J. ENVIRONMENTAL SYSTEMS, Vol. 6(1), 1976-77

A GROWTH MANAGEMENT PROGRAM CONCEPT: A RATIONAL APPROACH TO THE DILEMMA OF GROWTH AND ENVIRONMENTAL PROTECTION*

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ABSTRACT

There is currently an increasing general awareness and concern regarding growth and its threat to the environment, the general health, safety and welfare of the public, and the sound development of our communities. At the same time, there is a growing dissatisfaction with the processes which are currently available to deal with growth and development. This paper describes two new concepts of land use management which attempt to deal with this fundamental dilemma involving growth and environmental protection. The first is the transfer of development rights (TDR) concept which is a relatively simple zoning device designed to preserve environmentally critical natural resource areas. The second is the growth management program (GMP) concept which involves the incorporation of the TDR concept in a comprehensive planning and zoning process.

Preface

In March, 1972, B. Budd Chavooshian[1] and Dr. George H. Nieswand[2] initiated the research and study of the transfer of

* Paper of the Journal Series, New Jersey Agricultural Experiment Station, Cook College, Rutgers University—The State University of New Jersey, New Brunswick, N.J. 08903.

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doi: 10.2190/LQVU-RPJK-H7BR-4X2G
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development rights (TDR) principle as a land use control device to preserve farmlands and other critical land resources. Thomas Norman, Esq.[3] shortly joined them to provide legal analysis and services. The Division of State and Regional Planning of the New Jersey Department of Community Affairs took an early interest and participated in these research activities. Subsequently, funds were provided by the New Jersey Open Space Policy Commission to develop fully the TDR concept and draft a legislative proposal. A small group of specialists from related disciplines was invited to serve on an advisory committee to assist in this research effort which was completed in May, 1973 [1].

Following this initial research, a year of intensive study was devoted to the TDR principle in a broader growth management context. This study was pursued again in cooperation with and with the support of the New Jersey Division of State and Regional Planning as well as the continued assistance of the advisory committee. The study, which was completed in June 1974, resulted in a conceptual model of a growth management program (GMP) which insures a compatible relationship between the accommodation of growth and defensible environmental concerns [2].

This paper describes the results of these two related research efforts—the TDR and GMP concepts.

Introduction

Land is one of modern man's most precious natural resources. Its wise and considered use is essential to the maintenance of a quality environment. Until very recently, however, land use policies dictated by economic, political and social (or perhaps antisocial) considerations have insensitively and irresponsibly squandered the land and have ignored the consequential environmental affects.

There is currently an increasing general awareness and concern regarding growth and its threat to the environment, the general health, safety and welfare of the public, and the sound development of our communities. At the same time there is a growing dissatisfaction with the processes which are currently available to deal with growth and development. This new mood has produced some "knee-jerk" reactions ranging from restrictive zoning which frustrates attempts at development to unmasked attempts to stop all growth or to set an arbitrary limit to growth.

Increasingly, however, there is also a genuine effort to develop

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more rational and acceptable ways of dealing with growth and its inherent threats to the environment. This paper describes two new concepts of land use management as they have been developed at Cook College which deal with this fundamental dilemma involving growth and environmental protection. The first is the transfer of development rights (TDR) concept which is a relatively simple zoning device designed to preserve environmentally critical natural resource areas. The second is the growth management program (GMP) concept which involves the incorporation of the TDR concept in a comprehensive planning and zoning process.

The Setting—A Brief History

American attitudes toward real property were inherited from the English land-tenure system and were strengthened during colonial times when there seemed to be unlimited land available. As expressed, for example, in the Northwest Ordinances of 1787, the central idea was ownership of land in "fee simple," which meant ownership that confers upon the owner the right to do anything he wants with his land except what is prohibited by local, State, and Federal governments. In a sense land was treated as an unlimited commodity as abundant as air and water.

