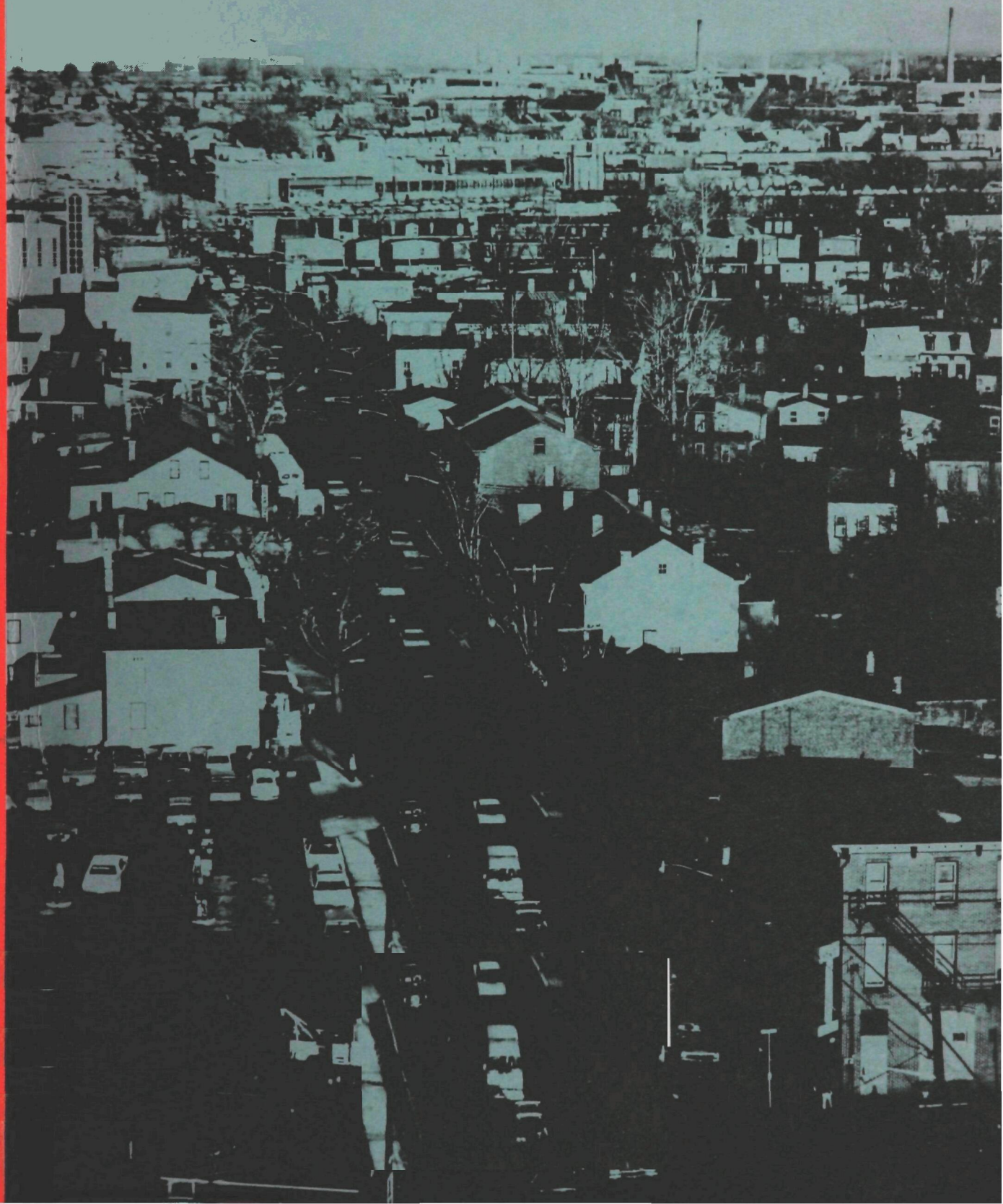
LAND USE

A Report of the Region II Youth Advisory Board
to the Environmental Protection Agency
Regional Office II



LAND USE

Report of the Region II Youth Advisory Board to

the Environmental Protection Agency

Regional Office II

November 20, 1972

Prepared by

Paul Chakroff
Steve Melman
Marilyn Spigel

Edited by

Marilyn Spigel

Environmental Protection Agency
Regional Office II
26 Federal Plaza
New York, New York 10007

Acknowledgements

The authors of the report wish to thank Vivian Li, Richard Willinger, Miguel Antonetti-Alvarez, and Nancy Carter for their contributions to and extensive comments on the Report. We would also like to thank Robert Jacobson and Herman Phillips for their assistance and patience. Our thanks too to the Region II Public Affairs secretarial staff for their help on everything from travel vouchers to the myriad typographical corrections made in the draft report.

Youth Advisory Board
Environmental Protection Agency
Region II Office
Federal Building
26 Federal Plaza
New York, New York 10007

Letter of Transmittal:

Region II Administrator:

Mr. Hansler: The Region II Youth Advisory Board herewith submits its Land Use Study, November 1972, in accordance with the resolution of the National Youth Advisory Board, Environmental Protection Agency, February 1972, that a National Study of EPA's Effects on Land Use should be conducted. The document represents the work of the Region II Youth Advisory Board and its Intern Staff. The members of the Board generally agree with the contents and recommendations of the Report, however, their agreement on specific items is by no means unanimous. The Board feels that the most important suggestions of the report are that one, the EPA weigh environmental problems and their solutions in a holistic arena, which intrinsically includes land parameters, and two, the EPA strengthen its anticipatory role in environmental protection.

Richard Willinger
YAB Region II Chairman

Paul Chakroff
Land Use Coordinator

Miguel Antonetti Alvarez

Roger Davis

Nancy Carter

Dennis Hayden

Bruce Jacobson

Vivian Li

-TABLE OF CONTENTS-

Preface

This report is an attempt to trace the interrelationships between land use and environmental quality, especially as they relate to the U.S. Environmental Protection Agency. Many of these relationships are subtle and their significance is often neglected. However, the Land Use Task Force believes that unless increasing attention is paid to land use, the Environmental Protection Agency will progressively decrease in its effectiveness. The report also studies the extent to which Federal policy and other Federal agencies work counter to EPA's mandate to preserve and protect the environment.

This report attempts to deal more completely with the functional relationships between land use and environmental quality by discussing EPA programs within the context of major users of the land. Thus, the report is divided into categories which reflect the urbanization process, the transportation network, and the open land and water areas of the region. As befitting a region that contains many of the major urban areas of the United States, the report devotes considerable attention to these categories within an urban or suburban context. The final section of the report recommends immediate, specific changes that EPA could make to more actively engage the problem of land use.

EPA is still a young agency searching for its most effective role. As changes and reorganization take place, it is hoped that increasing attention will be paid to the ways in which land is used. A tendency currently exists to regard the question of land use as somewhat frivolous in light of the many other serious problems that confront this region.

The authors understand that program divisions are overworked and understaffed even without taking on new responsibilities. However, without a new orientation for EPA, one that considers land use as an integral part of environmental quality control, the situation can only grow worse. Without this orientation, EPA will constantly find itself in a position of cleaning one environmental scourge and as a result injuring another important environmental system the land.

SECTION I

URBANIZATION AND FRINGE DEVELOPMENT

1. The Urbanization Process: Obstacles to Rational Land Use

For myriad reasons, much current development in the United States takes the form of loosely strung together suburbs in ever expanding radii from our major urban centers. The evidence of this continuing development on the urban fringes is all around us: some hypothesize the existence of one huge metropolis in not too many years from now, consisting of the continuous suburbs from Boston to Washington, D.C.

In few parts of the country is this urban fringe development more widespread than around New York City. The Regional Plan Association (RPA), a New York City-based citizens organization dedicated to the development of an efficient, attractive and varied tri-state metropolitan region surrounding the Port of New York, has projected the New York City Standard Metropolitan Statistical Area to grow by six million people in the next ten years. Half of this growth is to occur in northern New Jersey. The currently existing farmlands will house a major proportion of our urban uses--residential, industrial, and recreational--by the 1980's.

An indication of this fringe growth is that of housing starts. While only 25,500 new dwelling units were authorized for construction in Newark between 1960 and 1965, some 211,400 new units were authorized in the nine northern New Jersey counties which comprise the western portio of the New York City Metropolitan Area.[1]

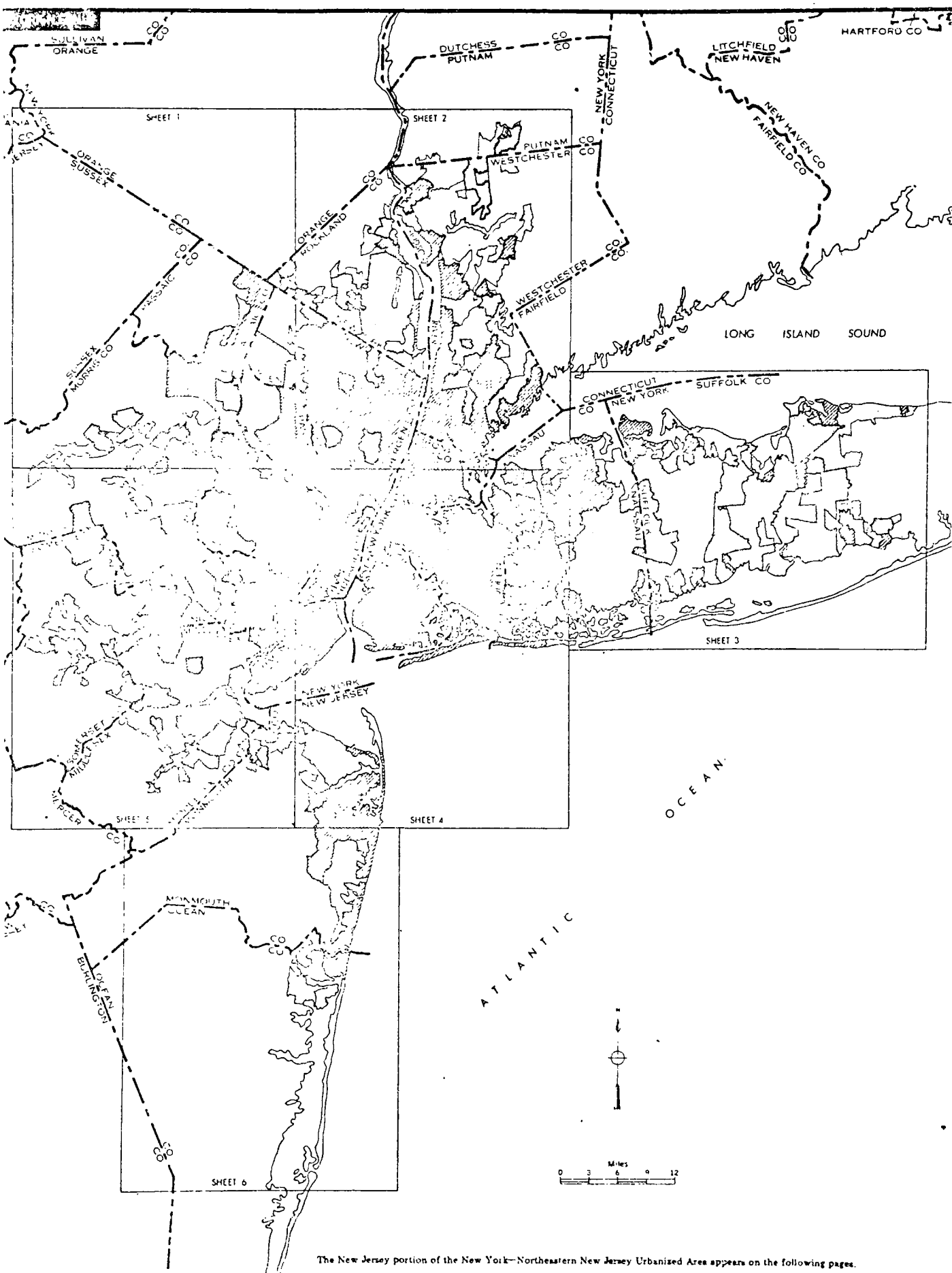
The successive fringe developments since WW II now total more people than the original inner city. And the growth has not been entirely residential. In 1970 more workers commuted into suburban Westchester County, N.Y., in the morning than commuted out.[2] Industrial relocation from outmoded plants in the city to new modern facilities in developing areas is bringing the new jobs to these areas. Decentralization from Manhattan is a very real phenomenon as corporate headquarters such as IBM sprout among the rural settings of the region.

Unfortunately, this development all around the large cities has proceeded in a manner that can best be described as haphazard and capricious, with consequent profound impacts for environmental quality, some of which have not yet been felt. The reasons for the squandering and misuse of the land are many. An attempt will be made to explain several.

In the United States land is not thought of as a resource but rather as a kind of blue chip stock known as real estate. "Buy land as a hedge against inflation" people are told--and buy land they do, for which they ultimately expect a handsome return on their investment. Thus, land goes to the highest bidder more often than it goes to the use which would be best environmentally, socially, economically (in the sense of long range cost to the community, etc.)

Not only is this one predominant value that must be countered to foster sensible use of the land, there are numerous other facets of the tradition of the United States that lead to poor development practices. One is the "Go West Young Man" ethic--the big push for clean, fresh land out on the frontier where life can begin anew. It should have

ıized Areas



The New Jersey portion of the New York—Northeastern New Jersey Urbanized Area appears on the following pages.

been obvious to the public for many years that we have just about run out of frontiers. However, not an issue of the New York Times goes to print without an ad for land in Arizona or New Mexico for sale (in quarter-acre plots) and for those who can't bear to be too far from Saks and Bloomingdales department stores, there are always Westchester County or Northern New Jersey plots.

Another common attitude makes regulation of land development an uphill task: There is an ancient legal and historic tradition that we have inherited from England that "a man's home is his castle." It is true that numerous modern court decisions have upheld the right of municipalities to zone, condemn land, perform eminent domain, etc. However, the effectiveness of these types of tools is often a function of the degree of public cooperation. It is entirely possible that this cooperation would be forthcoming in instances where the planning agency's decision was well justified and where care was taken to explain how the action would benefit the public as a whole. However, the planner is first faced with the problem of explaining to the public many of the factors governing land use that are never discussed in school and rarely discussed afterwards. It would be difficult to find a profession that is more obscured from public understanding. Land development and planning are virtually never part of a general education process. Thus, when suddenly faced with an unknown planner who wants to stop a nice old Mrs. Miller from selling her farm to a factory complex that would mean more jobs and tax revenues for the town at large, public reaction is predictable and understandable.

There are a number of more tangible governmental obstacles to rational land use, not the least of which is the present reliance upon property tax for the finance of local public services.

The bulk of municipal revenue collection comes from the property tax. The property tax, or real estate tax, is a tax on property owners. Each parcel of property is assessed a monetary taxable valuation. Usually this assessment is a fraction of the actual market price of the parcel. The assessment is then taxed at a rate which is usually expressed as so many dollars per $100 of assessed valuation. Suburban municipalities developed after World War II spend a major percentage of their budget on schools, and therefore most of the property taxes go towards school expenditures. Older municipalities (which exhibit characteristics of socio-economic problems generally categorized as "inner city") spend proportionately less of their budget on schools. These older cities usually have larger service expenditures such as welfare and fire protection.

In the older cities the property is not valued as highly as property in the newer suburbs, especially residential property. In fact, with the increased incidence of deterioration, abandonment, and demolition, the total dollar value of assessed real property becomes less and less capable of meeting the costs of the municipality. Old streets in the municipality need more repairs than the new ones in the suburbs. And older, younger, and poorer people generally require more expensive services than the people found in newer suburbs.

Thus, although the older cities need far more money to meet their fiscal requirements, they have increasingly less valuable property to tax

for the necessary revenues. The inevitable outcome is that they must keep raising their property taxes until the rates are higher than those in the surrounding suburbs. This reinforces the undesirability of the older locations and sends many home owners and much industry out to the urban fringes that might not have otherwise relocated.

The property tax has hurt the communities on the urban fringe and altered development patterns there, as well. The plan for Nassau and Suffolk Counties, New York termed the reliance on the property tax (particularly for support of local school systems) "the most formidable obstacle to successful implementation of a rational land use plan."[3] Due to the high costs of running education facilities and providing basic capital improvements such as sewers and streets, only a few of the things that the property tax finances, municipalities become more concerned with attracting high-tax uses of the land than with developing a well-planned attractive environment. "Clean" industry such as the computer industry or executive offices of large corporations became in terrific demand and land that was formerly set aside for open space was sold so it could provide tax value.

Although much industry moved out to the urban fringes, many blue collar and middle income workers could not. Just as industry means a high tax base, low price homes mean low taxes to town authorities. Many towns protected their all-sacred tax base by passing zoning ordinances that required not only large minimum lot acreage before a home could be constructed but also minimum home sizes far above any standards that bear a relationship to health and safety. A frequent rationale local governments used for these actions was the absence of

adequate sewers, water, etc., to accommodate a large influx of population. Sometimes, the courts accepted these arguments, increasingly they will not. It has been well documented (as will be discussed later) that there are methods of preserving land, natural resources and environmental amenities without requiring the purchase of $75,000 worth of land by each family moving into a community as had occurred in a number of town with five acre lot minimums and land that sold for $15,000 dollars an acre.

Ironically, the municipalities seeking to limit their costs by imposing high lot requirements and thus allegedly diminishing demands upon schools, utilities, and other public facilities, may incur far more hidden costs than they realize. These communities with large acreage zoning often are victims of a sprawled land use pattern with its concomitant high social and capital costs. More streets and longer sewer connection lines are required. Their children may have to travel much further to school than if the community were better planned, entailing high social costs and expensive school busing. These types of communities may end up paying more taxes than even they can tolerate in their quest for exclusiveness.

Quite justifiably, the property tax is now under attack by a wide cross-section of communities in both New York and New Jersey, however, challenges to the tax in both states have failed thus far. In New York, the Fleishman Commission Report of January, 1972 recommended that the state take over the full financing of public education during the course of the next five years. The recommended method would be a uniform, statewide property tax for education at a rate of $2.04 per $100 of true value. Local rates would eventually be stabilized at this figure.

This would be in line with recent court decisions made in California, Texas and Minnesota holding that the use of local property tax to support education discriminates against children who live in communities with low property values. However, a challenge to the constitutionality of New York's school financing system was dismissed in the New York State Supreme Court of January of this year.

Similarly, setbacks were faced in New Jersey on this same issue. Governor Cahill's tax reform bill which sought to remove the regressive property tax burden from municipalities and replace it with a broad based income tax met with defeat by the New Jersey State Legislature in July of this year.

The whole concept of land taxation is very much related to another enemy of rational development patterns--that of governmental fragmentation in the face of problems that demand a regional approach. New York and New Jersey are both strong home-rule states, which means that considerable planning responsibility is delegated by the state to local municipalities. These municipalities are continually competing with each other for tax base, for industry, for government grants, etc. Few cooperate with each other to any significant extent.

Yet, they are all faced with problems far beyond the scope that they can control as individual towns or villages. These small communities are collectively creating such massive problems as the New York City regional conglomeration of natural, economic, and social forces, yet the regional agencies currently existing have far less political and legislative authority than even a small village.

Regional problems demand a regional problem solving approach, most obvious in terms of resources such as air and water, but in addition, in relation to such pressing difficulties as solid waste disposal, allocation of land, attraction of tax revenues, watershed protection, flood plain zoning, etc. Unfortunately, regional planning and co-ordination will be slow in coming as local political leaders loosen their grip on local pursestrings and patronage sources with only the greatest reluctance. The courts are just beginning to rule against localities that have deprived whole regions of what was rightfully theirs. For example, the New Jersey Supreme Court recently ruled that beaches and ocean waters are a public trust.[4] It was decided that municipalities with such natural resources cannot charge higher fees to non-residents for use of these resources. Now suits are underway against several of the communities on Long Island that shut the doors to their beaches to New York City residents. Hopefully, the number of rulings in other areas related to regional sharing and coordination will lead to the reform which is unlikely to come from the legislatures of the two states at present.

One of the major forces likely to spur legislation giving broad ranging authority to regional planning agencies is the pollutant level spilling from the older central cities that lack the tax base to curb the pollutants. The suburbs are just beginning to realize that while they have, for example, attracted significant amounts of New York City's tax base, they are also inheriting its pollution as it spreads down through the Long Island Sound. New York City claims that it simply doesn't have the funds to construct the necessary water treatment plants

as rapidly as they are needed. Consequently, with each heavy rainfall, the Long Island Sound receives a fresh influx of New York City's pollutants.

Interestingly enough, Puerto Rico (which will be discussed later in the report) has a fairly centralized governmental system, and yet it still must struggle with a difficulty that is plaguing all urban and fringe areas most severely and causing blatant misuse of the land. That, of course, is the extensive Federal and State highway building programs that has such marked impact upon urban fringe development. There is incredibly little interface between State Highway Departments (which do most of the planning for federally aided highways) and land planning agencies. Even if there were, it has been pointed out that the power of regional agencies is exceedingly limited in most cases and local agencies are often totally incapable of dealing with and channeling the massive push for land that follows even rumors of highway construction.

Despite the fact that New Jersey presently contains highways that have been described as "the country's biggest free parking lots," pressures are mounting on what undeveloped land remains to construct still more of the sprawling residential and commercial developments that demand automobile use. In fact, the people who make their living by dealing with the land as a speculative entity rather than a resource prefer to see the highway built in advance of development (the antithesis of rational planning) so that they can see their land increase in value. This type of approach practically insures that the highway will be obsolete before it is formally opened. It also leads to a development pattern in which it is very difficult to efficiently operate any kind of

transit facility on anything but an inconvenient and money-losing basis. These considerations do not deter people like realtor Joseph Dobbs however, whose Dobbs Associates, Inc., earned $16.5 million last year by selling residential property in Morris, Somerset, and Hunterdon Counties, much of it along the interstate routes. "We still face a housing shortage in New Jersey and more highway miles that are opened, the greater the land availability for our basic working force. The limits of a 45 minute travel time for the wage earner can be extended as much as 10 or 12 miles by the simple addition of an express route," Dobbs has said.[5] Only at the beginning. And only if he/she is one of the first to move in. After several years it may take as long as 45 minutes just to cover those extra 10 or 12 miles on the "expressway" at rush hours. "The basic working force," as Mr. Dobbs likes to call them will also, no doubt, have to suffer the brunt of the increased carbon monoxide and nitrous oxide levels. For if typical trends continue, industry will also move out along the new interstate routes, drawing its labor from widening circles.

While the air pollution levels in suburbia grow higher, they grow unbearable in the inner cities, particularly for the urban poor. For the urban poor there are no expensive trips out of town in the summer, even few daily escapes. Often, their housing lies close to both heavy street traffic and inefficient industry living out its last, polluting days. This leads to serious health hazards, such as the high blood lead levels that 400,000 inner city children are believed to suffer with.[6]

Highway money is not the only major federal spur to development that can then procede far ahead of resource planning. Federal sewer grants in some communities have stimulated growth levels that communities never expected and had no capability to handle. In general, communities have not tended to worry about their resource problems until severe shortages or pollution levels appeared on the horizon. With not many exceptions, it was only then that air or water or land quality became more important than tax base or some other more "practical" goal.

Thus, critical elements of our environmental system such as flood-plains, wetlands, open space, drainage patterns, and soil content have been sacrificed to tax base, land speculation and political expediency. The resulting environmental problems are expected and numerous. Many communities that developed too rapidly, with insufficient thought to the future, have created extreme water shortages for themselves. Wetlands that should have been protected were used for sanitary landfill as communities turned to what seemed the easiest and cheapest way to dispose of solid wastes. Septic tank subdivisions provided more profit for the developer than his/her bearing part of the cost of sewering. Some communities lacked both the foresight and the nerve to forbid such practices. Air quality diminished as automobiles became necessary for every trip from home in the sprawled fringe environment.

If just two of these environmental difficulties are examined more carefully at this time, it becomes clear what a great stake EPA has in rational land development. Other cases will be examined throughout this report. At this point a brief look at drainage patterns,

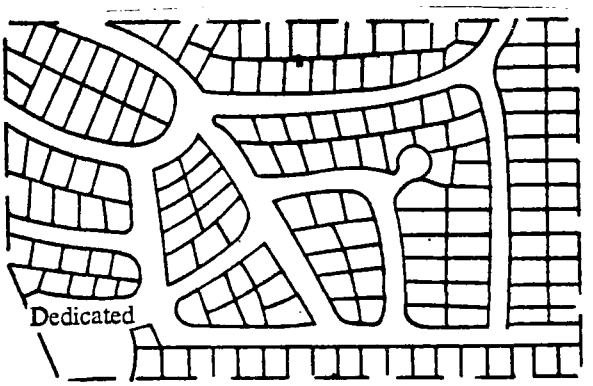
subdivision planning and solid waste disposal practices will help emphasize what has been discussed.

Nature performs a number of valuable functions for man free of charge. One such service is the vast underground water network that underlies most communities, and is continually replenished if man does not interfere. However, as much of the surface of the land is paved over, the cycle is disturbed, a major source of pure water curtailed. According to one authority, "...the introduction of hard surfaces such as buildings and streets increases the amount and velocity of surface runoff. The coefficient of runoff c, the fraction of total rainfall which runs off on the surface may vary from almost 1 on waterproof surfaces or even over 1 when warm rain falls on ice or snow to as low as .01 in dense old woods with spongy soil."[7]

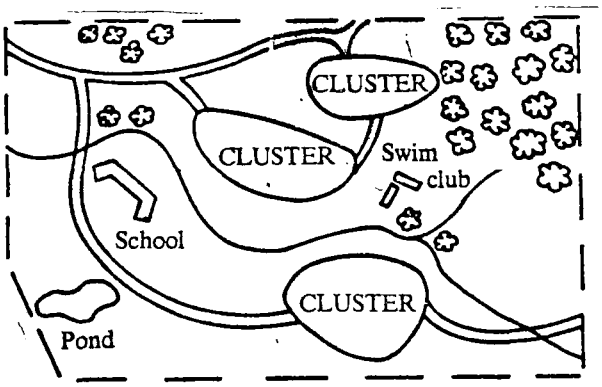
Unfortunately, however, the predominant development approach that has been taken to deal with this problem is not the best solution. The State of New Jersey (among others) recommends certain minimum lot sizes based on the drainage and water recharge capabilities of the soil. Hunterdon County, New Jersey, which shall be examined later, follows these state recommendations religiously. However, the evils of large lot zoning have already been examined, and countless experts feel that clustered development--an environmentally sound approach--actually improves drainage much more.[8]

As usual though, good ideas don't always work when set into the arena of uninformed public opinion. In Suffolk County on Long Island, two builders attempted to combine a 230 acre tract Planned Unit Development with wetland preservation. They would have built clusters of two story

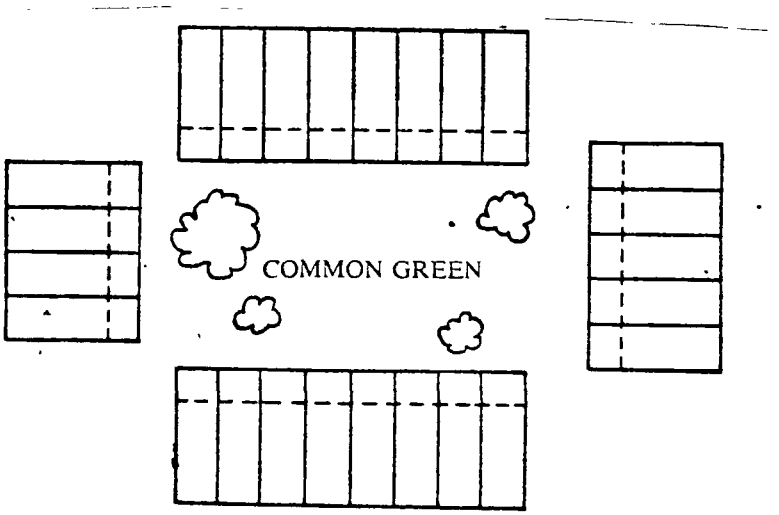
A not un-typical development plan in which little attention is paid to protecting open space or the natural features of the landscape.



A cluster development plan allows land to be protected without additional cost to the developer.



There is considerable leeway and opportunity for variety in the design of the individual clusters that make up a cluster development. Here is how a cluster could look.



rce of
grams:

Last
ndscape

liam H.
/te

garden apartments on 119 acres, and deeded the other 112 acres of open space to a land trust. However, there was great public opposition to the Town of Islip having to change its zoning ordinance in order for this to be accomplished.[9] Long Island residents, as do residents of many other suburbs across the United States, view apartment construction as encroachment by the city they moved to the suburbs to escape.

Similarly, solid waste disposal practices that result from expediency, too rapid development, shortage of funds, and lack of knowledge of the long range environmental results of these actions are foolhardy. As long as sanitary landfill continues to be the cheapest means of disposing of solid waste, many communities will continue to use this method, even though they may be radically misusing the land in the process.

One such site is the Hackensack Meadowlands of New Jersey, parts of which may still be described as a fragile and valuable environmental system. Despite this, 118 communities dispose of their waste in the Meadowlands, accounting for 27% of the solid waste generated in the State of New Jersey. New York City looks longingly towards the Meadowlands as relief for its own waste problems, even though at this time it is clear that New York City will never use the Meadowlands for waste disposal.

It is conceivable that if EPA provided markedly increased assistance in such areas as resource recovery programs, it could alleviate the strains on other EPA programs involving water resources. This could happen if water recharge areas such as wetlands were not used for dumping but rather, were allowed to do what nature intended them to do--store water.

Numerous good arguments can be made for a land development system based on the "physiographic determinism" put forth by Ian McHarg, Chairman of the Department of Landscape Architecture and Regional Planning at the University of Pennsylvania. Instead of laying down an arbitrary design for a region, the plan that nature has already laid out would be found and adhered to. Development would procede only where it would not markedly disturb the complete environmental cycle that could function in an almost self-regulating way. Presently, according to McHarg, "...Marshes seem made to be filled, streams to be culverted, rivers to be dammed, farms subdivided, forest felled, flood plains occupied, and wildlife eradicated."[10] It would be most beneficial for EPA to completely explore the implications that this type of planning could have for its programs. At this point a general discussion of the existing legal devices and tools available to planners would help to clarify what mechanisms for the control and regulation of development are currently available.

2. Land Use Control Mechanisms

One authority describes three land use control systems.[11] The first is the official system. It consists of the legal tools of zoning, subdivision, and official map control. Zoning regulates the use of land and structures within given zones, i.e., residential, industrial, etc. Subdivision regulates the dividing of the land for more intensive use and allocates the costs for certain incidental facilities such as sewers and other utilities. When a developer blocks off his/her land into several lots on each of which a house will be built, subdivision has taken place. Finally, the official map designates future open space in undeveloped areas. This open space is primarily in the form of parks and stream beds. Environmental criteria are allegedly used with each tool. In providing municipal services the functional interrelationship of uses is analyzed so that compatibility of use can occur.

The second system of land use control is the tax system, that is, the regressive property tax system previously discussed. Many believe that once the tax system topples, other systems will be ripe for a merging of inner city and suburban interests.

The third system of land use control is the planning of public works. In the case of Readington Township in Hunterdon County, New Jersey, the completion of two Interstate highways suddenly made the town easily accessible from all directions. The impact of these highways on land values and development, in any area, is massive. Hi-rise office structures frequently are built at the intersection of two highways, one example being the Hess Office Tower at the intersection of the New Jersey Turnpike

and the Garden State Parkway. The degree to which public facility planners have neglected the economic, social and environmental impact of their projects is clearly demonstrated by the 20-year master plan recently unveiled by the New Jersey Department of Transportation. The plan sheds no light on how New Jersey is to develop its system. DOT Commissioner John C. Kohl comments, "What we have here is a broad framework for development, and we will show how various programs fit into the framework as we go along."[12] As usual, the highway planners will look at the havoc they create after the damage has been done.

Norman Williams Jr., suggests a creative method for avoiding the ugly strip-commercial development so common along highways. He combines official map techniques with public facility planning to subdivide a layout so that the next residential street parallel to the highway is only a half block back. "With such a system, the principal problems are thus resolved automatically (ribbon development). Here again it is the physical layout of the public facilities specifically, the distance between two public streets, and the provisions for access from adjacent lots to the highway--which is likely to determine the future land use."[13] With a landscape buffer between the highway and the backyards of the adjacent residences, the commercial development with its unsightly appearance and dangerous traffic generating parking lots would be impossible. Through such logical, legal means, land use can be positively affected.

The New Jersey Department of Environmental Protection has recognized the vital role land use controls play in determining environmental quality. Thus, Commissioner Richard J. Sullivan testified as

amicus curiae (friend of the court) in a recent zoning case in the Somerset County division of the New Jersey Superior Court.[14]

The action involved the Allan-Deane Corporation's attempt to upset a five acre minimum lot size ordinance in Bedminster Township. Allan-Deane wanted to build a conference center, dwelling area, and stores in a planned unit type of development near the recently completed intersection of two major transportation corridors, Interstates 78 and 287. On June 13, 1972, Commissioner Sullivan stated that the New Jersey Department of Environmental Protection (NJDEP) took no sides in the action. Rather, he wanted to initiate a general discussion of the need to consider environmental factors in land use decisions and the legal justification thereof.

