

DEVELOPMENT PLANNING IN ENVIRONMENTALLY SENSITIVE
BARRIER ISLANDS: A CASE STUDY OF
KIAWAH ISLAND

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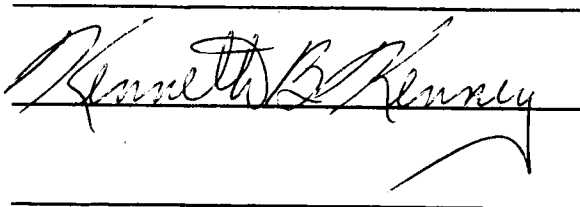
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To the Graduate Council:

I am submitting herewith a thesis written by Boyd R. Dethero entitled "Development Planning in Environmentally Sensitive Barrier Islands: A Case Study of Kiawah Island." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Planning.

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ABSTRACT

Environmentally sensitive areas, such as the coastal zone, and their vulnerability to development pressures have become a major policy issue in the United States during the last three decades. Decision makers and planners have not had an objective basis for evaluating the tradeoffs between development and preservation of these areas. It is the purpose of this thesis to examine one particular case of this conflict over development in the coastal zone: the development of Kiawah Island.

The development processes that occurred at Kiawah Island were studied and compared to three distinct planning processes, which were described in Chapters II through IV. The processes of environmental planning, development planning, and the public approval process were discussed as they have been developed in the planning literature. This detailed discussion formed a framework for comparing the Kiawah Island development planning processes.

Two methods were used to examine the Kiawah development. The first is an examination of the written planning documents that were developed for the master development plan for Kiawah. The second method involved the interviewing of major actors concerning their roles in the development process. In studying the various aspects of the development, the purpose was to consider the following components of the development of the Island:

1. What was the intended strategy for developing Kiawah, and how was this process carried out?
2. What are the economic ramifications of environmentally sensitive development planning at Kiawah?
3. Who were the major actors in the planning process and what roles did they play in the development of Kiawah Island?
4. What effects did these actors have on the development of the final plan?
5. What were the major factors and elements in the environmental design planning process, and how are problems and issues resolved?

Following the comparative analysis of the planning processes as set forth in this literature, the major conclusions were:

1. The Kiawah planning process, because of its comprehensive nature and being based on a complete natural systems inventory, is unique in its scale as applied to an environmentally sensitive area within the coastal zone.
2. The process, because of its high cost, is only economically feasible for large-scale projects, with an affluent clientele, without large public subsidies.
3. The process has merit on a smaller scale when using only readily available information or systems such as soil, slope, floodway and vegetation data.

4. The process needs monitoring to test its transferability to other coastal zone areas, as well as environmentally sensitive areas beyond the coastal zone.

5. The public approval of the project was only successful because of the developers consummate negotiating skills.

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CHAPTER I

INTRODUCTION TO THE PROBLEM

Concern for the protection and conservation of the natural environment has increasingly become a major policy issue in the United States in the last three decades. More specifically, the treatment of the coastal zone has become a leading environmental issue. This is due primarily to competition and conflicting demands for a relatively limited supply of coastline and an even more limited supply of barrier islands.

The controversy concerning use of our scarce coastal resources divides itself between two extremes. On the one hand, the "environmentalists" believe that all coastal resources should remain in their natural state and be utilized for limited, low-impact recreational purposes (if used at all). At the opposite pole, the "developers" contend that all resources should be accessible for development purposes. Here development is desired as an end in itself as measured by increases in income to developers and to those who provide them with capital, and in increases in jobs and tax revenues to governments where the development occurs. Decision makers and planners are exposed to pressures from both groups, and these pressures are difficult to resist because these officials have no comprehensive or objective basis for evaluating the tradeoffs between the two extremes, and since many of

the tradeoffs which are made are based on inherently subjective criteria.¹

Purpose

It is the purpose of this thesis to examine one particular case of this conflict over the development of the coastal zone: the development of Kiawah Island.

This examination will take place against a context to be developed in Chapters Two through Four. Chapter Two is a discussion of the environmental planning process as it has been developed in the planning literature. Chapter Three takes the same approach to the development planning process, examining the techniques which have been developed in the planning and development literature. Chapter Four carries out this analysis for the public approval process. These three chapters lay the groundwork for the detailed examination of these three processes as they unfolded in the planning and development of Kiawah Island.

The detailed examination of the process as it took place at Kiawah uses two distinct methods. The first is an examination of the written documents which were developed in the development process of the island. These documents include the preliminary environmental analysis; the development plan, including a master plan and economic analysis

¹James C. Hite and Eugene A. Laurent, Environmental Planning: An Economic Analysis (New York: Praeger Brothers, 1972), p. 3.

of development alternatives; and the minutes of various public hearings and other meetings which took place during the development of Kiawah. The second method is the study and documentation of the interactive process that took place among the major actors and the roles that they played in the development of Kiawah Island. Numerous individuals and several strong opposition groups were active during the planning and rezoning process on Kiawah. Those groups that were most vocal include the Sierra Club, the Audobon Society, the Nature Conservancy, the Jewish League, and the Heritage Trust.

Other actors included representatives of the Kiawah Beach Company, Inc., which is wholly owned by Coastal Shores, Inc., a subsidiary of Kiawah Investment Company. Members of the Charleston County Planning Board and the Charleston County Council also played an important role in the process. Professional planners and experts in community building were all important, and their views of the Kiawah Island development are an essential ingredient of the study. The purpose here was to interview key actors in the development process and to document the impact that each major group had during the interactive process.

In studying these various aspects of the project, the intent was to consider the following aspects of the development of the Island:

1. What was the intended strategy for developing Kiawah, and how was this process carried out?
2. What are the economic ramifications of environmentally sensitive development planning at Kiawah?
3. Who were the major actors in the planning process and what roles did they play in the development of Kiawah Island?
4. What effects did these actors have on the development of the final plan?
5. What were the major factors and elements in the environmental design planning process, and how were problems and issues resolved?

Before examining in detail the development process as it occurred on Kiawah Island, it will be useful to consider the context in which the development took place. In order to do this, brief consideration must be given to the characteristics of the coastal zone and some of the historical conflict over its development.

Definition and Extent of the Problem

The coastal zone, including open water, estuaries and shorelands, contains a significant amount of the nation's population. Over half of the U. S. population, 140 million people, reside in counties bordering the Atlantic or Pacific Oceans or the Great Lakes. Land development in these areas has led to extensive destruction of estuaries and marshlands.

Between 1922 and 1955, over one-fourth of the salt marshes in the United States were destroyed by filling, diking or by constructing walls along the seaward marsh edge. From 1950 to 1970 more than one-half million acres, or seven percent, of the fish and wildlife estuaries in the United States were dredged and filled.²

Nowhere in the United States does the conflict between public environmental needs and private development pressures come into sharper focus than on the barrier islands.³

These areas are long chains of relatively flat, sandy islands that flank much of the U. S. Coastline, extending from Maine to Texas. The barrier islands are just now beginning to be recognized as an endangered resource which contain several irreplaceable public benefits. Among these benefits are:

1. These islands are the mainland's front line of defense against storms and hurricanes.
2. Barrier islands have a special serenity and scenic quality along the ocean front, and contain landward expanses of sand, forests, marshes, mangroves, and estuaries.

²Dan K. Richardson, The Cost of Environmental Protection, Regulating Housing Development in the Coastal Zone (New Brunswick: Center for Urban Policy Research, 1976), p. 7.

³John R. Clark and Robb Turner, "Barrier Islands: A Threatened Fragile Resources," Conservation Foundation Letter, August 1976, p. 1.

They provide many of the Atlantic and Gulf coast beaches, and offer unique recreational opportunities for millions.

3. Barrier islands provide unique habitats and food supplies for countless species of birds, mammals, and aquatic life. Ecologically, they contain waterways that lie between the barrier strips and the coastline.⁴

The process of degradation of the coastal zone and the barrier islands has been documented by many other studies:

Pollutants transported down rivers or in direct runoff from the land are concentrated within coastal estuarine systems and cause irreversible damage to the resources of the coastal interface.⁵

Included is damage to the commercial fishing industry, 70 percent of which occurs in the coastal waters at a yield of \$300 million annually.⁶

The coastal estuarine waters and marshlands provide the nutrients, nursing areas, and spawning grounds for two-thirds of the world's entire harvest of fish, worth over seven billion dollars annually.⁷ These fisheries account for one-tenth of the world's animal protein production.⁸

⁴Ibid., p. 1

⁵Commission on Marine Science, Engineering and Resources, Our Nation and the Sea (Washington, D.C.: United States Government Printing Office, 1969), pp.73-74

⁶Richardson, p. 7.

⁷U. S. Senate, Senate Report No. 92-753, p. 3.

⁸Commission on Marine Science, Engineering and Resources, pp. 87-88.

Residential and commercial-recreational developments provide the major competitor for coastal zone resources and dominate land uses in the coastal area. A substantial amount of the estuarine environment has been lost to housing developments, which has contributed to a significant amount of "nearshore" pollution. The negative external costs of coastal housing developments have exceeded those produced by offshore oil drilling and mineral mining.⁹

Many barrier islands have become attractive areas for real estate speculation and intensive development during the last decade. Growing demand for these fragile strips of land has occurred due to increased leisure time, and a prosperous economy, improved transportation, and the growing scarcity of available beachfront recreational land.

Due to their remoteness and special characteristics, development of barrier islands usually requires massive public subsidy. Bridges, roads, sewers, water supply, beach protection, and storm insurance are several of the elements which are generally more costly and extensive than for mainland developments. Thus, a disproportionate amount of public money is utilized to support barrier island development, which then usually preempts public access to beaches and other island amenities.¹⁰

⁹H. Ketchum Bostwick, The Water's Edge: Critical Problems of the Coastal Zone (Cambridge: The MIT Press, 1972), pp. 103-104.

¹⁰Clark and Turner, p. 2.

The Conservation Foundation, in a 1976 survey inventory, identified the existence of 281 barrier islands and barrier beaches of 100 acres or more in size along the Atlantic and Gulf coasts.¹¹

Barrier beaches were included because they are very similar in form and function but are in reality spits or peninsulas connected to the mainland.

Ownership of the islands was found to be in four categories:

1. Developed islands where private ownership is share among many small landholders;
2. Partially developed or undeveloped islands where land is privately held in large trusts by individuals, families, or corporations;
3. Islands partially or wholly owned by the Federal Government for national shores, historic sites, or wildlife refuges; and
4. Islands, or small tracts of islands held by state and local governments as public parks, beaches or wildlife refuges.

Of the 281 islands, 70 were found to have been heavily developed and in some cases urbanized.¹² Many

¹¹Ibid.

¹²Ibid.

of these are virtually destroyed as natural resources or are locked up for private use. These include such famous strips as Atlantic City, New Jersey; Miami Beach; Hilton Head, South Carolina; Jekyll Island, Georgia; Galveston Island, Texas; and Atlantic Beach, North Carolina.

Islands that have been partially saved by "eleventh hour" federal and local land use regulations include: St. Georges, Marco, and Sanibel Islands in Florida; St. Phillips, South Carolina; and Bald Head, North Carolina. Approximately 30 islands or parts of them have been acquired by purchase for inclusion in public recreation areas or preserves.¹³

The Nature Conservancy, which leads the way in private preservation efforts, has spared from development many barrier islands, including a contiguous string of thirteen along the Virginia coast. The federal government has acquired or plans to acquire a dozen or so of the larger, more impressive islands for inclusion within seven existing National Parks. They include Fire Island, Assateague Island, Cape Hatteras, Cumberland Island, Gulf Islands, Padre Island, and Cape Lookout National Seashores.¹⁴ The survey also identified another 100 significant, undeveloped, private owned barrier islands which are under immediate threat of development.

¹³Ibid.

¹⁴Ibid.

Despite the fact that no comprehensive federal program exists for preserving or regulating barrier island development, some programs have been undertaken by individual agencies. For more than thirty years the National Park Service and the Corps of Engineers have been performing and implementing beach restoration and dune stabilization projects in North Carolina. However, extensive research on beach and dune dynamics in the last decade has confirmed the impracticality of stabilizing a barrier island. Therefore, these projects were abandoned, at a significant saving in tax dollars, by allowing these islands to follow their natural dynamic course.¹⁵

The danger of destabilizing the system of barrier islands was poignantly illustrated in March of 1962 when a severe storm hit the northeast coast from Long Island to Georgia. Sixty mile-per-hour winds continued for three days, producing forty foot waves and leaving eighty million dollars damage in their wake.¹⁶ Interestingly enough, where the dunes were unbreached and reinforced with natural groundcover, development along the coastal zone remained and was subjected to only minor damage. Unfortunately, the housing that collapsed was rebuilt on the same unstable sites, atop the sand dunes.

¹⁵Ibid., p. 9.

¹⁶Ian McHarg, Design With Nature (Garden City: The Natural History Press, 1969), p. 19.

Responses To The Problem

It is clear that the problem of maintaining a balance in the coastal zone is a task which is both necessary and complex. Increasing numbers of people have urged that something be done before more problems are created, some of which may be impossible to cure. It will be useful to consider what pattern these responses to the problem have taken.

Although the coastal zone has increasingly been subjected to steadily mounting development pressures, local land use control measures have not been effective in either maintaining a viable coastal zone resource base or handling conflicting demands on these resources. Local land use regulations that have been implemented with varying degrees of success to manage development in conformity with natural restraints include: subdivision regulations, zoning, setback standards, non-conforming use controls, identification of poorly located buildings (e.g., on storm threatened beach fronts), and special protection ordinances for sand dunes and wetlands.

These traditional land use control regulations have proven too inflexible for "blanket coverage" of coastal areas. These control mechanisms help prevent particular mis-uses of the land, but do not provide for the optimal use of land. Procedural inefficiencies or incongruities, rather

than social or environmental sensitivity were the catalysts for change.¹⁷

Another problem with local land-use control measures is the strength of the planning on which many of them are based. Barrier island conservation using land use controls should start with a comprehensive plan based upon natural systems. This would require complete redrafting of most communities' plans.¹⁸

Since most local measures proved to be ineffective, action on a higher level to solve the problems of the coastal zone was soon called for. After more than a decade of debate, the Federal Government formulated the Coastal Zone Management Act in 1972. The Act was intended to protect and manage the sensitive coastal environment. As with most federal legislation, the goals of the act were lofty. In testimony during the hearings on the act, the National Governor's Association stated:

To resolve these pressures an administrative and legal framework must be developed to promote balance among coastal activities based upon scientific, economic, and social considerations. This would entail mediating the differences between conflicting uses and overlapping political jurisdictions.¹⁹

¹⁷Richardson, p. 39.

¹⁸Clark and Turner, p. 10.

¹⁹National Governor's Conference, Policy Positions of the National Governor's Conference, 1971, p. 34.

Further emphasis on the need for effective control in the coastal zone was expressed by Hite and Stepp:

Of all the natural resource-environmental policy problems facing the American people, the most pressing appear to be centered in the coastal zone. Coastal resources are not as widely scattered geographically as other natural resources. They are concentrated in a rather narrow band where the continent meets the tidal sea and they are used by the population scattered across the continental land mass. The pressure on these scarce coastal resources has grown with increases in population, wealth, mobility, and leisure time. With this growing pressure has come increased conflicts over who is to use the resources of the coastal zone, how they are to be used, and when that use is to take place. The result has been a new interest at both federal and state levels in devising a management system (or systems) for the resources of the coastal zone.²⁰

Under the Coastal Zone Management Act of 1972, all development activities have to conform to approved state programs. However, the state programs can only be effective if backed by strong local ordinances. Most states are depending on state and local beach, dune, and wetlands ordinances and laws which leave island interiors unprotected.²¹

The most comprehensive approach to local regulation of development on a barrier island took place in the City of Sanibel Island, Florida. The City was incorporated in 1974 by a vote of concerned residents who reacted against Lee County zoning practices that would have allowed more

²⁰James C. Hite and James C. Stepp, Coastal Zone Resource Management (New York, Praeger Brothers, 1971) p.v.

²¹Clark and Turner, p. 9.

than 100,000 residents to occupy the island. Following Island incorporation, the planning firm of Wallace, McHarg, Roberts and Todd was retained to formulate a development plan. The consultants were also responsible for receiving public input through interviews and workshops with representative groups. As a result the population ceiling was reduced to 25,000. This meant severely cutting back on the number of beachfront condominiums and single-family houses, which served to protect sensitive dunes, marshes, and mangrove swamps from development.²² As would be expected, numerous lawsuits from angry developers have ensued.

The "Sanibel Plan" is exceptional and exemplary in both its content and implementation. Thus, its application, via the public sector, is a process that deserves attention. The plan, in McHarg fashion, was based on a natural systems inventory and resulted in replanning of an entire barrier island. Details of the Sanibel Plan are discussed in the following chapters.

Numerous barrier islands weren't so blessed with such a plan, and have fallen prey to haphazard development. The remaining undeveloped or partially developed islands will be subjected to increasing development pressure. The federal government is inadvertently supporting or encouraging the development of these vulnerable islands

²²John Clark, The Sanibel Report (New York: The Conservation Foundation, 1976), p. 15.

through public works programs, federal flood insurance, and housing mortgage guarantees.²³ With these indirect federal subsidies and the public's increasing demand for coastal living, development by the private sector is imminent. The value of studying and documenting an environmental development plan which originated from the private sector is apparent, since that process may lend some insight concerning measures which will work in other situations.

Before beginning the detailed discussion of environmental design planning and its application to several barrier island development situations, a few terms and concepts within the field of coastal zone management must be clarified.

Coastal Zone Management

Coastal zone management's primary concern is with the maintenance of coastal ecosystems in their optimal condition. This delicate ecosystem is composed of highly interrelated elements which are classified by coastal zone resource management programs according to the following criteria:

1. Vital or preservation areas: ecosystem elements of such critical importance and high value that they are to

²³John Clark, Barrier Islands and Beaches (Washington, D.C.: The Conservation Foundation, 1976), p. 15.

be preserved intact and protected from disruptive forces--encompassed within an area of environmental concern.

2. Environmental concern or conservation areas: broad areas of environmental sensitivity, possibly containing one or more vital areas, the development or use of which must be carefully controlled to protect the ecosystem.

3. Normal concern or utilization areas: regions where only the conservation practices of the land ethic apply to development activities.²⁴

When the taxonomy of coastal zone management began to become more sophisticated, new concepts emerged. One system aimed at regulation of cumulative or indirect degradation of the coastal resource base uses the concept of the area's "carrying capacity." This process entails measuring the ecological or natural resources and identifying the intrinsic constraints these impose upon population density and development. A balance is then achieved between the natural and human elements which will determine the extent to which the environment will continue to be productive. Figure 1 illustrates the components and their interdependence within a carrying capacity approach to the planning process.²⁵

This concept of combining human and natural resource management has provided a new dimension in traditional land

²⁴Richardson, p. 7.

²⁵A. B. Bishop, Carrying Capacity in Regional Environmental Management (Washington, D.C.: U. S. Environmental Protection Agency, 1974), pp. 104-106.

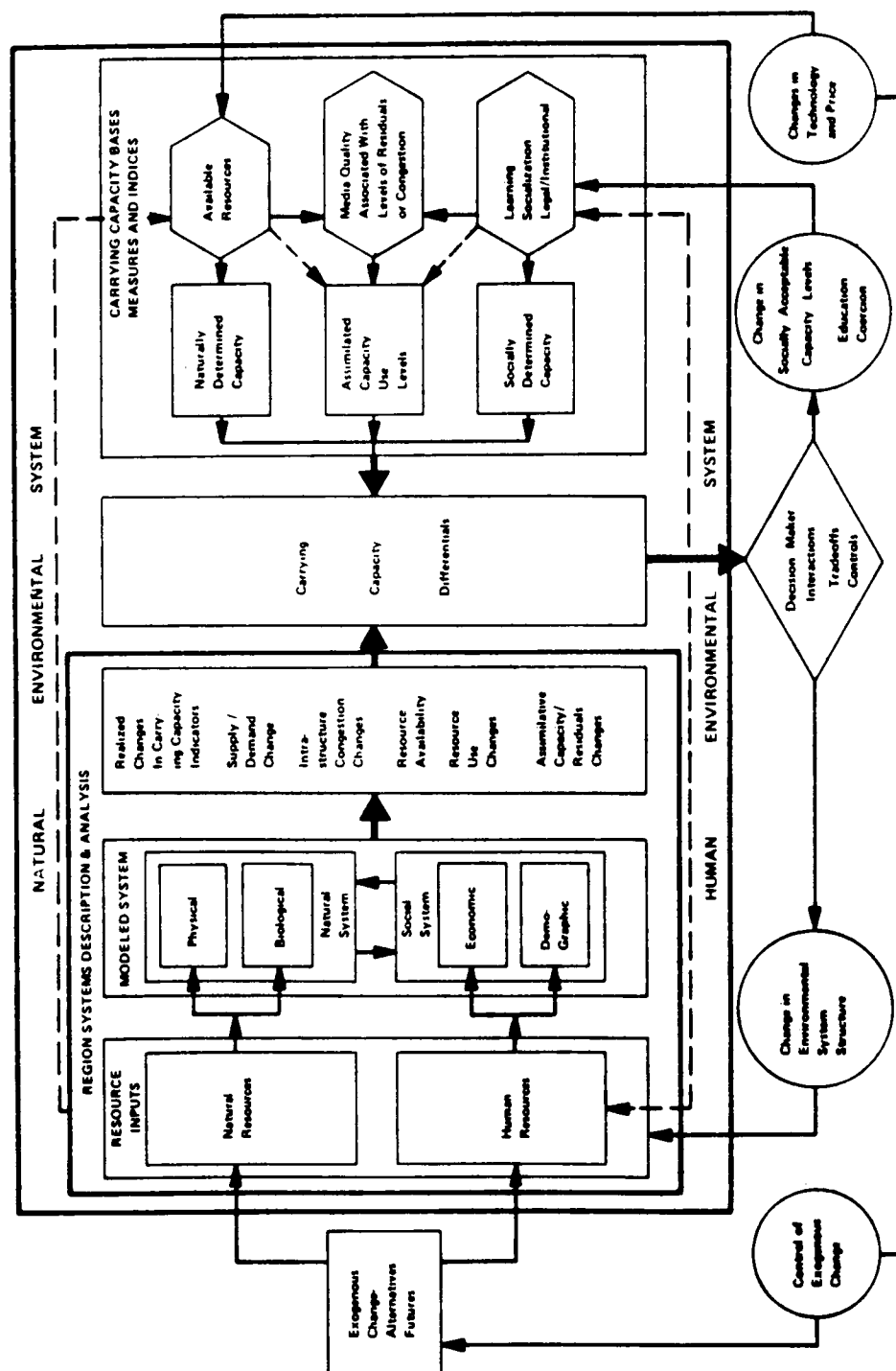


Figure 1. THE CARRYING CAPACITY PROCESS

Source: A. B. Bishop, Carrying Capacity in Regional Environmental Management (Washington, D.C.: U. S. Environmental Protection Agency, 1974)

use planning by incorporating social as well as ecological components into the planning process.²⁶

Another method used to assess land use locations and the resulting impacts on coastal marine resources was developed by the Nassau-Suffolk Regional Planning Board for the Office of Policy Development and Research of the Department of Housing and Urban Development. The guidebook, published in 1976, is entitled, Integration of Regional Land Use Planning and Coastal Zone Science--A Guidebook for Planners. The publication sets forth a comprehensive, integrative methodology that develops land use and disposal alternatives which are then ranked on the basis of environmental, economic, and socio-political characteristics. Twelve studies are integrated, including: Land Use Data System, Waste Generation Rates, Transportation Coefficients, Pollution Susceptibility, Biological Constraints, Environmental Constraints, Waste Treatment Evaluation, Coastal Zone Modeling System, Cause-Condition-Condition-Effect, Economic Analysis, Political Analysis, and Legal Analysis.²⁷ Figure 2 illustrates how the integrative methodology is applied to the planning process.

²⁶Richardson, p. 39.

²⁷Nassau-Suffolk Regional Planning Board, Integration of Regional Land Use Planning and Coastal Zone Science--A Guidebook for Planners (Washington, D.C.: U. S. Government Printing Office, 1976), p. xvii.

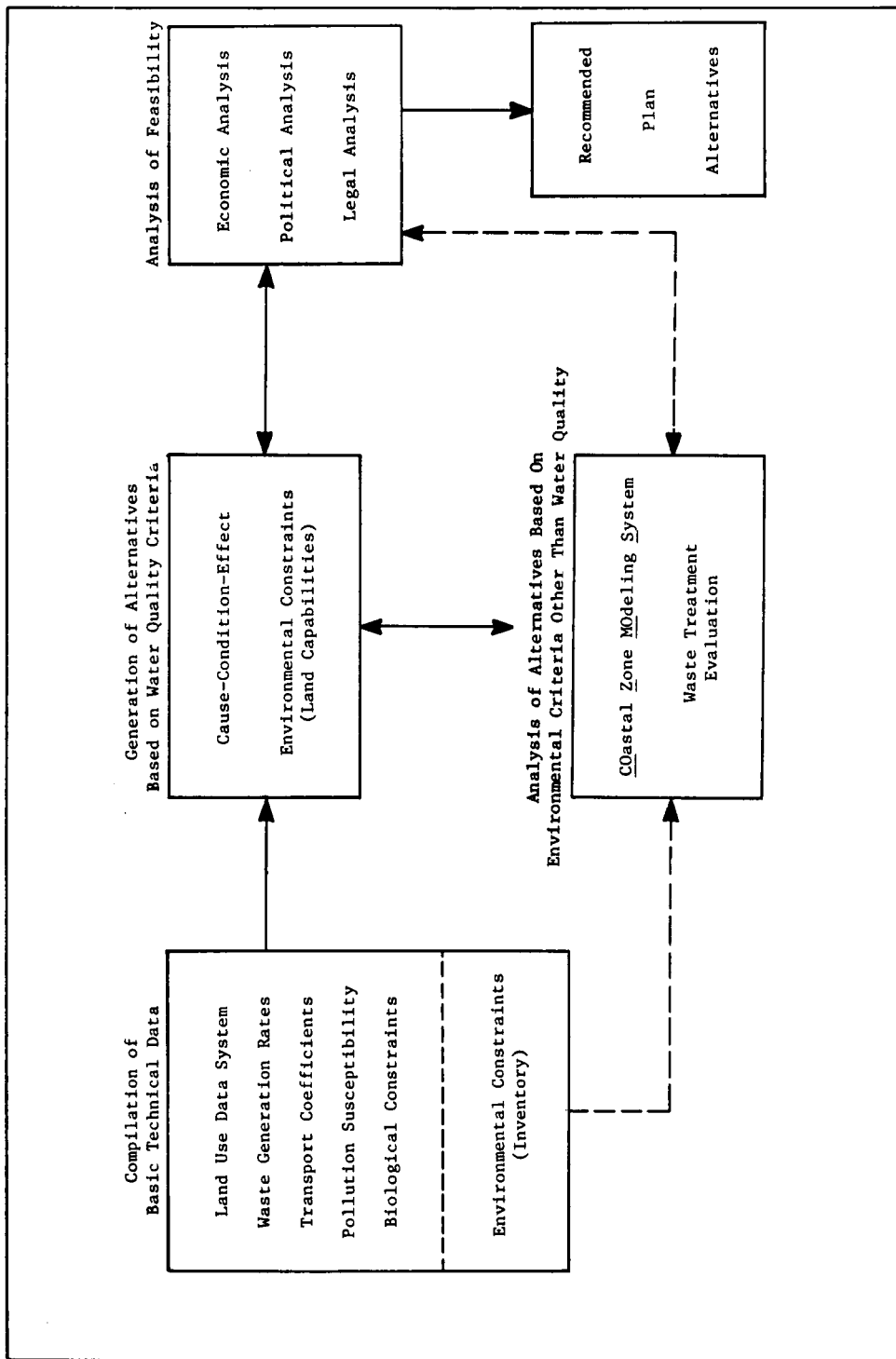


Figure 2. INTEGRATED METHODOLOGY FLOWCHART

Source: Nassau-Suffolk Regional Planning Board, Integration of Regional Land Use Planning and Coastal Zone Science--A Guidebook for Planners (Washington, D.C.: U. S. Government Printing Office, 1976).

Both the "Carrying Capacity" approach and the approach developed for the Nassau-Suffolk region will be examined in detail in the following chapters, not only in their theoretical development, but also in applications to coastal zone situations.

CHAPTER II

ENVIRONMENTAL DESIGN PLANNING

Introduction of Concepts

Environmental design planning may be defined as a systematic interdisciplinary study of the natural and manmade environment which forms the basis for a comprehensive development planning process. The "design" aspect differentiates the concept from environmental planning, which is concerned only with the natural environmental features inherent in an area. Environmental design planning is broader in scope, and includes consideration of the interaction of and interdependence between the natural and man-made environments. The properly established environmental design process continually takes into consideration the interactions between the environment and the man-made design products, and periodically reevaluates the development plan. In contrast, environmental planning may have the inventory of natural features as an end in itself.

In this chapter several different methodologies for carrying out environmental design planning will be considered, with the goal of understanding the strengths and weaknesses of each. Thorough discussion of these techniques will provide a sound basis for evaluation of the environmental design process as it took place at Kiawah Island. This evaluation will take place in Chapter V. Although there are

differences in approach among the methods which will be considered, all of them are based on the concepts of natural system capability, human use suitability, and carrying capacity. Careful consideration of these concepts will provide a basis for further discussion.¹

Land Capability

Land capability describes the extent to which the environment of a natural system can be modified without the necessity for extensive artificial measures to redevelop or maintain a natural balance within the system (or in its place among other systems), once the new environment is established.² A land capability study involves an analysis of the natural features of the environment to determine their natural ability to accommodate particular land uses without creating significant problems for either inhabitants of an area or for the environment itself.³ Studies which are used in the land capability analysis may vary according to the level of detail required, time constraints, or financial support. Most commonly, at least the soils, surfaces or

¹Richard Zelinski, Evaluating Dichotomies in Resource Development, Master's Thesis, University of Tennessee, 1977, p. 14.

²Zelinski, Crowland, TVA, p. 14.

³Rogers, p. 8.

subsurface geology, and slopes are inventoried. Data acquired from the environmental inventory can then be translated into standards and development criteria. Examples of these are wastewater treatment effluent limits, logging restrictions, erosion controls, drainage provisions, and plotting areas of critical environmental concern. The capability concept involves the consideration of the physical features of an area, which in some cases is sufficient. When one is considering development planning, however, attention must be given to the human and social possibilities as well as to the physical characteristics. Capability is usually termed "suitability" when this other set of considerations are added.

Land Suitability

The term land use suitability describes the ability of a natural system to accommodate a desired use of the human community without the necessity for extensive artificial measures to develop or maintain the human use desired.⁴ A land suitability analysis is a study that links the needs and desires for various land uses and the results of the capability analysis.⁵ Physical features, social, and cultural facilities are all considered in the suitability analysis. Examples include foundation stability require-

⁴Zelinski, p. 15.

⁵Rogers, p. 8.

ments, septic field regulations, and drainage provisions. Other considerations include adequate transportation facilities, proximity to schools and recreation areas, and the compatibility with future and existing land uses.⁶ An environmentally designed plan should attempt to match the capability of the natural system with a site's or area's suitability for human development.

The translation of the capability and suitability concepts into a development plan is a complex process. Except in most extreme situations, where the capability analysis reveals that the ecosystem is too fragile for any development, estimates must be made of the quantity of development which can be safely accommodated. The concentration on the quantitative dimension has been one of the most challenging areas in the development of environmental planning techniques. The Urban Land Institute relates such a process of quantification to the calculation of carrying capacity.

Carrying Capacity

The concept of carrying capacity was originally utilized to relate the demand and supply of resources to sustain life. Grazing land is said to be stocked at its carrying capacity when a given number of animals with known daily nutritional and water requirements is in

⁶Zelinski, p. 15.

equilibrium with or does not exceed the actual land productivity for forage and water on a sustained-yield basis.⁷

Carrying capacity, when employed as a planning tool, involves the consideration of the interaction of environmental, socio-psychological, and institutional factors. Thus, the amount of development that is allowed to occur in an area experiencing development pressure depends on:

- (1) the area's natural characteristics that limit development;
- (2) the perceptions and values of area residents as expressed in their preferences for life styles and environment; and
- (3) the ability of the area's governing body and managing agencies to provide the services and impose the controls necessary to insure that the desired quality of life is maintained.⁸

It is more difficult to define carrying capacity in an urban context than when it is utilized as a method for managing natural resources. Human activity systems are more complex, demanding a definition which has a broader scope, reflecting the trade-offs between the environment and the economy. Bishop, realizing this dichotomy, has provided a more representative definition of carrying capacity:

⁷ Bishop, p. 1.

⁸ Ibid., p. 2.

Carrying capacity must be interpreted as a variable which is essentially socially determined within our understanding of economic, social, and environmental values and their relative contribution in maintaining quality-of-life levels. It is that level of human activity (including population dynamics and economic activity) which a region can sustain (including consideration of import and export of resources and waste residuals) at acceptable "quality-of-life" levels in perpetuity.⁹

Within this broad definition of carrying capacity, three dimensions of the concept require examination: environmental carrying capacity, perceptual carrying capacity, and institutional carrying capacity.

Environmental carrying capacity. This is the limit at which human activity will lead to undesirable changes in the environment. The concept is based on the assumption that there are limits which the environment itself imposes on development. The critical assumptions include the present level of technology, economics, and life styles. The carrying capacity limit assumes that all will remain constant in the projectable future. Naturally, if the assumptions are altered, the physical limit can be expanded.¹⁰

There are three different theoretical situations which are useful in applying the concept. Each situation differs as to the level of environmental change which is acceptable. In the first situation, the environment can

⁹Ibid., p. 33.

¹⁰Ibid., p. 135.

tolerate very little new activity before alterations begin to appear in the ecosystem. It is desirable to maintain the integrity of an existing environmental system. Here the ecosystem is highly vulnerable and incapable of safely supporting development. Areas such as wetlands, estuaries, and flood plains typify these highly restrictive environs.

The second theoretical situation which is used in his application of the carrying capacity concept is concerned with cases where development is acceptable but only allowed at a level which will not degrade certain aspects of the environment below predetermined standards.¹¹ This situation is the most common. As standards are set for ambient air and water quality it will be feasible to work backwards from the standards in order to determine the amount of unused capacity available in an area. A licensing and permit system may then be employed to limit waste discharge to the carrying-capacity level.

The third situation is most commonly found in resource management and deals with the capacity of the environment to accept a new activity before that activity becomes self-limiting. Rangeland management provides an example, where the addition of too many cattle leads to resource depletion and consequent starvation of the animals. In this case large changes in the environment will be allowed

¹¹Ibid., p. 136.

up to a point, at which the system is destroyed. This theoretical situation is not usually applied to urban development, but rather to cases such as drainage of wetlands for agricultural uses.¹²

Since the theoretical base for environmental carrying capacity is founded in ecology and the natural sciences, it is more easily applied to the first situation (maintaining the natural system intact) and the third situation (that of environmental collapse due to overloading). Unfortunately, environmental carrying capacity is less helpful in the second situation, where the capacity is related to man-developed standards of environmental quality.

An environmental carrying capacity analysis is begun with traditional resource inventories. The next step involves an attempt to project the relationships between each resource and the expected or potential uses of that resource. The most critical limiting resource is also identified which is utilized to define the carrying capacity. The output would be a series of graphs which indicate the amount of each resource that would be absorbed by an additional unit of population or development activity.¹³

The final product of the analysis will not be a single, fixed carrying capacity limit, but rather a series

¹²Ibid., p. 137.

¹³Ibid., p. 138

of limits defined by each critical resource. Typically the limits will not be the same for each resource, but instead will identify a wide range of thresholds for growth. Some thresholds can be exceeded by increased investment in new technologies. The decision to make the necessary investment will depend on the proximity of other threshold limits imposed by other resource limitations or thresholds. If the other limitations or thresholds are much less restrictive than the first, an investment in technological remedies might be justified. On the other hand, if several thresholds are similarly restrictive, an investment to remedy one problem would lead immediately to a need to prevent the violation of several other thresholds. The extent to which carrying capacity is an absolute limit on growth will depend on whether or not there is such a conjunction of limits imposed by different resource limitations.¹⁴

Perceptual carrying capacity. Whereas the environmental carrying capacity is basically an objective analysis, perceptual carrying capacity judgments are highly subjective in nature. The perceptual analysis is based on the amount of activity or the degree of change which can occur before one perceives the environment as different than before.¹⁵

¹⁴Ibid., p. 139.

¹⁵Ibid.

The concept has been applied to determine the carrying capacity of wilderness areas to support hiking and other forms of recreation. Perceptual carrying capacity can apply as well to different scales and intensities of urbanism. There are distinct differences in the way one visually experiences forest land, rural settlements, small towns, and large urban concentrations. Maintenance of this variety may be deemed important before growth threatens a perceptual change. In coastal areas experiencing rapid growth, a perceptual carrying capacity analysis can be employed to determine if and where what kinds of growth should be allowed.¹⁶ Carrying capacity can be an expression of public attitudes, which in turn can provide the basis for planning policies concerning future growth and development. The basic methodology used for a perceptual carrying capacity analysis is some form of citizen survey. The survey generally uses a series of photographs to determine how the respondents react to different levels of development, and then respondents are asked to apply these reactions to areas under consideration. This exercise results in a map of how residents perceive particular environments in conjunction with their attitudes toward future growth and development in that environment. In this way perceptual carrying

¹⁶Ibid.

capacity can provide an important link between citizen attitudes and planning implementation.¹⁷

Institutional carrying capacity. Institutional carrying capacity may be described as the ability of an area's organization to direct development toward public goals and objectives. There are three levels of institutional considerations which should be included: (1) the individual organization (e.g., the planning agency); (2) a group of organizations that deal with a certain function (e.g., land development and health services); and (3) the community, which includes all public and private organizations that play a role in community development.

Within this context there exist certain thresholds of institutional capacity for development guidance. A rural county may have as its major threshold the ability to draft and pass basic land use regulations. Other institutional thresholds may include the ability to enter into inter-governmental agreements or simply to make land use decisions in the face of private opposition.¹⁸ Numerous disciplines provide a basis for understanding institutional carrying capacity, including: administration, management, economics, social welfare, sociology, political science, and social

¹⁷Ibid., p. 140.

¹⁸Ibid., p. 141.

psychology. A theory which has synthesized many of these disciplines has been set forth in the form of "guidance theory" at the societal level,¹⁹ the community level,²⁰ and for land use and environmental planning.²¹ Applied methods for analyzing and building institutional capacity are exemplified by the program of the Tennessee Valley Authority and the Appalachian Regional Commission.²²

Environmental Planning Methodology

The Carrying Capacity Concept Applied

In 1973 research was begun at Rutgers University in order to develop an approach to land use planning that would include environmental concerns. One of the key elements of their growth management program was the concept of current planning capacity or a practical carrying capacity approach to land use planning. Here, carrying capacity was described as the amount of activity that an area can support without suffering irreversible harm.²³

¹⁹Amatai Etzioni, The Active Society (New York: The Free Press, 1968)

²⁰Ibid.

²¹Kaiser, et. al.

²²Bishop, p. 143.

²³Urban Land Institute, Management and Control of Growth (Washington, D.C.: The Urban Land Institute, 1975), Vol. iv, p. 140.

In many parts of the country the amount of development that is allowed may be determined by something as simple as a zoning ordinance. Zoning usually regulates the number of buildable acres along with permitted lot sizes, which when combined with the estimated number of persons per dwelling unit will facilitate the calculation of the "capacity" of that community. However, since zoning was developed for entirely different purposes originally, there is often little correlation between zoning-determined capacity and the physical capacity of the land and water resources. An imbalance may be created where the zoning-determined capacity is in excess of the carrying capacity, creating pollution or resource shortage problems. Conversely, if the zoning-determined capacity is set below the carrying capacity for an area, an arbitrarily low density could have been assigned, based on physical capacities.²⁴

Practically speaking, the carrying capacity of a community is usually based on an estimate of the amount of development that can occur under present conditions. An area's current carrying capacity can then be defined as the measure of the region's ability to accommodate growth and development within limits defined by existing infrastructure and natural resource capabilities. For the model developed

²⁴Ibid., p. 142.

by the Urban Land Institute, current carrying capacity was determined based on three factors: water supply, water quality, and air quality. Though many other factors may be important to a community, these three factors were chosen to be "proxy variables" for natural resource availability, technological capacity, public fiscal capability, and public health and safety needs. The fact that the measures are based on these considerations insures the scientific and legal defensibility of the three factors, should they be used to limit growth.²⁵

A five-step process is involved in this method of determining the current carrying capacity for an area. Each of the three component factors' carrying capacity is calculated, and the overall carrying capacity is set at the minimum of the three determined limits. The first step requires the delineation of the resource area for each factor. Natural boundaries such as watersheds or utility service areas tend to dictate area delineation. The second step is to determine the availability of each resource in terms of its relative quality and quantity. For example, the water supply limit is usually determined by the extent of the pipeline system, the yield of the aquifer or water source, or the capacity of a reservoir. Water quality is related to septic tank suitability of the soil, sewage

²⁵Ibid., p. 143.

collection system and treatment plant capacity, or stream or river quality. Air quality measurements take the form of permissible deterioration increments for specific parameters such as sulfur-dioxide and suspended particulate levels. In order to make comparisons possible, each of the limits determined in this step is converted into a population equivalent. This step involves making certain assumptions about per capita usage of resources and per capita generation of wastes. This calibration step for the model must be based on local situations rather than national standards. The fourth step in the process is the selection of the most limiting population equivalent--the jurisdiction's gross carrying capacity.²⁶ The last step is the comparison of the current carrying capacity with the existing "demand" in terms of population equivalents. The result should indicate the allowable growth which can safely take place or the reductions which need to be achieved.²⁷ Although this technique considers only a few factors, it is intended to be a rational and legally defensible approach to using carrying capacity to guide planning decisions.

²⁶ Ibid., p 142.

²⁷ Ibid., p 143.

The McHarg Environmental Planning Methodology

The work of Ian McHarg has perhaps done more to establish natural process analysis as a basis for land use planning than that of any other planner. McHarg's method is based on the belief that natural processes should ultimately dictate land use. His environmental approach to planning includes the following aspects:

1. It requires an understanding of nature as a process, and it reveals causality.
2. It requires the analyst to interpret natural processes as resources and hence to predict and prescribe compatible communities of prospective land uses.
3. It provides an insight into the given or natural form of the environment and thus provides implications for the man-made form of design through a better understanding of the forces at work.
4. With the addition of demand and investment, a land use plan can be produced for a wide range of areas.²⁸

McHarg's basic philosophy can be gleaned from his contention that:

any place is the sum of historical, physical, and biological processes; ... these processes are dynamic; they constitute social values; each area has an intrinsic suitability for certain land uses; and...certain areas lend themselves to multiple coexisting land uses.²⁹

²⁸Raymond Belknap. Three Approaches to Environmental Resource Analysis (Washington, D.C.: The Conservation Foundation, 1967), p. 62.

²⁹Ibid., p. 65.

An outline and descriptive critique of McHarg's approach to environmental planning has been developed by Raymond Belknap. Figure 3 is a diagram of McHarg's analysis procedure. The outline below is coded to the numbering system used in the diagram.³⁰

A. Define and delineate the total study area: the area under consideration may vary in size from a continent, a major region, a river basin, to a city. Sub-areas are delineated by the use of political or natural physical boundaries.

B. An environmental inventory is prepared and interpreted.

1. Natural and cultural features are inventoried and mapped; traditional field methods are used to obtain information on the physical base of a study region. Data is collected for the following eight categories:

- 1) Climate
- 2) Historical Geology
- 3) Physiography
- 4) Hydrology
- 5) Pedology (soils)
- 6) Plant Associations (flora)
- 7) Animals (fauna)
- 8) Land Use

³⁰Ibid., pp. 66-73.

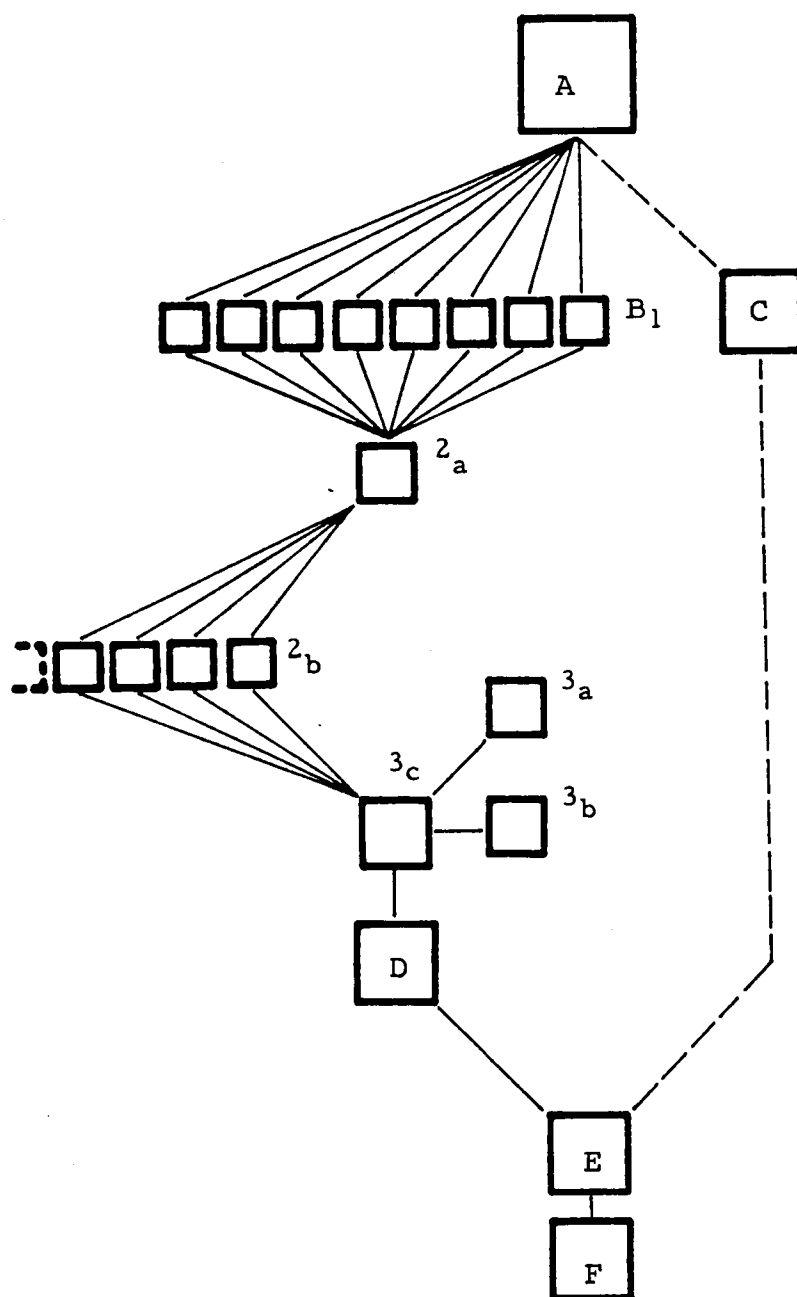


Figure 3. DIAGRAMMATIC OUTLINE OF ANALYSIS PROCEDURES

Source: Raymond Belknap. Three Approaches to Environmental Resource Analysis (Washington, D.C.: The Conservation Foundation, 1967).

The data is collected in this sequence, because McHarg feels that it conveys cumulative causality. In other words, it is necessary to analyze the climate and historical geology of an area before its physiography can be interpreted. Consequently, an understanding of physiography permits an understanding of river and stream patterns, aquifers, and aquifer recharge areas. By using this sequential procedure, McHarg feels that an analysis can be based on historical reasons for an area's identity as well as the pattern and occurrence of its resources. The identification of the supply of resources can then be matched later with the demand for them.

2. Inventory data is interpreted to reveal dominant prospective land uses for each.

a. Data relevant to prospective land use is interpreted; here all of the prospective land uses are compiled into land use groupings, containing several land uses. A land use group might be termed "production" for example, which contains such land uses as agricultural, forestry, wildlife propagation, and mineral extractive industries. The environmental resource data are then checked to indicate their positive, negative, or neutral effects on each of the prospective land uses. This procedure is followed, using a comprehensive matrix, until each resource data factor (e.g., steep slopes, flood areas) is examined in terms of each prospective land use. Other

considerations include economic minerals, scarce or unique features, water resources, and accessibility.

b. Intrinsic suitability maps are prepared.

This step includes the development of a series of maps locating economic minerals, unique sites, location of water resources, slope, and exposure, as well as intrinsic suitability maps for agriculture, forestry, recreation, and urbanization. The maps are prepared on transparencies in tones of different colors from most to least suitable for each land use. The maps are then overlaid to indicate a single most suitable land use for every area in the total study area.

3. A value is attributed to every land area in the total study area for all prospective land uses. This is done to point out that while a dominant land use may be present for each area, so may other compatible uses be ascribed to an area.

a. A system for rating intrinsic resources is established. Values are assigned to each intrinsic resource. All resources are then mapped with a scale of values on transparencies and superimposed. The result is a composite map showing areas of least social value in the lightest tone and areas of highest social value in the darkest tone.

b. Compatible and incompatible land uses are grouped. Here a matrix is constructed to show the major

existing and prospective land use classifications in relation to each resource data inventoried. Each land use is then evaluated in terms of its impact on the ecosystem. A map is then produced to show present and prospective land uses in relationships of compatibilities with dominant and compatible land uses.

c. Data is then synthesized into a combined suitability map. Here a synthesis map is prepared to illustrate the maximum conjunction of co-existing, compatible land uses that can be sustained by every area. Prospective land uses are grouped into four major divisions: agriculture, forestry, recreation, and urbanism and their subdominants. Alternative suitable land uses are shown in differing colors on the composite map. For instance, a dark olive colored area would be suited for either prime urban, commercial forestry, or recreation; whereas a blue-green color would indicate an area that is only suited for recreation.

4. An economic inventory is prepared and interpreted. An economic planner is needed to study the area in order to provide information on locational values and the nature, locational and spatial requirements of demand. These two components are then matched with the supply of resources obtained in the environmental inventory and interpretation.

5. Criteria for visibility are established. In addition to environmental and economic considerations, McHarg includes visual values in his planning process.

The principles considered for evaluating the consequences of proposed land uses are as follows:

- a. The path of the viewer;
- b. The fact that the area visible from these locations will vary with physiographic regions;
- c. The degree to which vegetation provides a visual barrier independent of physiography;
- d. The degree to which forest cover can absorb developments while preserving its forest cover. This study aids in making recommendations for density control based on visual values.

6. Criteria for form and design are established. At this stage in the planning process, the environmental analysis, the economic study, and the visual component are all combined to develop alternative plans varying the location and intensity of compatible land uses. The plans would incorporate the environmental analysis to suggest the forms of buildings, spaces, and their spatial distribution within the study area.

7. Powers necessary to realize the plan are acquired. This is the implementation phase of McHarg's planning process and calls for sufficient capital expenditures and necessary regulatory and zoning powers.

McHarg's environmental approach to planning has been able to incorporate both natural and man-made forms. He

stresses a greater role for nature in determining man's use of land, as well as a larger part in influencing social and economic decisions. Social, political, and economic factors are less emphasized in plan formulation. As will be seen later, in the development planning process which took place at Kiawah, social and economic factors were incorporated in the process.

McHarg also tends to slight the behavioral aspects of man in his environmental approach. He assumes that the economic study can produce data which will be compatible in form with that prepared in the environmental process, so that final recommendations can be arrived at. He seems certain that resource supply determination can be made and that the economist will be able to relate supply to the natural, locational, and spatial characteristics of demand.³¹

Modifications of the McHarg Approach

An environmental planning model was developed by Treasure H. Rogers, Jr., which incorporates modifications of the traditional planning model proposed by Ian McHarg and Edward Kaiser. To give greater attention to environmental planning, Rogers suggests that the following five components be adapted from McHarg's process:

³¹Ibid., p. 91.

1. The inventory and mapping of environmental features are used as a rationale for determining optimal space allocations for land use.

2. Intrinsic suitability maps are used to identify those characteristics of land and water that are most beneficial for prospective land uses. The maps also provide a basis for alternative land use schemes.

3. The interpretation of environmental data are used to analyze prospective land uses and to the projective phase as well.

4. An environmental evaluation matrix is used in the projection and alternatives phase. The matrix was also employed in the evaluation phase in order to point out environmental constraints and opportunities for each land use within each alternative land use scheme.

5. A composite suitability map is used to provide an environmental basis for the land use plan element of the master plan.

