas.

Marshes and meadowlands were considered as being unsuitable for any type of urban development, while land along the major streams and rivers outside the flood plains was rated according to water quality standards of the State Health Department. Lands along streams rated FE-1 were considered unsuitable for urban development since these areas, according to the Health

Department Plan, are to be maintained as completely pure water sources. Urbanization along FW-2 streams is moderately limited in that slight waste discharge is permitted in these streams. Finally, the land along streams rated FW-3 was considered suitable for urban development when normal waste treatment facilities are provided.

The two remaining natural characteristics used as criteria for urban development were considered more from an aesthetic or recreational viewpoint. Land surrounding navigable channels was considered desirable for the possibilities of both pleasure craft marinas and for commercial shipping facilities; and land which contained natural scenic features was considered desirable for its aesthetic and recreational potential alone.

When all of these criteria were mapped and the maps were overlaid, six distinct areas appeared. The lightest area, Classes I and II, has little or no limitations for urban development and therefore should be looked to first when planning for urbanization. Classes III and IV have moderate limitations and development should be permitted only when land in the first two classes is not available – and then, only under careful controlled conditions. Classes V and VI are not suited for urban development of any type should be discouraged.

OPEN SPACE

In mapping the physical requirements for open space and recreation land, many of the same criteria used in the urbanization and agriculture maps were used but with different interpretations. At the same time, several different criteria were mapped. Specifically, those natural features used to determine the land suitability for open space and recreation include the unique character or scenic land features of different parts of the county, flat land for large active recreation areas, potential riverboat beach areas, existing forests, marsh and meadowlands, aquifer outcrop areas, lakes, streams and rivers, flood plains, and potential reservoir areas.

The character of the land in Salem County was analyzed in a search for those areas which are particularly important in Salem County. These were then rated by degree from most unique to least and mapped in that fashion. Examples of large areas that were found to be of great importance with respect to character are the marshlands of Elsinboro and Lower Alloways Creek, and the rolling farmland in Pilesgrove.

Using the slope maps developed for the urbanization study, the flat lands were then plotted as being particularly suited for active recreation areas, while the steeper slopes were mapped as unusual physiographic features. The Delaware River shoreline was searched for potential beach areas which were rated as to their size and accessibility. All of the existing woodland was mapped, but special emphasis was given to the larger forested areas as being suitable for open space and wildlife preserves.

The marshes and meadowlands were mapped and rated as to their vulnerability to encroachment and pollution from possible future development with the assumption that those which are most vulnerable should be preserved first. As with urbanization, aquifer outcrop areas were plotted, but this time emphasis was placed upon their desirability for open space preserves in that this type of land use would guarantee a very low density land coverage. Floodplains and tidal plains were also considered ideal for open space and recreation purposes because of their flood protection

capabilities, the difficulties attendant upon development, their generally high level of underground water recharge potential and their pleasing natural appearance.

The last natural features examined, water bodies, was the most complex. The lakes, streams and rivers of the county were studied from several points of view. All of these were rated for tier use by pleasure craft, so that the larger the water body, the heavier was its rating. In this light, the Delaware river was considered most important because no type of pleasure craft would be eliminated. Lakes were next in importance, while streams were given the lowest rating because their use is limited to canoes and small boats, except in the tidal estuaries. Lakes, rivers and streams were also rated as to tier accessibility and vulnerability to pollution and encroachments. Finally, areas which serve as potential reservoirs such as Mannington Creek and Fenwick Creek were mapped.

When all of these factors were rated and mapped they were overlaid to produce the recreation map seen here. This process produced nearly twenty-five different shadings which were then reduced to six broad classes. Most of the Class I and Class II open space and recreation is situated on or near bodies or marshlands because of the recreational importance attached to these natural features. Several important implications can be seen from the relative concentrations of suitable land. Major emphasis should be placed upon the meadows and upon land in the Alloway area while a third important area is in Upper Penns Neck around Game Creek. As with the former suitability maps, the first classes should provide the starting points when planning for open space and recreation.

AGRICULTURE

The mapping of land capabilities for supporting agricultural development was adopted from the Soil Survey of Salem County. In the survey, each of the almost one hundred soils in Salem County is rated as to its agricultural capability. The United States Department of Agriculture has established a rating of eight classes divided into two major categories. Classes I through IV are ratings primarily for cropland, while classes V through VIII have restrictions that suggest limiting the use of the soil to pasture, woodland or wildlife.

The cropland soils are rated from Class I, having few or no limitations, through Class IV, which have very severe limitations that restrict the choice of plants, require very careful management, or both. In the second category, soils range from Class V soils, which are subject to little or no erosion but have other limitations that limit their use largely to pasture, range, woodland, or wildlife food and cover, to Class VIII, which has no agricultural value at all.

It was impossible to map each individual soil in the county, so the larger associations were used. Since each of these associations consists of two or three major soil types and several minor ones, ratings were applied to the major types. By using this rating method it was possible to develop a new and more useful classification which placed each of the nine soil associations into one of five classes based upon the U.S.D.A. system. Classes I through III are generally suitable for agriculture, particularly crops, while Classes IV and V have such severe limitations on them that they should be used only as grazing land or wildlife areas.

It is instructive to note the relationship between the land which is highly suitable for crop production and the distribution of the silt mantle shown in Chapter Twp. Except for the organic silts

of the meadows, the best farmland covers those areas which comprise the heart of the silt mantle. As the land tends more toward gravel, the greater are the limitations on crop production.

Many of the same implications for planning derived from the urbanization map can be applied here. Class I land has the best potential for agriculture and therefore should be most jealously guarded for future farming operations. Class II should be considered next most valuable, and so on. Only with extreme preparation procedures can Classes IV and V be put to any rewarding agricultural pursuits.

As can be seen, many of the areas that are best suited to agricultural use also rate high for urbanization. Obviously an important and perhaps critical choice will have to be made. If all aspects of the County's future welfare are to be accounted for this important choice should be based on much more than immediate economic benefits. The well being of the entire future community will hinge on our ability to maintain an ample degree of open land use. If some of this is to be in the form of tax-paying, food and fiber producing agricultural land, we must see that the best of our farmland resources are preserved.

COMPOSITE SUITABILITY

Even a cursory examination of the three suitability maps reveals the fact that large sections of the county are suitable for more than one of the major use categories. Therefore, it was necessary to form a composite, to see exactly where uses could co-exist vis-a-vis the land. To overlay the three suitability maps with a total of seventeen classes would produce approximately three hundred combinations of classes-obviously and untenable situation! Therefore, only the first two classes from each of the suitability maps were used. These were then overlaid to produce the composite land capability map which shows, through color variations, which lands in the county are suitable for only one use, for two different uses, or for all three. Furthermore, it shows the Class I and II graduations.

Earlier in this chapter, it was strongly emphasized that this map is not a plan. This fact is further realized when we look at many of the orange areas which are suitable for both agriculture and urbanization. These two land uses are generally incompatible. All the orange designation can show is that some of our land is especially capable of supporting either one of the uses.

Yet this map is an extremely valuable planning tool. By examining all of the positive factors of the land, we are able to plot a map which shows which lands are most valuable, in non-economic terms, for any particular use. Furthermore, it tells where choices can be made. In every place where the land is suitable for two or more uses, but where the uses are not compatible, a decision must be made as to which use should prevail. If, on the other hand, we find the land capable of supporting two compatible uses, e.g., agriculture and open space, then the decision making process is greatly aided.