Sullivan pointed out that land use "...is clearly the single most important determinant of the quality of air and water, and it is probably the single most important factor in determining the quality of life generally."[15] At the same time, land use commitments are generally more or less permanent, changes cannot be made without great effort. Poor land use inevitably leads to environmental problems, some of which may be remedied by technology. However, Sullivan emphasized that technology is only a short-term expedient. As he stated in his brief:

> It is possible to build sewage treatment plants, at great expense, to cleanse the effluents of any town or city; but if the number of connections to a sewer treatment plant increases beyond the capacity of that plant, water quality will continue to deteriorate. It is possible to require potential sources of air pollution to install the most modern abatement equipment; but if the number of chimneys and the number of automobiles grow rapidly the air will remain unhealthful...It is unmistakably clear that choices between competing demands upon this limited resource /the land/ must be made with infinite care and wisdom.[16]

Although efforts by environmental protection agencies to involve themselves in land use considerations are noteworthy, unfortunately, Sullivan's implied solution to the dilemma rests again with exclusionary zoning. He concedes that if a zoning ordinance that is restrictive or exclusionary "is found not to be fairly justified through competent proof by environmental considerations, the appropriate remedy is to direct the municipality to develop a new master plan and zoning ordinance in conformity with certain environmental guidelines."[17] Implicit in that statement is the notion that if the ordinance were well supported by environmental considerations it should be allowed to stand in its current form. That would be a grave mistake. As discussed previously, large lot zoning not only discriminates against sizable segments of the population, it leads to environmental problems not found in communities that make intelligent use of such techniques as cluster zoning. While it is important that land use regulatory tools become part of the everyday language of environmental agencies, it is necessary that they be understood thoroughly, and that planners be employed who can deal more successfully with local planning authorities in attempts to guide land development along environmentally sound paths.

To illustrate in depth many of the points that have been brought up so far, examples will be drawn from two case studies that exhibit both striking similarities and differences. Readington Township in Hunterdon County, New Jersey, is rather typical of an urban fringe area in Region II faced with factors that suddenly make it ripe for rapid development. It is failing to cope with the rapid development in an intelligent and foresighted way, and environmental problems lie ahead for it.

The island of Puerto Rico, also facing continued rapid growth, is already encountering critical environmental difficulties due to the limited land area it has to work with and land consumption patterns that ignore this factor. It has established sensible governmental structures which, due to its centralized nature, could handle problems. However, extraordinary factors make proper land use extremely difficult to obtain in Puerto Rico.

FOOTNOTES

Section I - Urbanization and Fringe Development

1. The Urbanization Process: Obstacles to Rational Land Use

2. Land Use Control Mechanisms

1. Ernest Erber and William Andersen, Jr., "New Jersey: Issues and Actions Regional Plan News, No. 83 (April, 1967), p. 12.

   The nine northern New Jersey counties are Bergen, Essex (containing Newark), Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset, and Union.

2. Chris Kristensen, John Levy, and Tamar Savir, The Suburban Lock-Out Effect, Research Report No. 1 (White Plains, N.Y: Suburban Action Institute, March, 1971)

3. Nassau-Suffolk Regional Planning Board, Nassau-Suffolk Comprehensive Development Plan: Summary (Hauppauge, N.Y: Nassau-Suffolk Regional Planning Board, 1970)

4. Borough of Neptune City v. Borough of Avon-by-the-Sea, Supreme Court of New Jersey (September Term, 1971, A-71)

5. "Realtor Credits Highways in Opening Residential Area," Star-Ledger (Newark), January 28, 1972.

6. Task Force on Environmental Problems of the Inner City, Report of the Task Force to the U.S. Environmental Protection Agency, Our Urban Environment and Our Most Endangered People, September, 1971, p. 50.

7. William Howard Espey, Jr., C.W. Morgan and F. D. Masch, Some Effects of Urbanization on Storm Runoff From a Small Watershed, Report 23, Texas Water Development Board, 1966.

8. Just a few of the sources that indicate the superiority of clustering to large lot zoning as a protection for the land and the environment are:

   R. W. Carter, Magnitude and Frequency of Floods in Suburban Areas, U.S.G.S. Professional Paper 424-B, 1961.

   William H. Whyte, The Last Landscape (Garden City, N.Y: Doubleday & Co., Inc., 1968)

   William H. Whyte, Cluster Development (New York: American Conservation Association, 1964)

9. Charles E. Little and John G. Mitchell, Space For Survival: Blocking the Bulldozer in Urban America, A Sierra Club Handbook (New York: Pocket Books, 1971), p. 14.

10. Whyte, The Last Landscape citing the works of Ian McHarg, pp. 182-83.

11. Norman Williams, Jr., "The Three Systems of Land Use Control," Rutgers Law Review (Fall, 1970)

12. Star-Ledger (Newark), July 28, 1972.

13. Williams, "Land Use Control..."

14. See Brief of Richard J. Sullivan, Commissioner of Environmental Protecti State of New Jersey, Amicus Curiae, Allan-Deane Corporation v. Township of Bedminster, Superior Court of New Jersey Somerset County (Docket No. L 36896-70 P.W.)

15. Ibid.

16. Ibid.

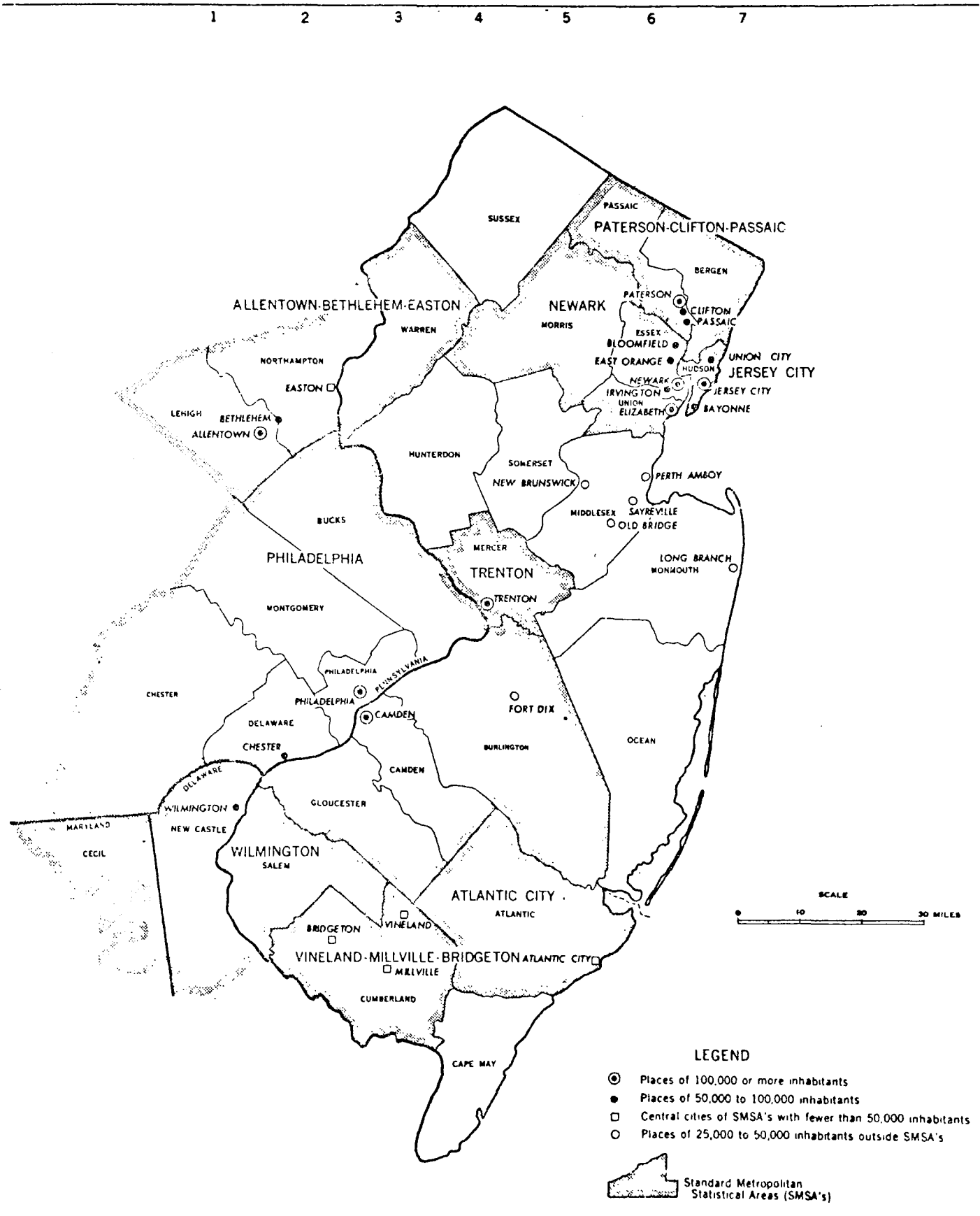
17. Ibid.

3. Case Study: Readington Township, Hunterdon County, New Jersey

Hunterdon County is a large county with a small population. Recently beginning to feel the impact of urbanization, Hunterdon has a 1970 population of 69,718, a 28.85% increase from the 54,107 residents of 1960.[1] Readington Township is a municipality in the eastern part of Hunterdon with a 1970 population of 7,688 which is a 25.06% increase from the 6,147 population of 1960. To the west is the Easton, Pennsylvania industrial area. To the south is Trenton and Philadelphia. And to the east is New York City and environs. Clearly, with the completion of Interstates 78 and 287, along with other good roads, Hunterdon County is within an hour and a half of a market made up of the two largest cities in the eastern megalopolis, New York and Philadelphia: a market comprising over 25 million people. Industry realizes this potential and so do developers. The big push, so typical in the slightly older counties to the east, is on.

Hunterdon County is growing at a more rapid pace than the state of New Jersey as a whole. A conservative estimate would be that 200,000 people will live in Hunterdon County by the year 1985. East-west public transportation, especially bus service to New York City, is excellent and provides a further impetus for growth. North-south travel will be over excellent highways, I-287 and route 202. About one-fourth of the land area is being used for residential purposes while half of the land is in agricultural production. Only one-tenth of the municipality is classified as vacant.[2] An additional undocumented fact is that a majority of the land held by so-called developers is really in the hands

unties, Standard Metropolitan Statistical Areas, and Selected Places



of speculators, according to Mr. Sturmer, Readington's zoning officer.

The above synopsis indicates that the area, in particular Readington, on its present path is doomed to oversaturated development. The necessary transportation facilities are there, and so are the land speculators, driving up the price of the remaining farm and vacant land. What if this situation were allowed to proceed without any controls. What would be the impact?

At a 6% growth rate, by 1985 Readington would need 45,000 new dwelling units. If this residential impact seems staggering, consider the impact of the facilities that are necessary to accommodate this growth. With an uncontrolled growth rate of just 6%, by 1985 Readington would need about 140 miles of new streets. The impact of these additions will be massive on drainage facilities and upon the landscape. But equally significant will be the effect on the real estate taxes which pay for the improvements. Each additional subdivision projected allows an additional developer to drive up land prices and to treat the land as a speculative commodity rather than as a resource.

The County Planning Board, in its Master Plan Report No. 18, has set criteria for industrial growth. Based on a rating system of highway access, existing sewers, existing water sources and proposed sewers, the Board has allotted an additional 1,350 acres for industrial developments, creating a 1985 total of 1.5% of the county land area in industrial use. The maximum employment growth from such a projection would be an additional 2,150 workers. When this figure is compared to the 45,000 new dwelling units planned for Readington, alone, by 1985, it becomes clear that those who live in Readington and Hunterdon County will have to work elsewhere.

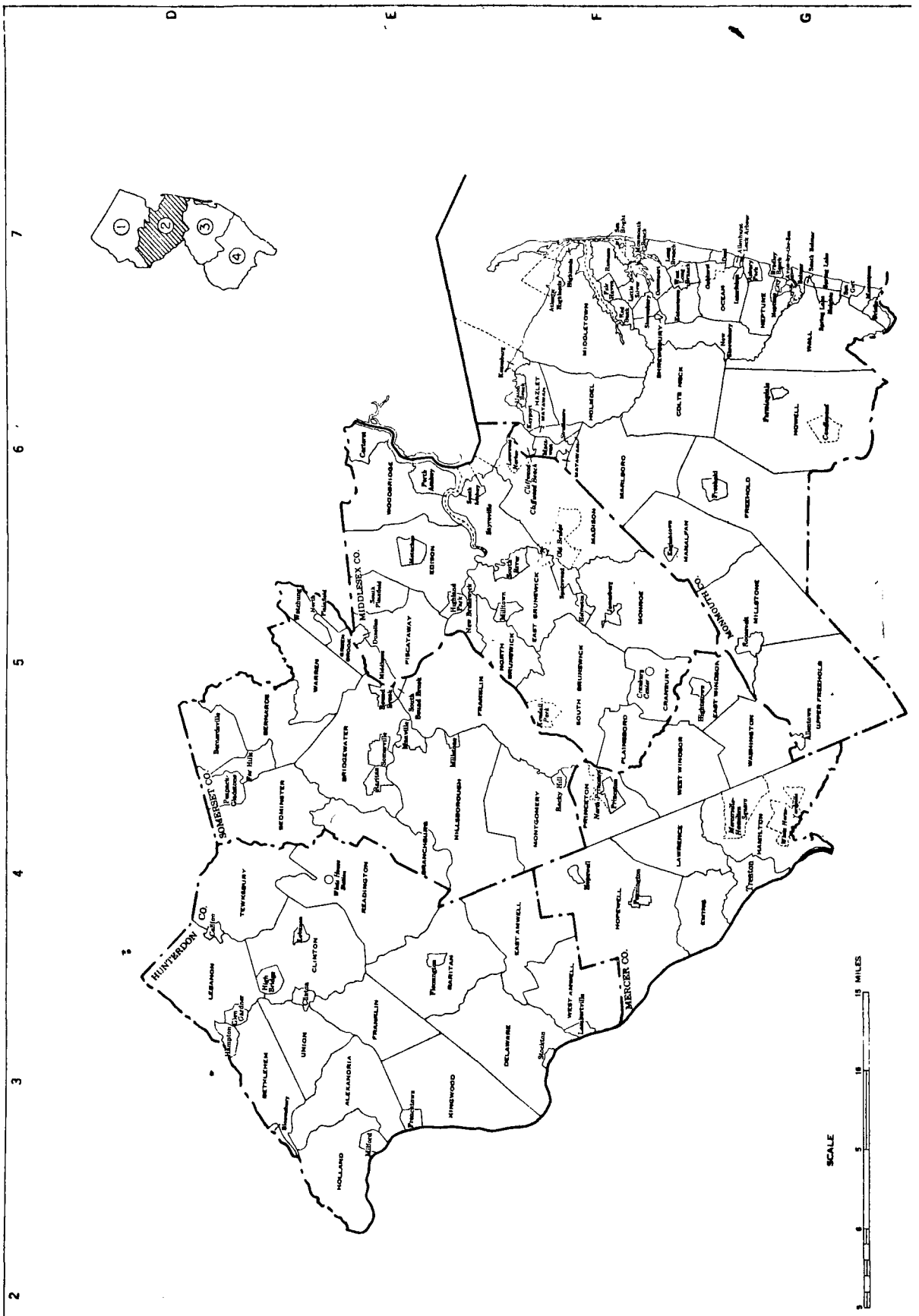
Despite this planned housing construction, a severe housing shortage exists in New Jersey. It has been estimated that when present demand, replacement of substandard units and replacement of those units becoming substandard are considered, 79,000 to 87,000 new dwelling units are needed each year in the state. In 1969 less than 40,000 permits were issued, meaning the housing shortage is increasing in severity, aggravated by growth and migration coupled with spiralling costs. From 1960-69, Hunterdon County's housing stock grew by 20% with 3772 permits being issued. Of these, 88.5% were one-family structures, 1.7% two family structures, and 9.2% three or more unit structures (no public housing was built in the county during the 1960's).[3]

Governor Cahill has expressed fears that while single family homes pay their way in most states, it is not the case in New Jersey where real estate taxes are counted to pay for twice as much of the municipal budget as elsewhere in the nation.[4] Not only is the projected growth forcing people to commute between homes and jobs, but also this growth will, if left uncontrolled, be of such a nature as to bankrupt the municipalities which are paying for facilities out of real estate taxes.

To bring the focus from the regional and county levels to the local level, the Readington region of the county, being older, led all five county regions in the total number of dwelling units, 5227, in 1960. From 1960 to 1970 Readington led all Hunterdon towns in the increase in new dwelling units, 1201. However, Readington was last in the percentage of new dwelling units built in multi-unit structures, only five percent.[5] The result is a continuing fiscal bind which will peak in Readington before other parts of the county. The picture of the case

NEW JERSEY

County Subdivisions/Townships and Places



study area so far is that of uncontrolled growth spelling disaster for the future. The county has no authority in subdivision, zoning, building, health, or nuisance codes. The municipality's ordinances are permitting an amount of growth which cannot be handled environmentally or fiscally without disaster.

What of the open space in the County which has yet to fall into the hands of developers and speculators? The New Jersey Green Acres program has already acquired 232 acres of a desired 453 acres in Hunterdon County within the Delaware River Valley.[6] These purchases will insure the availability of boat launching, fishing, picnicking and other water-related activities. Parks, playgrounds, and wilderness areas are also being planned for the newly purchased Green Acres land. The federal government covers half of the purchase price of $700,000 (about the same federal share which is contributed for sewer construction).[7] Of the 23% of the County designated as open space, very little is used for active recreation.[8] It appears that outright purchase of open space is not providing much recreation for the County's residents.

As for landscape preservation, the purchase of less than fee rights and interests is necessary. Visual paths from highways preserve magnificent views if billboards are controlled along with development. For example, the State could purchase the right to restrict tree cutting on a mountain which produces a beautiful view from a highway. A combination of various legal techniques is necessary to preserve landscape without huge expenditures.

The provision for sewers is a major shaping force in any developing area. The New Jersey Department of Health must approve all new sewage

plants in the State. As a result of 1966 legislation, New Jersey requires sewage treatment facilities to be built on the basis of drainage basin rather than municipal boundaries. The Department of Health makes grants for feasibility studies for sewer systems, while the Hunterdon County Planning Board is the area-wide planning agency for federally assisted community improvement project review.[9] Sewers are the one type of facility which seems to be dealt with on a regional basis. The problem to date is that the regional needs and criteria determining sewer placement are usually soil conditions and existing development. These criteria are insufficient in that they fail to consider social implications. Development, whether it be residential, commercial, or industrial often follows the corridors of municipal improvements such as sewers. The regional planning of sewers must consider future land use as a primary concern, in addition to the other criteria such as soil condition.

Readington will build, finance, and govern most of northern Hunterdon's sewer system. Other municipal users of the system will pay rent for their line tie-ins and treatment of effluent. Attorney William D'Annunzio, representing Readington has said that approval by the New Jersey Department of Environmental Protection would allow interest-free loans from the State to pay for the preliminary engineering studies. Anticipating approval, Readington already has applications for federal sewer construction funds pending before the U.S. Department of Housing and Urban Development. The system will not be completed for at least two years because the State may require tertiary or advance treatment. Such a requirement would entail nitrate and phosphate removal from sewage and the establishment of polishing ponds or lagoons to hold the effluent for two or three

days while it aerates. Industries and restaurants might have to treat effluents before sending them to Readington's treatement plant.[10] This process indicates many of the interrelationships among local, state and federal governments in planning for sewers.

The present water supply in Hunterdon can support 200,000 people, an increase of 8.8 million gallons per day must come from surface sources to meet the demands of 1980.[11] The expected cluster of industry and the geologic formation of the area does not produce large yield wells. The Hunterdon County Planning Board estimates that by 1985 some 128,412 people will be served by water companies. Using the figure for per capita demand as one hundred gallons per day, a total residential demand of 12.84 million gallons per day will occur by 1985. The residential demand coupled with the industrial demand means that 8.8 plus 12.84 or about 21 million gallons per day will be necessary. In 1966 only 2.1 million gallons per day were supplied by water companies. To meet these immense future demands, proposals have been made to have the North Branch and South Branch Raritan rivers flow into a confluence reservoir. The Elizabethtown Water Company would draw 60 million gallons per day while the North Jersey Districts Water Supply Commission would request 70 million gallons per day with an additional 20 million gallons per day in reserve. There are also plans to build a pipeline to the Delaware River via Rockaway Creek, the confluence reservoir, and the Round Valley Reservoir. The ecological impact of eastern New Jersey drinking water pumped from western New Jersey is obviously massive.

The Master Plan Report for water put out by the Hunterdon County Planning Board describes the proposal in detail. The County has asked

the State Water Policy and Supply Council for 15 to 25 million gallons per day to service the communities of the South Branch watershed. The County would treat and put back the water, although such a process is less than 100% efficient because of septic tank usage. In summary, land use planning is proceeding ahead of water resource planning and no agency seems to be coming to grips with this crisis. The Round Valley Reservoir, once opposed by conservationists, is now the object of protective efforts by conservationists. The projected demand for water is reversing priorities, even among the staunchest conservationists.

According to the Master Plan Report of the Hunterdon County Planning Board, the County is responsible for all bridges, most large drainage structures, and drainage into and out of the County road system. Therefore, the County is looking at development in the area in terms of the effect on drainage. The County has the power to adopt subdivisions and site plan resolutions. However, such power is best described as suggestive rather than jurisdictional. A county wide Drainage Plan is currently being written which will aid developers and give municipalities a way of assessing the costs of development.

The County Master Plan Report Solid Waste indicates that all but four of the municipalities dispose of their solid wastes outside the County boundaries. Readington, however, has its own sanitary landfill site. The County feels that a carefully watched sanitary landfill is the best way to dispose of solid wastes, but at a rate of 4.6 pounds of solid waste per resident per day, the County is now dumping 37,000 tons of waste outside of its boundaries each year. If 6 to 12 acres of sanitary landfill are necessary today, some 344 to 675 acres will be

necessary by 1985. To minimize the impact of solid waste on land use, Hunterdon must begin to plan ahead for solid waste disposal.

One point must be emphasized. In addition to the federal and state agencies, as well as the county and local planning boards, numerous other agencies and organizations are involved in the development and regulation process of a geographic and political entity such as Readington Township. This fragmentation of different levels of official and unofficial authorities make even relatively simple procedures complex. This can be observed by examining the land regulatory process in Readington.

Land use decision-making at the local level is carried on by the planning board. The planning board is a body of local residents which decides whether or not certain proposed uses are compatible with the Master Plan. The Master Plan or Comprehensive Plan is not a legal tool, but rather a report which gives evidence of a well thought out rational plan. If a developer is denied a building permit, he might look at the master plan to see whether he was arbitrarily and therefore, unjustly denied, or whether his proposed development was really an incompatible use with future plans. The courts require the existence of the comprehensive plan to justify any action of the planning board. The zoning map, another non-legal device often mentioned,is merely a pictoral display of the zoning ordinance.

In Readington, another body other than the Planning Board, the Board of Adjustment, handles cases requesting variances from the uses the zoning ordinance allows. The stated purpose of the Readington Zoning Ordinance adopted on November 1, 1961 and revised this year is,

Existing Land Use in Readington Township

(in acres)

Total Residential	7,728
High Density Residential	-
Village Residential	492
Low Density Residential	1,362
Rural Residential	5,874
Commercial	242
Industry	33
Agriculture	16,830
Institutional	-
Public and Semi-Public	90
Recreation	6
Transportation and Communication	42
Vacant	5,812
Total	30,783

The various residential areas range from one to two acre zoning for individual lots.

Source: Hunterdon County Planning Board, Existing Land Use and Natural Characteristics, 1969.

insurance program requires detailed flood plain mapping to exist in each applying municipality. There are three methods of determining where the flood plain ends. The State uses the least cautious method of noting the high water marks. Noting alluvial soil deposits defines a wider area of flood plain. The safest method, with tropical storm Agnes only a short time in the past, is to determine the 50 year flood mark. One would feel relieved if the State had some control where Readington was noticeably negligent. But the Bureau of Water Control in the Department of Environmental Protection reviews only those subdivision requests which are sent to it. The Bureau cannot require all requests to be sent to its reviewers, so there is no back up control on possible risky development.[15]

The subdivision ordinance is the legal tool which most directly controls problems such as drainage, sewers, and landscaping without having additional hidden social effects. The Township of Readington Subdivision Ordinance of 1963 and amended in 1971 is a potential land use control of great power. For a developer to subdivide his parcel into lots, he must first submit a sketch plat to the Planning Board. Such a sketch is only approximate although the extent of detail required is precisely stated in the Ordinance. The Planning Board is able to notice any non-compliance or other problems from the sketch plat. When the sketch plat is approved, the developer pays fees to have the Board examine the preliminary plat. This second step is at a very precise, engineering level, and usually one of the Planning Board members is, in fact, an engineer. To show serious intent and to protect the community, the developer must, at this second stage, post performance bonds to insure

that the expensive municipal inspections will not be wasted on a false project. Finally, a more detailed final plat is submitted at which time additional performance bonds must be arranged by the developer to assure the construction of facilities such as sewers even if he goes bankrupt before the development is complete. This procedure is of necessity very rigorous. An appeals procedure is also in effect for dissatisfied developers. Variance procedures are established. And detailed requirements for street, sidewalk, and utility construction are listed.

This Subdivision Ordinance appears to be a good control, but it could be much stronger. The County reviews all subdivision applications within its boundaries, but it has only advisory "power."

It is easy to see how regional environmental, social and economic problems occur when the agencies that were created to administer for the regions are subordinate in land use control power to the small municipalities. Readington Township's zoning ordinance is by no means unique. In fact it is rather typical of the area. It satisfies the citizens of the community as well. However, satisfying individual communities rarely leads to a well planned region as an entire unit unless comprehensive measures are taken to assure this.

For example, the Hunterdon County Planning Board devised a questionnaire and conducted a survey to help them determine goals with the participation of the residents. The results of the survey showed that there is a definite desire to maintain the rural atmosphere of the County and to retain open space. Growth should be limited and the County should "...encourage the provision of a variety of dwelling units

in terms of environment and cost without encroaching on the open space character or natural beauty of the County's landscape." Cluster development was favored. The people desired an age diversification among future residents but wanted no racial mix. A combination of small and large lots was favored while the "new town" concept was disliked.[16]

One of the problems with the Planning Board's analysis is that nowhere is the concept of "regional need" mentioned. The Governor of New Jersey has appealed to the varied municipalities of the state urging them to contribute their fair share of the solution to New Jersey's housing shortage. To protect scarce natural resources, regional planning must take place. Yet, many communities within Hunterdon County actively attempt to avoid their share of the responsibility.

Industries are relocating from inner cities to suburban areas because of high taxes, crime, and outmoded, crowded plants. People work in these plants and when the plant relocates, the worker must relocate or be able to commute long distances to keep his/her job. Commuting generates traffic. Moving with one's job generates housing demands. But Hunterdon County prefers no racial mix, so restrictions are devised. Expensive housing is a barrier for low and moderate income people, so if Hunterdon can require expensive housing to be constructed, they have closed the door to all of the forces of change operating in the region outside. In cyclic fashion a new wave of high taxes forces relocation and more severe housing and job shortages result. The present low income residents of Hunterdon are faced with severe problems. The Directory of Manufacturing Industries published by the County Planning Board shows only 100 factory jobs in the Readington area. How do un-

skilled workers earn a decent living when the higher income residents zone out industry for aesthetic reasons? With whom should the responsibility rest? Can a municipality close its doors to regional problems?[17]

A developer, the Mack Company, and a not-for-profit institute, Suburban Action Institute, are jointly sponsoring a proposal to build 2000 units of town houses and garden apartments on 200 acres in Readington.[18] The area is presently zoned for 1-3/4 acre lots and single family detached dwellings. With federal and state subsidies, rents would range from $30 a room for a family with an income up to $9,500, to $50 a room for those with incomes between $9,500 and $18,000. Depending on income, a two-bedroom apartment could rent for between $135 and $225 a month. A full 51% of the development area is designated for open space. Ecologically and socially, such a mixed development relieves more regional needs and is less environmentally devastating than the proposed 1-3/4 acre square lots, scalped to fit a street pattern. The work schedule proposed would give priority to a sewer project before the housing was constructed. Such a project would bring diversity of people and would allow low and moderate income to relocate with their jobs when industries move away from the cities. Under New Jersey not-for-profit laws, any profits derived from this development would be channelled back into the project. Final plans will be submitted to the Readington Planning Board by the fall of 1972. Mr. Sturmer, Readington's zoning officer, doubts whether the project will be approved, and at any rate, hopes to delay matters until the State Supreme Court sets a precedent for such development. The future of this project in Readington will in

a large way be a harbinger of the type of urbanization one can expect over the next decade in New Jersey. Ten years ago, the fringe of urban development was much further to the east. In one decade, poor land use planning has allowed huge areas to be paved over. Now a good percentage of the population lives in these new developments. Regional problems must not be hidden from through exclusionary systems.

There is a hopeful note in that goals change over time. Five years ago the residents of Hunterdon County voted down the state's first large scale funding of Green Acres projects.[19] Since then open space has been bought up by speculators and leased back to farmers until the time came ripe to develop. State laws allowed low taxes to be applied to farmland enhancing the developers interests in some cases. This process, repeated many times, convinced County residents to favor the Green Acres program which is preserving vast lands along the Delaware and elsewhere.

The changing attitudes towards the Green Acres program emphasizes the differing opinions concerning open space. Some people like huge wilderness areas which can be driven to. Others like scattered public open spaces which can be walked to in the neighborhood. The idea is to permit options and personal choice, that do not lead to environmental or social harm. Increasing the number of alternative options will in the long run please more people than any solution forced upon them. At the turn of the century, the Englishman Sir Ebenezer Howard proposed a set of concentric circular greenbelt buffer areas to surround London. Such a forced open space solution has advantages and disadvantages.

The major disadvantage occurs when engineers draw their concentric circles and leave as open space a choice development site while they allow a perfectly beautiful natural resource area to be developed. Flexibility is vital. People are happiest when they have viable alternatives to choose from. No two people like the same things and planning for recreation or different types of housing should recognize this, where it is still possible.

However, in the past public choice and its fear of delegating too much power to a central agency that could then assure that rational land use occurred, has caused much of our sprawled suburban environment. People wanted single family homes on quarter acre plots and they got them, regardless of the environmental, economic or social consequences for the public at large. Land was dealt out via a consumer demand system as are toasters or automobiles.

Mr. Dumont Van Doren, the new Hunterdon County Planning Director, has said that "In Hunterdon County, we are right in the middle of a growth period and we have to plan now for future needs, which we've done in the master plan."[20] That is sheer nonsense. No master plan handles growth and land development. It merely describes what should be done. Then, only those agencies with the appropriate legal authority to act may do so, and those agencies are mainly at a micro rather than a macro level, where regional development and growth cannot be channeled effectively.

Rational growth could be accommodated without crises if adequate mechanisms existed to deal with this growth. Many of our other environmental resources could be protected if land were so protected.

An examination of the land development patterns and environmental problems of Puerto Rico helps to emphasize some of the points that have been made with reference to Hunterdon County, and also to show what may happen to these suburban fringe areas, if they continue to develop in the manner they have been following in the past.

FOOTNOTES

Section I - Urbanization and Fringe Development

3. Case Study: Readington Township, Hunterdon County, New Jersey

1. Hunterdon County Planning Board, 1970 Population Data (Flemington, N.J: Hunterdon County Planning Board, 1971)

2. Hunterdon County Planning Board, Existing Land Use and Natural Characteristics (Flemington, N.J: Hunterdon County Planning Board, 1969)

3. New Jersey Department of Community Affairs, The Housing Crisis in New Jersey (Trenton,N.J: New Jersey Department of Community Affairs, 1970)

4. Ibid.

5. Hunterdon County Planning Board, An Anaylsis of Housing in Hunterdon County (Flemington, N.J: Hunterdon County Planning Board, 1970)

6. Hunterdon County Planning Board, Delaware Valley Impact Study (Flemington, N.J: Hunterdon County Planning Board, 1970)

7. Hunterdon County Democrat, July 6, 1972.

8. Hunterdon County Planning Board, Open Space in Hunterdon County (Flemington, N.J: Hunterdon County Planning Board, 1970)

9. Hunterdon County Planning Board, Sewers in Hunterdon County (Flemington, N.J: Hunterdon County Planning Board, 1969)

10. Hunterdon County Democrat, June 29, 1972.

11. Grossman & Sherman-Consultants, Present and Prospective Use of Water by the Manufacturing Industries of New Jersey, Report to the New Jersey Division of Water Policy and Supply, June 14, 1963.

12. Township of Readington, Zoning Ordinance of 1961 (By Order of Readington Township Committee)

13. Ibid.

14. Constance Gibson, Mobile Homes (New Brunswick, N.J: Rutgers University Press, 1972)

15. See R.S. Tatton, The Need For Flood Plain Zoning in Readington Township, Hunterdon County, May, 1967.

16. Hunterdon County Planning Board, Goals for Hunterdon County (Flemington, N.J: Hunterdon County Planning Board, 1970)

17. The Courts are beginning to rule otherwise. See Oakwood at Madison, Inc.v. Township of Madison in which Middlesex County Superior Court voided an entire zoning ordinance because all of the remaining vacant land in the Township was zoned for large acreage lots, and because multi-family development was virtually prohibited. In re Appeal of Kit-Mar Building, Inc. 439 Pa. 446, 268 A. 2d (1970) was also an important decision in this area.