Rogers also suggests that the following three components from Kaiser be added to the baseline model.

1. Decision guides are added in the "alternatives" phase to enable policy plans and recommendations to focus on specific short-term issues.

2. Action instruments are included in the implementation phase to align the development process with environmental quality goals in order to control the spatial

design characteristics for a site, as well as the location and timing of development.

3. Two monitoring devices are added: public surveys and environmental monitoring devices. Surveys aid in assessing public officials' and the general public's concern for and perceptions of environmental quality. Water quality, air quality, and noise monitors are used to assess the performance of various components of the model.³²

The Rogers model, shown as Figure 4, may be considered an improvement over the traditional planning model because of its increased ability to fully consider the effects of environmental features on the urbanization process. The model remedies somewhat the incomplete and generalized nature of the McHarg model, which does not consider social objectives very thoroughly or systematically. Zelinski notes that:

It is apparent that the ecological approach, alone, cannot provide a basis for the satisfactory planning of resource development if a detailed consideration of human values is deemed significant.³³

Impact Analysis Approach to Planning

Another approach to environmental planning is based on techniques developed in response to the National Environmental Policy Act in 1969. Procedures for impact

³²Treasure Rogers. A Review of Approaches to Incorporating Environmental Considerations in Planning in Tennessee, Masters Thesis, University of Tennessee, 1979, p. 97-99.

³³Zelinski, p. 21.

PHASES

< Goal Statements * Base Studies * Projections & Goals * Alternatives * Evaluation * Master Plan * Implementation * Feedback & Monitoring * Start Process Again >

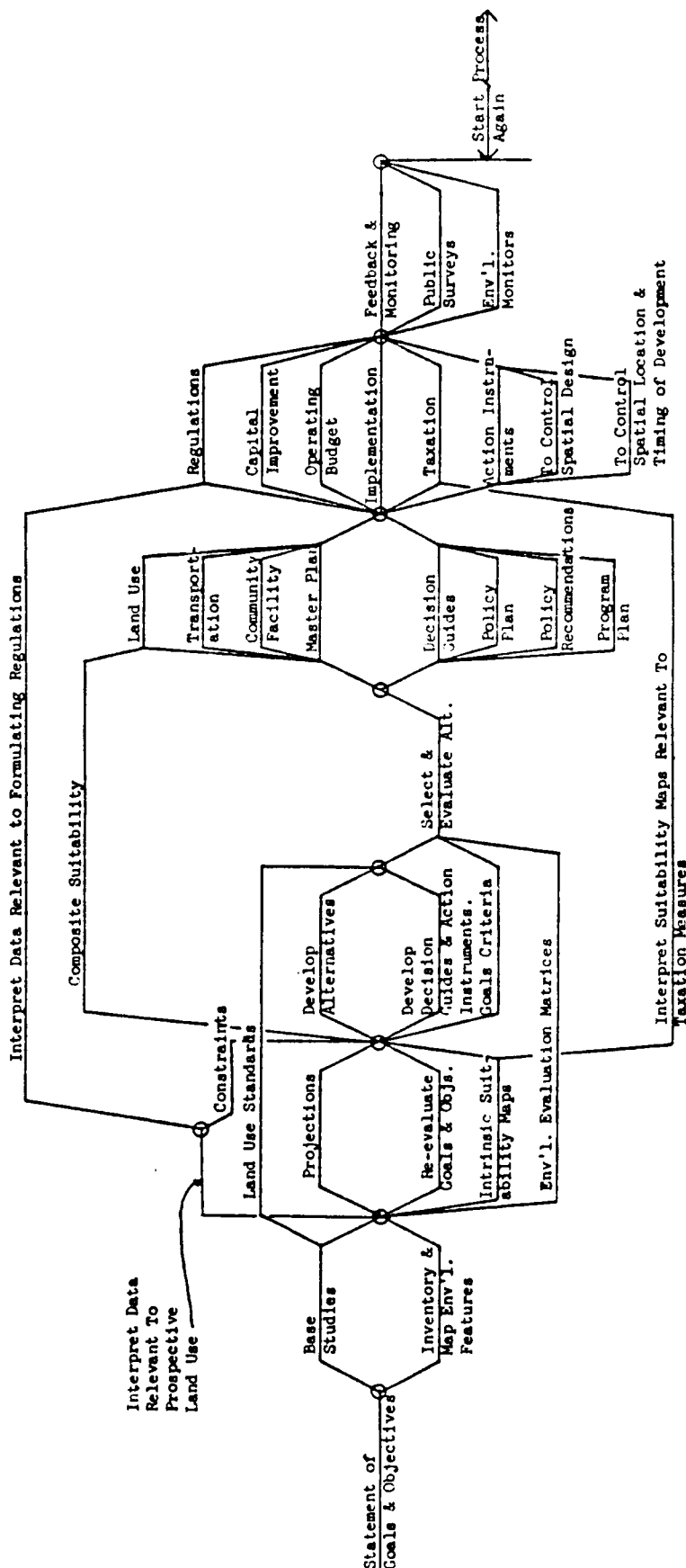


Figure 4. ENVIRONMENTAL PLANNING MODEL

Source: Treasure Rogers. A Review of Approaches to Incorporating Environmental Considerations in Planning in Tennessee, Master's Thesis, University of Tennessee, 1979.

assessments have been formulated agencies themselves, by consultants, and by independent academic researchers.³⁴

Many impact assessment approaches ignore the planning process and employ impact analysis only on an individual project basis. Impact analysis is useful as a guide to policy development, although it is not a policy in itself; therefore, it is comparable to the traditional comprehensive plan, which also can serve as a policy advisory instrument. The major difference is that an impact assessment analyzes the impact of a single action or project within a larger system. The assessment is usually a one-time analysis of the probable effect of a part on the whole. The comprehensive plan is developed to identify the optimum pattern of interrelated elements and analyzes the entire community in terms of its individual parts.³⁵

Impact assessment can also aid in the analysis stage of environmental planning. If every component of a plan were analyzed by impact assessment, the need for case-by-case review could be reduced. The plan, having been subjected to a rigorous impact analysis, could then be a more useful and efficient tool.³⁶

³⁴William M. Marsh, Environmental Analysis for Land Use and Site Planning (New York: McGraw Hill, 1978), p. 268.

³⁵Ibid.

³⁶Ibid.

Marsh, in his recognition of impact assessment as a potential integral part of planning, frames his discussion of impact assessment within a simplified version of the planning process. The process of planning is divided into four components: problem definition, formulation of alternatives, impact analysis, and evaluation of trade-offs. All four activities occur as interrelated components of a process. The transition from one action to another is in emphasis only. Therefore, impact assessment can be considered not only a separate analysis after a course of action has been chosen, but also as an integral part of the planning process.³⁷

Within this context of the planning process, impact assessment is composed of six steps.

1. The identification of those variables, termed evaluative factors, which are of particular importance to the planning tasks.

2. The second step involves the identification of relationships between the evaluative factors, which include systems-type relationships as well as those between dependent and independent factors, such as those between flooding and runoff.

3. Step three involves the formulation of alternatives, or more specifically, alternative scenarios of desired futures.

³⁷. Ibid., pp. 268-286.

4. The fourth step entails the forecasting or predicting the effects or impacts of each alternative.

5. The fifth task is the description of the differences or trade-offs among the alternatives in terms of the evaluative factors and alternative scenarios.

6. The final step involves the evaluation of the different alternatives, which is following by a decision or recommendation of which one to adopt.

These six steps are discussed more thoroughly below.

Identification of evaluative factors. The most common method to identify factors for consideration in the impact analysis is the checklist. This can be accomplished either by using a simple listing or by using a matrix.

The United States Geological Survey (USGS) has developed a matrix which incorporates 100 agency actions and 88 environmental components, which include historical, cultural and social considerations. The analyst checks a box where likely impacts will occur. Numbers are placed above and below the check to indicate the magnitude and importance of the impact. Figure 5 illustrates this method.

Advantages of checklists and matrices include:

1) They identify categories of potential effects; and 2) they serve as sources for ideas of differing types of effects, which helps to avoid important omissions. Disadvantages of checklists and matrices include: 1) They are static,

INSTRUCTIONS

1. Identify all actions (located across the top of the matrix) that are part of the proposed project.
2. Under each of the proposed actions, place a slash at the intersection with each item on the side of the matrix if an impact is possible.
3. Having completed the matrix, in the upper left-hand corner of each box with a slash, place a number from 1 to 10 which indicates the MAGNITUDE of the possible impact: 10 represents the greatest magnitude of impact and 1, the least (no zeroes). Before each number place + if the impact would be beneficial. In the lower right-hand corner of the box place a number from 1 to 10 which indicates the IMPORTANCE of the possible impact (e.g. regional v.s. local); 10 represents the greatest importance and 1, the least (no zeroes).
4. The text which accompanies the matrix should be a discussion of the significant impacts, those columns and rows with large numbers of boxes marked and individual boxes with the larger numbers.

SAMPLE MATRIX

	a	b	c	d	e
a		2/1			8/5
b		1/2	8/8	3/1	9/7

Figure 5 (continued)

reflecting only direct effects of various types of action; 2) interrelationships among and between actions and impacts are not shown; and 3) they may not include all factors and therefore should not be considered as an exhaustive source of ideas.

Identification of relationships and systems. The two most often utilized techniques for identifying relationships and systems are the cross-impact matrices and networks. The cross-impact matrices may be used singularly as tables, or as input to the development of networks. They differ from the cause-effect USGS matrix in that they can show two-way linkages rather than one-way relationships. Here the "causes" column and the "effects" row of the USGS matrix is expanded by listing the same items on both columns and rows, to show all interrelationships.

Network approaches improve matrices by tracing sequences of impacts that could follow modification of one or more elements.

An example of the combined use of matrices and networks is provided by Sorenson's stepped-matrix in which actions are disaggregated into "causal factors." This approach, as shown in Figure 6, begins with a matrix which disaggregates each use of the coastal zone into various causative factors. Dots are used to show relationships between each causative factor and a list of environmental conditions. A forecast

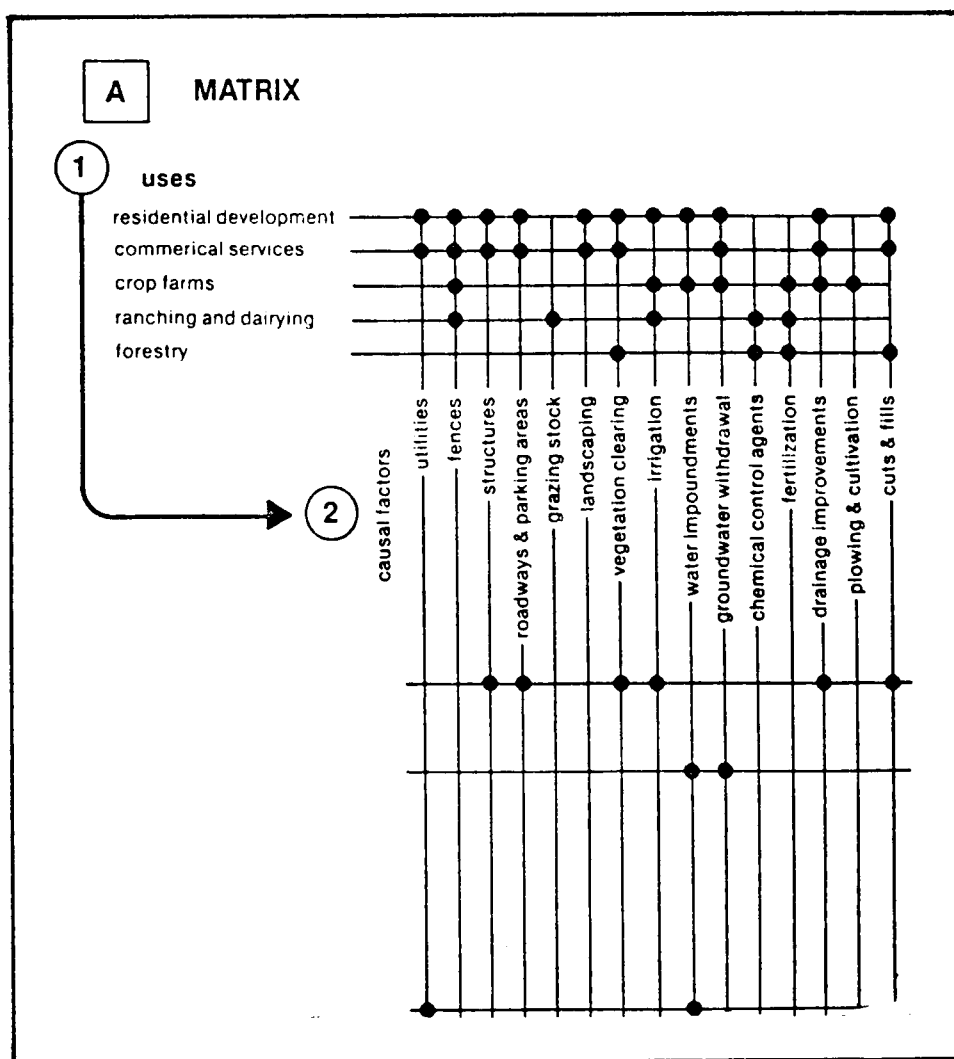


Figure 6. SORENSON STEPPED MATRIX PROCESS

Source: William M. Marsh, Environmental Analysis for Land Use and Site Planning (New York: McGraw Hill, 1978).

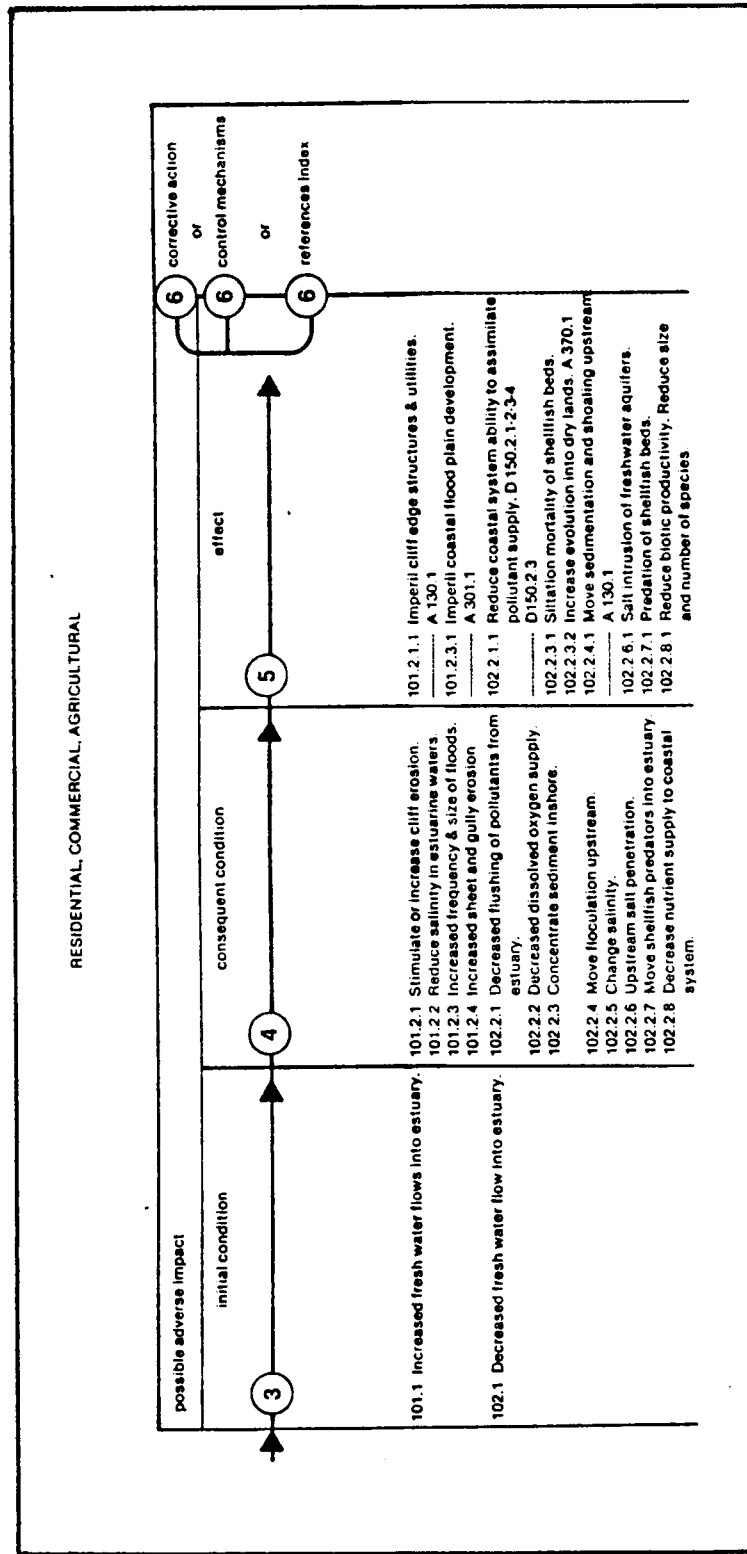


Figure 6 (continued)

is then made of consequent conditions, from which a final forecast of evaluative factors is made.

Formulation of alternatives. In this third step the purpose is to formulate alternatives which suggest sets of related actions that are implementable. All alternatives should have the same objective, with each differing in its effect on the environment and other social values. They should be formulated to provide meaningful choices rather than merely to reflect differences in structural means or economic costs. Input should be interdisciplinary and alternative formulation should be done by professional planners. A conceptual scheme for alternative development is shown in Figure 7 which illustrates the major steps.

Forecasting of effects. The fourth step in the impact assessment is the impact analysis portion. The test of the approach used is its reliability and effectiveness as a tool for predicting significant impacts.

Most approaches are based on intuitive predictions by the user or on the collective consensus of workshop participants. More complex techniques include: Delphi techniques for assembling expert consensus, statistical correlation techniques, and quantitative modeling.

Of the techniques reviewed (checklists, matrices and networks) the Soreson method seems to have the most value for predicting impacts, because it requires the identification

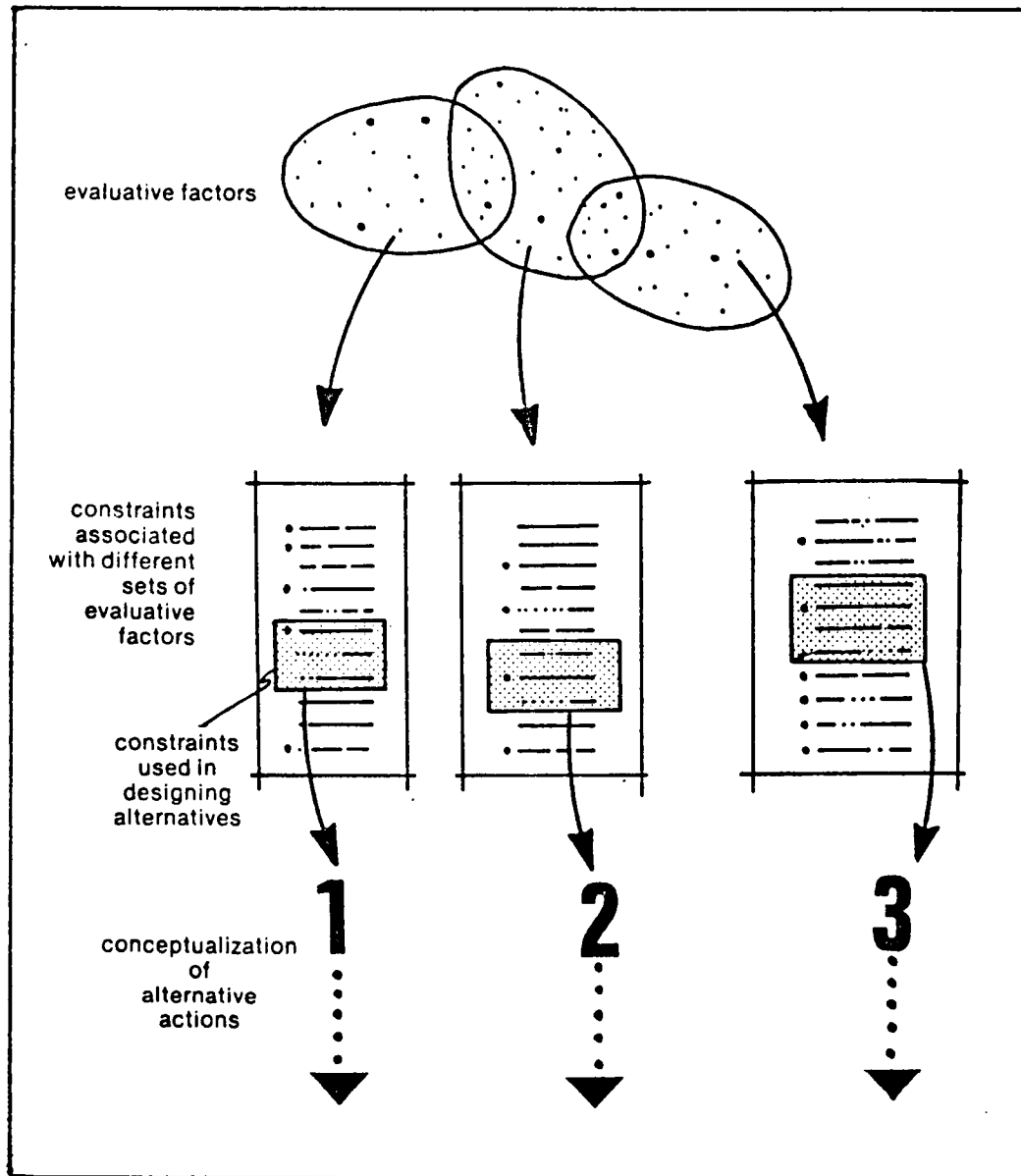


Figure 7. ANALYSIS OF IMPACTS

Source: William M. Marsh, Environmental Analysis for Land Use and Site Planning (New York: McGraw Hill, 1978).

of linkages through which impacts are transmitted. The other approaches are effective for preliminary planning concerning impacts of a general nature, but are not appropriate when decisions must be made about gathering information and developing reliable forecasts.

Display of trade-offs. Step five of the process, in addition to the techniques already discussed, often uses overlay maps to provide a spatial display of factors which reveal potential conflicts. Another technique designed to show the different impacts among several alternatives, uses a trade-off "balance sheet" to summarize the impacts of each alternative. This technique is exemplified by the guidelines of the Nuclear Regulatory Commission. The account format, shown in Figure 8, has the ability to present a large amount of information which is easily compared. A separate account is prepared for each subsystem - in this case alternative cooling systems - from which alternatives can be considered. The basis for impact measurement is found in the first column titled, "environmental costs". The second column describes the units of measurement for each factor and the remaining columns show the magnitude of impact for each alternative.

This format has three advantages:

1. It displays a great deal of technical information allowing a direct comparison of all alternatives on each point to be made.

COST DESCRIPTION—ALTERNATIVE COOLING INTAKE SYSTEMS

ALTERNATIVES		A		B		D	
INCREMENTAL GENERATING COST	Present Worth						
	Annualized						
CAPACITY FACTOR							
ENVIRONMENTAL COSTS	UNITS	Magnitude	Page	M	Magnitude	Page	
1. Natural Surface Water Body							
1.1 Impingement or entrapment by cooling water intake structure							
1.1.1 Fish							
1.2 Passage through or retention in cooling systems							
1.2.1 Phytoplankton and zooplankton							
1.2.2 Fish							
1.3 Discharge area and thermal plume							
1.3.1 Water quality, excess heat							
1.3.2 Water quality, oxygen availability							
1.3.3 Aquatic organisms							
1.3.4 Wildlife (including birds, aquatic and amphibious mammals, and reptiles)							
1.3.5 Fish, migratory							
1.4 Chemical effluents							
1.4.1 Water quality, chemical							
1.4.2 Aquatic organisms							
1.4.3 Wildlife (including birds, aquatic and amphibious mammals, and reptiles)							
1.4.4 People							
1.5 Not applicable							
1.6 Consumptive use (evaporative losses)							
1.6.1 People							
1.6.2 Property							
1.7 Plant construction (including site preparation)							
1.7.1 Water quality, physical							

Figure 8. ACCOUNT FORMAT

Source: William M. Marsh, Environmental Analysis for Land Use and Site Planning (New York: McGraw Hill, 1978).

2. It disaggregates complex actions into their component causative actions.

3. It provides a usable summary and page references for more detailed information.

However, the technique is limited because it fails to display effectively the composite effects of each alternative system as a whole. In addition, it neglects to show the interrelationships among impacts and subsystems.

Evaluation. The final step in the assessment process is evaluation. There are basically three types of evaluation procedures: direct display techniques, constraint setting, and weighting procedures. Direct display techniques, exemplified by the "account sheet" method, provide disaggregated information so that decisions can be made between alternatives. This allows decisions to be made and reviewed by many different users with different values.

Constraint setting indicates that a set of standards and criteria be agreed on by all involved parties. It simplifies and reduces the number of trade-offs that need to be balanced. All actions must comply with set standards, but decisions can be based on trade-offs between other factors not previously considered constraints.

Setting the standards is one of the most difficult aspects of this step. For instance, air quality standards might be considered sufficient by some but others might feel

them too high while still others might reject an alternative meeting the standard because it degraded air quality to the maximum allowable level. Therefore, constraints or standards need to be generally agreed on before they are set.

The weighting procedures are used in evaluation by aggregating the various evaluative factors, quantifying them and then assigning to each a multiplier to indicate the importance of the factor. The USGS matrix shown earlier is an example of the weighting procedure. This weighting is, of course, an intuitive judgement. There is a risk that a value judgement may be concealed behind numbers whose meaning may have never been clarified, nor widely agreed upon.

Conclusion

The discussion of the McHarg planning process and the Marsh impact planning process was intended to survey the array of thought processes for dealing with environmental design planning. A few examples of application of the processes will help clarify their uses.

Land Capability Applied

The Chattanooga-Hamilton County Regional Planning Commission completed a land capability study for all of Hamilton County, Tennessee. The purpose of the study was to collect, analyze, and present data concerning the physical

environment which was deemed essential to the optimal use of land in Hamilton County. The study assumed that future development is desirable and necessary, but wanted such growth to occur with minimal injury to the natural environment.³⁸

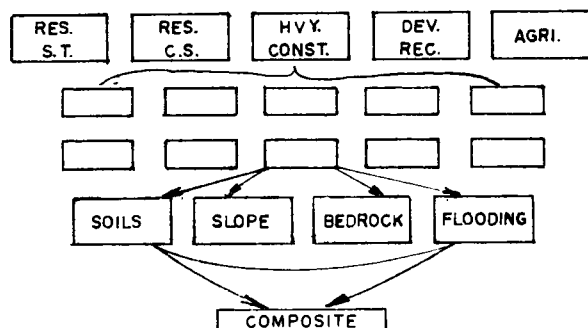
Central to the study were the opportunities and constraints which the environment imposes on various types of development. They recognized that some areas are more suitable for development than others; that certain areas are suitable for a particular type of development while unsuitable for others; and that some areas are unsuitable for any type of development. The land was analyzed according to the limitations imposed by the natural environment on different development types; to encourage the best utilization of the land for the developer and the ultimate user alike.³⁹ Five volumes were produced in the study--each concentrating on a specific development type. Residential with septic tank, residential with central sewage, developed recreation, heavy construction, and agriculture were the five types chosen. These five types were selected both because they included all major development types, and because these were

³⁸Chattanooga-Hamilton County Planning Commission, Land Capability Study, Volume II, Residential and Central Sewage, Chattanooga-Hamilton County, Tennessee, p. 1.

³⁹Ibid.

the types used in a soils study that was a key component for the entire capability analysis. Any land areas which were found to be unsuitable for any of the five uses were recommended for use as natural recreation or open space. This "catch all" category included such uses as hunting areas, bridle paths, and hiking trails.⁴⁰

The basic method of analysis and presentation in this study was based on McHarg's method, in this case using overlays of soils, slope, bedrock, and flooding. The components were mapped according to their degree of limitation for each type of development, the degrees of limitation varying from slight to severe. The spectrum from slight to severe is usually indicated by the density of the shading on the map, more limiting factors being shaded darker. Composite maps are then designed, with all of the constraints overlaid, to form what is usually called a composite constraint map.⁴¹ The process used in Hamilton County is graphically portrayed below.



5 Development Types
(1 Vol. Each)

4 Component Maps Per Type

1 Composite Map Per Type

⁴⁰ Ibid., p. 2.

⁴¹ Ibid., p. 8.

The inherently general nature of this method suggests that the capability study be utilized for screening the development suitability of broad areas. Decisions concerning particular tracts of land can only be made following a detailed on-site analysis. However, the land capability study is a useful tool for public and private decision making, and may be put to any of the following uses cited in the study: development of the general plan; subdivision planning; locating sites most suitable for development and identifying problems that may have to be overcome; assessing land development costs; reviewing subdivisions based upon the effect of the development on the environment; letting the buyer know something about the natural environment around his new home; highway location; assistance in general corridor locations and identification of problems that may have to be overcome; industrial location; utility extensions; identification of areas likely to be developed and needing utilities; locating public utility sites, schools, airports, recreational areas, sanitary landfills, etc; analyzing rezoning requests and developing new zoning plans; preparing and reviewing environmental impact statements; and assuring that land that has severe limitations for all types of development has low assessment, thereby reducing the taxes on the land and reducing the economic pressure to develop land that should not be developed.⁴²

⁴²Ibid., p. 9.

Sanibel Island, Florida

A more thorough application of the McHarg approach was that done in Sanibel Island. The suitability approach for development of a comprehensive plan was employed by the planning firm of Wallace, McHarg, Roberts and Todd (WMRT) in their master plan for the development of the island. As noted in Chapter I, Sanibel Island was incorporated in 1974 by concerned residents, who feared that intensive development would destroy the island's natural beauty. The peak seasonal population at that time was only 12,000, but the County Zoning Ordinance would have allowed a population of more than 90,000.⁴³

The Conservation Foundation prepared a natural systems inventory and analysis, which served as the basis for the WMRT plan. WMRT supplemented the Conservation Foundation team's work by spatially delineating various conditions discovered in the field studies. Aerial photographs were interpreted to show distribution of plant types. Other maps produced included topography, surface waters, groundwaters, and historic geology. The entire island was then divided into ecological zones according to particular ecological conditions and functional systems.⁴⁴ After public meetings were held to present the environmental

⁴³John Clark, The Sanibel Report, p. v.

⁴⁴Ibid., p. 85.

maps, descriptive information was gathered concerning utilities, roads, land uses, population, and socio-economic conditions. The combination of all of the information allowed the island's present conditions and capacities to be determined.⁴⁵

Alternative scenarios were then developed based on future demand projections for land and public services. Critical limits to urbanization were estimated, which if exceeded would place the health, safety, and welfare of the residents in jeopardy. The major constraints to future island development were found to be:

1. Limits of available technology and land area for disposal of treated effluent;
2. Capacity of the causeway to accommodate evacuation of residents to the mainland in the event of a hurricane;
3. The quantity and quality of potable water; and,
4. The capacity of the existing road system to handle increased traffic volumes.

Based on these constraints, alternative levels of future population were considered. Options of 6,000 to 24,000 dwelling units were analyzed. On the basis of

⁴⁵ Ibid., p. 86.

⁴⁶ Ibid., p. 88.

projected impacts, the Planning Commission recommended the development of a plan for a maximum of 6,000 dwelling units, only 2,000 more than the existing 4,000 units.⁴⁷ Allocation of these units throughout Sanibel was accomplished by a complex formula, which was based on the relative suitability of each ecological zone to support development. The carrying capacity of the natural environment was considered along with each zone's proximity to sewer and water lines, fire stations, and egress evacuation routes. The degree of private investment in development improvements was also considered.⁴⁸ The WMRT chart which was used to project environmental impacts of development based on the function of the individual ecological zones is shown as Figure 9.

To implement the target densities determined in the analysis, densities from one-unit-per-thirty-acres to five units per acre were prescribed, the lower densities being specified for environmentally sensitive areas. In order to introduce equity into the plan, the allocation process shown in Figure 10 was used to distribute the additional units. Because of partially completed buildings and established subdivisions, 1,800 units had to be added to the 6,000 unit ceiling during this phase.

⁴⁷ Ibid.

⁴⁸ Ibid.

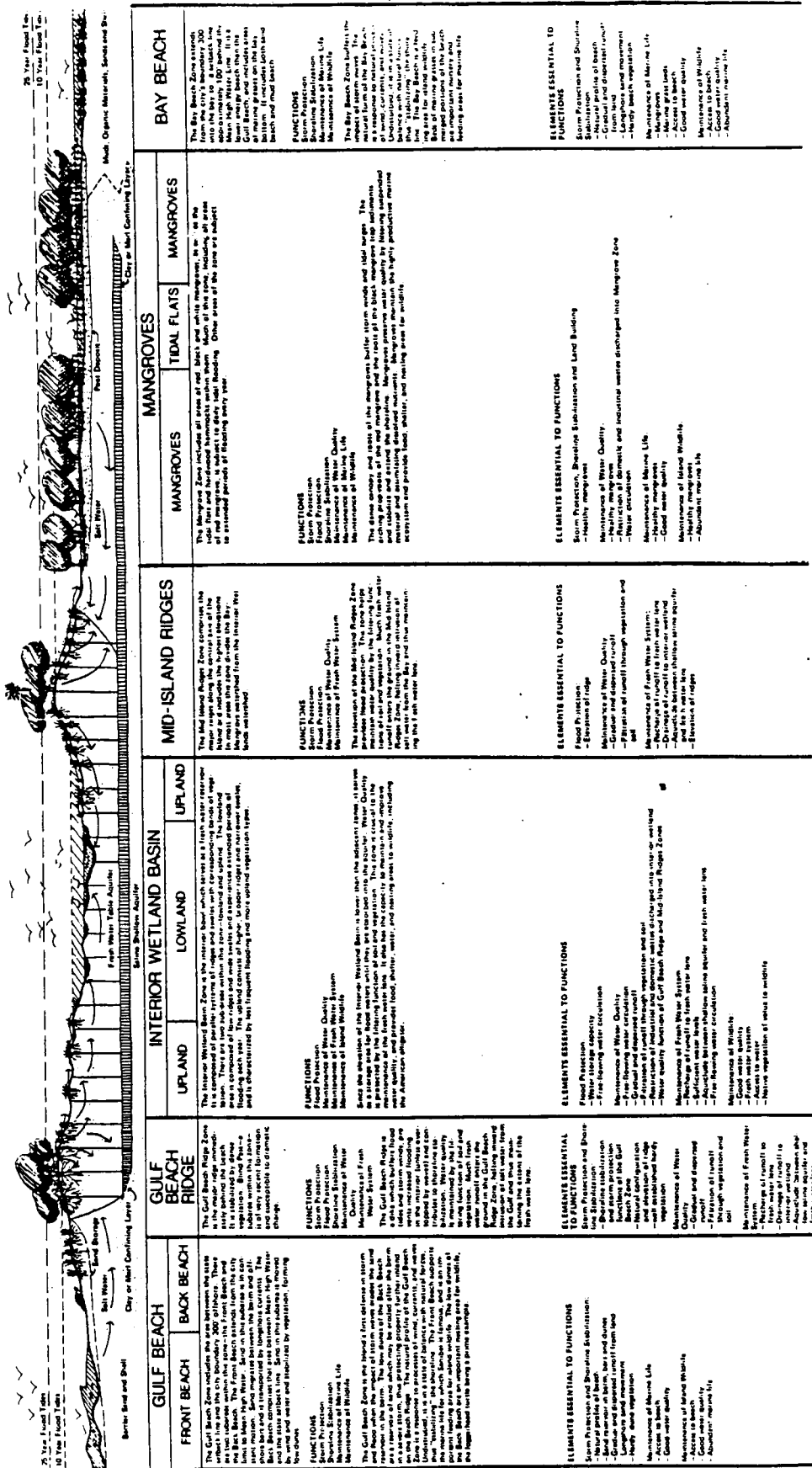


Figure 9 SANITEL ENVIRONMENTAL IMPACT STUDY

Source: John Clark, The Sanibel Report.

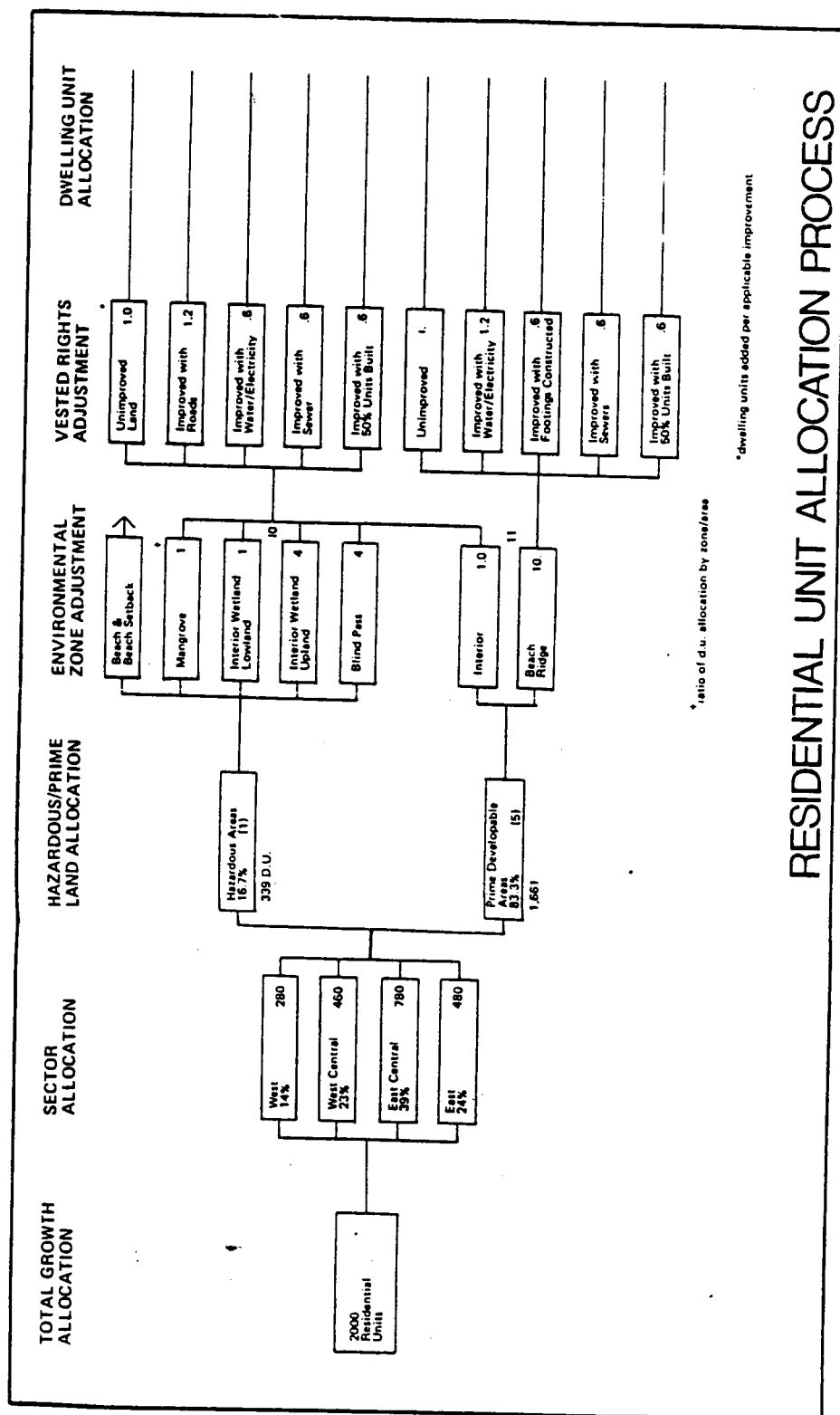


Figure 10. RESIDENTIAL UNIT ALLOCATION PROCESS

Source: John Clark, The Sanibel Report, p. v.

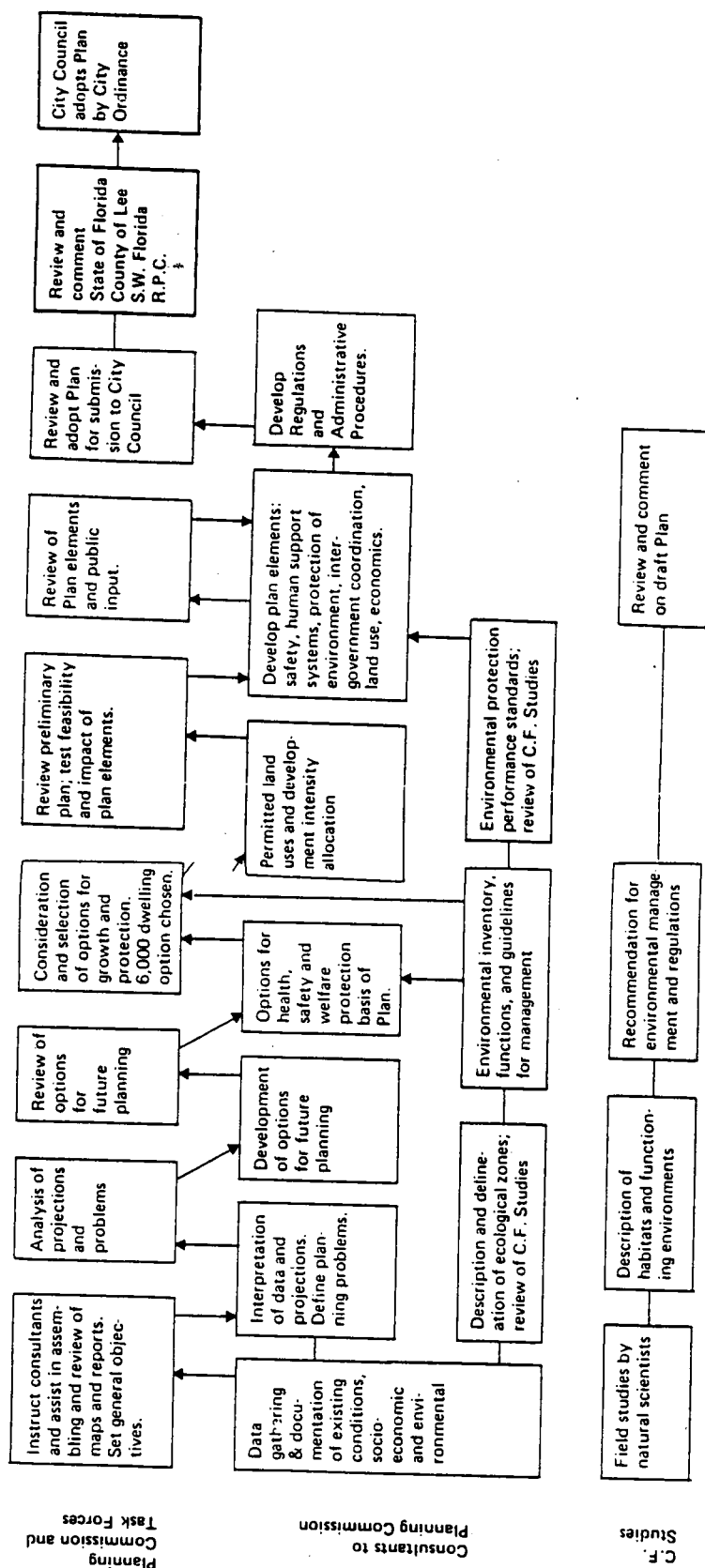
To complete the implementation of the process, comprehensive performance standards were developed to protect the integrity of each ecological zone. These included setbacks from the beach, restrictions on vegetation clearance and topographic disturbance, and lot coverage limits.⁴⁹ Administrative regulations were drafted to insure the integrity of the process, as well as to provide for permit issuance and hearings for plan amendments. The entire process is summarized in Figure 11.⁵⁰

The comprehensive plan for Sanibel provides for long-term preservation of natural resources, while allowing a reasonable amount of development. The methodology combined a suitability and carrying capacity analysis which:

1. Set a future limit population consistent with natural limits, notably those imposed by water resources and by the imperative of evacuation before hurricanes;
2. Distributed the permitted number of new structures (about 2,000) over the developable land in accordance with the carrying capacity of the natural systems;
3. Established a strong set of performance standards for all development;

⁴⁹ Ibid., p. 92.

⁵⁰ Ibid.



Input by Others
C.F. Studies
Planning Commission and Task Forces

Island Water Association; Chamber of Commerce, Various Civic Groups

Figure 11. THE PLANNING PROCESS

Source: John Clark, The Sanibel Report.

THE PLANNING PROCESS - approximately one year duration

4. Developed a scientific plan for restoration of past ecologic damage (particularly to the water systems); and,

5. Provided for the highest level of continuing public participation.⁵¹

The Sanibel Plan was not only conceived to protect the citizens and natural systems of the island but also to demonstrate the valuable contribution that a natural systems study can make to the planning process. Sanibel Island is particularly well suited to an environmentally designed plan because of the many and varied constraints to development. The most notable constraints include: the island's location in a storm hazard area; the highly permeable soils, which are not well suited for septic tanks; and the presence of mangroves and interior wetlands which serve as valuable animal habitats.

Consideration of these two examples of application of the environmental planning process gives some insight into the strengths of the McHarg process. As mentioned earlier, the technique focuses strongly on the physical, as opposed to the social and economic factors. The Sanibel plan was also essentially a preservation of an existing developed island, making it somewhat different from Kiawah.

⁵¹Ibid., p. vi.

The fact that Kiawah was developed essentially from raw land created different types of constraints and different types of opportunities. Before considering the Kiawah process in detail, the other two elements of the development process must be further developed: the development planning process and the public approval process. This will be done in the next two chapters.

CHAPTER III

DEVELOPMENT PLANNING: THE PRIVATE SECTOR PROCESS

The primary focus for Chapter III is the process a developer goes through to improve or develop raw land. The improvement of raw land may include residential, commercial, industrial, or multiple land uses; the emphasis here will be limited to residential and large scale multi-use projects.

Chapter III is organized into two sections. The first is a discussion of the developer, organization, developer goals, and the development team. The second section deals with the development process.

The Developer and Organizational Framework

The developer, as a project initiator, assumes the financial risk of development and determines what land will be purchased, when improvement will take place, and for what market the project will be built. The development process is a multidisciplinary business, and the developer must identify and coordinate the required disciplines, rather than perform them himself. A great deal of the project's success is therefore dependent upon the ability of the developer to manage and coordinate all of the participants in the process.

The developer must ultimately measure his success in terms of profit. As Clawson points out:

A basic consideration, always to be kept firmly in mind, is that private housing development for a private market is first, last and all the time a business operation, conducted for profit, and the merit of decisions is always judged by their effect upon profit.¹

Thus, it may be said that the ultimate goal of the developer is to maximize his profit and minimize his risk.

Developer Organizational Forms

A developer may pick from three basic forms to organize his business: sole proprietorship, partnership, or corporation.

A fourth type, which should be mentioned briefly is the real estate investment trust (REIT), utilized to diversify the risks of several projects. The REIT is usually established by a large land developer, a mortgage lending institution or a mortgage broker, and allows a large number of small investors to participate in large developments. At the same time the REIT gives the developer access to funds on a continuing basis without his being totally dependent on financial institutions. During the 1960's and mid 1970's

¹Marion Clawson, Suburban Land Conversion in the United States. (Baltimore: The John Hopkins Press, 1971) p. 59.

the REIT helped overcome the illiquidity of conventional real estate finance by issuance of shares of stock. The REIT concept was sound but ran into trouble because of soaring interest rates and poorly analyzed projects.²

The partnership is the most widely used form of organization.³ It's main advantage is the ability to spread the liability and financial risk among several individuals, whereas, with the sole proprietorship one individual must bear the total equity responsibility and all liability. The partnership also allows income and expenses to be distributed in the most advantageous method to each of the partners for tax purposes.

In a general partnership each partner assumes his pro rata share of all debts. In addition, the partnership is terminated and all property distributed if one partner dies. A more often used organizational form for land development is the limited partnership. This organizational form consists of limited partners and a general partner. The limited partners serve as passive investors and have no direct voice in the management of the partnership. Their liability is limited to their investment, and partnership

²John McMahan, Property Development (New York: McGraw Hill, 1976) pp. 60-63.

³C. W. Griffin, Development Building: The Team Approach (New York: John Wiley and Sons, 1972) p. 96.

income and expenses are apportioned according to a predetermined percentage.⁴ A developer who chooses this organizational vehicle is provided with a source of financing and flexibility in project management. But, as a general partner, he assumes unlimited liability.⁵ The limited partner, though protected by limited liability, is provided with no practical market for his partnership shares, as he would have if he owned stock in a corporation.

Most large land development firms with continuing projects select the corporate form of organization. The development corporation is considered a separate entity from its owners, whose liability is limited to their equity contributions. Continuity beyond the life of a shareholder is assured with the corporate form, whereas with the partnership forms it is not.⁶

The greatest disadvantage of corporate ownership is double taxation. Corporate income is taxed, as is income which is distributed in the form of dividends to shareholders. One way to take advantage of the corporate form while avoiding double taxation is the use of the Subchapter S corporation. This mode of organization allows a direct

⁴McMahan, p. 250.

⁵Ibid., p. 251.

⁶Griffin, p. 97.

pass-through of income and expenses to shareholders, similar to the partnership. The corporation itself pays no separate tax. The "Sub S" form is, however, limited to specialized situations due to the following restrictions: only 10 shareholders are allowed; 80% of income must accrue from active sources; rental income is limited to 20% of the total; and corporate losses cannot exceed the shareholders equity and loans.⁷

A developer may also choose to combine partnerships, individuals, or corporations to form a separate entity. Joint ventures and syndications are organizational forms designed in this way for single project developments. For example, a developer may establish a joint venture agreement with a lending institution. The developer benefits by raising needed capital at perhaps a more favorable loan-to-value ratio with lower interest charges. The lending institution benefits by receiving a good return on investment without the overhead of project management.⁸

The type of organizational form which the developer picks is related to his goals and objectives, his financial capability, the resources needed for project development, and the tax consequences of each form of equity participation.

⁷ McMahan., p. 252.

⁸ Ibid., p. 253.

Regardless of the many intangible benefits that the private developer may receive, his foremost goal is to create a project that generates a profit. Profit in real estate development was enhanced by the accelerated growth of urban areas in the 1950's and 1960's, the increased supply of mortgage money, more liberal lending policies, and more favorable federal income tax policies.⁹ Within this framework of real estate investment incentives there are three dimensions which allow a developer to garner a profit: appreciation, leverage, and tax advantages.

Appreciation is the increase of a development in value over time. The amount of appreciation is dependent on the location of the property, its purchase price, its potential uses, and the demand for those uses.¹⁰ The tendency for construction costs to rise faster than the general inflation rate lead to appreciation in values and make real estate an attractive investment.

The concept of leverage is also an integral part of real estate finance. A developer is using leverage whenever he is borrowing funds. In typical situations a developer might borrow 75 percent of the value of his project. Positive leverage occurs when the rate of return is higher through the use of borrowed funds than without them. The degree of leverage is measured by comparing the

⁹Ibid., p. 254.

¹⁰Ibid.

annual cost of amortizing the borrowed funds with the annual project income. Thus, if the cost of the borrowed funds is lower than the income, positive leverage results and if it is greater, negative leverage occurs.

The extent of leverage depends on the percentage of funds borrowed (versus equity cash) on which a fixed rate is charged, with the expectation of earning a profit on the borrowed funds. Generally, the greater the leverage the greater the returns, which are of course accompanied by a greater degree of exposure to risk.

Appreciation and leverage are important to the economic viability of a development, but without the benefit of certain tax incentives many projects would never have been conceived. The capital gains tax, depreciation, and deduction of certain development costs are all important to development feasibility.

The capital gains tax is currently forty percent of the ordinary income tax rate, and applies to sales of property held for at least six months.¹²

Another major tax benefit is depreciation. Here the developer is allowed to deduct a certain percentage of the worth of his development each year, which serves to offset income from his property and reduce taxes.

¹¹Ibid., p. 255.

¹²Ibid., p. 256.

Improvements to commercial real estate can currently be depreciated over a fifteen year period on a straight-line basis.

The usual situation in highly leveraged properties is for the developer to shelter all income from the project until principal payments on the debt exceed depreciation allowances, which usually occurs in between 7 to 12 years. During this time, which is termed the "crossover period," the developer can sell, trade, or refinance the project.¹³

In addition to capital gains tax and depreciation expenses, development costs such as construction period interest fees, property taxes, and ground rents can often be included in deductible expenses, and can be used to affect income and minimize taxes.¹⁴

All of these financial incentives make real estate development an attractive investment and are indispensable to the developer's ability to make a profit. However, as noted earlier, there are two parts to the developer's goal: maximizing his profit while minimizing the risk.