Planning began in a serious way in 1926 with the *Euclid* decision [3], a United States Supreme Court ruling which upheld zoning and essentially accepted the notion that a preconceived approach to growth is more likely to promote the general welfare than is haphazard, fortuitous development. As a practical matter, for forty years after *Euclid*, zoning was implemented on the premise that all land in private ownership was considered developable—essentially a commodity to be programed for development for some appropriate use—a notion entirely consistent with our frontier heritage.

Natural resource and environmental factors seldom entered into consideration in the planning/regulatory process for a considerable time following *Euclid.* In many ways the objection, based on constitutional grounds, that regulations to protect and preserve areas of natural or environmental sensitivity are confiscatory prevented a greater use of environmental factors. Indeed, this fear of the "taking issue" was justified in the light of judicial decisions up through the 1960s [4].

As a result, conventional zoning did little to preserve essential natural resources. Occasionally the judicious application of physiographic, geologic and hydrologic data sometimes did produce zoning

classifications and densities that were less damaging to the environment than was random development. But at its very best, zoning could only provide for the harmonious and efficient development of all the land.

To overcome these shortcomings in the application of conventional zoning, new concepts were developed to preserve some open space in the urbanizing landscape. Among these are the concepts of density zoning, clustering and planned unit development.

However, since these devices are generally applied to small areas and are usually an option to the existing lot-by-lot subdivision process within a municipality, the best to be achieved is some minimal break in an otherwise monotonous development. Haphazard, noncontiguous, scattered open space generally is the result. This is not necessarily bad or undesirable, but it does not protect the large areas of open space, such as aquifer recharge areas, floodplains, wetlands and farmlands, which are necessary to the maintenance of a sound environment.

Since the advent of "Earth Day," April 22, 1970, which signaled a greater appreciation and understanding of the environment, a new mood has developed concerning the protection of environmentally fragile areas and the possibility of establishing density limits on the basis of health and safety factors. A legislative movement to protect various aspects of the environment which began in 1970 is well documented in *The Quiet Revolution in Land Use Control* [5]. Moreover, natural-resource factors are finally being recognized as among the vital limiting considerations in any rational planning scheme. In addition, while standards relating the impact of various land use patterns on natural resources may not yet be devised, the importance of these factors to a community's health, safety and general welfare is generally accepted. This reflects an attitude that critical land can be treated as both a resource and a commodity. It is antithetical to a system which treats all land as only a commodity to be bought or sold and developed as soon as the market is ready, regardless of the environmental implications.

Of critical importance for the 1970s is an environmental balance that will ensure health and safety, retain open and productive land for water and air quality, and give psychological relief from the continuous sprawl of the megalopolis. The challenge is to accomplish this without creating so-called wipeout conditions for some landowners while creating windfalls for others[4]—to adopt a

[4] Donald G. Hagman, U.C.L.A., is completing a study to document the windfall/wipeout process. See "Windfalls for Wipeouts: A Preliminary Report," Donald G. Hagman, Chapter 4, Volume I, *Management and Control of Growth*, The Urban Land Institute, 1975.

land use control policy that balances legitimate development needs with valid environmental concerns in a positive, rational and equitable manner.

The TDR Concept

Transfer of development rights (TDR) is a new concept in land use management designed to help solve the fundamental dilemma of growth and the preservation of environmentally important areas without violating basic rights and due process as guaranteed under the Constitution. It combines planning with certain aspects of property law.

The basic TDR process is initiated when a municipality designates an area of open space for preservation and prohibits development therein. At the same time provisions are made for the development potential associated with the preserved area to be transferred to other areas within the municipality where it is determined that development is feasible. Landowners in the preserved areas, who will continue to own their land, may sell their rights to future development to other landowners or builders who wish to develop those areas in which development is agreed on.

A development right is basically a creature of property law. It is one of the numerous rights included in the "fee simple" ownership of real estate. A mineral right (the right to mine and remove minerals from the land), an air right (the right to utilize the air space above the land's surface), and the right to travel across another person's property are examples of land ownership rights. A development right is the right that permits the owner to build upon or develop his land; in an urbanizing region it constitutes great economic value and is usually the owner's most valuable right.