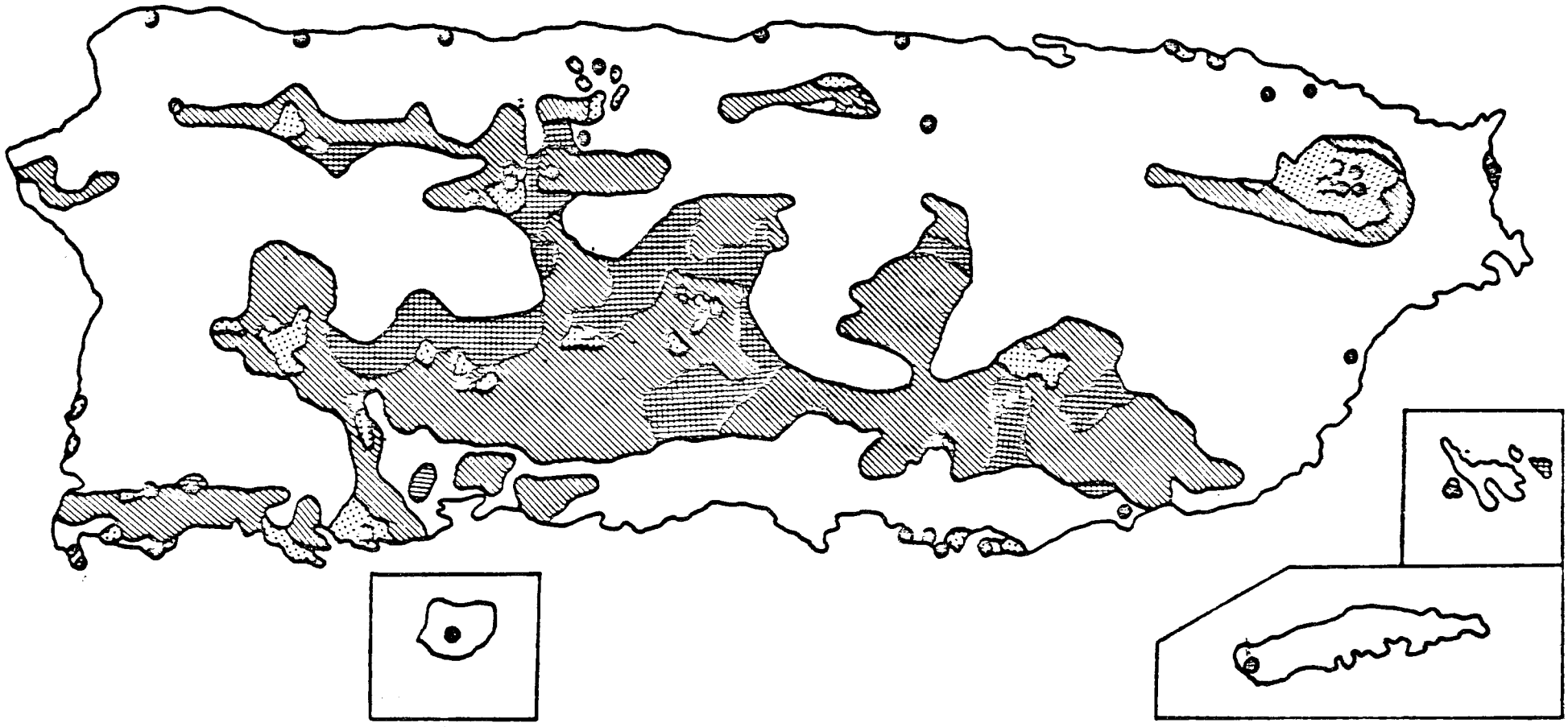
18. Bergen County Record, April 28, 1972.

19. Editorial, Hunterdon County Democrat, July 6, 1972.

20. Hunterdon County Democrat, June 15, 1972.

AREAS THAT SHOULD BE PRESERVED IN NATURAL CONDITIONS

Commonwealth of Puerto Rico



Natural Areas that should be preserved because of: (1)Slope > 60 per cent, (2) slope > 40 per cent and thin soils, (3) non productive lands, or (4) more than 100 inches of annual rain fall.

Natural Areas of Extraordinary Value

Other areas that should be preserved to protect scenic views, lakes and basins.

Existing Public Forest Areas.

Source: US Soil Conservation Services in cooperation with The Bureau of Master Plans, P.R. Planning Board.

4. Case Study: The Commonwealth of Puerto Rico

Puerto Rico is no longer a "quiet, little island" leading an agricultural existence. Far from that, it is a vastly urban island which suffers from many environmental problems. Perhaps the greatest cause of these problems is the unplanned and haphazard growth of the island's urban centers which are devouring one of the island's most precious resources -- the land.

In order to appreciate why land is such a precious commodity in Puerto Rico, it is important to be aware of the island's population distribution and density. As of the 1970 census, Puerto Rico, which has a surface area of 3,339 square miles, had a total population of 2.7 million people, 55% of which lived in built-up areas.[1] Vast areas on the island are not utilizable for urban purposes because the land is either too hilly or it lies on flood plains. For this reason it is not possible to obtain any reliable information about population density from the above figures.

A recent study has estimated that around 455 square miles of land on the island are potentially utilizable for urban purposes,[2] but the islands urbanized areas as of 1970 occupied 137 square miles of level area.[3] The island's population density was over seven thousand people per square mile in the urbanized sectors of the island in 1970, the population density within the municipal boundaries of San Juan being well over 9700 persons per square mile.

Although cities now occupy a very small fraction of the island's level surface, the urban land area is expanding more rapidly than the

population. The Puerto Rico Planning Board has predicted that by 1985 the urbanized portions of the island will occupy over 300 square miles of level area.[4] This increase is profoundly dramatic, since it will represent more than a doubling of the urban land area in a little over a decade. It is important to bear in mind that the 137 square miles occupied by cities in 1970 represents urban growth since the island was discovered in 1492. According to this projection, by 1985 almost 66% of the total level area potentially available for urban development would be used up. Thus if urban sprawl continues at today's rates, it is reasonable to expect an urban land shortage in the near future.

There are many causes for this dramatic urban explosion. First of all the urban population densities have been decreasing in recent decades, while the rate of natural population increase has been relatively stable at 1.95% per year. The 1950 census showed an average urban population density of over 11,000 persons per square mile as opposed to 7000 in 1970. This decrease in density has been caused in part by rising income levels which have brought about a reduction in overcrowding within houses. Rising incomes have also enabled more people to own automobiles which encourages lower population densities.

Automobiles account for not only a decrease in the population density of the cities but also for an added pressure for developing level areas near cities. In order to emphasize the extent of influence of the automobile, it should be noted that in the decade beginning 1960, the number of motor vehicles on the island increased almost as much as the population did during that same period.[5] One last factor responsible for the decreasing urban density is the overwhelming preference of people

buying homes for single-family detached dwellings. This type of low density development is a major threat to sound land resources allocation since the amount of land available on the island for urban purposes is so severely limited.

In many ways, the Commonwealth government has failed to respond adequately to these problems. Government action has lagged behind in ending some of the economic incentives offered that encourage urban sprawl. The Commonwealth government currently provides funds for the construction of public facilities, such as flood control works and waste disposal facilities, for all new developments. If the funds for such facilities were provided only to existing and planned developments, then this would have a positive effect towards ending urban sprawl since it would mean that the costs of public facilities for unplanned developments would have to be borne by the land developer and/or ultimate homeowner. A haphazard planning process accompanies many developments on the island. For instance, land for a new development is obtained as needed, meaning that the developer, in all likelihood, will be forced to pay astronomical prices for land. This creates several problems. First of all, the developer is unable to acquire enough land to plan an organized, attractive development; secondly the developer is left with little land profit which could potentially be used to provide a higher quality development. Another problem which this brings out is that it causes the developer to refrain from using a site which may be physically more appropriate for his project in order to defend himself against unreasonably priced land--thus the developer is forced to skip over the best land site because of inflated land prices.

This factor accounts, in many instances, for the seemingly random location of many public and private developments. Thus, in general, the island's land development process caters too much to short term economic forces (i.e., inflated land prices), without giving due consideration to the best use that a parcel of scarce land could be put to, and without duly considering the natural variety of the land.

Puerto Rico is paying a heavy price for its unplanned development and haphazard sprawl in diminished environmental quality. According to the Environmental Quality Board's 1972 Environmental Report:

> Nearly all our waters are polluted. Only in the highest headwaters of a few streams is the flowing water safe to drink. The quantity of pollutants is rising rapidly, responding to increased population and production and consumption.[6]

The Puerto Rico Planning Board is attempting to take a land use approach to control future water pollution by preparing a land use plan for the location of contaminating industry. However, to end water pollution from existing land uses a minimum expenditure of $300 million would be required. Thus, the 1972 Environmental Report estimates that because of the cost, a decade or more will be required to satisfy these needs.[7]

Although not as serious a problem as water pollution, air pollution is increasing with the growing number of automobiles in use and with increasing pollution from stationary sources. SO_2 concentrations are of concern, exceeding national primary standards in four locations, mainly near the major power plants and petrochemical plants. Similarly, hydrocarbons and carbon monoxide levels are on the rise.[8] Solid waste disposal

is still on a fairly primitive level as open burning takes place at municipal dumps.

Although strategies and techniques for alleviating these environmental problems are being developed in Puerto Rico at this time, it is essential that steps be taken to curb the land pollution that has been responsible for many of these other forms of pollution.

There are a number of specific measures which if applied in Puerto Rico may have an effect of decreasing urban sprawl. One area is to give government agencies such as the Environmental Quality Board or the Puerto Rico Planning Board more statutory authority over the processes of urban expansion. The Planning Board has zoning power over "urban" areas, but it lacks the general authority to zone on an islandwide or holistic scale. This holistic authority is important for controlling urban sprawl, because unplanned developments, especially along highways in rural areas outside of the "urban areas," are establishing today the urban patterns for the future. A recent move which will undoubtedly have a positive effect in the future land use outlook on the island is the establishment and implementation of an environmental impact statement process whereby government agencies and private firms must analyze the effects on the environment of any project prior to its initiation. This statutory power was given to the Environmental Quality Board.[9]

Another way in which the Commonwealth government could control urban sprawl is through tax reform. Ironically, although high property tax levels make rational land use planning extremely difficult in the United States, in Puerto Rico, residential property tax is almost non-existent. A series of political maneuverings have exempted all homeowners

with residential property of less than $20,000 assessed value from paying any property tax. Thus, the Commonwealth operates under continual fiscal crisis, and little money is available with which to fund land use planning. In addition, Puerto Rico cannot profit from such funding sources as revenue sharing (as the states can) and incomes in Puerto Rico are often low enough to preclude extensive dependence on income tax revenues. Thus, increase in property taxes could be beneficial in implementing land controls in Puerto Rico, at least for the time being.

Increasing import taxes on all motor vehicles entering the island may also produce a decrease in urban sprawl. Since motor vehicles are partly the indirect culprits of urban sprawl on the island, primarily because of the increased mobility which they give the auto-owners and the pressure that they create for more highways, a decrease in the absolute numbers, or at least, a decrease in the rate of increase of automobiles on the island would tend to slow the rate of urban sprawl. Of course, such a move must be accompanied by the development of an efficient mass transportation system, which would provide the populace with a cheap and rapid means of getting about--to work, school, etc.

Another area where the federal government can have a favorable effect on the critical land use situation on the island is by tightening the funds it provides the island for highway construction--a reduction in the rate at which new highways are constructed will surely produce a reduction in urban sprawl.

The Commonwealth government can also exert its power of the purse by refusing to provide the costs of providing public utilities in unplanned

developments, thereby decreasing the economic incentives for such developments.

All of the measures discussed up to this point are aimed at arresting haphazard or unplanned urban development. Yet it is important to bear in mind a prime consideration--houses are being constructed because there is a demand for them. Obviously the urban explosion in Puerto Rico has as one of its principal driving forces the legitimate need or desire of island residents for homes and other facilities. Measures which seek to protect the island's land resources by curbing this desire for more homes will not work. It is important that, at the same time that the measures discussed above are implemented, that people be given an alternative to today's style of homes and to the urban sprawl that abounds throughout the island. One alternative is to stimulate intensive development in specific areas, thus providing for these needs with high density urban developments. The Puerto Rico Planning Board will allow high density developments of 23 dwellings per acre and possibly 60 dwellings per acre[10] as long as such a project is within the overall plan of the Board for development in the area in question. Such high density developments would be of inestimable value in terms of their effects on the conservation of level resources. It is important to keep in mind that living in a well-planned high density development can be a very pleasing and aesthetic experience. In fact such high density developments would, by virtue of their intensive land use, make more land available in the immediate urban setting for open space.

The biggest stumbling block currently faced by high density developments in Puerto Rico is the island's residents overwhelming preference for single-family detached dwellings. Ways of making living in high density development more appealing to the majority of prospective homebuyers on the island must be found. To this effect it may prove fruitful to conduct a study which would determine precisely why the population has such a great preference for single-family detached houses. Environmentally sound alternatives to that life style that incorporate the attractive qualities of single-family home living should be developed.[11]

FOOTNOTES

Section I - Urbanization and Fringe Development

4. Case Study: The Commonwealth of Puerto Rico

1. Environmental Quality Board, Environmental Report-1971, Report to the Governor (San Juan, Puerto Rico: Office of the Governor, May, 1971)

2. Ibid.

3. Puerto Rico Planning Board, Politica Sobre Uso de Terrenes (Commonwealth of Puerto Rico: Puerto Rico Planning Board, 1970)

4. Ibid.

5. Environmental Quality Board, Environmental Report-1971.

6. Environmental Quality Board, Environmental Report-1972, Report to the Governor (San Juan, Puerto Rico: Office of the Governor, April,1972), p. 13.

7. Ibid.

8. Ibid.

9. Section 4(2)(c) of Law 9 requires the preparation of Environmental Impact Statements in connection with proposed governmental actions that could significantly affect the environment. Almost identical to Section 102 (2)(c) of the U.S. National Environmental Policy Act, the statements are intended to assure that environmental factors are both considered by agencies, and also, widely explained and discussed.

10. Puerto Rico Planning Board, Politica Sobre...

11. See "EQB Attacks Waste of Land", The San Juan Star, June 28, 1972 for a discussion of this issue in Puerto Rico. However, single family homes are obvious extremely popular throughout the whole United States as well, and are a major aspect of suburban development patterns. Only recently, have there been signs to indicate that apartment construction is again, slowly increasing (after the single family home boom that began after World War II and continued to accelerate). The elderly and the young are showing strong interest in apartment living, and condominiums and cooperatives are gaining widespread popularity due to the tax shelter that they supply, and because they represent an investment rather than a rent payment. However, in the U.S. and in Puerto Rico there are numerous non-economic motivations for home ownership, many of which have never been systematically investigated It is easy to speculate that social class motivations, the quest for privacy,

11. (cont.) racism, the lack of safety in many major cities, the environmental degradation of the cities all play a part in the exodus to single family homes in the suburbs. However, considerable amounts of research are still required, for whatever the motivations are, they are leading to land use development patterns which make the attainment of environmental quality extremely difficult.

SECTION II

TRANSPORTATION AND ENVIRONMENTAL POLLUTION

1. The Urban Transportation Crisis

In urban areas, and in particular, in an urban area as dense as the New York Metropolitan Region, survival depends upon the efficient movement of goods and people.

Eighteen million people live in this region and depend upon the so-called "balanced transportation system" of the area to get to work, recreation, shopping, etc. Theoretically, this concept of "balanced transportation" refers to an interface of modes, in which the most practical mode or modes is used in a particular instance with connections to different transit means at appropriate points. However, it must be pointed out that this system is merely theoretically workable.

If any city in the United States offers a variety of transportation facilities, it is New York. Around two million people travel into Manhattan alone each weekday on the journey to work. Of these people, roughly 1.4 million use the subways, 200,000 come by bus, 140,000 drive or ride in a car and 100,000 use the commuter railroads.[1] Ferries, the three huge metropolitan area airports, taxis, private planes and boats, and even helicopters are responsible for bringing still more people into the city each day.

Yet, despite this, the automobile is becoming increasingly more responsible for the squandering of our land and the deterioration of the quality of life in the New York Metropolitan Region, and in particular, in the inner-city. In a hearing of a subcommittee of the New York State legislature, Jerome Kretchmer, New York City's Environmental Protection Administrator testified that:

> At the beginning of this century, the automobile was hailed as the emancipator of the common man. Today, that dream has become a nightmare...We see these cars clogging our streets, endangering our lives, fouling the air, assailing our ears, devouring our open space. Nowhere are these problems more intense than in New York City.[2]

Fortunately, most commuters in the New York Metropolitan area use mass transit in one form or another. New Yorkers use public transportation more than residents of any other city in the United States, and in turn, 80% of the public vehicle miles operated in the United States are in New York City.[3]

The large number of transit riders in the New York area however, has not prevented either the increasing use of automobiles nor the increasing environmental degradation to which the city is subjected. This trend towards the use of automobiles can be traced to many causes. Among these are the development of the highway systems around the region which encouraged the use of automobiles and the decentralization of housing and employment which occurred as mobility increased. For many residents of the region, the highway systems around New York City represent nothing more than a means to get from New Jersey to Long Island or Connecticut.

Although the reasons for increased use of automobiles in this area are many, the increase is occurring at an alarming rate at the same time that use of transit facilities has been gradually falling off. The Tri-State Regional Planning Commission and the Regional Plan Association studied this phenomenon and found that while fewer people are coming into the Central Business District (CBD) of Manhattan each

day, there has been a continual increase in the number of automobiles traveling to or through Manhattan's business district for the last 23 years. By 1971 there were a half-million more cars entering the CBD than there were in 1948.

This increased and continued car usage is readily apparent if the urban landscape is examined. Every mile of freeway uses up to 30 acres of land, while interchanges use approximately 80 acres.[5] The automobile itself uses up a great deal of land as well as requiring approximately 300 square feet of land in its home garage, 300 square feet in its place of destination and 200 square feet of land for those places that repair it, sell it and service it.[6] If these figures are applied to New York City, and if current trends continue, an appalling future awaits New York:

> As new housing is built, as the final goal of 11 million inhabitants is reached, and as old housing is replaced by new housing, all 11 million inhabitants of New York will have to have one car space per family unit. That will give us about 3 million automobiles in New York City. These 3 million automobiles will need as their living space, 4.8 billion square feet of area or 120,000 acres, most of which will be ground area. The total land area of New York is 204,000 acres.[7]

Nor is land the only resource that automobiles squander. During 1970, the New York City Department of Air Resources estimated that private cars, taxicabs, buses and trucks poured out 77% by weight of all the city's air pollution.[8] The full effects and costs of this pollution are just beginning to be felt and quantified. More than 80,000 old or wrecked cars were abandoned on New York City streets in

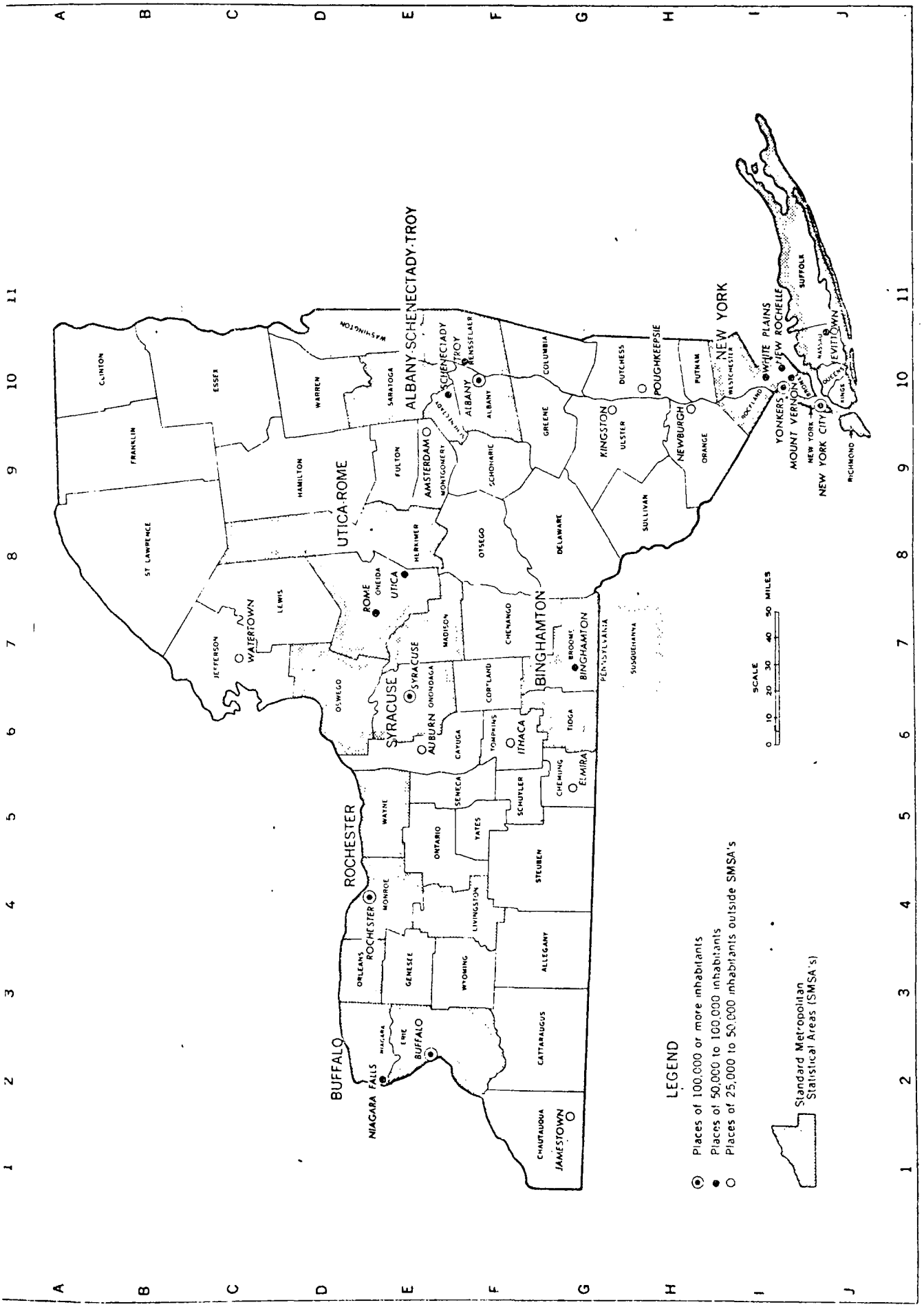
1971.[9] Rush hour traffic produces enough noise to cause hearing loss under continuous exposure.[10] The highways that carry these cars take land that could be used for parks or housing, divide neighborhoods, and cost billions of dollars.

Why has this pattern occurred? Does this land use and expenditure pattern represent the best use of our nation's resources? What do these Federal and State policies promoting highway development mean for the operation of EPA Region II?

Unfortunately, there is substantial evidence that the governmental agencies that promote, subsidize and regulate the development of highways and other facilities for the automobile are insufficiently aware of the effects of their actions upon urban growth and development. In turn, this growth and development leads to both direct and indirect environmental problems.

Highway programs and the development that accompanied them in the newly accessible areas have shifted the employment patterns of the New York Metropolitan Region. There is a new trend towards employment in the outlying areas of New York City. For example, in Westchester County in 1968, it was found that while 116,000 Westchester residents commuted out of the county to work, over 80,000 non-residents commuted in. Another 264,000 people both lived and worked in Westchester.[11] Since that time, there have been a number of other indications that many major employers are leaving New York for outlying suburbs.

ies, Standard Metropolitan Statistical Areas, and Selected Places



Part of this phenomenon can undoubtedly be traced to the deterioration of the transit systems of the New York area and the increased volumes of traffic in the streets, making it difficult to ship goods in or out. Although employment leaves the city, or moves from other ares to New York City's outlying counties, New York City's environmental degradation accelerates. Not only is auto use almost mandatory for intra-county commutation in Westchester, Nassau or Suffolk, as these counties have grown and developed, they have tended to regard New York City as an area best left strictly alone--except to pass through by car enroute elsewhere. There has been little consideration of the fact that air and water pollution know no political boundaries, and thus, many suburbanites feel few qualms about car travel through or in Manhattan.

Due to exclusionary zoning practices and inflated land values, many unskilled laborers must live in New York City and commute to where the new opportunities are for unskilled labor--the suburbs. A frequent mode of commutation in the transit-shy New York suburbs is what has been described as the heavily polluting "fifty dollar bomb"--a car that is barely running.

But one of the main factors pushing people towards the use of automobiles in the New York Regional Area is the deterioration of the transit facilities and the lack of funds available to improve, expand and modernize them.

It is true that a major modernization program is currently going on, and a new 2nd Avenue subway is being constructed with the aid of City, State and Federal money. However, most of these projects are

far behind schedule already. The new rail link to Kennedy Airport, for example, was originally scheduled to be completed at this time, while construction has actually just begun. The money available for rail construction and modernization (or for any urban transit facility) is a mere pittance compared to the funds that the Federal government pours into its highways; thus luring still more people to automobile use and making mass transit operation more difficult.

It costs about $1 billion a year to run the transit systems in the immediate New York City area alone. At a recent hearing of the New York State Joint Legislative Committee on Transportation it was also pointed out that it will cost $13.5 billion just to meet operating deficits in the area around New York City from Bridgeport, Conn., to New Brunswick, New Jersey from 1972 to 1983. Another $7.3 billion would be needed for capital expenses.[12]

Many suggestions, some rather desperate, were made for the future financing of transit facilities in the region, however one theme emerged. Each time the transit fares are raised, ridership drops dramatically. Another substantial fare increase could completely doom the system, and any financing attempts must look to the general population of the area rather than specifically to the transit users. The rationale for this is clear. All residents of the area benefit from the existence of transit systems. If there were no mass transit the air might be completely unbreathable, the traffic flow would become even heavier, the city and region would choke and strangle on its own masses. Yet, it is understandable that when funding proposals for transportation are put to state referendums, the upstate and rural

areas of the region are less than enthusiastic about supporting NYC's subways.

One group of proposals made at this hearing dealt with revenue raising techniques within the limitations of city and state revenue-raising power.

Among the suggestions made were the following:

1. A mass transit tax on all people who live or work in the city backed by 100% income tax credit from the Federal government. At $25.00 per individual this would raise $100 million for NYC alone.

2. Equitable tolls on all water crossings to New York City to provide up to $30 million extra per year for NYC transit, and perhaps discourage vehicle entry.

3. Zone fares and higher fares for rush hour travel, lower fares for non-rush hour travel.

4. Higher parking rates for cars that enter the Manhattan CBD.

5. A 1¢ sales tax or cigarette tax earmarked for transit.

Many of these solutions are unfeasible. Most are regressive, and would cause even more hardship for the poor of NYC than they are suffering now. Flat rate taxes pose particular hardships.

Even if newer, less expensive and more innovative forms of transportation were turned to as partial substitutes for some portions of existing transit facilities, the cost of developing,perfecting and constructing these facilities would be prohibitive without the significant Federal support that does not appear to be forthcoming.

For example, one such innovation, the "dial-a-bus" system which scientists at the Massachusetts Institute of Technology have been in-

vestigating for years could be an important new development in lessening dependence on the automobile. Computer directed mini-buses would pick up passengers at their homes and deliver them to other parts of the city. This system combines the convenience of the automobile with the advantages of taxi use (i.e., the passenger does not have to find parking, and less valuable land in mid-town is needed for car storage). Yet, it is even better than the taxi in that it is cheaper, and the computer constantly reprograms the bus route eliminating pollution causing "cruising" for passengers. However, in July 1970 when the demonstration phase of the project was to begin, Carlos Villarreal, head of the Urban Mass Transit Administration, withdrew Federal money.[13] Eventually, some very limited funding levels were given to "dial-a-bus" projects on a demonstration basis. But this should represent only a beginning, rather than any kind of end point, for environmental problems associated with automobile use are accelerating.

Two such problems that will be examined in connection with transportation policy are those of air and noise pollution. To varying extents, competent land use planning, changes in funding priority and an increased inter-governmental cooperation and coordination could help to prevent these problems. Instead, EPA presently deals with these problems after they have been caused, and expectedly with only limited degrees of success.

2. Transportation Systems and Air Pollution

> During 1970, New York City's Department of Air Resources estimates that private cars, taxicabs, and trucks poured out 77% by weight of all the city's air pollution; 43% of the nitrogen oxides, 67% of the hydrocarbons, 98% of the carbon monoxide and virtually all of the lead particles. These pollutants all have had serious effects on human health.[14]

New York State has been divided into eight Federal Air Quality Regions for the purpose of best dealing with these serious air pollution problems on an individual regional basis. The New York City Metropolitan Area includes New York City and Nassau, Suffolk, Rockland and Westchester Counties in New York; nine counties in northern New Jersey and most of Fairfield County in Connecticut. The New York City Metropolitan Region is the largest and most complex region in the United States. Its air pollution problems, well documented over the years, are correspondingly severe and complex.[15]

Awareness of the dangers to human health, safety and productivity and the extreme costs of air pollution are now common knowledge. However, the odds of eliminating the sources of pollution without a change in the priorities and degree of coordination between governmental agencies are slim. Complex interrelationships exist among urban growth, transportation system policy and construction, and air pollution. They must be understood if EPA intends "to protect and enhance the quality of the Nation's air resources"[16] Many of these same forces are also governmentally funded.

The development and transportation patterns of New Jersey's most urbanized areas help to illustrate the scope of the problem. The most urbanized State in the U.S., New Jersey had over 3,000,000 registered motor vehicles in 1968. The state has the greatest geographic density of motor vehicles of all the States, averaging over 400 vehicles per square mile. However, the urban area vehicle density is much higher, e.g., 1,643, 2,583 and 3,961 vehicles per square mile in Bergen, Union and Hudson Counties respectively.[17] This vehicle density is indicative of the mobile source of pollution emission problems which exist over large stretches of New Jersey.

The problem is further aggravated by New Jersey's geographic location. It is situated right in the midst of what is fondly known as "Boswash"--the Northeastern Seaboard Megalopolis. The 15-mile wide corridor across New Jersey that runs between New York City and Philadelphia has been called "the most heavily travelled strip of land in the entire United States."[18]

No major improvements in pollution levels can be expected to occur in the near future in New Jersey if present development and highway policies continue. The State of New Jersey has around $740 million in highway contracts outstanding as compared to $645 million in September, 1971 and $319 million in mid-1969 when the last transportation bond issue was passed.[19] The bond issue that New Jersey voters will be voting on this year[20] retains the same 2 to 1 ratio that was approved last time ($410 million--highways, $240 million--mass transit). Already, citizens have expressed indignation at the prospect of being "blackmailed" into

voting for highway funds in order to get the far too meager transit allotment, which would be used among other things for the improvement of the Erie-Lackawanna rail line, the Penn Central line, an extension of the Newark subway and the beginnings of a commuter line in the Hackensack Meadowlands.

State officials have been explaining away the disparities quite facilely by claiming that "the $240 million for mass transit actually would attract $760 million in matching Federal aid funds."[21] It might. But more likely, due to existing federal budget priorities, the $410 million that the state would be putting up for highways would attract far more than that, especially since part of the money would go towards completion of the interstate system which receives 90%-10% Federal-State matching funds.[22]

The New Jersey Clean Air Council came to these conclusions in its 1970 Report on the Status of Air Pollution from Mobile Sources:

1. Mobile source pollution has reached levels adverse to human health in New Jersey.

2. Mobile source pollution has caused damage to the general environment and to the ecosystems of the State.

3. New car controls already programmed will cause carbon monoxide and hydrocarbon concentration to decline, but the increase in the number of vehicles will again cause an increase in these pollutant concentrations after 1980.

4. After 1980, pollutant concentrations in the State can be reduced only through (1) introduction of low pollution vehicles, (2) displacement of private vehicles by mass transportation systems, and (3) supplemental controls by the State.[23]

In January the Clean Air Council expanded on its undefined recommendation 4.(3). The Council proposed that a "statewide Land

Use Plan be developed to end the hodgepodge building that it said was destroying vast tracts of open space that could help reduce pollution."[24] The Plan would include "regional control over the location of employment and shopping centers, hospitals, industrial parks and large housing projects; a regional open-space system, the channeling of growth along predetermined transportation corridors, a 'rational spacing and hierarchy of highways' and an abolition of exclusionary zoning practices that 'segregate low, moderate and high-income households from their job.'"[25]

The Council clearly recognized that as automobile density increases, emission controls will not be nearly strong enough measures. In addition, an attack upon the air pollution problem caused by automobiles that also seeks to alleviate other problems is far superior to a partial solution to air pollution abatement only. The development of new transportation modes, and the increased support of mass transit speak to the dilemmas of misuse of the land versus rational land management, solid waste disposal, improvement of the quality of life for a wider segment of the population, etc. While emission controls for individual automobiles, although a necessary measure, only speak to that wondrous day when technology will come up with an automobile that doesn't pollute. What of the land that its roads will use up; the continued sprawl that resulted when roads are built; the people who are too young or old or poor or infirm to drive (a sizable portion of the population)?

There are extreme limitations in the current federal approach towards achieving an improved ambient air quality. One of the most serious is the difficulty that federal environmental programs have in

countering the efforts of the series of federal step-children known as state highway departments. Negligible cooperative effort is involved in the planning of human developments so that intelligent transportation systems can be evolved and so that high environmental quality standards are feasible.

The lack of interface between programs that should be integrally related was embarrassingly obvious at a meeting EPA-Region II held in September, 1972. This "Transportation Control Meeting" was held because a number of the urban areas within Region II were experiencing particular difficulties in coming up with air quality implementation plans to meet Federal standards, despite having already received one extension. A fairly large number of the major governmental entities affecting the transportation and the planning of the urban environment systems of the New York City Metropolitan Regions attended, over 25 different agencies in all, although due to the vast bureaucratic structure of the New York City area this represents only the most major of agencies.

EPA explained that a consultant had been hired to assist the two states and the urban areas confronted with acute problems towards developing satisfactory air quality implementation plans. Essentially, the consultant, TRW Corporation, was hired to:

1. Review implementation plans previously submitted and rejected with regard to possible transportation control strategies.

2. Review traffic and transportation patterns in the New York City area and examine various control strategies for this area.

3. Develop emission reduction and air quality estimates based on different strategies and determine which strategies yield best results.

4. Define and discuss the obstacles to the implementation of each strategy.

5. Set up a schedule for the implementation of such a strategy, including the passage of necessary rules and regulations, and the resulting air quality and transportation milestones until the target date of 1977.

However, the consulting firm, TRW, will actually consist of only one individual working full time for four months to solve the problems of transportation and air quality in Region II and in particular, the New York City Metropolitan Region! Although the function of the consultant is not to actually submit an air quality standard implementation plan (that task must rest with the state), he is clearly being delegated the most difficult portion of the task.

The magnitude of the task becomes clear if one examines the situation around New York City--the unsatisfactory Air Quality Implementation Plan submitted for that area and the forces affecting air quality in the Metropolitan Area. The entire air pollution problem for the New York City Metropolitan Area within New York State has been given Priority I for all contaminants.[26] The 8 hour carbon monoxide average for midtown Manhattan was 32 parts per million (ppm), more than 3 times the allowable average of 9ppm.[27] Despite this, the new Statewide Master Plan for Transportation in New York pays mere lip service to environmental problems and scarcely mentions air pollution. The following excerpt is the oly discussion of air

pollution that could be readily found in the entire Policy, Plans & Programs section of the Plan, released in July, 1972, long after it was apparent that many areas of the state were experiencing difficulty in devising satisfactory implementation plans.