We now have, in effect, a yardstick by which to measure planning decisions. It is a concise and comprehensive analysis of the physical environment which should be looked to whenever a land use planning decision is made. Obviously compromises will have to be made. It was not the intent of this chapter to take into account the existing land use or the social and economic environment. Implications from these areas will have a great effect on land use decisions. Development which exists now, but which is not compatible with the land, can be changed only over long periods of time, if at all; and such changes may not in fact be desirable when all implications are weighed.

Another important implication gained from this study is that, contrary to normal single use zoning practice, much of the land is capable of supporting a variety of uses. Indeed, the variability of the land seems extremely complex. This should be regarded not as a complication, but as an opportunity. We are finally realizing that single purpose zoning and planning can be both socially and economically debilitating. Slowly this situation is being remedied through such concepts as new towns, cluster developments, and planned unit developments. These realizations, coupled with the awareness of the complex capabilities of the land can greatly expand the possibilities of planning our environment.

Furthermore, this awareness of the capabilities of the physical environment adds an important new set of values to the decision making process. The expanding citizen concern over the use and misuse of our natural landscape is a plea that we must no longer allow economics to control every decision alone. A new set of values must be established which will harmonize social, economic and physical concerns. This chapter has been an attempt to re-establish the natural values of our environment which were so much a part of the agricultural history of Salem County and which must not be forgotten in our decisions for tomorrow.

7. COMPREHENSIVE DEVELOPMENT

The history of planning is as old as man himself. It has gone through numerous changes in philosophy, scope and promise, at times with brilliant foresight and success, at other times with astounding failure. In most cases history has been the judge. Confined primarily to cities, planning has produced some of the world's treasures: the Paris of Housmann, the Florence of the Medici and the Washington of L'Enfant. And yet, the recent history of planning certainly claims more failures than successes.

Reasons for the recent disappointments in the history of planning are not difficult to uncover if we examine the context in which the planning took place. The shining examples, of which Paris and Florence are just two, were born in the minds of one or two individuals who possessed a great deal of power, influence, money, or all three. The citizenry of these cities was not consulted; indeed, was not even considered as a factor to be concerned with.

Today, we can no longer plan in this manner for several reasons. We are beginning to realize the importance of individual choice as being a unique characteristic of the human species. The corollary of course is the realization that to deny individual choice invites tragedy. Secondly, in order to properly function, the democratic form of government must offer to its citizens the right of individuality in determining their future. Yet it is quite obvious that we cannot always do as we please, for in such a case the governmental system would collapse and anarchy would reign. What is needed is a wide range of individual choice confined within clearly defined boundaries which must be established and agreed upon by the citizens themselves.

The rigidity of far too many plans in the recent past has doomed them to obscure governmental shelves for failure to achieve the correct balance of choice within limits. The regional plan which is presented here has been designed to overcome this dilemma. Under the generally accepted definition, this document may well be considered not as a plan but rather as a framework, as a definition of limits for individual action.

From this description, it is easy to see the importance of the criteria for establishing the framework. Limits cannot be arbitrarily set. A great amount of information must be gathered about the environment – physical and social. Still more important, this information must be analyzed and sifted over and over again in an attempt to understand how all of the parts are interrelated. Well over a thousand pages of research material has been prepared in an effort to gain a sufficient understanding of the environment of Salem County and to design the framework within which future growth will take place.

Now that this has been completed, we are ready to put together all of the parts. The pages which follow present a blueprint within which individuals and municipalities can act. One of the fundamental principals which underlines this plan is that we must realize the limits placed on us by nature itself. We can no longer disregard the physical environment or dismiss it as an easily conquered foe, for it is the physical environment which forms the initial framework for our actions. In this light, we have realized that our choices are limited, yet within these broadly defined

limitations we have an astounding freedom of action. This has also been tempered with the pragmatic limitations of government structure. We do not believe that it is the job or responsibility of the County to indicate on a map where a particular commercial center should go; rather, we have defined large areas as suitable for one use or another. Within this framework it is the responsibility of municipal government and individual citizens to act. Where it is the responsibility to indicate particular locations for functions, or to propose specific action to solve a problem or meet a challenge, we have done so.

TRANSPORTATION

An important key to the growth and development of Salem County will be its transportation network. The freedom and extent of travel generated by the automobile has opened up previously inaccessible, remote areas of the County. Almost anyone who wishes is now able to live in the woods and still commute to work in Wilmington. And the truck has made the transportation of goods across land a relatively simple matter.

It has been pointed out earlier that major transportation routes have been the precursors of development. Thus it follows that the transportation network of Salem County should be developed in such a way as to encourage growth where it fulfills regional plan objectives. By the careful design of new road patterns, and the strategic renewal of existing roads we can guide development, not restricting the choice of location of those who would urbanize, but merely making it moiré practical for urbanization to occur where it will be most advantageous for all.

In order to make the road system in the County effective and serve its purpose well, several criteria have been established. There must be efficient traffic movement within and through the increasingly urbanized western sections of the County. The transportation plan set forth should be in compliance with planning already accomplished at Federal, State, and Municipal levels. Immediate consideration must be given to the relief of traffic bottlenecks at critical locations. An efficient network of primary County arterials and collector roads must be developed and maintained to facilitate movement to and from the regional freeway system. And finally, it is essential that future rights-of-way be established so that the acquisition of these rights-of-way can precede the actual construction or implementation of the plan.

The implementation suggested for Phase I is intended to remedy major existing highway problems in various sections of the County. Most important will be the improvement of the High Bridge intersection in Woodstown and the Pointers intersection of Salem. Equally as important will be the widening or otherwise improving State highways, 40, 45, and 49 as they pass through the major urbanized areas of the County. And the improvement of U.S. 130 is also critical. At the County level, the widening of major intersections with Interstate 295 and the acquisition of right-of-way along Hook Road as a by-pass for Pennsville should be undertaken immediately. Also, acquisition of rights-of-way by the State along more heavily traveled highways is recommended, as is immediate acquisition by the County of rights-of-way along the Pointers-Auburn Road in Mannington Township and the section of the Bridgeton-Vineland road that passes through Salem County. Alternatively, the entire road could be taken over by the State, thus eliminating the responsibility of Salem County for the maintenance of a road that has neither its origin nor destinations in the County.

The implementation proposed for Phase II is concerned with the future development of both the Regional freeway system and the County arterial system. The most important aspect of this Phase

of the transportation plan is the determination of the feasibility and exact location of a southern east-west expressway. This might be either a toll facility or state highway which would traverse the Counties of Salem, Cumberland, and Cape May. It would extend from the Delaware Memorial Bridge to the Garden State Parkway in Cape May County. The purpose of this road is to provide direct and rapid access to the Cape May County resort area from Baltimore, Washington, Wilmington, and southeastern Pennsylvania. It will also provide rapid movement between the urbanized western section of Salem County and the tri-city area of Bridgeton, Millville, and Vineland in Cumberland County. An expressway such as this will have the capacity to handle large volumes of traffic, thus removing much through traffic from several urban bottlenecks. Its feasibility (if a toll road) and alignment should be determined by the end of Phase II.

The extension of East Pittsfield Street across Mannington Meadows at the point of the old bridge should also be a part of Phase II. This will provide more direct access for Pennsville residents to Woodstown and points east; to the Salem County Hospital; and to the Salem County Vocational College being proposed for the site of the Lakeview Home. Also included in this Phase will be the acquisition of rights-of-way along major County arterials.