All land ownership rights are subject to reasonable regulation under the police power and are also subject to the governmental power of eminent domain. Rights to land ownership may be separated from other rights and regulated by the government or sold by the owner and transferred separately. For example, a landowner may sell his mineral rights or air rights and still retain ownership and use of the land surface. A common example involves the owner's sale of an access easement to a public utility so that utility lines can be established and maintained on the owner's property. Similarly, an owner may sell all of his rights to develop his land and these rights may be bought and sold by persons other than the owner who still retains the ownership to the land.

The transfer of development rights concept is essentially a system that identifies the right to develop and creates a market for such development rights. Under this system an overlay on the current zoning is created wherein zoning districts are established for preservation of open space and for the accommodation of the displaced development potential. In the preservation district all development other than farming or low intensity recreation use is essentially prohibited. The development potential of the preservation district before its open space designation is calculated and added to a developable district in the community. In other words, the development potential of the preserved area is transferred to another district in the community which can accommodate a higher density without causing environmental damage, creating incompatible land use patterns or putting heavy strains upon existing infrastructure. Development right certificates equal to the total development eliminated from the preservation district are distributed to the landowners in that district on the basis of the ratio of the value of each tract in relation to the total land value of the preservation district. To build at a higher density in the developable districts, development rights as well as the appropriate zoning is required.

Thus, a builder who proposes to construct at a higher density based on the new capacity or density resulting from the establishment of the preserved area must also purchase development rights equal in number to the increased density and at a price arrived at through the bargaining process of the marketplace. The builder has the right to develop at the lower density permitted by the previous zoning regulations, but he cannot build the higher densities unless he has development rights. Finally the continued marketability of the development rights is insured by adequate "incentive zoning" in the developable districts. In other words, for this system to remain valid and functional there must always be a market for the development rights. Otherwise, there would be no place to transfer them, and the entire system could become invalidated and inoperative. Such a situation would occur if a builder chose not to build at the new permitted higher density, thereby creating a surplus of development rights equal to the number he could have used and for which there is no longer a market. In this situation the municipality would be required to rezone in such a manner that a market for all outstanding development rights is maintained.

A more detailed presentation of the basic operational components of the TDR concept is included in the discussion of TDR as an integral element of the growth management program

(GMP) concept which follows. Before moving on to a discussion of GMP, however, some planning implications associated with TDR are worth noting.

The primary objective of the TDR concept as proposed here is the preservation of environmentally important open space. However, the impact of this technique on the planning process cannot be ignored. More predictability, which is essential to effective planning, is promoted since all open space designations are identified and permanently locked in the master plan and in zoning regulations. Also, the number of people who will live in the community is more clearly identified through the emphasis on the density requirements necessary to guarantee value for development rights. Once approximate total density is established, better judgments relating to the planning and construction of capital improvements can be accomplished because districts where development is permissible can be very effectively planned on a comprehensive scale and related to the tracts of permanently preserved open space. In this process the locations of more intense development are identified and public services and facilities can be geared to them.

Another important aspect of TDR is the probable interest and participation in the planning process of many citizens within the community. Many will have development rights to protect and will be very interested in the process which gives these rights value.

In summary, TDR helps a community plan its growth. The net effect is the preservation of environmentally important areas with equitable compensation for the owners. There is no cost to the taxpayers since no acquisition by government is involved and, at the same time, the housing needs of a growing population can continue to be met.

The GMP Concept

The TDR concept as described above is quite specific in intent to preserve critical open space, accommodate displaced development and compensate affected landowners. By itself the concept does not represent a comprehensive planning and zoning process. The challenge that naturally evolves is that of developing just such a comprehensive process that balances recognized legitimate development needs with valid environmental concerns in a positive, rationale and equitable manner.