> It is clear that the major potential for improvement in air and noise pollution from transportation in urban areas is by strict and effective enforcement procedures to ensure meeting legislated standards for vehicle air and noise pollution. For the short term, restrictions on vehicular traffic for specific limited times and places may be necessary to meet environmental standards. Transportation-system development has distinct limitations for lessening environmental pollution.[28] (Emphasis supplied by this author.)

In other words, the New York State Department of Transportation is placing the major burden for meeting air quality standards upon the other branches of state government responsible for enforcing federal law and devising an implementation strategy. In their view, they are not responsible for the pollution from automobile traffic using the extensive highway system that the state has built with extensive federal funding.

Thus, they defend themselves:

> The most ambitious transit program proposed in any urban plan and the complete cessation of new highway construction would not result in more than a five-percent reduction in the overall amount of urban highway travel, and that travel would generate higher rates of pollution because of its congested flow.[29]

Needless to say, they do not cite a source for that sweeping statement. One wonders if they have heard of the New Jersey Lindenwold Hi-Speed Line which runs between southern New Jersey suburbs and

Philadelphia, scant miles from the New York State border. Run by the Port Authority Transit Corporation of Pennsylvania and New Jersey (PATCO), it began service on February 15, 1969 and its number of riders has been climbing steadily ever since. Considered a model of mass transportation, the line has a central tower in Camden, N.J., in direct communication with the operating console of every train. Only one operator rides aboard each train, while all stations are automated and unattended as is ticket purchase. Television cameras monitor the whole line reducing vandalism and crime to the minimum, while the train runs at 10-minute intervals most of the day. It presently has over 40,000 riders each day, many of whom are former motorists who park-and-ride. These people had never before ridden buses or other public vehicles regularly.[30]

There are many areas of the New York Metropolitan Region that would undoubtedly lend themselves to the effective operation of such an automated line. However, given the direction in which the New York State Department of Transportation has allocated its budget, such innovations are unlikely to occur. Although it is true that the state DOT is contributing sizable portions of money to the improvement of existing transit facilities and the creation of new subway lines in the New York Metropolitan Area, the DOT is planning on spending far more on highways, especially on urban highway improvement. The DOT's minimal objective for urban transit is $8.6 billion, or the equivalent of obligating $430 million annually over the next 20 years.[31] However, the minimal objective for urban highway expenditures is $12.35 billion, plus an additional $3.85 billion to be spent on intercity highway con-

struction.[32] Almost twice as much will be spent on highways as transit. The $8.6 billion for public transit represents an annual decrease over the total amount obligated in the three year period 1968-71 (during which the transit portion of the 1967 Transportation Bond Act was completely obligated).[33] It is an improvement over the years prior to that, but no great accomplishment in light of the problems that are becoming increasingly apparent.

The May 1972 New York City Metropolitan Area Air Quality Implementation Plan assumes that stronger controls will be exerted upon the state DOT by the New York State Department of Environmental Conservation. This will undoubtedly force the state DOT to become more aware of air quality in their future transportation plans; however, it is unlikely that this will help the state devise an air quality implementation plan that will meet Federal Standards by 1975. This is because, while the 1970 Federal Aid Highway Act requires that the Federal Department of Transportation establish guidelines to insure that new highways are consistent with a state's air quality implementation plan, very few "new" highways will be built in the New York Metropolitan Area. Much of the money will be spent on highways in the state, and,particularly in the New York Metropolitan Area,will go towards the renovation and improvement of existing highways. Thus, while these highways will be able to carry more traffic which will generate more pollution, they are outside of Federal highway law as it relates to air quality.

In general, EPA must begin working towards a long-range preventative approach to air pollution to avoid continually dealing with crisis situations. This means that EPA must get involved in the land use

planning and transportation planning that lead to air pollution rather than continuing to rely upon exhaust and fuel standard regulation. Air pollution control devices cannot be relied upon to clean up after the damage has been done. EPA must expand so that it is dealing with cause as much as effect. To that end, EPA must communicate more effectively and extensively with major agencies in the Region concerned with land development and transportation planning. Regular meetings should take place--not just when air quality implementation plans are due--but perhaps on a monthly basis, with EPA acting as environmental consultant to any who need assistance or advice. EPA-hired planners should comment on as many major plans and zoning ordinances as they can find time for, and let communities know what likely environmental outcomes they can expect from their plans. By growing more future oriented, EPA will make its daily functioning much easier and more efficient.

3. Transportation Systems and Noise Pollution

Few would disagree that noise, or unwanted sound, qualifies as a pollutant. Besides causing sleeplessness, reducing work capabilities, frightening humans and animals, and disrupting communication, it has been demonstrated to be one cause of deafness and hearing loss in humans and may be responsible for numerous other human ailments as well.[34] For example, since our hearing system is also partially a warning system, and since the body reacts to loud noise with constriction of the blood vessels, the shooting of adrenalin into the bloodstream and the tensing of muscles and internal organs, a link has been tentatively established between excessive noise and hearing, circulatory and digestive disorders.[35]

> Even when excess noise is steady and therefore without surprise it produces tension and nervousness, which in turn may take the form of headaches, fatigue, depression and irritability. Researchers are now suggesting that noise, rather than overcrowding, may be the main reason why people who live in large urban centers like New York so often have a reputation for being brusque and short-tempered.[36]

Noise pollution levels are particularly related to transportation systems. In New York City, where the noise problems have reached serious proportions, traffic is a cause of most of the midtown background noise level. The New York City Bureau of Noise Abatement estimates that this background level noise now frequently reaches 85 dBA in decibels on the A scale--noise levels weighted to frequencies which effect humans--during the work week; beyond the noise level where normal conversation is possible (70 dBA); and dangerously close to the level where physical injury can result from continuous exposure (90 dBA).[37]

Automobiles and trucks play a significant role in generating noise in any urban area. While they are not nearly as noise polluting individually as, for example, a 4-engine turbofan aircraft, the total noise energy that they generate may be as significant in dense urban areas. This is a function of several factors. Total noise energy will be higher for noise polluting systems that generate high noise levels, exist in large numbers and operate more hours per day.[38] When considered in that light, it becomes apparent that automobiles are major contributors to the noise levels of our cities, since there were 87 million cars in 1970, and the number grows each day. In addition, there were 19 million trucks in operation, which are generally far noisier than automobiles.[39]

EPA has calculated that noise energy levels for elements of the transportation system and found the following results: while highway vehicles--trucks and autos--were responsible for a total of 7,300 noise energy units (Kilowatt-Hours/Day) locomotives, freight trains, high speed intercity trains, rapid transit trains, passenger trains, city and school buses and highway buses all together only contributed 1,271.93 noise units.[40] Admittedly, a large percentage of the non-transit highway vehicle noise-energy total can be attributed to medium and high duty trucks. Nevertheless, automobiles still contribute some 1,800 noise energy units--more than the combined total from all forms of transit (excepting aircraft use).

Noise from highway vehicles can be attributed to three major sources: 1) rolling stock (tires and gearing), 2) the propulsion system (the engine and related accessories), and 3) aerodynamic and body noise. Tire noise

increases with speed until it becomes, at about 50 mph, the principal source of noise for highway vehicles. At speed below 45 mph for trucks and 35 mph for automobiles, engines are responsible for the most noise.[41]

Most states have chosen to attempt to monitor individual vehicle noise as their main attempt at monitoring transportation-created noise pollution. Forty-three states have legislation requiring that ground vehicles use mufflers, while 15 states restrict noise from horns and five have set limits on total vehicle noise based on subjective standards.[42] Enforcement of these regulations is often far from zealous.

New York City has attempted to take a comprehensive approach to its noise pollution problem with the New York City Noise Control Code of 1972. Many of the sections of the Code focus upon transportation related noise and its control. For example, Section 5.03 sets decibel limits on motor vehicles of all sizes that includes city driving conditions (slow speeds and narrow streets) as well as highway driving conditions.[43] But most noteworthy in the approach of New York City towards noise pollution control is its attempt to deal with land use within the context of the Code, a facet of noise control sadly ignored by most other state or municipal agencies.

The Code begins with a base of noise laws that many states and a few municipalities currently have; that is, the common law nuisance regulations which prohibit "unnecessary noise." These include, for example, the laws which prohibit horn blowing (except in case of emergency). The Code then sets specific decibel limits for sound-producing devices for which there is currently available noise abatement equipment.

Finally, an attempt is made to place those noise-level standards within the context of intelligent land use planning. The Code does this by introducing the concept of ambient noise standards which it defines as individual noise limits within a particular zone of the city that will be related to the land uses planned for that zone.[44] Thus, for example, Article IV of the Code contains a section (4.21) which allows the New York City EPA Administrator and the Board of Health to declare certain sections of the city as "noise sensitive zones" in which the public health requires more stringent standards of prohibited noise.[45]

This is a step in the right direction towards alleviating noise pollution in already developed areas. However, land use controls must be used much more often and effectively to limit the necessity, when possible, of developing extensive noise control codes or expensive noise abatement equipment. It is certainly far more desirable to prevent incompatible land uses from occurring in order to achieve aesthetic quality, including noise control.

To an extent, a number of municipalities attempt to do this at the present time through their zoning ordinances. It is not infrequent for noise levels to be mentioned explicitly within the ordinances. However, it is not unlikely that a local zoning board would make a variance or exception for a noisy but lucrative industry that would bring in significant new tax revenues. But if municipalities lag on the use of land use controls to limit noise pollution, state governments are even more lax. According to EPA's Report to the President and Congress on Noise, as of last year, Minnesota was the only state

making any significant attempt to control noise through land use (in this case, by exercising state control over zoning around new state-owned airports.)[46]

It is unfortunate that land use is considered so seldom and so inefficiently in relation to noise control, because it could be of much help in minimizing the effect of highway noises. For example, it is possible to predict what noise levels can be expected from a given roadway. Planners, builders and highway designers must be persuaded to use and be assisted in using available techniques in order to coordinate highway development with compatible land uses (in terms of noise levels and otherwise). According to Peter A. Franken and Daniel G. Page, one way to help further "acoustic compatibility" is by developing highly simplified tests and screening procedures that even people without special skills in acoustics can use to make "first-step" decisions as to possible suitability.

They point out that noise levels along highways depend on many different variables including the distance from the roadway to the observation point, the total volume of traffic, the average speed of traffic, the percentage of trucks in the total traffic volume, the slope of the road, the type of road surface, the surrounding terrain, and the location of artificial and natural barriers. Extremely complicated programs are available to assess what noise levels can be expected when information on these conditions is supplied. However, a much simplified version of this procedure may be performed to help determine during the initial screening period where potential noise problems are likely to occur. The only information required for this

procedure is the distance from the roadway to the receiver, the number of cars and trucks per hour, and their average speed.[47]

Law requires that some type of noise evaluation system be used in the planning of all highways. Policy and Procedures Memorandum 20-8 of the Bureau of Public Roads issued January 14, 1969 stated that environmental effects which the state or local sponsor seeking Federal aid must consider include "noise, air and water pollution." The 1970 amendments to the Federal-Aid Highway Act (P.L. 91-605) state that the Secretary of Transportation must "assure that possible adverse economic, social and environmental effects have been considered" and that he is to "develop and promulgate standards for highway noise levels compatible with different land uses after July 1, 1972."

However, this legislation may have relatively little impact. The New York State DOT scarcely mentions noise in its Statewide Master Plan for Transportation. "Transportation-generated noise is another environmental impact..." says the plan. Further, the DOT has shown little concern in its design of highways in the state for possible impacts of noise pollution (see Richmond Parkway Case Study).

Theoretically, EPA should be able to force a federal-aid highway project to consider noise impacts of the project through Environmental Impact Statements (EIS) (Section 102C-NEPA). However, in Region II at least, that would be extremely difficult. In general, the Federal Highway Administration has been turning out large numbers of impact statements, many of them incomplete. At the same time, Region II's entire noise division consists of one part-time employee. It is virtually im-

possible to carefully evaluate every statement that comes to EPA under those conditions. In addition, much is still unknown about noise and its effects, and it would be very difficult to stop the construction of a highway (which the DOT could doubtless prove was "vital") on the grounds of inadequate noise controls.

Under Title IV of Public Law 91-604 (The Clean Air Act) Section 402C, Federal agencies are required to consult with the Administrator of the Environmental Protection Agency on their current noise generating activities that may create a nuisance. It is important that through this mechanism EPA disseminate information on land use and the ways in which it can relate to both the generation of noise and noise control. EPA Region II should attempt to hire more staff for its noise division, particularly, staff with some skill in relating noise to land use. That staff could then provide technical information and services to any other federal, state or local agency in the region interested in preventing noise pollution through preventive land use planning. EPA could conceivably help interested communities develop land use control strategies for noise control purposes. However, funding and legislation should be sought as well as legislation to allow EPA to help communities to acquire key parcels for more effective noise control (around airports, for example). Possibly some kind of program could be developed in cooperation with HUD which already is involved in the development of comprehensive urban noise survey methodologies, metropolitan aircraft noise abatement policy study, etc.

It is vital that in the area of noise pollution, as in all other environmental problems, EPA move towards an approach that emphasizes the prevention of the problem before it occurs. There are ways of developing transportation systems that minimize the impact of noise. As demonstrated earlier, in the composite sense, mass transit is less noisy than automobile use, which is a compelling reason for the increased development and funding of transit systems rather than highways. However, additional research is necessary to make transit much quieter than it currently is. Subways, in particular, can generate noise levels that are extremely uncomfortable. In New York City, although new lines will be quieter, the old lines can generate noise levels of 90 dBA on the subway platforms. Wheel screams cause noise peaks of 109-114 dBA.[48] Although many of the new trains are air-conditioned and have sealed windows (and thus are fairly quiet inside), this does not help the people waiting for the train on the platform.

However, inadequate amounts of time and money are being put into research for quieter transportation systems. In the same way, far too little is spent on transit itself.

4. Transportation and Federal Fiscal Policy

The partial solution to New York City's transportation and environmental problems is obvious--greatly increased funding by the federal government. The reasons why this has not happened have been numerous and demonstrate most accurately the ways in which the different agencies of the federal and state governments are working at cross purposes with each other.

In 1969, the Federal Highway Trust Fund collected $5 billion from taxes on gasoline, tires and auto accessories. When this money is combined with taxes collected by the states, the total amounts to a $15 billion a year road building fund.[49] Although in 1972 the Senate approved a measure by which up to $800 million could be used for transit, it has failed to receive approval by the House, and representa a mere pittance of what is needed if our most dense urban areas are to be saved. The fund had a $3.6 billion surplus in 1971[50] as the construction of the interstate system, the ostensible purpose for the funds, nears completion.

Even legislation designed to assist urban areas is grossly inadequate. The Urban Mass Transportation Assistance Act of 1970 stated that:

> "The Congress finds...that it is imperative, if efficient, safe and convenient transportation compatible with soundly planned urban areas is to be achieved, to continue and expand the Urban Mass Transportation Act of 1964; and that success will require a Federal commitment for the expenditure of at least $10,000,000,000 over a twelve year period to permit confident and continuing local planning..."51

How optimistic of Congress to feel that the whole urban transportation crisis can be fixed with $10 billion over 12 years, give or take a little, when about half that amount is poured into the highway systems each year. $10 billion would not even pay all of the operating expenses for just the New York Region Transit Systems over that twelve year period.

In other ways, the meager allotment of transit funds discriminate against urban areas such as New York. Formulas for federal aid distribution limit funds to 12½% for any one state--a grave hardship to the New York Region that contains most of this nation's transit. In addition, funds may neither be used for capital outlay nor for debt service. However, realistically, it must be acknowledged that it is not optimism that keeps transit appropriations so low. Rather, it is the highly visible highway and road building lobby along with the massive automobile industry that is partially responsible for the strangulation and rot of our cities. Not very surprisingly, it was reported in 1969 that forty-four members of Congress held interests in oil and gas companies.[52] And on a more local scale, J. Burch McMorran, former head of the New York State Department of Transportation, has belonged to the Highway Research Board and was a past president of both the American Road Builders Association (ARBA) and the American Association of State Highway Officials. This becomes more relevant when the membership of these organizations is examined. For example, ARBA has 5300 members representing the entire highway construction industry as well as state and federal highway officials and members of Congress.[53]

Thus, because of federal and, to a lesser extent, state fiscal policy, a large portion of the work of EPA and its state and local

counterparts consists of almost futile cleanup operations after the implementation of other federal programs, the highway program being a notable example.

To be fair, it is important to note that not all of the New York City Metropolitan Area's problems, transportation or otherwise, can be blamed upon the federal government. Far from it. The state, and to a lesser extent, the city itself, must share the blame.

For, to a marked extent, the city has only a limited measure of legal authority with which to control its transportation destiny, and thus, its ultimate fate. In recent years, the historical pattern that has given the state control of major transportation development in the New York Metropolitan Area has accelerated.

This can be readily seen if a few of the agencies controlling the development, management and revenues of the New York City area transit systems are examined. One excellent example is the Metropolitan Transportation Authority (MTA).

MTA was created in 1968 as a regional approach to transportation planning and management; however, several incongruities appear. Most notable is the composition of the Board of the MTA. MTA's legislatively mandated responsibility for public transportation extends to the five boroughs of New York City plus the seven outlying suburban counties--Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk, Westchester. But their main ridership is in the immediate New York City area. Their own figures show that of the 8,017,379 passengers served daily throughout the whole MTA system, about 6.5 million passengers used the facilities right in New York City.[54]

Despite this, the only input that the Mayor of New York has into the MTA is the "power" to nominate three of the nine MTA Board Members, all of whom must ultimately be appointed by the governor. The Mayor also has power to veto any transit capital project over $1 million in value. In turn the MTA controls the New York City Transit Authority and the Triborough Bridge and Tunnel Authority whose assets formerly belonged to the city.[55]

FOOTNOTES

Section II - Transportation and Environmental Pollution

1. The Urban Transportation Crisis
2. Transportation Systems and Air Pollution
3. Transportation Systems and Noise Pollution
4. Transportation and Federal Fiscal Policy

1. New York City Planning Commission, Plan For New York City: A Proposal, Vol. I: Critical Issues (New York: New York City Planning Commission, 1969), p. 48.
2. New York City Environmental Protection Administration, The Car is Anti-City (New York: New York City Environmental Protection Administration, n.d.)
3. New York City Planning Commission, Plan For New York City, I.
4. Tri-State Regional Planning Commission, Monthly Report, July, 1972.
5. U.S. Congress, National Transportation Policy (The Doyle Report), 87th Cong., 1st sess., 1961.
6. "A Cure For the Highway Epidemic: A Balanced Subsidy," Suffolk University Law Review (Spring, 1971), p. 904.
7. Ibid.
8. New York City Environmental Protection Administration, The Car is Anti-City.
9. New York City Environmental Protection Administration, Solid Waste Operations in New York City (New York: New York City Environmental Protection Administration, n.d.)
10. Lenox Hill Hospital, Can Noise Harm Your Health?, Environmental Memo. No. 1 (New York: Lenox Hill Hospital, n.d.)
11. Westchester County Department of Planning, Westchester's Economy (White Plains, N.Y: Westchester County Department of Planning, August, 1970), p. 35
12. Testimony at Hearing of New York State Joint Legislative Committee on Transportation, New York, September 21, 1972.
13. Environmental Action, Earth Tool Kit: A Field Manual For Citizen Activists (New York: Pocket Books, 1971), p. 108.
14. New York City Environmental Protection Administration, The Car is Anti-City.

15. New York State Department of Environmental Conservation, New York City Metropolitan Area Air Quality Implementation Plan (Revised May, 1972) pp. 1-5--1-6.

16. The Clean Air Act, P.L. 91-604 (December 31, 1970) Sec. 101 (b)(1).

17. New Jersey Clean Air Council, Report of the New Jersey Clean Air Council to the New Jersey Department of Environmental Protection, Report of the New Jersey Clean Air Council on the Status of Air Pollution From Mobile Sources, July, 1970, p. 4.

18. George M. Raymond, "Issues in Non-Metropolitan Growth: An Overview" (paper presented at the Non-Metropolitan Growth Conference, Trenton, N.J., September 12, 1972)

19. "Highway Boom May Be a Short-Lived One," Home News, January 31, 1972.

20. State of New Jersey, Chapter 46, Laws of New Jersey (1972), approved June 1, 1972.

21. "State Moving to End Transportation Pinch," New York Times, May 21, 1972.

22. A function of the 1956 Federal Aid Highway Act (70 Stat. 378) which represented an all-out national commitment to complete an interstate and defense highway system. It provided for a 41,000 mile system to be completed by 1972 (since extended for several more years) linking more than 90% of all cities having populations of 50,000 or more. To assure success, the Federal government now finances 90% of this system.

23. New Jersey Clean Air Council, Report of the New Jersey Clean Air Council... on Air Pollution.

24. "Jersey Clean-Air Panel Offers A Plan to Curb Pollution Perils," New York Times, January 8, 1973.

25. Ibid.

26. New York State Department of Environmental Conservation, New York City... Air Quality Plan

27. Statement of Ken Johnson, U.S. Environmental Protection Agency-Region II at EPA Transportation Control Strategy Meeting, New York, September, 1972.

28. New York State Department of Transportation, Statewide Master Plan For Transportation in New York: Policies, Plans and Programs, Prehearing Draft (New York State Department of Transportation, July, 1972), p. 20.

29. Ibid.

30. "Lindenwold Line: A Good Example of Mass Transportation," New Jersey Environmental Times, June, 1972.

31. New York State Department of Transportation, Statewide Transportation Master Plan, p. 49.

32. Ibid.

33. Ibid.

34. Environmental Action, Earth Tool Kit, p. 260.

35. New York City Environmental Protection Administration, A Guide to the 1972 New York City Noise Control Code (New York City: New York City Environmental Protection Administration, 1972), p. 2.

36. Ibid., p. 3.

37. Ibid.

38. U.S. Environmental Protection Agency, Report to the President and Congress on Noise (Washington, D.C: U.S. Environmental Protection Agency, December 31, 1971), p. 2-73.

39. Ibid., p. 2-59.

40. Ibid., p. 2-74.

41. "EPA Analysis of Noise Problems Points Way to Future Legislation," Automotive Engineering (April, 1972), p. 31.

42. Ibid., pp. 31-32.

43. New York City Environmental Protection Administration, Guide...to Noise, p. 6.

44. Ibid., p. 1.

45. Ibid., p. 5.

46. U.S. Environmental Protection Agency, Report...on Noise, p. 4-13.

47. Peter A. Franken and Daniel G. Page, "Noise in the Environment," Environmental Science and Technology (February, 1972)

48. New York City Environmental Protection Administration, Guide...to Noise, p. 3.

49. Helen Leavitt, Superhighway-Superhoax (New York: Ballantine Books, 1970), p. 10.

50. "Group Trying to Unlock Highway Trust Fund," Asbury Park Evening Press, January 25, 1972.

51. Urban Mass Transportation Assistance Act of 1970, P.L. 91-453, 84 Stat. 962

52. Ronald A. Buel, Dead End: The Automobile in Mass Transportation (Englewood Cliffs, N.J: Prentice-Hall, Inc., 1972), p. 227.

53. Leavitt, Superhighway-Superhoax, p. 107, 145.

Metropolitan Transportation Authority, Metropolitan Transportation Authority Facts (New York: Metropolitan Transportation Authority, 1971).

Joseph McC.Leiper, Clarke R. Rees, and Bernard Joshua Kabak, "Mobility in the City: Transportation Development Issues," in Agenda For a City: Issues Confronting New York, ed. by Lyle C. Fitch and Annmarie Hauck Walsh (New York: Institute of Public Administration, 1970), p. 410.

5. Case Study: Port Authority of New York and New Jersey; Transit versus the World Trade Center

The regional approach to transportation management and planning is a good one only if it is combined with extensive inputs from each locality concerned. Although the MTA is one example of a regional authority that ignores the most demanding and difficult segment of its region, the Port Authority is an even better example of the ways in which New York City's most acute needs are subordinated to political expediency and--in the case of the Port Authority--to profit.

This bi-state agency was created in 1921, allegedly to create a mechanism that would "close the jurisdictional gap between the two states and remove the transportation decision-making process from the 'petty' influence of local municipal government."[1] In this way, control of the policies and actions of the Port Authority was placed with the legislatures and governors of the two states, and thus, supposedly well in hand.

If this was the plan, it has failed miserably. The Port Authority is now blissfully independent, and it may well be the only agency in the New York region with surplus funds and profit-making capability large enough to begin to solve some of New York's transportation problems. However, not only is the Port Authority largely exempt from financing transit at the present time; it has been engaging in programs and practices that have aggravated New York's environmental crises still further.

How did this come about? A number of allegations have been made that are fairly well supported by data. In 1962 legislation was enacted

which enabled the Port Authority to build the vast World Trade Center, now nearly completed.[2] However, a number of bonuses came along with that mandate, most notably the section which the Port Authority has used to prevent its involvement in mass transit. Essentially, that section states that in order to protect the investment of the bond holders of the Port Authority (PA), the PA shall not "apply any of the rentals, tolls, fares, fees, charges, revenues or reserves...for any railroad purpose...other than permitted purposes..."[3] Permitted purposes only included the trans-Hudson transit lines, freight operations, rail construction on vehicular bridges owned by the Port Authority and those railroad facilities that the Authority has "certified" to be "self-supporting" or within a "permitted deficit" range that they themselves shall determine.[4]

The main catch in their mandate seemed to be the "gentlemen's agreement" that they would assume the operation of the broken down transit lines between New York and New Jersey known as the Hudson Tubes, although they had a continuing estimated annual deficit for operations of more than $12 million.[5] However, their reluctant agreement to take over operation of the Hudson Tubes has gained them far more than they have lost. Because of this agreement they were "given" the World Trade Center, and in addition the Port Authority convinced the legislatures of New York and New Jersey to make statutory covenants with the Port Authority bond holders granting assurances against the further dilution of the already pledged revenues and reserves by the operation of any other deficit commuter rail project.[6] It should be recognized to the credit of the Port Authority that the hundreds of millions of dollars spent on the Hudson Tubes provides mass transit for well over 100,000 commuters daily.

This legislation enacted many years ago has ultimately affected the environment of the New York Metropolitan Area most profoundly. The effects stem from two sources: first, the exemption of the Port Authority from further involvement in mass transit, and second, the construction of the World Trade Center.

The Port Authority's published surplus was $72.5 million last year,[7] but this figure is eminently deceiving.

In testimony before the New York State Joint Legislative Committee on Transportation, Theodore Kheel, respected New York labor mediator, pointed out this year that if they doubled tolls on just one of their facilities, the Holland Tunnel, it would support a borrowing of $1-$1.5 billion. Similarly, revenues from the World Trade Center would support an additional borrowed $1.5 billion. The acting director of the Port Authority admitted at the same hearing that Port Authority reserve funds totaled $199 million currently. Such wealth is astounding in the face of the dire poverty of the rest of the New York area transit programs. But the refusal of the Port Authority to become involved in financing and operating transit in the region that supports it is only one phase of its attack against New York, and perhaps the less direct one. For it has scored a veritable bullseye with the construction of the World Trade Center.

It is not just the tallest building in the world, it is the two tallest buildings in the world, each twin tower rising 100 feet higher than the Empire State Building to a height of 1,350 feet. But there are far more sobering statistics associated with it. By 1974 it will be producing about 50 tons of solid waste and using about 2.25 million

gallons of potable fresh water a day. The peak power demand would be enough to supply a city the size of Stamford, Connecticut, about 110 megawatts. At current 1/3 occupancy, it is producing 750,000 gallons of raw sewage a day (when fully occupied it's sewage output will equal that of the state's capital, Albany --2.25 million gallons daily.) Currently, the raw sewage is being dumped directly into the Hudson River untreated, and the City's 14th Street pumping station which would pump the sewage to the Newtown Creek treatment plant won't be finished for another two years.[8] Needless to say, the raw sewage does little to enhance the water quality of the Sandy Hook area in New Jersey, due to become part of the Gateway National Recreation Area.

Similarly, the 130,000 employees and visitors the World Trade Center is expected to attract will have no help in getting to work from the Port Authority. A Port Authority study has predicted that 43,000 subway riders will be leaving the Trade Center each day during the peak rush hours (and foisted upon the already overstrained subway system nearby).[9] The Trade Center is very proud of its elevators, however, which are considered the fastest in the world.

The argument has been made concerning the Trade Center that many of the employees and offices will only be moving from other parts of Manhattan, that no real new growth will be caused by the Center. This argument is extremely faulty.

For one thing, although it has been demonstrated that concentrated and aggregated office space is more efficient, a point of diminishing returns is always reached eventually. In office buildings, it is felt that this point is reached at about one million square feet, while the

World Trade Center has nine million square feet. "After that, when you double the size of a building, you're not just doubling the impact on utilities--you may be quadrupling it," according to one expert.[10]

The environment also does not easily cope with the effects of such highly concentrated development. If spread over a much larger area not only would transportation problems be less acute but sewage, solid waste and air and thermal pollution would be less serious. The 96,000 gallons that the cooling equipment of the Center uses per minute, for example, and draws from the river, raises the temperature of the river in the immediate vicinity of the Center by some 15 degrees.[11]

There is, of course, the question of what the Port Authority is building and managing the World Trade Center in the first place. Theodore Kheel has pointed out that $50 million dollars yearly are being supplied by federal, state, city and private subsidy to compete with private builders. While he feels that the Port Authority should be involved only in areas where the private sector needs help, instead it is competing with private industry and using its subsidies to undercut floor space rates in other parts of Manhattan.

In May, 1972, the New York State Legislature repealed those portions of the law exempting the Port Authority from using its money for transit facilities. This is subject to concurrent action by the State of New Jersey, expected to be forthcoming, but as usual, the Port Authority has an answer. It claims that even if New Jersey acts, the repeal of this restriction will not become effective until its last outstanding bond issue has been paid off. Since they just sold a bond issue last February,

this would occur in the year 2007.[12] The case is being taken to the U.S. Supreme Court shortly, where it will be decided if the Port Authority can be forced to begin financing transit (as readily as it did the $600 million plus World Trade Center.)

FOOTNOTES

Section II - Transportation and Environmental Pollution

5. Case Study: The Port Authority of New York and New Jersey

1. Joseph McC.Leiper, Clarke R. Rees, and Bernard Joshua Kabak, "Mobility in the City: Transportation Development Issues," in Agenda For a City: Issues Confronting New York, ed. by Lyle C. Fitch and Annmarie Hauck Walsh (New York: Institute of Public Administration, 1970), p. 410.

2. New York, Unconsol. Laws, §6606 (McKinney Supp. 1970)

3. Ibid.

4. Ibid.

5. "Leeching the Port Authority: A Monetary Transfusion," Suffolk University Law Review (Spring, 1971), p. 938.

6. New York, Unconsol. Laws, §6606 (McKinney Supp. 1971)

7. Glen Collins, "Notes on a Revolutionary Dinosaur," New York Times Magazine, August 6, 1972, p.27.

8. Ibid., p. 20.

9. Ibid., p. 22.

10. Ibid., p. 24.

11. Ibid., p. 26.

12. Testimony of Theodore Kheel at Hearing of New York State Joint Legislative Committee on Transportation, New York, September 21, 1972.

6. Case Study: The Richmond Parkway & The Staten Island Greenbelt

The conflict between the Staten Island Greenbelt and the final section of the Richmond Parkway scheduled to pass through or near a number of parts of the Greenbelt is a microcosm of many of the fierce battles being waged in urban areas over how land should be used. Some consider this particular Parkway the last of a dying species, and feel that this particular issue has been resolved. In actuality, the construction of the Parkway is still very much a question for debate. Budgetary and political problems have only prevented its completion up to this point and much of the Greenbelt is being used only for a wide variety of outdoor recreation at the present time. A brief history of the issue will clarify the nature of the conflict.

The New York State Highway Department indicates that planning for the Richmond Parkway began as far back as 1941 when the New York City Planning Commission adopted its Master Plan of Arterial Highways and Major Streets that included the Parkway.[1] Other sources imply that the basic concept for a Richmond Parkway has been considered since the 1920's.[2] Whatever the precise date, clearly these plans were being formulated before environmental protection and social criteria were even superficially a part of a highway planning program. It was not until 1960 and 1961 that the final plan for the Richmond Parkway was approved by the New York State Department of Public Works, the City Planning Commission, the Board of Estimate and the Bureau of Public Roads.[3] On August 21, 1961 the Board of Estimate authorized the acquisition of right of way by condemnation, and by July of 1962, 70

residential and 5 commercial tenants had been relocated and the buildings that they occupied demolished under contracts let by the State Department of Public Works with city approval.[4] Most parts of the Parkway were constructed with no incident save some difficulty in obtaining funds for the construction; it was not until it was time to construct Section I--the section that runs mainly through the Staten Island Greenbelt--that widespread public opposition began to be felt. Mayor Lindsay, newly elected to his first term of office asked the State Department of Public Works to defer construction of Section I in March of 1966 while possible alternate routes for the Parkway were examined.

Section I has still not been completed, and most of the same alternates that were being considered then are still under discussion, if not by the State Highway Department, then by varied citizen's groups. The State Highway Department does not consider the issue of the Richmond Parkway dead, but only lying dormant. Two-thirds of it are constructed and they would very much like to complete the remaining third. However, times and ideas have changed enough so that the basic opposition to the Parkway is the following: does it utilize the very rare and beautiful (for New York City) stretch of land known as the Staten Island Greenbelt in the best possible way?