Risk is an integral element of the development process. In many respects a developer is a gambler who contributes time and money without knowing for certain if he will receive anything in return. Lending institutions

¹³ Ibid., p. 257.

¹⁴ Ibid., p. 258.

that provide funds to developers demand a return that reflects the amount of risk they perceive that they are assuming.

The two basic types of risk are business risk and financial risk.

Business risk is simply the probability that a development will not generate the expected level of return, which is net income before debt service.¹⁵ This basic risk is not influenced by the manner in which a developer finances his project and includes such elements as location, construction costs, marketing, design, or natural calamities.

Financial risk, on the other hand, refers to the added risks to the developer which are generated because of debt financing. These risks increase as the amount of leverage increases. High leverage can produce a liquidity problem because a high proportion of project income is committed to pay fixed payments created by debt financing.¹⁶ Thus, the less liquid a project is the greater is the financial risk. Financial risk might be further caused by a rise in interest rates when borrowed funds are tied to a "floating prime rate."

¹⁵James R. Cooper, Real Estate Investment Analysis (Lexington Books: D. C. Heath and Company) 1974, p. 315.

¹⁶Ibid., p. 315.

The developer must assess all the risks as carefully as possible prior to initiating a project. The risks and returns should then be compared with other projects and investment opportunities. Only if the project or investment compares favorably should the developer proceed with his development.

The Development Team

Until recently the development process was viewed in a linear fashion with each step being segregated from the others. Roles were narrowly defined and development phases were divided into simple chronological elements with no overlap between phases and little communication among team members. This traditional development process with its inherent communication gaps, its fragmented responsibilities, and its slow construction schedule, had to be replaced by the team approach, especially in large, complex projects.¹⁷

The greater dependence on close coordination between development team members has evolved as a result of four major factors.

Industrialization of building technology

Increased size of development projects

¹⁷Griffin, p. 14.

Increased need for good economic planning to assure project success

Growing economic importance of construction speed¹⁸

These factors make it imperative that experts in various disciplines participate in every phase of the development process. The developer can no longer assume that he possesses all the skills necessary for planning and implementing a development project. He needs a development team made up of economic, political, financial, design, environmental, and legal experts. The extent and type of expertise needed depends on the type of development, the site characteristics and the local political climate. The developer, because of his risk and ownership position, is still the chief decision maker.

Early team assembly has recently become more critical because of environmental assessment requirements. Several states such as California, Florida, and Hawaii have mandated environmental assessments, and developers in other states have adopted environmental studies as a matter of good practice. Many of the professional skills represented on the development team will be needed to perform an adequate environmental assessment.¹⁹ The front-end cost of environmental assessment by geologists,

¹⁸ Ibid.

¹⁹ Urban Land Institute, Residential Development Handbook (Washington: Urban Land Institute, 1978) p. 8.

biologists, and environmental engineers is not only a safeguard against purchase of an unsuitable site but also will accelerate project design time.

The number and type of development team members is generally a function of the scope and complexity of the potential project. Many development teams are usually comprised of some or all of the following: subdivider, attorney, planner, engineer, geologist, market researcher, architect, landscape architect, financier, banker, realtor and contractor. A brief description of each of their roles will clarify the process.

The subdivider or developer is an investor who commits his equity, equipment, labor force and management team to the conversion of land from one use to another.²⁰ The developer, as a risk taker and manager must feel confident with costs, income or cash flow projections, and capitalization estimates. He must also be analytical enough to comprehend and coordinate the skills represented by other team members.

The attorney on the development team is virtually indispensable. He should have a strong background in real estate law and be familiar with local economic and political environment. The development team attorney's duties usually

²⁰ Halbert C. Smith, Real Estate and Urban Development, (Homewood, Illinois: Richard C. Irwin, Inc. 1973) p. 278.

include the preparation of documents for financing, land purchases, leases, zoning changes, sales contracts, and any special covenants inherent to the project.²¹ In addition, because of his knowledge of key community leaders, the attorney may serve in a valuable public relations role, especially to a developer who is moving into a new area.

A good land planner must be aware of local zoning policies and municipal regulations. The planner is involved with the site evaluation, from which specific uses of the land are allocated. Topography, access, circulation, vehicular and pedestrian paths, utilities, open space, and residential uses are examined in order to produce a unified plan for development. The plan must be economically feasible and designed for the target market. In addition, the plan for development must be in harmony with the comprehensive plan for neighboring uses.

Homogeneous topography creates an even greater need for a good land planner, as Carl Norcross states:

A good land planner is not only a necessity, but he often saves many times his fee by creating houses with more value and by reducing road costs. The developer with flat land needs a good planner more than if he had rolling land. If he does not have a good plan, his houses look dull and

²¹ULI, Residential Development Handbook, p. 9.

monotonous. An imaginative²² plan goes far in creating visual interest.

The engineer contributes to the land plan by performing soil tests; making site specific decisions regarding streets, lot and building lines; completing working drawings for setting grades, earthmoving, stormwater drainage, sewers, water, and electric lines; as well as specifications for materials and their costs.²³

The architect and landscape architect also play valuable roles in the development process. The architect, who plans, designs and supervises the construction of buildings, is responsible for creating buildings which are well adapted to the site and other structures, as well as having marketable floor plans. Other duties include: site planning (small scale), housing material selection, exterior color, styling, interior design, professional supervision, and merchandising suggestions concerning display and advertising.²⁴ Architectural services are needed early in the development process, especially concerning budget decisions and program design. The Schematic in Figure 12 illustrates the architect's position for input within the

²²Carl Norcross, Open Space Communities in the Market Place, Technical Bulletin No. 57 (Washington: Urban Land Institute, 1966) p. 64.

²³ULI, Residential Development Handbook p. 11.

²⁴*Ibid.*

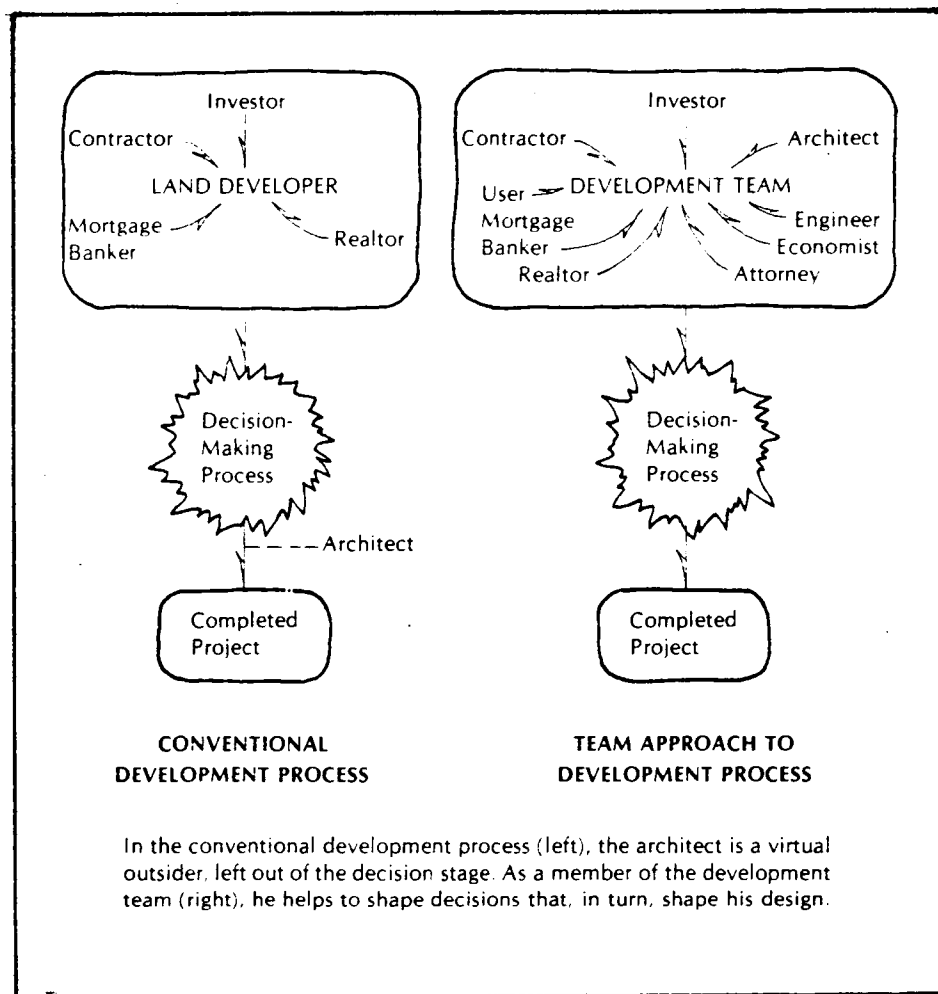


Figure 12. CONTEMPORARY TEAM APPROACH

Source: C. W. Griffin, Development Building: The Team Approach (New York: John Wiley and Sons, 1972).

conventional process as opposed to the contemporary team approach.²⁵

The landscape architect is also a vital team member, helping to establish the character of a project by protecting and enhancing the natural character of a site. The architect's three dimensional perspective is helpful in selecting plant materials, analyzing the relationships between buildings and sites, creating open spaces, and designing recreational facilities.²⁶ Architectural influence should be apparent before construction is initiated.

Sound financing is essential to the viability of any development. Consultation with an experienced financier (a banker, real estate finance specialist and/or cost consultant) is critical to the economic success of the project. The team financier is responsible for developing a feasibility study and determining the source and terms of the construction and long-term financing of the development. The feasibility study will be discussed in detail in this chapter.

An experienced contractor is needed from the outset for cost estimates, and later for building the development. The contractor assembles and organizes building materials and labor, supervises construction, and disburses payments to building subcontractors.²⁷

²⁵Griffin, p. 3.

²⁶ULI, Residential Development Handbook, p. 11.

²⁷Ibid.

In some developments the developer buys, builds and markets the project, thereby becoming the contractor. In other cases he only purchases and prepares the site for development (by installing site infrastructure), then selling improved building sites to other building contractors. Whichever the case, the contractor is the key actor in the development process, and ultimately affects the quality and timeliness of the finished product.

The Development Process

The process by which raw land is converted to other uses may be characterized as a complex set of decisions over time by a groups of key and supporting participants or decision agents. Key decision agents include the landowner, the developer, and the consumer; supporting decision agents include realtors, financiers and public officials.²⁸ The transition of land to active uses tends to follow a pattern composed of the following stages:

1. Land acquires the potential for urban use,
2. It is actively considered for purchase and subsequent development,
3. A developer has a definite idea of the character of development and the specific timing involved based on the market and feasibility studies,

²⁸ Shirley F. Weiss, et al, Residential Developer Decisions (Chapel Hill: Center for Urban and Regional Studies, University of North Carolina, 1966) p. 10.

4. Active development begins, and
5. A housing unit is purchased by a homeowner.²⁹

For purposes of discussion, this section will focus on steps two through five. At this point the developer has assembled a basic team of experts and is actively searching for a parcel of land. These steps in the development process and their sequence is important, but it is equally important to bear in mind that the phases in the development process are interrelated.

There are many variations for detailing the steps in the development process. The three major phases in the development process are: the decision stage, the design stage, and the delivery stage.³⁰

Decision Stage

During the decision stage the developer, as prime project mover, accomplishes the following tasks.³¹

- assembly of development team
- economic design (market and feasibility studies)
- site selection
- program and budget

²⁹Edward Kaiser and Shirley Weiss, "Public Policy and the Residential Development Process," Journal of American Institute of Architects, January, 1970.

³⁰Griffin, pp. 11-12.

³¹Ibid., p. 11.

- construction cost projections
- conceptual design
- land acquisition (option, lease or purchase)
- preparation of financing package for submission to prospective lenders

The sequence of decision stage tasks is not rigid and may vary from development to development. However, the three key tasks (market and feasibility studies, land acquisition, and project financing should be accomplished in that order.

The two major components for establishing overall project feasibility are market analysis and financial analysis. The marketing study assesses the magnitude and type of demand for (in this instance) residential units. This data is in turn utilized to generate project costs, revenues and cash flow projections from which a financial package can be assembled for prospective lenders.

Market analysis. The market analysis accounts for the following factors: delineation the local market area; an analysis of local economic trends; a determination of demand factors (employment, disposable income, population and household characteristics, the political and economic growth environment and the absorption rate). In addition the following supply factors are considered: current residential construction rates, housing unit inventories, market conditions such as vacancies, unsold inventory,

marketability of sales vs. rental units, prices, rents, building costs, and mortgage defaults and foreclosures.³²

Delineation of the competitive market area is the initial task of the market analysis. Precision is virtually impossible but a close approximation can be achieved by analyzing transportation networks, major employment centers, commuting patterns, residential development trends, school districts, major shopping modes, and topographic barriers.³³ Local planning maps should be gathered which specifically deal with topography, transportation, land use, population distribution and housing. The end result will be a market area map which reflects the extension and direction of future growth and patterns of residential development. Information should also be gathered about the overall economic stability of an area. The local economy and the presence or absence of employment opportunities will provide the developer with a feel for the type and price of housing that residents require.³⁴

The next step in the market analysis is to determine the housing demand for the market area. Factors which influence the demand for housing include: income and

³²ULI, Residential Development Handbook, p. 13.

³³Ibid., p. 17.

³⁴Ibid.

employment patterns; changing growth rates in family size; population characteristics, formation of households; changing tastes and consumer desires; and interest rates.³⁵

The next task in the market analysis is to conduct a survey of the competition which focuses on development of the type and price or rental range envisioned by the developer. Elements to include are:³⁶

- Location of project
- Number of units
- Unit mix
- Size of units
- Features (appliances, finishings, cable TV)
- Amenities (open space, recreational facilities)
- Price/rental range
- Sales terms
- Merchandising techniques
- Sales-to-date/rented-to-date
- Absorption rate/vacancy rate
- Buying or renting profile of residents

The final step in the market analysis is to calculate the approximate rate at which units can be sold or leased

³⁵Ibid., p. 18.

³⁶McMahan, p. 140-142.

for the proposed development. This rate, termed the absorption rate, is highly subjective and is based on other projects in the survey of competition as well as the knowledge and experience of the developer and the market analyst. Once a rate has been agreed upon, that percentage is applied to the total number of units in the price range anticipated. Table 1 illustrates the technique.³⁷

The entire market analysis process, from delineating the market area to project market capture and absorption, is an essential preliminary step to actual siting and construction of a development. Ideally the analysis would include several potential sites, which could accommodate a development of the size and scope envisioned by the developer with the actual site selection being indicated, if not dictated by, the market analysis. (See Table 2.)

A market analysis is an initial step, the "bottom line" of which says whether or not there is potential for a development. Despite its quantitative nature, the market analysis is merely an adjunct to good judgement and experience. The market analyst, from the assessment of the potential for a development in the market area, concludes, for example, that there is a need for a new apartment or single-family development and makes recommendations to construct a given number of units at certain prices or rental ranges.

³⁷Ibid., p. 142.

Table 1. Projected Demand on Subject Site.

	1976	1977	1978	1979	1980	Total
Single-family demand, \$30,000- \$45,000 range						
Total market area	575	500	450	400	350	2275
Market capture by subject site		30-40%	20-30%	10-20%		
Market demand on subject site		150-200	90-135	40-80		280-415
Average monthly absorption		13-17	8-11	3-7		8-12

Table 2. Project Cost Estimate

Land costs		
Current market value*	\$200,000	
Site preparation	3,000	
Landscaping	<u>12,000</u>	\$ 215,000
Construction costs		
Building: 43,230 sq ft @ \$20.00	\$864,600	
Parking: 23,240 sq ft @ \$7.50	174,300	
Swimming pool	<u>34,500</u>	1,073,400
Interim costs		
Property taxes	\$ 10,400	
Interest	37,500	
Finance fees (1½ pt)	15,000	
Insurance	5,000	
Architecture and engineering	62,700	
Legal	4,000	
Promotion	5,500	
Miscellaneous	<u>4,500</u>	144,600
Total project costs		\$1,433,000

*Land purchased for \$165,000.

Source: John McMahan, Property Development (New York: McGraw-Hill, 1976).

The financial analyst will use the information collected in the market analysis to get a ceiling for total project cost, or budget, that will yield the necessary rate of return on the developer's capital investment. Economic feasibility and physical design can occur simultaneously, but constant interaction between these two parallel processes is necessary.³⁸

The actual site selection, indicated by market analysis, can occur during or after the financial feasibility study and is further dependent on project size and type, its cost, and location.

Locational factors usually used for development siting are: the direction of high, medium and low cost development (because directional trends are difficult to reverse); good access from major arterials; and the availability of utilities.³⁹ Perhaps just as important to site selection as location are a site's natural characteristics. A site might be located adjacent to a major transportation corridor, but be unsuitable for development because of natural constraints. Thus, any potential site should be evaluated in terms of soil, slope, and geological and hydrologic factors.

³⁸Griffin, p. 18 .

³⁹ULI, Residential Development Handbook, pp. 37-38 .

The financial feasibility analysis. Following the market analysis and site selection, a feasibility study can be done. Input for the analysis include: the project's appraised value; mortgage terms (loan amount, interest rate, term of constant annual payments); and the minimum acceptable rate of return on equity investment.⁴⁰ From this data the analyst is able to compute the project cost that yield the necessary return on investment. The project is deemed feasible if it can be planned, built and marketed within the prescribed budget.

An appraisal of the development is not only needed for the feasibility analysis but also for the mortgage loan, which is directly related to the appraised value. There are three ways to compute project appraised value: the income method, replacement cost method, and the comparable sales method. The income method is most applicable for properties such as apartment complexes and large developments.

Data needed for the income method includes:

- leasable area in square feet (from market analysis)
- annual rental price per square foot (from market analysis)
- operating expenses (as a percentage of gross rent)

⁴⁰Griffin, p. 34.

- a capitalization rate (the interest rate which is considered a reasonable return on investment)

From this information the capitalized value or market value (assuming a willing buyer) is computed and serves as the basis for the mortgage loan.⁴¹

In addition, the interest rate and the capitalization rate are directly proportional (the higher the interest rate, the higher the capitalization rate). Since the project's capitalized value is inversely proportional to the capitalization rate, it follows that the effect of high interest rates is to reduce capitalized value and thus the amount of mortgage loan available.⁴²

The next steps in the financial analysis proceed as follows: estimating project costs; estimating project income; return on investment analysis; and a cash-flow analysis. It is important to make accurate estimates of project costs in order to avoid underfinancing of the development. The cost of the development site should always be representative of the current market price. Construction costs should be expressed by applying unit costs to the amount of square footage that will be constructed. In addition, an inflation factor should be applied to reflect the time for construction. Interim costs must be included, which

⁴¹Ibid.

⁴²Ibid.

represent the time span between the beginning of the development process and the first project revenues.

Table 2 is representative of a project cost estimate format.⁴³

Project income (in this case from an apartment development) is calculated as an estimate of total annual income exclusive of financing costs. The process involves three steps. First, the scheduled revenue is computed by multiplying the monthly rent for each unit by the number of units. Next an estimated vacancy rate is deducted, which results in the effective revenue. Finally the project's operating expenses are deducted from the effective revenue to give project income. Table 3 sets forth the most common operating expenses associated with project income calculation.⁴⁴

Prior to calculating the return on equity, the analyst must establish the capital structure for the project. This enables the developer to estimate how much equity will be needed and in turn how much will need to be borrowed.

The amount of mortgage is derived by taking a certain percentage of the appraised project value. The percentage loan is typically between 60 and 90 percent and will depend on the type of financial institution, its legal lending limits, the strength of the development and the credit rating of the developer. The typical capital structure formal is displayed in Table 4.

⁴³McMahan, p. 261.

⁴⁴Ibid., p. 263.

⁴⁵Ibid., p. 264.

Table 3. Project Income.

	Monthly	Annually
Scheduled revenue		
Apartment units		
1 Bdr. 15 @ \$340	\$5,100	\$ 61,200
2 Bdr. 25 @ \$370	9,250	111,000
3 Bdr. 7 @ \$430	<u>3,010</u>	<u>36,100</u>
Parking (60 stalls @ \$15)	<u>900</u>	<u>10,800</u>
Total	\$18,260	\$219,100
Vacancy and collection loss (5%)	<u>920</u>	<u>11,000</u>
Effective revenue	\$17,340	\$208,100
Operating expenses		
Property taxes	\$5,335	\$ 40,000
Utilities	300	3,600
Insurance	250	3,000
Trash removal	100	1,200
Pool maintenance	100	1,200
Landscape maintenance	150	1,800
Repairs, supplies, etc.	500	6,000
Replacement reserve	500	6,000
Management	800	9,600
Miscellaneous	<u>200</u>	<u>2,400</u>
	6,235	74,800
Project income	\$11,105	\$133,300

Table 4. Capital Structure.

Project cost estimate	
Land	\$ 215,000
Construction	1,073,400
Interim	<u>144,600</u>
Total	\$1,433,000
Sources of capital	
Mortgage*	1,000,000
Equity	
Land value	\$200,000
Cash	<u>233,000</u>
Total	\$1,433,000

*8%; 30 years.

Source: John McMahan, Property Development (New York: McGraw-Hill, 1976).

As implied before, the developer gauges the feasibility of a project by establishing a predetermined rate of return. The return is expressed as a percentage and is termed rate of return on equity investment (ROE). A simple technique called the before-tax cash-flow method is often used to estimate ROE. With this approach the debt service (principal and interest payments) is deducted from the total project income to arrive at the annual net spendable income. This amount is then divided by the amount of total equity to yield the percentage equity return. Using arbitrary figures, a sample ROE is calculated as follows:⁴⁶

Project Income	\$133,300
Debt Service	<u>88,100</u>
Equity Income	\$ 45,200
Equity Investment	433,000
Equity Return	10.4%

This method is inadequate because it fails to show variations in return from year to year and it doesn't consider the all-important tax consequences of a development. The cash-flow analysis is used to compensate for those factors.

⁴⁶Ibid., p. 265.

In order to construct a cash-flow analysis, the financial analyst must first establish which project costs are depreciable capital assets and which are deductible operating expenses. A depreciation schedule is set up for capital assets, includes expenses which can be capitalized such as: building and accompanying parking spaces; site development and landscaping; architectural and engineering fees; property taxes, financing fees and legal costs. Deductible operating expenses, which are increased by an inflation factor each year generally include: insurance, promotional costs, maintenance and management fees and utility costs.⁴⁷ In addition, an amortization schedule is developed in order to compute how much interest is available for deduction each year and how much principal or equity build up has accrued. More of the amortization payment is applied to interest in the early years of the loan and less to principal. By using the depreciation and amortization schedule the developer can project just when his tax shelter is reduced, and the cross-over phenomenon (discussed earlier) occurs. At this time it is considered wise to sell, trade, or refinance the project. Table 5 illustrates the cash-flow analysis.⁴⁸

⁴⁷Ibid., p. 266.

⁴⁸Ibid., p. 267.

Table 5. Cash-Flow Analysis (in Thousands).

Year	1	2	3	4	5	6	7	8	9	Total
Vacancy	Construction	10%	5%	5%	5%	5%	5%	5%	5%	
Scheduled revenue*		\$219.1	\$219.1	\$224.5	\$230.1	\$235.9	\$241.7	\$247.1	\$252.7	\$1870.2
Less: vacancy allowance		21.9	11.0	11.2	11.5	11.8	12.1	12.4	12.6	104.5
Effective revenue		\$197.2	\$208.1	\$213.3	\$218.6	\$224.1	\$229.6	\$234.7	\$240.1	\$1765.7
Operating expense*										
Property taxes	\$ 10.4	\$ 39.0	\$ 40.0	\$ 41.0	\$ 42.0	\$ 43.1	\$ 44.2	\$ 45.3	\$ 46.4	\$ 351.4
Utilities		3.4	3.6	3.7	3.9	4.0	4.1	4.2	4.3	31.2
Insurance	5.0	4.0	3.0	3.1	3.2	3.2	3.3	3.4	3.5	31.7
Trash removal		1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	10.3
Pool maintenance		1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	10.3
Landscape maintenance		3.0	1.8	1.8	1.9	1.9	2.0	2.0	2.1	16.5
Repairs, supplies, etc.		8.0	6.0	6.2	6.3	6.5	6.6	6.8	6.9	53.3
Management	8.0	9.0	9.6	9.8	10.1	10.3	10.6	10.8	11.1	89.3
Miscellaneous	3.0	2.8	2.4	2.5	2.5	2.6	2.6	2.7	2.8	23.9
Total		\$ 71.6	\$ 68.8	\$ 70.5	\$ 72.5	\$ 74.2	\$ 76.0	\$ 78.0	\$ 79.9	\$ 617.9
Project income		\$125.6	\$139.3	\$142.8	\$146.1	\$149.9	\$153.6	\$156.7	\$160.2	\$1147.8
Capital expense										
Interest (deduct)	\$ 37.5	\$ 80.1	\$ 79.1	\$ 78.1	\$ 77.1	\$ 77.1	\$ 75.1	\$ 75.1	\$ 73.1	\$ 652.3
Depreciation (deduct)		58.5	55.5	52.7	50.2	47.6	45.2	43.0	40.8	393.5
Total		\$ 37.5	\$138.6	\$134.6	\$130.8	\$127.3	\$124.7	\$120.3	\$118.1	\$1045.8
Profit before taxes		\$ (13.0)	\$ 4.7	\$ 12.0	\$ 18.8	\$ 25.2	\$ 33.3	\$ 38.6	\$ 46.3	\$ 102.0
Taxes (50%)			2.4	6.0	9.4	12.6	16.7	19.3	23.2	89.6
Profit after taxes		\$ (13.0)	\$ 2.3	\$ 6.0	\$ 9.4	\$ 12.6	\$ 16.6	\$ 19.3	\$ 23.1	\$ 12.4
Cash adjustments										
Depreciation (add)		\$ 58.5	\$ 55.5	\$ 52.7	\$ 50.2	\$ 47.6	\$ 45.2	\$ 43.0	\$ 40.8	\$ 393.5
Amortization (deduct)		8.0	9.0	10.0	11.0	11.0	13.0	13.0	15.0	90.0
Replacement reserve* (deduct)		5.0	6.0	6.2	6.3	6.5	6.6	6.8	7.0	50.4
Net		\$ 45.5	\$ 40.5	\$ 36.5	\$ 32.9	\$ 30.1	\$ 25.6	\$ 23.2	\$ 18.8	\$ 253.1
Project cash flow		\$ (63.9)	\$ 32.5	\$ 42.8	\$ 42.5	\$ 42.3	\$ 42.7	\$ 42.2	\$ 42.5	\$ 265.5
Tax shield		\$ 32.0	\$ 6.5							\$ 38.5
Equity cash flow		\$ (31.9)	\$ 39.0	\$ 42.8	\$ 42.5	\$ 42.3	\$ 42.7	\$ 42.2	\$ 42.5	\$ 304.0

* Assumes 2.5% annual increase after third year.

Source: John McMahan, Property Development (New York: McGraw-Hill, 1976).

The accuracy and reliability of the economic feasibility studies is, of course, dependent on the accuracy of the cost and revenue projections. The feasibility analysis provides an approximation of the economic and investment consequences of the development under certain assumptions. It is considered wise to construct three or four economic scenarios by varying the assumptions. If the feasibility analysis conclusions are consistently below the standards of return as set by the developer, or if risks are inherently too great, the project as planned should be reconsidered or abandoned altogether.

Site acquisition. The next major task in the decision stage is land acquisition. The developer is required by most lending institutions to accomplish this task before a financial commitment can be made. Land acquisition is one of the most important and costly elements of the development, so the developer attempts to minimize its impact on project feasibility by delaying or deferring actual cash expenditure for as long as possible. The various methods of land acquisition include the following: purchase-money mortgage; land contract; land option; ground lease; joint venture; deferred acquisition; and syndication.⁴⁹

⁴⁹Griffin, p. 53.

A purchase-money mortgage is used when the developer places a downpayment on the land and repays the balance over regular intervals. The landowner acts as mortgagee with right of foreclosure if payments are overdue. However, it is common practice for the lending institution to require that they hold the first lien on the land in case of development foreclosure. This serves to weaken the strength of the landowner and consequently complicates the negotiation process.

The land contract is similar to the purchase-money mortgage, except that, the title is transferred to the developer following the downpayment when using a purchase-money mortgage, whereas with the land contract title is transferred only after certain percentages of the land are paid for. For example, if a development were to occur in four equal phases, the developer would not have a release on the first 25 percent of the land until it was paid for.

The actual commitment of funds to purchase a development site before completion of feasibility studies and public approval can be presumptuous and risky. Therefore, the land option is often used to control the site for a specified period of time and with minimal cash investment. Before the option period expires (usually three months to one year)⁵⁰ the developer may contract to purchase

⁵⁰ULI, Residential Development Handbook, p. 95.

the property or negotiate another extension of the option. The option payment is usually from one to five percent of the purchase price and includes all carrying costs such as taxes or second mortgages.⁵¹ Options can be less costly if their price is applied as part of the purchase price, and they serve to control a site with minimal cash outlays until a final decision is reached.

With a ground lease the developer has no title to the property but has full use of the site by virtue of rent payments. The developer owns the improvements until the lease expires, which is usually such a lengthy period (often 99 years) that it is of little concern.

The joint venture is a technique which eliminates any initial land acquisition cost. Here the land owners become a partner in the development with the market value of the land representing a percentage share of the development, which is based on the total project equity. For example, if \$200,000 were needed as project equity and the land had a market value of \$100,000, then the developer and the landowner could each share 50 percent of the project's return.

The deferred acquisition technique for land control enables the developer to plan, design, and arrange financing for his project prior to leasing the land or entering into

⁵¹Griffin, p. 54.

a joint venture with the land owner. This agreement requires a formal legal document between the land owner and developer, which should contain the following provisions.⁵²

1. The land owner should agree to hold the land 6 to 12 months while the developer arranges for market and feasibility studies to be completed.

2. If a go-ahead decision is then made the land owner should further agree to hold his land for another specified period allowing the project's conceptual design and financing to be completed.

3. The land is then agreed to be held until a firm financial commitment is negotiated for construction funds.

4. At this point the land owner decides either to lease his property or enter into a joint venture agreement with the developer for the market value of his land.

In this way the developer defers all front-end land acquisition costs until disbursements of funds from the construction loan begin.

The syndicate is another method of acquiring development property and may be organized as a corporation, a joint venture, a real estate investment trust and general or limited partnership. Often the syndicate is formed to

⁵²Ibid., p. 56.

acquire and hold the land until development, at which time a new more suitable organizational vehicle is formed. This allows syndicate share holders the option of selling their shares or assuming more risk during the development phase.

Of all these land acquisition techniques, the option is perhaps the safest method to employ. Public approval, which frequently requires zoning changes, needs to be negotiated and is by no means guaranteed. In addition, a financial commitment, which is often contingent on public approval, must be acquired. Thus, during the decision stage the option is an attractive device because of its inherent flexibility.

Development financing. The last major task in the decision stage is to arrange for financing of the proposed development. The financing of most projects involves the negotiation of two types of loans; the construction of interim loan and the permanent loan.

Construction financing is used to cover the costs of site improvements, buildings, amenities and other expenses incidental to the project. This type of loan is short-term, provides installment payments to the developer, and usually has a variable interest rate. The developer pays simple interest on the construction loan during the loan period, usually on a monthly basis. At the end of the building

period the loan is then repaid or "taken out" with the permanent loan.

The permanent mortgage loan is usually set up as a self-amortizing, level payment loan which involves equal payments with more being credited to interest in the early years and more to principal in the later years.⁵³

The major sources of construction funds include commercial banks, savings and loan associations, and real estate investment trusts. Permanent financing is generally acquired from insurance companies, savings and loan associations, or pension funds. Interest rates charged by construction lenders are usually 1 to 2 percent greater than the permanent loan interest rate.⁵⁴

The development loan package. Most lending institutions require the preparation of a loan package in order to evaluate the proposed project in terms of risk, yield, and other competitive developments. The exact content of the information package may vary with institutional requirements but generally contains the following data:⁵⁵

1. a description of the development, the development team and the economics of the project;

⁵³Ibid., p. 62.

⁵⁴Ibid., p. 68.

⁵⁵Ibid., p. 63.

2. the design concept, schematic drawings, site plan and floor plans;
3. description of prospective presales or lessees;
4. summary of the market and feasibility studies;
5. a program of services and facilities;
6. a detailed description of improvements - site-work, building materials, mechanical equipment, etc.;
7. a site description and location - photograph and map;
8. the developer's pro forma (investment projection) including a summary of total costs, equity investment, first mortgage loan requirement and complete projected cash flow;
9. development team members and qualifications and experience.

This general information package is circulated among several potential lending institutions in order to obtain permanent financing. Once a potential lender indicates a high degree of interest, the developer and his team submit a formal application document, which is often accompanied with 1 to 2 percent standby commitment fee. The formal application letter includes the following additional data.

1. data on the developer and other financially responsible participants (e.g., financial statements and credit ratings from Dun and Bradstreet);

⁵⁶Ibid., p. 64.

2. detailed project description;
3. site plan which illustrates property lines, topography, zoning, building outlines, streets, parking spaces;
4. plans and elevations with floor plans and typical unit designs;
5. the builder's track record and estimated date of construction completion;
6. development team members experience (architects, engineers, planners, realtors);
7. a detailed cost analysis (land, fees, construction costs and an itemized breakdown of materials and labor);
8. the leasing or sales schedule (lease or sales terms);
9. detailed accounting of estimated income and expenses, indicating the amount of net income allocated to debt service;
10. land acquisition data - copies of the purchase agreement or option;
11. location of competing projects and accompanying characteristics such as size, rent structure, and tenant characteristics;
12. an independent market analysis and appraisal.

The steps normally included in the process from search to repayment are the following:⁵⁷

1. circulation of the preliminary financial package among prospective lenders;
2. submission of the formal application letter to an interested lender;
3. payment of 1 to 2 percent standby fee;
4. submission of a final application in accordance with lender's specific requirements for review;
5. signing of mortgage loan commitment by the developer and lender;
6. negotiation of a construction loan prior to actual construction with the same or different lender;
7. payment of the construction loan prior by the mortgage lender (when construction is completed);
8. repayment of the developer's deposit minus fees.

The type of financing that the developer requires depends on the nature and scope of his project. A single-family financial package is different from a multi-family one and a unit-for-sale project is financed differently than a rental development. However, the use of the basic loans (construction and permanent) are prevalent throughout the development process, as are the basic required information and the steps following in acquiring a financial commitment.

⁵⁷Ibid., p. 63.

Preparation of the financial package is often done by a mortgage banker whose expertise is especially critical in geographic areas where the developer is unfamiliar with lending institutions. His preparation and presentation of the financial package, as the last major task in the decision stage, often determines if the development process will continue. Without the ability to convince a prospective lender of the development's sound physical and economic character, the development will never proceed beyond the planning phase.

The Design Stage

The second major phase in the development process is the design stage. According to Griffin, the key tasks to be accomplished include the preliminary design, final financial arrangements and the final design with construction documents and working drawings.

Project design is carried out in conjunction with the economic design, which is part of the decision stage. The interrelationship is graphically portrayed by the diagram in Figure 13.⁵⁸

⁵⁸Griffin, p. 30.

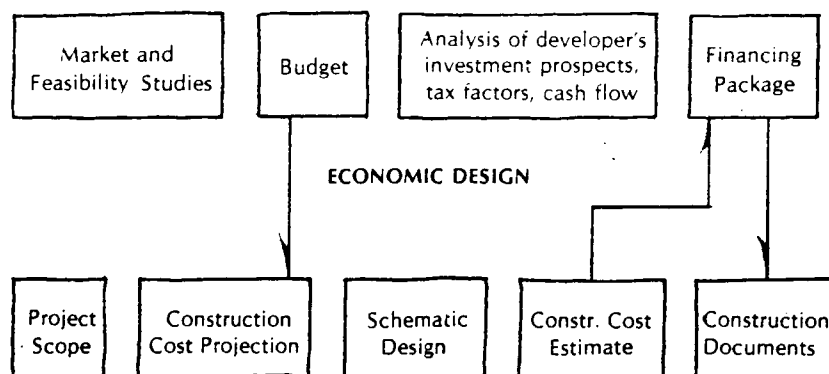


Figure 13. ECONOMIC AND PROJECT DESIGN

Source: C. W. Griffin, Development Building: The Team Approach (New York: John Wiley and Sons, 1972).

As can be readily observed, the project design stage is not an isolated independent step in the development process. The developer's budget determines the construction cost projection and in turn the more accurate construction estimate provides valuable input to the terms and requirements of the financial package. In addition, the financial package helps determine the scope and content of the construction documents.

During the design stage the developer is most concerned with controlling costs as projected in his budget. At the same time the architect and land planner should not be restricted to the point of stifling creativity. Close communication between the developer and his project designers can often turn a cost constraint into an opportunity for innovative design.

There are six basic premises on which the philosophy of residential development design is based.

Population will continue to increase.

Urbanization will continue to increase.

Population density will continue to increase.

Environmental problems will escalate with urban and economic expansion.

Natural resources will continue to become more scarce.

Urban and economic expansion and environmental concerns are not irreconcilable.⁵⁹

As environmental awareness continues to increase, the developer has been forced to heed natural constraints. Environmental impact statements and hostile citizen's groups have made the developer more conscious of the long-term effects of employing sound land planning and design principles. As the Task Force on Environmental Quality states:

The developer's role should not only be that of a participant in improving environmental quality, but by virtue of his profession that of a catalyst. The developer has significant impact on the face of our land and often carries the awesome responsibility of structuring the habitat of many people over a long period of time with great investments of capital.⁶⁰

Since developers are by nature profit motivated, they have too often in the past sacrificed environmental quality for economic gain. The gain was small and short-term but the environmental impacts were large and long-term.

⁵⁹ULI, Residential Development Handbook, p. 111.

⁶⁰Ibid.

More recently developers have recognized that an environmentally sensitive development is good business in terms of public acceptance and more rapid market absorption.

The developer who creates the environmentally sensitive project utilizes the following principles.⁶¹

- 1) Incorporating open space which enhances the natural characteristics of the land, such as vegetation or water bodies;
- 2) Devising mechanisms to conserve and protect the natural beauty of the site, while at the same time reserving certain areas for recreational use;
- 3) Designing storm drainage facilities as an integral part of the development plan, with an effort made to locate open space near natural drainageways;
- 4) To the extent possible, selecting open space from land lying between the direction of prevailing winds and the areas of human occupancy to foster temperature control, sound control and clean air;
- 5) Planting vegetation, if the land is devoid of it, in order to foster temperature control, sound control and clean air--maintaining such vegetation by creating a perpetual organization to take care of open space as mandated by restrictive covenants;

⁶¹Ibid., p. 112.

6) Preventing erosion in areas with steep grades and susceptibility to erosion--insuring that in the future this land is used for purposes consistent with the preservation of open space;

7) Designing drainage systems to minimize the possibility of soil erosion, siltation and change due to flooding;

8) Keeping in mind that the PUD principle clearly offers a framework for good design, environmental concerns, and energy conservation through the cluster concept--also that energy inefficient development patterns are outmoded and add to the cost of housing;⁶²

9) Applying good housekeeping practices to construction as well as the finished product;

10) Being aware of water and air contamination, land despoilment, erosion and noise during construction.

McMahan divides the process of planning and design into four phases: land planning, site planning, preliminary design, and contract documents for construction.⁶³

Land planning generally is done for multi-use sites. The final product is a land use plan, which is conceptual in nature. It is presented in map form and shows the general

⁶²ULI, "Energy and Land Use: A statement by ULI - the Urban Land Institute, Environmental Comment, September 1974.

⁶³McMahan, p. 276.

location and magnitude of various land uses, the utility system, and the transportation system.

The natural characteristics of the site are considered in the land use plan and generally include topography, geologic conditions, groundwater, surface hydrology, soils, plants, wildlife, climate, and the site's vulnerability to earthquakes, floods and hurricanes.⁶⁴

In addition, surrounding and neighboring services and facilities are taken into consideration. Access to major arteries and their capacity to accomodate increased traffic is of major importance, as is the availability and capacity of existing utility systems to handle increased demands on water, electricity, and waste disposal. The presence or absence of neighborhood facilities such as schools, churches, parks and playgrounds are also considered.

An architect, landscape architect, or professional land planner is in charge of completing the land plan. Ancillary professions may include an ecologist, lawyer, civil engineer and traffic engineer.

With a thoroughly competent land planner leading a team of other professionals, the land-planning activity is a creative process, which engages the developer and his own specialists in market research, financial analysis, and project management. Ideas are proposed and tested against other alternatives until the best mix and fit is agreed on.⁶⁵

⁶⁴Ibid., p. 277.

⁶⁵Ibid., p. 279.

The resulting land plan may be used to acquire a zoning change or other form of public approval. More detail is present in the utility and transportation elements, while the locating and design of actual buildings is dealt with in a general fashion.

Site planning is more detailed than land planning and shows the location of all buildings, roads, and utilities. Preliminary studies for site planning may include: foundation conditions, soil quality, utility availability, traffic circulation, zoning, and building code regulations.⁶⁶

Site planning's major objective involves the relating of buildings to the inherent characteristics of a given piece of property.⁶⁷ To attain this objective three design parameters must be respected. The first involves the site's natural constraints as determined by such factors as soil conditions, topography, drainage patterns, climate, and vegetation. The second parameter is composed of all legal restrictions such as zoning restrictions, subdivision regulations and building codes. This legal parameter establishes a "building envelope" in which design and construction must function.

⁶⁶ Ibid.

⁶⁷ Ibid.

Densities, setbacks, building volumes, floor area coverage ratios, parking requirements, street widths and utility specifications all legally serve to establish minimums under which the site planner must work. The third site planning parameter is an economic one. It is determined by the developer's budget and the market demand study. Here the site planner must coordinate the design with available resources and the need for various land uses.

Since site planning deals more specifically with a building's location and dimension, an architect may serve as the site planner. In addition, a contractor or cost consultant is needed for cost estimates. The market analyst should also work closely with the architect. In this way cost, market and design can be dealt with in an integrated manner. Figures 14 and 15 illustrate the differences in detail between the land plan and the site plan.

The preliminary design and the site plan are very similar and are developed concurrently as the plan becomes more specific. The objective of this phase is to design a building or buildings which fit into the "building envelope" as established in the site plan.

The development team architect is responsible for the preliminary design and develops several alternative building types. In an urban environment the architect tests the building types against the following design factors:

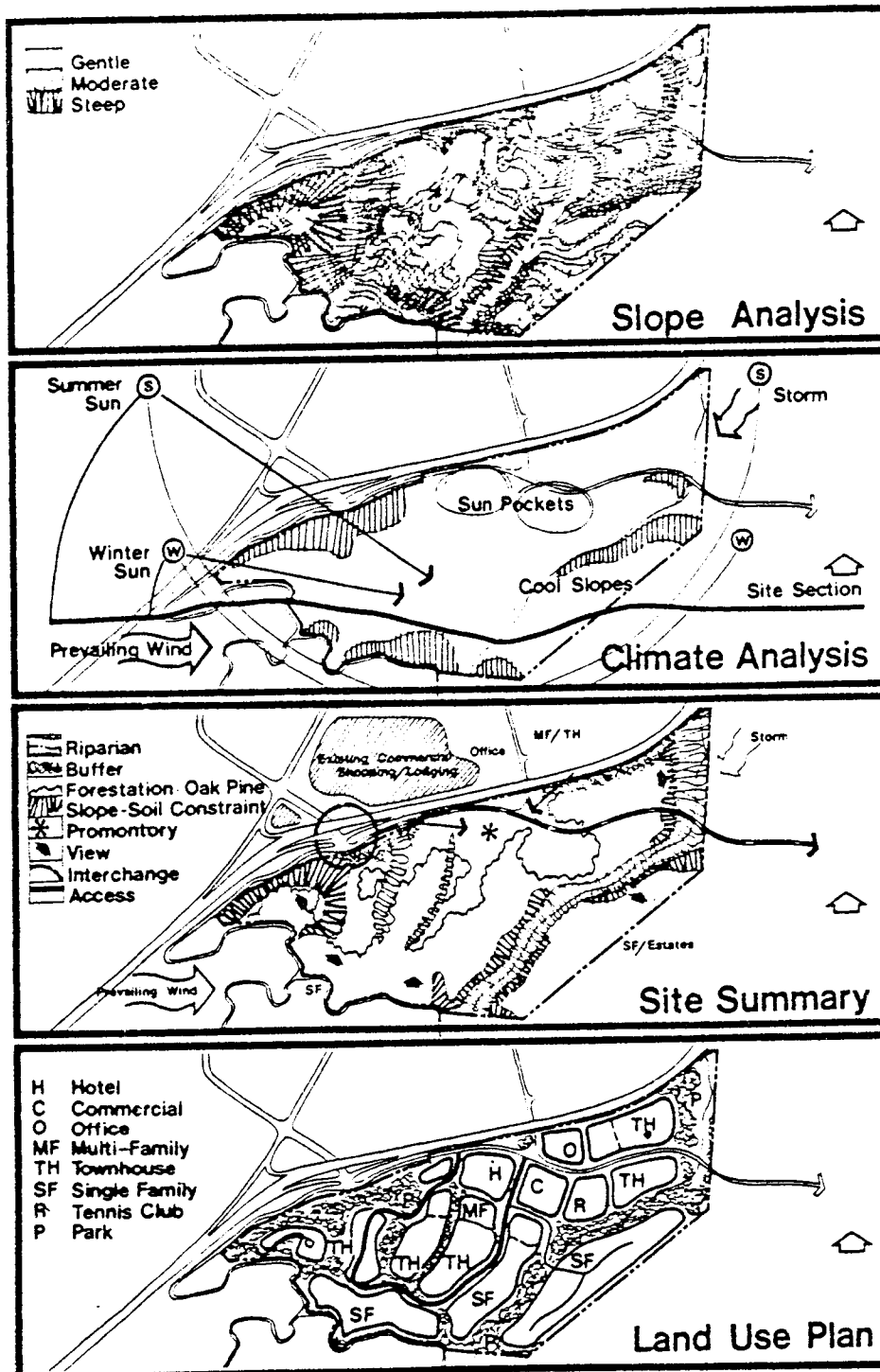


Figure 14. LAND PLAN

Source: Urban Land Institute, Residential Development Handbook (Washington, D.C.: Urban Land Institute, 1978).

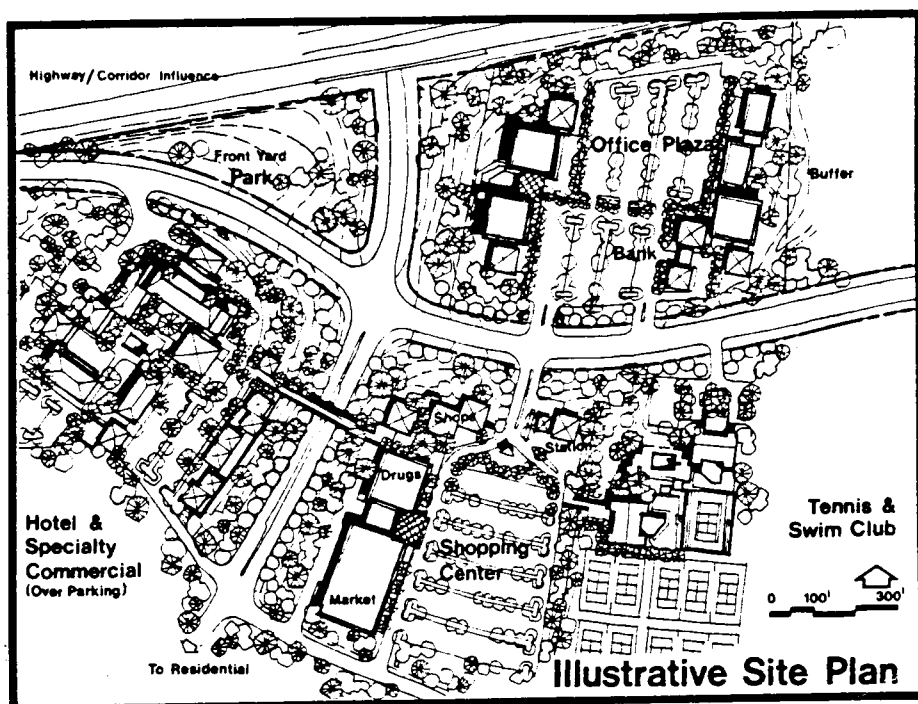


Figure 15. ILLUSTRATIVE SITE PLAN

Source: Urban Land Institute, Residential Development Handbook (Washington, D.C.: Urban Land Institute, 1978).

view amenity; sun and wind conditions; building mass relationships to surrounding existing buildings and land uses; pedestrian movement patterns and relationship to public transportation, and other factors which relate the proposed building to the surrounding physical and social environment.⁶⁸

The architect then chooses the alternative designs based on their conformity with the work program, legal requirements and standards, and aesthetic objectives. A financial feasibility check is then made on each preliminary design alternative in order to ascertain which one is most cost efficient.

The most appropriate design is then selected and developed in greater detail. Factors considered include the structural and construction system, the mechanical system, materials, and equipment. Decisions on these detailed factors will then allow completion of the floor plans, elevations, and cross sections from which preliminary cost estimates can be made.⁶⁹

The preliminary design and cost estimates are valuable inputs into the loan package. Design modifications, if requested by the lending institution, must be made before proceeding with the working drawings and contract documents.

⁶⁸Ibid., p. 283.

⁶⁹Ibid.

In addition, the preliminary design and accompanying cost estimates may also be required to secure final public approval.

The contract documents represent a refinement of the preliminary design and are used to obtain a building permit, final lending institution approval, and bids from interested contractors.

The contract documents are composed of a set of detailed working drawings and accompanying specifications for all construction work. The three elements which make up the working drawings are 1) the structural elements 2) the nonstructural elements and 3) interior design components.

The structural elements include items such as columns, beams, foundation types and truss systems. Each element used must be checked for its ability to handle building stress.

Nonstructural elements are then specified and may include walls, partitions, floors, roofs, stairs, and windows. The mechanical and electrical systems are also selected at this time.⁷⁰

⁷⁰Ibid.

The final element involves the interior design. Here specifications are finalized regarding ceilings, floor coverings, drapes, electrical outlets and other interior finishings. The extent of interior finishings varies and may be left up to the purchaser, who may either upgrade or downgrade depending on minimum standards set by the developer.

The architect, by intergrating these three elements, has completed a final set of working drawings. Flexibility must be anticipated in the drawings to cover any unanticipated problems. Change orders may be necessary for hard-to-get materials, and structural revisions may have to be made as unforeseen site problems arise.

In addition, before the working drawings are finalized and construction begins, all tasks completed during the design phase should be continually tested against the market and financial feasibility studies.

The Delivery Stage

The three major tasks in the delivery stage are construction, marketing, and management. This stage in the development process is action oriented because all prior plans, ideas, concepts and designs are implemented. The developer's major concern during this stage, as with the design stage, is time and speed of delivery.

Construction and financial costs are greatly affected by inflation. One month's delay in construction can jeopardize the validity of the cash flow analysis. Construction and mortgage loans are committed for a definite time period and if construction is not completed within those deadlines, the financial commitments may become void.

William Zeckendorf, the head of Webb and Knapp development corporation, describes the collapse of his firm in 1968 as follows:

A great many of our urban-redevelopment projects were running late and costing us money. Less obvious, but in the end more painful, the projects had fallen out of phase with local markets because of their delayed construction cycles. Though in case after case we had been among the first to see the demand for quality housing in city cores, the delays we ran into in our pioneer efforts, and our own financial difficulties, permitted a wave of follow-the-leader builders to finish rival structures about the time we came to market. This competition meant greater difficulties in getting adequate first rentals for many of our projects. As a result, we had losses, rather than income on our books during those stretched-out beginning periods.⁷¹

In order to insure a more rapid and orderly completion of construction, two management tools have been employed: the use of a construction manager, and the use of accelerated scheduling and monitoring techniques.

⁷¹Griffin, p. 17.

The construction manager's role is one of time and cost control. He may be employed during the decision and design stages as a cost consultant and as a job scheduler throughout the delivery stage. In addition, in a line capacity the construction manager may serve as the developer's liaison between other key members of the development team. In essence, the manager fills the gap between the contractor and the architect.