Implementation suggested for Phase III includes the construction of the new east-west expressway. If the expressway has not been found to be feasible, study and right-of-way acquisition will be necessary in terms of another east-west expressway. One such route, proposed by the State Highway Department, shows where this freeway might be located and efforts by the County Planning Board should be directed toward alignment and interchange location that would help facilitate the Board's urbanization proposals. This phase of development also indicates the improvement of major County arterials and collectors, including the Penns Grove and Salem (if a southerly east-west expressway location is not chosen) bypasses; as well as right-of-way acquisition for projected expansion programs.

The development of mass transportation has been long overlooked in Salem County. The decline of the steamboat and the railroad and the enchantment of Americans with the automobile has left the County with meager bus service which offers little choice but to accept the automobile as the only means of travel. However, as the roads and highways become increasingly jammed, especially in and around major population centers, the automobile will inevitably come to be less and less valued as a means of transportation.

An increased communication and dependence on the cities of Wilmington and Philadelphia for special services not obtainable here has led Salem County residents to travel more frequently to these cities. A bus transit service between the centers in Salem County and Wilmington and Philadelphia now exists but the service is very poor. A first step in a better system would be to increase service and to alter existing routes to better accommodate the people of the County. This has been done recently between Bridgeton, the Camden area and New York City and may presage a similar step up in bus service in Salem County.

SEWER AND WATER

The continually increasing development in Salem County creates serious problems that must be dealt with as soon as possible. Large industrial complexes and new, high-density housing combine to make great demands for water supply, and in the aftermath, leave the problem of disposal of

their wastes. In handling these problems, we must be careful to prevent the contamination of the much needed water by the disposal of sewerage and solid waste.

The Delaware River Basin Commission has recently undertaken an extensive study for a major regional sewerage treatment plant to be located at Deepwater, near the Delaware Memorial Bridge. The purpose of this plant will be to handle the waste from the major polluting industries along the Delaware River in Salem and Gloucester Counties as well as the waste sewerage from the population centers in these areas. The map at the right shows the proposed route for the main truck line.

Although the proposed treatment plant will be capable of treating waste from the western portions of the County, an area which consists of almost 60 percent of the County's population and the majority of industry, there remain areas throughout the County which will not be accommodated. These problem areas are outlined on the map. The most serious areas, those requiring immediate solutions, are Woodstown and its environs and Elmer. Because of the greater population in Woodstown, this area deserves top priority. Areas of concern in the near future are Alloway, Quinton and Auburn. The centers of Hancocks Bridge, Canton, Daretown, Yorketown, Sharptown, Pole Tavern, and Norma have not reached the densities at which pollution from sewerage is a pressing problem, but they will eventually have to face the prospect of joint or community waste collection and treatment. The Salem County Planning Board is preparing a study which investigates the problems of rural sewerage treatment and disposal which will propose solutions to these problems.

Future water supply poses a different set of problems. Because of salt water intrusion from the Delaware River into the Raritan-Magothy formation which underlays the populous western region of the County, careful management will be needed in this area. This would entail a series of test wells strategically located in order to maintain close supervision of water quality throughout the aquifer.

The New Jersey Division of Water Policy and Supply has designated Salem County as a protected area in which any well withdrawing in excess of 100,000 gallons per day from "subsurface or percolating sources" must obtain a permit. The purpose of this regulation is to help insure the continued replenishment of subsurface water and prevent any radical changes in the height of water tables or salt water intrusion.

The location and depth of wells are also important considerations in terms of water management. The improper location of a large well could cause tremendous damage to the aquifer, contaminating it beyond repair.

Many parts of Salem County have other important problems with regard to water supply. The subsurface aquifers contain more abundant water for the whole county, but the recharge areas of these aquifers are highly susceptible to pollution. The Cohansey Sands are an excellent transmitter of water for both recharge and with withdraw. Therefore, urbanization with its propensity for surface pollution should be located when possible in areas where the surface sands are not directly connected to these subsurface aquifers.

URBANIZATION

The role of urbanization is becoming increasingly important to the future of Salem County. Not only will it become an ever more apparent physical attribute of the landscape, but its social implications are vast. It is no longer realistic in this section of the United States to recognize a mutually exclusive urban-rural dichotomy; development and the major regional facilities that dictate its pattern are being instituted in such a general and widespread fashion, especially along the central axis of megalopolis, that the repercussions of urbanization are felt even in the most remote hinterland areas. In our Northeast region, rural and suburban areas are far too bound into the economic and social structure of urban America to treat them as individual, isolated areas.

With this recognition, we have chosen to broadly define the meaning of urbanization for this plan. The normally accepted definition of urbanization connotes massive high density areas with a multitude of unsolvable problems. For our purpose this definition is far too limited. In our view the term must include built up areas of both high and low density and in addition, other, perhaps almost vacant, areas coming under the spreading influence of urban social and economic systems. Therefore, we are treating urbanization as any development which requires major urban services, additional roads, police, and fire protection, as well as immediately adjacent affected lands.

One of the primary reasons for utilizing this rather broad definition of urbanization lies in a fundamental concept underlying this regional plan. As we stated, we do not believe that it is sole role or responsibility of the County Planning Board to set precise areas on a map and rigidly insist that that particular area be, for example, an industrial park. This is the responsibility of municipal planning programs. Therefore, we have designated broad areas in the county which would best support urbanization, based on a large body of information gathered about the County and by taking a broader look than is generally available at the local level. Within these urban areas, any number of decisions can and must be made by local governments through subdivision and zoning controls. This we consider to be working within the framework.

The areas designated as urban on the accompanying map were derived from three principal sources: the land suitabilities map of urbanization; the existing land use pattern; and projections and forecasts of future development. Theoretically, those areas shown on the urban suitability map in Chapter VI are ideally suited to urban growth based on the capability of the land to support such functions.

The second major input was the existing land use. As noted in Chapter III, the land use pattern is the result of social processes beginning over three hundred years ago. Present locations of towns and urbanizing areas must be taken into account, for it is naïve not to recognize that these areas form a nucleus for future urban expansion. It was necessary to determine, where possible, the reason each town was located at its particular site and to understand the social and economic context in which it was developed. It is not surprising to find that most of Salem County's towns and villages were established at places where the natural environment provided an important economic asset. O additional importance was the examination of the state of urbanization in Salem County with respect to development in surrounding counties, the Delaware Valley, and the east coast megalopolis. These factors, when examined together, give an indication of the trends of urbanization throughout the county's long history, and lead us into the third important parameter.

In Chapter IV we were concerned with developing a set of workable projections and forecasts about the next twenty years for Salem County. From the assumptions given and facts gathered in that section, some important trends can be seen. While the pace of urban development has been

relatively slow in the past, the near future will see an unmistakable acceleration in the rate of urbanization as Salem County comes more into the mainstream of east coast development. More and more land will be given over to higher density uses, particularly as the transportation system expands, and people find it easier to get from Salem County to the major urban centers which surround us. Furthermore, as affluence increases, so will the demand for additional urban-oriented services.

Since the existing urban centers in Salem County serve as the nuclei for future development, it is to these areas that we must first turn when planning the future urbanization. Almost all the trends examined point to two major areas as future urban containers. The most intensively developed area will be the western section of the County in Oldmans, Upper Penns Neck and Pennsville Townships. The second major area will be in Pittsgrove Township resulting from the rapidly expanding urbanization taking place in Vineland and southern Gloucester County. In addition, further expansion can be expected south of Salem and surrounding Woodstown.