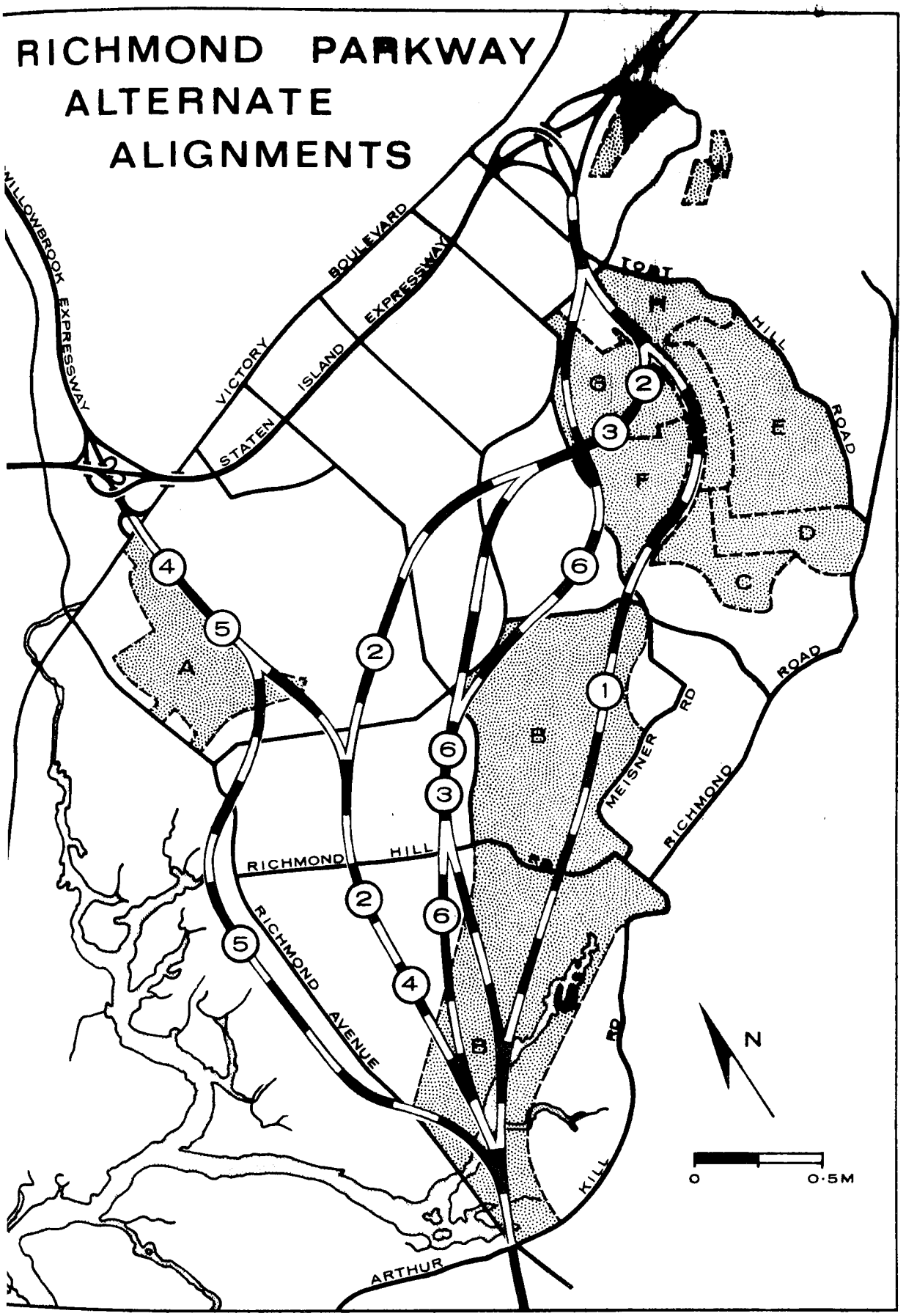
Much of this is related to the basic concepts underlying parkway construction. The American Association of State Highway Officials defines a parkway as, "An arterial highway for non-commercial traffic, with full or partial control of access, and usually located within a park or a ribbon of parklike development."[5] However, a publication of

the Office of Environmental Policy of the Federal Highway Administration, (FHWA) sheds some additional light.

> A parkway is managed to provide a highway that serves recreational needs. Although many urban parkways serve peak hour commuter traffic demands, this is not their primary function. The design of the highway itself and the control of the highway corridor are developed to provide appurtenances for pleasure driving and recreation.[6]

In other words, although the parkway may serve other functions, i.e., provide accommodations for picnicking and walking, help accommodate rush-hour traffic etc., its prime function is to provide facilities for driving as recreation. In the words of the FHWA[6] "a parkway is developed to display a natural environment to the user."[7] As open space and recreational lands, particularly lands of great natural beauty, become almost non-existent in the New York Metropolitan Region, the use of such land for a limited access highway to show off what's left became highly suspect by many people. The Staten Island Greenbelt is widely considered to be unique in New York City.

The term, "The Staten Island Greenbelt," currently describes an aggregation of woodlands and open space which runs along the central ridge of Staten Island for a distance of about five miles. The right-of-way for the original route of Section I of the Richmond Parkway runs through or near much of this contiguous or nearly contiguous open space which is mainly in public or quasi-public ownership. The 1700-odd acres of the Greenbelt are dotted with small ponds and lakes and forests of oak, hickory, gum, beech and sassafras. Many birds and small mammals



A - WILLOWBROOK PARK
B - LATOURETTE PARK
C - HIGH ROCK PARK
D - MORAVIAN CEMETERY
E - RICHMOND COUNTY COUNTRY CLUB
F - POUCH BOY SCOUT CAMP
G - KAUFMANN CAMP
H - TODT HILL
I - STATEN ISLAND COMMUNITY COLLEGE
J - REEDS BASKET WILLOW SWAMP

can be found within the Greenbelt as well.[8] As indicated previously, the uses and ownership of the land within the Greenbelt are many and varied. A brief description follows of the major users and owners of the land within the Greenbelt.

Latourette Park--a somewhat elongated park 2½ miles long by ½ mile across, it contains about 510 acres, a comparatively large area for an urban park. Considered a limited use facility, it presently contains low intensity recreational facilities; mainly golfing and woodland trails.[9] The Buck's Hollow natural area lies within the woodlands of the Park and is an area regarded by National Park Service naturalists "as a model mini-wilderness in the midst of metropolis."[10]

High Rock Park-Conservation Center--an environmental education center run in cooperation with the New York City Board of Education and the Staten Island Institute of Arts and Sciences. Set amid 72 acres of century-old oak and tulip trees, ponds and brooks, it teaches children from all over New York City about their natural environment. In 1965, this land narrowly escaped subdivision into a housing development when the Girl Scouts, the former property owners, decided to sell the land. The land was purchased by theCity of New York at literally the last possible moment with the aid of the state. High Rock Park Conservation Center has recently been declared a National Environmental Education Landmark.[11]

Henry Kaufman Campgrounds--operated and owned by the United Jewish Philanthropies of America, the Flora Haas Daycamp maintained on these grounds serves 50,000 children, many from the inner city, during the

months of July and August. It also operates a year-round program including activities for the elderly in its heated buildings.[12]

Pouch Boy Scout Camp--provides both short and long-term year-round camping facilities for city youth. Considered to be the busiest camping area of the Greater New York Council, it provided 60,000 scout-days of camping service in 1968.[13]

Richmondtown Restoration --this historic town, dating back to pre-Revolutionary days, was once the County Seat. A $5 million program for the reconstruction and re-building of 32 of the old sites is being undertaken by the Staten Island Historical Society and the City of New York.

Other land uses in the Greenbelt area which help to keep the land open and undeveloped are the Moravian Cemetery and the Richmond County Country Club. Depending upon which route for Section I of Richmond Parkway is chosen, any of the above mentioned recreational activities could be markedly affected. Alternate I, the original route proposal which prompted Mayor Lindsay to ask for a postponement in 1966 would be particularly damaging as it carves through the heart of the Greenbelt. Other public facilities, although not in the Greenbelt proper, that could be conceivably affected by the Richmond Parkway are Willowbrook Park adjacent to the Willowbrook State School for the mentally retarded, Susan Wagner High School, and the Sea View Site (an old tuberculosis care center) on which a Public Health Infirmary Care Building will eventually be located.

The possible damages to the public and quasi-public areas which the Richmond Parkway could affect also had to be reconciled with social cost, economic cost, damage to private property, highway planning principles, political feasibility and what legal mandates applied to the use of parkland for highway construction. The State Highway Department found itself dealing with vociferous public groups of opposing goals, a feud between Mayor Lindsay and Governor Rockefeller, continually changing highway regulations and the rapid development of whatever Greenbelt land wasn't under protection. These have been some of the many factors that have led to an eight year stalemate on the completion of the Parkway. However, it is of interest to observe how the political entities involved dealt with these delays and with each other. It is not apparent that any political body or personality considered damage to the environment to be a serious matter except when he/she was placed in the political limelight or when it was politically sound to hold such views.

The route selection process itself, once the original alternate began to be considered in an unfavorable light, was a masterpiece of illogic and misplaced priorities. The events that have occurred since 1966, when Mayor Lindsay halted construction temporarily, illuminate the nature of the highway decision-making process and the extent to which it fails to lend itself to the maintenance of a high quality environment.

Although many citizens and environmental groups have expressed disagreement with the original route that the State Highway Department

planned to follow, that is presently the only route for which right-of-way has been acquired. This is a most significant factor in terms of the nature of Staten Island. Staten Island legally became part of New York City in 1898 but was not physically connected to the city until 1964 when the Verranzano-Narrows Bridge was completed. Until that time, the borough was urban in name only. Little of the island was developed except a heavily concentrated area known as St. George in the immediate proximity of the Staten Island Ferry Terminal, the only transportation means to the rest of New York City. The 1964 population of 250,500 has already expanded rapidly. The Tri-State Regional Planning Commission estimates that Staten Island will contain some 480,000 people by 1985.[14]

This type of population growth across most of the island demanded a vastly improved transportation network. The State Department of Transportation considered it to be more important now than ever that Richmond Parkway be completed, describing it as "a vital link in the regional arterial network as well as in the Staten Island Highway system." Little attention was paid to the possibility of developing new transit systems in conjunction with the rapid growth of the island.

One obvious outcome of the rapid development of the island from around 1964 on was that there existed a new and sudden difficulty in securing land for the purposes of public development. The original route had a right-of-way, but was becoming very unpopular as a result of the environmental damage it would wreak. If the remaining section of highway were to be built anywhere else, it would necessitate the condemnation of many homes. Each division of government with a vested

interest in the route location of the Richmond Parkway proceeded to hire consultants to determine where the "best" location would be. Out of these consultant reports and subsequent compromises between governmental agencies, a total of six alternate routes were proposed, each entailing differential environmental, social and economic costs. The alternates fall, for the most part, within two general study corridors. One corridor is basically true to the original route, passing through the Greenbelt to varying degrees to a termination point with the Staten Island Expressway at the Sunnyside Interchange. Alternates 1 (the original), 2 and 3 fall within this corridor. Alternates 4 and 5, located in the second corridor, veer considerably westward and bypass most of the Greenbelt. They also terminate at the Staten Island Expressway, however, at the Willowbrook Expressway Interchange rather than the Sunnyside Interchange. Alternate 6 was a city-state compromise, and is essentially the route that the State Highway Department plans to construct at this point if funds and administrative approval are forthcoming. It, too, terminates at the Sunnyside Interchange. (See diagram of Richmond Parkway Alternate Alignments).

There are, inevitably, problems with all of the routes. Consultants submitted to the agencies that had hired them reports documenting why the route that they had chosen was the best. However, of paramount importance in these types of studies was what costs were considered to be the most important.

The New York City Highway Department engaged Lockwood, Kessler and Bartlett, Inc., Consulting Engineers, and received their report in August of 1966. The report did not compare alternate routes and chose

one, Alternate 3, as the most suitable. Significantly, it gave little weight to the fact that Alternate 3 would have split the Kaufman Camp in half and also carve across the top of Todt Hill. In its Table of Costs which lead to the derivation of an obscure "Road User Benefit Ratio," the deciding factor in the selection of Alternate 3 in the study, the only costs that were considered were those of right-of-way acquisition, construction, engineering services, and the cost of lost investments (i.e., engineering services for the original route).[16] In a special addendum to their report, they ultimately pointed out that the original route was suitable in every respect (emphasis supplied) although the terms of their contract did not authorize them to compare it to the other routes.[17]

In reply to this, the Triborough Bridge and Tunnel Authority hired their own consultant, Andrews and Clark, Inc., to evaluate the study of Lockwood, Kessler and Bartlett. This study re-emphasized that the parkway should be constructed as originally planned since no other alternate would give better service to Staten Island.[18]

Shortly thereafter, environmental groups began to make their strength felt and the city recommended to the state that Alternate 4, the overwhelming choice of environmentalists, be substituted for the original alignment. Late in 1966, the state transmitted a recommendation for Alternate 4 to the U.S. Bureau of Public Roads which the Bureau rejected in early 1967 for a number of reasons, mostly related to administrative practices and highway planning procedure. It did, however, approve Alternate 3.

The next report to be released was prepared by the Vollmer Ostrower Associates for the New York State Department of Public Works on the Staten Island Greenbelt. The report asserted that:

> It is our firm opinion that a complete system of hiking trails, bicycle paths, and horse trails with appropriate related recreational facilities can be accommodated within the existing right-of-way and adjacent city-owned park land in complete harmony with the Richmond Parkway.[19]

Many were enraged at the notion of major recreational facilities bordering a highway. The Greenbelt Emergency Conference had this to say about the Vollmer Ostrower Study:

> Arnold Vollmer (long an associate of Robert Moses) proceeded to produce a document that shall forever be remembered for its profound absurdity. Vollmer, in effect, claimed that Moses' original route could become "a recreational amenity' by shoe-horning all the features of the Olmsted Trailway--plus the park-way itself--into a 300-foot right-of-way. Amenity... in a median strip.[20]

The City began to take action to meet some of the Bureau of Public Roads requirements for the approval of Alternate 4. One necessary change would have been the change of the Interim Plan by the area-wide review agency for the New York City Metropolitan Region: the Tri-State Transportation Commission (now known as the Tri-State Regional Planning Commission) to insure compatibility of Parkway with Plan. Tri-State deferred action on the City's request until they received the latest consultant report on the Parkway and the Greenbelt.

This report was prepared by Wallace, McHarg, Roberts & Todd for the New York City Parks Recreation and Cultural Affairs Administration.

The report, entitled "The Least Social Cost Corridor For Richmond Parkway" used a system of overlap maps superimposed upon one another to take into account such diverse variables as slope, susceptibility to erosion, historic values, forest values, scenic values, residential values, etc.[21] As each subsequent parameter is superimposed upon the next a pictoral image of the least social cost corridor is depicted where the darkest areas represent the sum of social values and physiographic obstructions to a highway corridor; the lighter tones the areas of least social value. According to the report:

> When the proposed alignments are examined in these terms, it is seen that the Vollmer Ostrower Alignment would violate the highest social values and will incur highest social costs. Route #3 is as culpable, whereas route 4 and 5 in large part conform to the least social cost corridor.[22]

In November of 1968, the Tri-State Transportation Commission altered its Interim Plan to include Alternate 4. Alternate 4 remained the favored route until March of 1969 when the New York State Department of Transportation held the Corridor Public Hearing. At the meeting the battle lines formed and the political nature of highway construction and location was unveiled for all to see. Essentially, all those testifying supported either Alternates 1 or 4. According to the transcript of that hearing the sides broke down as follows:

Alternate 1: all Staten Island elected officials that testified as well as those community planning boards appointed by the Borough President. Neighborhood groups lying in the path of Alternate 4 and most business groups also supported 1 since they saw this alternate as being the most easily and quickly constructed once the decisions were made to do so.

Alternate 4: the Mayor, elected officials who were not from Staten Island, appointed officials with executive responsibilities, other city appointed officials, conservation related groups, and some of the neighborhood groups.

Clearly the overwhelming support of Alternate I by Staten Island Officials had a great deal to do with the general anti-Lindsay sentiments of the Borough of Staten Island. Rep. John Murphy's remarks at the hearing in support of Alternate I began with a Lindsay attack:

> I would like to open my remarks with the observation that had it not been for the delays of the Lindsay Administration, construction of the original route for Section I of the Richmond Parkway would have been completed more than six months ago.[23]

The citizens of Staten Island were rebellious and resentful of the inadequate transportation facilities to be found in Staten Island, the highway construction trades were losing jobs because of the delay, the local businessmen were fearful that without the Richmond Parkway and its additional traffic capacity their businesses would suffer, and the conservation groups were adamant about the irresponsibility of placing a highway through the Greenbelt when other alternatives were available.

No political official wanted to deal with these competing forces. Another alternate was simply created scant months before the hearing but not discussed there as the public focused on Alternatives 1 and 4. Thus, in February of 1970, Governor Rockefeller sent Mayor Lindsay a letter explaining to him that he was withdrawing support for Alternate 4, and supporting instead the new alternate, Alternate 6. According to

his letter, the reasons for his support of Alternate 6 were as follows: 1) it saves the Greenbelt, 2) it relieves traffic congestion 3) it saves the homes of many families 4) it utilizes the already constructed Sunnyside Interchange 5) it does not infringe on Willowbrook Park.[24]

Mayor Lindsay's reply made it clear that all the city could do would be to either accept the state's will or do without the Parkway.

> The initiative, of course, remains with the State... Richmond Parkway is a State highway project. It thus seems clear that if the State so decides, Alternate 4 cannot be built. On the other hand, without agreement among all parties, Richmond Parkway will never be completed. Despite our clear preference for Alternate 4, I believe that the City cannot afford further delay in getting this necessary road built.[25]

Since that time, the Department of Transportation has received state and metropolitan clearinghouse approval (as Tri-State reversed their decision still a third time) for Alternate 6, the Alternate that remains with us today. However, there are innumerable problems with Alternate 6, as there are with any compromise decisions. Some feel that this compromise incorporates many of the worst features of the proposals that it was derived from. It also ignores the rapid development constantly occurring in the land where its right-of-way would have to be located.

The New York City Transportation Administration commissioned an alignment study of the Alternate 6 Corridor and hired the Vollmer Associates to prepare it. The report suggests an alignment which allegedly insulates the Kaufman and Boy Scout Camps from the parkway. In addition, it claims that "...All the houses in the way of the parkway

can be moved, and, therefore, none need be demolished. However, those to be displaced must have assurance that land for this purpose, in their own neighborhood, will be available when they are required to be moved."[26]

The Greenbelt Emergency Conference, a conglomeration of all of the groups that have banded together to save the Greenbelt, has prepared a position paper that highlights many of the problems with Alternate 6 that city and state officials have tried to downplay. For example, they point out that this housing that will be relocated upon city land will in fact, be relocated upon the right-of-way for Alternate I--the heart of the Greenbelt now commonly referred to as the Olmsted Trailway, as it is heavily used for nature hikes.[27] A close reading of the Vollmer Associates Report confirms this, although it is certainly not emphasized in the report.

Another point that the Greenbelt Conference brings out is that in strict economic terms Alternate 6 is the most costly of all the routes given serious consideration. The state's own figures show that Alternate 6 would have to be 4.7 miles long while Alternate 4 would only be 3.9 miles. Total cost for Alternate 6 is given as $42.4 million while Alternate 4's cost is listed as $39.4 million.[28] Although these are 1969 costs, proportions should remain approximately the same. Moreover, the state's cost of Alternate 4 includes a so-called "lost investment" of $1.5 million for the Sunnyside Interchange. The state built this interchange for the Richmond Parkway when they constructed the Staten Island Expressway. They are extremely reluctant to listen in an open minded way to the merits of <u>any</u> alternate that does not use

this interchange, i.e., 4 or 5, as they would then have to pay this money back to the federal government. The costs of losing precious open space cannot be computed accurately, however it is ironical that the state could be losing more than it is saving through its false economy.

Still other problems that city and state officials have tried to obscure are inextricably related to air and water quality and the effects of noise upon a public institution. Alternate 6 would pass High Rock Park Conservation Center at a distance of about 1400 feet. The Staten Island Institute of Arts and Sciences prepared a voluntary environmental impact statement and filed it with the New York City Transportation Administration in October of 1971. It stated, in part, that:

> The position of Alternate 6 will have several deleterious effects on the conservation center. The increase in run-off caused by the 300 foot wide Parkway construction will reduce the amount of natural water reaching the ground water table of the area. If the water table is lowered by only as little as 1 foot, the damage to trees and other plant life will be enormous...the loss of the mature trees in the route of Alternate 6 will have an effect of High Rock Park almost as serious as the Original Route (Alt. 1) with respect to the air pollution created and emanated, and to the loss of wildlife habitats.[29]

It is also possible that Alternate 6 could impose high levels of air and noise pollution on three public facilities in its proximity that are used mainly by young people: Susan Wagner High School, Camp Kaufmann and the Pouch Boy Scout Camp. Alternate 6 would pass so close to Wagner High as to require the taking of the faculty parking lot. Vollmer Associates plans call for a separated and depressed roadway at this point. They also propose the use of an acoustical barrier fence

or wall in combination with the parkway side slope. "This, in combination with dense planting, will also visually separate the parkway from the school."[30] According to the Greenbelt Emergency Conference, "These assurances are given without substantive technical evidence that noise would not, in fact, reverberate harshly within the classrooms of the high school."[31] They point out, justifiably, that the state of the art of noise control is still in a rather primitive stage. One notable example of this lack of refinement occurred in Elizabeth, New Jersey where in a recent decision the courts awarded the Board of Education more than $250,000 in compensatory damages because noise from Inter-state Highway 278 was interfering with the quality of education in a school adjacent to that highway.[32] Air pollution could conceivable pose an even stronger threat to the students of Susan Wagner High School as it could to Pouch and Kaufmann Camps.

This is especially interesting in light of all the much heralded legislation which was passed in recent years in order to assure that highways and other major public works programs infringed as minimally as possible upon the natural environment and upon open space and park land.

The most notable pieces of legislation towards this goal were the Federal-Aid Highway Act of 1966 and Section 4F of the Department of Transportation Act of that same year. Combined with NEPA, effective tools should exist towards curbing highway construction that can take park land when it is not the last resort and towards protecting the environment in general. However, the Richmond Parkway has remained

almost impervious to this legislation thus far, for a variety of reasons, not the least of which are the attitudes of the State DOT.

Section 15 of the Federal Aid Highway Act of 1966 requires that the Secretary of Transportation approve a highway location through a park only when the highway plans include "all possible planning, including consideration of alternatives to the use of such land, to minimize any harm to such park or site resulting from such use."[33] A month later the Department of Transportation Act was passed, including Section 4(f) which provided that the Secretary should not approve a highway location through a park unless "no feasible and prudent" alternatives existed and then, only if the route and design plans included all possible techniques to minimize damage to the park. In 1968, Congress acted to harmonize the wording of Sec. 15 of the Federal-Aid Highway Act with Section 4(f) of the Department of Transportation Act and the basic wording of Sec. 4(f) was used.[34] This was noteworthy because Sec. 4(f) focused more directly on the necessity of examining alternative routes than did the original Sec. 15. One main substantive change particularly relevant to the case of the Richmond Parkway was the restriction of the federal protection to publicly owned land,[35] since a number of key parcels within the Greenbelt are privately owned.

There are a number of ways in which these laws have proved less than effective than they might have been in the case of the Richmond Parkway and the Staten Island Greenbelt. For one thing, normally the State DOT would prepare a 4(f) statement before the first mandatory public hearing, the corridor hearing. This statement would then be incorporated in the draft environmental impact statement the DOT would

prepare for FHWA under NEPA. At the time of the public hearing in March of 1969 no such 4(f) statement had been prepared although the law requiring 4(f) statements had been effective since April of 1967. According to a spokesman of the New York State Highway Department, no such criteria had been sent down from FHWA at that time (almost two years after the effective date of the law).[36] In other words, the FHWA is in no hurry to have new legislation affecting it or its state counterparts implemented. For in the truest sense, the FHWA watches out for and is part of the same family as the State Highway Departments. Intricate connections between the members of the vast happy family of highway builders have been well documented,[37] and many of them were educated at the same schools, belong to the same professional organizations and essentially hold very similar beliefs about the paramount importance of highways in our society.

This can be observed quite readily in the draft Environmental Impact Statement that the New York State Highway Department submitted in August of 1970. Although it dutifully contains a section entitled "Preservation of the Greenbelt" and another called "Concerns of those Interested in Protecting and Enhancing the Environment" its deficiencies were so marked that even FHWA had some harsh words for it. The deficiencies that the State DOT was ordered to correct show that they do not take very seriously Federal law concerning their activities.

For example, in terms of considering all "feasible and prudent alternatives" before park land is taken for highway use the 4(f) statement included in the EIS makes no mention of most alternatives. It simply

compared a few of the most "popular" for convenience sake. The alternative of simply not completing the Parkway was dismissed in a sentence as being impossible. In its discussion of the environmental damage that the Parkway could cause it failed to even mention the existence of High Rock Park Conservation Center. The State Highway Department has been ordered to more fully examine alternatives and to solicit statements from all affected land uses within the Greenbelt and the path of the Parkway as to what they estimate that the damage will be.

EPA must, at this point in time, play a rather frustrating role in its review of the Richmond Parkway EIS. EPA must limit itself to comments concerning the areas over which EPA has a direct mandate. Thus, although it has been pointed out that even if the route for Richmond Parkway bypasses the Greenbelt, the detrimental effects of air pollution, noise and damage to property and vegetation will still occur EPA must be somewhat more specific than that in order to have some effect upon the halting of the Parkway. It must deal with probabilities that have still not been clearly defined. How many cars will really use this Parkway? How much pollutant will they emit? How much pollutant is needed to actually cause damage that outweighs whatever the benefits are of having such a Parkway? It may be impossible to state the answers to these types of questions with scientific exactitude. Nor can EPA discuss loss of open space, amenities of life, or beauty as substantive proof that the Parkway should not be built. Air, noise, water, solid waste, radiation--this is the stuff of which EPA is made. It is only after volumes of traffic are producing completely unmanageable loads of

pollutant that EPA is allowed to begin thinking about land use and thus devise perfectly reasonable standards which are almost inenforceable due to the magnitude of the problem.

This unsystematic approach to environmental problem solving can be seen quite clearly in another incident related to the Richmond Parkway. The New York State Department of Transportation solicited comments from many governmental agencies concerning the Richmond Parkway. One such agency was U.S. Department of Housing and Urban Development (HUD-Region II). The State DOT wrote to HUD (and numerous agencies) that "Your views and comments will assist us in determining the positive and negative impact of this and other alternatives upon the environment and the area's needs." HUD had no comments whatsoever to make.[38] It would have been most relevant for HUD to have commented upon what spurs to growth the Parkway could provide for the region, whether this growth could be accommodated, and how HUD could assist. In a public hearing held this year on a proposed master plan for Staten Island, members of the public expressed grave concern over the sewer shortage on Staten Island, and the wisdom of continued growth without additional sewers.[39] It should be very much HUD's business to comment on any incentive to growth, particularly in an area lacking facilities which HUD funds (i.e., sewer grants).

However, the lack of attention paid to the system of actions and reactions that causes land use, environmental, social, and economic problems was apparent throughout the whole Parkway issue. An active spokesman and worker for the groups seeking to preserve the Greenbelt pointed out that all along, the issue was considered a "highway problem" and thus,

highway people dealt with it. It was not dealt with within the context that it will actually exist--i.e., as part of a dynamic urban system but rather relegated to an isolated and artificial role.[40]

In an urban area like New York, after a Parkway is proposed an extended search must be conducted for land on which it can be built. The odds are excellent that seemingly appropriate land is already being used for numerous and varied activities ranging from open space to industry to housing. Something, and usually, some people must be displaced unless the alternative of not building the Parkway is given the most serious consideration possible. There is no question that this was not done in the case of the Richmond Parkway. Roads and existing highways were becoming overloaded, population was growing and so the classic solution was brought up--another highway. One reason for this preoccupation with highway building is that state departments of transportation are not equipped with the funds nor the imaginative personnel necessary to research, develop and provide new forms of transportation appropriate to areas like Staten Island that are not yet dense enough (and may never be) to support traditional fixed rail transit to any significant degree.

They may be forced into developing those capabilities as enforcement of federal environmental standards becomes more stringent and highway construction costs continue to increase in all cost realms, i.e., economic, social, environmental, political. Citizens groups, too, have become more vocal and have won a number of recent landmark decisions that will undoubtedly help to protect park land and open space from highways.[41]

However, even if legislative and legal considerations don't stop or alter the course of the Richmond Parkway, simple financial ones might. The original cost estimate was $17 million; the price has been driven up to over $40 million at this time.[42] The State Highway Department is fond of pointing out however, that since a number of the pieces of land in the Greenbelt are not in public ownership, they are being subjected to heavy development pressures and rising taxes. In other words, what the State DOT may not be able to get, the subdividers will, if a far-reaching and comprehensive land protection and acquisition program is not instituted.

Towards that end, the New York City Parks, Recreation and Cultural Affairs Administration has undertaken a study to ascertain the best use use and method of preservation of each vulnerable parcel in that area. Other organizations have submitted ideas for protection of the land. One method of protection would be purchase. Unfortunately, the City of New York does not have the legal first right of purchase on mapped semi-public and private open space. Until such a time when new state legislation is enacted, such properties as the Boy Scout Camp and the Kaufmann Camp can be offered for sale to whomever the owners choose. If that problem is resolved, the difficulty remains of obtaining the money to purchase that land.

One likely source of funds are those derived from the sale of "in-rem" lands--land that the city confiscates for three years of non-payment of real estate taxes. These parcels are first circulated to other city agencies to see if they can use them, if not, they are sold at public aution. The city could acquire additional lands in the

Greenbelt by earmarking funds from the sale of "in-rem" lands on Staten Island for acquisition of new parks and recreation areas on Staten Island.

The possibility of obtaining federal funds for purchase of the Greenbelt lands exists with at least two sources the Land and Water Conservation Fund and

1970. In particular, the "urban shaping money" of this act could apply to the Greenbelt area as Staten Island undergoes rapid urbanization that could conceivably be better channelled by judicious acquisition of selected parcels.[43]

One type of device that would not require fee acquisition of the land would be the purchase of a scenic or conservation easement. This easement could be affirmative, i.e., giving the owner the right to use the land for a stated purpose, or negative, giving the easement owner the right to prevent the owner of the land from using his land for certain stated purposes. Payments for easements are made at the time of the acquisition of the easement and are based on the difference between the market value of the tract before and after the easement is imposed.

Leasebacks could also be investigated. In this type of situation, the city would buy the land from the private owner and lease it back with certain rights for a finite period of time. Not only would this allow the city to purchase land at a much cheaper price than it could be purchased in 10 or 15 years, it could conceivably enable organizations like the Kaufmann Camp and the Boy Scout Camp to continue operations.

Still other suggestions revolve around the creation of special zoning districts that could protect the existing uses. A tax exempt status could even be linked to that type of zoning ordinance.

However, whatever the methods used, what must be kept in mind is the most judicious use of one of our urban area's most limited resources --land. It has been pointed out that:

> Planning in general, and the location of a highway in particular, is a political process. While the procedure may seem susceptible to scientific objectivity and a final determination by the 'expert', not only the decision where to locate, but even the decision to build an urban highway is a political one in the broad sense of the term.[44]

If this is kept in mind, then it becomes apparent that the Greenbelt is a unique resource and should not be used for a highway location. No scientific formula or unshakable logic decreed that the only possible solution required desecration of the Greenbelt. It was simply the easiest solution. However, other solutions can and must be sought.

An obvious starting point would be with an honest evaluation of the true necessity for the Parkway. A new major roadway along the western edge of Staten Island is currently being constructed. That may well be sufficient. Concurrently research must be stepped up on new transit methods, particularly personal transit systems such as Dial-A-Bus and people movers. It is possible a development freeze can be put upon several areas that might have to be used as right-of-way to minimize condemnation and the wholesale displacement of people, should the Parkway really need to be built. There are many things that should be done and are

not being done. They would require a complete reorientation of the premises behind the highway planning and development process however, and the changes are only slowly beginning. It would be to the profound advantage of EPA to assist in any way possible, including, if necessary, in an education program for highway planners that covered the environmental impacts of highways as they relate to federal law. The feasibility and legality of EPA grants for research into new transportation methods might also be considered. As long as highways that may not be necessary are being constructed through urban parks and open space--not only will the quality of life suffer but EPA's work will be made that much harder.

FOOTNOTES

Section II - Transportation and Environmental Pollution

6. The Richmond Parkway and the Staten Island Greenbelt

1. New York State Department of Transportation, Location Recommendation and Report for Section I of the Richmond Parkway, Staten Island (Albany, N.Y: New York State Department of Transportation, August, 1970), Appendix D.

2. New York City Transportation Administration, Chronological Order of Richmond Parkway (New York: New York City Transportation Administration, n.d.)

3. Testimony of Congressman John M. Murphy of Staten Island at Richmond Parkway Corridor Public Hearing, Staten Island, N.Y., March 25, 1969.

4. New York City Transportation Administration, Chronological Order.

5. American Association of State Highway Officials, AASHO Highway Definitions, 1968, p. 9.

6. Federal Highway Administration-Environmental Development Division, Park and Recreational Facilities: Their Consideration as an Environmental Factor Influencing the Location and Design of a Highway (Washington, D.C: U.S. Department of Transportation, 1971), p. 25.

7. Ibid.

8. Vollmer Ostrower Associates, The Staten Island Greenbelt: A Report on Its Significance As An Outdoor Recreation Resource, Prepared for the New York State Department of Public Works (New York, May, 1967), p. 3.

9. New York State Department of Transportation, Location Recommendation.

10. Greenbelt Emergency Conference, The Olmsted Greenbelt Trail (New York: Greenbelt Emergency Conference, 1970)

11. Information supplied by Cynthia Jacobson, Coordinator for Higher Education, High Rock Park Conservation Center.

12. Information supplied by Mr. Hochran, Camp Supervisor, Flora Haas Daycamp.

13. New York State Department of Transportation, Location Recommendation.

14. New York State Department of Transportation, Richmond Parkway-Alternative Alignments For Construction From Arthur Kill Road-Richmond Avenue to Staten Island Expressway (Albany, N.Y: New York State Department of Transportation, n.d.)