The construction manager is responsible for the following tasks.⁷²

- assembly of construction documents for bid
- solicitation of bids from contractors
- negotiation with successful bidders
- negotiation of contractor claims
- construction cost control
- processing of subcontractors requisitions and other supervisory and administrative work usually done by the general contractor

One tool that the construction manager often uses is accelerated scheduling. This type of scheduling permits construction to commence early in the design process. This enables foundations to be laid as their location and specifications are designed. Figure 16 illustrates the difference between the linear process and the accelerated process.

⁷²Ibid., p. 22.

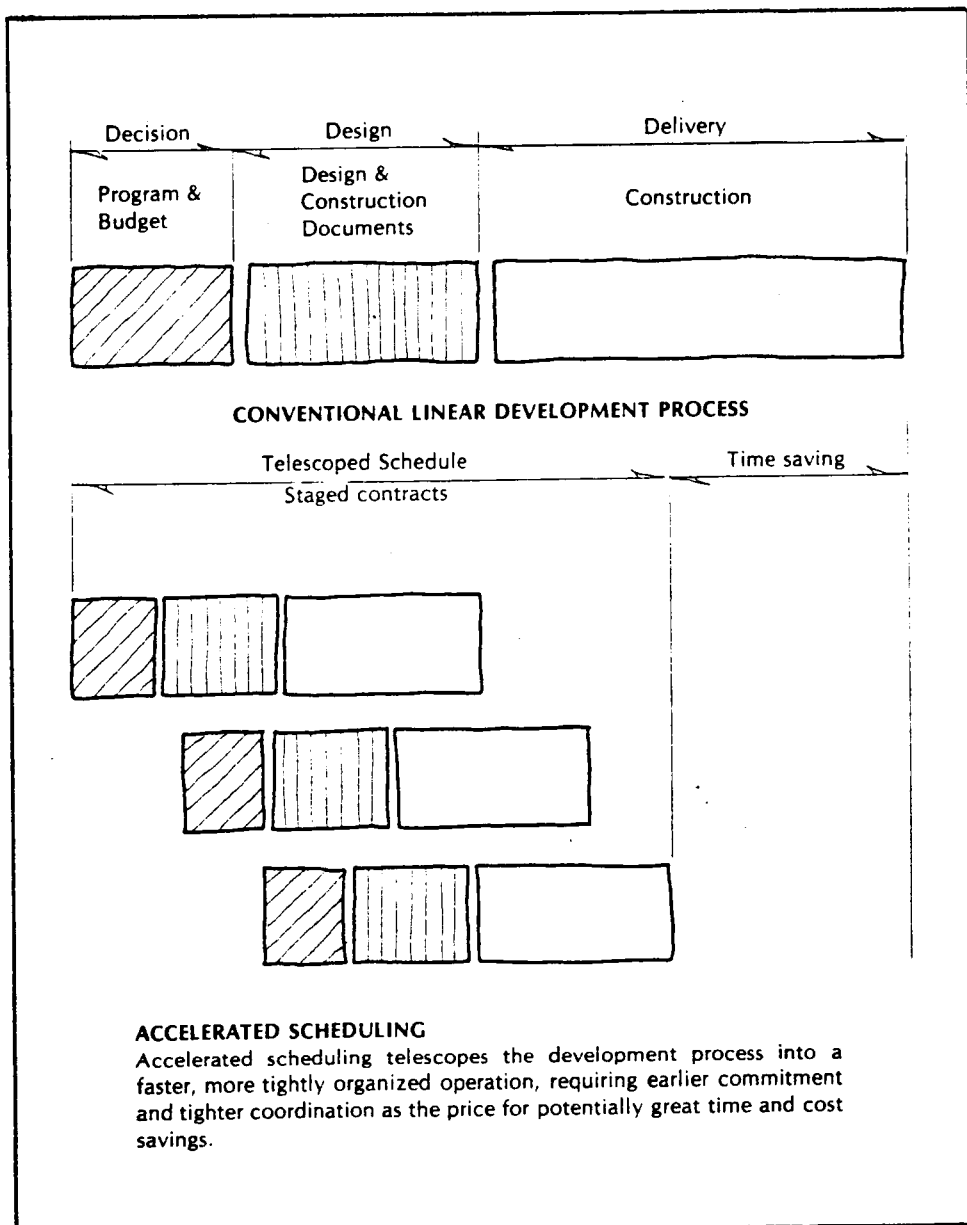


Figure 16. SCHEDULING PROCESS

Source: C. W. Griffin, Development Building: The Team Approach (New York: McGraw-Hill, 1972).

The great advantage of accelerated scheduling is the time saving with its overlapping and coordinated project stages. The major disadvantage is the early commitment to a certain design, limiting flexibility. The overall objective of project scheduling is to insure that all materials, labor and equipment arrive at the site, in the needed amounts, at the proper time and in the correct sequence during the construction process. Typically, construction scheduling is accomplished in an informal manner with limited interaction between the developer, the contractor and his subcontractors. On large scale projects the contractor may attempt a crude scheduling of events but more often than not is unable to include the vast amount of needed data.

One solution has been to employ the critical path method. (CPM). CPM allows each activity in the construction process to be scheduled in its proper sequence. Initially, each major task is described based on the working drawings. Major tasks may include site preparation, foundation work, framing, roofing, plumbing, electrical and interior finishing.

The next step involves determining the amount and type of material, labor and equipment that will be needed for each task. All major construction activities are then divided into subelements and are depicted in their order of accomplishment. Figure 17 graphically illustrates the technique.

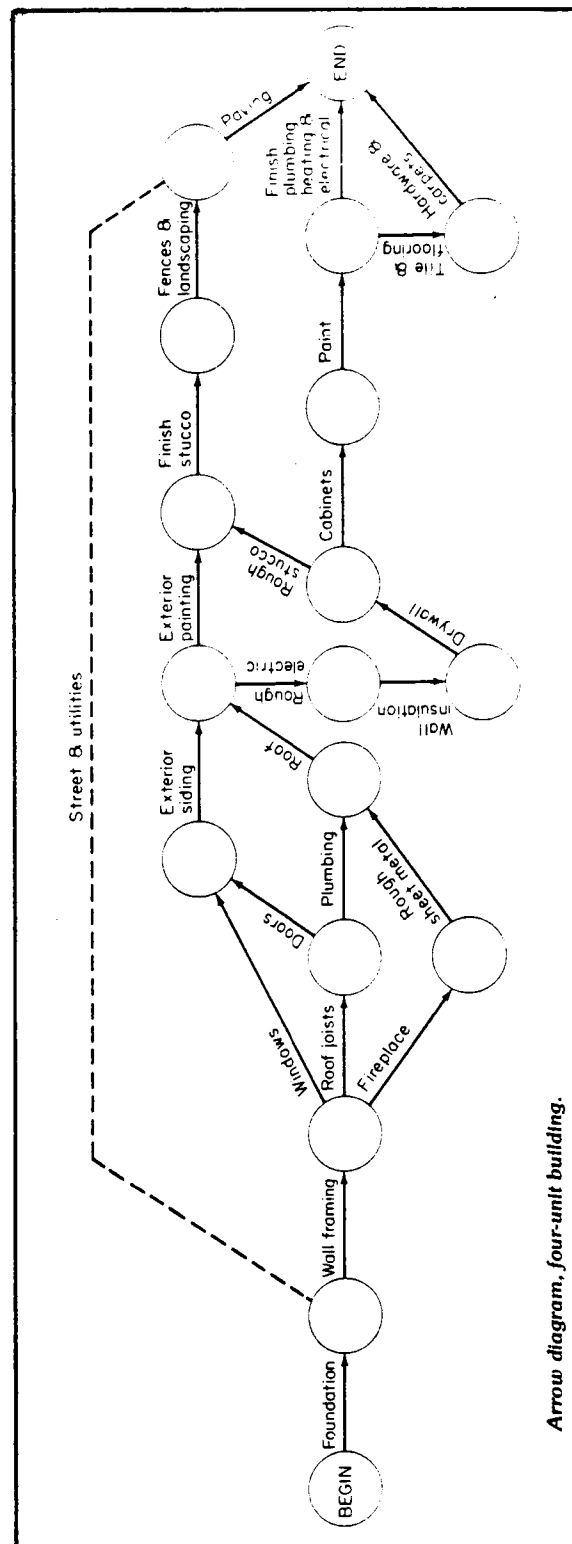


Figure 17. CRITICAL PATH METHOD

Source: John McMahan, Property Development (New York: McGraw-Hill, 1976).

The order of accomplishment is determined by two criteria. The first criteria is that some activities must occur before other can proceed; e.g., completion of the framing must proceed wiring. The second factor to consider is which activities might be completed if desired, but are not critical; e.g., establishing an assembly area for floor and roof trusses. Thus, a network is established which depicts each critical activity and those which can be done simultaneously.⁷³

A time factor is then established for each activity. The time for each sub-element is added in order to calculate the total time required for a major task. Available time between subelements is called float time. If no float time is available, the path between major tasks is considered critical, which indicates that the task must be completed within the specified time if the project is to remain on schedule. The total time for construction is then computed and compared with the contract completion dates. If the critical path time is longer than allowed, adjustments should be made to accelerate the process, perhaps by increasing the labor force or by preordering and stockpiling materials. Figure 18 shows a CPM schedule with the added time factor.⁷⁴

⁷³McMahan, p. 318.

⁷⁴Ibid.

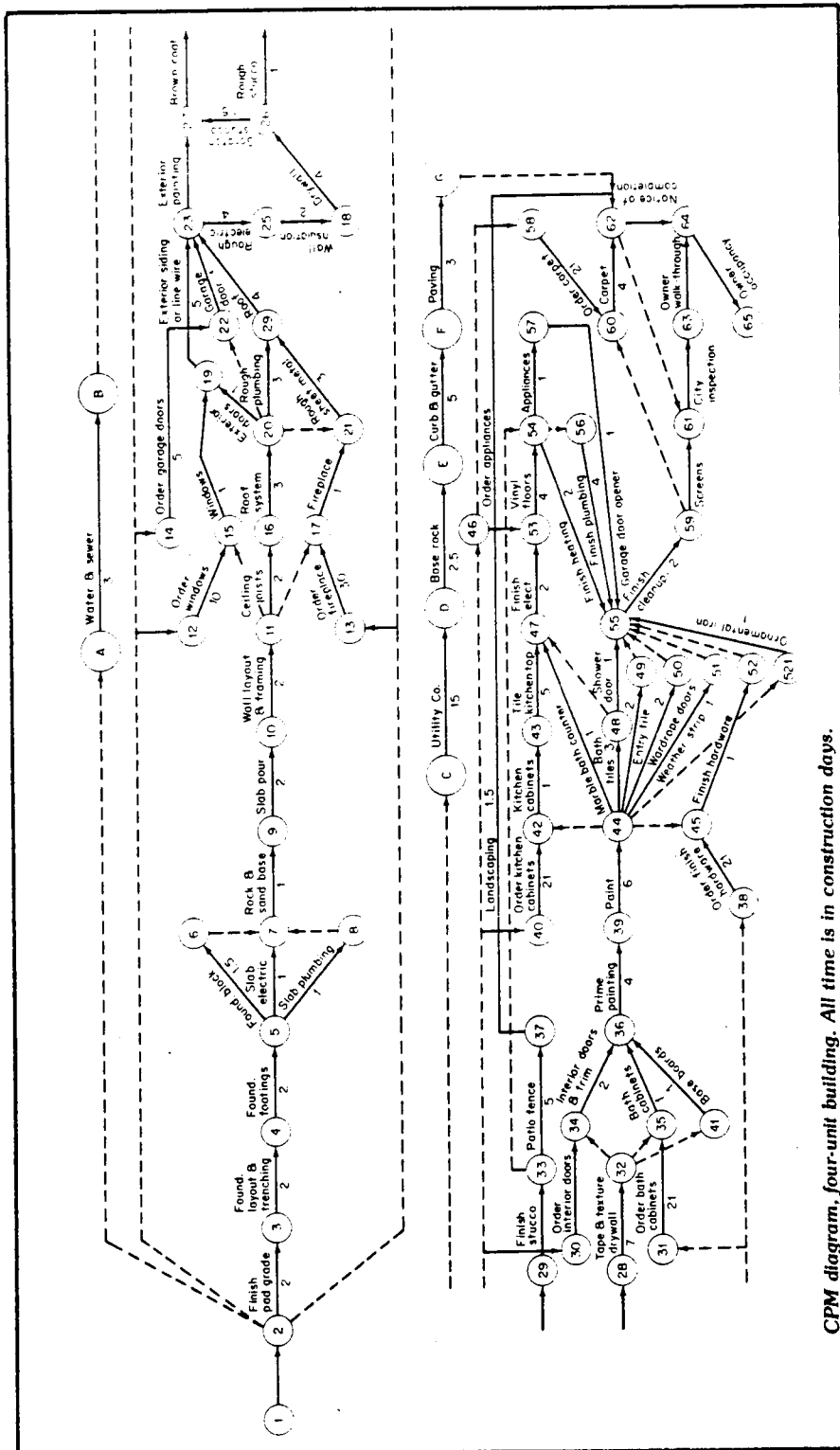


Figure 18. CPM WITH TIME FACTOR

Source: John McMahan, Property Development (New York: McGraw-Hill, 1976).

Based on the completed CPM schedule, a total work program can be planned. The work program includes the days on which subcontractors will be needed as well as the amount of material and type of equipment required. Such a schedule helps to insure an orderly and timely completion of construction. The use of CPM provides a rational technique for planning and implementing a successful development. Whether computerized for monitoring or simply used in diagram form with written updates, the CPM has a good track record for construction scheduling and monitoring.

Project Marketing

As will all the major steps in the development process, project marketing is not an isolated step. The preliminary marketing strategy determines the physical plan and design of the project, which is then implemented by the construction program.

The actual marketing of the project has three major elements. First, the initial marketing strategy should be reassessed in view of any changes that might have taken place during the time between the decision stage and the delivery stage. The target market should be reestablished as to age and income. This enables the developer to design his sales force and promotional tools accordingly. In addition, he should reexamine competing projects to make sure that a demand still exists. Any inherent project

strengths and weaknesses should also be checked. Unique amenities, site advantages, or construction qualities need to be exploited, whereas design flaws or neighboring detractions should be downplayed.

The next step involves the assembly of a sales force. Larger projects tend to use an internal staff, whereas smaller developments may use a real estate broker. Still others may find an advantage by using both. Robert Engstrom, a member of the Residential Development Council, advocates using an internal staff in the larger metropolitan areas for control and accountability. The exception might be in specialized markets such as condominiums or townhouses, where a real estate firm has a great deal of experience. Engstrom also feels that a broker, or combination of several brokers might be employed in areas with less than 100,000 population for referrals.⁷⁵

In any event, most effective sales programs possess the following common qualities:

1. Well paid, well trained, and properly motivated sales people;
2. Regular sales meetings in which prospects are discussed and plans are formulated for follow-up;
3. A system for handling, recording and getting back to prospective buyers;

⁷⁵ULI, Residential Development Handbook, p. 252.

4. A system of obtaining leads and referrals;
5. A reporting system to let management know of buyer objections, preferences and attitudes;
6. A customer service system for handling color selection, closing details, occupancy procedures, and other customer problems.

The next step following sales staff assembly is to promote the development. There are three objectives of project promotion which are: 1) to publicize the fact that the project exists; 2) to inform prospective purchasers/tenants about the project; and 3) to create a sufficiently good impression to bring the prospect into the sales/lease office or make the prospect receptive to a field call.⁷⁶

Promotion activities such as advertising and public relations do not actually sell a housing unit, but they serve to generate the necessary interest and traffic to the site from which sales can be made. Large-scale advertising campaigns, which utilize the mass media, are only employed for large scale developments. Small projects may use classified ads, direct mail, and site signage. The ad campaign needs to be designed for the target market which is to be attracted.

⁷⁶McMahan, p. 333.

An advertising agency is often retained by the developer in order to create a campaign that is coordinated to create a positive image for the project. The budget and thus extent of the campaign will depend on the size of the project, the number of competitive builders, the reputation of the developer in the area and the introduction of new concepts into a market area.⁷⁷

The next step beyond advertising, which is used to inform and attract potential buyers, is merchandising. Merchandising tools which are commonly employed include: signing (external approach and on-site), the sales center for graphic displays, slide presentations and actual closings and decorated model units. In addition sales brochures are often provided which include floor plans, site plans, renderings, a description of features, benefits and options, an area location map and a listing of area conveniences such as schools, churches and shopping areas. Brochure design should adhere to the following principles:⁷⁸

1. Don't bind the floor plans into the brochure, because people tend to want the plan which is sold out.
2. Don't include exact prices because they change.
3. Don't include square footage unless it provides a competitive advantage.

⁷⁷Ibid., p. 254.

⁷⁸ULI, Residential Development Handbook, p. 266.

The advertising, merchandising and sales staff are all geared, designed and coordinated to close the sale. Once the project has been successfully sold out or leased, the developer must be concerned with property management and maintenance.

There are several forms which property maintenance can take. The simplest but most often overlooked, is the developer's concern for the continued quality of the project. There is no legal mandate here, but rather a desire to protect the developer's reputation. The second form is insured by warranties and guarantees which the developer is legally obligated to perform. A third form is also legally guaranteed and includes deed restrictions and protective covenants which may be in conjunction with governmental controls. The fourth form of property maintenance is the setting up of an organization which bears the responsibility for long-term maintenance and the provision of services to the residents.

This final form is most often used by large-scale community builders and condominium developers and is called the community association or home owners association. The association is funded by resident assessment and serves the following purposes. ⁷⁹

⁷⁹Ibid., p. 281.

1. To provide maintenance services to the properties which it owns or administers;

2. To protect the investment and enhance the value of the property owned by its members;

3. To provide an efficient mechanism for numerous people with diverse interests, backgrounds, and living habits to live in close proximity and to share common possessions with a minimum of inconvenience and loss of personal rights;

4. To provide the matrix which social contracts between neighbors can develop spontaneously.

Depending on the size, type and scope of the development, maintenance can be arranged internally, contracted out or handled by the home owners association. Regardless of the structure of a maintenance program, it is an integral part of the development process and should be well planned prior to the completion of the delivery stage.

Summary

It is obvious that the development process is a complex one in which many elements must be controlled to assure a successful project. The discussion of development planning at Kiawah will clear up some of the ambiguities in the process by relating the process to a concrete situation. Before doing that, however, the next chapter will lay the final groundwork by considering the public approval process.

CHAPTER IV

THE PUBLIC APPROVAL PROCESS

At some point in the development process the developer must receive public approval for his project. Most often, public approval precedes project financing and construction. Initial contact should take place during the decision stage with final approval from the applicable regulatory agencies being acquired during the early part of the design phase. In addition, many developers will use a land option with actual purchase of the site contingent upon public approval. At any rate, it is important for a developer's project to get public approval as early in the process as possible.

Participating in the the process of implementing most large development proposals are three decision-making bodies or institutions. These three sectors, which interact to shape the built environment include the developer, the government, and the community.

Each sector is concerned with somewhat different questions, but each generally seeks to maximize its benefits while minimizing "costs," both monetary and measured in other terms. Examples of the kinds of questions typically addressed by each sector are outlined in Table 6.

Table 6. Development Questions.

<u>Decision-Making Sector</u>	<u>Questions to Address</u>
Developer	Market Feasibility Land and Development Costs Cash Flow Scheduling Delays Materials Availability Marketing and Promotion
Government	Zoning Subdivision Regulations Environmental Impact Community Amenities Provision of Timely Service and Utilities Tax/Gain Loss Building Codes
Community Speical Interest Groups	Change in Character Tax Burden Visual Characteristics Loss of Amenities Social Compatibility Job Resource Environmental Degredation

A balance between economic and environmental costs and benefits might be easily achieved if only the criteria important to a single sector were considered. However, when the concerns of all sectors must be addressed simultaneously, it becomes a complex task to ensure each sector's benefits and the satisfaction of the other participants. Tradeoffs and compromises are inevitable in the process. The optimal situation is where the most benefits are realized at the least costs to all parties concerned, and where no

more benefits can be achieved for any party without a greater amount of costs to the others.

Developer's Role

The classic role of the developer as initiator and the local municipality as accommodator has changed, particularly with increasing concern with the environment. The private sector, including developers, builders, and real estate interests has lost its dominance to a degree with increased involvement by the public sector in land use decisions. The contemporary developer must not only deal with local authorities but also with special interest citizens groups; planners; and state, regional, and federal bureaucracies.¹

This increased regulation and concern has not been without justification in many cases. The development industry has often been guilty of exploiting land with little concern for the impacts on neighboring land or the natural environment--with little attention to the problems created for existing transportation, educational, medical, and recreational facilities.

Many developers do consider community impacts and provide needed housing, office, and retail centers. But

¹ULI, Residential Development Handbook, p.76.

the entire industry suffers when irresponsible land speculators indiscriminately develop land for poorly planned projects, which place fiscal and environmental burdens on the entire community.

The professional land developer must have an expanded scope of concern. As a community builder, the developer needs to be very sensitive to long-range needs and expectations. "Today, regardless of ownership, land is looked at by a large portion of society as belonging to all of the people, with the owner's role being that of caretaker."²

The "ideal" concept of the developer is as a community's growth agent. This growth-agent role should begin prior to the last-minute approach to the planning commission for a zoning change for a specific parcel of land. The developer can actively advocate competent planning procedures, should encourage the community to use adequate and up-to-date regulatory tools, and a comprehensive planning process.³

Involving planners and public officials early in the development process (preferably in the conceptual phase) is important for two reasons. First, a sense of cooperation

²Raymond L. Watson, "The Private Developer et al: Changing Roles," Management and Control of Growth, Vol. 3 p. 488.

³ULI, Residential Development Handbook, p. 77.

and trust is established. And second, disputes and potential problems can be identified prior to the expenditure of time and money by both parties.

Many developers prefer to deal with the regulations of a community through a single planning agency, or more specifically, an agency in which all work is completed administratively by the planning staff with a right of appeal to a planning commission or city council. This arrangement is considered more desirable than a lay commission decision based on recommendations by the staff, since such a framework should reduce the incidence of refusals for purely political reasons.⁴

Following the initial contact with local planners and completion of preliminary development plans, the developer would be well advised to plan meetings with local special interest and advocacy groups. Informing the public will enable developer to receive advanced community reaction to their project. Constructive two-way communication between the developer and concerned citizens can often dispel rumors and hostilities which could develop into direct confrontation during later public hearings. In addition, valuable ideas and advice can sometimes be received from such groups as neighborhood councils, the League of

⁴Ibid., p. 78.

Women Voters, the school board, local environmental groups, and various minority groups.

Before meeting with community groups, developers should be prepared to answer questions regarding the project's impacts on the community. They should be capable of projecting impacts on property values, school enrollment, tax changes, employment, and the environment. If the developers are not prepared to answer these and other questions, they could place their project in jeopardy.

It is clear that the developers in today's market must be far more sophisticated, particularly the large-project developers. In the past a developer needed only to know what would sell, which could be determined by a market analysis, past experience, or gut feeling. Now the developer must not only know what will sell, but also what will be approved and what the community will accept.

He can no longer convince only the members of the regulatory agencies and feel that his development will gain approval. He must also pre-sell the community at-large or they will picket the developer, haunt the agencies, pack public hearings, write letters, demonstrate, erect⁵ signs and finally file costly class action suits.

The Government's Role

The government's role in land development has greatly increased over the last two decades. This is due both to

⁵Watson, p. 488.

a growing environmental concern, and the "energy crisis." Land development is influenced today at the federal, state, regional and local levels of government.

Federal and state authorities are chiefly responsible for environmental protection. The process of environmental planning and the division of responsibilities among the various levels of government was discussed in Chapters One and Two. As was discussed there, most state controls are single-purpose programs in such areas as wetlands protection, coastal zone management, power plant siting, or surface mining. States traditionally delegate most power over land use to local governments and special purpose agencies, and the state's strongest direct impact on land development has been through highway programs, public facilities funding, and recreation and park programs.⁶

Regional councils and agencies have also been formed to handle common problems which transcend political boundaries.

A full discussion of federal, state and regional impacts on land development is beyond the scope of this discussion. They are mentioned in order to point out the growing role that they play in land development decisions.

As pointed out earlier, the states delegate most regulation and administrative responsibilities to local

⁶ULI, Residential Development Handbook, p. 79.

government. Two major groups usually are involved at the local level. The first is composed of nonelected public officials, and may include planners and planning commissions, public authorities, and other government agencies. The second group includes elected officials, who are usually members of city or county councils.

The local planning function is vital to the developer and to the locality in which the development process is carried out. Many local governments have developed comprehensive or master plans which serve as development guides for the community. The elements of the plan typically include: land use for residential, commercial or industrial purposes; circulation; and community facilities. A civic design element and a utilities element may also be included. The plan is prepared to focus the community's legislative and administrative decisions with regard to land use planning and control.

Most comprehensive plans are advisory and represent the planning board's recommendations for uses of land. The plan is a guide rather than a land use control mechanism.

The developer's project should be within the scope of the community's comprehensive plan. If the plan is properly prepared and periodically updated it can provide the developer with an indication of the current areas which are most acceptable for development.

The most commonly used land use control mechanisms for regulating or guiding development are: zoning, subdivision regulations; building codes; official maps, and capital improvement programs. With these tools the municipality, through the state's delegation of police power, attempts to promote the health, safety, morals and general welfare of the community.

Through the use of zoning, pursuant to the police power, the localities may regulate and restrict the following:

1. The height, number of stories, and size of buildings and other structures;
2. The percentage of the lot occupied;
3. The size of yards, courts and other open spaces;
4. The density of population; and
5. The location and use of buildings, structures and land for trade, industry, residence or other purposes.⁷

Zoning is the most commonly employed regulatory measure to implement a community's land use plan. It is a way of attempting to insure that land uses complement each other.

Deviations from the zoning ordinance are usually handled administratively by the board of adjustment or appeals. The board is empowered to grant special exceptions, or variances. Special exceptions include uses which are

⁷Elaine Moss, Land Use Controls in the United States, (New York: Natural Resources Defense Council, 1977) p. 322.

allowed under the zoning ordinance but only after approval is granted by the board of adjustment. Variances authorize locations or densities which are different from those included in the existing ordinance. Three conditions must usually exist before a variance can be authorized.

First, it must be shown that a reasonable return from the property cannot be made without a variance. Second, the conditions involved must be the result of special zoning anomalies and not a general condition either of the land market or of the zoning ordinance. Finally, the new use sought must not be contrary to the essential character of the locality.⁸

Amendments to the zoning ordinance may be requested by a developer who desires that the zoning of a particular piece of property or the regulation of it be altered. The legislative body is responsible for handling zoning amendments, with some enabling acts calling for an advertised public hearing prior to a final decision.

Although amendments, variances and special exceptions provide a degree of flexibility in zoning enforcement, zoning still has been criticized as being too inflexible. It is agreed that zoning, when narrowly interpreted, results in monotonous subdivisions, lack of provision for open space, and the inability to deal with large-scale developments which include a variety of uses and densities. As a consequence, innovative modifications

⁸ Ibid., p. 325.

to the zoning district have been developed. Among the most commonly used devices to increase zoning flexibility are floating zones, cluster zoning, and the planned unit development.⁹

The floating zone is essentially a district with prespecified uses which have yet to be located on the zoning map. Exact delineation of the district is established when a developer submits a proposal that matches the use intended by the legislative body, which does so by amending the zoning ordinance.

Cluster zoning is employed to preserve a greater amount of open space than would be allowed under conventional zoning. The overall density for a tract of land is not changed, but more units are allowed to be clustered on a smaller portion of the land, which has proved to have some advantages over conventional subdivisions.

The planned unit development is in reality a floating zone which allows mixed land uses and mixed densities. This concept adapts well to large tracts of land, whose land plan calls for innovative design features and higher densities. The standards set for a PUD usually include a minimum acreage, a maximum amount of land to be covered with structures, detailed ingress and egress requirements, utility specifications, and open space minimums.

⁹ Ibid., p. 326.

To acquire PUD status the developer must first gain approval from the planning commission and then often from the legislative body. Public hearings prior to approval are also normally required.¹⁰

The use of subdivision regulations by cities and counties is a more specific land use control tool than zoning. These regulations are mainly concerned with the layout and standards for lot-by-lot development. Developers must gain plat approval before they are allowed to divide or sell their land, thus coordinating the various unrelated plans benefitting local communities. The primary purpose of subdivision regulations is to eliminate the premature sale of lots before utilities and roads are installed, but they also benefit developers by protecting them from neighboring developments, which if poorly done could reduce property values.

The design and improvements section of subdivision regulations generally deals with:

1. Streets - their location, width, alignment, grades and names;
2. Blocks - their length and width;
3. Lots - their size, shape, and layout;
4. Curbs, sidewalks, open spaces, and easements;

¹⁰Ibid., p. 329.

5. Storm water facilities, sewer, water, gas and electric utilities;

6. Any special improvements required in steep topographical or special planning communities.¹¹

The approval process for subdivision proposals follows a series of steps before final approval is granted. The first formal action is the submission of a preliminary plat with multiple copies for each relevant agency. After review, the approval agency can either approve the plat, approve with conditions or disapprove. Negotiations and discussion are required in the latter two cases.

The next step is the submission of the final plat. The purpose here is to insure that the recorded plat is in accordance with the approval plans and that construction will proceed accordingly. Following final approval, the plat must be recorded before construction and lot sales can begin. The following document (Figure 19) is illustrative of the approval process in Greenville, South Carolina.

To insure that developers will fulfill required improvements, they may be required to make various security provisions. Usually the developer must:

1. Actually complete construction of all required improvements;

¹¹National Association of Home Builders. Land Development Manual (Washington, D.C.: 1974), p. 13.

Developer or Developer's Engineer submits preliminary plat to Planning Commission.

Collect fee \$10 plus .50 per lot.

Plat is stamped with:

- a) Subdivision Advisory Committee Stamp.
- b) Planning Commission Approval Stamp.
- c) Preliminary Subdivision Stamp
- d) File Number Stamp

Assign a file number to preliminary out of subdivision book and put in book the name of subdivisions and number of lots.

Make 3" x 5" index file card with name and number of subdivision.

Fill out subdivision information and attach to front of file folder.

Give file folder to secretary for colored label with name and number of subdivision.

- a) white - preliminary
- b) yellow - summary
- c) green - final

The Subdivision Advisory Committee meets on the Monday before the fourth Wednesday of the month. Cutoff for preliminaries is 10 days prior to the fourth Wednesday of month.

Adenda for the Subdivision Advisory Committee should be done on Tuesday after preliminary cutoff.

After agenda is done, run copies of all preliminary plats and mail to each member of the Subdivision Advisory Committee. (see list)

On Wednesday after preliminary cutoff, the agenda for the Greenville County Planning Commission should be submitted to Brenda. This should include all preliminaries, finals, etc.

- a) After Advisory Committee meeting minutes should be typed.
- b) Preliminary plats shall be marked as recommended from meeting.
- c) Check preliminary plat for street name duplication.

All finals shall have the following:

- a) two mylar copies
- b) Surveyor's seal on plat
- c) Road or Street Dedication Form.
- d) A bond and contractor estimate to back up the bond.
- e) If work is complete, then letters of completion from appropriate agencies is needed.

For final plats received, a file number should be given. If the subdivision has been developed in sections. The first section should have the preliminary plat file number and each additional section file number should be taken from the subdivision book index.

Take final plats to block book office for tax number.

Prior to Planning Commission meeting a subdivision location map should be run and all subdivisions marked on it.

A copy of all subdivisions should be run and displayed for Planning Commission Meeting.

All road Dedication Forms and Performance Bonds need to be approved by the County Attorney prior to the Planning Commission meeting.

After Planning Commission Meeting, run copies of approved plats, signed by Royce or Jimmy, to mail to utilities. (See mailing list)

Stuff envelopes with plats and mail Friday afternoon.

Figure 19. GREENVILLE, SOUTH CAROLINA SUBDIVISION APPROVAL PROCESS

2. Post a performance bond guaranteeing such construction within a given period;
3. Submit a petition that the municipality construct the improvements and levy the costs against lots in the subdivision under its usual special-assessment procedure; or
4. Give the municipality a mortgage on the property in the subdivision, releasable in stages as improvements are completed.¹²

In addition, fees to pay for legal and administrative costs of plat approval must be paid by the developer. This fee is usually a fixed rate or a fixed amount per lot, or a combination.

Whereas subdivision regulations pertain to the quality of site layout, building codes pertain to the quality of the actual materials, wiring, and plumbing used in construction of alteration of buildings. The state usually delegates authority to local governments for the enforcement of building codes. Some states have their own codes, which creates a diversity of code requirements from state to state and municipality to municipality.

Building codes may either set forth specific materials or be based on performance standards. Though

¹²ULI, Residential Development Handbook, p. 74.

not considered a powerful land use tool, the building code may help insure zoning compliance, since a building permit will usually not be issued unless there is compliance with both the building code and the zoning ordinance. This may require approval by both a building inspector and a zoning administrator. In addition, compliance with the building code may be insured by a certificate of occupancy, which is issued before a building is utilized.¹³

There exist four model building codes which are used frequently throughout the United States. The first was developed by the American Insurance Association and is entitled the National Building Code. The remaining three were drafted by building officials organizations including: the International Conference of Building Officials, with its Uniform Building Code; the Building Officials and Code Administrators International, with its Basic Building Code; and the Southern Building Code Congress, with its Southern Standard Building Code.¹⁴ As a general rule moderate size cities (100,000-200,000) amend one of the basic codes to fit individual conditions, while large cities with more than one million people usually develop their own codes.

¹³Moss, p. 340.

¹⁴ULI, Residential Development Handbook, p. 75.

Developers often criticize building codes as obsolete or for inconsistent administration. Advances in building construction technology and material improvements may not be accounted for in local codes. To account for this some localities are adopting performance standards in lieu of specific materials usage.¹⁵

Another commonly employed land use guidance tool is the Official Map. It is not an integral part of the comprehensive plan nor is it a kind of zoning map, but rather, it is a type of plan which delineates present and future streets, utility systems, and public improvements. The function of the official map is to enable the municipality to guide future growth and to enable developers to plan their projects within the scope of planned public services. Approximately 50 percent of the states have enabling legislation which allows for adoption of the official map.¹⁶ As with most other forms of land use control, public notice and hearings must occur prior to the adoption of the map.

Legal ramifications for official map use as a basis for approving or disapproving development proposals varies among states. The map's usefulness is dependent upon the degree of accuracy and comprehensiveness. Examples of its application include the following: subdividers

¹⁵Ibid., p. 76.

¹⁶Ibid., p. 68.

may be required to design their plans in accordance with the official map; developers may be denied permits to build in the bed of proposed streets which are on the map; and installation of municipal utilities may be prohibited on streets which are not on the map."¹⁷ In addition, the official map should be closely coordinated with the capital improvements program.

The capital improvements program can also influence the location and intensity of growth in the community. The program enables a community to schedule needed improvements as to their timing, location, and financing. Improvements, which are usually planned on a 5 to 10 year basis, may include transportation system upgrading, utility extensions, land acquisition for parks, and the construction of public facilities. Capital improvements programming is a commonly used method to implement the comprehensive plan, and has proven to be an excellent means of controlling and coordinating the growth pattern of a community. Community improvements may act as private development inducements in areas which it is desired. Similarly, the lack of public improvements and facilities may inhibit growth.

Perhaps the most widely known case of a capital improvements program being employed to coordinate private land development is the Ramapo case. Here the town of Ramapo,

¹⁷Moss, p. 340.

New York established an eighteen-year capital improvement program in six-year increments. The program stated that no land in the town could be residentially developed until the developer could prove that certain capital improvements would be present, whether provided by the developer or the town, before project completion. The effect was to control and coordinate the timing of development and to promote orderly growth. The program was challenged and upheld in the New York Supreme Court in 1972, and is illustrative of the major role that a local government can play in the development processes.

This broad array of land use controls indicates how much the government's role in controlling and managing land use has increased at all levels. There are three constitutional powers on which these controls are based: 1) the power of eminent domain, through which land may be acquired with just compensation to the owner for an acknowledged public purpose; 2) the power to regulate, via the police power, the activities in the private land market without compensation to affected land owners and 3) the power to tax and spend. From these three basic powers, local governments fulfill their role as regulators of land use and reconcilers of disputes that arise between citizen groups and developers.

The Community's Role

Just as the government's role has expanded, so too has citizen involvement in the land development process. In fact, the government's involvement has increased as a response to citizen concern and disenchantment. New development is not often seen as economic progress and is more often being judged by the extent to which environmental criteria are satisfied. New housing and business construction are questioned as to what they will generate in terms of additional traffic, pollution of air and water, erosion, school enrollment, and scenic encroachment.

Historically, local government generally conceived that development and growth--in numbers of people, in jobs, in industries--would ease the public burden by increasing tax revenues and thus spreading per capita costs. However, a belief is now often expressed that larger size means lesser quality and higher costs. Today's citizens are becoming more conscious of the long-term economic impacts of development. Short-term economic gains from job creation, land sales, and the construction of new facilities are perceived as being offset by public costs of schools, roads, water-treatment plants, sewer and various services that new residents require. In addition to economic concerns, there is an increasing emphasis on human values and concern for

the natural and cultural characteristics that make for a more liveable environment.¹⁸

In addition to the economic costs and environmental consequences of development, the general citizenry also often displays mistrust in local officials. They may lack confidence in local land use plans and the manner in which zoning decisions are made. This distrust has often led to the election of local officials with anti-development or environmental platforms, to replace those perceived as siding with the land development industry.

The roles of the community and special interest groups are often more advocacy-oriented, and as diverse as the many interests represented in the community. But there is often commonality in concern for the environment, fear of the negative economic impacts of development, and basic distrust of the local officials who administer land use decisions.

The tactics which concerned citizens use to influence land use decisions can, for purposes of discussion, be divided into three categories: 1) citizen pressure; 2) citizen voting power; and 3) citizen legal action.¹⁹

¹⁸William K. Reilly, The Use of Land: A Citizens Policy Guide to Urban Growth. Management and Control of Growth, ULI, Vol. IV, p. 86.

¹⁹ULI, Management and Control of Growth, Vol. 1, p. 168.

Citizen pressure. The initial strategy for applying pressure usually involves the formation of a group of similarly concerned citizens, who realize that more influence can be generated with a large unified group than through individual effort. A central core of highly interested individuals generally remain on a regular basis with less concerned workers being recruited as major issues arise. In addition, coalitions of groups may be developed to fight a major project. For example, environmentalists may ally themselves with minority group members who would be directly affected by a project.

The next step usually involves gathering information about the development proposal. This includes information about the community leaders, the attitudes of elected officials, the structure and key members of governmental bodies and agencies, relevant federal, state and local laws, and basic demographic data.

Blocking approval of a development often entails finding out what the development plan calls for, discovering any hidden conflicts or inconsistencies with public plans, and projecting the impacts of the development. Details concerning the development proposal can be obtained at the planning office. Inconsistencies may be observed at the site, while public ownership records might reveal a conflict of interest of one of the elected officials. The project impacts can be projected with assistance of professional planning consultants.

The next task when opposing a development calls for the citizen group to publicize its views. The expense of advertising may be prohibitive for an extended campaign, but free time is often available from radio and TV. A series of public meetings may enlist the support of other groups and impress the local legislators. Local media talk shows are still another method of enlisting support.

The final opportunity for citizens to apply pressure is just prior or during the governmental review of the proposed development. The first confrontation is usually held with the planning department, while the main effort is directed toward the decision makers, members of the city or county council. A lobbying campaign is usually carried out prior to the actual hearing. Each member is approached with an individualized argument designed to appeal to the member's particular leaning. For example, a councilman may not oppose a high density residential project for environmental reasons but may vote against it if shown convincing figures indicating that the development will overload the sewer system.

When testifying at the actual hearing, the opposition groups usually attempt to show strength for their cause by bringing as many supporters as possible. Knowledge of procedure is important because some municipalities require pre-hearing registration for testimony and others do not.

Diverse testimony is usually planned from architects, engineers, attorneys, group leaders and effected citizens in order to show broad community opposition.

Citizen voting power. When citizen pressure proves to be an ineffective tactic for influencing land use legislation or policy, the interest group may either attempt to override the decision by referendum or seek to elect officials more sympathetic to their concerns.

The referendum alternative allows citizens to veto legislation by vote, but due to the judicial limitations and cost of a referendum effort, many interest groups opt to try to attain a sympathetic voting majority on city council, using either the recall election or the general election.

The general election is the simplest method for electing or educating sympathetic representation. Interest groups may choose to run their own candidates or to endorse several sympathetic candidates in different races.

Citizen legal action. Legal action against a governmental body or a developer can be expensive and timing consuming. A lawsuit can usually be initiated by those individuals directly affected, as opposed to an environmental groups as a whole. Thus, opposition groups must seek a sympathetic citizen

in the affected or impacted area to be named in the suit. This frees the group to intervene as a "friend of the court."

Numerous lawsuits have been won in recent years by individuals on purely environmental grounds. At a minimum, the suit may be used as a delaying tactic in order to gain compromises. The threat of legal action may force a developer to forgo his project until the case is decided, or the court may issue an injunction or temporary restraining order. These delays may force a developer to curtail his construction because of financial difficulties.

These citizen tactics are illustrative of the sophistication and organization abilities of interest groups. In recognition of the increasingly important role that citizen groups are playing in development projects, several federally funded programs have mandated their participation.

Federal programs such as the EPA Section 208 program and the National Oceanic and Atmospheric Administration's Coastal Zone Management Program, have formalized the process of citizen participation. The mandates provide an opportunity for "full-participation" by those groups or individuals who may be affected by program implementation.

Citizen participation generally takes the form of citizen advisory committees or educational groups, such as the League of Women Voters, who are contracted to assist with information dissemination and participation activities.

The contracted groups may be responsible for circulating program documents for review by special interest groups, holding public information meetings or hearings, and implementing public and media information campaigns involving press releases, brochures, slide shows and films.²⁰

The purpose of formally establishing these channels of communication is theoretically to increase the accountability of the public sector and to generate positive input to promote responsive programs. Developers with vested economic interests have also participated in the process to try to reduce the tension and hostility between the private and public interest.

The Interaction Process: A Basis for Agreement

The roles and interests of the three sectors are different. The developer, as growth agent, seeks to profit as a "risk taker." The community and its interest groups seek to protect themselves from environmental degradation, high impact developments, and insensitive unresponsive public officials. The government with its delegated powers seeks to be responsive, representative and to settle disputes which affect the community. In order to accommodate these varying interests, an atmosphere of cooperation is needed to replace confrontation. Cooperation may be achieved

²⁰ ULI, Management and Control of Growth, Vol. IV, p. 283.

via three methods: 1) creation of a planning partnership between the private and public sectors; 2) increased diplomacy at all levels of interaction; 3) and improving negotiation skills of everyone involved.

A public-private partnership is needed so that a clear set of rules are provided by the governing body, in order that the developer may know what is allowed and when. Land use plans usually indicate where certain types of development are desired but rarely when. In addition, private developers need to become more aware of community concerns, taking into account the environmental and public fiscal impacts early in the planning stages of the development process.

The partnership would serve to combine public land use planning with private profit-oriented efficiency. This arrangement would call for a developer who accepts the role of implementor for public land use plans where and when development is needed. Working together, environmentalists, minorities, local public officials, and planners should develop a comprehensive management strategy--a strategy which establishes a detailed set of goals based on parameters set by the market, the environment, and the budget. The end result of such a process could be an urban growth management plan, which includes a master land use plan that is viable in the marketplace, environmentally sound, and

fiscally responsible. The strategy could also include the location and timing of needed and publically serviceable development to be implemented by the private developer.²¹ In order to achieve this type of partnership a diplomatic approach is required. "Diplomacy means direct dialogue and negotiation with citizen interests."²² The objective of diplomacy planning is to maximize conditions under which local governments can politically and psychologically accept a proposed project. Diplomacy entails making tangible and realistic concessions to legitimate neighborhood concerns. This may mean a scaling down of project size, changing a unit mix or seeking a smaller profit within the bounds of economic feasibility. And finally, the diplomatic approach acknowledges that the local government should not be relied upon to act as mediator or arbiter, thus requiring direct negotiation between the developer and citizen before the public hearing takes place.

Negotiation, whether for a particular development proposal or an entire land use guidance system, is a delicate process, filled with possible conflict. The process tends to break down unless the common interest is maintained. Articulate representation is essential from each interest

²¹ ULI, Management and Control of Growth, Vol. III, p. 524.

²² Ibid., p. 513.

in order to set the limits to concession and compromise. Successful negotiation requires that all concerned interests display three qualities: sensitivity; toughness; and technical skill.²³ Sensitivity to opposing views is essential. The developer must accept legitimate environmental concerns, and the citizens must be willing to consider economic realities. Toughness does not mean stubbornness, but rather the ability to maintain composure and civility during heated discussions. The ability to display forthrightness of ones views and willingness to accommodate opposing views will usually win support. Technical expertise from architects, engineers, soil scientists, hydrologists, and economists, is also needed in order to develop alternative solutions and test their impacts. In this way all parties involved can be assured that alternatives are technically, environmentally, and economically feasible. Expertise in these and related fields should ideally be available to government, citizens, and developers to insure the integrity of project design while accommodation and compromise take place.

The major disadvantage of a negotiated plan for development is its cost. Technical skills must be purchased and time consumed in the process may cause a developer to

²³ULI, Management and Control of Growth, Vol. IV, p. 293.

lose a market advantage. These costs of negotiation will be passed on to the consumer which in effect may limit the applicability of the process exclusively to large-scale projects for the affluent. Thus, perhaps only the best funded developments will be capable of absorbing the costs of negotiation.

The extensive negotiation process which took place in the process of attaining approval for the Kiawah development plan is discussed in the next chapter, along with the environmental and developmental planning processes. The comparison of the processes as they took place at Kiawah Island with those developed in the literature will suggest areas where further work is needed to insure sound developments in coastal zones.

CHAPTER V

THE PLANNING AND DEVELOPMENT PROCESS AT KIAWAH ISLAND

Chapter V consists of four major sections. The first section is a general description of Kiawah Island and an introduction to the Kiawah Island project. The second section is a discussion of the environmental planning process that took place at Kiawah Island and how environmental data were used as a basis for development planning. The last part of this section is devoted to a comparative analysis between the classic environmental design planning process which was discussed in Chapter II, and the environmental planning process at Kiawah.

The third section addresses the Kiawah development planning process and how it is being implemented. This section will conclude with another comparative analysis between the classic development planning process and the Kiawah plan for development.

The final section discusses the Kiawah Island public approval process, focusing on the major actors and their roles, various approval strategies, and the concessions and compromises that were made. In addition, a comparative analysis will be made between the discussion of public approval in Chapter IV and the Kiawah Island experience.

Kiawah Before Development

As was mentioned in Chapter I, Kiawah Island is about twenty miles southeast of Charleston, South Carolina. Figure 20 shows the location of Kiawah and its relationship to the surrounding islands. The island was first inhabited by the Kiawah Indians in the 1600's, and was deeded to George Raynor, an early colonial citizen, in 1699. Since that time, the ownership of the island has changed five times. The Vanderhorst family acquired the island around 1770 and operated it as a cotton and indigo plantation. In 1952 the Vanderhorst family sold Kiawah to the C. C. Royal Lumber Company of Aiken, South Carolina. C. C. Royal used the island for timber. The heirs of C. C. Royal then sold the island to the Kiawah Investment Company in 1974 for \$17.3 million.

After purchasing the island the Kiawah Investment Company transferred the property to a subsidiary, Coastal Shores, Inc., which was a U. S. corporation intended to operate all of Kuwait's American real estate investments.

Coastal Shores, being a newly formed company, chose to seek an experienced group to manage the project. The Sea Pine Corporation, which had developed Hilton Head Island, was chosen. Sea Pines then assisted Coastal Shores in forming the Kiawah Beach Company, which was wholly owned by Coastal Shores and staffed entirely with Sea Pines Corporation personnel.

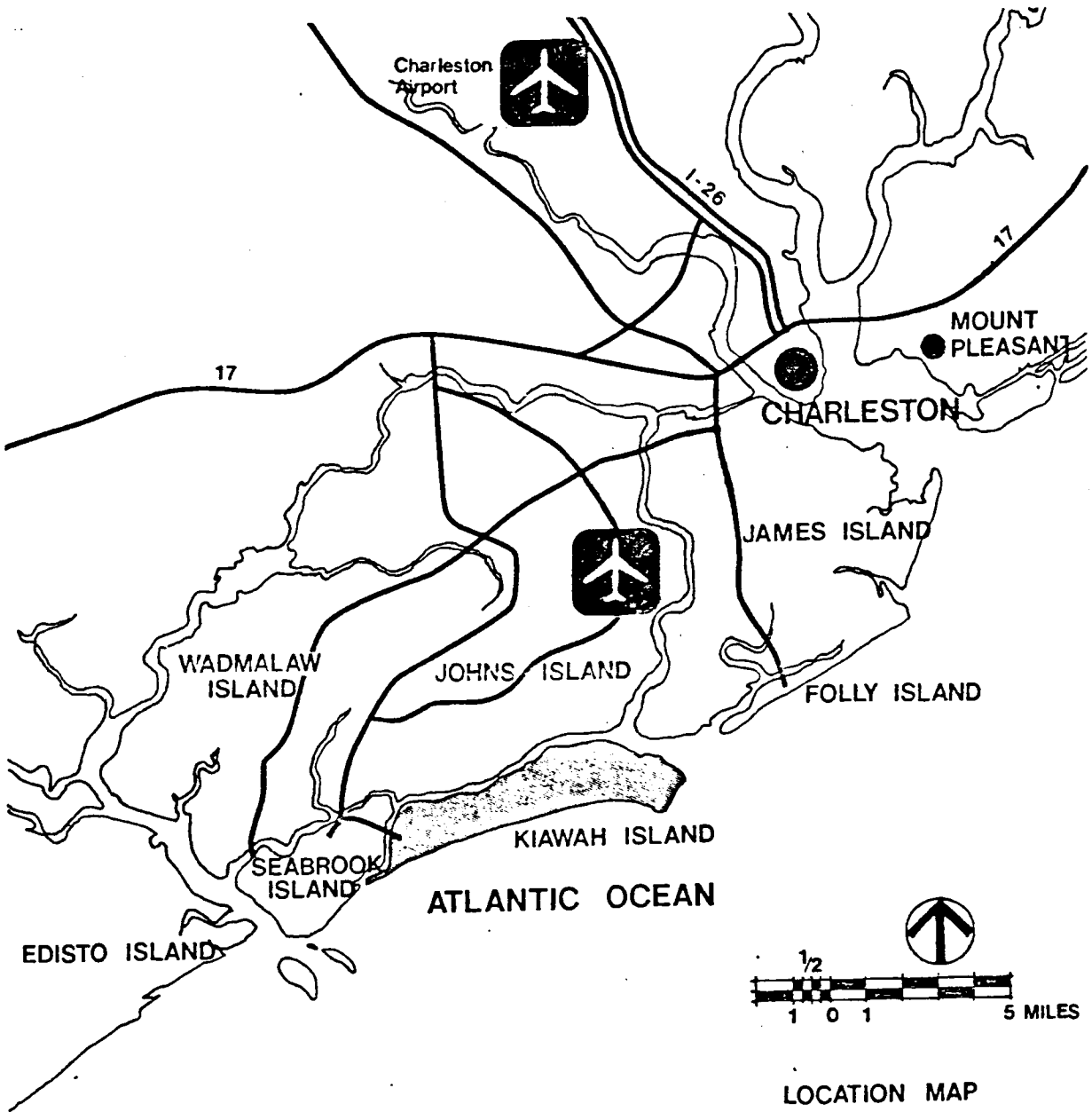


Figure 20. KIAWAH LOCATION MAP

Source: Kiawah Beach Company, Planned Development District
Volume 1.

It was at this point in 1974 when the planning and development process began in earnest. The Kiawah Beach Company placed about forty-five professionals on the site, and they began the design of a planning and development process which would last several years. They were acutely aware of the problems which they would probably face in bringing the development to fruition, so they laid out a three-pronged program to minimize the time before development.

Since the barrier island was a sensitive environment, and was perceived as such by the entire community, the developers knew that a well-designed environmental planning process was essential. They contracted with the Environmental Research Center for a plan which would eventually take sixteen months and cost over \$200,000. This planning process will be discussed in more detail in the next section.

Because of the extreme complexity of the development process, the developers designed development controls using state-of-the-art techniques, such as CPM and PERT. These controls and the other development planning elements are discussed below.

Simultaneously, the developers also set out to design an effective citizen participation and public relations program.

The details of these three elements are contained in the following sections.