When all three of these major inputs are examined together we can get a rather accurate picture of future urbanization. One very important fact quickly appears when we compare the existing land use with land suitabilities – in every place where urbanization has taken place thus far, it has been on land which has been quite suitable for such use. While it is true that in isolated instances, notably in the Pennsville area, the land is more suitable for agriculture, this does not seriously conflict with the land's capabilities. A continuance of this practice is of the utmost importance. It becomes a major goal as we plan for future urban areas.

An examination of projected urban areas against land capabilities reveals immediate conflicts with this goal. Since the quantity of land is finite, the expansion of one land use must mean a reduction of another. Considering the location of existing urban areas in Salem County, the two land uses which are likely to come under increasing pressure from urbanization are agricultural lands and marshlands, both of which the County can ill afford to lose. Therefore, it becomes more and more important to channel urban growth into areas which are both suitable for urban development and do encroach on these other two land users. While this can be done to a certain extent in both the western and eastern urbanizing areas, we must acknowledge the pragmatic economic land market and realize that a sizable amount of land which is now being farmed will eventually become urbanized. Given the existing tax structure based solely upon land values and ratables, there is almost nothing that can prevent this.

Therefore, the plan for urbanization in Salem County presented here is based upon utilizing land which is located near existing urban centers and which is only of marginal agricultural value; and then urbanizing that land which now is being farmed but which is outside the prime agricultural areas. It is our belief that in so doing, the economic and open space values of agriculture will not be seriously damaged if a stand can be made which will effectively preserve the integrity of the prime farm land area.

The staging presented here is to be as a guide for municipal planning and zoning action. It is based on our assessment of land capabilities and evaluation of the likely path of urban development. Within those areas designated as urban in the plan, it is the responsibility of municipal government to exercise its own judgment as to what land it will permit to be developed and to implement that plan through zoning power. Since much of the land designated urban in this plans is now being used for agricultural pursuits, we recommend that municipal planning and zoning make every attempt to

preserve this situation. While this will not be easy, there are ways available to municipal government to achieve a balance between land uses for urbanization and agriculture while maintaining a suitable tax base. This can be brought about by imaginative use of cluster developments, planned unit developments and special agricultural zones. By utilizing such devices, a municipality can still expand its urban population while maintaining much needed open space for agriculture. This balance can further be enhanced on both municipal and county levels by the judicious provision of services to special geographical areas. For example, if a municipality wants its urbanization to go in a particular direction, it can encourage development by providing essential public services such as sewer and water in that direction. Conversely, it can retard development in areas which it considers unsuitable for urbanization by refusing services. This method, which is in reality a form of capital budgeting based upon careful planning, can also accomplish the staging of urban development suggested in this plan.

It should be the goal for everyone concerned to preserve the prime agricultural land in the heart of the county. If the plan for urbanization presented here is implemented we may be able to achieve this goal. However, the time will come when the urbanized areas shown on the plan will reach maximum density. When this happens, we shall be faced with an important decision for which there are two options. We can either give up the prime agricultural areas to urbanization, and in so doing sound the final death knell to rural heritage of Salem County; or, we can direct our urbanization to other areas in the county.

The land capabilities investigation presented in Chapter VI indicates a third major area of the county which is suitable for urbanization. This is the area located in south-central Salem County primarily in Alloway and Quinton Townships. Presently the area is devoted primarily to woodland, with a scattering of non-farm rural dwellings. It is our proposal that this area be eventually utilized for urban development rather than destroy the rich farmland in central Salem County. Again, this will not easily be accomplished. In order to prevent chaotic and sporadic development in this area, it is vital that an overall urbanization plan for the area be instigated in the near future. It is essential that we think in terms of new town development and that a total environment be planned well in advance to include adequate provision of all essential facilities and services. Traditional subdivisions will not be equal to the tasks involved. While such an undertaking will be vast in scope, it is our belief that only through such large scale thinking and equivalent action can Salem County have the urbanization which is inevitable and the rural atmosphere which is historic and so important to its environmental quality.

OPEN SPACE

Although there are many planning measures which can be used in guiding the physical and social growth of an area, the planning and acquisition of open space and recreation areas is one of the most important. There is nothing inherently wrong with industries, apartments, or large commercial areas. They are, in fact, vital elements of the maturity of an area. However, the placement of these elements in the environment has too often been dictated by pure economics, a force not much concerned with long-range aesthetic and social well-being. The need and desirability of open space and recreation opportunities has already been established. Now, by properly providing for these needs, a more rational and pleasant environment can be established.

The proper placement of open space and recreational facilities is as important as it is necessary to have these amenities. For this reason, many criteria were used in evolving the Open Space Plan. In

addition to the factors concerned with the physical environment outlined in Chapter VI, other factors, those related to the people of Salem County, had to be considered.

The most important of these factors is the population distribution of the County. It is expected that over 60 percent of the almost 120,000 people projected for Salem County in 1990 will live in the western portion of the County, particularly in the municipalities from Oldmans Township to Elsinboro Township along the Delaware River. Since this area consists of only 18 percent of the total land area of the County, it is obvious that primary consideration must be given this area before the opportunity to secure suitable open space and recreation areas is eliminated by the use of all the existing land for urbanization.

A second important factor in the location of major open space and recreational areas is transportation. These recreation facilities will fulfill an important need of Salem County and it is important that these areas be readily accessible to the majority of the County's population. The transportation network which will serve the population centers is planned to be comprehensive and capable of moving the projected population with little or no difficulty. Therefore, regional or County parks and open space preserves need to be located in the heart of these population centers but may be removed to more remote areas provided that they remain easily accessible. However, these major recreation areas should be supplemented at the municipal level by smaller, in-city interconnected park systems and playgrounds.

Because of the immediate pressures of urbanization on the western portion of the County, Phase I of the Open Space Plan will be primarily concerned with providing the needed open space and recreation areas for this section. State or Federal acquisition of the Mannington Meadow will be the single most important item of Phase I. Also public acquisition of the Goose Pond Meadow would be an important addition to the open space preserves of the County.

Salem County itself will have to begin its participation in providing recreation and open space for its residents. Initial action should be the acquisition of approximately 250 acres of land for a linear park along Game Creek and Game Branch. This would run almost parallel to the present population center of Penns Grove-Carneys Point and in the near future will be in the heart of the residential and industrial complex which is forming in Upper Penns Neck Township.

The County should also begin acquisition for a major, County-wide park. This park would have active recreational facilities and support activities such as swimming, camping, boating, athletics, nature study areas, and possibly other educational or cultural facilities. The area between Alloway and Woodstown was chosen as the approximate location for such a County park.

The designation of scenic drives should be made by the Board of Chosen Freeholders, and efforts should be made to preserve their scenic quality. At this same time the County should obtain conservation easements along the Salem River in order to prevent development until these areas can be purchased by the County for the purpose of a linear park system.

Phase II will be concerned with the following up the initial acquisitions of the Open Space Plan. The remainder of the required land for the County Park should be acquired, as would be the land along the Upper Salem River for development as a linear park. Also at this point the initial development of a marina on the Salem River at Salem City is also recommended. This marina would provide both a

needed recreational facility of this type for the area and would also provide a tourist attraction in bringing people to the Salem County area.