15. New York State Department of Transportation, Location Recommendation.

16. Lockwood, Kessler, and Bartlett, Inc., Richmond Parkway Section I: Study of Alternate Routes From Richmond Avenue to the Staten Island Expressway, Prepared for the Department of Highways, City of N.Y. (New York, 1966)

17. New York City Transportation Administration, Chronological Order.

18. Andrews and Clark, Inc., Report on Alternates Proposed for Richmond Parkway Contract I, Prepared for the New York State Department of Public Works (New York, 1967)

19. Vollmer Ostrower Associates, The Staten Island Greenbelt.

20. Greenbelt Emergency Conference, Olmsted Greenbelt Hike: November 23, 1968 (New York, Greenbelt Emergency Conference, n.d.)

21. This type of process is well described in Ian McHarg's book, Design With Nature

22. Wallace, McHarg, Roberts and Todd, The Least Social Cost Corridor for Richmond Parkway, Prepared for the New York City Parks, Recreation and Cultural Affairs Administration (Philadelphia, 1968), p. 18.

23. Testimony of Congressman John M. Murphy of Staten Island at Richmond Parkway Corridor Public Hearing, Staten Island, N.Y., March 25, 1969.

24. Letter of February 11, 1970 from Governor Nelson Rockefeller of New York to Mayor John Lindsay of New York City.

25. Letter of Feburary 20, 1970 from Mayor John Lindsay of New York City to Governor Nelson Rockefeller of New York.

26. Vollmer Associates, Richmond Parkway Alternate 6 Corridor Alignment Study, Prepared for the New York City Transportation Administration (New York: 1972)

27. Greenbelt Emergency Conference, "Position Paper on the Staten Island Greenbelt/Richmond Parkway," New York, 1972. (Mimeographed.)

28. New York State Department of Transportation, Richmond Parkway-Alternative Alignments.

29. Greenbelt Emergency Conference, "Position Paper..."

30. Vollmer Associates, Richmond Parkway Alternate 6...

31. Greenbelt Emergency Conference, "Position Paper..."

32. Federal Aid Highway Act of 1966, P.L. 89-575, Sec. 15, 80 Stat. 771.

33. Department of Transportation Act of 1966, P.L. 89-670, 80 Stat. 931-50.

34. Federal Aid Highway Act of 1968, P.L. 90-495, Sec. 18, 82 Stat. 823-24.

35. 49 U.S.C. § 1653 (f), 1970.

36. Information supplied by Mr. Kilduff, Associate Civil Engineer in charge of planning for New York City of the New York State Department of Transportation.

37. See a good portion of Helen Leavitt's Superhighway-Superhoax (New York: Ballantine Books, 1970)

38. New York State Department of Transportation, Location Recommendation, Appendix E.

39. New York Post, May 3, 1972, p. 36.

40. Terence Benbow, a Commissioner of the New York City Landmark Preservation Commission and one of the leaders of the fight to save the Greenbelt was extremely helpful in providing information about the Richmond Parkway and the Staten Island Greenbelt as was Robert Hagenhofer, past-president of the Staten Island Citizen's Planning Committee.

41. See Citizens to Preserve Overton Park, Inc. v. Volpe 401 U.S. 402 (1971). One particularly important outcome of this decision was that highway projects may not be considered segment by segment by the Secretary of Transportation, with respect to 4(F) review. Instead, they must be considered in totality so that true impacts are more readily apparent, as segmentation sometimes forces the selection of a most environmentally damaging route. Another decision important to this area is that of San Antonio Conservation Society v. Texas Highway Department 400 U.S. 939 (1970). An excellent discussion of these two cases, and a number of other important issues relevant to highway planning and parks can be found in the Iowa Law Review issue of February, 1972, in an article entitled "Favoring Parks Over Highways-A First Step Toward Resolving the Conflict Between Preservation of Environmental Amenities and Expansion of the Highway System."

42. Information supplied by Mr. Kilduff, New York State Department of Transportation.

43. Housing Act of 1970, P.L. 91-609, 84 Stat. 1770, 1781.

44. Alfred C. Aman, Jr., "Urban Highways: The Problems of Route Selection and A Proposed Solution," Journal of Urban Law Vol. 47, No. 4 (1969-70).

SECTION III

OPEN LAND AND WATER AREAS, DEVELOPMENT PATTERNS AND ENVIRONMENTAL QUALITY

1. Open Space and Environmental Quality

The acquisition, preservation and development (or lack thereof) of open space are particularly pressing problems in the United States. Nowhere are these problems more difficult to solve than in our urban areas where every piece of land has so many potential uses, and so many competing forces affecting it.

EPA has no direct mandate to deal with open space and recreational facilities in any way. Despite this, not only does open space affect the policies and programs of EPA, but EPA's varied functions affect the availability of open space and availability of land for recreation of all types. A series of brief illustrations will demonstrate that this is true.

Each time that EPA develops new ambient air quality standards it affects the incineration process by which many urban areas dispose of some of their solid waste. New York City, for example, has been incinerating about 22% of its solid waste and disposing of almost all of the rest of it in the rapidly filling landfill areas that are spread around the outskirts of the city.[1] As federal air standards make it impossible to continue using some of the more obsolete incinerators, the temporary solution is usually to dispose of that waste that the existing incinerators cannot handle by barging this waste to the landfill

areas. Although the intent is only to do this as a make-shift measure until either new incinerators can be built or other new processes developed, in effect, because of the expense and time needed to construct and develop new facilities, this extra burden upon the landfill areas continues for some time.

In order to relieve some of the pressures upon landfill areas, New York City Mayor Lindsay and Environmental Protection Administrator Jerome Kretchmer have seriously proposed that New York City be allowed to dump its wastes in the ocean. However, with the passage this year (October 3) of the Marine Protection, Research, and Sanctuaries Act, EPA has the power to strictly regulate ocean dumping. Although for the sake of environmental quality it is important that EPA follow the recommendations of the Council on Environmental Quality[2] and greatly curtail ocean dumping, it must be recognized that at this time such regulations will almost certainly affect open space in the New York area.

However, even as EPA affects the availability of open space, open space affects the functioning of EPA in such diverse areas as air pollution control, water quality, noise pollution control, etc. Eradication of greenery deprives humans of a screen against airborne pollutants, a barrier against noise, a natural thermostat and an oxygen source. In the United States alone around 20,000 acres of vegetation are paved over each week.[3]

This becomes particularly significant when the oxygen producing capabilities of plants are examined. Cornell ecologist LaMont Cole has calculated that the average acre of green, open land produces about 2,500 pounds of oxygen each year, while a deciduous forest can produce 1,000 times that amount or 2,500,000 pounds per year.[4] In addition, plants can serve as effective air purifiers since they can absorb pollutants through the pores in their leaves, and transport them into the soil. It has been shown that a forest can significantly reduce the suspended concentration of certain air pollutants.[5]

A study was performed in which the atmospheric concentration of sulphur dioxide (SO_2) was studied in mid-Manhattan in an area running from the Hudson River to the East River along 79th Street downwind. The results showed a 40% dilution of the SO_2 level at the measurement point in Central Park. Of course, the absence of pollution-causing devices within the park itself was in part responsible for the dramatic decrease, but that, in itself, helps to indicate the importance of setting aside open space in urban areas.[6]

Plant life, like human beings, can be adversely affected by air pollution. Many maintain, in fact, that air pollution has a greater toxic effect upon vegetation than upon animals.[7] Ozone is a chief offender, and is recognized as being the air pollutant that causes the greatest harm to plants in the U.S.[8] In a study that measured ozone levels downwind from Los Angeles, it was found that ozone levels were reduced appreciably by plants.[9] However, other sources indicate that plants show the signs of ozone poisoning if they are

subjected to air containing 0.07 ppm for a four hour period.[10] The study of plant life around Los Angeles showed ozone concentrations ranging from 0.03 to 0.15 ppm.[11]

Nor is ozone the only air pollutant that can affect plant life. Paroxyacetyl nitrate (PAN) has undesirable effects at a concentration of 0.12 ppm for six hours; SO_2 at 0.50 ppm for four hours and NO_2 at 2.0 ppm for four hours. Florides accumulate in plant tissues, and when levels of 50-200 ppm are reached the leaves show symptoms of floride poisoning.[12] For these reasons, the ability of vegetation to act as an air pollution reducer over extended periods of time must be questioned and further researched.

Although it has been established that 1) plant life generates oxygen, 2) plant life has a certain capacity to absorb pollutants, and 3) pollutant levels above that capacity damage the plants, there has been little systematic study to integrate these factors with the diminishing amounts of plant life and open space and the increasing air pollution sources in this country. This may well be an important relationship for EPA to examine.

Another area of investigation that would be well worth pursuing is the noise abatement properties of plant life. It has been the conclusion of a number of studies that trees or tree-shrub combination buffer strips can have a significant effect on noise abatement under certain conditions. One of the most important conditions is that of temperature as sound is refracted towards cooler air.[13] Thus, at night, when the air temperature is normally cooler near the ground, it is possible for sound directed above a barrier to be refracted back to the

ground on the other side of the barrier. Generally, however, strips of trees and shrubs can be somewhat effective in noise abatement.

The noise attenuation by natural forests varies from 6 to 16 db per 100 ft.[14] The amount of attenuation has been found to be more dependent upon the density than the species of trees in the stand. The highest attenuation recorded in the study was cited as 8-16 db/100 ft. in a cedar stand where visibility was limited to 60 feet.[15]

Much more study is needed to find the most effective buffers to use. It has been shown so far that 100 foot buffers are effective in buffering highway noises,[16] however, possible harmful effects of the automobile exhausts upon the trees should be taken into account.

Clearly there are numerous other examples of the ways in which open space and the presence of land set aside for recreation is relevant to EPA. It would be beneficial to elaborate upon the ways that current land use practices and policies make the preservation of open space in urban areas so difficult, and the need for urban open space so great.

The fight for open space proceeds on a number of levels. There is the necessity of finding small plots of land in dense urban areas and preserving them for recreational use, and the relief of density. In rapidly urbanizing areas whatever suitable land is left must be acquired immediately, before it is lost to development. In rural areas protection of the abundant resources is necessary to insure their continued existence for many years to come. However, the obstacles to these goals are numerous and range from

politics of individual communities to the financing of open space acquisition.

About 770,000 acres of land will be needed to meet the recreation needs of the 27 million people expected to live in the Tri-State Region by the year 2000.[17] That figure does not include extensive grounds for camping, hiking and hunting since such use of land is difficult to justify directly in immensely dense urban areas; however, it does include virtually every other kind of recreational activity. Of the 770,000 acres needed, about 160,000 acres are expected to be set aside by such nongovernmental groups as golf clubs, scout camps, boat clubs, etc. Federal, state and local governmental agencies already own about 230,000 acres, thus 380,000 acres must be somehow obtained[18] if these figures are to be assumed to be accurate.

Where these 380,000 acres can be found is somewhat of a dilemma. For example, New Jersey is the most densely populated state in the country--averaging 953 persons per square mile.[19] The population has been increasing at the rate of about 100,000 people per year at the same time that the amount of open space keeps decreasing. According to the Report of the New Jersey Commission on Open Space Policy:

> In gross acreage, to be sure, there is still a great deal of open space. The great bulk of this acreage, however, is massed in a few large areas. In the urban areas where there are the most people and where the need is greatest, there is the least space. What space there is, furthermore, is growing dearer and coming increasingly under development pressure. So, too, is rural land...In such places the landscape may seem reassuringly untouched, but that is only illusion. Long before the signs go up and the graders start to work, the speculators will have cast the die.[20]

For, unfortunately, whatever land would seem eminently suitable for open space is also most sought after as land for private homes. In the words of the Nassau-Suffolk Regional Planning Board, priorities for recreational land "will be easy to overlook since, unfortunately, the most valuable recreation land is frequently the best for home sites as well. Conservation land appears to cry out for 'improvement' and hard pressed taxpayers are anxious to attract revenue-producing facilities."[21]

There are numerous critics of the present entrepreneurship approach to the development of land who have collected data to try to convince a community that conserving land as open space will not ultimately cost them more than the development of that land. This, of course, does not even attempt to put dollar values on the many psychological, social and health benefits of living in a community with adequate open space.

A notable example of a cost study occurred in Lloyd Harbor, New York when Robert Moses announced his intention to purchase the land now used for Caumsett State Park from the 1,426 acre Marshall Field Estate. After Lloyd Harbor residents raised an opposition to this much land being removed from their tax rolls, the village board hired a group of planning consultants to more accurately assess the costs. Their findings were most significant: It would cost almost an additional 20% per taxpayer, an extra $2.58 per assessed $100 of property value to have this land removed from the tax rolls. However, they also set up a statistical model to calculate what costs might be if this land were actually developed, based on 2 acre plots containing houses worth $35,000 each. Under those circumstances the increase would be $7.31, nearly three times as much.[22]

Still another approach to assessing the cost of open space is the one that Ian McHarg uses. According to his system, all surface water and riparian lands as far back from the banks or shores as would keep the water body stable would be high priority open space. Included would be all marshes and wetlands, as well as all flood plains and all aquifer recharge areas where water percolates into the ground. If one looks at the aquifer in New Jersey parallel to the Delaware River, the implications of McHarg's policies become clearer. This aquifer has been estimated by the Soil Conservation Service to have a potential capacity of one billion gallons per day. A water value of 12¢ per 1,000 gallons (the water price in Philadelphia) would lead to a value of $40,000,000 per year. Capitalized, this makes a very valuable piece of real estate, providing that the water recharge areas are not covered over by development.[23]

2. Open Space For Urban Areas: Federal and State Policy

What of the inner-city residents and their open space and recreational needs? Ringed in by the suburbs, inner-city residents of New York are effectively isolated from many of the recreation facilities and much of the open space of the region. Facilities such as Jones Beach State Park not only fill by 8 or 9 a.m. on hot summer Sundays, they are virtually inaccessible except by automobile, eliminating many inner-city residents. This acute inner-city shortage of open space and recreational areas is a most serious matter. The National Advisory Commission on Civil Disorders discovered that grievances concerning inner-city recreational facilities were some of the most common complaints of a large majority in the twenty cities studied.

However, unusual effort and imagination are needed to provide open space and recreation in a city like New York or Newark. One way in which New York City has been attempting to turn a deficit into an asset is through the use of the open space that arises out of urban blight. Declines in small businesses and their inability to pay property taxes have forced many shopkeepers and landlords to leave the inner-city. There are now vacant lots where these tax delinquent tenements and abandoned businesses once stood; about 24,000 of them according to the Open Space Action Institute.[24] Although many were being used as neighborhood garbage dumps, at the same time a number of agencies were interested in financing and assisting in turning these lots into "vest pocket parks" or "parklets."

The city began purchasing these lots until money ran out; then turned to HUD for money from the open cities, model cities, and urban beautification programs.[25] Community action groups play a key role in converting these vacant lots into parks and useable open space. The City's Department of Real Estate rents the lot for one dollar a month to any responsible person or group that can get liability insurance. This applies to any unused lot that the city owns that can be found in any particular neighborhood; the group may use the lot in the way the community deems best. The Department of Public Works will pave the lot, and the city will provide park equipment if it is desired, however the community is responsible for all maintenance.[26]

This vest pocket park approach is a good but limited effort to provide additional open space and recreational areas for urban people However, in many of the more important ways Federal and State policy often slights urban areas in favor of the acquisition of open space in the more rural areas where it is not needed as urgently. In the urban or rapidly urbanizing segments of the country (and in all of the New York City Metropolitan Region), money is urgently needed before it is too late to purchase some or all of the rights in the open space land.

Back in 1968, the Regional Plan Association pointed out that:

> The total cost of purchasing the land now and paying interest on long-term loans would almost certainly be lower than the total cost of the land later on, after it is surrounded by houses, stores and highways. This is particularly true if government waits to buy a prospective park until a builder has purchased the land for a project, which has happened several times recently.[27]

Yet, government programs have until very recently stubbornly given the vast bulk of the park and open space money to areas that still have some time before development pressures hit. For example, the State of New Jersey used a great deal of its 1961 "Green Acres" Bond Issue money to purchase public open space holdings in the counties that already had the most open space. In Atlantic County which had 33,786 acres, 6,500 acres were added; in Burlington County which had 98,521 acres, 8,000 were added; in Cape May County which had 11,312 acres, 26,000 acres were added. At the same time, relatively little acquisition took place in the heavily urban areas of Bergen, Essex, Union and Hudson counties--a total of only 5,900 acres were purchased for those four counties.[28]

In the New York State Environmental Bond, the majority of the $175 million earmarked to be spend on land resources will be spent for land far from the state's urban areas. Lower land values will enable the funds to purchase more acreage in rural areas; however, even small parcels of land can be of crucial importance to densely built up urban areas. The bond allots no more than $77.5 million for open space acquisition in or around the urbanized areas of the state: $18 million for the acquisition of 5000 acres of valuable tidal wetlands in private ownership; $4.5 million for preservation of unique natural areas in the Hudson Valley, Metropolitan New York and Long Island; $40 million for metropolitan parklands; and $15 million for open space within or near urban and suburban areas.[29]

It is unfortunate that while New York State Environmental Conservation Commissioner Henry Diamond bicycled from one urban center to another to

sell his Bond Issue, he did not have the foresight to allocate the monies more adequately for the majority of the inhabitants of those centers--the people who haven't the means to vacation in the Adirondack or Catskill Mountains.

These same types of trends continue at the Federal level. For example, as of 1969, Connecticut, New Jersey and New York contained less Federal parkland per capita than any other state except Rhode Island.[30] Allocations made through the Land and Water Conservation Fund administered by the U.S. Bureau of Outdoor Recreation (BOR) are weighted to favor less heavily populated states. This can be observed if one looks at past allocations and formulas for the distribution of aid.

Although the money the Federal government has allocated for the states to share has risen dramatically in the last three years (from $62 million to $255 million), allocation formulas among states weigh heavily against population.[31] Congress has mandated that 40% of the states' share shall be divided equally among the 50 states regardless of population or density. The other 60% is divied out on the basis of need as the Secretary of the Interior sees fit--with several provisos including one that says that no single state can receive more than 7% of the total.[32]

As a result of this, for fiscal year 1972, for example, per capita allocations for such states as Wyoming and Idaho were $6.44 and $3.28 respectively while the far denser and more heavily urbanized states got much less--$1.00 for New Jersey and $0.87 for New York.[33] The Administration supported two reform bills in Congress (S.1175 and H.R.4705) which would have changed allocation formulas to assist urban areas more in the

acquisition of open space (i.e., raise from 7 to 10% the amount any one state could receive, etc.) However, the provisions in these bills which would have benefitted urban areas were thrown out last year by the House Interior Subcommittee on National Parks and Recreation.

Another problem in the Federal funding of open space rests in a congressional tendency to lump funds for open space projects with funds for urban renewal and public facility programs on a competing basis as in Community Development Bloc Grants under the Housing and Urban Development Act of 1972. In addition, although this fault may be partially rectified in this session of Congress, neither BOR nor HUD has the authority to make grants to cover operating or maintenance expenses. This has particularly grave consequences for an urban area. New York City has, for example, been running into extreme budgetary difficulty as it attempts to administer and maintain the 36,913 acres in its system.

Joseph P. Davidson, First Deputy Administrator of the City's Parks, Recreation and Cultural Affairs Administration told an Interior Department forum that restrictions on the use of Federal funds to build outdoor park and recreational facilities prohibit the money from being used to help to maintain the facilities or to provide indoor swimming pools and the like that can be used all year round. He pointed out that in cities, limited open space is available, and thus construction is needed to provide recreational facilities that go upward not outward.[34]

One interesting point to note concerning Federal funding and urban recreation is that the Department of the Interior has scrapped a study of American recreation needs that took 6 years and cost more than $6 million

dollars. It is currently redoing the report and refuses to release any portion of it, even to one of its own consultants hired to evaluate the National Park system. According to the Washington Post, the Office of Management and Budget suppressed the report after it suggested that it could take more than $25 billion in additional funds to give urban dwellers "the same amount of nearby recreation opportunity by 1975 that was available on the average nationwide in 1965."[35]

However, in the midst of the generally inadequate Federal programs for urban areas, one notable and valuable Federal effort to provide increased recreation availability and open space is the "Legacy of Parks" Program which has led to the creation of Gateway National Recreation Area. The Gateway National Recreation Area will be discussed as a case study in the next section.

FOOTNOTES

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

1. Open Space and Environmental Quality

2. Open Space for Urban Areas and Federal and State Policy

1. New York City Environmental Protection Administration, "Solid Waste Operations in New York City," (New York: New York City Environmental Protection Administration, n.d.), p. 4.

2. Council on Environmental Quality, Ocean Dumping: A National Policy (Washington, D.C: Council on Environmental Quality, October, 1970)

3. Charles E. Little and John G. Mitchell, Space For Survival: Blocking the Bulldozer in Urban America, A Sierra Club Handbook (New York: Pocket Books, 1971), p. 22.

4. Ibid., p. 23.

5. Ibid., p. 24.

6. Joseph James Shomon, Open Land For Urban America: Acquisition, Safekeeping and Use (Baltimore: The Johns Hopkins Press, 1971), p. 30.

7. Information supplied by Dr. Paul D. Manion, Assistant Professor of Plant Pathology, SUNY College of Environmental Science and Forestry.

8. Saul Rich, "Effects of Trees and Forests in Reducing Air Pollution," in Trees and Forests in an Urbanizing Environment (Cooperative Extension Service, University of Massachusetts, March, 1971), p. 29.

9. Ibid., p. 31.

10. F. A. Wood, "Sources of Plant Pathogenic Air Pollutants," in Phytopathology, Vol. 58 (1968), pp. 1078-1084.

11. Rich, "Effects of Trees and Forests..."

12. Wood, "Sources of Plant Pathogenic..."

13. Raymond E. Lenhard, "Effects of Trees and Forests in Noise Abatement," in Trees and Forests in An Urbanizing Environment, above, p. 36.

14. Ibid., p. 37.

15. Ibid.

16. Davis I. Cook and David F. Van Havebeke, "Trees May Help Solve the Traffic Noise Problem," University of Nebraska Quarterly, Vol. 16 (1969)

    See also, Davis I. Cook and David F. Van Havebeke, "Trees and Shrubs For Noise Abatement," in Trees and Forests in An Urbanizing Environment, above.

17. Tri-State Transportation Commission, Outdoor Recreation in a Crowded Region (New York: Tri-State Transportation Commission, September, 1969), p. 2.

18. Ibid.

19. U.S. Dept. of Commerce, General Social and Economic Characteristics, 1970 Census of the Population, New Jersey.

20. New Jersey Commission on Open Space Policy, Report of the New Jersey Commission on Open Space Policy, March, 1971, p. 2.

21. Nassau-Suffolk Regional Planning Board, Nassau-Suffolk Comprehensive Development Plan: Summary (Hauppauge, N.Y.: Nassau-Suffolk Regional Planning Board, 1970)

22. Little and Mitchell, Space For Survival, pp. 115-16.

23. Ibid., p. 19.

24. Open Space Action Institute, "Lot About Lots," Open Space Action No. 22 (May-June, 1969)

25. Public Health and Welfare Law, 42 U.S.C.A. §§ 1500 (a), 1500 (c-1), 1500 (c-2) (1969)

26. "Aesthetic Considerations in Land Use Planning," Albany Law Review, Vol. 35 (1970), pp. 136-37.

27. Regional Plan Association, The Second Regional Plan: A Draft for Discussion (New York: Regional Plan Association, November, 1968), p. 16.

28. New Jersey Commission on Open Space Policy, Report of the New Jersey..., p. 5

29. New York State Department of Environmental Conservation, "Environmental Quality Bond Act of 1972 Factbook," (Albany, N.Y.: New York State Department of Environmental Conservation, 1972), pp. 15-19.

30. Tri-State Transportation Commission, Outdoor Recreation..., p. 15.

31. The Conservation Foundation, CF Letter: A Report on Environmental Issues (Washington, D.C.: The Conservation Foundation, March, 1972)

32. 16 U.S.C.A. 460

33. The Conservation Foundation, CF Letter...

34. "U.S. Aid is Sought For City's Parks," New York Times, July 16, 1972.

35. "Interior Starts All Over on $6 Million Study," Washington Post, July 17, 1972.

3. Case Study: Gateway National Recreation Area

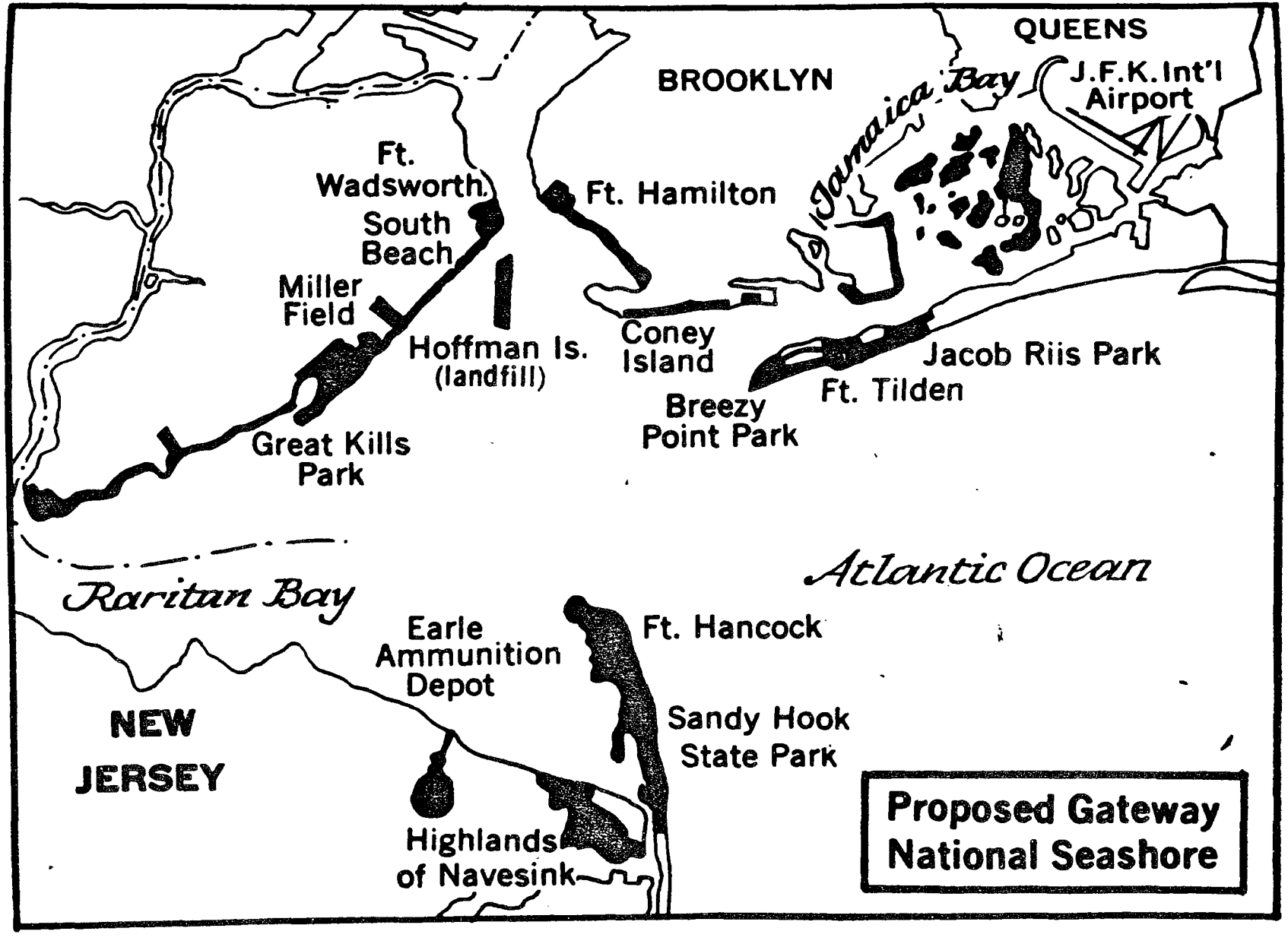
The creation of the Gateway National Recreation Area is of the first major indications that Federal funding is beginning to support a previously invisible effort "to expand the Nation's parks, recreation areas and open spaces in a way that truly brings parks to the people where the people are."[1]

Both the Senate and the House have finally passed versions of a Gateway Bill and agreed upon a compromise bill. Congressman Ryan first introduced the bill into the House in June of 1969. It is ironical that it passed only a few short weeks after his death. He wanted what federal policy and politicking has so long denied inner-city residents and the urban poor. In his testimony before the Senate Subcommittee on Parks and Recreation of the Committee on Interior and Insular Affairs Ryan stated that:

> Gateway is a park for the millions of people not privileged enough to be able to afford long vacations or expensive trips. It is for the millions of disadvantaged whose summer recreation resources are now limited to an open fire hydrant or, if they are lucky, a crowded neighborhood pool...We talk so much of preserving our wild lands and scenic vistas. But what is this but rhetoric to the ghetto child of Harlem who only knows the hot summer streets of his own neighborhood.[2]

Gateway will be one of the two first national recreation areas near major urban centers. It will include about 26,000 acres, taking in Jamaica Bay and most of Breezy Point in Queens; Floyd Bennett Field; Great Kills Park, Miller Field and Fort Wadsworth on Staten Island plus

Map: New York Times



the beach front running between Great Kills and Fort Wadsworth; Hoffman and Swinburne Islands of Staten Island and Sandy Hook in New Jersey.[3]

Up until this point many of these areas have managed to remain relatively free of development. This has occurred because much of this land was under government or military ownership (i.e., Floyd Bennett Field and large portions of Sandy Hook were owned by the DOD, Great Kills is a reclaimed landfill site, etc.) However, without the creation of Gateway it would have been only a few years until these lands were used for non-recreational and non-open space purposes despite its public ownership.

Jamaica Bay, for example, is heavily polluted in parts. Despite this, it supports an astounding wealth of birdlife. Prior to Gateway, various proposals were being made for the construction of new runways of Kennedy Airport through Jamaica Bay. Similarly, serious considerations was being given to suggestions that portions of Floyd Bennett Field be used for public housing rather than recreation.

The preservation of this land for recreational use was vital, especially when one considers the extent to which so many stretches of land across the country are being purchased and conserved with federal money that are not near major centers of population. There is no way that Gateway could be compared to the beauty of Yellowstone or Grand Teton National Parks. However, this can scarcely be considered important when the inner-city residents of New York and New Jersey were literally living right next to the Atlantic Ocean and yet could not even reach the beaches.

In his testimony to the Senate, Mayor Lindsay pointed out that Coney Island attracts more than one million people on a hot summer Sunday--four thousand people to an acre of beach--which is five times the figure that the BOR recommends.[4] With the creation and development of Gateway, the more than 20 million people who live within two hours of some part of Gateway (1/10 of the Nation's population) will have an accessible recreation area. This becomes most significant when one considers that the 6 existing national seashores combined serve only a total population of 15 million people within a two hour trip.[5]

Federal participation was essential to insure the creation of a recreational area on the Gateway lands. Despite the degree of crowding at other New York Metropolitan Region beaches, the state and local governments have lacked the funds to develop any significant portions of the land that they already owned for recreational purposes. One estimate for the development of the Gateway area is a five year capital investment of about $168 million,[6] far above the means of state and local governments.

However, even Federal participation in the creation of Gateway National Recreation Area may not guarantee that it operates successfully. A number of obstacles are readily apparent.

One major difficulty is assuring that Gateway is accessible to inner-city residents. After Mayor Lindsay's testimony to the effect that Gateway could not succeed unless the Federal government helped to make it accessible through low-cost transportation, the proposal went into a "deep freeze" in the House. It was stalled until Donald H. Eliott, Chairman of the New York City Planning Commission, stated that "no major

capital expenditures" would be needed, as a shuttle bus system from existing subways could provide the necessary service.[7]

However, even if Mr. Eliott is right, the incident has shown how reluctant Congress is to assure the success of Gateway in serving those who need it the most. For example, the area Gateway would include around Breezy Point in the Borough of Queens is on a peninsula with few transportation links to the heavily populated sections of New York City. Other than surface routes through Nassau County to the eastern section of Queens, only two bridges provide access to this peninsula, the Marine Parkway Bridge and the Crossbay Bridge. Only one subway line, the BMT-IND HH train runs to the subway terminal closest to Gateway on the weekends.[8] Shuttle buses could be run from the proximal subway lines.

The Regional Plan Association has produced figures to show that by providing this bus service and an exclusive lane for buses on the Marine Parkway Bridge, all visitors can be transported adequately to Breezy Point during the first five years of operation.[9] However, this ignores several factors. Firstly, after those five years were up, if demand had exceeded capacity, as it almost certainly would, it would take any number of years from that point until new, additional facilities could be provided. Secondly, the train-shuttle-bus system is one that would take two or three round trip car fares per person. At two carfares, the cost would be $1.40 per person, or $7.00 for a family of five; at three carfares this would rise to $2.10 per person or $10.50 for five. In New York City where 29.6% of all family incomes are under $5,000 a year[10] this is a substantial amount to spend.

Federal commitment to Gateway must also include some commitment to transportation to insure that firstly, the urban poor can actually get to this national recreation area for city people and secondly, that the natural environment of the more delicate areas of Gateway (particularly Sandy Hook) is not ruined by excessive automobile use. It is the recommendation of the report that the EPA do everything in its power to promote mass transit access to the Gateway.

Another danger to the success of Gateway, water pollution, will be examined separately along with a discussion of EPA and New York City's waste water treatment facilities.

FOOTNOTES

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

3. Case Study: Gateway National Recreation Area

1. Richard M. Nixon, State of the Union Message, January 22, 1971.

2. Testimony of Congressman William F. Ryan at Hearings of the Senate Subcommittee on Parks and Recreation of the Committe on Interior and Insular Affairs, U.S. Senate, Ninety-Second Congress, First Session (Hearings on S. 1193 and S. 1852), May 12 and 17, 1971. Gateway National Recreation Area.