Following the development of the TDR concept, a year of intensive study was devoted to a consideration of the TDR principle

in a broader growth management context.[5] The study resulted in a conceptual model of a growth management program (GMP) which insures a compatible relationship between the accommodation of growth and defensible environmental concerns.

The underlying basis of the GMP concept is current capacity—the current ability of a municipality to adequately support development—and zoning regulations which reflect this capacity, rather than some vague or unknown future capacity. Further, as an integral element of the GMP concept, the total program must be adjusted incrementally as current capacity is increased. The mechanism to overcome the unequal treatment of property owners is the transfer of development rights technique which makes the GMP concept both realistic and fair. In short, the GMP concept employs a current capacity determination to insure rationality, integrates planning, zoning and capital improvements programming to assure comprehensiveness and uses the TDR mechanism to promote essential fairness.

BASIC PREMISES OF GMP CONCEPT

Environmental resource base—The establishment of an environmental resource base to serve as the source of primary information for the operational elements of the growth management program and which includes a consideration of:

- physical environment (natural and man-made)
- socio-economic environment

Critical areas—The identification, delineation and selection of critical areas which should be preserved and protected from unregulated development including areas which:

- must be preserved (health and safety considerations)
- should be preserved (general welfare considerations)

Current capacity—The determination of current capacity reflecting the ability of the land to support development without creating health or safety problems considering:

- natural resource characteristics
- existing infrastructure
- critical areas exclusions
- existing development demands

[5] See the preface for an explanation of the research sequence that led to the development of the TDR and GMP concepts.

Growth management regulations—The development of growth management regulations to guide development within the context of a specific current capacity determination and which is based on a consideration of:

- existing current capacity
- protection of critical areas
- community objectives and socio-economic factors
- regional concerns

Transfer of development rights mechanism—The establishment of a transfer of development rights mechanism which permits the preservation of critical areas and provides for a more equitable distribution of the "windfalls" and "wipeouts" associated with the regulation and development of land.

Revision process—The creation of a program revision process which recognizes growth as a dynamic process and involves an integrated updating of current capacity and growth management regulations coordinated with a capital improvements program to control both the rate and sequence of development so that they will be expressly consistent with the ultimate development objectives set forth in a long-range growth management plan.

A brief discussion of each of the above components follows:

ENVIRONMENTAL RESOURCE BASE

The initial step in the GMP concept involves an inventory and analysis of the resource characteristics of the area that is to be planned for and ultimately developed. This is fundamental and there is no need for a long rationale on why such an inventory is basic to a land development scheme. However, there is no equally obvious or universal agreement on a definition of what resource characteristics must be considered. In the absence of such a consensus, and on the basis of current experience, it can be assumed that the following are generally available, identifiable, and useful data which should constitute at least a minimum of an environmental resource base:

1. Natural physical environment
   a. Land factors
      1. topography
      2. geology (surface and subsurface)
      3. soil properties and characteristics (i.e., fertility, drainage, erodability, septic field capability, etc.)

b. Water factors
   1. standing and flowing water (streams, lakes, swamps, etc.)
   2. watershed areas
   3. flood plain areas
   4. aquifers and recharge areas
   5. (water quality)

c. Biological factors
   1. vegetation
   2. wildlife

d. Climatological
   1. precipitation
   2. prevailing winds
   3. microclimate
   4. (air quality)

e. Natural land types (some overlap with above factors)
   1. areas affected by natural hazards
   2. wetlands, marshes and swamps
   3. woodlands
   4. prime agricultural lands
   5. sites of special or unique scientific or cultural value

2. Man-made physical environment
   a. Existing land use
      1. residential
      2. commercial
      3. industrial
      4. vacant
      5. agricultural
      6. parks and other open space
      7. community facilities
   b. Infrastructure
      1. water supply systems (wells, reservoirs, treatment plants, water lines, etc.)
      2. sewage disposal systems (treatment plants, sewer lines, etc.)
      3. solid waste disposal
      4. storm drainage network
      5. transportation facilities (roads, railroads, etc.)
      6. energy resources (electric, gas, etc.)
3. Socioeconomic environment
   a. Demographic information
   b. Community facilities and services
   c. Housing and employment
   d. Aesthetic and historic considerations

An analysis of these data to determine general affinity to and compatability with development provides basic knowledge of the area that is to be planned for development. It becomes, in essence, the base map upon which the plan and land use regulations are constructed.