Phase II also recognizes the developing eastern portions of the County. At this time, the acquisition of the land along Muddy Run from Parvin Park to the County line should be undertaken, and conservation easements along the upper branch of Muddy Run from Parvin Park to Elmer should be obtained.

Phase III of the Open space Plan, the emphasis is on supplementing the overall park system. Joint projects along Oldmans Creek in the northern part of the County and the Maurice River in the eastern part are proposed. The purpose of these projects is to provide inter-county linear parks along major streams. The linear park from Centerton to Elmer along Muddy Run should be established. Also included in Phase III is an active recreation area on the Delaware River in Oldmans Township

In Chapter V, our statement of policies, the establishment of a Parks and Recreation Commission was proposed. This Commission would have the legal authority to implement open space and recreation proposals, coordinating the efforts of all participating agencies in providing an excellent open space and recreational program.

Another important policy of the County should be to obtain conservation and drainage easements whenever possible in order to protect the streams and floodplains of Salem County. This will be done primarily in the case of large sub-division and site planning projects.

AGRICULTURE

It has been pointed out that agriculture is Salem County's largest user of land. It has also been shown that most of the land now used for agriculture is also suitable for urbanization, readily usable to accommodate our expanding population. It is time, therefore, to make some decisions as to how this land should be used.

The number of farms in New Jersey has been decreasing at a rate of almost 1,000 per year. The total number of acres in agriculture has also been decreasing by nearly 42,000 acres per year over the past twenty years. These figures dramatically show that it not only can happen here, it is happening here. The vital open space so highly prized by the residents of Salem County is fast disappearing. Unless priorities are established and action taken, we will inevitably succumb to the claustrophobic fate of so many North Jersey communities.

There are two major considerations. First, there is the land itself. When development pressures build up, it would be foolish to try to save land that is only marginally good for agriculture. Thus, the lands designated best suited for agriculture on the Agricultural Suitability Map in Chapter VI must be the ones we aim to preserve. Other lands now in agriculture will remain so as long as possible, but it is not expected that these lands will survive the ubiquitous subdivision unless special efforts are made by the municipalities to keep this space open.

The second consideration, and possibly more important than the land in terms of our present society, is money. As long as agriculture remains economically viable, it will be continued. However, when the cost of production becomes too high and the pressures from approaching

urbanization becomes too great, the farmer, if not forbidden by ironclad, community supported regulations, will abandon his land, selling out to the highest bidder. And as suburbanization spreads, both taxes and land costs rise, making it difficult for owners to resist the attractive offers made by developers for their farms.

The proposed Agricultural Plan outlines the areas of Salem county best suited to remain in agriculture. These areas not only contain the best growing soils in the County, but are important for other reasons as well. If they are conscientiously maintained as agricultural land, they will serve the dual purpose of acting as open space as well. In this capacity they will: first, serve to buffer the undue spread of urbanization over the whole face of the County; and second, act as a relief to the monotonous vistas provided by row upon row of houses spawned by the increasing number of subdivisions that will come.

The areas designated as Prime Agriculture are both the best growing lands and the most removed from the pressures of urbanization. Thus measures can be established now that it will protect these valuable lands from encroachment. These areas are also strategically located so as to separate major population centers from each other, providing not only a visual relief when traveling between the centers, but also imparting a sense of individuality to the centers thus separated, not allowing them to merge into one, as is now happening along the Delaware River.

The Secondary Agriculture lands also contain excellent soils but are more subject to pressures of urbanization. If at all possible, these areas should be maintained as open space due to their proximity to existing and future populated areas. However, as the population in the County grows, it will become increasingly difficult to maintain these lands in agriculture, both from an aesthetic and monetary point of view, unless their added open space values are recognized and subsidized by the community.

The Primary and Secondary Agriculture areas as shown on the Future Agriculture Plan do not encompass all land on which agriculture is being practiced now or will be in the future. Neither does the land mean to imply that any area not shown as important agricultural land be abandoned. What is suggested is the maintenance of the areas shown because they are the most important with regard to their location in the County as well as the fact that the excellent soil; on this land will enable agriculture to continue longer as an economically viable land use.

GOVERNMENT

Throughout the history of our County, as the population has grown in numbers, become more densely settled and more specialized in occupation, the functions of government have increased accordingly in complexity. From the beginning, Americans have clung to the principle of home rule, only surrendering authority and responsibility to higher governmental levels when the problem to be solved clearly transcends local boundaries or when the cost of a particular service appears too high to pay locally. As a result, at this point in time, the boundaries of responsibility between the Federal, State, County, and Municipal governments are indistinct, caused by confusion in methods of funding and authority.

If the County is to remain a vital and meaningful governmental institution, it must make evident a willingness to expend its traditional functions where necessary to meet new regional needs which are continually arising in our rapidly changing society. There is little question that many

governmental services and functions can be most economically provided at the County level, but unless the County government shows a desire and ability to accept these new burdens and responsibilities, a diminution of the prestige and power of the County will no doubt follow. And if the County is to meet its new and expanding responsibilities in an afforded, and effective manner, it must be afforded, and be willing to take advantage, of the opportunity to periodically improve its structure.

Within the existing County government structure, the Board of Chosen Freeholders is the controlling body. It is from this Board that all directives emanate and to the Board that all departments are answerable. The seven Freeholders have the responsibility for the legislative functions of County government as well as for coordinating all facets of the County's facilities and services.

It is also the duty of the Board of Freeholders to provide the administration and supervision for all the departments which make up the County government structure. The relatively large number of independent elective officials, appointive officers, and special function boards and commissions creates a definite need for a coordination of the County's administrative activities. This could be most efficiently accomplished by a professionally trained appointee who is directly responsible to the Board of Chosen Freeholders or to a strong elected executive. An executive head would be generally responsible for carrying out policies and projects legislated by the board of Chosen Freeholders. Specifically, he would be responsible for such duties as the overall direction of departmental activity; the coordinating of work on annual budgets and capital improvement programs and budgets; advising the Board of Freeholders about the work in progress and needs of the various County departments; the appointment of administrative department heads (other than constitutional officers); as well as other matters concerning finances, personnel and purchasing. It will be almost a necessity in the future to relieve the Board of chosen Freeholders of most of their administrative duties if they are to have adequate time for policy making decisions, and the appointment or election of such an administrator could be the step that could accomplish this.

A further step toward revision of the county government structure would be the adoption of a County Charter. It would be necessary for the State to pass legislation that would make available to counties the option of a County Charter. Such a charter with legislative approval, would set forth the powers of the County, the County's organizational structure, and the procedures for the conduct of County affairs. A County charter should provide for an integrated government with modern procedures for fiscal and personnel management and planning. The charter should also provide administrative flexibility to allow adjustments to changing conditions and needs.

The County charter offers the most comprehensive approach to improving and modernizing the outdated County structure. A well conceived charter law could provide County government with the same degree of home rule determination now enjoyed by the municipalities and provide a government designed specifically to meet the needs of a particular County. It must be realized that by adopting a charter, Salem County would be increasing its responsibilities. However, if the County is to grow and remain vital, it must be willing to accept new burdens which otherwise will be assumed by the State or Federal governments and in many cases leave the County with little, if any, voice in its own affairs.