3. "House Votes Bill on Gateway Area But Kills Housing," New York Times, September 27, 1972.

4. Testimony of Mayor John V. Lindsay of New York at Hearings on Gateway National Recreation Area, above.

5. Appendix to text of hearings on Gateway National Recreation Area, above, p. 161.

6. Ibid., p. 162.

7. New York Times, February 21, 1972.

8. Trina Steinberg, "Interim Transportation," in Gateway National Recreation Area: A Discussion of Problems and Suggestions For Development (New York: Environmental Intern Program of the Mayor's Council on the Environment-New York City, November, 1971), p. 11.

9. Information provided by the Regional Plan Association to the Senate Subcommitte on Parks and Recreation of the Committee on Interior and Insular Affairs, above, Table #12, "Immediately Available Capacity to Breezy Point on Existing Facilities."

10. Information provided by Regional Plan Association to Senate Subcommittee... Table #5, "New York City 1968 Poverty Levels."

4. Case Study: New York City Water Pollution and Waste Water Treatment Plant Funding

The pollution levels of the waters in the component areas of Gateway endanger the success of the recreation area as well as the health and welfare and quality of life of those living in or near the New York Metropolitan Region. Present water pollution levels make a number of Gateway's beaches unsafe for swimming. At some beaches, levels are so high that even fishing and boating are forbidden.

Undeniably, this is a function of the 1.1 billion gallons per day of inadequately treated domestic and industrial wastes that New York City discharges into the waters around it from its twelve major sewage treatment plants. Another 480 million gallons per day of raw sewage are discharged into the Hudson and East Rivers.[1] These discharge levels contain unacceptably high levels of suspended solids, BOD, coliform bacteria, and heavy metals, vastly unsuited to the waters surrounding a national recreation area.

Under the Water Pollution Control Act, EPA Region II in July, 1972 issued formal notice to both New York City and the Passaic Valley Sewerage Commission (PVSC) that gave them 180 days to submit updated abatement plans. If no acceptable plans are forthcoming, EPA has said that it will request that the Justice Department pursue legal action under other laws.

Currently, New York City must upgrade its twelve existing plants and

construct two new ones in order to treat 100% of its effluent. According to the New York City Environmental Protection Administration, this construction and modernization program will cost a total of about $2 billion. One of the two new plants alone, the North River plant, is expected to cost about $750 million to construct. However, EPA Region II has done little to alleviate the financial burden of New York City in its efforts to construct and modernize its waste water treatment plants. Only an estimated 3-4% of the waste water treatment plant construction money EPA Region II has to allocate has gone to New York City.[2]

EPA Region II had only about $222.4 million to allocate in waste water treatment construction grants this past year for New York, New Jersey, Puerto Rico and the Virgin Islands, $141,952,250 of which went to New York State.[3] Despite the scant resources on hand, it is difficult to understand how New York City got only 3-4% of the money for the region with far more than that percentage of the population. In fact, the 1970 census shows that with its population of nearly 8 million, New York City had almost a third of the 28 million people in Region II and almost half of New York State's population of slightly less than 18 million. Ironically, until very recently Federal law allowed up to 55% reimbursement for this purpose. Fifty-five percent of the cost of the new North River plant would be almost twice EPA Region II's entire budget for waste water treatment--admittedly beyond the region's means.

Federal funding policy on a national level has consistently been oriented away from assisting urban areas with sufficient funds to upgrade the quality of their waste water treatment facilities. Since the inception

of Federal grant programs for waste treatment works (around 1956) to mid-1969, the Tri-State Region (NYC and New York counties nearby, contiguous part of New Jersey and small portions of Connecticut) with 10% of the nation's population has received less than 3% of such Federal funds.[4] Between January, 1963 and June, 1968 Federal grants amounted to only about 8.6 precent of the expenditures made in the Tri-State area: around $32 million in Federal funds compared to the $400 million that the local and state budgets had to supply. Although the nationwide average for the Federal contribution for waste water treatment construction grants is about 23%, in New York City many projects have received as little as 1.1 percent of their construction costs from the Federal government.[5] If Federal money is funding waste water treatment plants for areas with virtually no population or water problems in Texas as reported at the Washington EPA Land Use interns meeting, the grotesqueness of this situation becomes even more apparent.

Theoretically, two potential sources of financial relief are in sight for the New York area so that the upgrading of the waters around New York City may be possible. However, this financial aid may look far better on paper than in actuality. First, the New York State Environmental Bond Issue will provide $258.6 million to use for waste water treatment facilities. Another potential source of funds might be the increased Federal funding participation available under the 1972 Water Pollution Control Act.

Realistically though, not too much faith should be placed in either of these sources. A serious difficulty is that in the past at least, New York City projects have been financed by roughly 56% State,

40% City, and 4% Federal money.[6] Some applications for Federal money have had to be withdrawn because understandably the State could not come up with necessary funds to pay for its share. Now, with the passing of the new bond, the State will have some matching money available--but still far from enough. For the main problem is that the State has calculated its participation on the basis of 75% Federal participation--made possible by new water pollution law--something that may never occur in New York City under planned Federal budget levels. 100% Federal participation would take the construction grant money budgeted for the entire nation to fund just the New York City area, under current budget levels.

It is difficult to believe that even the much heralded 1972 water bill will lead to anything like 75% Federal participation for the New York City area--up 71% over the 4% funding they have currently been receiving.

* * *

Region II contains large tracts of land characterized by estuaries, tidal salt marshes, cord grass, mud algae, phytoplancton, and thriving communities of fish, shellfish, birds and mammals. This rich productive ecosystem is known as the Wetlands. In the following part of the report the discussion will focus on the pressures exerted upon this fragile ecosystem by various land use practices.

FOOTNOTES

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

4. Case Study: New York City Water Pollution and Waste Water Treatment Plant Funding

1. U.S. Environmental Protection Agency, Region II News Release of July 17, 1972, "Fact Sheet I-EPA Actions Against New York City."

   However, New York City's Environmental Protection Administration disputes EPA's figures. They contend that not 480 million gallons per day of untreated sewage are discharged, but closer to 395 million gallons, 125 million of which will be treated as soon as the East 14th Street pumping station is completed. In addition, they point out that it is unfair to compare New York City's treatment process with that of the Pasaic Valley Sewerage Commission (PVSC). New York City treats a total of 1.2 billion gallons per day, and according to a report that the NYC Environmental Protection Administration has published (New York City Water Pollution Control Record-1886-1972) the weighted average for their BOD removal is 74%. (See Table III-1-"Flows and Treatment Efficiencies of NYC Water Treatment Plants"). By contrast, the PVSC performs 15% treatment on waste water from heavily polluting industrial sources. The authors cannot determine the accuracy of the New York City Environmental Protection Administration's claims as compared to those of EPA-Region II, however, these figures have been presented for purposes of comparison.

2. This information was supplied by Susan Werbe, Press Officer, New York City Environmental Protection Administration.

3. U.S. Environmental Protection Agency, Region II Budget for Fiscal Year ending April 30, 1972, "Construction Grants-Waste Water Treatment Facilities."

4. Figures provided by the Regional Plan Association to the Senate Subcommittee on Parks and Recreation of the Committee on Interior and Insular Affairs at hearings on Gateway National Recreation Area, May 12, 17, 1971, p. 167 of Hearing text.

5. Ibid.

6. Susan Werbe, Press Officer, New York City Environmental Protection Administration.

7. Richard H. Wagner, "The World Ocean: Ultimate Sump", Environment and Man, W.W. Norton and Co. Inc., 1970, pp. 153-156.

5. Impacts of Land Use on the New Jersey Wetland Eco-system

Wetlands have generally considered useless mosquity infested swamps to be dredged, filled and built upon; settled by oil refineries and other forms of heavy industry; used as dumps and landfill areas; or simply diked and injected with pesticides to kill the mosquitoes. Scientists, however, began to notice that the number of shellfish and commercial and sport fish were dwindling at an ever increasing rate, beaches and popular coastal resorts were becoming polluted and unusable, floods and damage due to storms were on the increase, and large numbers of migratory birds and small mammels were disappearing. These undesirable environmental effects were also noticed by naturalists, area residents, and vacationers who began to attribute them to the mass destruction of the Wetlands, which, after several studies, were recognized as a vital life support system.

The complex food chain and nutrient recycling systems of the Wetlands provided many things: a nursery for 70% of the ocean life off the Atlantic coast, a buffer area with an amazing capacity to absorb excess water due to storms, a zone to dissolve or dilute various forms of pollution by tidal flushing, a recreation area for people, a teaming wildlife habitat, and a place of beauty.[1]

Thus with much public support, the Wetlands Act A505 was passed by an overwhelming majority of the New Jersey Legislature in September of 1970 and signed by Governor Cahill on November 5th.[2] "Described by its sponsors as the most significant conservation measure to pass the legislature in decades, the Wetlands Act of 1970 not only regulates

construction and development in marshland areas but also launches a determined effort to salvage or restore the ecological balance.[3] The Act assigns the state Department of Environmental Protection the task of regulating land use, i.e., draining, dredging, filling, construction, dumping, polluting, or altering in any way those areas subject to tidal action. The user is required to submit a permit to be reviewed and filed by the Department.

The Wetlands Act is now being implemented in stages. Infrared aerial photographs are being taken. Wetlands are being delineated according to vegetation types and other factors which produce identifiable colors under infra-red light. Public hearings are then held on a county by county basis to give the public a chance to comment on the areas designated wetlands before the Act is implemented in that area. (Minor changes in the regulations have already been made as a result of the first two public hearings. Permits are no longer required for hunting lines and muskrat trappings.) After the public hearings and necessary changes are made, a second set of photographs are taken. The regulations are then promulgated and the Act is officially in effect for that particular county.[4] As of February 1973, five out of eighteen counties are affected by the Act.[5]

Problems with the Act have surfaced. It is immediately apparent that implementation of the Act is extremely slow. Although there is some expected opposition from land developers and owners of large areas of wetlands claiming that the bill is confiscatory, a bigger problem exists in that "enforcing the Wetlands regulations pose a major burden on a presently understaffed and under funded administration."[6]

Another drawback has recently been researched and publicized by the N.J. Public Interest Research Group. Land developers (including a N.J. State Assemblyman) have been taking advantage of the time span between mapping and delineation of wetlands and the actual promulgation of the regulations. As a result of this loophole, land is being dredged, filled and developed at a faster rate than would have occurred normally to beat the deadline of regulation promulgation. N.J. PIRG has recommended that to correct this situation, the Department of Environmental Protection "apply the broad enforcement powers it was given when organized...to receive or initiate complaints of pollution of the environment, hold hearings in connection therewith and institute legal proceedings for the prevention of pollution of the environment and abatement of nuisance."[7]

At this point, it will be interesting to see how and if these problems will be alleviated. Otherwise an act originally intended to protect the New Jersey marine and coastal environments will continue to lose strength in reality.

Hackensack Meadowlands:

Encompassing 20,000 acres within northern New Jersey, the Hackensack Meadowlands constitutes one of the largest remaining tracts of open space and salt marsh in this region. Located in Bergen and Hudson Counties, New Jersey, this area has long been utilized as a dumping ground for over 100 communities, including New York City. Its unfortunate location makes it the cross-roads of transportation networks--particularly highways--between New York City and the suburbs of New Jersey.

In recent times, however, certain State and local officials, as well as entrepreneurs have recognized the potential financial returns from development of this area, particularly as a result of its close proximity to New York City while at the same time its separation from the problems plaguing New York City. Its unique location has thus earned it the title, "the most valuable piece of real estate in the world.[8]

In order to maximize returns to the State as well as to subordinate individual municipal desires for additional ratables, the New Jersey Legislature, in 1968, passed the Hackensack Meadowlands Reclamation and Development Act. This Act created the Hackensack Meadowlands Development Commission (HMDC), which was charged with the "orderly, comprehensive development" of the Meadows.[9] The legislative mandate also noted that "the necessity to consider the ecological factors constituting the environment of the meadowlands and the need to preserve the delicate balance of nature must be recognized to avoid any artificially imposed development that would adversely affect not only this area but the entire State."[10] Furthermore, the mandate called for the HMDC to provide a method of disposal for the solid waste generated in the region.

The HMDC, in attempting to address that mandate, published its final master plan on November 8, 1972, after revisions in its preliminary plan of October, 1970. The plan, as currently proposed and adopted, calls for the development of an urban center containing 125,000 inhabitants and 100,000 daily commuters.[11] Unfortunately, the plan as proposed, although modified in certain aspects, still will not be able to satisfy the ecological needs of this region. In particular, serious

deficiencies exist within the Plan in the following areas: air quality and water resource management; solid waste disposal as mandated by the Act; and open space requirements of the region.

Air quality:

Presently, the air quality in this region does not meet any of the standards established for national ambient air quality control.[12] The adoption of more stringent measures toward emissions control will still not insure the attainment of standards for particulate matter and hydrocarbons, according to the N.J. Department of Environmental Protection (DEP).[13]

With the proposed influx of industries into the region as outlined by the Master Plan, particulate levels may, at best, stabilize with the adoption of new control measures. However, any chance for a reduction of such levels would be negated with the introduction of new industries into the area, in light of the fact that, through improper combustion operations, additional particulate matters would be added. To invite more industries into the region, then, would only serve to compound the situation, even with the most sophisticated control devices.

An indication of the efficiency of such control devices exists in the example of the proposed incinerator for the Meadows. This incinerator, the largest in the world, would have a maximum capacity of 6,000 tons daily. The U.S. Environmental Protection Agency, in its evaluation, noted that it would probably have an efficiency of 97%. According to them, "a pessimistic, or expected 'worst case,' annual efficiency of only 95% would likely result in a particulate emission of

1,370 tons (particulate matter) per year."[14] This amount, when considered in the light of existing problems, takes on an added dimension.

Hydrocarbons represent another area where federal standards will be exceeded. The current standard for hydrocarbons is now exceeded by a factor of 10 or more in every urban area. With the enforcement of new, more rigid standards, it can still be expected that the standard wi-1 be exceeded by a factor of 6 in 1990.[15]

Hydrocarbons, which are contributed primarily by automobiles, will also be greatly increased with the proposed development, particularly with the stop-and-go movement of cars anticipated. Hydrocarbons, combining with nitrogen oxides under the influence of sunlight, converts to smog. Anyone riding along the New Jersey Turnpike presently is confronted by the prevailing smog conditions within the Meadowlands district. Such smog affects visability, respiratory health, and agriculture. The curtailment of smog caused by automobiles is therefore important, and must be addressed by the Commission.

Unfortunately, the transportation plan advanced by the Commission does not aid reduction of hydrocarbons. The lack of appropriately planned mass transportation facilities can only be expected to increase (significantly) the amount of air pollutants related to vehicular traffic. Traffic at the Holland and Lincoln Tunnels can be expected to increase by 65% and 51%, respectively.[16] The Master Plan, for example, notes that an important provision towards the accommodation of such numbers daily lies in the upgrade of certain highways in the Meadowlands district, specifically, Routes 3, 20, and 17, as well as the Belleville Turnpike.[17]

No definite plans for mass transit are put forth. Three "transportation centers" are mentioned in the Master Plan. Vague plans are mentioned, for instance, of an expansion of the Erie Railroad's New Jersey and New York Branch to connect with the Newark line and the PATH system. Yet, "This connection may initially have to operate as a bus route until traffic becomes heavy enough to justify rail operation," the Plan Notes.[18]

There seems little doubt, however, that with the completion of the first structures within the Meadows, the heavy traffic will readily provide the justification for such a connection. In the interim between the evidence of such a need and the development of plans for mass transit, the increased number of cars will only tend to further congest major arteries within the Meadowlands district. At present, the roads, especially during rush hours, are difficult to travel. Unless an extensive mass transit system is planned, the roads will not be able to accommodate the additional 100,000 workers into the region. This, in turn, will only intensify the air pollution problem.

The New Jersey Department of Environmental Protection, in an assessment of the Meadows Plan, offered numerous suggestions for minimizing air pollution. In its report, the DEP called for those land use categories especially vulnerable to air pollution (residential areas, hospitals, schools, etc.) to be located in areas of lowest pollution concentration. These categories, dubbed as "critical receptors", should therefore be located in the western one-half of the Meadows. Furthermore, such critical receptors should not be located within a radius of 30 times the stack height of any large 100 ton/yr. or greater point source. Within the vicinity of critical receptors, buffer zones

of not less than 300 feet should be located along highways, according to DEP.[19]

DEP also called for the dispersal of manufacturing categories, in an attempt to minimize concentration of pollutants.[20] They rationalized that the decreased concentration of industries in a particular area would result in less concentration of air pollutants.

The HMDC has not adopted either of these recommendations at this time. EPA, in an attempt to help alleviate the situation, should strongly urge the HMDC to adopt the suggestions of the DEP. From a land use point of view, these recommendations would help alleviate stress in this area.

EPA must also adopt a comprehensive, regional approach to the problem of air quality. While it is probably accurate that the proposed incinerator, by itself, would not exceed air quality standards, it could greatly exacerbate the problem for the region as a whole.

EPA should also request the State of New Jersey to reform its State Implementation Plan to accommodate projections of the impact from proposed development. Presently, the Implementation Plan does not take the Meadows into account. To accurately assess the air quality for the future, the Meadows must be included in all plans.

Water resource management:

In studies conducted of the Hackensack River and its surrounding tributaries, it was found that the water quality was very poor, particularly as a result of neglect from the past. The high concentration of industries within the district and the relatively few sewage plants in

the area have contributed to the deterioration of the water quality. As one report noted, "...the combined information gathered from many diverse sources all point inexorably to the unhappy conclusion that the present water quality within the Hackensack River is far from satisfactory."[21]

In many sections of the river, the dissolved oxygen level is near zero.[22] According to the Commission, "Penhorn and Berrys Creek can tolerate no additional oxygen demand loadings (BOD and COD) if any strategy to improve water quality is to be meaningful."[23]

The biological measures once so effective in monitoring the water quality can no longer function effectively under the burden of the excessive contaminants. According to the HMDC consultant John J. Kassner, "The volume of purified waste water and fluiral advective flow is insufficient either to restrain or to flush out pollutants bought into the Hackensack River by the daily volume of 4.5 billion gallons of tide water from Newark Bay."[24] Furthermore, "...as the area continues to be urbanized, the runoff and sewage flows increase, thus increasing the organic loads on the river...the assimilation capacity of the estuary is static or decreasing as the eutrophic load increases,"[25] there exists a great need for treatment of the effluent discharged by both industries and the municipalities in the region. However, the sewage plants in the area--Little Ferry, Bergen County Sewage Authority, etc.--are already operating at capacity or over-capacity levels. New plants will have to be constructed to accommodate the 125,000 new residents as well as the daily commuters.

Certain financial considerations must be taken into account in the construction of these plants. Presently, the Bergen County Sewage

Authority plant is operating at capacity, with a load of 50 million gallons per day (mgd). Although plans are underway for the expansion of the plant to 62.5 mgd, the facility is reported to be only fourteenth in the State-wide priorities.[26] With the current freeze on funds from the Water Bill by the Nixon Administration, it seems unlikely that funds for construction of this plant, as well as some of the others in the region, will be forthcoming in the near future.

EPA should encourage the Nixon Administration to release all of those funds authorized by Congress in the Federal Water Pollution Control Act amendments of 1972. Until such funds are made available, EPA should actively discourage all parties from further construction within the Meadows.

Furthermore, the future supply of potable water within the Meadows must be supplemented. According to Kassner, "It has been reported that a shortage of potable water may soon occur in the Hackensack River basin unless new potable water sources outside the basin are developed and utilized. Comprehensive development of the Hackensack Meadowlands district can be expected to compound the possibility of a water shortage. The Comprehensive Master Plan and this report assume (emphasis added by the author) that potable water will be available as needed for the proposed development of the Meadows."[27]

It is not enough to assume that the supply of water for future inhabitants will be met. Rather, EPA, as well as other related federal and state agencies, must insure that an adequate water supply exists before permitting new constructions for inhabitants. Unless such safeguards are assured, chaos will prevail upon completion of construction.

Solid waste disposal:

According to the mandate passed by the State Legislature, the HMDC was charged with providing a method of disposal of the amount of garbage entering the district at that time. In a subsequent survey, it was found that 26,000 tons of garbage were entering the district weekly. Since then, the amount has increased to 42,000 tons weekly, or a violation by 12,000 tons of the amount mandated by the Commission. This additional amount accepted each week has contributed to the rapid depletion of landfill sites. EPA has calculated that the remaining life of existing landfills is about five years, from March, 1972.[28]

During the two years after the publication of the first preliminary plan, the HMDC attempted to formalize plans for the world's largest incinerator within the Meadows. It was on these plans that EPA proposed their suggested revisions. However, since the EPA comments, the HMDC has almost totally dropped plans for the incinerator. In their final plan, there was no mention of an incinerator or any other form of disposal. In private discussions with a YAB member on November 29, 1972, Chet Mattson, one of the authors of the Master Plan as well as chief environmentalist for the HMDC, noted that the HMDC had decided against the incinerator.[29] Since that time, the HMDC has been cooperating with the Committee for Resource Recovery, an ad hoc committee of 334 groups, that has been advocating resource recovery as a viable means of disposal for the region. Since January, 1973, the technical advisory group of the coalition, comprised of members of the paper, glass, metal, and plastics industries, have been meeting with the HMDC to begin to design the mechanics of operation for resource recovery.

Recently, too, a Manhattan firm that markets pollution control devices has purchased land from the HMDC to build a $15 million recycling center that would convert waste to fuel. Those non-combustible materials such as metal or glass would be sold back to plants for reuse. Combustible products such as paper would be used to make low-sulfur fuel.[30]

EPA must insure that the best method of disposal, in line with land use considerations, be undertaken in the Meadowlands. No additional sites must be allowed for landfill operations, since much of the land presently being considered for such operations are of viable marsh, and could provide a social amenity to the region.

Instead, EPA should provide the HMDC with both technical and financial assistance towards the development of a resource recovery system. Without such support from the Region II office, attempts by the Committee for Resource Recovery and the HMDC will not be totally successful.

EPA should work with other agencies towards the enforcement of laws governing landfills and any other laws governing this particular landfill. EPA should recommend to the HMDC that they only accept the mandated amount of garbage, in order to extend the life of landfills. Such a measure would require affected communities to regulate the amount of garbage generated in their respective communities, and may provoke the reuse of products to reduce volume.

EPA should also insure that the regulations governing sanitary landfills are respected within the Meadowlands district. Unfortunately, very few of the landfills in the Meadows are covered after the day's operations. Furthermore, open burning on dumping areas must be controlled by EPA working through agencies which have such enforcement powers.

Leachates entering water tables and water bodies must also be reduced. Presently, such conditions exist within the Meadowlands, disrupting once viable eco-systems.

Open space:

The Hackensack Meadowlands represents one of the few large tracts of open space remaining in the region. Surrounded by the cities of New York, Newark, Paterson, Jersey City, and Elizabeth, the Meadows is situated in the midst of an urban ring.

Within the region mentioned above, there exists a deficit in lands reserved for recreational purposes. With the great density of residents at present, parks cannot possibly accommodate as many as those who wish to utilize them. According to the National Park and Recreation Association, there should be a minimum of 20 acres of parklands for every 1000 persons, with a minimum of 250 acres for regional parks.[31] Currently, there are only half as many facilities as needed. It is, therefore, important that as much of the Meadows be reserved for public use as recreational areas as possible.

Furthermore, it is imperative that those areas labelled by the DEP as high- or moderate-value marsh be preserved and/or restored to their former states. In an assessment of the Master Plan, the DEP called for the preservation of all those areas with potentially viable eco-systems. The DEP, using infrared scale photos, prepared overlays of the entire Meadowlands district. Based on these infrared pictures, DEP was then able to suggest those areas still viable for fauna and flora.

The interpretations by the DEP and the HMDC differed concerning lands still ecologically viable. The DEP, using its infrared photos,

concluded that 3600.6 acres were of high value wetlands, 1403.2 acres were of moderate value, and 1873.1 acres of the district's 6877 acres of wetlands were of low value.

HMDC, using task forces on the ground, concluded that a total of only 3160 acres of wetlands were worth preserving. Furthermore, some of the areas zoned by the HMDC for wetlands preservation are only of low value, according to the DEP. On the other hand, the HMDC has permitted development of varying intensities on areas DEP has assessed as viable marsh. Two large tracts east of the Hackensack River, including part of an area along Mill Creek, labelled as viable marsh, has been zoned for island residential housing as well as light industrial use.[33]

Furthermore, the HMDC, disregarding the DEP's recommendation, rejected the State's Wetlands Order, and instead, devised their own. Unfortunately, those adopted by the HMDC are not as rigid as that of the State and hence, does not provide for maximum land use control. The State's Wetland Order, effective in areas where riparian rights do not exist, prohibits the dumping of solid and liquid waste; establishes stringent review criteria; and serves to prohibit all but environmental compatible land use patterns within the Wetlands.[34] The HMDC Order, on the other hand, imposes no such burden of proff on the developers. Furthermore, it allows for the discharge of both solid and liquid waste, provided it is in conformance with the HMDC's standards.[35]

It is most evident that the HMDC will not be able to preserve the most valuable pieces of marsh from further human infringement if it persists in following the course it has outlined. The HMDC has not

committed itself to preservation of the best pieces of marsh area remaining. Furthermore, even those areas of high quality may eventually be destroyed if subjected to the HMDC's own Wetlands Order, a very watered-down version of the State's Order.

EPA should encourage the HMDC to adopt both the DEP's Wetland map as well as Wetland Order for maximum land use regulation. Unless more of the high quality and moderate marsh areas are saved, the Meadows may not be able to provide the recreational as well as educational facilities it should otherwise be able to.

The EPA, using its influence as well as financial levies, should encourage the HMDC to postpone the granting of construction permits in areas deemed by the DEP to be of viable marsh until certain environ criterias are satisfied. Specifically, air quality must be made to conform with federal standards; water quality must meet minimum requirements for current needs before allowing an influx of new residents; and solid waste systems must be devised to handle to mandated waste as well as to minimize impact upon the area. Until that time, EPA should encourage the HMDC to allow only construction in low quality marsh areas (as judged by the DEP) of facilities that would provide amenities to the area, e.g., resource recovery system, wastewater treatment plant, etc.

* * *

Open space such as Gateway National Recreation Area, coastal reaches, marshes and estuaries are threatened by the water pollution from the inadequately treated wastes of the region's urban centers. However, at the same time, they are threatened by additional causes of water pollution that are particularly crucial to open space: that of pollution

by agricultural uses of the land which are often in close proximity to natural water storage areas and recreation areas.

Still another problem crucial to that of pure water supply is the uncontrolled growth patterns so visible in many of the urban fringe areas of our region. Long Island will be focused upon as an excellent example of an area where urbanization is proceeding ahead of water resource planning.

FOOTNOTES

Section III Open Land and Water Areas, Development Patterns and Environmental Quality

5. Case Study: Impacts of Land Use on the Wetlands Eco-system

1. Richard H. Wagner, "The World Ocean: Ultimate Sump", Environment and Man, W.W. Norton and Co. Inc., 1970, pp. 153-156.
2. "Governor Cahill signs Wetlands Act into law on November 5", N.J. Environmental Times, Vol. 3, No. 4, Nov., 1970, p. 1.
3. Ibid., p. 5.
4. From an interview with Mr. Barker, Director of the Bureau of Marine Lands Management, N.J. DEP, Jan. 1973.
5. From a letter to former N.J. Assemblyman from Dr. Eleanor J. Lewis, Executive Director, N.J. PIRG, Re: Wetlands Bill-A505, Dec. 29, 1972.
6. Interview with Mr. Harold Barker, Jan. 1973.
7. Dr. Eleanor Lewis, "The Destruction of the Wetlands with the Consent of the New Jersey Department of Environmental Protection", N.J. PIRG, Jan. 1, 1973, p. 6.
8. HMDC Commission, Hackensack Meadowlands Comprehensive Land Use Plan Oct., 1970.
9. Hackensack Meadowlands Reclamation and Development Act, 1969, approved by N.J. State Legislature.
10. Ibid., p. 2.
11. HMDC Commission, Hackensack Meadowlands Master Plan, Adopted November 8, 1972.
12. New Jersey State Implementation Plan..., January, 1972.
13. New Jersey Dept. of Environmental Protection, "An Environmental Assessment of the Master Plan and Proposed Zoning Ordinance for the Hackensack Meadowlands District", Oct., 1972, p. 17.
14. EPA, Region II, "Report-Refuse Disposal-Hackensack Meadowlands", March, 1972, p. 1.

15. Dr. John McCormick and Associates, Draft Impact Assessment: New Jersey Sports Complex, July, 1972, p. 89.

16. Environmental Design Studio, Livingston College, Hackensack Meadowlands: Preliminary Findings, May, 1972, p. 6.

17. HMDC Comprehensive Land Use Plan, op. cit., p. 49.

18. Ibid.

19. N.J. DEP, op. cit., p. 19.

20. Ibid., p. 20.

21. John J. Kassner and consultants, Water Quality in the Hackensack Meadowlands, p. 81, 1971.

22. Mattson, Chester, Poter, George, and Saks, Margaret Water Quality In a Disordered Ecosystem, 1971, P. 24.

23. Ibid.

24. Kassner, op. cit., p. 65.

25. Kassner, op. cit., p. 92.

26. Sports Complex, op. cit., p. 67.

27. Kassner, op. cit., p. 87.

28. EPA, op. cit., p. 15.

29. Ibid.

30. Bergen Record, January 28, 1973, p. 1

31. National Park and Recreation Association, Open Space Standards, 1969

32. DEP, op. cit., Table 1

33. HMDC Master Plan, op. cit.

34. New Jersey Wetlands Act of 1970

35. HMDC Wetlands Order, November 8, 1972

7. Water Pollution From Rural and Urbanizing Land

According to the 1968 report of the President's Water Resources Council, "In areas undergoing rapid urbanization, sediment derived from construction of subdivisions and highways may be as much as 80 tons per acre before the land is restabilized, or as high as 57,000 tons per 1000 increase in population. In the Potomic River Basin, watersheds that are undergoing urban growth discharge 10 to 50 times as much sediment as similar watersheds in rural areas."[1]

The pollution from a highway does not stop once the broken ground is stabilized; approximately 20% of the 2.2 million miles of rural roads and highways need conservation measures for sediment control beyond those for normal maintenance. The unprotected roadsides contribute an average of 56 million tons of sediment annually to the nation's streams, reservoirs and harbors.

A land use-caused water pollution problem that was identified in the Tocks Island Reservoir proposal is that of poultry farming. Chicken farms of New York are allowing runoff to flow into the Delaware River watershed. It has been estimated that this runoff would be sufficient to pollute the proposed reservoir.[2] The excess nitrogen introduced would very likely accelerate the eutrophication of the reservoir which would provide conditions unacceptable for a lake that is proposed to support at least 4 million visitors annually[3] and was once intended to serve 10 million visitors per year.[4]

A paper presented at the 1970 Cornell University Conference on Agriculture Waste Management[5] stated that manure is produced by chickens

and turkeys at a rate of over a ton per 400 chickens raised annually. Manure returns to the soil at a rate of over 10 tons per acre annually. This results in a soil pollution problem consisting of excess soluable salts, chemical imbalance of potassium and excess NO_2. The nitrates are leached out of the soil causing a water pollution problem in the drainage stream.

Following the pollution downstream, substantial water pollution problems are often found in the reservoir, marsh or estuary that becomes the destined depository for the fouled water. This is exactly the effect many fear will be created in the Tocks Island Reservoir if it is constructed without concurrent strict regulation of poultry farm wastes.

This is a problem that should deeply concern EPA of both Regions II and III, and EPA has a responsibility to advise all participants in the debate in order to insure maximal protection of the environment. The potential pollution of a reservoir should be a most grave and serious concern of EPA. The effects of the unregulated use of water by poulty farmers can be easily observed in the case of Long Island's Great South Bay.

Great South Bay is 24 miles long and up to 3 miles wide with an average depth of 4 feet. The greatest pollution of the lagoon comes from the untreated runoff from the duck farms in the bay's watershed. The duck industry produces 3300 pounds of nitrogen, 5600 lbs of phosphorus, and 55,600 pounds of suspended solids in a total effluent of 133 million gallons per day.[6]

The solid wastes from the ducks give the water a gray turbidity and accumulation of the solids greatly reduces the dissolved oxygen in areas of high concentration of the waste. The anaerobic conditions encourage sulfide bacteria to produce hydrogen sulfide which bubbles to the surface buoying rafts of solid wastes which float in the bay. The environmental conditions of the bay provide the ecological requirements of the algae Nannochloris[7] which builds up on the gills of the oysters once found in great abundance in the bay. Due to this interference with respiration and feeding, the oysters die of either starvation or suffocation. As a direct effect of eutrophication, oyster production of the bay declined from 600,000 in 1950 to zero in many of the years since 1960.

The clam industry has been affected by another result of the duck wastes.[8] Salmonella is a coliform bacteria that is introduced into the bay via duck waste and untreated municipal sewerage. Bacterial poisoning of the shellfish industry is currently a major economic problem, as was evidenced by the poisoning of several people after dinners of eastern shellfish in the summer of 1972.

Land uses such as duck farming must be regulated. EPA can act according to the Federal Water Pollution Control Act Sec. 10(a) and require the duck farming industry to abate its discharges. It is the recommendation of this report that the EPA try to work with the farmers as they have with other industry to encourage them to voluntarily abate their effluents. The duck farmers should be required to separate the solid wastes and dry them for fertilizer. The supernatant should then be treated as any municipal waste before it is released to the bay or recycled.

Other water pollution problems that must be dealt with will be those caused by the purchase of farmland by speculators for residential and industrial development. Depletion of the water supply and salt water intrusion in the coastal areas of the region can be expected as haphazard and extremely rapid growth accelerate.

This can be observed in Nassau and Suffolk Counties on Long Island. Although Nassau and Suffolk Counties would both have enough water for their immediate needs, it is estimated that if current practices continue, Nassau County alone will experience a deficit of 92,000,000 gallons per day in the year 1990.[9] Suffolk County would have adequate supplies until perhaps ten years after that, but it, too, would soon run into extreme shortages.