It should be noted that further investigation and research is essential to improve the accuracy, reliability, use and range of the environmental resource data used to enhance this phase of the program. Furthermore, consideration should be given to the techniques, devices and administrative procedures necessary to ensure objective, standardized inventory procedures.

CRITICAL AREAS

An important element in the GMP concept is the identification and delineation of critical resource areas which must be preserved and protected from unregulated development on the basis of health and safety consideration, such as aquifer recharge areas, flood plains, wetlands, prime agricultural lands, etc. Data developed from the environmental resource inventory would be used as the basis for the delineation of these areas on a growth management map.

Since natural areas do not adhere to municipal boundaries, it is recommended that consideration be given to regional delineation and allocation of certain critical areas and natural resources.

Beyond critical areas that must be preserved, attention should be given to critical areas that should be preserved, such as steep slopes, scenic landscapes, historic areas and sites, etc. Once again, standards and guidelines will be necessary to assure proper selection and delineation by the municipality.

CURRENT CAPACITY

Regardless of zoning, the current capacity of a community should be determined as a function of (1) natural resource characteristics, (2) existing infrastructure, (3) critical areas that must be preserved, and (4) existing demands of development. This becomes the first critical and controversial phase of the GMP concept because it establishes the current growth potential of the community. Therefore, it must be accurate and reliable.

In this regard, studies would be initiated to determine "loading factors" based on development demands which are satisfied by:

1. on site natural resource capacity such as well water supply, septic tank capacity, erosion potential and flood potential

2. existing infrastructure providing natural resource related capacity to a site such as water supply, sewer capacity, solid waste disposal and energy
3. existing infrastructure providing nonnatural resource related capacity to a site such as roads, schools, etc.

When considered in the aggregate, loading factors would represent the maximum demand that could not be exceeded by development either on a given site or with respect to the comprehensive area. Site factors would be mapped. On a given site, current holding capacity would be related to all of the loading factors affecting the site. These factors would represent the maximum demands in terms of density regulations that development would be permitted to make.

The demands of existing development should be deducted from the total loading factors to determine the increment of new development that could be permitted in a manner consistent with current capacity. The result of this final calculation gives the maximum current growth potential.

Upon determination of its current capacity, a municipality could conceivably zone accordingly and make no provisions for capital improvements for additional future growth and development. Realistically, this is not likely to happen. Conditions will change (a new trunk line built by the county, a new state highway, a new state facility, increasing regional demands) and the municipality will have to make adjustments in its plan and growth management regulations. The bridge from the present to the future which establishes the base of ultimate growth is a growth management plan. This plan is included in the revision process.

Needless to say, models and standards are essential to insure uniformity and objectivity in determining current capacity. When legislation is being prepared, serious consideration should be given to how these standards and models could best be developed and administered.

GROWTH MANAGEMENT REGULATIONS

The purpose of growth management regulations is to guide development in a manner consistent with the preservation of critical resource areas, existing current capacity, socioeconomic factors, community objectives and regional concerns. In essence, this is the traditional zoning ordinance, developed within a comprehensive planning process, but based upon an explicit current capacity determination.

The legal instrument of the GMP concept is the growth management regulations adopted in ordinance form and designed to allow growth which cannot exceed the current capacity unless capital improvements are made consistent with a growth management plan. Development rights would be issued on the basis of these regulations. The intent of the initial growth management regulations would be to establish a maximum density and intensity of use which could not be exceeded unless improvements were made to expand facilities related to load factors.