Thus, even though the task of securing minor state legislative changes is a difficult one and the prospect of constitutional change highly improbable, the County should approach the State legislature in concert with other counties, requesting logical enabling legislation to meet the need

for organizational improvements and structural revisions including constitutional revamping of the time honored row office system and the imposition of programs and officials through State mandate and appointment.

In addition, there are other areas to which attention must be directed. The increasing volume and complexity of Salem County's financial affairs will soon lead to the necessity of reorganizing and strengthening the County Treasurer's Office into a Department of Finance. While eventually such a Department should be headed by a person having formal training in public finance, it would be more appropriate at this time to engage a trained public accountant within the Treasurer's Office. This would enable a much needed general review and supervision of expenditures of all departments throughout the year and would provide continuing technical assistance with the details of fund and debt management and long-range capital planning and budgeting.

Presently the Office of Personnel and Central Purchasing are handled by the Secretary to the Board of Chosen Freeholders. As the number of County employees continues to increase, these jobs will become more demanding in terms of time and expertise. When this occurs, a separate Office of Central Purchasing should be established with a person trained in purchasing policy. The Personnel Department should also be expanded, to include in-service training programs, pension and fringe benefit programs, personnel recruitment, employee safety and welfare, and employee security and grievance procedures. Such a department could also be made responsible for an overall job analysis and efficiency study, which would have improved employee relations and overall operational efficiency as its goals.

Increased County activity will also be accompanied by additional printing work which will require a central printing department. A wide variety of reproduction equipment is scattered among various County offices and agencies at the present time, in addition to the sizable volume of forms and letterheads that are job printed outside. A small central printing department could reduce the need for the numerous duplicating and copying machines and could save a substantial portion of the County's printing costs.

FACILITIES AND SERVICES

The primary task of County government is to provide more efficient and effective means of dealing with the regional problems and needs of Salem County. To do this, the revised government structure just discussed will be necessary, as well as an expansion of the County's existing activities and the inception of new programs and directions. In order to meet the new responsibilities that we thrust upon it in the future, the County will need to plan what action programs are most desirable, where these programs will be needed, and how to accomplish them when the proper time is reached.

Within its own structure, the first move made by the County government should be the establishment of a Public Relations Department. Such a department could be invaluable to the board of Chosen Freeholders in terms of information provided and policy dispensed. Public Relations could allot major portions of its time and staff to soliciting response to County action and to obtaining wants and needs from the citizens of the County. The Department could be the intermediary between the creator of legislation and those who create the demand for, and benefit by, this legislation.

The Public Relations Department could also work in conjunction with other departments, such as an Economic Development Commission. This Commission would be developed to maintain detailed County data files and work closely with industrial realtors and industrial prospects.

Another important extension of the County's authority would be the creation of a Parks and Recreation Commission. This Commission established under the provisions of State law, would work toward carrying out the recommendations of the Open Space and Recreation plan detailed in the previous section. The Commission would be empowered by the Board of Freeholders to acquire land, build and maintain parks and buildings, lease lands, and exercise the power of eminent domain.

One of the most important functions of the Parks and Recreation Commission would be the acquisition of open space. The Open Space and Recreation Plan expressed the need for preserving open space. The meadows on the Delaware River and Bay are presently owned for the most part by public agencies, both State and Federal. Therefore, the thrust of the County Commission should be to acquire lands, either by gift or by purchase, in the inner, more populated areas of the County. It is in these areas that the squeeze for open space will first be felt, and it is in these areas that the County should act.

The preservation of the historical heritage of Salem County should be important to those in County government. As the speed of development picks up there will be an increasing frequency of instances when important historic landmarks will fall prey to new development projects. Thus the establishment of a Historic Preservation Commission is recommended. Such a commission would be able to work effectively with other interested groups and individuals to seek out ways to preserve important examples of Salem County's rich tradition. The Commission should explore the potential of both local and national trusts, non-profit corporations as well as investigating other techniques for preserving the County's historic background.

The County should also seek to expand its activities in other areas where a regionalization of service would be beneficial. An important area is the provision of water, sewer, and solid waste services. With these services provided on a regional basis, the County and other regulating agencies would be better able to effectively and safely utilize available water supplies, to prevent salt water intrusion of aquifers due to improper withdrawal techniques and pollution of surface and ground water reserves. In terms of the comprehensive plan for Salem County, these services can be used to advance or retard the spread of urbanization in those areas so designated in the plan.

Continuing study of the need and availability of adequate police and fire protection for all residents of Salem County should be carried on. As is the case with several other services, the greatest efforts of County government will need to be concentrated in those areas of the County which, because of the factors of size and density, cannot provide these services themselves.

In the area of transportation, the County should initiate a capital budgeting and expenditures program based upon the continuous monitoring of traffic volumes and road capacities. Only by keeping a constant watch on the expected trouble spots can we hope to stay ahead of the problems. These and other efforts should be made to initiate solutions before crises occur. Strict enforcement of the road design standards set forth in the Site Plan and Subdivision Review Resolutions will be extremely helpful in achieving a high quality County road network at the least cost.

Many kinds of health care and health care facilities can best be provided and administered by the County on a regional basis. Also, inspection personnel operating under the County Health Coordinator appears to be the most efficient way of enforcing State and Local Health Codes. The State Health codes should be adhered to at all levels and municipal governments should be encouraged to adopt and enforce those that depend on local enactment for application.

Although the County Hospital and the Lakeview Home are well run institutions, long range plans should be made not only for the expansion of these facilities; but also for the development of out-patient clinics. A desirable time table for such expansion and recommended financial programming should be developed as well as a continuous planning and capital budgeting program.

The responsibility of the County with regard to education appears to lie primarily in the area of vocational education. This will be true until the County is much more populous – when a full scale junior college will become feasible. Sal Tech offers a running start for an outstanding junior college with emphasis on vocational training. A vocational high school or job training center serving all county high schools on a shared time basis also appears to be a logical means of combating the dropout problem and at the same time providing badly needed skills for the modern, rapidly-changing production and service technology.

The percentage of the County Budget allocated for welfare is so large that the County should seek to have the management and complete financing of these State mandated programs assumed by State government. Failing this, the County should make special efforts to more adequately oversee these operations. The goal of providing adequate assistance for all families incapable of earning a living should be supplemented by programs designed to encourage these families to become productive members of our society. Technical job training programs should be supported to equip these people with usable skills. Day care centers should also be established and expanded where necessary to allow working parents to leave their children with competent care while they are at their jobs. By encouraging these and other practices to help the less skilled and educated people, the economy of the County will be bolstered while at the same time reducing the soaring welfare costs.

COMPREHENSIVE DEVELOPMENT

So far we have examined all of the constituent elements which make up the Comprehensive Development Plan of Salem County. While each was presented by itself, a necessity dictated by the mode of presentation, these elements are not meant to be isolated plans in themselves. Indeed, they were not prepared in that matter. Therefore, to get a clearer understanding of the totality and interrelatedness of these elements, it is necessary to piece them together for a comprehensive look. In order to do so, two important factors must be pointed out – time and interactions.

In the preceding pages of this chapter, certain elements were put within a relative time frame; at least to the extent of establishing priorities. Ideally, we would like to say when which planned event would take place. But at this stage of the planning program, this is an impossibility. While we have generally been concerned with a time span of twenty years, this has not been a rigid criterion. Some elements are easier to deal with temporally than others. For example, the aggregation of road right-of-ways on a systematic basis can be dealt with readily by establishing a capital budgeting program within the governmental structure. This is equally true of any planning program which can be directly implemented by the government.