The Environmental Planning Process At Kiawah Island

The environmental planning process which formed the basis for development of Kiawah was initiated with an analysis with three interrelated steps:¹

1. An environmental inventory of the island;
2. An analysis of environmental elements and processes to determine environmental sensitivity, development suitability, and intrinsic market appeal;
3. A synthesis of the site's environmental components to identify physical opportunities and limitations for development.

The Environmental Inventory

The initial step for environmental planning at Kiawah involved a comprehensive inventory of the Island's natural elements. In order to accomplish this task, the Environmental Research Center, Inc. (ERC) of Columbia, South Carolina was hired. Scientists representing thirteen environmental disciplines were assembled to perform the inventory. Rob Hull stated that the environmental inventory served three purposes:

1. To serve as a basis for the land development plan;
2. To appease opposing environmental groups;

¹Kiawah Beach Company, Planned Development District
Volume 1, p. 15.

3. To enable the Island to be monitored for environmental changes during and after development.

Hull further stated that the ERC study, to his knowledge, is unprecedented for a private developer because of its scope (13 disciplines), expense (over \$250,000) and its built-in monitoring feature, which allows development impacts to be scientifically measured during and after development.

The study took sixteen months to complete and was published in October of 1975. The finished report, entitled Environmental Inventory of Kiawah Island, represented a broad multidisciplinary approach, which was needed in order to address the complex interrelationships present within the Kiawah ecosystems. It also attempted to provide information from which recommendations and informed decisions could be made in order to minimize the impacts of development.

The inventory resulted in a composite of thirteen different reports which included:

1. Geology and coastal process;
2. Dune and marsh vegetation;
3. Forest ecology;
4. Climatology;
5. Ornithology (i.e. birdlife);
6. Mammalogy;
7. Herpetology (i.e. reptiles and amphibians);
8. Loggerhead turtles;

9. Water quality and microbiology;
10. Phytoplankton (i.e. microscopic plant life);
11. Macrobenthic community (i.e. bottom dwelling animals);
12. Nektonic community (i.e. fish and crabs);
13. Archaeology.

The inventory methodologies and significant findings from each study are outlined in the following discussion.

Geology and coastal processes. The geology of Kiawah Island was examined through the use of sequential aerial photographs, maps, soil borings, grain size analysis, and beach profiles. Since its formation over fifty thousand years ago, Kiawah's shape and size have changed in response to long shore drift, sediment loads, and storm stresses. Figure 21 traces these changes since 1867.² Kiawah was found to be unique among other barrier islands along the South Carolina coast because it has actually grown by sand accretion, while most other islands are unstable and have shown steady erosional trends. This phenomenon was caused by the construction of the Charleston harbor jetties in 1896, which diverted sediment away from the neighboring islands of Folly and Morris in deeper waters. Diversion of this sediment has left Folly and Morris islands unprotected from

²Ibid., p. 17.

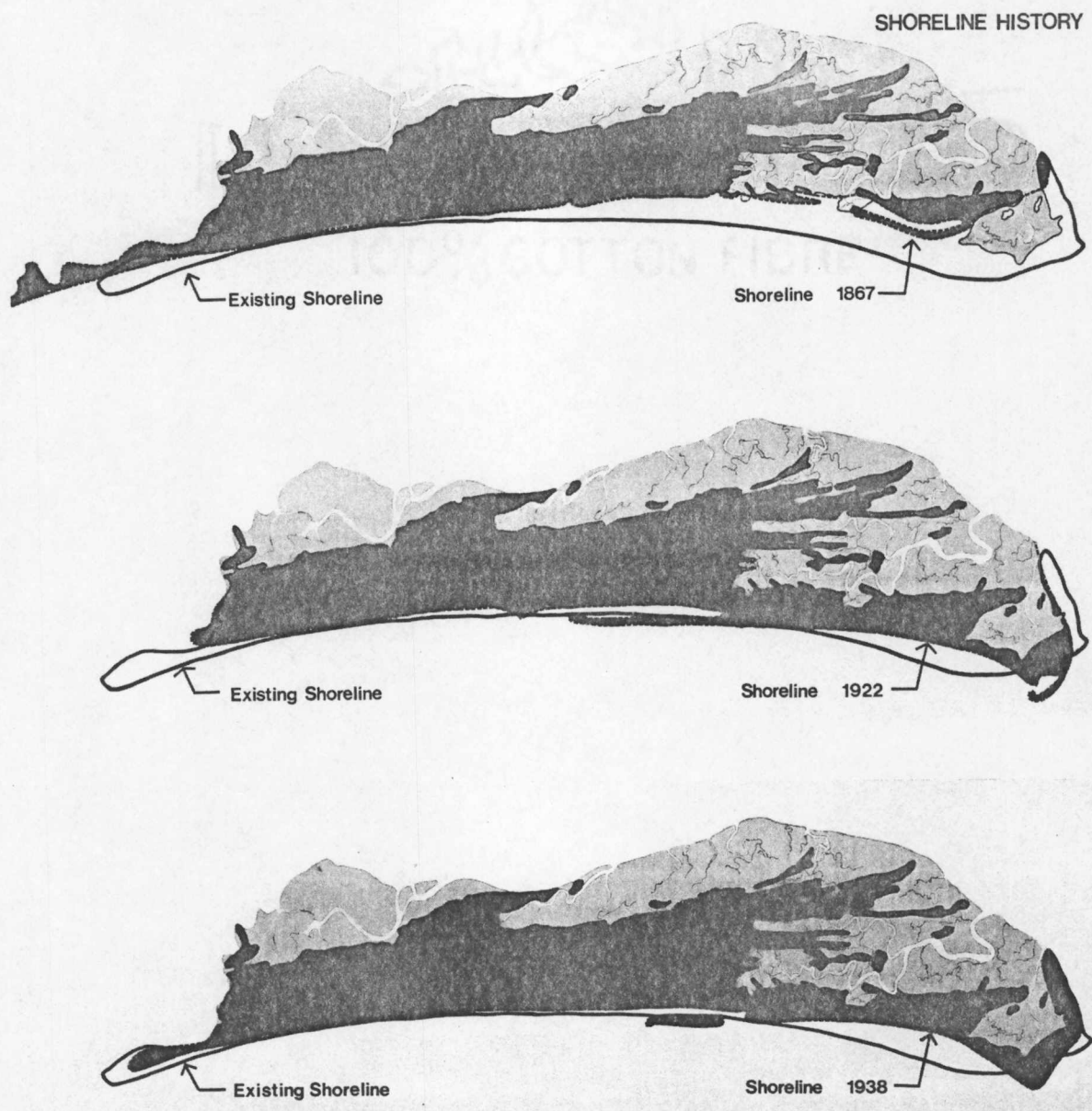


Figure 21. SHORELINE HISTORY

Source: Kiawah Beach Company, Planned Development District, Volume 1.

wave attack, causing beach erosion, which is accumulating at Kiawah.³ Kiawah receives eroded material from other beaches because of its east-west orientation, whereas beaches subject to erosion are generally oriented in a north-south direction. The elements which make up the geomorphology of Kiawah Island are shown in Figure 22.

Dune and marsh vegetation. Due to the prograding seaward growth nature of Kiawah, the dune system is unusually stable. Vegetation associations along the beach, through the dunes, and in the salt marsh were classified and analyzed by the use of transects (cross-sections). Monochromatic and color infrared aerial photographs were used to display vegetation patterns.⁴ Figure 23 is an example of the type of transect that was used at Kiawah. Table 7 displays the different vegetation communities and the effects on them by various environment factors.⁵

The most notable finding was that most of Kiawah's stability and protection from adverse weather conditions is dependent on the maintenance of the dune and salt marsh

³Environmental Research Center, Environmental Inventory of Kiawah Island (Columbia, South Carolina, 1975), p. I-1.

⁴Ibid., p. I-2.

⁵Ibid., p. D-6.

GEOMORPHOLOGY

LEGEND

- 1 Ebb-Tidal Delta of Kiawah River
- 2 Recurved Spit - Mouth of Kiawah River
- 3 Intertidal Beach
- 4 Dunes on Beach Front; Grass Vegetation
- 5 Beach Ridges Vegetated by Cinnam Forest
- 6 Fresh Water Ponds
- 7 Fresh Water Marsh
- 8 Salt Marsh
- 9 Pleistocene Beach Ridge
- 10 Washover Terrace



Figure 22. GEOMORPHOLOGY

Source: Kiawah Beach Company, Planned Development District, Volume 1.

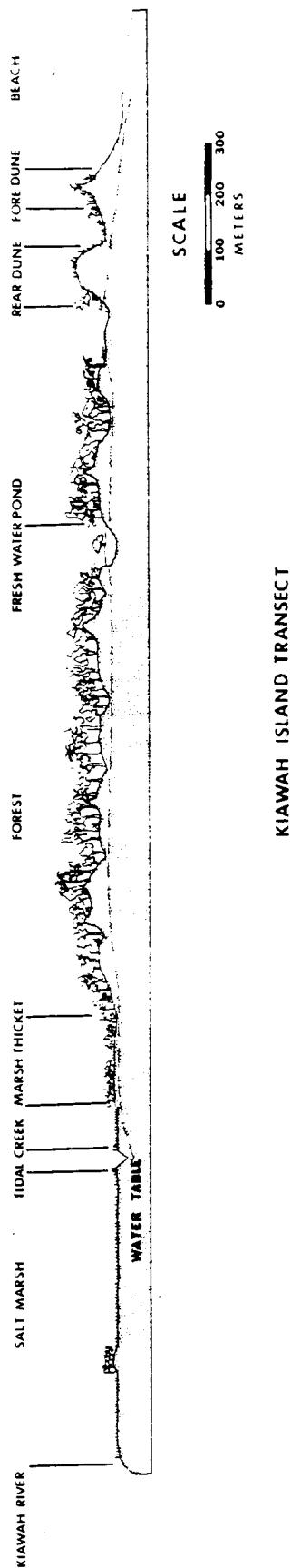


Figure 23. KIAWAH ISLAND TRANSECT

Source: Kiawah Beach Company, Planned Development District, Volume 1.

Table 7. Vegetation Environment Interactions.

Community	Environmental Factor			
	Salt Spray	Water Influences	Soil Profile	Wind
Strand	Intense	Tides	None	Blowing sand
Foredunes	Intense	Water table low	None	Blowing sand
Dune field	Strong	Water table low	Some organic matter	Moderate
Rear dunes	Strong	Water table low	Some organic matter	Moderate
Slack	Moderate	Water table 3' or less	Some organic matter	Slight
Salt marsh	Low	Tides	Peat	Slight
Fresh marsh	Low	Fresh water inundated	Peat	Slight
Marsh thicket	Low	Salt water occasionally	Peat	Slight
Slack thicket	Moderate	Water table 3' or less	Weak profile	Moderate
Salt spray thicket	Moderate	Moisture held in soil	Developed profile	Moderate
Pond	Variable, usually low	Fresh water inundation	Organic matter accumulation	Slight

Source: Environmental Research Center, Environmental Inventory of Kiawah Island (Columbia, South Carolina, 1975)

vegetation. Development in any of these areas, and especially on the primary dune system, was projected to have severe impacts.

Forest ecology. A Maritime forest was found to occupy the central portion of Kiawah Island. A detailed analysis of each forest association was made in terms of species composition, aerial distribution, and understory conditions. Areal photograph interpretation, verified by ground checks, was used to divide Kiawah into five major stand types: oak-pine, mixed oak-hardwood, palmetto, oak thicket, and wax myrtle thicket.⁶ In addition, transect lines were drawn to analyze specie composition. The transect line resulted in the cross sectional drawing shown in Figure 24.⁷

The forest was found to be the most stable ecosystem on Kiawah. The most important forest type was found to be the windpruned maritime thicket including live oak and myrtle. This zone of secondary dune vegetation serves to protect the interior forest from damaging salt spray and is also the final defense against erosional forces. Thus, it was recommended that development not occur in this protective zone. Conversely it was recommended that major development efforts could be carried out in the oak-pine and mixed oak hardwood zones because of their wide areal coverage,

⁶Ibid., p. I-2.

⁷Kiawah Beach Company, Vol. I, p. 23.

Vegetation Cross Section

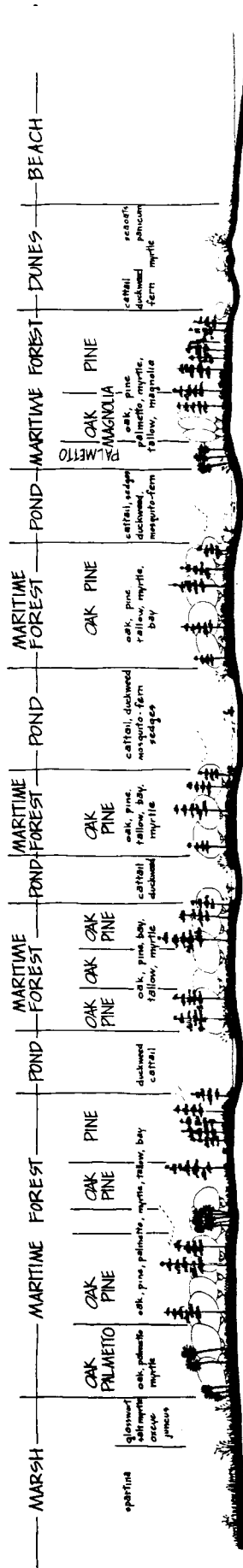


Figure 24. VEGETATION CROSS SECTION

Source: Kiawah Beach Company, Planned Development District, Volume 1.

interior location and more rapid regeneration time. It was also pointed out that intense clearing of the maritime forest would greatly effect the distribution and support of Kiawah's reptile, amphibian, mammal, and bird population. Figure 25 shows the areal distribution of the major forest types.⁸

Climatology. The primary method used to analyze the climate on Kiawah was extrapolation of existing data gathered in the Charleston area. The process was supplemented by field observations focusing on microclimatological features. Kiawah was found to have a maritime subtropical climate that is primarily affected by the Atlantic Ocean. Although moderate temperatures dominate, extremely humid conditions often occur on Kiawah's interior where air flow is restricted by heavy vegetation. Hurricances and tropical cyclones were found to be the most threatening conditions. The greatest impact from heavy storms manifests itself in the storm tides, which may produce tidal flooding and erosion. Development recommendations included adequate evacuation systems and elevated structures to minimize flooding impact. Table 8 is a summary of Kiawah's climate.⁹ This climate data was also useful in building location and orientation to take advantage of prevailing breezes and sun angles.

⁸Ibid., p. 22.

⁹Ibid., p. 16.

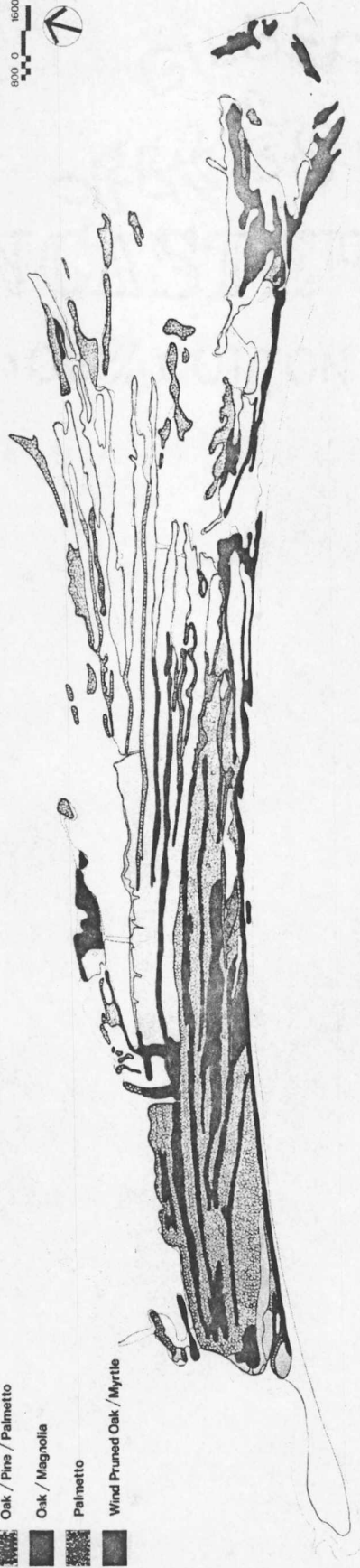
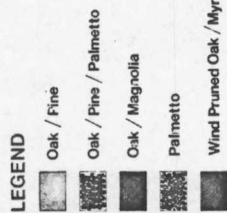
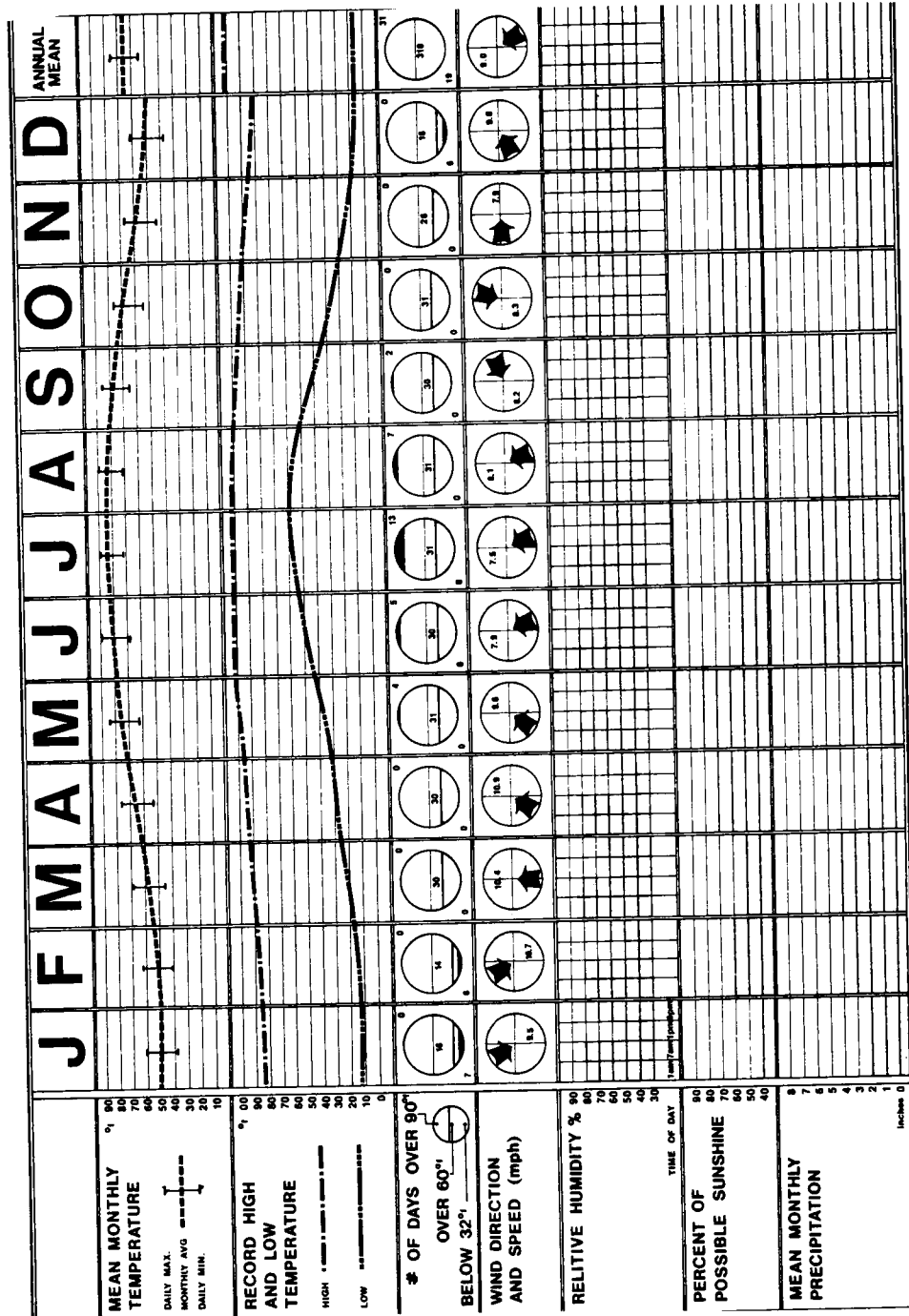


Figure 25. FOREST VEGETATION

Source: Kiawah Beach Company, Planned Development District, Volume 1.

Table 8. Climate Summary.



Source: Kiawah Beach Company, Planned Development District, Volume 1.

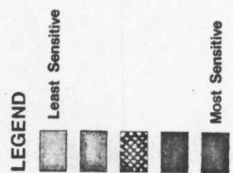
Ornithology. The amount and types of birdlife on Kiawah are functions of the distribution of plant communities and the proximity of major breeding areas for marine life.¹⁰ Types, amounts, and locations of birdlife on Kiawah were determined by daily survey sample censuses. Over 150 species were observed, which include eight rare or endangered species. Most notable were the Peregrine Falcon and the Roseate Spoonbill.

Mammalogy. Mammals on Kiawah were recorded by intensive trapping and transect lines. Night lighting and general observation were done, with special attention to specialized habitats within the five major habitats: dunes, woodlands, pond edges, marsh edges, and open fields. The most critical habitats for mammals were found to be on the pond and salt marsh edges. Twenty-three types of mammals were recorded, including three introduced species: the house mouse, feral goat, and feral hog. No endangered species were found, and the areas most sensitive to mammal habitats were mapped as shown in Figure 26.¹¹

Herpetology. Thirty species of reptiles and amphibians were recorded on Kiawah. Samples were gathered by terrestrial

¹⁰Environmental Research Company, p. I-3.

¹¹Kiawah Beach Company, Vol. 1, p. 31.



MAMMAL HABITATS
Kiawah Island
800 0 1600

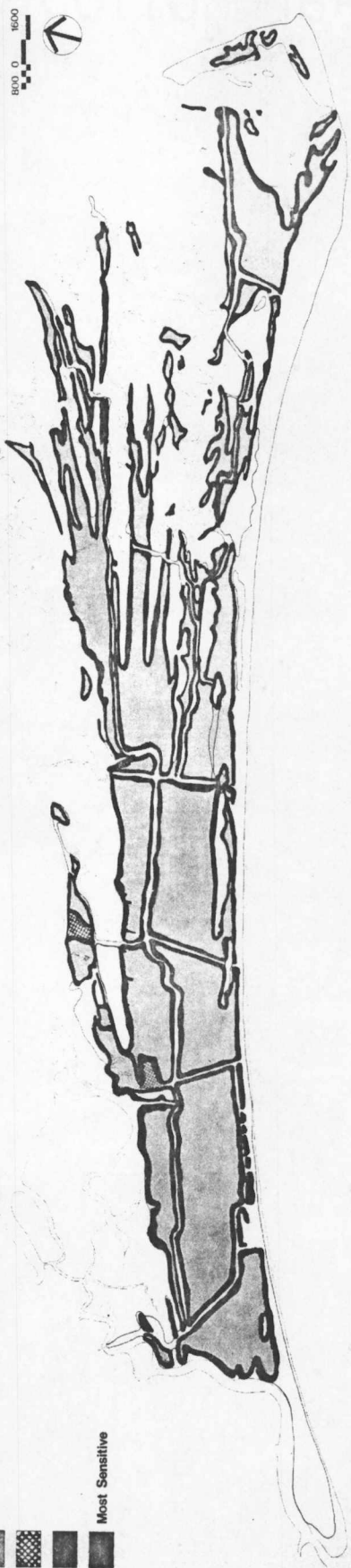


Figure 26. MAMMAL SENSITIVITY

Source: Kiawah Beach Company, Planned Development District, Volume 1.

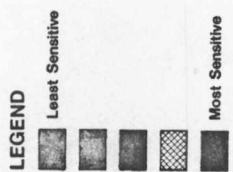
drift fences, seines, minnow traps, aquatic hoop nets, and tarpaper cover. Hand collecting and incidental collection along roads yielded the most specimens. The most apparent species is the American Alligator, which exist in abundance. In addition, a yellow-bellied turtle that currently holds the world record for size was discovered.

Development impacts would be most felt if there were major alterations to the forest cover or the fresh-water ponds. It was also pointed out that the most severe impacts would occur from the removal of essential organic litter, or ground cover, in the forest system. The reptile habitat sensitivity map (Figure 27) illustrates this observation.¹²

Loggerhead turtle. It was discovered that the loggerhead turtle is the most important animal on Kiawah. This giant sea turtle is an endangered species, and monitoring on Kiawah has been underway since 1972. Nightly patrols of the beach were done from May through August to locate females laying eggs. Notes were made on turtle size, egg clutch, and nest location. In 1975 forty-seven nests were moved to a hatchery for safe incubation, which produced over 1,600 hatchlings.

Kiawah's stable strand line at the high tide line is a main contribution to the maintenance of the loggerhead

¹²Ibid., p. 30.



REPTILE HABITATS
Kiawah Island
800 0 1600




Figure 27. REPTILE HABITATS

Source: Kiawah Beach Company, Planned Development District, Volume 1.

species in South Carolina. In addition, it has been recommended that the best way to protect the turtles would be to control the raccoon population, and to continue the indoor hatchery program.¹³

Water quality. Twenty-two water-analysis stations were found to be high in coliform (fecal contamination) but not due to human contamination. The creeks were found to have high water quality. Inorganic nutrients were average for estuarine and ocean areas but were higher in the ponds, which is caused by heavy use by birdlife.

Photoplankton. These microscopic plants found in the ponds, estuaries, and the ocean, serve as a vital link to support higher life forms. They convert solar energy into chemical energy and are the base for the aquatic food chain. Monitoring them can reveal changes in the aquatic system quality. Fifteen sampling stations were established with monthly samples being taken in the ocean, the tidal creeks, and ponds. Samples were taken by trolling with an ultrafine-mesh net. Amounts and types of phytoplankton were found to be typical for the region. Fresh and salt water species fluctuated in the ponds as spring tides introduced saline species and runoff promoted freshwater types.¹⁴

¹³Environmental Research Center, p. T-17.

¹⁴Ibid., p. I-8.

Macrobentic analysis. These animals live in the sand and mud of creek bottoms. Animals such as amphipods, copepods, and polychaetes are important in the aquatic food chain and act as indicators of water quality. Samples were taken at five locations four times per year. The analysis of species diversity and biomass indicated a healthy, non-polluted estuarine system. These organisms respond quickly to changes in sediment load and residential chemical compounds. Thus, it was suggested that their continued monitoring would provide an effective warning systems during and after development.

Nektonic community. This animal group is highly mobile and is made up of fish, crabs, shrimps, etc. Four creeks and eight ponds were sampled each season using a twenty foot trawl net and cast nets. The creeks produced crabs, shrimp, squid, and 36 species of fish. Species diversity was dramatically reduced in the ponds because of the lack of dissolved oxygen. Once again the marsh was found to be the most important area in terms of food supply.

Archaeology. The period of study covered was from prehistoric times (3900 B.C.) to the post Civil War period. Twenty-two sites were established and analyzed by surface collection and excavation.¹⁵

¹⁵Ibid., p. I-9.

Two areas were found to be of significant importance, because it is likely that they have been occupied continually for the last 4,000 years. Evidence of a Kiawah Indian village was found. The most detailed study involved the Vanderhorst House, which was built in the 1700's and served as a plantation house for the harvesting of indigo. The house has been nominated for the Historic Register and plans call for its eventual protection and restoration.

Figure 28 provides a summary of the various elements in the environmental planning process, and how they are related to each other.

Suitability/Sensitivity Analysis

The next step in the environmental planning process at Kiawah involved the completing a suitability/sensitivity analysis. The analysis served to integrate the environmental inventory studies by pointing out the interrelationships among the individual environmental components. The analysis is divided into three elements: environmental sensitivity, development suitability, and intrinsic market appeal.

Environmental sensitivity. Environmental sensitivity on Kiawah Island was determined by analyzing the results of the ERC study and considering the following elements: coastal morphology, mammal habitats, bird habitats, herpetofauna habitats, forest vegetation, dune and marsh vegetation, and archaeology.

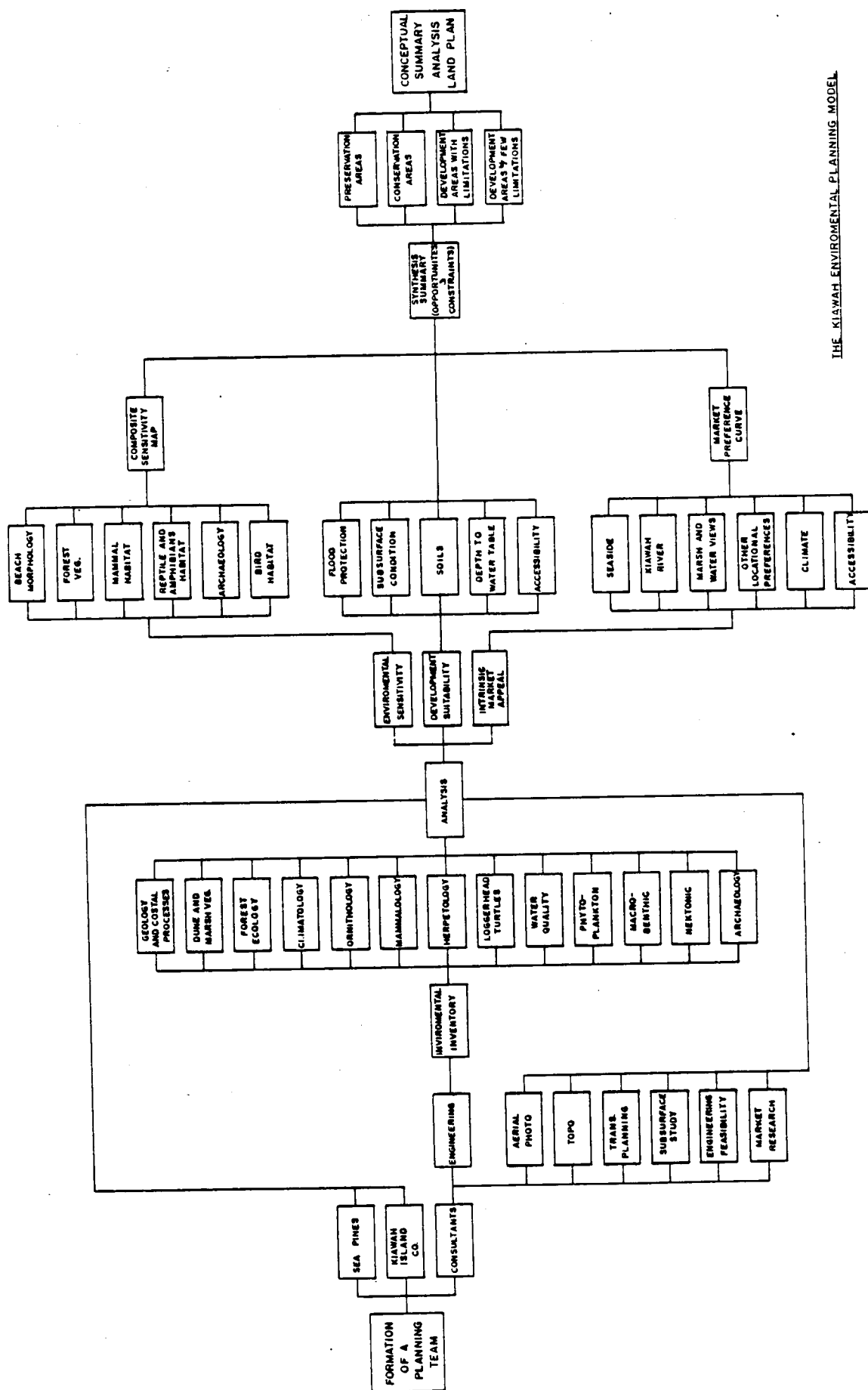


Figure 28. ENVIRONMENTAL PLANNING PROCESS

Sensitivity maps were prepared for each component and each area was ranked on a 1 to 5 scale, from least sensitive to most sensitive. These rankings are shown in Table 9 and Figure 29. Each sensitivity map was overlapped in order to prepare the final environmental sensitivity composite map.

Development suitability. This involves an analysis of those considerations which favorably or unfavorably impact land development and construction processes.¹⁶ The factors which were considered dealt with cost and time constraints and not necessarily ecological impact; however, because both were derived from the same base studies, it was evident that the most environmentally sensitive areas would also be the areas most difficult to develop. The suitability analysis considered the following factors: flood potential, subsurface conditions, depth to water table, soils, and accessibility.

Flooding is a major consideration for any coastal development. Expected flood elevations were mapped as shown in Figure 30, based on 25, 50, and 100 year storms. Kiawah receives an average of 49 inches of rainfall each year, making storm drainage a major issue. The topography, which was extensively mapped at a cost of \$500,000, lends itself to

¹⁶ Kiawah Beach Company, Vol. I, p. 34.

Table 9. Environmental Sensitivity.

	Least Sensitive →				Most Sensitive
Beach Morphology	Inlet-Influenced Beach	Washover, Transgressing Beach	Recurved Spit Beach	Prograding, Reclaimed Inlet Beach	Mid-Barrier Straight Beach
Forest Vegetation	Low Oak Woods (Thicket)	Palmetto Stand	Oak-Palmetto-Pine	Oak-Magnolia	Oak-Pine
Mammal Habitat	Edges (Marsh, Pond & Dune)	Edges (Road and Field)	Old Fields	Woodlands	Grazed Pasture
Bird Habitat	Dunes, Brackish Ponds & Rookery	Freshwater and Tidal Ponds	Tidal Marsh	Beach and Seral Habitat	Maritime Woodlands
Reptile & Amphibian Habitat	Ponds, Pond Edges & Palmetto	Maritime Woodlands	Low Oak Woods (Thicket)	Dune Fields	Marsh and Beach
Archaeology	Vanderhorst & Bass Pond Dam Sites	West Pasture Site	Old Dock & Deptford Sites	North Field Site	Morrow Mt. Site (Oldest Site)
Soils	Capers (Cg), Beach & Dune (Co)	Dawhoo (Da), Rutledge-Pamlico (Rp)	Kiawah (Ka)	Crevasse-Dawhoo (CvC), Seabrook (Sk)	Wando (WnB)

Source: Kiawah Beach Company, Planned Development District, Volume 1.

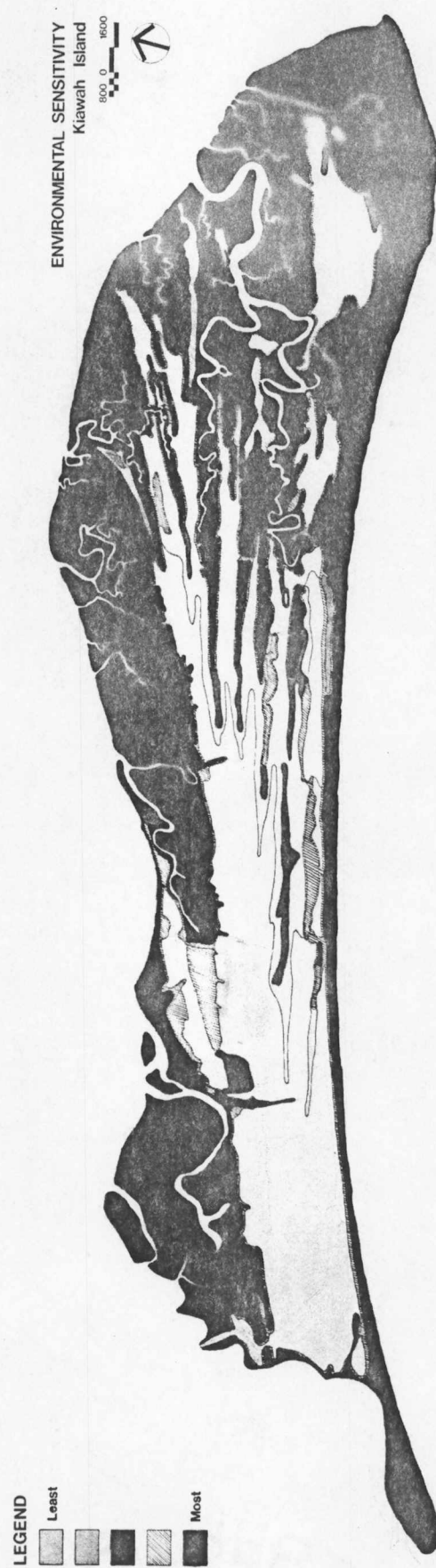


Figure 29. ENVIRONMENTAL SENSITIVITY

Source: Kiawah Beach Company, Planned Development District, Volume 1.

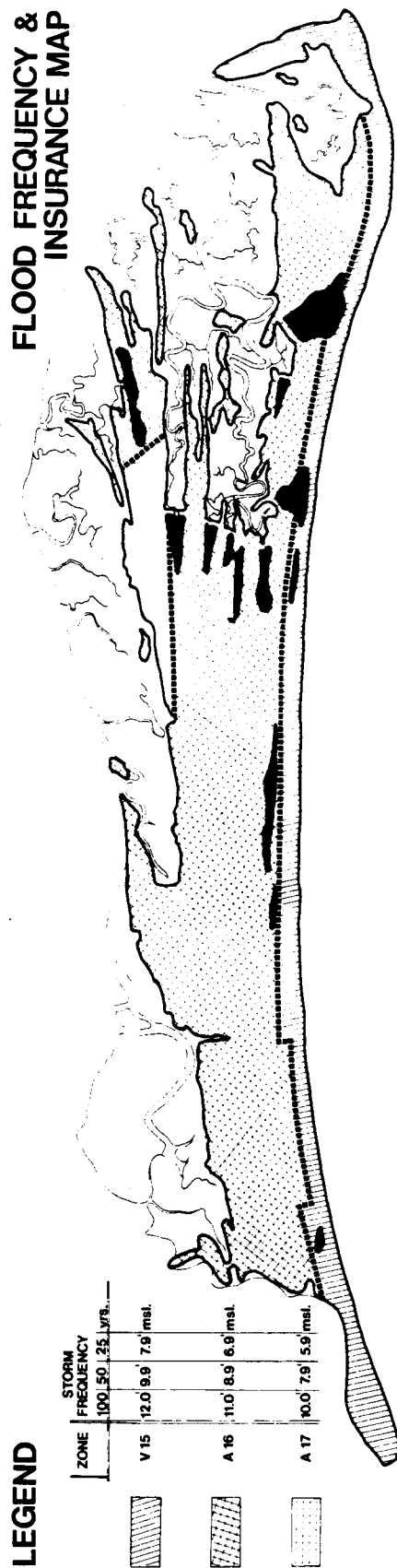


Figure 30. FLOOD FREQUENCY AND INSURANCE MAP

Source: Kiawah Beach Company, Planned Development District, Volume 1.

a good drainage system. Kiawah was found to have a series of east-west low areas, which can be developed into a system of interconnected lagoons. This system can handle storm runoff and serve as a storage area until water can be released into adjacent waters.

Subsurface conditions were analyzed on Kiawah in order to assess the capability of the site to support structures. Figure 31 illustrates the various test boring sites and a cross-section that typifies Kiawah's subsurface conditions.¹⁷

The results indicated that suitable conditions exist over most of the island for lightly loaded (two-story masonry and three-story frame) structures. The study also recommended that whenever water-laden clay strata of low density were encountered, any structures built over them must have properly engineered foundations.¹⁸

The depth to the water table is another critical development suitability factor on Kiawah. It is important in determining the feasibility and cost of building and maintaining buildings, roads, and utility systems. It is especially critical when considering the treated sewage effluent, which is to be sprayed on golf course fairways.

¹⁷Ibid., p. 35.

¹⁸Ibid.

SOIL BORING LOCATIONS

LEGEND

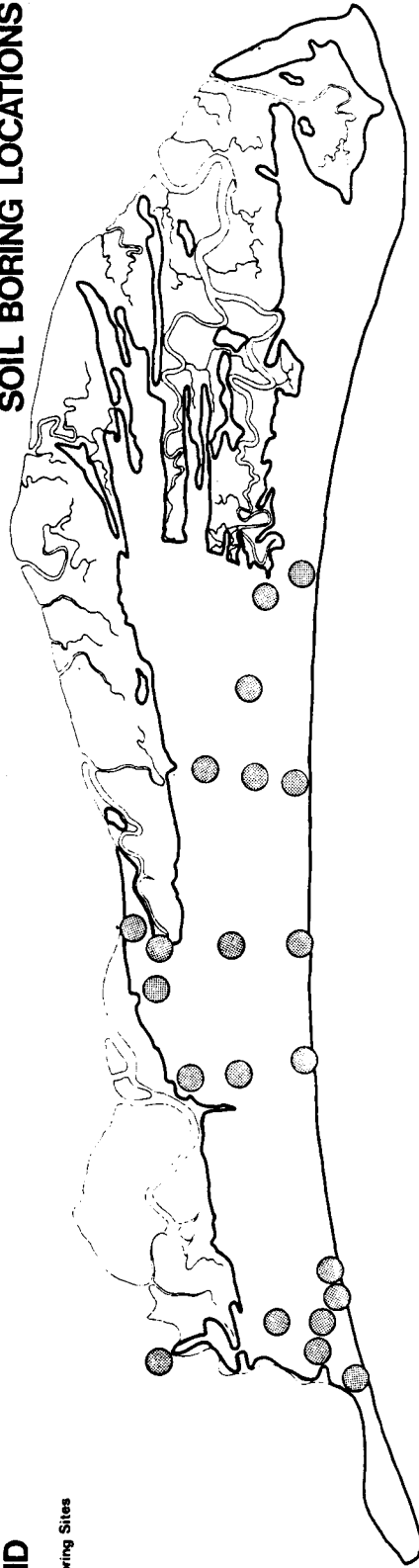


Figure 31. SOIL BORING LOCATIONS

Source: Kiawah Beach Company, Planned Development District, Volume 1.

The depth to the water table will effect the rate of application and the number of acres available for spray irrigation. The water table was found to fluctuate with the weather. Dry periods may cause the level to fall below four feet while wet periods raise the level above the surface. The problem is most apparent in the flat interior portions of the island which lack sufficient slope to drain the excess.¹⁹

The soil analysis, as shown on the soil suitability map (Figure 32),²⁰ revealed a situation that is conducive to development. Soils were found to be basically sandy, well drained, permeable and by themselves presenting no development constraints. However, if the sandy soils are combined with low elevations and seasonably high water tables, constraints become evident. In addition, sandy soils are subject to erosion by wind and rain, which prevents any steep cuts and dictates that any major disturbance be accompanied by extensive landscaping.

Accessibility to and within Kiawah Island was considered in order to provide good vehicular circulation. Access to the island is very adequate from the mainland via a causeway with only one short (200 foot) bridge connection across the Kiawah River. However, several areas of the

¹⁹Ibid., p. 35.

²⁰Ibid., p. 36.

LEGEND
 Most Suitable
 WnB
 Cvc/Sk
 Ka
 Da/Rp
 Ts/cg/co
 Least Suitable

SURFACE SOILS ANALYSIS
 Kiawah Island
 800 0 1600

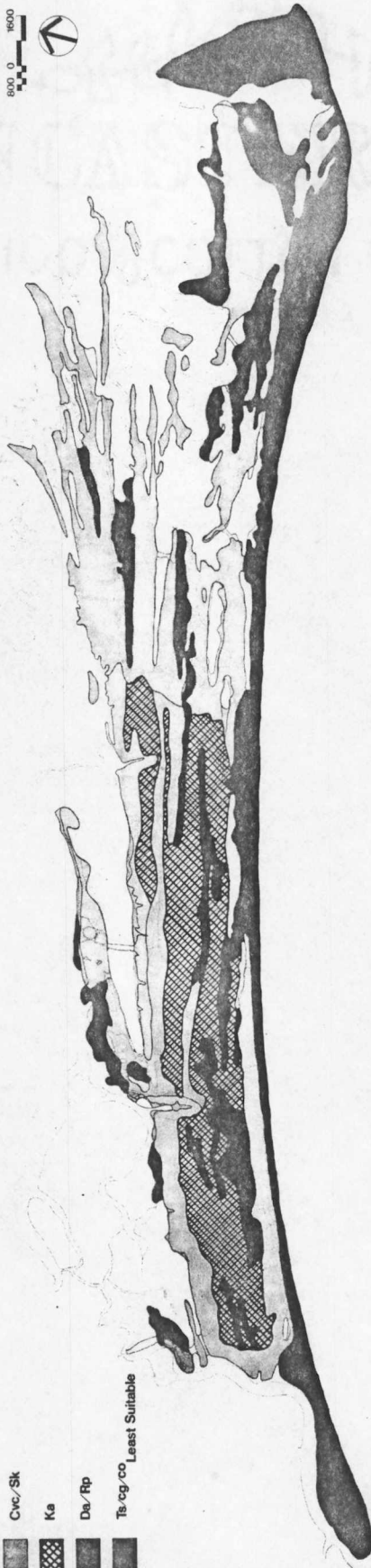


Figure 32. SURFACE SOILS ANALYSIS

Source: Kiawah Beach Company, Planned Development District, Volume 1.

island are tenuously connected to the main body of the island by narrow dikes. These areas are potential washover points and their narrow widths prohibit a loop road system. These conditions also limit the number of residential units which can be served by a single road.²¹

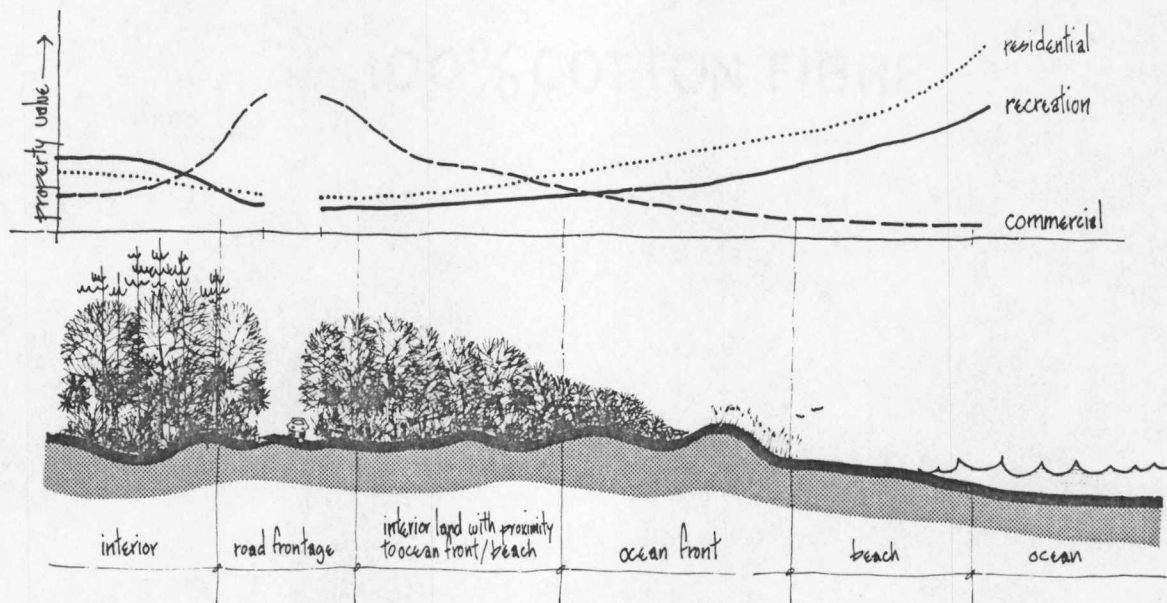
Intrinsic market appeal. The final step in the suitability/sensitivity analysis was the intrinsic market appeal study. Here, the inherent physical features and qualities of the island were compared to various market demands and preferences. Figure 33 shows the current demand for various site conditions, ranging from the interior woodland to the ocean front.²²

As can be readily seen the demand for residential and recreational sites dramatically increases with proximity to the ocean. However, only recreational activities, such as swimming, fishing, sailing, sunbathing, and shelling, can be allowed on the beach because of its environmental sensitivity.

The Kiawah River provides the second most desirable location. The 45 miles of marsh and water views, apart from 11 miles of ocean front, have the highest recreational and residential-view market demand. Marsh views in the eastern part of Kiawah amounted to approximately 32 linear

²¹Ibid., p. 36.

²²Ibid., p. 37.



Environmental Sensitivity

	severe	moderate	slight
slight			
moderate			
high			

Market Preference



Figure 33. MARKET PREFERENCE

Source: Kiawah Beach Company, Planned Development District, Volume 1.

miles. While frontage on the interior freshwater and tidal ponds provided an additional 13 linear miles.

Other high market demand locations include property which is within walking or bicycling distance of the beach. Much developable land falls in this category due to the linear nature of Kiawah. More isolated interior property can be enhanced in desirability by creating lagoons and golf course fairways, which would also serve to absorb treated sewage effluent. Other property enhancing amenities include proximity to tennis courts, swimming pools, playgrounds, parks and clubhouses. Areas with no immediate access to natural or manmade amenities have market appeal because of their privacy and/or lower cost.²³

Synthesis of opportunities and constraints. When the environmental sensitivity, development suitability, and market analyses were synthesized and related to the overall development objectives, an opportunities and constraints framework was established. The framework dictated that the island be divided into the following four categories: preservation areas; conservation areas; development areas with limitation and; development areas with few limitations.²⁴

²³Ibid., p. 38.

²⁴Ibid., p. 40.

Preservation areas included the saltmarsh and primary dune system. These will be left virtually untouched because of their extreme environmental sensitivity and lack of development suitability. The only improvements might take the form of docks, limited access points or protective structures.

Conservation areas were established that include the dune fields, marsh and pond edges, and low areas, which are environmentally sensitive or generally unsuitable for permanent construction. Exceptional improvements would be limited to utility and road crossings, leisure trails, day-use shelters, picnic areas, cabanas, docks, and other similar low-impact structures.

Development areas with limitations were found to be the wind-pruned forest, the rear dunes, the chenieres and other areas with limited environmental and developmental constraints. These areas generally provide superior market opportunities which can be developed by employing special design, construction, and management precautions.

Development areas with few limitations included those areas with low environmental sensitivity and high development suitability where development could occur by utilizing good environmental design principles.

The graphic representation of the opportunities and constraints analysis is displayed in Figure 34.²⁵ The areas which have the most opportunities and constraints are the natural edges. These tend to occur between two ecosystems such as marsh/forest, forest/field or dune field/beach. Thus, compromises or "trade-offs" were an inevitable consequence. High density activity nodes were recommended in areas where market opportunity was highest and environmental and developmental factors were favorable. Of the 57 linear miles of high market areas, only 27 were suited for development. In addition, it was revealed that only 5 miles of the 11 miles of beach front were judged resilient and stable enough to provide ocean view property. In general, the synthesis analysis dictated that the most desirable form for development to take would be to cluster land uses into the most suitable areas. This would leave the highly sensitive, difficult-to-develop, and low-market-value areas in various open space states. This grouping and clustering concept was felt to be the most efficient method for developing a master plan that would minimize the conflict between the economic and environmental factors.

Comparative Analysis

When comparing conventional environmental design planning thought with the Kiawah Island experience, one

²⁵ Ibid., p. 41.

finds many parallels. The use of the concepts of capability and suitability was readily apparent on Kiawah, but there was also emphasis on the carrying capacity concept.

Comparisons to capability analysis. A natural system capability analysis was in essence performed on Kiawah Island, although it was termed sensitivity instead of capability. The sensitivity analysis stressed changes in the natural environment that might occur as a consequence of development. The environmental inventory, which formed a basis for sensitivity analysis, was similar to, yet more extensive than typical capability studies. It extended beyond soils, geology and slopes to include flora, fauna and archaeology. Sensitivity maps were prepared and ranked from least to most sensitive on a scale from 1 to 5. In addition, a composite map was constructed by employing the overlay technique, which comprehensively pointed out the areas of Kiawah most sensitive to development.

The Kiawah Island environmental sensitivity analysis was used as a basis for determining development objectives (as they relate to environmental considerations) as well as planning and design guidelines. This direct application of data closely fits the classic capability analysis discussed in Chapter II. The environmental objectives which

evolved as a result of the environmental sensitivity analysis include the following:²⁶

1. Aquatic systems: Protect the quality of brackish and freshwater ponds and maintain a diversity of floral and faunal populations. Protect adjacent marine resources through proper control of sewage effluent disposal, fertilization programs and other development activities that are potential sources of pollution.
2. Forest vegetation: Maintain the natural vegetation of the island to the maximum extent possible. Protect rare or unique botanical species and maintain the natural stages of forest successions.
3. Wildlife: Manage habitat areas to adequately sustain a maximum of wildlife species. Protect rare or endangered species, in particular the loggerhead turtle. Protect wildlife habitat areas.
4. Air: Maintain the air quality at or above levels that meet all local, state and federal standards.
5. Soils: Keep cut-and-fill operations to a minimum and protect soils from erosion.
6. Salt Marshes: Protect the quality and productivity of the salt marshes by preventing contamination from any development related activities.