The system for the creation, distribution, utilization and conversion of development rights is directly related to the current density and use regulations, as described below.

TRANSFER OF DEVELOPMENT RIGHTS MECHANISM

The intent in incorporating the TDR concept into the growth management program is to provide for a more equitable distribution of the windfalls and wipeouts associated with the regulation and development of land. In this way handicaps to effective planning and zoning are considerably reduced and growth is encouraged to proceed from a sound planning basis. At the same time, critical area preservation is facilitated while citizen participation in the growth process is enhanced.

The basic components of the TDR mechanism are:

1. creation of development rights
2. distribution of development rights
3. utilization of development rights
4. adjustment of development rights
5. taxation of development rights

Creation of development rights—The initial creation of development rights would be based on the initial growth management regulations developed for a community. Two alternative bases for the creation of rights are suggested: (1) density and (2) acreage. In either case, three primary types of development rights would be created: (1) residential, (2) commercial and (3) industrial. Within each of these categories, subclass distinctions could be made if judged necessary (e.g., single-family detached and multifamily attached development rights).

Using a density base, development rights would be created corresponding to:

1. the total number of dwelling units (or possibly bedroom

units) reflected in the growth management regulations, including existing units
2. the total square footage of commercial space reflected in the growth management regulations, including existing commercial space
3. the total square footage of industrial space reflected in the growth management regulations, including existing industrial space

It should be noted that in each case the development rights created include rights to cover existing development (although these rights would be merged with existing development).

On an acreage basis, the number of development rights created would simply correspond to (1) residential, (2) commercial and (3) industrial acreage contained in the growth management regulations.

It should be noted that although density and acreage are presented as alternative bases for the creation of development rights, a combination of the two would also be feasible.

Distribution of development rights—Regardless of the basis used in creating development rights, the distribution of each type of right (residential, commercial, industrial) would be established on the basis of the ratio between the assessed value of each parcel of land in the community and the total assessed value of all land in the community. Every landowner would be entitled to receive a proportionate share of each type of development right based on this ratio but not to exceed the full development potential of developable land as reflected in the growth management regulations. In the case of existing development, landowners would receive sufficient development rights to cover such development.

Utilization of development rights—In order for any parcel of land to be developed, it would be required that development rights consistent in both type and number with the proposed development be demanded as a condition precedent to the issuance of a building permit. Needless to say, the proposed development would have to conform to the growth management regulations for the parcel in question. Once a parcel is developed, the development rights exercised would merge with the development until the land was either returned to an undeveloped state or redeveloped or converted into a use requiring a different type and/or number of rights than those originally used. In the case of redevelopment or conversion of use,

development rights would have to be obtained to cover such changes. Development rights distributed to landowners for existing development would automatically merge with the developed parcels upon distribution, and filing procedure would record this fact.

The owners of unattached development rights would be free to use them for the development of their own land, subject to the growth management regulations on that land, or in the present or at some future date they could place them up for sale in the free market.

Adjustment of development rights—The type and number of development rights that exist must at all times be consistent with the growth management regulations in a community. As growth management regulations are changed, development rights will have to be adjusted to maintain the required consistency.

In the case of density based rights, changes in the growth management regulations would necessitate (1) the creation and distribution of additional development rights if the changes resulted in increased gross densities for a community and/or (2) the conversion of existing unattached development rights from one type and number to another if the growth management program changes resulted in a change in the type of development rights required for a particular parcel (e.g., a change in use from residential to commercial). In such instances, the conversion of unattached rights would be based on the ratio between the number of rights of each type involved in the changes (i.e., an exchange rate would be established for each amendment of the growth management regulations).

On an acreage basis, changes in use would always involve only the conversion of development rights from one type to another. Such conversion would simply be based on an acre-for-acre exchange rate.

The distribution of additional development rights created as a result of an increase in current densities could accrue to all landowners or to the local governing body for the benefit of all community residents. The latter alternative may raise legal questions concerning the exercise of police as opposed to taxing powers.