There are, however, major elements of this plan which do not lend themselves to this kind of governmental control. With respect to the future use of the land, the two most comprehensive elements are of this nature – agriculture and urbanization. The increase of urbanization and the concomitant decrease in agricultural land are governed by economic and social pressures which unfortunately are to a large extent determined by external forces or by financial and other decisions made in the private sector. Indeed, they are controlled by events which are primarily determined by values ingrained in American society as a whole. In this light, we cannot establish a critical path of events and aftermaths, nor can we program them into a capital budget.

All of the time related elements of this plan have been based on the assumption that unforeseen circumstances and events such as wars, depressions, population explosions and changes in national values will not take place and that growth in Salem county will take the path of most northeastern areas. This, of course, is the only realistic approach to take, even though such historic figures as Herbert Hoover and Neville Chamberlain could attest to the unreliability of such major events.

In order to achieve the understanding which is desired, the plan seen opposite is divorced from time. It presents all of the parts together leaving out any phasing or priorities. To leave out time might be considered academic or a little too idealistic, in as much as planning is far from static. But, on the contrary, two very important advantages are gained by this approach.

The first is that this plan again emphasizes the importance of planning based on the natural capabilities of the County's physical environment. This plan proposed the ultimate stage of development which can be sustained without damaging the physical environment, or contradicting the goals set forth earlier. Of course, this is based on the assumption of today's values, technology and knowledge. Regardless of when it takes place, we should not allow development which exceeds the limitations imposed on us by the physical environment. To do so invites disaster through both an unhealthy and a socially unacceptable environment.

The second advantage of this "ultimate" plan is that it provides us with a visual jumping off point for an examination of the interaction among the various plan elements discussed earlier. To adequately list and explain all the relationships between the various elements of this comprehensive plan would be well beyond the scope of this publication, if not impossible. However, some of the major interactions are readily seen and should be discussed. This is best facilitated by first looking at the three major land uses – urban, agriculture and open space – and then examining the remaining elements as they affect the major three.

Throughout this report, we have repeatedly stressed the interaction between urbanization and agricultural land. As urbanization increases, farmland decreases. Noting the three major urban areas planned for the future underscores the importance of the horseshoe-shaped agricultural district. If we do not maintain the integrity of this essentially open area, then it is more than probable that unconfined subdivisions and commercial development would sprawl unchecked throughout the County. This in turn would put further pressures on those areas preserved specifically as open space. The major criterion for open space preservation in this plan has been the conservation of areas which are both scenic and of unique ecological values, not as open space relief for high density urban areas. In some cases, notably the Mannington Meadow, this would be an ancillary benefit.

This is not to imply that residential, commercial and industrial development should not be regulated within the areas designated as urban. In a previous study, Open Space and Recreation, we pointed out that each level of government has particular responsibilities for the provision of various types of such facilities. As density is increased in the urbanizing areas, the responsibilities of all will become heavier. Moreover, it will become increasingly important to conserve streams and lakes within the urban areas, since these are tributary to much of our larger open space areas. Any pollution which is perpetrated in the urban areas will have serious effects in the marshes and meadowlands and quite possibly in ground water aquifers well removed from the point of release.

Thus when looked at as a whole, the three major land uses are interrelated. The manner in which one is treated will have direct effect on the others. A proper balance among the three is essential if we are to achieve many of the previously stated goals and if we are to maintain today's natural assets in the physical environment.

The remaining elements of the Comprehensive Plan can be considered as subsidiary to the three major elements. It is essential to the successful implementation of the plan that the transportation system efficiently serve all areas of the county.

For many years to come in our relatively low density region, all of the major and minor urban centers must be effectively linked together by safe, smoothly flowing traffic arteries. Furthermore, through traffic must be allowed to move swiftly through the County. The bottlenecks which now hamper our transportation system in Pennsville, Woodstown, and Penns Grove are not only unsafe but detrimental to the County's economy.

In addition, the nature of the highway net will have important effects on open space preservation. The faces of far too much parkland have been scarred by intruding superhighways, with severe and even disastrous ecological consequences. While it is necessary that these areas are accessible with relative ease, we should not permit expressways to dissect through these critically important areas.

Of equal importance is the relationship between the highway and the farmland. Most expressways have a right-of-way of three hundred feet, which, in terms of the County's 343 square miles, does not mean the loss of that much land. However, when this is valuable farmland, the consequences are serious. Limited access highways also have a tradition of breaking up farms, rendering portions of individual farms inaccessible by the farmers. Therefore, it is essential that we have an effective and logical highway system which will serve to tie together all of the major elements of the plan while at the same time not necessarily usurping or creating development pressures on land which should not be developed.

The locations and extent of future facilities and services such as sewer and water, education plants, hospitals, police and fire protection is of the utmost importance in relation to the Comprehensive Plan. Today's practice of providing these services at the demand of developments after the development takes place must be reversed. It is essential that we decide where we want development to take place and there to provide services and facilities on an orderly basis. Local and county governments in concert with the private utilities must work hard hand in hand for the provision of these elements, while denying all but minimal facilities and services in those areas which are to remain undeveloped. This is not to say that all forms of development are to be prohibited from these areas. We have no right to deny anyone from building a house in the county.

At the same time, government should not be forced to subsidize the urbanization of an area it deems necessary for preservation as open space.

By now it is obvious that local and county governments will play a leading part in the implementation and continuous planning process. In the final chapter, we shall be concerned with this aspect in greater length. However, the relationship between government and this particular plan is important and needs an elaboration here.

Most plans, including regional ones such as this, normally are quite specific about locations for future development. This plan is not, and from the outset was not intended to be. The reason of this lies in the pragmatic recognition that within the context of the New Jersey Municipal and County Planning Enabling Acts, the roles and responsibilities of each level of government are clearly set forth. Municipal government is given the power to zone which is, to date, the only realistic and most easily used land regulation. This right is explicitly denied to the County.

Therefore, considering this legal practicality and the variability of the economic and social pressures in the society, we have, as previously stated, avoided such locational specifics. This plan, when interpreted as a framework for action, places a great responsibility on Municipal government in Salem County. To a great extent, the plan will succeed or fail based on decisions made at the local level. It is therefore necessary for both levels of government to take an objective look at their individual capabilities to provide the leadership, services and facilities which can best serve the citizens of the county through effective guides to future development. We believe that in many cases, a regional approach to our problems can better meet these needs. Where the county can most effectively act in these capacities, it should do so. The same principle applies to municipal government. The nature of this plan demands that we not be tied onto the existing dichotomy of county-municipal government. If certain changes are needed, we must make them in a cooperative spirit, for to deny these needs is a disservice to the citizens of Salem, County.

8. Implementation

The desirability of change through urban and industrial growth is sometimes questionable. On the one hand are the new jobs and prosperity which are considered corollaries to its presence; on the other is the confusion and disruption which it brings to an established and regulated community setting. But desirable or not, it is a fact of life that change does occur. It occurs continuously, and unless we accept this fact and are prepared to deal with it, we will be inundated by the waves of progress.

Salem County is growing and changing, which is inevitable. Population projections estimate that the number of inhabitants in the county will increase by over 70% in the next twenty years. With this increase there will be a greater demand for housing, transportation and services at rates unprecedented in this county.

The purpose of the plan is to control and direct this impending growth. It has established guide lines and policies which channel development towards established goals.