²⁶Kiawah Beach Company. Kiawah Island Development Guidelines, Vol. 4, 1976, p. 62.

7. Beaches and dunes: Protect the natural stability of beaches and dunes.

8. Island history: Protect and preserve significant historical and archaeological sites.

From these objectives, a series of planning and design guidelines were developed. The categories covered and an example of one planning guideline for each category are set forth as follows:²⁷

1. Beaches and dunes: No activities or structures should be planned within the dune fields, except for beach cabanas and boardwalks for beach access, and then only basic pole structures should be employed.

2. Facilities around marshes and ponds: Landscaping should be kept natural around facilities adjacent to marshes and ponds and native groundcover should be maintained to reduce runoff and enhance infiltration.

3. Building siting: Specimen trees should be identified on all sites and become a dominant feature element on the site plans; efforts should be made to maintain the diversity of forest vegetation on a site.

4. Parking areas: Parking areas should be designed to preserve as much natural vegetation as possible to serve as visual screens, as well as to take advantage of the air filtering effect of the foliage.

²⁷Ibid., p. 4-13.

5. Fairways and lawns: Fairways and lawns should be designed to drain away from marshes and ponds to prevent pollution from fertilizers and pesticides in runoff.

6. Buffers: Foliage screens should be maintained between ocean-front buildings and the beach to minimize the disturbance of loggerhead turtles from lighting.

7. Pond and marsh edges: All edges should be maintained in their natural conditions to preserve wildlife habitats and to protect them from erosion from pollutants in runoff.

8. Wildlife habitat areas: Major habitat areas should be a minimum of 15 acres in size.

9. Wildlife corridors: Natural corridors should be maintained for wildlife access between habitat areas. They should be a minimum of 50 feet wide and located in low areas where water is available.

10. Oceanfront lighting: Low-intensity, shielded lights should be used to illuminate boardwalks along the beach in order to protect the loggerhead turtles.

11. Wind-pruned thicket: Where buildings are located within the wind-pruned thicket they should be designed to minimize changes in wind patterns in this zone, in order to protect the interior forest from erosion due to salt spray.

Utilities: A corridor for underground utilities should be identified as part of the siting of a home or other building so that trenching can be planned to avoid damaging root systems or selected trees.

The environmental sensitivity analysis performed on Kiawah Island compares closely with the natural system capability concept. Both included a preliminary inventory, a display technique using map overlays, and data translation into specific standards and development criteria.

Comparison to suitability analysis. Where the capability analysis focuses on maintenance of the natural environment, the human use suitability analysis emphasizes the maintenance of the human use desired. Uses which do not necessitate employing extensive artificial measures to accommodate the desired human use are considered suitable. As stated in Chapter II, the land suitability analysis serves to link the needs and desires for various land uses with the results of the capability analysis. In addition to the natural environment, physical, social and cultural facilities are considered in a suitability analysis. Transportation facilities, proximity to school and recreational facilities and land use compatibilities are also evaluated.

The suitability analysis carried out on Kiawah Island focused on those factors which would positively or negatively impact the actual construction process. Time and cost constraints were given priority over ecological considerations. In most cases it was discovered that the most environmentally sensitive areas were also the most difficult to build on. The factors considered in the Kiawah suitability

analysis included: flooding, subsurface conditions, depth to water table, soils, and accessibility. From an analysis of these factors the following construction guidelines were developed:²⁹

1. Construction schedules: Construction activities should be scheduled so that sites are disturbed for as short a time period as possible, with activities being minimized during periods of predicted heavy rains.

2. Construction traffic: All construction traffic should be prohibited on the beach and within the dune fields except on designated routes along boardwalks and beach facilities. Designated routes to and from construction sites should follow clearly marked routes.

3. Construction equipment operations: Construction activity should be closely supervised to avoid unnecessary damage to vegetation with fines being levied to contractors who destroy vegetation which has been flagged for preservation. Marsh and pond edges should be fended off to prohibit encroachment by construction equipment.

4. Clearing: Construction should be planned so that minimal surface area is disturbed. Areas and specimen trees designated for protection should be flagged and fenced.

5. Earthwork: Cut-and-fill operations should be carefully monitored to avoid erosion, disturbance of the

²⁹Ibid., p. 14-17.

water table and damage to root systems of trees. If more than six inches of fill is applied on a site, trees should be protected with tree wells.

6. Site drainage: Site drainage should be worked into the natural drainageways wherever possible. Sites should not be drained so that the level of the watertable is permanently altered.

These construction guidelines were supplemented by a comprehensive set of community management guidelines, which covered landscaping, fertilizers and pesticides, wildlife protection, beach and dune protection, open spaces, pond management, air and noise pollution abatement, and off-road vehicles. In addition, other guidelines were developed including the Kiawah Home Builders Manual, a Review and Approach Process Manual for all construction activity, and Design Criteria for single-family, multi-family and patio homes. Thus, in essence the suitability analysis served as a linkage between the environmental sensitivity analysis and the actual construction process.

The linkage is similar to the McHarg suitability approach to the plan for Sanibel Island. Here McHarg linked the environmental capability of each ecological zone with its suitability for development, which he put in terms of densities allowed. In addition, a further output of the suitability analysis resulted in the development of a set of performance standards and administrative regulations, which

bear a great similarity to the various Kiawah development guidelines, both in terms of form and content.

In contrast to Kiawah, Sanibel suitability planning involved consideration of existing land uses and their related support facilities. Compatible land uses and the extent of existing community facilities played a larger role in the Sanibel suitability analysis. Kiawah land use location and density along with the support facilities could all be planned in advance.

Comparison to carrying capacity. The term carrying capacity, as described in Chapter II, does not appear in the Kiawah planning documents; however, the Kiawah process did consider all three dimensions, including environmental, perceptual and institutional carrying capacity.

The environmental carrying capacity is based on the limit at which a human activity, such as development, will lead to undesirable changes in the environment. Three degrees of environmental change are described, which vary from slight to severe. Kiawah planners used this concept when delineating land use categories. Four categories, as mentioned above, were used, instead of three, and ranged from preservation areas (where severe change would occur with little activity) to developable areas with few limitations (where little change would occur with large amounts of activity). In addition to natural systems limits, which dictated the distribution

of the future population, the population ceiling was determined by natural resource limits. These limits were set by the available water supply and the transportation system, whose carrying capacity limit was set by the number of residents who could evacuate the island in case of a hurricane. A series of resource limits were determined which dictated the location, intensity, and absolute amount of population that Kiawah could support. This type of objective analysis compares with the concept of environmental carrying capacity.

Perceptual carrying capacity refers to the degree of change which can occur before one's perception of the environmental is altered. The scale and motif of the Kiawah development was influenced by analyzing resident surveys from comparable projects. Likes and dislikes were translated into master plan and individual unit design. Village clusters separated by open space systems were found to minimize perceptual change. Natural colors, landscaping, and unobstructed views were found to maximize the perception of privacy within residential units. Existing residents of Kiawah are surveyed regularly in order that future development can be modified to respond accordingly.

The concept of institutional carrying capacity refers to the ability of a community's organizations to direct development towards its goals. Kiawah's development organization

initially achieved its goal of acquiring the necessary community approvals and is continuing to achieve its goal by maintaining its projected development pace.

Comparisons with approaches to environmental design planning. Just as the concepts of suitability, capability and carrying capacity were evident in the environmental planning of Kiawah Island, so too can parallels be found with the approaches of constraints, opportunities and impacts. Environmental constraints were established by the suitability/sensitivity analysis and supplemented by engineering studies. Environmental opportunities were based on the intrinsic market appeal analysis, which attempted to maximize utilization of areas with great market appeal while minimizing activities in environmentally sensitive areas. Compromises had to be made in the natural edge areas which contained both the most constraints and opportunities. Development activity was minimized on the sensitive natural edge formed by the dune field and beach, which is the area of highest market demand. To compensate for this potential loss of revenue, the limited number of single-family lots which bordered this natural edged were priced at an average of \$250,000 per lot.³⁰ Thus, a natural constraint was turned into a marketing

³⁰ Interview with Kiawah Planner, Rob Hull.

opportunity by virtue of the area's limited supply and exclusivity. In addition, the marsh edges, which contain environmental constraints to development, can be developed near the edge in order to take advantage of the marsh view.

The impact analysis approach was most used in environmental planning on Kiawah Island in the engineering studies. In particular, the transportation study, water and sewage systems study, and the solid waste disposal study all employed the basic impact analysis approach. Each utilized alternative action proposals, which were based on future population projections. For example, alternative transportation systems with varying levels of service were evaluated in terms of environmental impacts, which included air pollution, water pollution, noise, physical disruption, and aesthetic degradation. The most attractive alternative was then chosen that had the highest level of service with the fewest environmental impacts. A similar process was undertaken for the sewage system and solid waste disposal selection.

Of the two environmental planning processes described in Chapter II, the Kiawah process was far closer to the McHarg process. The impact assessment process, which McHarg described, is very generalized in nature and seems more suited for governmental use. The outlines of the process itself, which essentially proceeds from base studies, to establishing

alternatives, to selection of the best alternative, is comparable but the means of performing these tasks suggested by Marsh differed from the Kiawah process.

The McHarg process on the other hand bears great similarity to the Kiawah environmental planning process because of its emphasis and reliance on the natural ecosystem and their interdependencies. The major points of similarity include:

1. Environmental inventory: Every subject and environmental factor that McHarg required was inventoried on Kiawah. However, emphasis was not placed on the order in which the elements were inventoried, as all were done simultaneously.

2. The use of intrinsic suitability maps: Both utilize overlay map techniques which are used to produce a composite suitability map.

3. An economic inventory: The intrinsic market appeal study on Kiawah was used to match the locational and spatial requirements of demand with the supply of developable land.

4. Criteria for form and design: Kiawah developed a comprehensive set of development and design guidelines which were based on the environmental analysis.

5. Powers to implement the plan. Sufficient capital resources were available for implementing the Kiawah plan and the necessary zoning and regulatory powers were acquired.

The major weakness of the McHarg process mentioned in Chapter II was its lack of emphasis on social, political and economic factors. These weaknesses were not present in the Kiawah process, which undertook extensive measures in all three areas. This will be discussed in the context of development planning on Kiawah which follows.

The Development Planning Process At Kiawah

Both during and after the time when the environmental planning process was taking place, another parallel process was also being carried out by the Kiawah Beach Company. This process can in some ways be seen as a physical expression of the opportunities and constraints that resulted from the environmental planning process. This section is intended to take a closer look at the development of the master plan and the beginning of implementation of that plan at Kiawah. Also important to the discussion is an elaboration of the techniques and management systems which were used to control the development process.

It is difficult to separate the environmental process described in the previous section from the development process itself. Many of the goals and objectives pursued in the development planning phase either arose from or were modified because of the results of the thorough environmental study. Both of these processes, however, were controlled by the development objectives which had been set out by the

Kiawah Beach Company at the outset. These objectives were aimed at the primary goal, which was the "building of a new community on Kiawah Island which will provide several generations of residents and visitors an attractive environment..."³¹ In order to pursue this goal, the company committed themselves to full cooperation with governmental agencies, comprehensive planning, balance between the community and the natural environment, strategic business responses to natural constraints, orderly sell-out, a variety of attractions, economic benefits to the community, tax revenue benefits to Charleston County, and managed growth.³²

In translating these general objectives into what they called "Master Plan Objectives," the developers set out the following list:

- Preserve the environmental integrity of the island by matching and blending human needs with-rather than imposing them on-nature.
- Provide for the maximum human enjoyment of and exposure to, the island's many natural views and experiences, particularly as they relate to the sea.
- Provide for a reasonable return on the owner's investment.
- Determine the most reasonable, efficient and economical use of the island's land.
- Introduce those experiences and activities which complement, heighten, and supplement the variety of natural opportunities.
- Mitigate disturbance to the natural setting of the island by strict design, construction and management standards.

³¹Kiawah Beach Company, Planned Development District, Volume 1, p. 10.

³²Ibid., pp. 10-11.

Provide a variety of innovative housing, support and amenity systems for each of the lifestyle options and environmental situations. Minimize the potential sources of pollution normally associated with development. Implement innovative techniques and land development concepts which reduce costs without compromising the island's environmental systems. Manage the island's natural systems to provide optimum benefit for both human and environmental needs. Provide several areas of communal activity, each of which is clearly identifiable and distinctive in terms of image, use and development pattern. Provide for, or make available, a high level of community services and facilities. Adopt a comprehensive set of deed covenants and other self-imposed regulations, codes, and standards which complement requirements of appropriate government agencies relating to the full scope of development activities to provide for the safety, comfort,³³ and welfare of residents and visitors.

Planning Process

In order to assure that the development team constantly kept these objectives in mind while immersed in the mass of detail inherent in such a large development, the developers formalized an organizational structure to "sort out the complexities of relationships, information and timing."³⁴ This structure was intended to track three different processes. First was the "linear" staging of the process, during which the project passes from one phase to the next and finally to completion. Within this process are

³³ Ibid., p. 41.

³⁴ Ibid., p. 43.

embedded numerous other processes, concerned with the internal work cycles of each discrete stage. Finally, there is a system which controls the inputs and outputs from these other systems to assure a consistent level of detail for analysis and a balanced input from all participants. The Kiawah Beach Company considered the combination of these three systems as a "Community Planning Process."³⁵

Another dimension to the development process was the "overlay" of financial considerations at all stages of the project. Throughout the process a computer model was used to calculate the consequences of various patterns or sequences of development on the financial returns to the developer. Inputs to this model included data from marketing and sales reports, current Master Plan ideas, current infrastructure costs, the level of amenity and support facilities needed to support the current plans, operation costs, and corporate financial considerations. Details of this model and the alternatives evaluated using the model will be discussed more thoroughly below.

Plan Elements

The final analytic step in moving toward a master land use plan for Kiawah was the definition of a set of physical concepts which were used to organize the uses and restraints from use on the island. It is apparent that the

³⁵Ibid.

data gathered in the environmental planning stage played a major role in determining which concepts or building blocks were chosen to make up the "language" of the plan. Discussion of these seven concepts in detail provides some insight into the process.

Clustering. The use of the clustering concept is a choice that has a clear connection to the results of the environmental analysis. Because of the differing capacities of the various parts of the island to support development, the clustering of activities in discrete groups is a natural conclusion. The clustering concept is realized in the Kiawah plan in the form of villages. These villages provide opportunities to allow a variety of amenities, styles, vistas, and prices to the various target markets of the development. The villages will be discussed in detail below.

Open space. The open space network provides the most important element in the Kiawah plan, according to the developers. The plan attempts to cluster the various activities around the open spaces to assure the preservation of environmentally sensitive areas, while providing an optimum variety of recreational activities within these constraints.

Movement systems. A variety of movement systems are used in the Kiawah plan to connect the villages and clusters

of activity, as well as to provide as many scenic vistas as possible for those using the network. The orientation of the villages and the activity clusters is such that pedestrian and bicycle transportation is encouraged. The system is also designed to make the hierarchy of movement systems clearly perceivable by the user.

Drainage/lagoon system. The flooding potential at Kiawah was mentioned in the environmental planning section. The system of lagoons on the island was designed to make the maximum use of natural drainage corridors. The developers also used the system of lagoons to provide for valuable vistas, as well as using the excess material from construction of the lagoons as needed fill.

Golf corridors. Golf is one of the main supplements to the natural elements at Kiawah, and provides one of the main methods of creating valuable building sites. The golf courses are also used as an integral element of the design, and are oriented so as to work effectively with the lagoon system. The golf fairways also provide a place for the disposal of treated sewage effluent through spray irrigation, as well as providing corridors for major utility networks.

Visual perception. The developers intended to capitalize on the uniqueness of the environment at Kiawah, and used natural features to provide clear identification

of the clustered areas. The natural scenery was also preserved through building scale and height controls.

Edge conditions. According to the developer, these boundaries between areas are both valuable as a view resource, and sensitive in terms of island protection and animal habitat. As was discussed earlier, the preservation of the salt marshes is vital to stability of barrier islands, and every effort was made to insure that no development took place in these critical areas.³⁶

Using these building blocks, the Kiawah planners then put together a master plan made up of seven elements.

Open space/conservation system. The main feature of the open space plan is that, because of the nature of the Kiawah development, the green or open space forms a framework in which development is then arranged--the reverse of the typical planning sequence. The open spaces are structured according to the levels of intensity set out in the environmental analysis into preserves, conservation areas, and active recreation areas. The conservation areas include almost all of the salt marsh below three feet mean sea level, while the strip between the marshes and the forests areas contains the beach parks, golf courses, lagoons, and other high-intensity uses.

³⁶Ibid., pp. 46-49.

Island villages. Integrated into the open space network are the six island villages which are the activity centers of Kiawah. The activities planned for each village are shown in Table 10; the concepts for four villages are shown in Figures 35 through 38 . The relative placement of the villages can be seen in Plate I (rear pocket). It can be noted that West Village is the most readily accessible to the mainland, and hence the general public, while East Beach Village is the least accessible, and is planned as an exclusive beach club for members only. The major commercial facility on the island, the Kiawah Inn, is also in West Village. Beach Village is designed around the beach view and is the planned site for the conference center. Island Center is the only one of the island villages that is not oriented around one of the island's natural assets, and is the planned site for the major man-made recreation facilities on the island, contained in the Sports Village. The River Village is oriented around a deep-water harbor, and will be the major site for boating activities. Finally, the Vanderhorst Woods Center is to be the cultural hub of the island, and is oriented around the preserved Vanderhorst mansion.

Residential land use. The largest planned use of land on Kiawah is for residential units, the primary income source for the developer. Table 11 depicts the types of dwellings which are planned and the densities and locations

Table 10. Preliminary Distribution of Village Elements.

	West	Beach	River	Island Center	Vanderhorst Center	East Beach Center
Conv. Shops	.	.	.	.		.
Meeting Space	.	.		.		.
Restaurants	.	.	.	.	.	.
Major Stores	.			.		
Resort Shopping	.	.	.	.		
Motel/Hotel	.	.	.	.		
Office	.		.	.		
Apartments	.	.	.	.		.
Beach Club	.	.		.		
Sports Club ¹	.			.	.	
Public Safety (fire/ police rescue)	.	.	.	.	.	.
Maintenance/Support	.	.	.	.	.	.
Post Office				.		
Community Hall			.	.	.	
Church	.		.	.	.	
School	.			.		
Playground	.	.	.	.	.	.
Swimming Pool	.	.	.	.	.	.
Fire Station	. ²			.		. ²
Entertainment	.	.	.	.	.	
Adult Education					.	
Day Care	.			.	.	
Transportation Center	.			.		
Bicycle Rental	.	.	.	.		
Post Office/Kiosks	.	.	.	.	.	.
Fast Food	.	.	.	.		
Marina	.		.		.	
Library					.	

¹Golf/Tennis²Sub-Station (Public Safety)Source: Kiawah Beach Company, Planned Development District, Volume 1.

West Village Concept

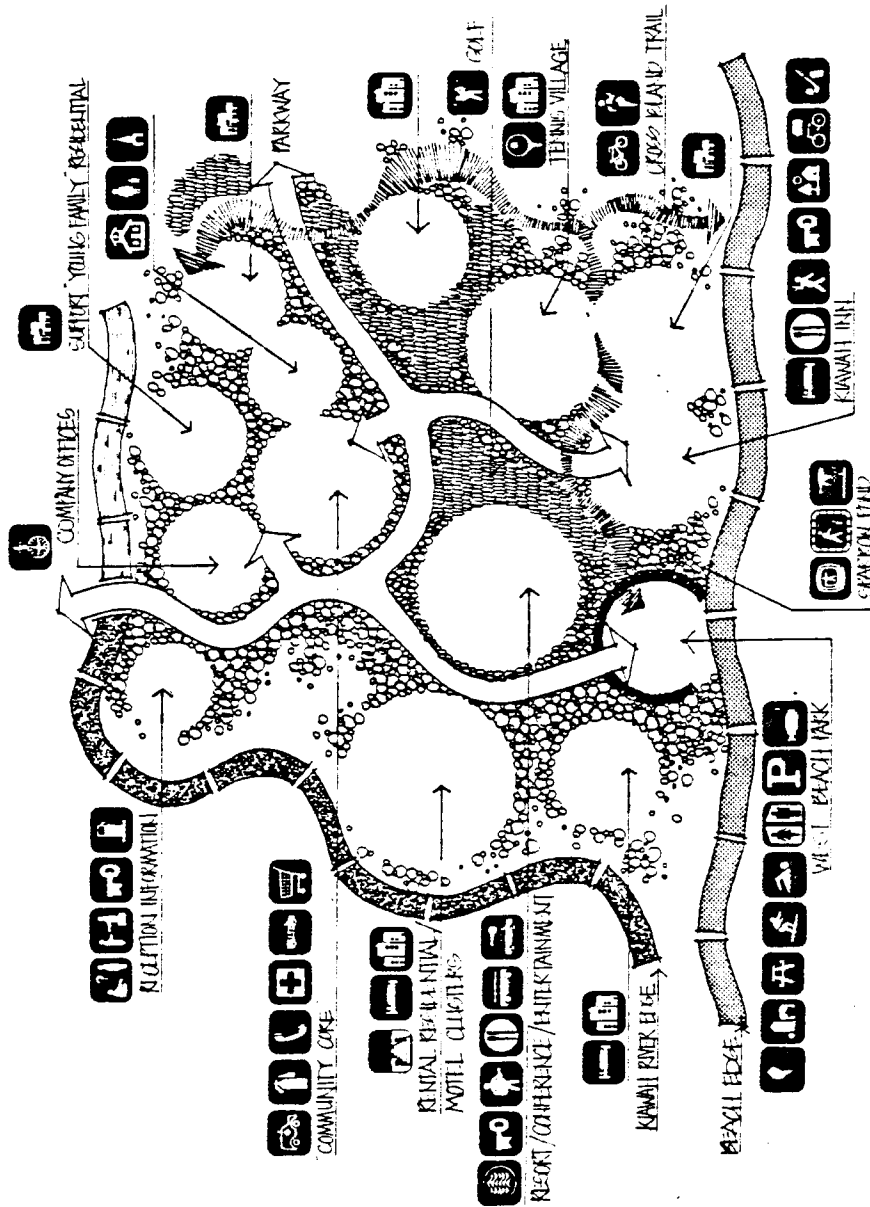


Figure 35. WEST VILLAGE CONCEPT

Source: Kiawah Beach Company, Planned Development District, Volume 1.

Island Center Village Concept

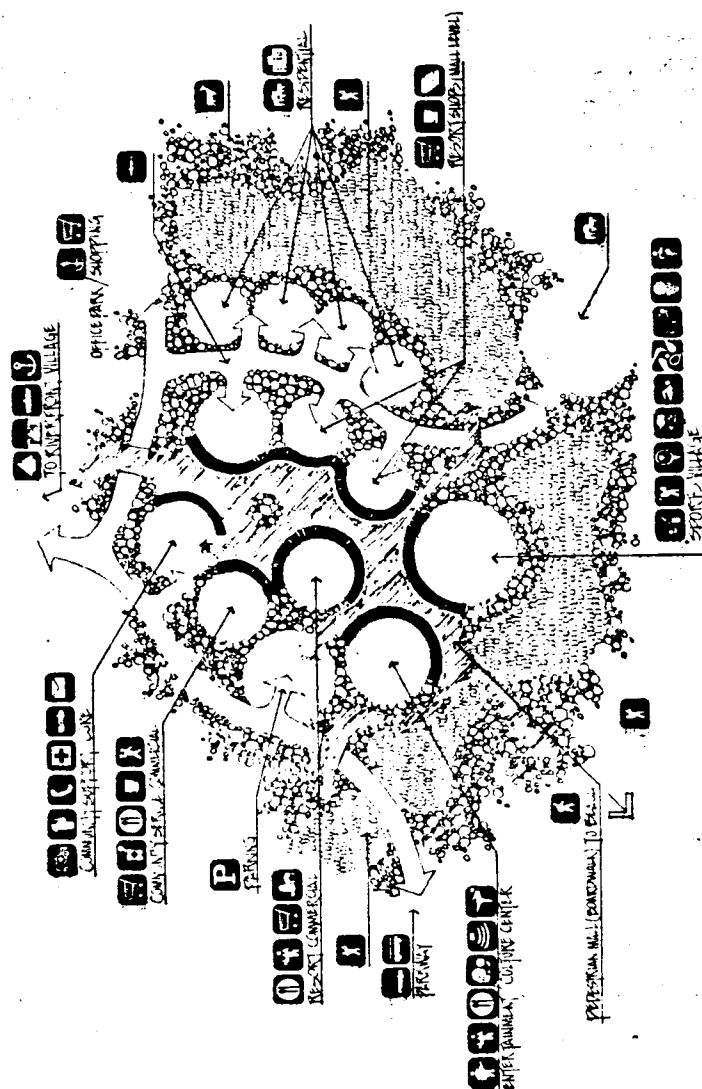


Figure 36. ISLAND CENTER VILLAGE CONCEPT

Source: Kiawah Beach Company, Planned Development District, Volume 1.

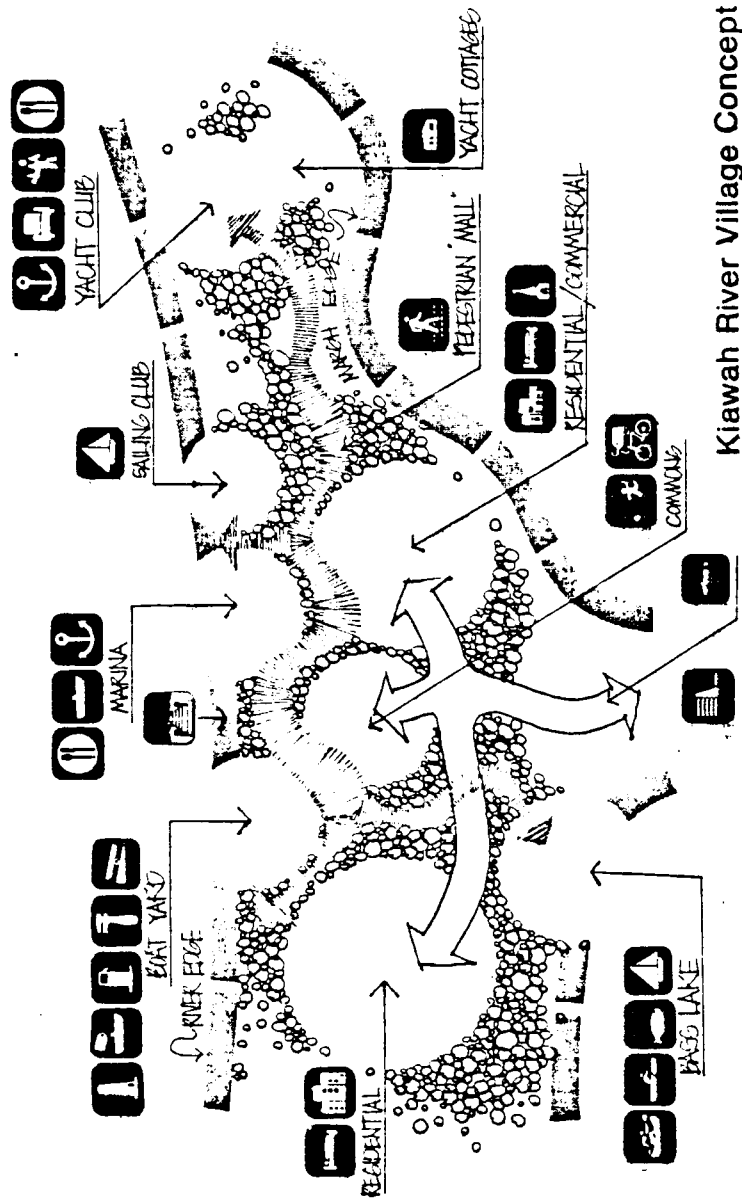


Figure 37. KIAWAH RIVER VILLAGE CONCEPT

Source: Kiawah Beach Company, Planned Development District, Volume 1.

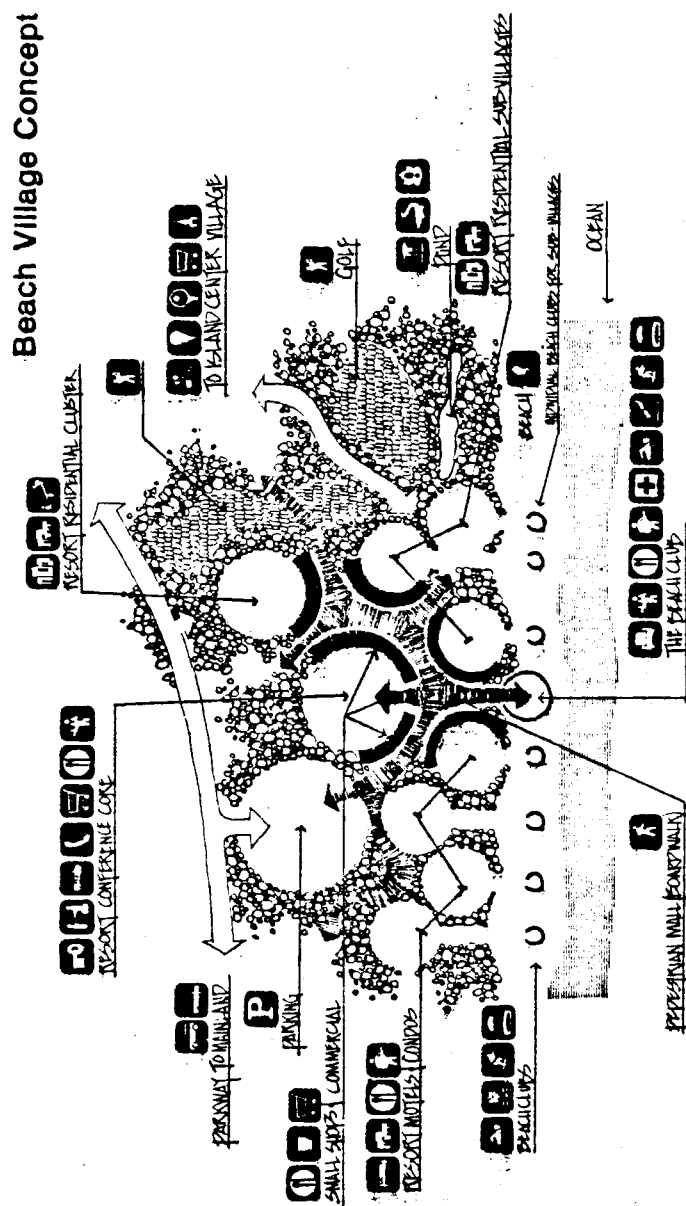


Figure 38. BEACH VILLAGE CONCEPT

Source: Kiawah Beach Company, Planned Development District, Volume 1.

Table 11. Residential Setting.

Type	Density Setting	Density Range (Gross/Parcel)	Residential Setting				
			Ocean	Quayside	Marsh	Golf	Interior
Single Family/Estate	Low	5-1					
Single Family/1/3 Acre	Low	1-3					
Single Family (detached cluster)	Low-med	2-5					
Single Family (patio)	Low-med	3-5					
Single Family (attached cluster)	Low-med	3-6					
Townhouse (lot)	Med-village	4-7					
Townhouse (condo.)	Med-village	4-8					
Townhouse (over apt.)	Med-village	6-10					
Apartment (garden)	Med-village	6-10					
Apartment (low-rise)	Village	8-15					
Apartment (mid-rise)	Village	10-20					

Source: Kiawah Beach Company, Planned Development District, Volume 1.

for each of these types. The dwelling types range from the exclusive one- to three-acre estates to mid-rise apartments of eight stories. The variety available covers almost all types of dwellings and ownership arrangements.

Residential land uses. Looking at the residential uses from the perspective of total uses of land on the island indicates that 1,155 acres, or 18 percent of the total land area above three feet mean sea level, is devoted to the least dense residential development, with three or less units per acre. 439 acres, or 7 percent of total land available, is used for residential development with three to six units per acre. 356 acres, or 5 percent of total land available, is planned for residential use at over 6 units per acre.

Recreation opportunities and facilities. One of the primary concepts in the Kiawah plan was the attempt to encourage residents and visitors to interact with the unique aspects of the Kiawah Island environment. Recreational opportunities include beach activities, nature trails and wildlife observation opportunities, lakes and ponds, and saltwater environments. Man-made recreational facilities include golf courses, tennis and paddle tennis courts, various types of court games, swimming, gardening, and others.

Due to the character of the development and the sensitivity of the island environment, it could be expected that recreational uses would use most of the island's land. 2,510 acres are planned as recreation uses in the preservation-conservation category, and 1,380 acres are designated for use as lakes and ponds. These two uses make up 60 percent of the total land available.

Commercial facilities. The developers do not intend Kiawah as a major shopping destination, and only planned sufficient space for commercial facilities in the village areas to accommodate shopping needs of visitors and residents. Approximately 500,000 square feet of commercial space were envisioned by the plan.

The commercial land uses, together with the built-up recreation areas and the support facilities, occupy 610 acres, or 10 percent of the total available land.

Circulation. Transportation planning for Kiawah was contracted to General Analytics, Inc., of Pittsburgh, and was designed to provide alternative methods for on-island movements. The major thoroughfare is the Kiawah Parkway, which begins near the mainland and extends through West and Beach Villages, the Island Center, and terminates at the River Village. The parkway is heavily buffered to minimize impacts on surrounding activities, but also designed to provide a series of visual experiences and vistas. Bicycle

and pedestrian ways are also prominent in the circulation element of the plan.

Community support system. Basic infrastructure services as well as some convenience-support services (i.e. post office, elementary school, churches) are included in the plan for Kiawah. The developers planned to use City of Charleston water as soon as mains were available. Before that time, water was provided from several deep wells. As mentioned previously, wastewater from the sewage treatment plan is to be used to irrigate the fairways of the golf courses. The sewage treatment plant was centrally located to minimize disruption from the installation of sewer mains, and the clustering concept and the use of golf fairways for sewer runs assured minimum disruption to the sensitive areas.

Table 12 summarizes the uses of land in each of the five zones into which the island was divided, while Figure 39 shows the phasing plan for the sequencing of development. The total area being considered for development is 4,100 acres, 63 percent of the island. The phasing plan is designed in such a way that the essential facilities will be in place at the time that they are needed, while maintaining the flexibility necessary to respond to changes in the markets.³⁷

³⁷Ibid., p. 48-84.

Table 12. Land Use Allocations by Tract.

TRACT	ACRES	DWELLING UNITS PER GROSS AC.	RESIDENTIAL	USES PERMITTED VILLAGE*	MAINTENANCE & SUPPORT	TRACT	ACRES	DWELLING UNITS PER GROSS AC.	RESIDENTIAL	USES PERMITTED VILLAGE*	MAINTENANCE & SUPPORT
1	25			X		31	69	6	X		
2	12			X		32	24	3	X		
3	60	10	X	X		33	51	6	X		
4	36	10	X	X		34	29	8	X		
5	47	10	X	X	X	35	29	5	X	X	X
6	20	5	X	X		36	16	10	X	X	X
7	20	10	X	X		37	13	10	X	X	
8	18	12	X	X		38	42	4	X		
						39	16	5	X		
						40	49	5	X		
9	12	5	X			41	19	5	X		
10	20	3	X			42	45	12	X		
11	22	3	X			43	23	3	X		
12	28	3	X			44	34	3	X		
13	40	5	X			45	49	3	X		
14	6	3	X			46	47	3	X		
15	51	10	X			47	35	3	X		
16	25	3	X		X	48	35	2	X		
17	50					49	41	3	X		
						50	26	3	X		
						51	35	6	X		
						52	35	6	X		
18	18	5	X								
19	69	10	X								
20	31	8	X			53	19	5	X		
21	12	10	X			54	226	2	X		
22	42	10	X			55	33	1	X		
23	116	12	X	X		56	67	2	X		
24	91	8	X	X	X	57	102	1	X		
25	19	6	X	X	X	58	244	1	X		
26	64	10	X	X		59	25	5	X		
27	10	5	X			60	10	5	X		
28	48	10	X								
29	31	6	X								
30	29	8	X								

*village uses are commercial, residential, recreation, necessary maintenance, support and community facility elements, and open space.

Source: Kiawah Beach Company, Planned Development District, Volume 1.

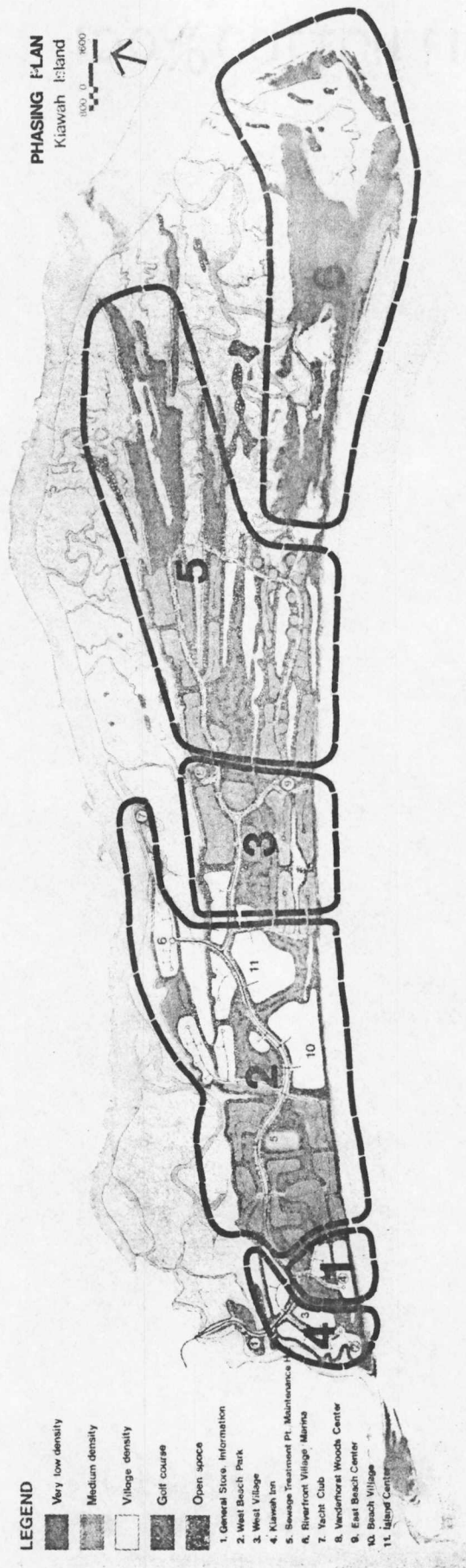


Figure 39. PHASING PLAN

Source: Kiawah Beach Company, Planned Development District, Volume 1.

Plan Implementation

After completion of the master plan it was necessary for the Kiawah Beach Company to obtain the necessary approvals from the Charleston County Council. The details of the approval process will be discussed in the following section. After the approvals were obtained the detailed planning for the first phase of improvements was started. The first major building improvement was the Kiawah Inn, which was completed in 1976. Also constructed in the first phase were homesites, cottages, villas, and homes for the company employees.

In order to manage the development process, the company made use of what they called a "Network Based Management System," which made use of CPM networks to track the process of construction. Table 13 is an example of a "Real Estate Progress Update" report for a group of subdivision development projects and sub-projects. Figures 40 and 41 are examples of the accompanying CPM networks for the "Windswept" and "Night Herron" cottages landscaping projects. It can be seen from the level of detail used in controlling these relatively simple projects that the network analysis for the entire development was of considerable magnitude.

Financial Feasibility

During the same period when the master plan was being prepared, continuous financial feasibility analyses

Table 13. Real Estate Progress Update: 17 Nov 80.

Page	Project Description	From: 3 Nov		To: 17 Nov		14 Days Passed Calendar Day Between Reports	FY 81		Actual Progress		Event or Activity Causing Gain or (Loss)
		CPM Completion Last Report	10 Nov 80	CPM Completion This Report	17 Nov 80		Annual Plan Targeted Completion	Variance to Annual Plan Gain or (Loss)			
1	421 Subdivision		10 Nov 80		1 Dec 80	(21)	1 Dec 80	On Time		Delayed HUD appvl completion	
2	427 Subdivision I		1 Jan 81		1 Jan 81	-	1 Jan 81	On Time		HUD submittal critical 25 Nov	
3	427 Subdivision II		2 Mar 81		2 Mar 81	-	2 Mar 81	On Time		Do not submit plat until after 12 Dec	
4	Windswept I		30 Mar 81		30 Mar 81	-	1 Apr 81	On Time		Need to accelerate site engineering	
5	Night Heron I Landscaping		22 Dec 80		29 Dec 80	(7)	1 Dec 80	(4 wks.)		Delayed construction contract award	
6	Mariner's Watch I Landscape Design		23 Dec 80		9 Jan 81	(17)	1 Dec 80	(5 wks.)		Delayed preliminary design completion.	
7	Night Heron I		8 Dec 80		12 Jan 81	(35)	5 Jan 81	(1 wk.)		Unit completions critical at 4 per wk.	
8	421 - PH II Grading and Paving		12 Jan 81		26 Jan 81	(14)	16 Jan 81	(2 wks.)		Delayed curbing start.	
9	Night Heron Lake Signage		4 Mar 81		18 Mar 81	(14)	12 Feb 81	(5 wks.)		Landscape architect selection delayed.	
10	Mariner's Watch I 421 - PH III C & D		2 Mar 81		9 Mar 81	(7)	17 Feb 81	(1 wks.)		Rough-in delayed start Bldg. 5.	
11	Grading & Paving		16 Mar 81		16 Mar 81	-	20 Mar 81	On Time		Work to Start By 19 Jan.	
12	Night Heron III		16 Feb 81		16 Feb 81	-	6 Apr 81	7 wks. ahead		Owner selections critical.	
13	Night Heron II		16 Mar 81		16 Mar 81	-	4 May 81	7 wks. ahead		Owner selections critical	
14	Mariner Watch III		13 Apr 81		20 Apr 81	(7)	11 May 81	3 wks. ahead		Delayed framing start Bldg. 2	
15	421 - PH III A & B Grading & Paving		4 May 81		4 May 81	-	13 May 81	On Time		Work to start by 23 Mar.	
16	Mariner's Watch II		6 Apr 81		13 Apr 81	(7)	25 May 81	6 wks. ahead		Delayed framing start Bldg. 3	
17	Old Mansion Circle		29 Dec 81		29 Dec 81	-	29 Dec 81	On Time		Detail engineering to start 14 Aug 81	

Source: Kiawah Beach Company, Planned Development District, Volume 1.

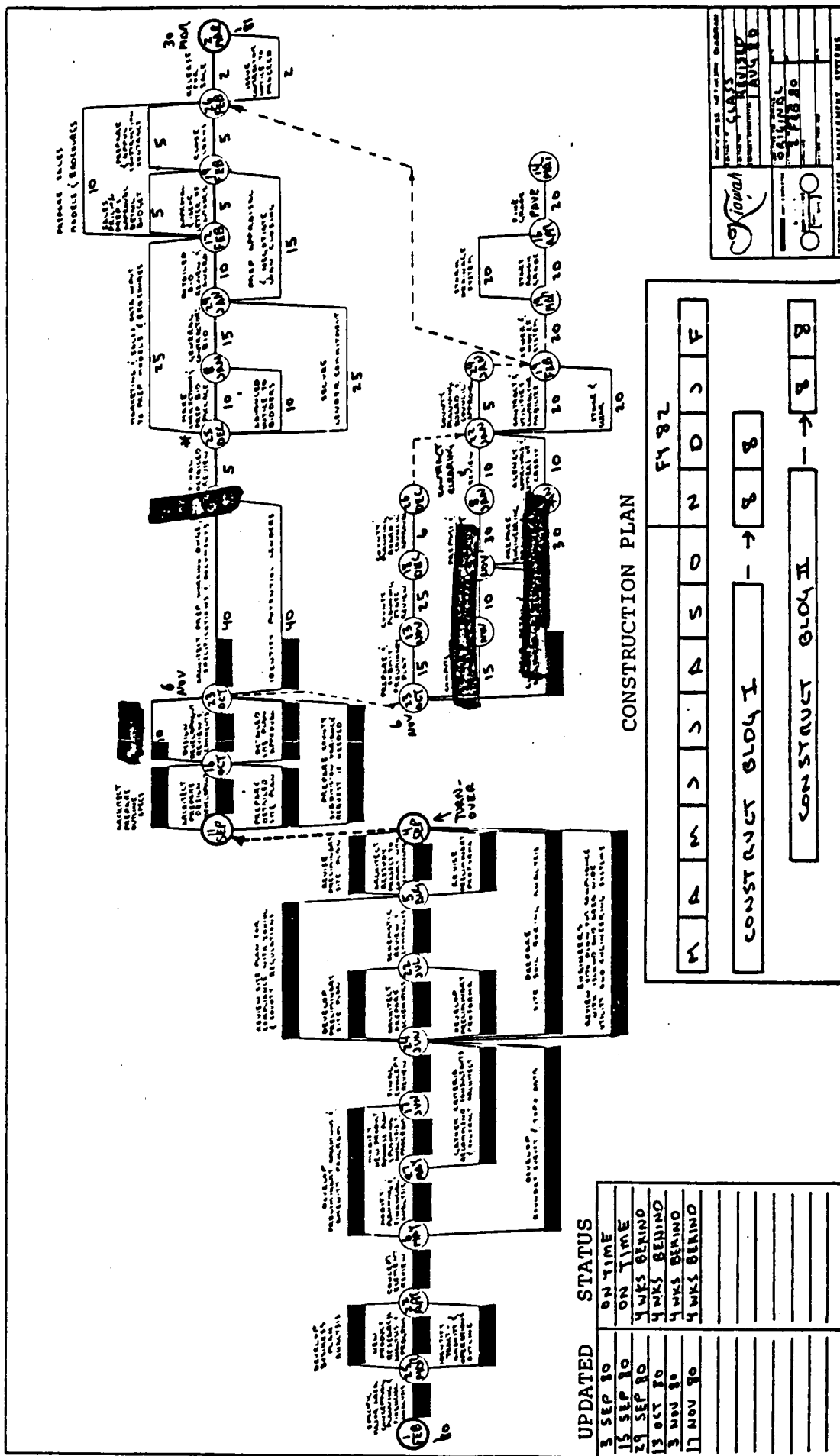


Figure 40. CRITICAL PATH ANALYSIS ("WINDSWEEP")

were being preformed. It will be useful to consider these analyses in some detail in order to gain a financial perspective on the project. One problem in doing this analysis is the lack of detailed data available from the developer. The developers required that data on detailed project costs, capital structures, cash flow, and profit-and-loss statements be held in confidence. Some of these data are not vital to the analysis because of the financial objectives of the Kuwaiti Government. They were not expecting the project to generate any positive cash flow until 1985. Their primary investment goal was to profit by appreciation when the project is sold after the build-out period. The cost and revenue data that are available do give a good idea about the financial aspects of the projects.

During the initial planning stages the Kiawah Beach Company developed a range of development possibilities based on their projections of market absorption rates. Both of these scenarios called for a fifteen-year development period. Under both of these possibilities, the company planned to make the following outlays:

- 1) Purchase of island for approximately \$17.4 million;
- 2) Planning and environmental design costs of \$1 million;
- 3) Construction of infrastructure improvements at a cost of \$10 million;

4) Construction of one golf course at a cost of \$2 million;

5) Construction of the Kiawah Inn in West Village at a cost of \$4.5 million.

These expenditures, totalling about forty million dollars, were to be made during the first five years of the project. Plans in the following years called for 200 additional hotel rooms in each of the following years: 1981, 1983, 1985, 1987, 1989, and 1990.

The construction of the residential units was to take place at the following rates, depending on the absorption rates:

	<u>Villas</u>		<u>Homes</u>	<u>Home Sites</u>	
	<u>Low</u>	<u>High</u>		<u>Low</u>	<u>High</u>
1975	100	296	---	100	296
1976	150	296	---	150	296
1977-1990	200	296	8-113	200-300	300-750
Total	3,050	4,225	850	3,900	5,500

These rates of development would result in annual net revenues of between \$3 million and \$4.5 million from villa sales, between \$4 million and \$6 million in home sites, and between \$5 million and \$9 million in guest revenues from the Kiawah Inn and the other hotels. Thus the project would bring in between \$12 million and \$20 million per year net revenues.

The Sea Pines Company's experience at Hilton Head Island led them to believe that the project absorption rates could easily be met.

After the controversy over the rezoning arose, a third scenario was developed in case the PD designation was not achieved. Under this scenario only a few units (approximately 25) would be built for sale, with about three thousand lots sold for single-family building. The investment in facilities would also be considerably lower under this scenario.

Table 14 summarizes the project cash flow over the build-out period, assuming an \$18 million loan which was initially obtained from Chemical Bank in New York.

At the same time the development was taking place, an intensive marketing campaign was also being prepared by the Kiawah Beach Company. Plate II (pocket) shows a typical brochure for townhouse units prices at about \$150,000. The personnel who worked in the marketing effort had the advantage of experience in marketing Hilton Head Island, and tried to focus their campaign on a younger family-oriented group to avoid competition with Hilton Head.

To further enhance marketability of the units, the villages were marketed in segments, and financing was offered at attractive rates (30 years, 15 percent renegotiable).

Table 14. Cash Flow Analysis

Cash Flow Analysis		Kiawah Island (1980)																
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1987	1988	1989	1990	
Loan	18000	32900	52650	74900	98425	129182	159418	196454	229849	261376	284300	305269	312822	312822	303868	278824	266311	
Purch Pr.	-14700																	
Planning	-1000																	
Infrast.	-6000	-2000	-2000															
Golf Cour	-2000	-1000		-1000	-1000													
Inn Cost	-4500				-6000		-6000		-6000		-6000		-6000	-6000			-6000	
Inn Rev.		2190	3205	3833	3831	8973	8942	14052	14052	19162	19162	24272	24272	24272	29382	34492	39602	
Int.Exp.	-1000	-3290	-5265	-7490	-9843	-12918	-15941	-19645	-22985	-26138	-28430	-30527	-31202	-31202	-30386	-27882	-26631	
VillaSls	100	100	100	100	100	175	200	200	100	175	200	200	100	100	175	200	200	
Val of SI	7500	7500	7500	7500	7500	13125	15000	15000	7500	13125	15000	15000	7500	7500	13125	15000	15000	
Cost of SI	-6000	-6000	-6000	-6000	-6000	-10500	-12000	-12000	-6000	-10500	-12000	-12000	-6000	-6000	-10500	-12000	-12000	
DrnetRev	1500	1500	1500	1500	1500	2625	3000	3000	1500	2625	3000	3000	1500	1500	2625	3000	3000	
Lots Sold	200	200	200	200	200	200	200	200	200	200	200	210	200	200	200	200	200	
Val of SI	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	
DrnetRev	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	
AsortPats		2150	4300	6450	8600	10750	13582	16642	19782	21852	24684	27714	30884	30884	32954	35787	38847	
NetCshFl	-14900	-4850	-2500	-1115	-7312	530	-6817	3649	1869	8681	2016	14056	14974	14974	25675	29876	50418	
Cum.Rev.	-14900	-19750	-22330	-23445	-30757	-30227	-37844	-33395	-31526	-22925	-20908	-683	8161	8161	33837	63713	114130	

Source: Team Plan, Inc.

Villa Financing 15.00% loan, 30 yrs. Lot Financing 15.00% loan, 10 yrs.

Notes: Infrast: Infrastructure--\$10 million over 3 years. Inn Cost--\$30,000 per room.
 Inn Revenue--Increasing to 70 percent occupancy in 1978. Assume that all units
 and lots are financed by Kiawah Beach Co.

To date, all of the releases have been sold out on the day of release (one recent issue at Night Herron and Mariner's Water sold \$10 million in one day). Table 15 is a summary of sales through 1979.

Comparative Analysis

The development process used at Kiawah contains all of the elements of the development process, with more emphasis on certain aspects of the project, mostly due to the size of the development and the unique location. As was the case in the environmental planning, enormous amounts of effort were put into the development planning process. This was done not only to assure that the project would be marketable at the high prices which were necessary to attain the desired returns, but also to assure that the County Council felt that the development would meet with their highest expectations.

Because of the large numbers of people who had to be involved in the development process, one of the major problems of the developer was to install the control processes at an early stage, to assure the timely completion of the planning and development processes. Only a highly sophisticated developer would have been able to manage all of the large professional contracts involved. Despite the extensive experience of the developer, problems were still encountered and conflicts developed between the Kuwaiti

representatives and the Kiawah Beach Company, as well as between the Sea Pines Corporation and Coastal Shores. The latter conflict, as mentioned earlier, finally resulted in a lawsuit.