Taxation of development rights—Development rights would be taxed in a manner similar to real property. Initially, the value of each type of development right (residential, commercial, industrial) would be determined as a percentage of the assessed value of

undeveloped land of each type. Subsequently, sales of development rights in the free market would be used to establish their values. Undeveloped land would continue to be taxed as real property though its assessed value would reflect the separation of development potential. Exercised rights would not be taxed but would be merged with the improvement on the developed land and the improvement would be taxed at its assessed value.

THE REVISION PROCESS

The foregoing sections set forth the basic elements needed to establish a growth management program. The revision process is essentially an updating or adjustment process based on a long-range view of community and regional growth. Many aspects of this process have been treated in the foregoing sections to permit each element to be presented in its entirety.

Specifically, any revisions of current capacity and growth management regulations must be accomplished in an integrated manner, coordinated with a capital improvements program to control both the rate and sequence of development so that they will be expressly consistent with the ultimate development objectives set forth in a growth management plan. In short, current capacity cannot be increased and reflected in the growth management ordinance unless the infrastructure is expanded as set forth in the capital improvements program.

The essential components of this revision process are:

1. a mandatory long-range growth management plan
2. a mandatory n-year capital improvements program related specifically to the densities and uses proposed in the growth management plan and the growth management regulations
3. a mandatory n-year review process requiring a reexamination of the entire program

In essence, the jurisdiction would have a specified time period (n years) following the adoption of the initial growth management regulations to prepare for the revision process.

Since a vital element of the GMP concept is the determination of current capacity, which in turn is the basic foundation of the growth management regulations, it is essential in developing a long-range growth management plan to make a careful reanalysis of the determinants of current capacity—natural resources, critical areas, existing infrastructure and existing development. This reanalysis provides a frame of reference for the various ramifications and

implications of long range socio-economic factors, long range community objectives and long range regional factors in relation to the development of a growth management plan.

It should also be noted that a revision of the growth management regulations would have to be accompanied by an adjustment of development rights as described in the section on the TDR mechanism.

Summary

In summary, the growth management program presented here is proposed as a local planning and zoning process that will realistically balance growth with environmental concerns. Its main emphasis is the determination of current capacity and its primary mechanism for implementation is the transfer of development rights. Owners of land in both the preserved critical areas and the developable areas share in the benefits of community development since the realization of full development potential is dependent upon the purchase and sale of these development rights. In essence, the GMP concept is intended to tie zoning to a more rational and definable base, and to eliminate the inequities in the traditional zoning process.

The growth management program described in this paper exists as a conceptual model. However, sufficient legal research is presently available to justify the statutory enactment of a growth management program based on the reasonable expectation that the concept will be upheld as a valid approach to guide growth. It should be apparent though, that its application to specific government jurisdictions will require considerably more than mere legal justification. It will also require specific types of research to transform the model from its conceptual form to a form that can be implemented with a minimum of administrative and technical complexity.[6]

REFERENCES

1. B. B. Chavooshian, T. Norman, Esq., and G. H. Nieswand, "Transfer of Development Rights: A New Concept in Land Use Management," Cooperative Extension Service, Cook College, Rutgers University, Publication 492-A, May 1973.

[6] The author and several of his colleagues are currently engaged in applied research efforts of the types indicated on both the TDR and GMP concepts. It is the author's sincere hope that this paper will stimulate others to undertake related research in this important area of growth management.

2. B. B. Chavooshian, G. H. Nieswand and T. Norman, Esq., "Growth Management Program: A Proposed New Approach to Local Planning and Zoning," Cooperative Extension Service, Cook College, Rutgers University, Publication 503, June 1974.
3. Village of Euclid v. Amblea Realty Co., 272 U.S. 365, 1962.
4. F. Bosselman and D. Callies, *The Taking Issue*, 1973.
5. F. Bosselman and D. Callies, *The Quiet Revolution in Land Use Control*, 1971.

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