The New Jersey Municipal Enabling Act of 1953 gives extensive authority to the municipalities to develop comprehensive plans, official maps and subdivisions ordinances and, in addition, the Municipal Zoning Enabling Act provides them the right to . . . "limit and restrict to specified districts and . . . regulate therein, buildings and structures . . . and the nature and extent of their uses, and the nature and extent of the uses of the land . . ."

Though the jurisdiction of the governing body to regulate within its municipal boundaries is extensive, the problems of growth which it faces do not always contain themselves within the boundaries. Thus for the purpose of establishing adequate controls and planning policies, it is impossible for any municipal unit to act independently. Their efforts must be efforts of cooperation and their planning must be detailed and esoteric process operating within a larger, but more general, regional framework.

The county does not have the extensive enforcement powers that are available to municipalities. Basically it has the authority to review any development which might affect county maintained road or drainage systems. Two important functions of which the county is capable are first, planning for and implementing regional facilities and services on a more economical and effective basis and secondly, coordinating municipal planning and development. A Board of Chosen Freeholders and its planning board, each group made up of representatives from various municipalities, brings together the diverse needs and desires of every area and puts them together into the general framework of a plan for the entire region.

The most important element of plan implementation is the participation of as many people as possible. It is at the municipal level where the closest contact with the citizenry participation can take place. The County Plan provides a generalized scheme and municipalities make the choices with local regulations and development approvals, the choices which fall in the spaces to solidify the form. The plan is designed for the benefit of the citizen. It will serve to protect and enhance his environment, provide guidelines which indicate where he is able to invest his energy and capital and then, if supported with sound regulations and firm and uniform enforcement, protect that investment. Consequently, because the plan is created to serve the individual, it is essential that

each citizen take an active part in making the choices, selecting policies and goals and contributing ideas to it on a continuing basis.

GENERAL ACTION

Implementation of a master plan for the county includes several forms of action. At all levels there are general activities which must exist. Administration improvements are a critical part of any plan implementation program. If municipal and county governments are to continue to provide the essential services as well as new ones, their administrative systems must be capable of expanding and changing. As Salem County continues to grow at a continually increasing rate, governmental facilities by necessity must keep pace. Municipal and county leaders must be flexible enough and have the foresight to adjust and modify both structure and methods, if they are to cope successfully with the new growth that is coming.

The most important part of any plan for future development is not the plan itself, but the motivation and action it generates. People must become interested in their future. They must want to assume a role in shaping the things to come. A great spectrum of ideas and opinions as to how growth should take place will exist and every individual should be encouraged to vocalize his opinion. It is through these ideas that the framework that has been proposed here will continually change to keep pace with the changing desires and needs of Salem County's citizens. In this process, the frame will necessarily bend, twist and stretch, as it should. But it will always be there – a clear representation of the best current thinking about the future, a valuable background upon which to base day to day development decisions.

Not only is it most important that as many citizens as possible be informed and interested in all aspects of the planned development of the county but it is also important that there be a widespread understanding of all of the tools of planning and the planning process itself. As a group of people living ever more closely together we must be able to recognize the nature of change in the constantly evolving social and physical environment and recognize that goals and methods of achieving goals can never be final. We must be ready to regularly change methods of implementation to meet changing needs.

With the existence of such an atmosphere of communication and cooperative action, the specifications of implementation can be accomplished at the county level creating the broader framework, and at the municipal level effecting the basics of controlling and directing growth in logical patterns. As indicated below the activities are basically the same, the differences being in degree of detail.

Adoption of a county master plan is the first and most important step in a coordinated regional planning program. The plan will serve as the frame of reference for all municipal plans and ideally all development should fall generally within its guidelines.

To allow for the orderly and systematic establishment of services and capital improvements, a comprehensive financial program will be developed to coincide with the plan. Likewise an official map will be recommended for adoption that will delineate and project future needs for highways, parks, open space and sites for public buildings. The map will facilitate long range road development projects and also serve as a guide to private developers.

The two basic regulatory rules will be site plan and subdivision review. The site plan resolution enables the county to establish rules, regulations and standards to review development plans for projects along county roads and thus promote a safe and efficient county road system. The subdivision resolution allows the county to establish rules, regulations and standards to guide subdivision activity in order to maintain the viability of the county road system and maintain an efficient regional surface drainage network and in so doing, promote the public health, safety, convenience and general welfare of the county.

In a similar manner county commissions and authorities will be recommended which will enable the county, acting as a regional agent, to oversee and coordinate efforts in important areas that are of concern throughout the entire county. In matters such as regional parks, sewer and water systems, solid waste disposal, mosquito control, etc., regional cooperation can mean substantial savings and better services.

Following the general framework of the county regional plan, municipal master plans deal in detail with matters such as the use of land and buildings, public facilities and services, transportation, housing, conservation, and distribution and density of populations.

Just as at the county level, an official map should be adopted which will delineate locations and dimensions of planned streets, parks, open spaces and sites for public buildings. Whether these facilities are existing or proposed, they can be determined and indicated on the official map in order to facilitate overall development planning.

The primary legal instrument for giving effect to that part of the plan which deals with the use and development of privately owned land is zoning. It is the most important means that presently exists of actually controlling the realization of the plan. Likewise, the regulation of subdivisions is used to insure orderly growth and development and to obtain needed site improvements as development takes place. Other devices such as building, health, and housing codes, urban renewal projects, and public land acquisition are used to help the community grow or renovate itself according to plan.

In terms of overall implementation, it is important to recognize that details of regulation and enforcement rests at the municipal level, and that it is here that much of our planning effort will either succeed or fail.

THE PLANNING PROCESS

The Salem County Plan is now complete. It is at this point that it leaves theory and begins to become a reality. It is at this point that the people of Salem County are again asked to help with their reactions, ideas, and opinions. The diagram above explains the part of the process we have just been through, and shows what must still be done to create a successful plan, and more importantly, its implementation.

The first step in the planning process is fact finding. It entails a complete investigation of all facets of the existing environment to include physical elements such as geology, soils and water and social elements such as population, housing, economics and land use. An extensive body of facts and data is the project of this investigation. In the second phase of the process, all information is correlated, and thoroughly analyzed. All possible implications are sought, and probable and theoretical development alternatives recognized and determined. Community opinion is solicited, the result

being the establishment of goals and policies. Thus, the guidelines are established within which the information resulting from phase one and two will be used.

The intent of this preliminary work is to establish a base for structuring a plan which best allows growth to occur in the desired manner and direction. Within this plan, the fruits of several years research and analysis are organized. Specific proposals to guide future development are made, and programs and methods for implementation are outlined. But because planning is a continuous and unending process, the plan is by no means the end product and culmination of all efforts. The cycle is completed only for the first time. It will be repeated over and over again.

As the plan is implemented, and as it begins to affect growth and development, side effects will be felt, both positive and negative, and will take the form of new information feedback. At the same time the environment is continuously changing, not only because of the plan implementation, but also because of new elements being introduced and unforeseen developments occurring. The data and information which served as the basis for the original plan must consequently be updated and revised. New implications must be determined and the possibility of new goals and policies investigated. Revaluation and restructuring thus produce an updated plan which realistically encompasses all consideration of the ever changing environment and allows for departures in development proposals and controls. But, like the original plan, this revision is not the final product. The planning process as a review procedure is used again and again in order to keep the framework of growth a current and realistic development scheme.