One final conflict that must be examined is that which arose during the process of obtaining public approval of the required rezoning for Kiawah. Examination of this process will further emphasize the value of the extensive background work and detailed planning done by the Kiawah Beach Company.

Through detailed comparison of each element of the master plan with the public standards applicable in Charleston County, in a "conformance" statement, the company removed most of the questions which might have arisen from the Charleston County Council.

The Public Approval Process

The major focus for the public approval process at Kiawah Island was its rezoning from Agricultural Conservation and Agricultural General to a Planned Development District. The Kiawah Beach Company prepared and submitted an application for this rezoning in December of 1974. On February 28, 1975,

after the mandatory 60 days with the Planning Board staff, the application was passed from the Charleston County Planning Board (8 to 1 positive vote) to the Charleston County Council, and a public hearing date was set.

After considerable opposition from various groups, the application received a positive vote (8 with one abstention) from the County Council, and the Planned Development District zoning classification became effective on May 15, 1975. The application which was finally approved, required an amendment to the zoning ordinance.

This capsule summary of the rezoning process at Kiawah Island forms the basis for discussion in this third section. The strategies and viewpoints of each sector involved in the process will be addressed. The three sectors which participated in the rezoning included the Kiawah Beach Company, the Charleston County Council, and the opposition groups represented by three groups: the Jewish Community Relations Committee; the Kiawah Defense Fund, a coalition of environmental groups; and the Emerson Land Fund, a representative group of black residents on neighboring John's Island.

The Developer's Role

Kiawah Island is being developed by the Kiawah Beach Company, which is wholly owned by Coastal Shores, Inc., which

in turn is a subsidiary of the Kuwait Investment Company. At the beginning of the development process, a contractual agreement existed between Charles Frazier's Sea Pines Company of Hilton Head Island and the Kiawah Beach Company for consulting work. The key staff members for the Kiawah Beach Company were at one time employed by Sea Pines. The agreement called for Sea Pines to provide research, planning, environmental, accounting, and other services to the Kiawah Beach Company. The owners soon realized that there was duplication and overlapping of services, which resulted in effect in double payment for the same work products. The contract was dissolved following rezoning. Each party filed a lawsuit against the other, and the dispute was settled out of court with Sea Pines receiving a substantial lump-sum payment and the forgiveness of all prior debts.

The developer as applicant for rezoning followed three major strategies. All three were pursued simultaneously and included:

1. The development of an environmentally and financially implementable plan and an accompanying economic assessment of that plan.

2. A detailed comparison of the type and intensity of development that would occur under existing zoning as opposed to development under the Planned Development District zoning classification.

3. An extensive public relations campaign that focused its efforts on both the public approval body and the opposition groups.

The comprehensive plan for the development of Kiawah Island was submitted as part of the request for rezoning. Its environmental and development planning elements were discussed in the first two sections of this chapter. Both were important in establishing credibility in terms of environmental sensitivity and development and management capability. Perhaps just as significant to the rezoning approval was the economic assessment study carried out by Team Plan, Inc. from the Rice University in Houston, Texas. The Team Plan document detailed the economic consequences and impacts of the proposed development plan. It was found that changes in the county would occur in employment, population, tax revenues, and local government expenditures. The focus for the economic impact analysis revolved around two major questions which were asked by the County.

will the tax revenues generated by the new development be greater than the amount of money which will be spent to provide community services for the development.

how many new jobs (of what kind) will result from the development.³⁹

In addressing these questions, estimated impacts were formulated based on the Kiawah Island Company's development plants which specified the number of homes and villa, the number of hotel rooms, the kinds of public service facilities, and the amount of square footage in retail and personal services business.

In order to account for annual fluctuations in the real estate market, a range of probable impact for each of the major economic consequences was developed. Thus, the major consequences (tax revenues, public expenditures, population and employment) were estimated on an annual basis assuming both moderately high and moderately low sales, thereby deriving a range for each consideration. The impact analysis concluded with four major findings.

Figure 42 compares the annual county revenues and expenditures related to the development of Kiawah over the 15-year development period. At no time are county and school district expenditures expected to exceed tax revenues. Table 16 shows the projected annual revenues to the state from sales taxes paid on purchases made on the Island and state income tax paid by Kiawah residents.

1. The Kiawah Island Development will provide to Charleston County an enormous surplus of tax revenues over expenditures by the County and public school district for services provided to the development.

³⁹Team Plan, Inc., Kiawah Island, Planned Development District (Appendix, Economic Assessment), p. 4.

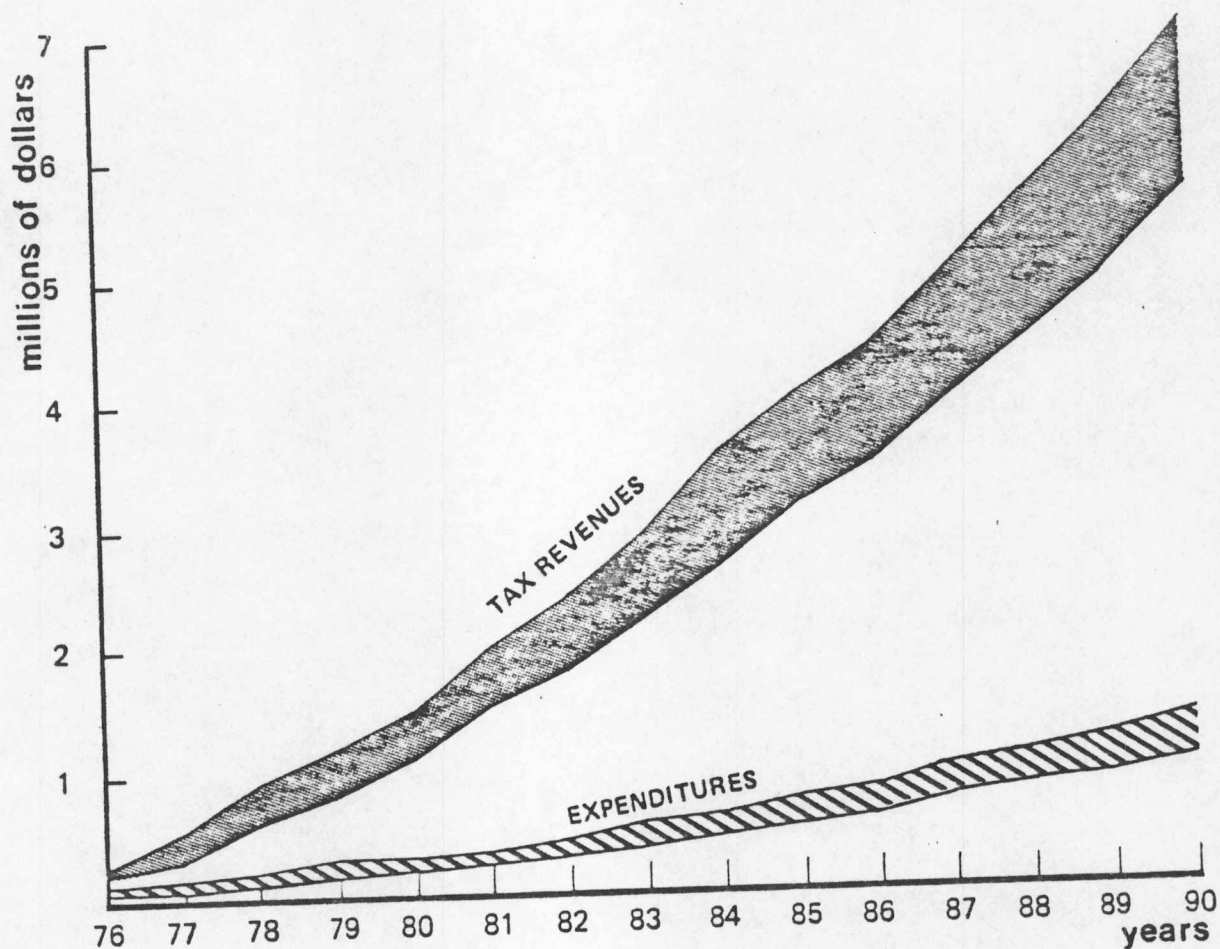


Figure 42. COMPARISON OF CHARLESTON COUNTY TAX REVENUES AND EXPENDITURES RESULTING FROM KIAWAH ISLAND DEVELOPMENT

Source: Kiawah Beach Company, Planned Development District, Volume 1.

Table 16. Tax Revenues: 1976-1990. (Taxes generated by Kiawah Island Development in thousands of dollars.)

YEAR	COUNTY TAX REVENUES					STATE TAX REVENUES					TOTAL TAX REVENUES GENERATED FROM KIAWAH ISLAND			
	PROPERTY		PERSONAL INCOME		TOTAL	SALES			PERSONAL INCOME ¹			TOTAL		
1976	200	200	1	4	201	204	212	400	173	400	384	800	585	1,000
1977	300	500	2	6	302	506	322	700	343	700	665	1,400	965	1,900
1978	600	900	4	8	604	908	547	1,000	505	900	1,052	1,900	1,652	2,800
1979	800	1,200	5	10	805	1,210	805	1,300	673	1,100	1,478	2,400	2,278	3,600
1980	1,100	1,500	6	14	1,106	1,514	1,246	1,900	915	1,500	2,161	3,400	3,261	4,900
1981	1,500	2,000	8	16	1,508	2,016	1,582	2,500	1,151	1,800	2,733	4,300	4,233	6,300
1982	1,800	2,400	10	21	1,810	2,421	2,190	3,200	1,455	2,300	3,645	5,500	5,445	7,900
1983	2,200	2,900	13	25	2,213	2,925	2,617	3,900	1,798	2,800	4,415	6,700	6,615	9,600
1984	2,600	3,500	14	28	2,614	3,528	3,337	4,700	2,051	3,100	5,389	7,800	7,989	11,300
1985	3,100	4,000	17	32	3,117	4,032	3,853	5,400	2,386	3,500	6,239	8,900	9,339	12,900
1986	3,400	4,300	19	36	3,419	4,336	4,658	6,400	2,751	4,000	7,408	10,400	10,808	14,700
1987	3,900	5,000	22	40	3,922	5,040	5,220	7,100	3,140	4,400	8,360	11,500	12,260	16,500
1988	4,400	5,600	24	43	4,424	5,643	6,100	8,300	3,455	4,800	9,554	13,100	13,954	18,700
1989	4,900	6,200	28	50	4,928	6,250	7,126	8,800	3,989	5,500	11,114	14,300	16,014	20,500
1990	5,600	6,900	32	56	5,632	6,956	8,208	9,900	4,571	6,200	12,779	16,100	18,379	23,000
TOTAL	36,400	47,100	205	389	36,605	47,489	48,022	65,500	29,356	43,000	77,382	108,500	112,777	155,600

Source: Kiawah Beach Company, Planned Development District, Volume 1.

2. The State of South Carolina will receive substantial tax revenues generated by the development in the form of sales and personal income taxes.⁴⁰ (See Table 16)

3. The Kiawah Island development will provide and generate new jobs in the county in excess of the new population which will live on the island.

4. The number of school children residing on the island is expected to be smaller than for a primary home community of comparable size. Because the development is directed primarily towards the second-home, vacation, and retirement markets, there will not be a large influx of school children in the county public schools.⁴¹ (See Table 17)

The impact analysis clearly showed that no financial burden would be placed on the county or state and, in fact, that the Kiawah development would produce revenue and employment gains. As a result, the impact analysis had a significantly beneficial effect on the efforts to acquire public approval.

The second public approval strategy employed by the Kiawah Island Company involved a comparative analysis between development of Kiawah under existing zoning and development under the requested Planned Development District zoning. The existing zoning on Kiawah, which was termed Agricultural-General and Agricultural-Conservation, would have permitted all uses allowed under Planned Development District except

⁴⁰Ibid.

⁴¹Ibid., p. 6.

Table 17. School Children on Kiawah Island: 1976-1990.

YEAR	NUMBER OF PERMANENT HOUSEHOLDS ¹		HOUSEHOLDS W/CHILDREN ²	TOTAL CHILDREN	CLASSROOMS ADDED ANNUALLY ³		NUMBER OF CLASSROOMS NEEDED	
1976	75	178	11	27	22	54	1	2
1977	137	269	21	40	42	80	1	2
1978	202	362	30	54	60	108	—	1
1979	269	458	40	69	80	138	1	2
1980	339	557	51	84	102	168	1	1
1981	411	658	62	99	124	198	1	1
1982	485	761	73	114	146	228	1	1
1983	562	866	84	130	168	260	1	1
1984	641	974	96	146	192	292	1	2
1985	723	1,085	108	163	216	326	1	1
1986	809	1,187	121	178	242	356	1	1
1987	897	1,290	135	194	270	388	1	2
1988	987	1,396	148	209	296	418	1	1
1989	1,078	1,504	162	226	324	452	1	1
1990	1,172	1,614	176	242	352	484	1	1

Source: Kiawah Beach Company, Planned Development District, Volume 1.

commercial shops and multi-family housing, both of which were critical to the financial feasibility of the development.

The original zoning classification and county subdivision regulations permitted Kiawah Island to be subdivided into lots for single-family detached homes with central sewer and water at a density of 4.3 dwelling units per acre for those portions of the island within the Agricultural-General District and 10 acre parcels in the Agricultural Conservation district. This would have allowed over 12,000 single-family detached homes to be built on the 4,100 acres of Kiawah Island in the Agricultural-General and Agricultural-Conservation zones. Table 18 outlines the uses permitted by right(x), permitted subject to a conditional use permit (p), and permitted as an accessory use (a). The accompanying map (Figure 43) shows the distribution and site design for Kiawah under the A-G and A-C classifications. As can be seen the site plan under existing zoning is restrictive, and limits the Kiawah plan to a conventional subdivision configuration.

In justifying the zoning change to Planned Development District, the Kiawah Beach Company stated that:

Upon review of Charleston County Codes, ordinances, and regulations, and an assessment of options available under current zoning, the applicant considers the zoning of Kiawah Island as a Planned Development District essential to achieve the project's primary goal: a rare and balanced natural and human environment, and to permit the greatest benefits to Charleston County. The reasons

Table 18. Uses Permitted Under Existing Zoning.

EXISTING ZONING CLASSIFICATION			AC	AG		AC	AG
I. Accessory Uses.							
Customary home occupations			a	a			x
Guest accommodations or living quarters for caretakers or servants			a	a			x
Off-street parking for principal use in same district			a	a			x
Real estate sales office, temporary			a	a			p
Signs			a	a			x
Construction facilities, temporary			ap	ap			p
II. Residential Uses.							
Detached one-family dwellings			x	x			p
Garage apartments			x	x			p
Retirement homes and orphanages			x	x			p
Mobile homes on individual lots			x	x			p
Recreational vehicle parks			x	x			p
III. Manufacturing.							
Dairy products				x			x
Canneries for fruits, vegetables, and seafood				x			x
Logging camps			x	x			x
Sawmills			x	x			x
Boat building & repairing				x			x
IV. Utilities, Transportation, & Communication.							
Facilities which customarily use public rights-of-way or easements provided in subdivision plats			x	x			x
Railroad right-of-way			p	x			x
Rapid rail transit and street railway right-of-way			x	x			x
Bus, aircraft, and marine craft transportation			p	p			x
Communications facilities			p	p			x
Electric transmission right-of-way and substations			p	p			x
Electric generation plants			p	p			x
Gas pipeline right-of-way and pressure control stations			p	p			x
Water pipeline right-of-way and utilities			p	p			x
Sewage treatment plants and sludge drying beds			p	p			x
Sewage pressure control stations and other sewage disposal			p	p			x
V. Services.							
Funeral and crematory services and cemeteries							x
Medical and dental offices and clinics (including hospital)							x
Nursery, primary, secondary, college, and professional schools							x
Vocations or trade schools							p
Churches, synagogues, temples							x
Welfare and charitable institutions							x
Civic, social, and fraternal associations							p
Private clubs							p
Day care centers							p
VI. Cultural, Entertainment, and Recreational.							
Cultural activities and nature exhibitions							x
Fairgrounds							x
Miniature golf and golf driving ranges							x
Golf courses, tennis courts, riding stables							x
Playgrounds, athletic fields, recreation center							x
Swimming beaches and pools							x
Marinas							x
Camping and picnicking areas							x
Resorts and group camps							x
Parks							x
VII. Resource Production & Extraction							
Farms and ranches (cattle, hog, poultry, and other livestock)							x
Feed lots							x
Dog kennels and other animal breeding, boarding, etc.							x
Forestry							x
Fishing							x
Mining							x

Source: Kiawah Beach Company, Planned Development District, Volume 1.

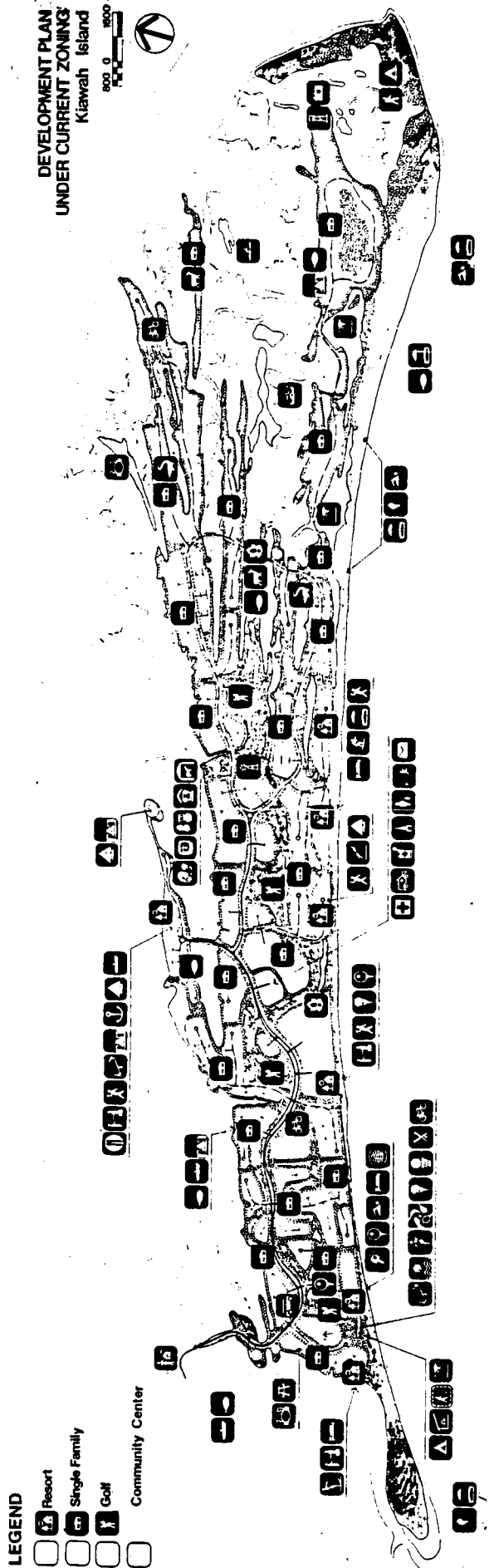


Figure 43. USES POSSIBLE UNDER EXISTING ZONING

Source: Kiawah Beach Company, Planned Development District, Volume 1.

behind this decision can be capsulated in two words--diversity and flexibility.⁴²

The diversity concept relates to the ability to provide a full spectrum of land uses, activities, and services in order to achieve a self-contained complete community, one which would be appealing to a wide spectrum of consumer markets. Flexibility was cited as important in order to be sensitive to environmental dictates. It was felt that such design flexibility would permit the developer to take advantage of a site's full potential and protect its environment, while minimizing its development problems and costs. In this way use intensities and building massing could vary in relationship to the site's capacity to support development. In addition, the planned development district would allow open space and natural areas to be dedicated where existing environmental conditions dictate preservation. Both concepts were described in Volume 1 of Planned Development District, which stated:

Kiawah Island, having exceptionally diverse physical qualities and thus many development conditions, can distinguish itself and the surrounding area with comprehensive and sensitive planning. The Planned Development District fosters good design and, in contrast to the existing zoning classifications, will improve upon the development of the island. It is this necessity of design flexibility and diversity of community environments that strongly suggests the Planned Development District as the most logical and best approach to regulating the orderly development of Kiawah Island.⁴³

⁴²Kiawah Beach Company, Planned Development District Application for Rezoning, 1975, p. 9.

⁴³Ibid.

As further support for the rezoning from Agricultural-General to Planned Development District, the developer pointed out the following basic differences between the two classifications:

PDD is better because A-G would permit the island to be covered with a blanket of houses and hotels.

Also permitted under A-G zoning are trailer parks, fairgrounds, feed lots, mining, logging camps, and canning factories. They are not permitted under PDD.

PDD is better for the island because it down-zones the permitted density from 4.3 units per acre to 1.3 units per acre.

PDD permits clustering in the stable parts of the island and conservation of sensitive areas. A-G does not.

PDD creates common open space areas running throughout the entire project instead of in isolated areas.

PDD requires less clearing of original natural growth and permits greater ability to blend with nature.

PDD produces a lower school load because it offers a greater variety of living units and attracts a less stratified population.

PDD requires a well organized and well-financed developer - security for local citizens.⁴⁴

In addition to the comparative analysis of development designs, the Kiawah Beach Company formulated an extensive "conformance statement," the basic content of which focused on the general policies and elements of the

⁴⁴ Kiawah Beach Company, Pertinent Facts About the Proposed Kiawah Island Community, 1975, p. 4.

comprehensive plan for Charleston County and the Berkeley-Charleston-Dorchester Region. Comparisons were made between the proposed Kiawah development and the general policies, land use plan, statements on conservation of the natural environment and cultural heritage, community design and planning principles, and the housing, transportation, and recreation goals of the comprehensive plan. The three major areas of comparison included natural and cultural resources, community design and planning, and community infrastructure. It was found that the Kiawah plan far exceeded the design standards for maintenance of natural and cultural resources and that, in fact, Kiawah could serve as a model for future development.⁴⁵

Two basic themes emerged from a review of the community design and planning policies for the region. First, there was in the plan an expressed desire to achieve cohesive, diverse, and independent communities and neighborhoods throughout the region. The Kiawah plan was found to be consistent with this theme because of its employment of the village cluster concept, although the villages would not be made up of a wide diversity of income groups. The Kiawah plan was found to be completely consistent with the second theme of the comprehensive plan, which stressed the value of the waterfront. Access to water amenities on Kiawah would

⁴⁵ Interview with Mr. McCabe, Planning Director, Charleston County.

be vastly improved over past conditions, and to satisfy the expressed need for public access, Kiawah agreed to construct and dedicate public beach facilities. With respect to community infrastructure, Kiawah was in complete conformance with, and exceeded many of the policy standards for housing, transportation, schools, water, sewer, and recreation.

As a final step in the "conformance statement" the zoning and subdivision regulations for Charleston County were reviewed. It was found that the conventional zoning, which was designed to protect areas likely to remain indefinitely in agricultural use, permitted all proposed new uses except multi-family residential and commercial uses. It was stated that the island development proposal was not consistent with retention of Kiawah for agricultural purposes, but Kiawah was not then, nor had it for many years, been used for agriculture. In addition, the developer stated that:

Its beauty and inherent recreational opportunities make Kiawah uniquely inappropriate for agriculture when contrasted to the vast quantities of fertile, but relatively mundane farmland found inland.⁴⁶

The current subdivision regulations for Charleston County were found to be inconsistent in terms of the scale of master planning for the 4,100 acres when compared to the degree of detail required for plat approval. To remedy this

⁴⁶Kiawah Beach Company, Planned Development District, Volume 1, p. 97.

situation, it was suggested that detailed plans for each development phase be submitted for approval.

The third major strategy used by the Kiawah Beach Company to secure public approval was the use of a public relations campaign. The campaign focused its efforts on both the public approval body, the Charleston County Council, and the three major interest groups. Major efforts were made to win approval from the Charleston County Council, including guided tours of Kiawah and public access to Kiawah for day use beach visitors. Guided tours for Council members were held in conjunction with audiovisual presentations and extensive briefings concerning the development plan. The Company also committed over one-half million dollars to provide facilities for a public beach. The beach cabana provided capacity for over 1,000 people per day with 150 parking spaces. The beach facility was built and donated to the County. In addition, the Kiawah Beach Company pointed out, in their economic impact assessment, that the County would receive \$47 million in tax revenues from the development over the 14-year build out. (See Table 16, p. 255.)

The Opposition Groups

The Kiawah Beach Company addressed on an individual basis the concerns of each of the interest groups: the Jewish community, environmentalists, and the black community on John's Island.

The Jewish community had two concerns. First, that Kuwait, as owner of Kiawah Island, was participating in the Arab boycott and blacklist of 1500 American firms with Jewish connections. Second they feared that secondary boycotts would preclude the hiring of Jewish firms to work on the project or the sale of property to Jewish investors. In response to these fears, the Kiawah Beach Company issued the following non-discrimination policy.

In light of world tension and the concern of Kiawah Island Company that the community be aware of its practices and its intention of conducting its affairs in the best American tradition, the following policy statement is provided:

The Kiawah Island Company, on behalf of the owners and developers of Kiawah Island, affirms a non-discriminatory policy as to race, color, creed, religion, sex, or national origin in all activities concerned with the development and use of Kiawah Island, including employment of both individuals and business concerns, sales of property, and the use and benefit of all facilities; and further, will abide with the letter and intent of South Carolina and United States Law.

Kiawah Island Company and its management partner Sea Pines Company, currently employ members of the Jewish faith in management positions and are doing business with firms owned, managed, and controlled by members⁴⁷ of the Jewish faith and will continue to do so.

The non-discrimination policy satisfied the demands of the more conservative Jewish leaders, but many were still against the whole concept of Arab investment in the United States. In order to address this group a series of points

⁴⁷ Kiawah Beach Company, Pertinent Facts About the Proposed Kiawah Island Community, 1975, p. 7.

concerning foreign investments were released by the developer:

- All foreign investment in the U. S. is approximately one-fourth the size of U. S. investments abroad.

Government regulations control foreign investment in the vital areas of the economy

South Carolina has actively sought foreign investment in the State

Seventy firms from 10 nations have been attracted to date.

Foreign investment, in South Carolina amounted to \$1.4 billion by June, 1974.

Fifty percent of the profits of foreign-controlled companies have been reinvested in the U.S.

Since 1960 foreign investment, in South Carolina has created an average of 1,200 new jobs per year - i.e., 100 per month. Eighteen thousand new jobs have been thus created over the past 15 years.

An excess of \$200 million will be invested in capital projects at Kiawah over the next 15 years.⁴⁸

The non-discriminatory policy statement along with the facts concerning foreign investment served as an effective two-point defense against the Jewish community's protests. But an even more noteworthy event occurred which caused the Jewish opposition to be less effective.

Unlike the environmentalists, who were unified, and the blacks, who were represented by a single spokesman, the Jewish community leaders of Charleston were divided. The established Jewish leaders, being older and more conservative, looked to the national Jewish organizations for guidance.

⁴⁸Ibid., p. 6.

These organizations, such as the American Jewish Committee, the Antidefamation League, and the American Jewish Congress, advised the Charleston leaders that obtaining a non-discrimination statement was the most that could be achieved. They reasoned that the Kiawah development could not be stopped anyway, and therefore that the wise course would be to avoid creating a great deal of resentment through drastic anti-development efforts. The other Jewish faction, more liberal than the first, took a more aggressive stand.⁴⁹ A young outspoken rabbi named Charles Sherman took a public stance against the Kiawah development. His protest was delivered before the Charleston County Planning Board, against the wishes of the older Jewish leaders. He further alienated himself by stating to the Jewish Community Relations Committee that he and his followers would campaign against the Kiawah development on their own if the committee didn't support a stronger stand against Kiawah. Thus Sherman, by failing to accept the compromise represented by the non-discrimination policy statement, divided the Jewish community leaders and reduced their effectiveness as advocates against the development of Kiawah Island. A more unified opposition group was represented by the Kiawah Defense Fund, composed of environmental groups.

⁴⁹ Interview with Jack Brickman, Jewish leader, 1980.

The Kiawah Defense Fund was composed of local Audubon Society and Sierra Club members, along with other nonaffiliated conservationists. These environmentalists contested the development of Kiawah Island because they contended that the development would:

(1) destroy wildlife habitats, including woodlands fresh and salt water marshes, dunes, and beaches used by the loggerhead turtle to lay its eggs;

(2) increase traffic congestion and urban sprawl in the Charleston area.

(3) increase taxpayer costs as a result of having to provide necessary services to additional residents;

(4) endanger productive shrimp fisheries; and

(5) result in the loss of valuable agricultural lands on adjacent John's Island⁵⁰

The Kiawah Defense Fund attracted a substantial following and funds were raised to fight the proposed development. The local Sierra Club's LeConte Chapter provided funds to help pay for a brochure and bumper stickers. In addition, flea market sales and advertising campaigns were used to heighten public awareness. The environmental coalition's goal was to halt the development of Kiawah and establish the island as a national seashore. The national sea shore at Assateague Island, which lies between Virginia and Maryland, was pointed to as an existing successful model, where two million tourists are attracted

⁵⁰Nancy Chirich, "Kuwait Comes to Kiawah," Sierra Club Bulletin, March 1976.

annually, providing significant economic gains to surrounding support facilities.

In order to achieve the goal of establishing Kiawah as a national seashore, the environmentalists attempted to halt the development by blocking the zoning change. A zoning change denial would have forced the developers to draft a new master plan, which would have proven to be a time-consuming and expensive process. Strategies used by the Defense Fund to halt the zoning change took several forms.⁵¹ Initial efforts involved the circulation of a petition favoring a national seashore. Over five thousand names were accumulated and it was felt that more could have been gathered if pro-development people had not torn down many of the publicly displayed petitions. Other strategies included writing letters to members of the planning board and open letters to the Charleston County Council in the Charleston News and Courier. In addition, an article appeared in the March 1975 issue of National Parks and Conservation magazine which reflected the same anti-development positions outlined in the local newspaper article. The article, which gave the address of the Chairman of the Charleston County Council, resulted in the sending of hundreds of letters from conservationists throughout the country to the Council. The Council members, however, refused to read the letters

⁵¹Kent Nelson, "Goodbye Wild Kiawah," The Environmental Journal, March, 1975, p. 21.

because they were from outside their jurisdiction. A copy of the open letter to the Council and its opposing response from Frank Brumley, representing the developer, are shown as Figures 44 and 45 . These letters exemplify the types of arguments which took place between the developer and the environmentalists prior to the actual rezoning hearing. It can be observed that each point of contention raised by the Kiawah Defense Fund was answered with factual refutations by the development group. More details of the arguments between the developers and the environmentalists follow below, in the discussion of the public hearing minutes.

In general, the environmentalists' efforts to halt the rezoning of Kiawah were unsuccessful because of a lack of support from influential politicians and community leaders. Their only major victory was an assurance by the County that the development would be closely scrutinized for conformance with zoning codes and standards. Another minor concession to environmentalists occurred when the developer promised to provide a Loggerhead turtle program designed to protect the eggs and thus insure the continuation of an endangered species.

Of the three groups contesting the rezoning of Kiawah, the blacks received the largest concessions from the developer. Both the Jewish leaders and the environmental leaders attempted initially to join forces with the John's Island black leaders; however, the most vocal black leader,

Kiawah Beach Company

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P.O. Box 579
67 Broad Street
Charleston, South Carolina 29401
Phone: (803) 723-6477

March 21, 1975

Dr. George G. Durst, Chairman
Post Office Drawer Q
Station 22 1/2
Sullivans Island, SC 29482

Dear Dr. Durst:

The enclosed ads appeared in the Charleston News and Courier on Thursday, March 20th, and Friday, March 21st.

I have numbered the issues raised in the ads and thought you would be interested in my responses, point-by-point.

March 20, 1975

1. The developing and managing agent, the body establishing policies and programs, is a reputable South Carolina firm.
2. Extensive environmental studies have been conducted and the results incorporated into the Master Plan to provide for wise environmental management and planning above and beyond existing environmental guidelines.
3. Legislation and community development programs have been proposed to channel the economic benefits directly into the neighboring islands and prevent negative tax impacts.
4. The public will have access to the island for the first time in history. The Kiawah project will be in the business of providing access to the Island.
5. A token fee will permit the developers to recapture a small portion of its \$500,000 investment in the day-use area.
6. The size was recommended by the Charleston County Department of Parks, Recreation and Tourism and will accommodate over 1,000 people per day, 168,000 per season.

7. The development will also compliment the area's vital tourism industry and offer needed recreational opportunities to local citizens.
8. No. By 1990 there will be 9,000 ongoing jobs, many at the management level.
9. A resident population of 5,000 is expected for the island in 1990.
10. The \$38 million tax surplus to the County will offset several times over any added costs to the County.
11. The profits are shared with the American development partner. The local community benefits from the long-term economic stimulation to tourism and other industries.
12. The National Park Service is \$572 million, 8 years, behind in its acquisition program for park lands.
13. Environmentalists are trying to keep people out of national parks because of alleged destruction. This includes Assateague and Cumberland National Parks.
14. Wholly untrue. What studies? 5 to 10 campers would be necessary to pay the same as two resort guests!
15. Not so. Many barrier islands larger than Kiawah remain undeveloped in South Carolina and are government or preservationist owned.
16. The existing zoning permits a low quality grade of development which is excluded in the environmentally sensitive PDD plan. The proposed new zoning permits sensitive land use on the Island and is in the best interest of the area.

March 21, 1975

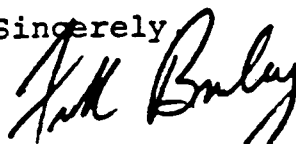
1. We too are concerned about the future of the Island and have spent over 12 months and \$1 million in research and planning to insure a quality development of which all Charleston citizens can be proud.
2. Although the island is owned by foreign interests, the developing and managing agent which establishes all policies and programs is a reputable South Carolina firm.

3. The boycott is an international issue which concerns us all, however, it must be dealt with by the President and Congress as outlined in the Constitution. The Kiawah Beach Company which deplores discrimination has on behalf of the owners and developers of Kiawah Island affirmed a non-discriminatory policy in all activities concerned with the development and use of Kiawah Island and will abide by the letter and intent of South Carolina and United States law.
4. Arab investments in the United States have been encouraged by President Ford, William Simon, and all government agencies. These long-term investments will help support our economy by providing or sustaining jobs in this country.

Foreign investments have played a major role in the growth of the United States and their contributions include contact lenses, the Wankel engine, radial tires, radar and jet-powered aircraft. Foreign companies have invested some \$1.4 billion in South Carolina and created 20,000 new jobs for South Carolinians. Long-term foreign investment using American know-how, such as the Kiawah project, is a valuable contribution to South Carolina and should be encouraged.

5. The Kiawah Beach Company hopes to contribute by providing new jobs, tax revenues and new recreational facilities for the citizens of Charleston County.
6. We urge Charleston residents to exercise their democratic right by voicing their opinions at the proper forum, the County Council Public Hearing.

Sincerely



Frank W. Brumley
Senior Vice President and
General Manager

FWB:jb

Enclosures

Source: Charleston County Files.

William Saunders, saw the development of Kiawah Island more as an opportunity than a threat. Saunders perceived opportunities in employment, housing, and economic development resulting from the Kiawah development. When asked to support the two opposition groups, Saunders replied:

The environmentalists wanted us to be concerned about frogs and fish and that's pretty hard to sell when people need jobs and food and houses. The Jews came and wanted us to support them because the Arabs boycotted American businesses that supported Israel. We weren't too interested in that because none of these people could be found when blacks on the islands were being discriminated against. I am not suggesting that Jews specifically had discriminated against the island blacks, but that whites in general had done nothing to help them. We are neither anti-semitic or anti-conservationist.⁵² We just needed something to help us help ourselves.

Frank Brumley, Vice-President of Kiawah Beach Company, approached the John's Island residents prior to the rezoning hearing in order to explain the ramifications of the Kiawah development. A series of community meetings was set up in order to establish common goals and mutual needs. During the course of the meetings a task force of island residents and government agencies on the island was formed. The task force then developed a list of needs and priorities. A negotiated agreement was then worked out, which, among other things, allowed blacks on the neighboring island to have preference for the estimated nine thousand jobs

⁵² "Island Blacks Look to Arabs For Future," Charleston Observer, June 13, 1975, p. 1A.

that will be created by the development. In addition, \$9,000 per year for three years was committed to develop a community school to teach marketable skills that Kiawah could utilize. The complete agreement between the Sea Islands Task Force and the Kiawah Beach Company is shown as Figure 46 in the Appendix. As can be seen from the agreement, a cooperative effort was emphasized between both parties in order to establish a program which was mutually beneficial to both developer and the neighboring residents. The developer also agreed to support state legislation to keep property taxes on islands neighboring Kiawah from escalating to the point where black residents and other poor people would be forced to sell their land, which in the case of John's Island has been farmed by black residents since before the Civil War.

Public Hearing of March 24, 1975

The public hearing of March 24 proved to be the final major confrontation between proponents and opponents of the Kiawah Island development. Rezoning from Agricultural to Planned Development District was the key issue at hand, but most of the other issues were brought up at the hearing, so it will be worthwhile to discuss the hearing in detail.

The location of the hearing was changed at the last minute to the Charleston County Library because it had a room with a capacity of two hundred persons. Since many opponents of the project were not aware of the change, by

the time they arrived most of the seats were occupied by reporters and camera crews from both local and national media. In addition, many of the Kiawah Beach Company employees were instructed to arrive early and occupy as many seats as possible.⁵³ This left many Jewish and environmental protestors to stage their own anti-development rally outside. The rally was broken up by heavy rains and hurricane warnings.

The hearing began with the chairman advising the development proponents and opponents that each would be allowed forty-five minutes to present their arguments. The Kiawah Beach Company began the discussion with a presentation by Frank Brumley. Brumley pointed out that the development would produce nine thousand jobs, thirty-eight million dollars in tax surpluses, and would bring increased tourism dollars to the Charleston area. He also stated that the question was not whether Kiawah would be developed or not, but rather if it would be developed under the present zoning ordinance or with an alternate plan as a Planned Development, which would be the best for the environment and the community. He pointed out that the developer had spent the last twelve months and over one million dollars in research and studies to determine the best plan. These studies included auto emissions studies, studies for the soil, traffic studies,

⁵³Interview with Rob Hull, Head Planner, Kiawah Beach Company, 1980.

transportation and circulation studies, water and sewerage studies, and general land studies, among others.⁵⁴

Brumley then introduced Mr. Campbell, President, Environmental Research Center. Mr. Campbell pointed out that the study done by ERC was comprehensive and objective, and that although the Center was hired by the developer, the study was done on a voluntary basis by the Kiawah Beach Company and not required by law. Campbell pointed out that their purpose was to study changes and the natural environment, and to make recommendations as to how to minimize adverse impacts on Kiawah.

The next pro-development speaker was David Ames, who is Vice President of Sea Pines Corporation. Ames contended that the main issue was whether PD was more applicable for getting a planning product which was more beneficial to all of the people affected. In his view, the PD designation was absolutely essential to the ecological and environmental opportunity represented by Kiawah Island, and Kiawah Beach Company was proposing that sound planning and maintenance of the environment are the keys to financial success, which would be obtained by rezoning. He pointed out that PD would be advantageous in regard to the number of stories of buildings, number of dwelling units, number of children in each

⁵⁴ Minutes of Public Hearing, March 24, 1975, Charleston County Council Meeting, item # 0632-c, p. 6.

specific area, and the number of resort units. He also stated that PD represented full disclosure of development programs and plans to the community, whereas under existing zoning it was not a legal requirement that the developer advise in advance what they planned to do. In summary, Mr. Ames contended that the County would not lose control under PD zoning as it would under the current A-G designation.⁵⁵

At this point in the hearing Councilman Leamond asked if the plan was in conformance with the county growth objectives, and also for a clarification of the total allowed number of dwelling units under each zoning designation. The Director of Planning for the County, Mr. Fujishiro, stated that the Kiawah development plan was in harmony with the County growth objectives. He further stated that the equivalency unit method used by the developer to determine total dwelling units was one of the most recent innovations for density planning. Under this system, an efficiency apartment was counted as one-third unit, a one-bedroom as one-half unit, a two-bedroom as three-fourths unit, and a three-bedroom apartment as one dwelling unit. Under this plan, Mr. Fujishiro stated, the developer would maintain the desired density while maintaining latitude to offer what the market demands.⁵⁶

⁵⁵Ibid., p. 8

⁵⁶Ibid.

Brumley then presented a series of individuals from the community to support the development. Generally the half-dozen individuals alluded to the employment and economic opportunities that Kiawah would produce. They also cited Sea Pines as an award-winning environmentally sensitive developer whose presence would help to insure the preservation of Kiawah's natural ecology.

Next, Bill Saunders of John's Island and the Sea Islands Community Task Force was quoted as saying:

There is nothing for anyone to do as far as work on the island and Kiawah Island would present an opportunity for blacks. I believe that zoning was the worst thing that ever happened to the island and that people are suffering because of the changing of the laws and the system. The schools are bad, there is no transportation and there are only a few jobs in farming. Our current negotiations with the Kiawah Beach Company will insure jobs and economic development to John's Island.⁵⁷

Before the opposition officially began their statements, Mr. George Ridbeth of the Urban Land Institute in Washington, D.C. addressed the Council. He stated that he was neutral in the controversy, and that in order to completely assess the situation they would need an independent, nonpartisan evaluation. He advised Council to delay their decision until such an impact study could be completed and warned them of the dangers of relying on studies sponsored by the developer who is seeking the zoning change. He further stated that it had been the experience of

⁵⁷ Ibid., p. 9.

other communities that there is an increase in the demand for facilities and that residents of a development like Kiawah would have higher incomes and would demand higher standards of facilities such as roads, police protection, and disposal facilities, etc. This in turn would cause higher rates for the present users in order to subsidize the needs of the new residents. He additionally stated that construction - induced employment would last only a short while and that the value of adjoining property would increase and result in increased taxes.

To this statement the Council Chairman replied that since the statement did not appear neutral, the time would be counted against that designated for the opponents. With that the opposition officially began their statements.

Beginning for the opposition was attorney Armond Durfner, who represented the Kiawah Defense Fund. His major points included the following:

1. By law of the County an application must be in full compliance with the County comprehensive development plan, and since no plan existed, questions are created as to the legality of approving the Kiawah rezoning request.
2. Although a vast amount of information has been presented by the developer, there is less detailed information than ever received for a PD rezoning request.
3. The higher density figures given under A-G as opposed PD were inaccurate "scare" figures and not realistic.

4. No impact study on traffic along the road which connects Kiawah and Charleston has been done.

5. No federal permit had been granted to widen the bridge access road to Kiawah from two to four lanes, which action would call for an environmental impact statement.⁵⁸

Next Mr. Frank Epstein spoke as another representative of the Kiawah Defense Funds. His major concerns centered around the following issues:

1. He contended that the development would completely destroy a maritime forest in the center of the island which would cause the island to flood, requiring expensive emergency operations by the County.

2. Road construction and fertilizer drainage into the marshes could destroy the spawning areas for fish and oysters, which could mean a loss of sixteen million dollars per year to the fishing industry.

3. There were no provisions for community support services and poor people in neighboring areas would have to sell their land because of tax increases.

4. Due to national attention which had been generated, if the developer would sell the land now, Congress would purchase the property and turn it into a national park for all of the people.⁵⁹

⁵⁸ Ibid., p. 12.

⁵⁹ Ibid., p. 14.

The final major environmental leader, Ben Gibbs, contended that the \$200,000 study by the Environmental Research Center of Columbia appeared to be the first comprehensive study made of any of the islands of South Carolina. But it was still incomplete, and the only planning staff member who had the expertise to interpret and make recommendations based on the study had resigned in disgust with the development. He noted that several of the Research Center's recommendations had already been ignored and in the future, these recommendations should be strictly adhered to. He then presented a petition with five thousand signatures. Several other non-affiliated environmentalists made more general comments that alluded to Kiawah as a natural resource that had more value when protected and left in its natural state than if developed.

The Jewish opposition was led by three spokesmen. Dr. Morey Lipon and Mr. Ken Goodman both opposed the Kiawah development on grounds that if Arabs were boycotting fifteen percent of the U. S. citizenship, then no business should be done with them. Goodman stated that "the Rice Institute's economic impact study was paid for by the Kiawah Beach Company, which is like letting the fox into the henhouse to count the chickens."⁶⁰

⁶⁰ Ibid., p. 13.

The most outspoken Jewish leader, Rabbi Sherman, was quoted as saying:

Charleston and the U. S. had fought to establish and protect democracy and that the issue involved the protection of this democracy, morality, and general equal rights for all. Mr. Brumley has not once denied participation in a boycott of fifteen hundred American firms in our country. Mr. Brumley has stated that this is a local issue, but what happens in Charleston affected the U. S., just as what happens in other states affects Charleston. Mr. Brumley states that he controls the development of Kiawah, but actually he is an employee of Kuwait.⁶¹

Rabbi Sherman then urged that County Council demand that Kiawah Beach Corporation publicly repudiate their boycott of U. S. citizens. He then submitted an opposition petition which contained 4,404 names.

At this point Council voted to extend the time to thirty minutes more for each group.

Mr. Robert Fuel, a black developer then spoke, and stated that he had between six hundred and one thousand applications for people who need jobs. He further stated that Bill Saunders was negotiating with the developers to hire people from John's Island and Wadmalan Island. He continued by saying that it was people who already had jobs that opposed the development. He stated that if someone there wanted to give the unemployed jobs then we wouldn't need people coming in from another country, but that otherwise these people should be allowed to develop and provide some jobs and revenue to the County.⁶²

⁶¹Ibid., p. 14.

⁶²Ibid., p. 17.

Frank Brumley then regained the floor and dominated the remaining public hearing time, which he used to refute earlier statements. He promised to the blacks of John's and Wadmalan Islands funds for a community school, a truss and crete factory, and first job priority to the islanders. Then Brumley called on Ms. Terese Lucas, Assistant Professor of Planning at Rice University, to comment on the economic impact of the Kiawah development. Ms. Lucas stated that she would suggest that the tax revenue data, which was in the economic assessment report, was realistic, as was the cost data. She stated that in any instance where a development had created a burden on the economy, it was because they were primarily a single-family community with families with an extraordinary number of children or because it was a plan which required additional people to come in because the existing community did not have the skills required. She then said that her report was very specific, which was in contrast to statements made by the Urban Land Institute representative. Brumley then reintroduced Mr. Ames of Sea Pines Company to comment on Mr. Epstein's specific questions. Ames stated that no development would take place in the marshes, which would neither be dredged or filled. He added that PD rezoning would better insure that subdivision and zoning regulations and health department requirements would be maintained. He also stated that the County would be

able to plan for the impact of this development of some four thousand acres and be able to adjust over the 10 year period in which development would be taking place. In regard to the destruction of the maritime forest causing flooding, Ames stated that the island was timbered in the 1800's and in the early 1950's and was not a pristine maritime forest.

Flooding would be prevented by interconnecting all lagoons and channels so that they would be able to drain the island in case of heavy rains.⁶³ Brumley then commented on the national park proposed by the Kiawah Defense Fund. He stated that the parks had been investigated, and they were advised that the government was approximately eight to nine years behind for projects already specifically approved. He stated that forty-seven percent of Charleston County's shoreline was already off the tax roles and that federal or state ownership of Kiawah would bring the percentage to 60 percent. On the subject of Kuwait control, Brumpley stated that the Kiawah Beach Company was a U. S. corporation operating in South Carolina under the laws of the State of South Carolina, and that no foreign country can direct it. He further pointed out that they had Jewish employees and were doing business with Charleston Jewish firms. He added that there would be nine thousand new jobs over a fifteen-year period, thirty-eight million dollars in tax surpluses,

⁶³Ibid., p. 18.

one billion dollars in tourism, and available public access to an island that had previously been closed to the public. The meeting was then adjourned. The rezoning was subsequently approved on May 15, 1975 with eight positive votes and abstention.

The Classic Public Approval Process Versus the Kiawah Experience

The public approval process described in Chapter IV provides a framework for comparing the Kiawah Island approval process. Each of the actors will be discussed separately.

The developers role. First of all, the developer, the Kiawah Beach Company, was primarily concerned with the rezoning of the island from Agricultural-General to Planned Development District. The zoning change allowed for more flexible development planning in the context of a very large scale development. The new designation would also allow them to build multi-family units and needed commercial support facilities. In order to achieve the needed rezoning, the developers assumed a very broad role. Their strategies for public approval included the consideration of both the governmental approval body and the concerned citizen groups.

When considering the governmental approval body, the Charleston County Council, the developers prepared numerous plans and studies that addressed all the impacts that the Kiawah development could probably have. The basic premise which the developer was trying to communicate was that the

rezoning of Kiawah to PDD would be the most beneficial way to develop the island. In order to achieve this, a series of studies were submitted to the Planning Commission and County Council prior to the actual request for rezoning. In this it was felt that an air of cooperation and professional comraderie would be established.⁶⁴ These studies included the Environmental Inventory, the Master Development Plan, the Development Guidelines, the Engineering Studies, the Architectural Studies, the Economic Impact Analysis, and accompanying legal documentation. These documents not only convinced the planners that the PD designation was the most beneficial with the least negative impacts, but also established the governmental body as an advocate for the development. In this way confrontations with the Council were alleviated, facilitating a relatively smooth public approval process.

A similar strategy of early involvement was used with the opposition groups. Jewish opposition leaders were appeased with the Non-Discrimination Statement and a series of published facts concerning foreign investments in the U. S.

The blacks on neighboring islands were actually converted from a position of opposition to one of advocacy when their interests were perceived as being addressed by

⁶⁴ Interview with Rob Hull, Kiawah Planner.

the developer. The commitment by the developer to provide jobs and job training, low interest loans, and stable taxes turned the potential opposition into a distinct asset.

The Kiawah Defense Fund and its representative environmental groups were the most hostile and the least responsible to the developer's strategy. The environmentalist goal of a national seashore was unattainable because the developer had a right under current zoning to develop Kiawah into single-family lots. In addition, federal funds were not available to acquire the property, a fact which was brought out by the developer. By their failure to choose an achievable goal and their being perceived as intransigent by the Council, the environmentalists posed no real threat to the developer's request for rezoning:

Compared to the roles of the developer outlined in Chapter IV, many similarities appear to the role played by the Kiawah Beach Company. Among them are:

1. the developer's expanded scope of concern;
2. the early involvement of all other interested parties;
3. the projection of community impacts prior to the request for rezoning;
4. interaction with and compromising with opposition groups prior to public confrontation; and

5. the "pre-selling" of the development concept to the public at large through vast amounts of publicity and documentation.

The government role. The major role in the process of approval of Kiawah was obviously played by local government; however, brief mention of the other levels is necessary.

The Federal Government had no immediate role in the development of Kiawah. Although the Coastal Zone Management Act had been passed in 1972, the required planning process had not yet been put in place in South Carolina and was not until after rezoning occurred. The state process was adopted in 1977 and approved by the Federal government in 1979, resulting in the formation of the Coastal Council of South Carolina. This council has direct permit control of all developments along all eight of the South Carolina coastal counties. The council has a professional staff and is composed of two State House Representatives, two State Senators, one representative of each of the six federal congressional districts, and one representative from each of the governmental bodies in the eight coastal counties.⁶⁵

Other involvement from governmental officials came in terms of pressure for development by former Governor West. West and other state governmental officials lobbied

⁶⁵Interview with Jack Smith, Coastal Council Staff, 1980.

for the development and subsequently purchased real estate on Kiawah Island.⁶⁶

The Charleston County Planning Board and County Council played the major governmental role in the approval process. The Planning Board, following a positive recommendation from the planning staff, voted eight to one to approve the rezoning request on February 28, 1975. The County Council subsequently approved the Planned Development District in May. Both governmental bodies based their official decisions on the fact that all submitted plans and applications met all conditions for general public access to the public beach area and also met all planned development requirements. The approval was heavily influenced by the large expected tax revenue increase resulting from the Kiawah development.

The major land use control device was obviously the planned unit development, in this case called the Planned Development District. Flexibility was cited as its major advantage, especially when developing an environmentally sensitive area, such as a coastal zone barrier island. In addition to the initial approval, each phase of the development must be approved by the County Council. Existing building codes and subdivision regulations were also used to evaluate the development codes and lot layout criteria which

⁶⁶Kent Nelson, p. 21.

were outlined by the developer. Figures 47 and 48 in the Appendix contain the Conformance Statement and the Staff Evaluation of the proposal as submitted by the developer.

The capital improvement program for Charleston County was accelerated to accommodate the Kiawah development. Water lines were extended to the island using local general obligation bonds and federal grants, ten years ahead of the schedule laid out in the program.

The government's role in this case can be characterized as one of accommodating a development and mediating the disputes within the community. Recognizing that the Kiawah master plan was exceptionally comprehensive and complied with all regulations, the Council accommodated the developer on all points.

The community role. Among the tactics mentioned in Chapter IV, citizen pressure was the main tactic used by the interest groups in the process of approving the development plan for Kiawah. The major pressure against the development was generated by the Kiawah Defense Fund, but their choice of goals and failure to respond to the needs of the other potential opposition groups - the island blacks and Jewish Community - precluded an effective opposition effort. The developers' sensitivity to these latter two groups allowed them to bring those groups over to their side.

The Defense Fund followed the steps in the classic format discussed in Chapter IV, including the following:

1. Organization;
2. Raising funds;
3. Research on the development plan, relevant laws, and public approval bodies involved;
4. Attempts to discover inconsistencies in the plan or conflicts of interest within the governmental bodies;
5. Public advertisement of the opposition views and attempts to gather broad public support;
6. Individual approaches to each decision maker; and
7. Public hearing confrontations using diverse testimony from credible individuals and experts.

These tactics were ultimately unsuccessful because of several factors. First of all, funds were not available to implement the alternative plan which they were advocating, designation of the island as a national seashore. Second, the developer was successful in convincing the governmental bodies that the master plan was environmentally sensitive and economically beneficial to the community, and far superior to what could happen under current zoning. Finally, the environmentalists failed to convince the state and local political leaders of the value of their cause. Their efforts did, however, provide valuable considerations, which ultimately assured that the environmentally sensitive development plan elements would be closely monitored by the approving governmental body.

CHAPTER VI

FINDINGS AND CONCLUSIONS

Introduction

The primary goal of this thesis was to define and document a planning process which comprehensively integrates environmental, developmental, and socio-political elements into a master plan for an environmentally sensitive area. In the pursuit of this goal the processes of environmental planning, development planning, and public approval were examined individually. Each of these three processes was then compared with the Kiawah Island case study.

Before the planning processes were considered, however, it was necessary to note the unique features which set the Kiawah Island development apart from other developments. The primary factors revolved around the location of Kiawah in the coastal zone, and the special sensitivity of barrier islands.

It was pointed out that the uses of the environment in general, and the coastal zone specifically, have been the subjects of increasing controversy in recent years. The concern by environmental groups and other citizens is both due to the islands' value as natural resource producers (e.g., fisheries), and as aesthetically beautiful areas.

Opposed to these conservationists forces are those who wish to make use of the potential of the coastal zone for economic gain, both public and private.

Local governments, caught between environmental protection groups and real estate development interests, have been unable to effectively evaluate consequences of development, because of the absence of comprehensive plans based on natural systems analyses. In addition, local government land use controls have proven too inflexible to deal with the unique and varied environments along the coastal interface.

As a response to this dilemma, the Federal Government formulated the Coastal Zone Management Act (CZMA) in 1972. Though not designed as a federal land use program, the CZMA is an incentive and assistance program for planning by the coastal states. The principal incentive is federal funding, provided on a cost-sharing basis, for planning and implementing a federally certified coastal management program. The act requires the states to identify boundaries of the coastal zone; define permissible land uses within the coastal zone; inventory and designate areas of particular concern; develop criteria for controlling land and water uses; and, consider priorities of use.¹

¹Robert W. Knecht, "The Coastal Zone Management Act: Incentives for Planning the Water's Edge," Environmental Comment, Oct. 1977, p. 2.

The 1976 amendments to the CZMA strengthened the existing program and added some new elements. The Federal funding ratio was increased to 80 percent, more program planning and implementation time were allowed, and funds were made available to promote public access to coastal areas and for preservation of islands.²

The latest disincentive to barrier island development came on December 1981 when Interior Secretary James Watt announced that many undeveloped barrier islands would be ineligible for federal flood insurance after October 1, 1983. This recently enacted law says that no new federal flood insurance shall be provided after October 1, 1983, for any new construction or substantial improvements of structures located on undeveloped coastal barriers as designated by the Secretary. All flood insurance issued prior to the effective date will remain in effect regardless of location.³

The impacts of the coastal zone management act and the withdrawing of the Federal Flood Insurance Program should make future development within the coastal zone more responsive to local needs. The states, by development of their comprehensive coastal zone plan and permit approval

²Ibid., p. 3.

³James M. Scott, "Coastal Development and Federal Policy: A Case Study," Urban Land, March 1982, p. 23.

system, should raise development standards for all forms of land use. Jack Smith, staff planner of the newly formed coastal council of South Carolina, says that these standards will most likely approximate those employed on Kiawah Island.⁴

Although the CZMA and new Federal Flood Insurance policy are not retroactive, they have impacted Kiawah in two ways. First, a permit for dredging a new deep water harbor on the Kiawah River has been denied until the impact on the oyster and shrimp leases have been determined. And second, the flood insurance program will not apply to houses on Kiawah which have been built within the mean high tide mark during major storm activity, a mark which averages out to be one thousand feet from the shore line. This means that to qualify for insurance the housing that is the most expensive on Kiawah will either have to be raised above this mark or do without the Federal program.

One secondary goal of the environmental coalition against the Kiawah development was to delay the rezoning and subsequent development until South Carolina adopted the CZMA. If they had been successful in achieving this delay, one wonders if Kiawah would be developing today.

⁴Interview with Jack Smith, Staff Planner, South Carolina Coastal Council.

Major Findings

Environmental Planning and Kiawah

The environmental planning concepts of capability, suitability, and carrying capacity as discussed in Chapter II, all were applied in the environmental planning process at Kiawah Island.

The natural system capability analysis dealt with projected changes in the environment as consequences of development; at Kiawah this was termed a sensitivity analysis. The analysis included a preliminary environmental inventory, used display techniques using map overlays, and a data translation into specific standards and development criteria.

A suitability analysis as described in Chapter II, emphasizes the maintenance of the human use desired without employing extensive artificial measures to accommodate the desired human uses. It also serves to link the needs and desires for various land uses with the results of the capability analysis. Physical, social and cultural facilities are stressed.

The Kiawah suitability analysis followed closely the classic description. It served as a link between the sensitivity or capability analysis by translating the variables of flooding, subsurface conditions, depth to water table, soils, and accessibility into development and construction guidelines. A further output of the suitability analysis resulted in the formulation of community management guide-

lines, a home builders manual, a review manual for all construction activity and a design criteria for single family, multi-family, and patio homes.

The three types of carrying capacity (environmental, perceptual, and institutional), were also evident in the Kiawah environmental planning process. The environmental carrying capacity is based on the limit at which development will lead to undesirable changes in the environment. The degrees of change are ranked from slight to severe. This concept was applied on Kiawah to delineate land uses and population limits. The limits were determined by water supply and the transportation system, whose carrying capacity limit was set by the number of residents who could evacuate the island in case of a hurricane.

The perceptual carrying capacity concept, which depends on the degree of environmental change that can occur before one's perception of the environment is altered, was determined on Kiawah by resident surveys. Likes and dislikes were then translated into design criteria to minimize perceptual change. A sense of privacy was maintained by using natural colors, landscaping and unobstructed views.

Institutional carrying capacity refers to an organization's ability to achieve its goals. Kiawah's organization achieved its goal of community acceptance through rezoning and its ability to implement the master development plan.

The approaches of constraints, opportunities and impacts were also prevalent in the Kiawah environmental planning process. The environmental constraints as established by the suitability and sensitivity analysis were translated into engineering studies. Environmental opportunities as established by the intrinsic market appeal analysis, were used to maximize utilization of areas with wide market appeal while minimizing development in environmentally sensitive areas.

The impact analysis approach was used in engineering studies. Studies most widely used in the impact approach included: the transportation study, the water and sewage systems study, and the solid waste disposal study. Impacts were determined and quantified in alternative action proposals which were evaluated based on varying future population projections.

The last major findings, in terms of environmental planning at Kiawah was that the McHarg environmental planning process was found to be very similar to the one used at Kiawah. The major points of similarity included:

1. An environmental inventory;
2. An intrinsic suitability map with overlays;
3. An economic inventory;
4. Criteria for form and design;
5. Powers to implement the plan.

The Kiawah Beach Company's process, in contrast to the McHarg process, placed emphasis on social, political and economic factors.

The Development Planning Process and Kiawah

It was found that the development process at Kiawah contained all major elements of the classic development process. One major element was emphasized more than the typical process--the use of computer models to coordinate all development activities. This was necessary due to the large scale of the physical site and the long-term build-out period.

Another atypical situation existed due to the unique composition of the development team. First, the developer or owner was oil rich Kuwait. Their large New York bank deposits allowed them not only to negotiate a highly leveraged financial package, but also a more favorable interest rate for permanent financing. However, this economic advantage was partly offset by two distinct disadvantages. First, the Kuwaits received more bad publicity than a domestic developer because of the Arab boycott against Jewish businesses and because of the general mistrust of foreign investors. Second, a communication gap developed between the Kuwait Investment Company and the planning management arm, the Kiawah Beach Company. Rob Hull, the

original planning director, felt that major decisions concerning obtaining the necessary funds for phase implementation were difficult and time consuming. This was caused by the Kuwait government's sending representatives who had no development expertise or decision making powers.

The Public Approval Process and Kiawah

The public approval process involved the interaction of the developer as growth agent; the governmental approval body as mediator and community growth regulator; and the community advocacy groups. The Kiawah rezoning process involved an intense and dynamic interplay between these three distinct groups.

The Kiawah Beach Company, as developer seeking rezoning approval, displayed a keen ability to "defuse" the objections of the other two groups. Prior to and during the rezoning process, the developer undertook extensive planning activities. A master development plan, a complete environmental inventory, engineering studies, development guidelines, architectural studies, and an all-important economic impact analysis were vital supports to the rezoning request.

The economic impact analysis addressed specific governmental concerns. The major community impacts of tax revenues, public expenditures, population and employment were all presented as beneficial to the community.

The opposition groups were dealt with in a similar way, with the developer anticipating problems before any direct confrontations occurred, and offering solutions and compromises in response. The developer's success in obtaining rezoning for Kiawah was primarily a consequence of these five actions:

1. The developer showed an expanded scope of concern;
2. The early involvement of all other interested parties;
3. The projection of community impacts prior to the request for rezoning;
4. The interaction with and compromising with opposition groups prior to the actual public confrontation; and,
5. The "pre-selling" of the development concept to the public at large through extensive publicity and documentation.

The government role was found to be largely one of accommodation, mediation and development monitoring. The county council accommodated the developer in the rezoning effort largely due to the exceptional detail and high development standards which were inherent in his rezoning application--standards which far exceeded the local standards, codes, and regulations.

Due to the high degree of beneficial community impacts which would accrue to the county during and after development, the council assumed a passive advocacy role while mediating between the development and the opposition groups. The only major regulatory role that the governmental body assumed involved development monitoring approval by permit as each development phase is initiated.

The major opposition group employed the tactic of citizen pressure to block the Kiawah development. Their opposition efforts were implemented by the following steps:

1. Organization;
2. Fund raising;
3. Research on the development plan, relevant laws, and public approval bodies involved;
4. Attempts to discover inconsistencies in the plan or conflicts of interest within the approval body;
5. Individual approach to lobby each decision maker;
6. Public hearing confrontations using diverse testimony from credible individuals and experts.

These efforts failed because their goal was inflexible and realistically unattainable, and because they failed to win support from major community and political leaders. In addition, broad community support was absent because of the environmentalists' inability to form a coalition composed of all three major concerned groups.

Conclusions

The planning processes at Kiawah Island, which included environmental, developmental, and public approval, were found to be closely related in form and content to those reviewed in the literature. The master plan for development of Kiawah integrated these planning processes into a flexible development guide for the twenty-year build-out period. The comprehensive environmental inventory served as a basis for the environmental plan, from which evolved the development planning framework. Both were synthesized into the Kiawah master plan for development.

The master plan was then used for justification of the rezoning of Kiawah to the Planned Development District. Thus, all three processes, though distinct, were integrated into a large-scale plan for development of an environmentally sensitive area. Within the context of this holistic planning process three major summary questions must be addressed:

1. What are the unique features of the plan and its implementation?

2. What is the degree of transferability of the planning process?

3. What future research needs to be done?

Unique features include:

1. The environmental inventory of Kiawah Island was unique in terms of its total scientific comprehensiveness;

2. The vegetation protection program. This program is exemplified by the developer's process for road building. Prior to clearing an area for a road, key vegetation is identified for preservation;

3. Sand dune protection is of particular concern and is given special attention. All homes must be built behind the secondary dune line, and boardwalks have been built over the dunes to the beach to prevent the dunes' from being breached. Educational signs have been posted concerning the value of a stable dune system. In addition, the developer has restored a section of dunes which had been destroyed earlier by bringing in sand and planting natural dune vegetation.

4. Kiawah's drainage system is uniquely creative; lagoons are planned and located in the island's natural low areas to control runoff. As a storm approaches the island, the water level of the lagoons is lowered through a controlled gate system. Heavy rain can then be collected through a drainage system which begins with rolled roadway curbs that channel water from drains to the lagoons. The lagoons have enough capacity to hold water from a "ten year" storm. To date two hurricanes have had no effects on Kiawah's natural or man-made environments while Charleston and surrounding islands have suffered significantly.

5. Water management was engineered so that treated effluent can be recycled by spraying it on golf courses, where it both irrigates and fertilizes the fairways. After discharge onto the golf courses, natural processes continue to filter the water and it is eventually recycled into the acquifer;

6. The endangered loggerhead sea turtle program involves the collection of eggs from the beach and transporting them to an incubator where after hatching they are returned safely to the sea. To date, this environmentally award winning system has returned more than 30,000 hatched turtles to the sea;

7. Architectural guidelines are enforced by a review board for all building plans. These internal controls and building standards far exceed those of Charleston County. The guidelines have been recognized as the most sophisticated in the industry, and are a result of a multi-disciplinary approach which includes input from design professionals, engineers, and environmental scientists. Emphasis is placed on the use of natural colors, earth tones, wood exteriors, and landscaping;

8. Marketing through environmental awareness and sensitivity--potential property owners have been willing to pay a premium for quality property in a natural setting.

The million-dollar expenditure necessary to do all the background work for the Kiawah plan limits the applicability of such a process to large projects from which large amounts of income can be derived. Smaller scale projects or those which could generate only modest amounts of cash would be unable to accomplish the detailed planning process used at Kiawah. Assuming a large project similar to Kiawah, however, the Kiawah Beach Company has shown that the least expensive way to develop a sensitive area is to avoid the most sensitive areas and develop the less sensitive portions.⁵ One other factor which must be recalled is that the ability of the Kiawah developers to command high development prices is dependent, at least in part, on their careful planning process.

The Kiawah planning process in its totality is unique, though elements of the plan have been used in other developments. This uniqueness alone would warrant that more research be done on the process and its transferability to other environmentally sensitive areas. The initial research would entail a monitoring of Kiawah in order to determine if the environmental process as planned has resulted in minimizing impact on the natural environment. Monitoring is also needed in order to determine the relationship

⁵Interview with past Kiawah Planner, Rob Hull.

between planning and implemenation. Monitoring would also be necessary to determine if the plan is being implemented as legally approved.

Further research is also recommended to resolve the issue of barrier island development versus preservation. Some islands are more suited for development than others, and such a differentiation needs to be made. If an island is found to be potentially developable, then its eventual development should be preceded by exhaustive planning processes similar to those carried out at Kiawah. The coastal council of South Carolina is currently undertaking such a program, whereby any future development in environmentally sensitive areas of the coastal zone would only be approved subject to a "Kiawah-like" planning process.

It can be concluded that such a governmental mandate would greatly limit any future development of barrier islands, because of the costly nature of such a planning process. It can also be concluded that if development did occur under such expensive criteria, then the utilization of the development would be limited only to the very wealthy consumer. Only with massive subsidies in the form of funding for planning and costly infrastructure would such a development be made available to lower income persons. The providing of subsidies is unlikely due to the political

controversy associated with any type of development in environmentally sensitive areas.

The Kiawah planning process, because it is based on natural systems studies, also should be considered for other environmentally sensitive areas beyond the coastal zone. Areas such as floodways, wetlands, aquifer recharge areas and watersheds etc., could all make valuable use of the process.

From this thesis five major conclusions are apparent:

1. The Kiawah planning process, because of its comprehensive nature and being based on a complete natural systems inventory, is unique in its scale as applied to an environmentally sensitive area within the coastal zone.
2. The process, because of its high cost, is only economically feasible for large-scale projects, with an affluent clientel, without large public subsidies.
3. The process has merit on a smaller scale when using only readily available information or systems such as soil, slope, floodway and vegetation data.
4. The process needs monitoring to test its transferability to other coastal zone areas, as well as environmentally sensitive areas beyond the coastal zone.
5. The public approval of the project was only successful because of the developers consummate negotiating skills.

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APPENDIX

Kiawah Beach Company

P.O. Box 579
67 Broad Street
Charleston, South Carolina 29401

Phone: (803) 723-6477

April 7, 1975

Task Force
Sea Islands Community

Re: Community Development Plan

Ladies and Gentlemen:

The following is a response to the development plan as prepared by the Sea Islands Community Task Force. It is considered as a commitment on the part of our company, if we are involved in the continuing development of Kiawah Island.

- A. Kiawah Beach Company will provide land and technical assistance for the development of a brickcrete and truss factory. The site will be on our 160-acre support facilities tract located on Bohicket Road some two miles from Kiawah and will be available on a long-term lease at \$1.00 per year.
- B. Existing recreation plans for the sea islands will be examined by the planning experts on the Kiawah Beach Company staff. Preliminary conversations have been held with the Charleston County Park, Recreation, and Tourism Commission, and Kiawah Beach Company assistance, as requested has been pledged.
- C. A Sea Islands Community Council will be organized and officially chartered at the expense of the Kiawah Beach Company. The purpose would be to coordinate lay citizens and organizations with professional expertise in planning for and acting on the economic needs of the islands.
- D. Kiawah Beach Company will provide the necessary funds to establish a community school program as detailed by the Charleston County School System. The following information was taken from the Rural Missions, Inc., Information Catalog dated September 1, 1974, through August 31, 1975.

Figure 46. AGREEMENT

Description of Program

1. The community school program is part of the school system of Charleston County. The program offers many opportunities for the individual to receive additional education and in turn enrich the life of the individual. Adults can receive courses which will lead to a high school diploma, and vocational training is offered. Courses are also offered for enrichment, including arts and crafts. A wide variety of recreational programs are also offered, especially during the summer.
 - (a) The community school is held in a county high school with most of the courses conducted in the evenings.
 - (b) Thus, the County School System provides the facilities and teachers and two-fifths of a director's salary to operate the school. A local entity must provide the remaining three-fifths of the director's salary (see Point 8).
 - (c) This program can be of benefit to the individual and to society as a whole in that the quality of life of a number of persons can be enhanced.
- E. Kiawah Beach Company will hire on its own payroll a mutually accepted individual as recommended by the task force to manage an economic service program as outlined below. The individual will be assigned full time to this work and will be provided secretarial assistance, office space, office supplies, telephones (including WATS lines), copying equipment, and staff technical assistance in areas of finance, construction, personnel management, engineering, and land planning. This individual's specific responsibility will include the management of such areas as:
 1. Management Consultant Services of counsel and technical assistance (e.g.--fundamentals of business development and management) to assist the sea islands' residents in business or contemplating entry into business.

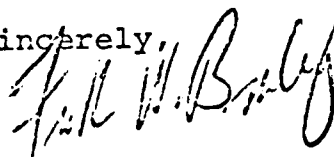
2. Providing assistance in obtaining career subsidies through educational assistance for those persons needing financial assistance to pursue further job related careers, academic as well as technical and vocational courses.
3. Consumer support services which will initiate cooperative buying projects and study the feasibility of more complex consumer cooperative activities for the islands. This group will work very closely with the credit unions and other existing cooperatives.
4. A Manpower Program to be developed which will address itself to factors affecting employability of the islands' residents, the deficiencies of inadequate job training opportunities, the dilemma of poor job adaption and job retention, and the problem of very little upward occupational mobility. Direct activities of the program will include recruitment and outreach, appraisal of applicants, job coaching, informal vocational counseling and referral for vocational training program. As an advocate, the program will oppose discriminating practices, promote affirmative action, and work for the establishment of realistic employment qualifications in local business.
5. Working with the local organizations and churches to provide child care and transportation services for persons involved in providing services to island developers.
6. Developing a program to solicit state and federal funds for the Johns and Wadmalaw Islands to be used as matching funds for construction of homes.
7. Working with the Minority Development Corporation to provide a loan assistance program for sea islands' businessmen.
8. Development of a consulting services program to provide expert advice on special situations.
9. Act as assistant personnel director for the Kiawah Beach Company so as to insure an involvement in the actual hiring programs of the development.

The program director will be given an employment contract to insure his flexibility and independence. Additional staff to assist in the above programs will be reviewed on an ongoing basis.

- F. The Kiawah Beach Company offers its assistance in providing an on-going land use planning effort to further develop a comprehensive land use plan for sea island needs. This study and effort will be coordinated with the Charleston County Planning Staff and the Regional Planning Commission.
- G. Kiawah Beach Company will deposit \$200,000 in the C. O. Federal Credit Union. The funds will be earmarked for minority development loans for the sea island area. In addition, the Kiawah Beach Company will be in a position to make introductions to area banks and give letters and contracts that should assist island businessmen in obtaining loans.
- H. A non-profit organization will be established at the expense of the Kiawah Beach Company. The purpose of this organization is for it to be the vehicle through which the community school is funded, and state and federal grants pursued.
- I. Residents of the sea islands will be given first opportunity for employment and business openings in conjunction with the development of Kiawah.
- J. The Kiawah Beach Company agrees to finance a socio-economic study that specifically deals with the sea islands. The scope and duration of this study is to be recommended by the Task Force.

The development of Kiawah Island by the Kiawah Beach Company over the next 20 years will provide thousands of jobs and hundreds of business opportunities to residents of the sea islands. By conservative estimate the total effect of this economic impact will exceed \$30 million. These dollars will be cycled and re-cycled throughout the sea islands through the purchase of goods and services, the building of new homes, and the formation of business enterprises.

Sincerely,



Frank W. Brumley
Senior Vice President and
General Manager

Sea Island Community Development

Task Force
March 24, 1975

Re: Community Development Plan

I. Areas in which Kiawah Beach Company and The Task Force agrees.

The following is a response to Kiawah Beach Company on the commitments they are willing to make to the Sea Islands.

The Sea Islands Community Task Force and Kiawah Beach Company agreed that:

- A. Kiawah Beach Company will provide free of charge both land and technical assistance for the development of a brick crete and truss factory. The site will be on our 160 acre support facilities tract located on Bohicket Road some two miles from Kiawah.
- B. A Sea Island Community Council will be organized and officially charted at the expense of Kiawah Beach Company. The purpose would be to coordinate lay citizens and organizations with professional expertise in planning for and acting on the economic needs of the island.
- C. Kiawah Beach Company will hire on its own payroll a mutually accepted individual as recommended by the Task Force to manage an economic service program as outlined below. The individual will be assigned full-time to this work and will be provided secretarial assistance, office space, office supplies telephones (including Watts lines), copying equipment, and staff technical assistance in areas of finance, construction, personnel management, engineering, and land planning. Individuals specific responsibility will include the management of such areas as:
 - 1. To work with the local organizations and churches to provide child care and transportation services for persons involved in providing services to Island Developers.
 - 2. To develop a program to solicit state and federal funds for the Johns and Wadmalaw Islands to be used as matching funds for construction of homes.
 - 3. Work with the Minority Development Corporation to provide a loan assistance program for Sea Island businessmen.
 - 4. Development of a consulting services program to provide expert advice on special situations.
 - 5. The program director will be given an employment contract to insure his flexibility and independence.
 - 6. Conducting an impact study with special consultant assistance.

- D. Kiawah Beach Company will provide the necessary funds to establish a community school program as detailed by the Charleston County School System. The following information was taken from the Rural Missions, Inc., Information Catalog dated September 1, 1974 through August 31, 1975.

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- E. A design for a socio-economic impact study be presented to Kiawah Beach Company for financial assistance.

The study will examine the impact of Kiawah Island Development on the surrounding Sea Islands. The study is expected to result in an action plan, Phase II of the Task Force Community Development Plan. The Action Plan (Phase II) will be further negotiated with Kiawah Beach Company for financial consideration of specific program areas.

The following areas to which Kiawah Beach Company agreed to be managed under an economic service program are to be included in the Impact Study.

1. Management Consultant Services of counsel and technical assistance (e.g., fundamentals of business development and management) to assist Island residents in business or contemplating entry into business.
 2. Provide assistance in obtaining career subsidies through educational assistance for those persons needing financial assistance to pursue further job related careers, academic as well as technical and vocational courses.
 3. Consumer support services which will initiate cooperative buying projects and study the feasibility of more complex consumer cooperative activities for the Islands. This group will work very closely with the credit unions and other existing cooperatives.
 4. A Manpower Program be developed which will address itself to factors affecting employability of Island residents, the deficiencies of inadequate job training opportunities, the dilemma of poor job adaption and job retention and the problem of very little upward occupational mobility. Direct activities of the program will include recruitment and outreach; appraisal of applicants, job coaching, informal vocational counseling and referral for vocational training program. As an advocate, the program will oppose discriminating practices, promote affirmative action and work for the establishment of realistic employment qualifications in local business.
 5. Existing recreation plans for the Sea Islands will be examined. Preliminary conversations have been held with Charleston County Park, Recreation, and Tourist Commission and Kiawah Beach Company assistance has been pledged.
 6. The Community School concept as a skills center will also be examined in the impact study.
- F. Kiawah Beach Company will solicit funds from Kuwait Investment Company for a substantial deposit in the C. O. Federal Credit Union. The funds will be earmarked for minority development loans for the Sea Islands area. In addition, the Kiawah Beach Company will be in a position to make introductions to area banks and give letters and contracts that should enable Island businessmen to obtain loans.
- G. A non-profit organization will be established at the expense of the Kiawah Beach Company. The purpose of this organization is for it to be the vehicle through

which the Community School is funded, state and federal grants pursued, and general policy decisions made for the enrichment of life on the Sea Islands. The Board of Directors to be selected from the business and residential community of the Sea Islands.

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- H. The Kiawah Beach Company assumes the responsibility for an on-going land use planning effort to further develop a comprehensive land use plan for Sea Island needs. This study and effort will be coordinated with the Charleston County Planning Staff and the Regional Planning Commission.

II. Areas in which Kiawah Beach Company and the Sea Island Community Task Force Needs to Negotiate.

The Task Force wishes to negotiate the following recommendations which is included in Phase I of the Community Plan:

- A. That Kiawah Beach Company, along with the Task Force, solicit Kuwait Investment Company for a four to seven percent cash investment in the surrounding communities of the Sea Island. The investment will amount to 8 to 14 million dollars invested in the Sea Island community over a twenty year period. The annual investment will be 4 to 7 hundred thousand dollars.

The justification of such investment will be reflected in Kiawah Beach Company's:

- . Purchasing job, sub-contract and business services from the Sea Island Community.
 - . Investment in community projects such as: housing, community skills center, transportation and child care services, etc.
 - . Loans to businesses and other community projects.
- B. That the economic development corporation agreed upon by both parties be a private investment company for profit. This company would be capitalized for about 5 to 9 million dollars over a twenty year period.
- C. That the programatic results of the socio-economic impact study be a further justification for the use of 18 to 12 million dollars over a twenty year period of development of the Sea Islands.
- D. That Sea Island residents be given a "right of first refusal" on jobs and business on Kiawah.
- E. That a portion of the investment be used as matching funds for government and private grants to various economic programs.
- F. That a portion of the investment be used as start up funds to allow the Task Force to hire an assistant to the director of the economic service program to help:
1. Organize and staff a Community Council.
 2. Conduct on impact study.
 3. Process job applicants and subcontracts through an employment service program conducted by the Task Force.

A summary of uses to be permitted are:

- * 150 lodging rooms
- * 100 seat dining
- * 200 person conference space
- * Spa
- * Lounge
- * Golf pro-shop and cart storage area
- * Tennis pro-shop
- * Tennis maintenance building
- * Area maintenance and bicycle rental building
- * 12 Duplex Villas
- * Pool recreation and sun-fun hut
- * Temporary sewage and water treatment facilities
- * Associated parking areas meeting P.D.R. 13 requirements
- * 20,000 s.f. resort commercial space and offices

All of the above uses are shown in detail on the enclosed Kiawah Resort Complex site plan, showing proposed locations and sizes. The presently approved engineering drawings are also included and reflect the commitment of the Kiawah Beach Company to follow our stated goals and objectives to make this a "highest possible quality" resort.

CONFORMANCE STATEMENT

This plan conforms fully with the plans provided in the Kiawah Island P.D.R. 13 and therefore, as provided in Chapter 4 of the Kiawah Island Development District Application, conforms with the "Comprehensive Plan" for Charleston County and for the Berkeley-Charleston-Dorchester Region.

REQUEST FOR APPROVAL

The Kiawah Beach Company, in compliance with its stated goals, objectives, and plans for the entire Kiawah Island P.D.D., requests approval of this application, and contends that this application has met or exceeded all criteria and standards as set forth by Charleston County in its comprehensive plan, zoning ordinance, and supplementary administrative procedures, and the existing P.D.R. 13.

Figure 47. CONFORMANCE STATEMENT

Specifically, the application meets the criteria described in section 97.30.60 required for P.D.D. approval as follows:

- * The amended zoning of these parcels conforms to all the previously approved provisions of the Kiawah Island P.D.D. (Charleston County Zoning Regulation P.D.R. 13).
- * The proposed development is compatible with and will enhance the surrounding property presently zoned P.D.D.
- * Roads and utilities have been and will continue to be constructed in accordance with the requirements specified in the proposed subdivision regulations, the Charleston County Major Street Plan, and Charleston County Road Code.
- * Emergency and service vehicles ingress and egress will be provided along with contingency plans for emergencies as provided in Kiawah Island P.D.D.
- * The intent and purposes of the Planned Development District Ordinance and Subdivision Regulations for Charleston County will be met throughout the development of the Resort Complex.
- * All units, facilities, and other development will be engineered to be properly drained, stabilized, and served functionally with good access provided to major roads.

The site plan, supplemental data, application, and the conditions established in the existing P.D.R. 13 Regulations provide adequate evidence that the proposed Planned Development District conforms to the standards and requirements set forth in Chapter 20 of the Zoning Ordinance and the amendment procedure of the Charleston County Planning Staff.

1. This area, known as Kiawah Island, consists of 5,544 acres when the existing Royal Subdivision and Kiawah Inn Complex are excluded. The proposed development features a balanced mix of uses such as single family and multi-family dwellings, neighborhood shopping areas, motels, recreational facilities, maintenance support activities and public service facilities.

A. The following information was submitted by the applicant for Staff review and recommendation:

1. Application #1--Kiawah Island, Planned Development District containing text with maps depicting:
 - a. Existing site characteristics
 - b. Master Land Use Plan
 - c. Conformance Statement
 - d. Development Criteria
 - e. Management Plan
 - f. Community Support System
2. Application appendix containing:
 - a. Legal documents consisting of covenants and master deed
 - b. Development Guidelines
 - c. Engineering Studies pertaining to:
 - (1) Transportation
 - (2) Subsurface conditions
 - (3) Water and Sewer Systems
 - (4) Surveying and Mapping, consisting of:
 - (a) Topographic maps
 - (b) Drainage plans
 - (c) Sewer and water plans
3. Economic Assessment Appendix
4. Preliminary Report on the Environmental Inventory of Kiawah Island dated September 15, 1974.
5. An approved perimeter survey of the island

B. After planning staff review and many conferences with the developer and his staff, Application #1 was condensed, rephrased and reprinted with an

Figure 48. STAFF EVALUATION

identity as "1a--Kiawah Island--Planned Development District--Application." This is the Official Application and conforms with the Planned Development Requirements.

C. Summary:

1. General

The development design concept is to concentrate uses in a small area. This concept provides much greater open space than the run-of-the-mill subdivision, and is in keeping with the philosophies and recommendations of the Urban Land Institute, American Society of Planning, and the American Law Institute.

2. Residential

The maximum number of dwelling units, single and multi-family, will be 7,000 equivalency units producing an approximate density of 1.3 units/acre. A flexibility is provided whereby types of units may vary with the total number of units, never to exceed a total of 7,000 dwelling units.

3. Commercial

Commercial development will be primarily in village centers for a maximum of 600,000 square feet. This consists of shops and offices needed to support the community. In addition, motels will be located at four sites.

4. Recreation

Kiawah Island will be open to the public and will provide beach access and with parking facilities for 150 vehicles at the west end of the island. A marina is also proposed at the north side of the island. The center of the island will be interlaced with golf courses and tennis courts will also be provided.

5. Preservation and Open Space

The area between the 5-foot mean sea level contour line and the mean high water mark will be limited to development as presently authorized in the Zoning Ordinance for an Agriculture Conservation (AC) District. All property in the ownership of the developer below the mean high water mark and containing marsh will remain zoned as an Agriculture Conservation (AC) District.

Open space areas are planned for protection of wild life habitats, historical and archeological sites and primary dune ridges.

6. Public Facilities

The developer is providing for water and sewer systems, fire protection, school site, garbage collection, police protection, mail delivery, etc., and all amenities.

VITA

Boyd R. Dethero was born in Cleveland, Tennessee on March 12, 1951. He attended elementary schools in that city and was graduated from McCallie High School in Chattanooga, Tennessee in 1969. The following September he entered the University of Georgia and in August 1973 he received a Bachelor of Business Administration degree.

After a 3-month active duty training session as a second lieutenant in the Army Reserve, he pursued a career as a private property developer in Chattanooga, Tennessee from 1973 to December 1976. He attained the vice presidency of two Chattanooga-based corporations--Carterton Oaks Development Corporation and Environmental Designs Incorporated. The former corporation developed condominiums on Lookout Mountain, Tennessee, while the latter served as a private consulting firm specializing in land planning, economic feasibility studies, and landscaping.

Following a 3-month apprenticeship with the City of Cleveland, Tennessee he entered the Graduate School of Planning of The University of Tennessee, Knoxville in 1977. After completion of all course work, he re-entered the field of private planning as a consultant and real estate developer. He is currently the vice

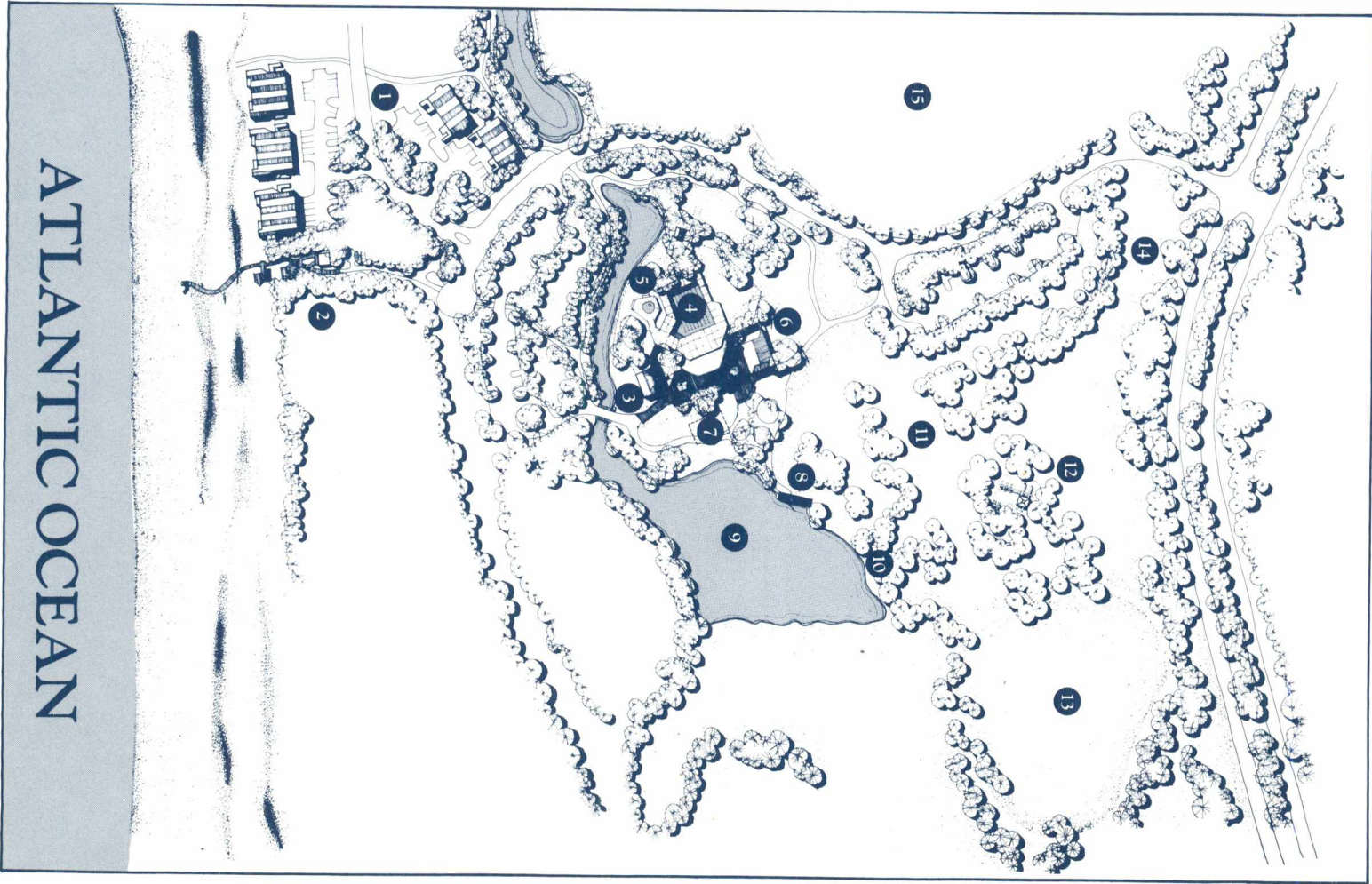
president of Cherokee Planning and Development, Inc., in Cleveland, Tennessee. He received the Master of Science in Planning degree in June 1983.

NIGHT HERON PARK

Twenty-one acre Night Heron is a unique asset of Night Heron Lake, Kiawah's newest critical area. The park offers a family-oriented setting that simply isn't available at resort communities in the area. A competition pool, recreation building, playground, fishing lake and picnic areas are all tied together in a greenbelt and grassed common adjacent to the parks so important family recreation earlier this century.

The entire area will be interconnected by bike and leisure trails emphasizing the need for automobiles and a major bike path in will link Night Heron Lake to West Beach Village.

- Mariner's Watch Villas
- Beach Facility
- Restrooms
- Sundeck
- Showers
- Bath House
- 25m - 8 Lane Swimming Pool
- Kids Pool
- Recreation Building
- Proposed Restaurant Site
- Fishing Dock
- Night Heron Lake
- Lakeside Picnic Area
- Lawn Sports
- Playground
- Playing Field
- Picnic Area
- Night Heron Cottages



ATLANTIC OCEAN

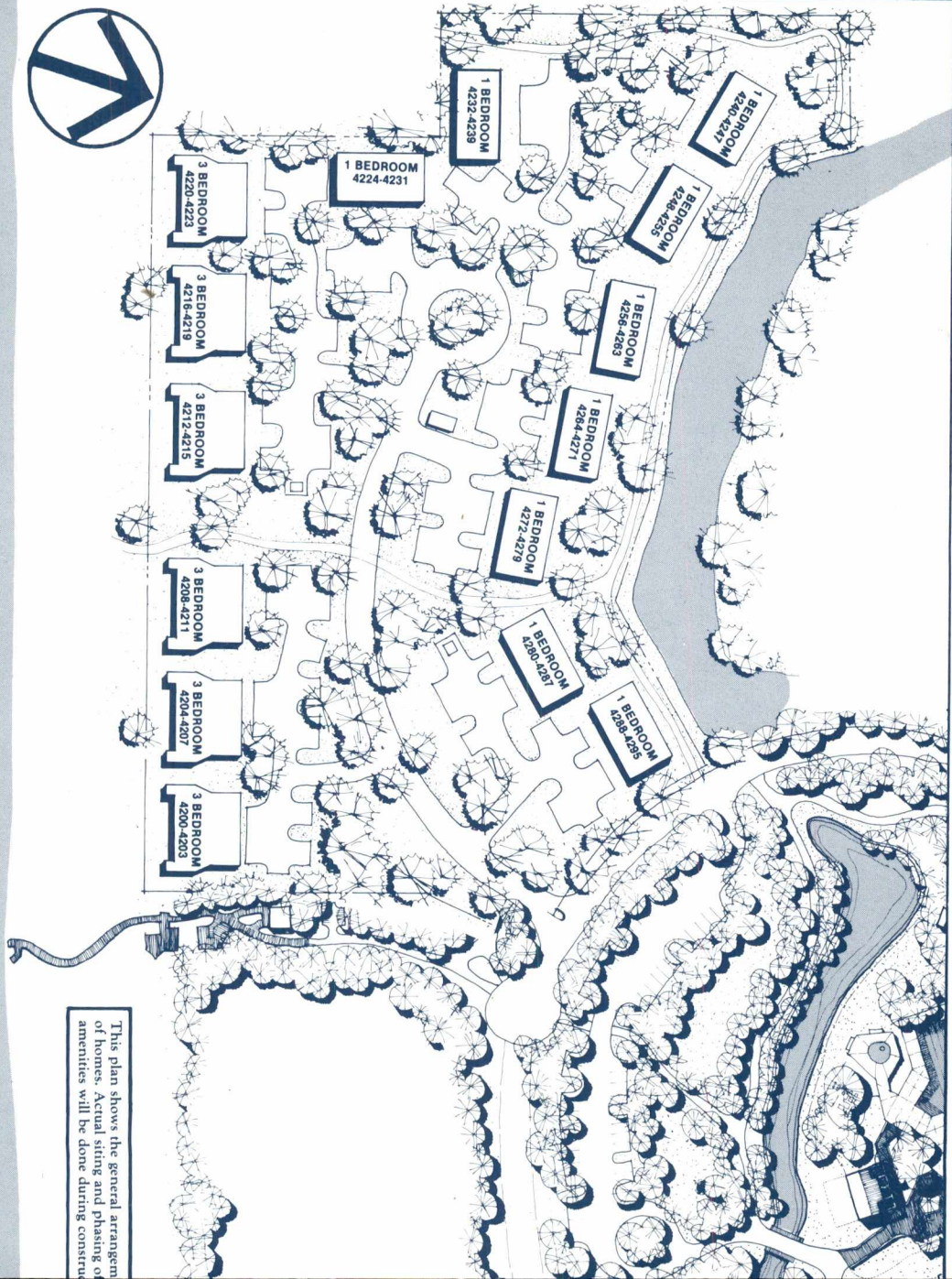
Plans are representative only. Actual locations may vary.

SITE PLAN



ATLANTIC OCEAN

MARINER'S WATCH



This plan shows the general arrangement of homes. Actual siting and phasing of amenities will be done during construction.

ATLANTIC OCEAN

2

FLOOR PLANS

DESIGN

- Three bedrooms / three baths.
- Exterior decks and storage.
- Screened porch.
- Exterior sheathed in cypress.
- Cedar-shingled roof.
- Insulated floors, walls and ceilings
- All electric heat and air conditioning via heat pump.
- Anderson insulated wood windows.
- Stained six-panel interior doors.
- Fireplace with slate hearth.
- Glazed tile foyer.
- Lockable owner's storage.
- Outside storage area under building.
- Short walk from beach, sports and 21-acre Night Heron Park.

BEDROOMS

- 100% nylon wall-to-wall carpeting
- Exposed beam vaulted ceiling -second floor units.
- 9½' ceiling in master bedroom -first floor units.

LIVING / DINING AREA

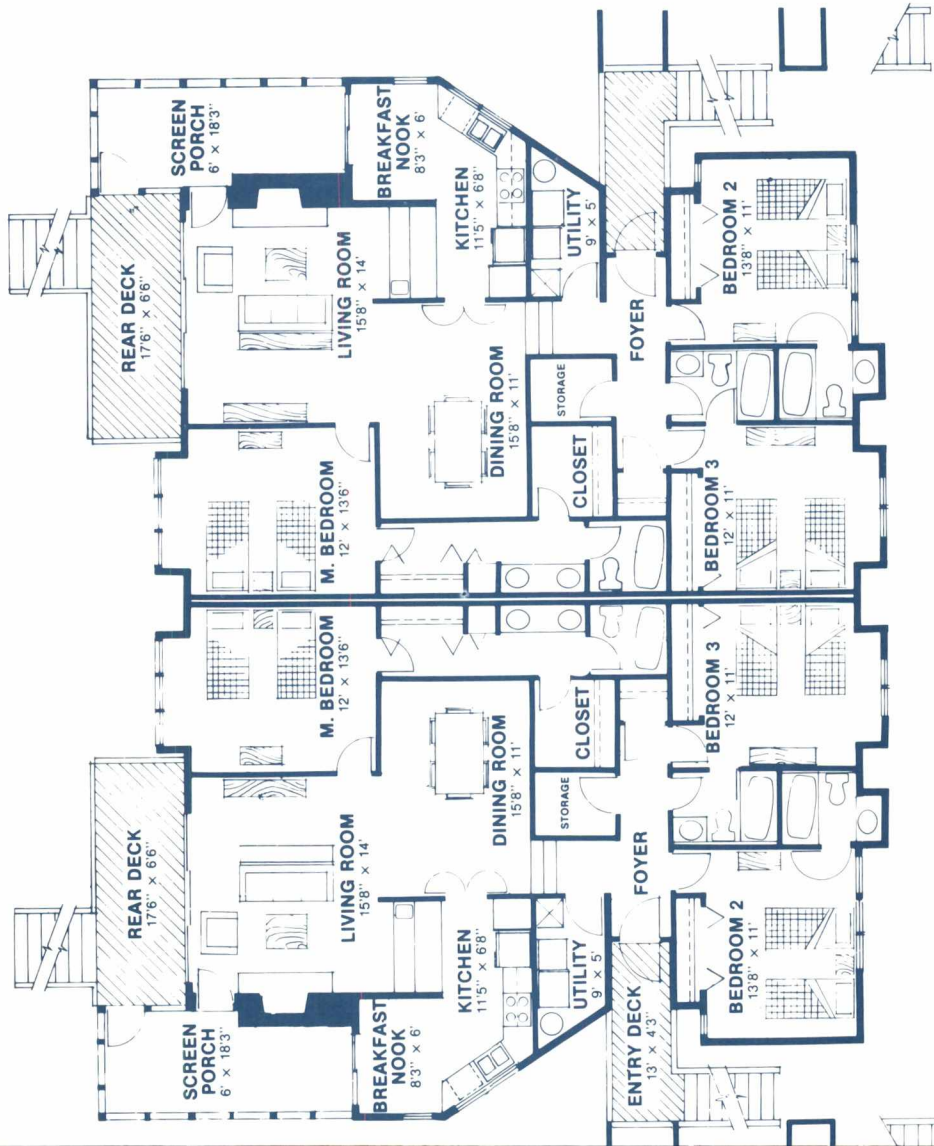
- 100% nylon wall-to-wall carpeting
- Exposed beam vaulted ceiling -second floor units.
- Step down into living / dining area -first floor units.

BATHS

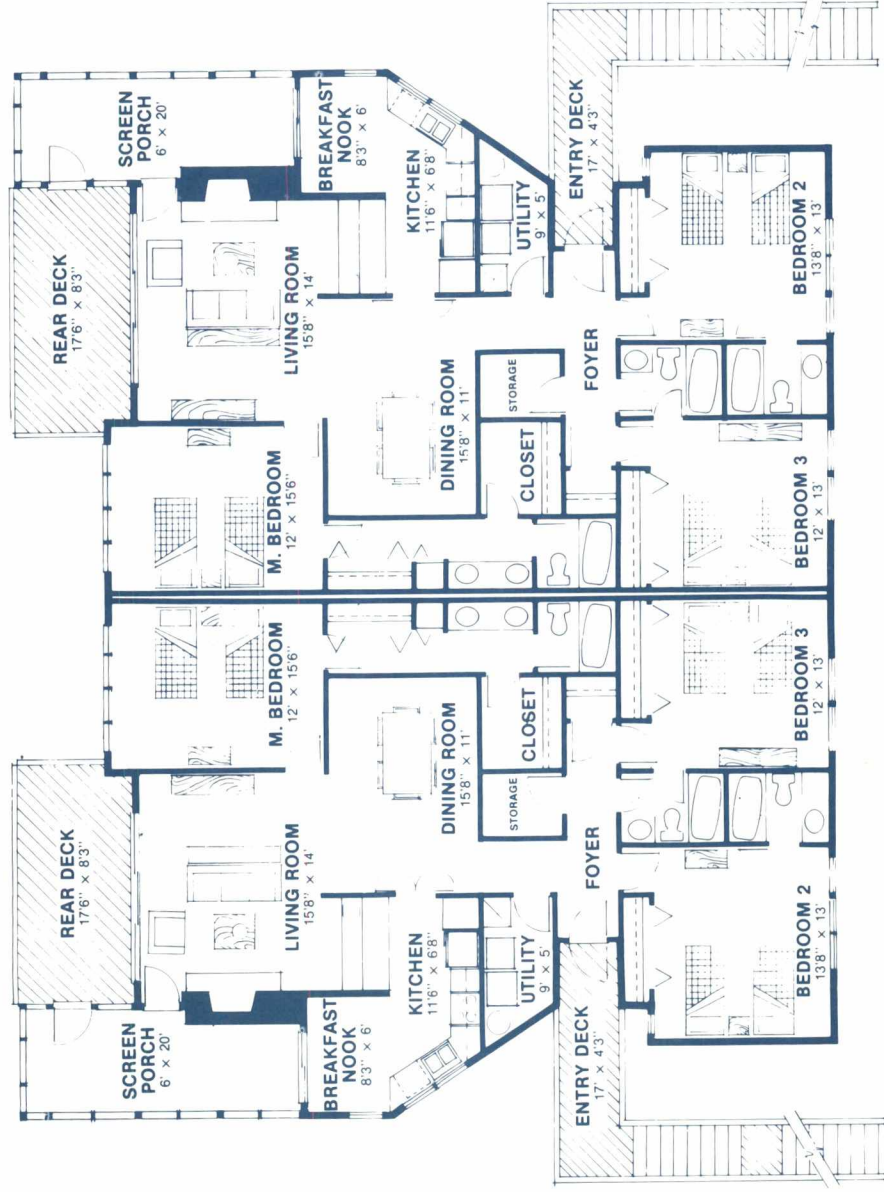
- Corian shower / tub enclosure.
- Porcelain on cast iron tubs.
- Ceramic tile floors.
- Corian vanity tops with integral sinks.

KITCHEN

- Microwave and self-cleaning oven.
- Double stainless steel sink.
- Oak cabinets.
- Sheet vinyl floor.
- 17 c.f. GE refrigerator with ice maker.
- Garbage disposal.
- Washer and dryer in adjacent utility room.
- Dishwasher.



First Floor Units



Second Floor Units

These renderings are representative only; actual dimensions may vary during construction.

Design: John Phelps Architect, Inc., Myles Glick, A.I.A., Architect, Kiawah Island Company

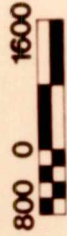
MARINER'S WATCH VILLAS

Three Bedroom

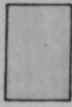


These luxurious three-bedroom villas overlook the Atlantic Ocean in Kiawah's newest residential area, Night Heron Lake. Offering the ultimate in resort living, these cypress and cedar units feature three baths, fireplace with slate hearth, wall-to-wall carpeting, exposed beam vaulted ceilings in the bedrooms and living room of the second floor units, and a 9½' ceiling in the first floor master bedroom. The completely equipped kitchen includes microwave and self-cleaning oven, double stainless steel sinks, 17 c.f. refrigerator with ice maker, disposal, dishwasher and washer and dryer in an adjacent utility room.

MASTER LAND USE PLAN Kiawah Island



LEGEND

-  Very low density
-  Medium density
-  Village density
-  Golf course
-  Open space

- 1. General Store, Information
- 2. West Beach Park
- 3. West Village
- 4. Kiawah Inn
- 5. Sewage Treatment Pt./ Maintenance Hq.
- 6. Riverfront Village/ Marina
- 7. Yacht Club
- 8. Vanderhorst Woods Center
- 9. East Beach Center
- 10. Beach Village
- 11. Island Center