The cause of this potential crisis can be traced to the spread of population out from New York City and the meager and ineffective measures that Long Island communities took to insure that growth occurred in a rational manner that respected the capabilities of the land. Around the time of World War II, a minor exodus began to the then farmlands of Nassau and Suffolk and still continues. The local communities of Long Island were unable to keep pace with their sewage problems as the influx of people continued, and soon the ground water supplies received large amounts of waste from septic tanks, polluting the ground water supply. The growth continued.

By 1970, Nassau County held 1.4 million people, and Suffolk County 1.1 million (after a growth of 69% since 1960!).[10] It was not until 1970 that a Nassau-Suffolk Regional Plan was even formulated, to try to channel development into rational patterns.

Long Island was endowed with a tremendous quantity of water stored in its underground reservoir, which the U.S. Geological Survey estimated at 60 trillion gallons, enough to cover the island to a depth of 200 feet.[11] However, as the demands that the increasing population makes upon the reservoir grow larger, salt water intrusion accelerates. In addition, only 54% of Nassau's population was under sewer service in 1970, while in Suffolk a scant 7% received such service.[12] This lack of sewer service led to the leaching of cesspool effluent causing additional contamination and deterioration of the ground water supply.

Nitrate content has also plagued the water supply of Nassau and Suffolk exceeding the U.S. Public Health Service limit of 10 mg/l (milligrams per liter) in some areas of Long Island.[13] This problem, among others, prompted Suffolk County to place a total ban on the sale of detergents within the county.[14]

EPA is currently sponsoring a study of ground-water recharge technology in Wantagh on Long Island in an attempt to combat the salt water intrusion that has been occuring and to help replenish the ground-water supply. The study is to include the future construction of a 5 million gallon per day demonstration plant in Wantagh.

In the Environmental Impact Statement on Waste Water Facilities Construction Grants in Nassau and Suffolk Counties, EPA noted in reference to further population increases that:

> These density increases must be limited to those areas that can best support the additional strain on land and water resources while maintaining a balance between the natural systems...[15]

This is both a timely and relevant statement for EPA to make concerning rational land use policy for Long Island, however, it must be recognized that under the present political and legislative climate the governments of Nassau and Suffolk may have no power to do this.

Nassau and Suffolk Counties each contain innumerable village and town governments whose prime allegiances rest in furthering what they consider to be their own self-interests. The result is, of course, that all residents of Long Island suffer from the rivalry in one way or another.

The same forces that have rendered the Nassau-Suffolk Regional Planning Board virtually helpless in its efforts to guide Long Island towards sensible growth patterns have also prevented the institution of an agency to manage the water resources of the entire region. As others have pointed out, ground water reservoirs do not recognize political boundaries and any hydrological problems that one area causes by a higher rate of development can affect the total resource.

There is currently no regional water resources planning board on Long Island despite the obvious need for one. Existing mechanism under state law enable one to be created (Article V, Part V New York State Conservation Law). Not only would such a board combine broad representation with the advisory powers of agencies such as the Nassau-Suffolk Regional Planning Board, it would be largely state-funded and aid in the development of both long-range and short-range plans concerning public water supply. However, these plans could and should also deal with flood prevention and control, water quality management, water-based recreation, fish and wildlife enhancement and related land use planning.

EPA's current activities aimed at supplementing Long Island's water supply are most valuable and such experiments as are being carried out in Wantagh, L.I., should continue. However, no amount of experimentation with water recharge could possibly keep up with a continued uncontrolled growth pattern such as Long Island has exhibited. It is most necessary for EPA to attack the roots of the problem rather than merely deal with the effects after the damage has been done. EPA must use all of its leverage to:

1) Urge Nassau and Suffolk Counties to complete their sewering program.

2) Assist in any way possible in the creation of a Long Island Water Resources Planning Board.

3) Demonstrate the folly of uncontrolled growth in the area of limited and fragile natural resources.

4) Continue support for water recharge technology programs (such as the Wantagh, L.I., study).

* * *

Even as poor land use planning can lead to inadequate water supply, it can also lead to the completely opposite problem--that of flooding. Americans have literally "paved the way to disaster" by developing flood plains and wetlands throughout the country. The federal government has allowed and encouraged development along hundreds of rivers by "protecting" the communities from flooding through the construction of dams and levees designed to retain the fifty or one hundred year flood. The subsequent development alters the flood plain, and in doing so increases not only the consequential cost of a flood if it occurs but also increases the very probability of the occurence of the flood.

FOOTNOTES

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

6. Water Pollution From Rural and Urbanizing Land

1. U.S. Water Resources Council, The Nation's Water Resources (Washington, D.C: U.S. Water Resources Council, 1968), p. 5--5-3.
2. U.S. Army Corps of Engineers, Proposal for Tocks Island Reservoir , 1971.
3. Star-Ledger (Newark), September 14, 1972, p. 1.
4. U.S. Army Corps of Engineers, Proposal for...
5. Leslie H. Hileman, "Pollution Factors Associated with Excess Poultry Litter Application in Arkansas," in Relationship of Agriculture to Soil and Water Pollution (Rochester: January, 1970), p. 41.
6. R.H. Wagner, Environment and Man (W. W. Norton and Co., Inc., 1971), p. 158.
7. Ibid., p. 159.
8. Ibid., p. 159-60.
9. "Nassau County Comprehensive Plan," Newsday (Garden City, N.Y.), December 14, 1971.
10. Nassau-Suffolk Regional Planning Board, Nassau-Suffolk Comprehensive Development Plan: Summary (Hauppauge, N.Y: Nassau-Suffolk Regional Planning Board, 1970)
11. New York State Office of Planning Coordination, Long Island Water Resources (Albany: New York State Office of Planning Coordination, January, 1970), p. 1.
12. U.S. Environmental Protection Agency,"Environmental Impact Statement on Waste Water Treatment Facilities Construction Grants for Nassau and Suffolk Counties, N.Y.," Final Statement-July, 1972-Region II, pp. 34-35.
13. Ibid.
14. Suffolk County, N.Y. Legislature-Local Law No. 21-1970.
15. U.S. Environmental Protection Agency, "Environmental Impact...Waste Water," p. 123.

8. Floodplains and Development Policy

The New Jersey State Legislature considered floodplain legislation after each flood disaster much the same way as Congress debates control of fire arms after each attempt to assassinate a public figure. Fortunately, New Jersey has finally passed a floodplain act; however, lack of regulations protecting floodplains in many states and municipalities indicates that most governmental bodies have not grown beyond the state of reacting to crises. That is, they have not accepted the responsibility of planning and implementing programs designed to prevent or minimize the costs of disasters that are inevitable without such planning.

Floodplains act as natural sponges to absorb rainfall, preventing the flash flooding that occurs when great amounts of water fall on non-porous surfaces such as rooftops, roads and soil that has been compacted by home and highway construction. Floodplains also decrease velocity of streams by increasing the surface area over which the stream is flowing. However, when floodplains are diked off, the velocity of the stream is increased. The average rooftop of 1200 square feet sheds 750 gallons of water in a one inch rainstorm. The water from the rooftops flows through storm sewers and culverts into the stream, bypassing the natural system (the floodplain) that would have restrained the waters.

For the purpose of assisting those who wish to regulate the amount and type of development upon floodplains, the Water Resources Council has divided up the floodplain into four zones: the regulatory floodway, the regulatory floodway fringe, the regulatory floodway limit, and the standard project flood.[1] No development should take place upon the regulatory floodway as extreme environmental hazards can result from this practice. In addition, any construction that took place within the

regulatory floodway would also certainly be destroyed ultimately. Some types of development may take place outside of the floodway (particularly in the last two categories), however great care should be taken in choosing appropriate uses for this land. For example, recreation is an eminently suitable use for a floodplain as many recreational activities such as golf, hiking, picknicking, camping, etc., do not require that the ground be paved with asphalt or concrete. Recreation areas can not only be quickly evacuated, when necessary, in the time of bad storms, they can also be left basically in their natural state, which aids in flood control. As long as the runoff waters are strictly controlled, the floodplains can also be used for agriculture, as much of the floodplain land is extremely fertile.

It makes a great deal of sense to restrict the use of floodplains both economically and environmentally. However, especially in regions such as Region II where open space is in such short supply, this is rarely done in practice. Instead, the Army Corps of Engineers builds dams so that development may occur "safely." Often this development has not proved to be safe. Protecting one town with a dike merely intensifies the effect of a flood downstream. It has been thought that if the levees had not broken in Wilkes-Barre, Pennsylvania as an aftermath of Hurricane Agnes, the damage in Harrisburg would have been much greater.

Unfortunately, however, this does not deter the public from wanting to live near the newly "protected" land after a dam is constructed. Generally beautiful areas fronting the rivers bring in high prices for developers. Thus in the face of inadequate governmental action, as the floodplains continue to be developed more and more flood damage can be expected

In many places in Region II, notably in Northern New Jersey, there has been a pronounced decrease in the amount of rain necessary to bring on flooding as compared with a very few years ago. The New Jersey Department of Environmental Protection estimates that in the Passaic River Basin, for example, it now takes half as much rain to cause minor flooding as it did before World War II. In Bound Brook, New Jersey, which was hit particularly hard by Hurricane Gloria in 1971, it has been estimated that it now takes three inches of rain in a twenty-four hour period to cause minor flooding, whereas it used to take at least five inches.[2]

However, floodplains should be left free from development not only for the prevention of flooding and flood damage, but also for the prevention of water pollution. The millions of dollars of debris that jammed the rivers, reservoirs and harbors following the spring floods were only one result of the flood. In addition, thousands of gallons of oil were spilled into the rivers of New York and Pennsylvania as refineries and storage tanks built upon the floodplain were damaged.

There is Federal legislation that could conceivably be used to help protect both floodplains and nearby water bodies from the dangers of water pollution due to storage of toxic materials upon the floodplain. For example, Section 11(e) of the Water Pollution Control Act states that:

> ...when the President determines there is an imminent and substantial threat to the public health or welfare of the United States, including but not limited to fish, shellfish, and wildlife and public and private property, shorelines, and beaches within the United States, because of an actual or threatened discharge of oil into or upon the navigable waters of the United States from an onshore or offshore facility, the President may require the United States attorney of the district in which the threat occurs to secure such relief as may be necessary...[3]

Although clearly, this section was not originally meant to refer to floodplains, it is possible that until states and municipalities begin to take more seriously the protection of floodplains, this (as well as Section 12(a) which refers to toxic materials other than oil) can be used to prevent some of the water pollution that occurs as a result of flooding.

There are a number of ways in which EPA could become involved more actively in the protection of floodplains. First, EPA could require that communities seeking EPA funding for the construction of sewerage treatment facilities implement adequate floodplain protection policies. Among the rationales EPA could use to require this floodplain protection would be Section 8(b)(1) of the Water Pollution Control Act.

> No grant shall be made for any project pursuant to this section unless such project shall have been approved by the appropriate State water pollution control agency... and by the Secretary and unless such project is included in a comprehensive program...[4]

EPA should also use its authority to review impact statements written on any development proposed for floodplains areas that will use federal money. This would mean any federal funding used to relocate and rebuild upon the floodplain after flooding has devastated an area. If this rebuilding were to occur upon the floodplain, it would virtually insure a continuing cycle of federally-subsidized disasters. Similarly, EPA should pay close intention to impact statements written by the Army Corps of Engineers for construction of dikes and dams in floodplain areas designed to "prevent flooding." Impact statements written by the Corps should account not only for the environmental impact of quarrying

for construction materials and the siltation caused by the construction, but also for the damage that can be caused to floodplain and the communities around it because of the presence of the dikes. These dikes tend to actually spur development upon the floodplain because they supply an illusionary sense of security. Regardless of whether dikes eventually break or not, the increased development alters the probability of flooding that the Corps uses in planning the project, making flooding far more likely.

Still another mechanism that EPA could use to help to protect flood-plains is that of the Johnson Administration Executive Order 11296. This order sought to prevent the uneconomic use and development of flood-plains and to lessen the risk of flood loss. Although the order discussed limiting construction of Federal facilities upon floodplains, the rationale behind this order was more economically and hazard-motivated than concerned with environmental damage. Thus, existing federally owned facilities upon the floodplain were ordered to be floodproofed rather than removed, the aim apparently being more to protect the building than to prevent the flood. However, EPA could use this order for the widespread dissemination of information concerning floodplain development and its dangers. Section 3 of the order, in particular, specifies that:

> ...any other executive agency which may have information and data relating to floods shall cooperate with the Secretary of the Army in providing such information and in developing procedures to process information requests...[5]

Section 1 (1) of the order states that:

> All executive agencies directly responsible for the construction of Federal buildings, structures, roads, or other facilities shall evaluate flood hazards when planning the location of new facilities and, as far as practicable, shall preclude the uneconomic, hazardous, or unnecessary use of flood plains in connection with such facilities....6

The Environmental Protection Agency should insure, through its review of Environmental Impact Statements, that all proposed construction within the floodplains is one; necessary and two; non-hazardous to both the occupants of the proposed facility and the eco-system in which it is to be located.

It is the recommendation of the Youth Advisory Board that the EPA request the President to issue a superceding Executive Order that will also require ecologic considerations in every instance that economic considerations are required by Executive Order 11296.

In general, floodplain regulation is still another area in which EPA has no specific mandate. Nevertheless, it is an area with which EPA must be concerned. Inadequate floodplain protection in Region II has led to environmental problems that EPA has legislative authority to deal with. Thus, it is both reasonable and necessary that EPA use all possible means at hand to become involved with the causes of these problems as well as the results.

Historically, floodplains have been used extensively for agriculture because of the fertile alluvial soil provided by previous floods. In a region that is rapidly urbanizing protection of all agricultural lands is and will continue to be a crucial environmental problem. This is the problem discussed in the next chapter of this report.

FOOTNOTES

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

7. Floodplains and Development Policy

1. U.S. Water Resources Council, Regulation of Flood Hazard Areas to Reduce Flood Losses, Vol. I (Washington, D.C: U.S. Water Resources Council, 1969), p. 46.

2. "Flood Perils Rise as Land Is Covered By Developers," New York Times, October 14, 1972.

3. As amended by the Water Quality Improvement Act of 1970 (P.L. 91-224).

4. Ibid.

5. Johnson Executive Order No. 11296, "Evaluation of Flood Hazard in Locating Federally Owned or Financed Buildings, Roads, and Other Facilities, and in Disposing of Federal Lands and Properties," Effective January 1, 1967.

6. Ibid.

9. Agricultural Lands and Development Pressures

There are any number of reasons why the preservation of agricultural lands and the farming industry are important to the New York-New Jersey Region. The agricultural industry is still far ranging in economic impact and scope, agricultural production being only one phase of a total "agribusiness" conglomerate. Farm lands represent some of the last major undeveloped pieces of land in certain parts of Long Island and New Jersey--land that is vitally needed for open space, air and water management purposes. However, it is becoming increasingly difficult for farmers to remain in business as property taxes spiral and land is continually sought for residential housing development.

Suffolk County on Long Island provides an excellent example of this phenomenon. The county covering the eastern two-thirds of Long Island, according to the 1969 U.S. Agricultural Census, is the richest agricultural county in New York State. Total gross sales in 1971 were worth over $71,000,000 and in 1969 there were 304 farms earning gross incomes of over $40,000 yearly.[1] Suffolk County nurseries, sod and flower farms, potato farms and duck farms are all first in quantity produced in New York State.

However, Suffolk County is also one of the fastest growing counties in the United States, and the spread of urbanization even out to the far reaches of Long Island is taking its toll on agriculture. From the present population of 1,127,030, it is expected that there will be 1,746,000 residents by 1985--a tremendous increase.[2] This wave of population moving outward from New York City will need homes, recreational facilities, com-

mercial facilities, etc., and all of this will be provided in a haphazard manner upon the land currently being farmed if new tax programs and development policies are not instituted. This ultimately leads to a sprawled development pattern that not only squanders the land but can result in high air pollution from excessive automobile use, water shortages (e.g., particularly on an island as is the case with Suffolk County), excessive taxation, etc.

Real estate developers are already beginning to have their way. Southold Town's Master Plan describes the situation. "The financial benefit that attends the transmutation of potato farms in speculative real estate have caused many Long Island farmers to put out a welcome mat to the residential subdivider."[3] The financial incentives that real estate developers provide together with the declining potato prices, for example, have caused 129 potato farms to go out of business in the three years between 1968 and 1971.[4]

The small farmer can't make it anymore; but as land values escalate will any farmer care to farm land he can sell for a much larger income? The Nassau-Suffolk Regional Planning Board calls for limited growth in the eastern end of Suffolk County so as to preserve some of this valuabe agricultural land and insure that it may continue to provide food and recreation for the larger region. The Nassau-Suffolk Comprehensive Development Plan has suggested that a minimum of 30,000 acres of the most productive farmland in the Towns of Riverhead, Southold and Southhampton should be publicly purchased and then leased back.[5] However, the Regional Board is strictly advisory in nature. Many towns enact zoning

ordinances to carry on development in ways completely contrary to the spirit of the plan.

For example, the plan calls for preserving farmland in the central portion of Southold that is currently zoned for half-acre lots. Yet, the Southold Town Supervisor has estimated that the town has already approved enough half-acre lots to hold 5,000 new residents. The town's current zoning ordinance, meanwhile, which was adopted in January of 1972, has a residential-agricultural zoning which covers half of the town and allows developers to build on one acre lots without public water and sewers or to build on half-acre lots when these facilities are provided. This promises a severe potential water shortage when a water survey made back in 1967 concluded that: "The water resources of Southold are limited to an amount which does not greatly exceed present use."[6] It also sets up a zoning structure virtually guaranteed to drive farmers off their farms.

New Jersey is facing a situation similar to that of Long Island, but perhaps on a larger scale. New Jersey lost 10,000 farms between 1957 and 1967[7] as the value of land for development increased, and communities pushed larger tax bases. An acre of farm land cannot produce the taxes of an acre of industrial or residential property without special tax programs and government assistance. Largely because of these types of pressures, the New Jersey State Department of Agriculture's farm statistics bureau estimates that the state will lose another 100 farms this year. Loss of farm land has been currently running close to 120 acres per day.

Only half of the farm land that existed in the late 1950's still remains in farming. In 1968 the average value of an acre of farm land was $832. In 1971 that figure rose to $1094. The New Jersey State Labor Department supplies figures that indicate only 140,000 acres of farm land will remain at the end of the century in the state. This acreage is about 1/8 the present amount.

It should also be recognised, however, that although agriculture is desirable aesthetically as open space as well as necessary for food production, the large scale agri-businesses of southern New Jersey often present serious environmental problems as a result of their dependence and heavy use of chemical fertilizers and pesticides. Fertilizer runoff pollutes the waters with excess nutrients while pesticides often kill more than "pests", birds, fish, and mammals. Yet they are still deemed as necessary under mass monoculture conditions, contaminating not only the air and water, but accumulating in the produce we consume. The New Jersey Department of Environmental Protection wages more battles with the big time farmers and chemical manufacturers than any other segment of the New Jersey population.

The point of view of most farmers is essentially that it is the non-farm people who need the open space the most. In order to make it possible for farmers to stay in New Jersey and maintain taxpaying open space, public expenditure as well as additional programs and policies will be necessary. If necessary, farmers can sell out and relocate to another state where land values are lower. However, once their land is sold and developed, it is essentially lost to farming and open space forever.[8] When one considers that farmers own a fifth of the total land area of

New Jersey, making up one third of the remaining open space, lack of public action could indeed be disastrous.

What type of public policies and tax reforms can be instituted to aid in the preservation of agricultural land in its current use, and thus prevent the environmental degradation associated with rapid, unplanned development and too little open space?

The staff of EPA should be aware of some of the different methods that have been suggested. One obvious solution would be the governmental purchase of these farmlands. The purchased land would then be leased back to the farmers who would continue to operate the farm. This type of program costs a great deal of money which most governmental units do not have. Suffolk County Executive John V.N. Klein had pledged after he took office last January that he would institute such a program. However, with land currently selling in Eastern Suffolk County for more than $1,000 an acre, the idea had to be abandoned as too costly. A variation of that approach is for government to make a less than fee purchase of the land, i.e., purchase a scenic easement whereby a farm owner voluntarily signs an agreement to keep his land in agriculture for a fixed number of years in exchange for lower property tax rates. Again, there are problems with this method in that 1) it is costly to purchase even scenic or conservation easements and 2) when the terms of the easement expire, the farmer is free to sell his land at a handsome profit--one which has been government subsidized during the period of the easement.

Another approach emphasizes the pre-emption of some rule priorities by a state agency when agriculture is threatened by a local zoning ordinance. One proposal for New Jersey emphasized the creation of an

Agricultural Resources Commission in the State Dept., of Agriculture which would 1) prepare an over-all statewide plan for the preservation of agriculture in New Jersey, 2) serve as advisor to such entities as the CEQ and the Land and Water Resources Authority, 3) work with farmers and local planning officials to create Agricultural Priority Districts, 4) have the authority to review proposed local ordinances that would affect these districts, 5) act as review board when an agency with the power of eminent domain threatens to take land in a Priority District, and 6) help farmers to organize agricultural land cooperatives which would enable the preservation of agricultural land combined with profit sharing as that land was developed that was least suitable for farming.[9]

Still a third group of solutions focus on changing the U. S. Internal Revenue Service laws and regulations so as to make them more amenable to the preservation of agriculture. Suffolk County Executive Klein has proposed a series of changes along that line. One would be an amendment of Federal inheritance and gift-tax laws so as to allow the deferment of tax liability on farmlands as long as the land continues to be used for that purpose. He calls for an indefinite deferral of liability; however, interest runs concurrently on the ultimate tax liability--both of which must be paid as soon as the land is no longer farmed. Land upon which scenic easements are purchased would also be given a lower assessed valuation during the existence of the term of the easement; however, interest on the difference between the tax is reduced and the amount which would have been due without the easement is ultimately paid to the government when agricultural users are terminated.[10]

***

A current land use practice that exerts a most critical pressure on open space land is a prevalent procedure by which solid waste is disposed of: sanitary landfill. As mentioned previously, air pollution caused by currently active incinerators, and the most recent legislation restricting ocean dumping will help to accelerate the search for additional land which can be used as landfill. Unfortunately, the type of land required is often the same land that is being sought by different city, state, or private agencies for a recreation area. The scope of the solid waste problem in Region II, and its implications for land use and environmental quality will be discussed next.

FOOTNOTES

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

8. Agricultural Land and Development Pressures

1. Suffolk County Cooperative Extension Office - Agricultural Division, "Comparative Importance of Suffolk County, New York Agriculture," (Riverhead, N.Y: Suffolk County Cooperative Extension Office, December 23, 1971). (Mimeographed.)

2. Ibid.

3. "Growth Outruns East End Plans," Newsday (Garden City, N.Y.), March 3, 1972, p. 17.

4. Suffolk County Cooperative Extension Office - Agricultural Division, "Suffolk County Agricultural Outlook and Trends," (Riverhead, N.Y: Suffolk County Cooperative Extension Office, December 23, 1971). (Mimeographed.)

5. Nassau-Suffolk Regional Planning Board, Nassau-Suffolk Comprehensive Development Plan: Summary (Hauppauge, N.Y: Nassau-Suffolk Regional Planning Board, 1970)

6. "Growth Outruns East...," Newsday.

7. New Jersey Commission on Open Space Policy, Report of the New Jersey Commission on Open Space Policy, March, 1971, Appendix.

8. Ibid.

9. Ibid.

10. "Protecting Farmlands," Long Island Commercial Review, September, 1972.

10. Solid Waste Disposal and Land Use

The dimensions of the solid waste disposal problem in Region II continue to increase daily. The centralization of population in many of the urban areas of the region, along with the increased emphasis on over-packaged, no-return containers are only two of the factors leading to the acute difficulties in waste disposal. Other factors adding to the dilemma are the severe shortages of land to be used as landfill, the air pollution levels of many parts of the region, and the lack of regional cooperation and coordination in waste disposal.

The volumes of waste in New York City, for example, are increasing with each year. Since 1960, the city's population has risen by only 1.5% while the flow of refuse has increased by 42%.[1] The city is fast running out of land which can be used for sanitary landfill, and according to current height regulations, all of New York City's landfill areas will be exhausted by 1976. Extension of the landfills could delay this date by ten or fifteen years at the most.[2]

The city is currently searching for any and all alternatives to sanitary landfill, many of which are clearly unfeasible. For example, Jerome Kretchmer, New York City's Environmental Protection Administrator, was quoted in the New York Times as saying that "...the City would be more than willing to railhaul the solid waste to areas such as strip mines, quarries, and the like, but other communities either within or outside New York State don't want New York City's garbage."[3] Instead, he proposed ocean dumping as an alternative, which was outlawed by the Supreme Court as early as 1933.

One reason for the stepped up search for all possible waste disposal

alternatives is that, most likely, the traditional alternative to landfill, incineration, will not be satisfactory for New York City in the future. The New York City Environmental Protection Administration recently cancelled a plan to construct a 6,000 ton per day incinerator because both the capital cost ($200 million) and the air pollution (more than 3,000 tons of particulates per year even with the most modern abatement equipment) were judged intolerable.[4]

Understandably, despite New York City's acute landfill shortage, communities near New York City are growing increasingly reluctant to let other cities use their precious landfill space. The Hackensack Meadowlands, for example, 20,000 acres located in New Jersey's Hudson and Bergen Counties has been relied upon as a dumping ground for over 100 municipalities in the area, including New York City. However, plans are underway for massive development of the Meadowlands. Included in these plans is the construction of the world's largest incinerator, but it is conceivable that plans for it could be cancelled for many of the same reasons that New York cancelled construction of its new incinerator. According to EPA, the incinerator should meet air quality standards. However, the 820 to 1,370 additional tons of particulate matter that the incinerator would generate could not help but add appreciably to the air pollution levels of already polluted Northern New Jersey.

Solid waste disposal problems are evident in other portions of Region II, as well. For example, according to the Comprehensive Solid Waste Planning Study of the Central New York Region, although the population density of the area is much less than that of the eastern portions of the state, poorly located landfill operations are not uncommon. Although Onondaga

County had 26 landfills in 1970, 8 were located immediately adjacent to residentially zoned areas, and 1995 projections call for 22 landfills to be either within or closely adjacent to such residential areas.[5] Such juxtaposition of landfill with residential area is quite undesirable from the standpoint of preserving neighborhood aesthetics, but in addition, little attention was paid to the natural features of the land in selecting sites for these landfills. For example, 10 of the 26 landfills in Onandaga County are located on 100 year floodplains.[6] In the future, some attention will undoubtedly be paid to the coordination of solid waste management and land use planning, but whether new regional governmental structures will be created to perform this function is uncertain.

In response to the severity of the problem, many areas of Region II are experimenting with new approaches to solid waste disposal. For example, New York City has contracted with the Monsanto Corporation for the construction of an experimental pyrolysis plant that can process 1,000 tons of solid waste per day and will cost the city nothing for its construction. The town of Orchard Park, N.Y., is currently experimenting with the Torrax Solid Waste Disposal System utilizing high temperature incineration. Once air pollution from such systems is under control, the molten residue from the plant could be reduced to only 5% of the introduced refuse. In addition, the heat produced could be used for power production; many of the toxic gases could be oxidized in the high temperature chamber; and some land could be conserved which would otherwise be used for sanitary landfill. Other systems being investigated at the present time include shredding, compacting, wet oxidation, and thermal decompostition.

However, it is increasingly necessary that priority be given by EPA

to research and funding of systems and strategies aimed at 1)Reducing the amount of solid wastes that must be disposed of, and 2)Re-using waste materials through reclamation and recycling, composting, etc. It is self-evident that only a finite amount of natural resources are available for human use. It makes both economic and environmental sense to focus attention on recycling.

A number of areas within Region II are attempting to initiate large-scale resource recovery programs. For example, the Central New York Regional Planning Board has set resource recovery objectives for 1980 that include the recycling of 30% of all paper and paper products and 10% of all ferrous metals.[7] A three stage implementation schedule has been set up to meet these objectives which hopes to be able to rely heavily on voluntary citizen cooperation. Thus, a substantial public information program would be carried out in conjunction with the plan. This type of public information program should be aimed at changing consumer habits. Citizens must be informed as to the environmental consequences of non-returnable bottles and the purchase of products with excess packaging, and taught to avoid these products.

At the same time, municipalities must take measures to provide economic incentives for the manufacture of products that are easier to recycle or dispose of. For example, the New York State Legislature has given New York City permission to enact a recycling incentive tax on containers. The tax is a one to three cent levy at the wholesale level on rigid and semi-rigid paper, glass, metal and plastic containers for all non-food items sold at retail. Any container that contains a prescribed percentage of recycled materials is allowed a one cent credit against the

tax. Additional tax credit would be granted to wholesalers purchasing products from manufacturers reusing old containers. Unfortunately, at this time, the City Council has passed only that portion of the tax applying to plastics. Subsequently, the plastics industry sued, and won their case, charging that the tax was discriminatory.[8]

It is important to examine the Federal role in relation to solid waste disposal, for, in some ways, Federal policy and programs have been most deleterious to sensible solid waste disposal, and, in particular, to resource recovery efforts. According to the Third Annual Report of the Council on Environmental Quality:

> Solid waste, unlike air and water pollution, remains substantially a problem of local control and concern. Federal initiatives in this area, primarily the Solid Waste Disposal Act of 1965 [P.L. 89-272] as amended by the Resource Recovery Act of 1970 [P.L. 91-512] are essentially limited to demonstration and planning grants, technical aid and information guidelines... Thus, the actual task of collecting and disposing of municipal wastes remains a problem squarely faced for the most part only by local government.[9]

This implies that the Federal Government really has very little to do with solid waste disposal, other than to provide some funding and some information. That is really not accurate, for Federal policy has a great deal to do with the difficulty that is being encountered in establishing economically viable recycling programs. The Third CEQ Report seeks to minimize these difficulties by explaining that new approaches of EPA are aimed at smoothing them out.

> The emphasis of EPA's solid waste demonstration grant program has shifted from hardware development to improving markets and managerial and institutional practices using currently available technology. Resource recovery--or recycling--demonstration grants will be keyed to commercially viable systems based on a realistic assessment of market conditions.10

If EPA is going to realistically assess market conditions, it should first do a thorough evaluation of those Federal programs which give preferential treatment to manufacturers who use virgin rather than reclaimed materials. Administrator Ruckelshaus of EPA admitted to some of these inequities in an interview in Catalyst:

> There are a number of regulations that discriminate unnecessarily against recycled products and which need to be studied in a new perspective. Specifications that require virgin materials need to be reexamined. So do freight rates and other practices that place undue economic burden on secondary materials... However, our biggest obstacles are attitudinal. In the past, the public did not see products manufactured from secondary materials as particularly desirable items. Now, in contrast, consumers recognize increasingly the long-range benefits of reuse and, I believe, will show their appreciation by increasing their purchase of recycled products.[11]

Most consumers are certainly not, despite what Administrator Ruckelshaus says, going to purchase recycled products that cost considerably more than other products on the market. It is questionable that at this time, the problem is more attitudinal than economic. A brief review of some of the discriminatory elements within Federal policy will help to illustrate this point.

1) A most significant cost factor in the recovery and use of recycled materials is that of transportation cost. Railroad and steamship transportation rates continue to discriminate against recycled materials by as much as 50% as compared to virgin materials. The Council on Environmental Quality, the Environmental Protection Agency and the Department of Commerce have asked the

Interstate Commerce Commission for a remedy to this, to no avail. Yet, opportunities certainly exist for correcting this discrimination at a time when the railroad and maritime industries seek increasing Federal subsidy.[12]

2) The General Services Administration has no requirements concerning the purchase of products made with recycled materials for anything other than paper products.[13]

3) Numerous tax laws exist which benefit those who extract or use virgin resources, and make it difficult for those who use recycled materials to compete favorably on the open market.[14]

4) Current accelerated depreciation rates apply to processes designed to prevent air or water pollution, but not to those designed to prevent land pollution, i.e. that pollution which stems from disposal or lack of disposal of solid waste. For example, a scrap processor who installs a car shredder is allowed accelerated depreciation on only that part of his installation designed to control air pollution which results from dust. It has been argued that the tax incentive should be granted to the entire investment, since the entire machinery fights pollution in one way or another.[15]

Everything mentioned up to this point suggest specific areas in which Federal intervention could alleviate the solid waste disposal crisis and also aid recycling. However, a number of other measures are necessary, as well. New York City's Environmental Protection Administration recommends additional areas in which strong Federal action is needed.

They recommend a recycling incentive tax such as New York City's where a national tax could be levied on all packagers, in an attempt to minimize all excess packaging and to foster environmentally sound packaging. They also suggest a reclamation allowance that would involve some form of Federal subsidy for the use of reclaimed materials. Another area for improvement is in the delineation of technical standards. Could a product be made in a manner that would make recycling easier? (i.e. by only making glass containers in one color, would glass be easier to reprocess?) Do certain materials deter recycling when they are used in a product? Could they be replaced? (A classic example is that of census forms--they are made from a high grade paper that would recycle well, but are printed with an insoluble ink that can't be removed.)

EPA should be expending increased effort to determine clearly what aspects of Federal policy are inhibiting resource recovery, and how they can be changed without hurting the economy. The costs of using our diminishing natural resources at an unprecedented rate are, unfortunately, rarely calculated in an empirical manner. Not only must resource recovery be encouraged because it is a less wasteful production process, it must be fostered because it allows us to use our land in far better ways than for sanitary landfill, open dumps or junkyards. It cannot be emphasized too often that land is as vital a resource as air or water are, and current solid waste disposal procedures are abusing this resource.

FOOTNOTES

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

9. Solid Waste Disposal and Land Use

1. New York City Environmental Protection Administration, "Solid Waste Operations in New York City," (New York: New York City Environmental Protection Administration, n.d.), p. 4.

2. Written testimony submitted by Marvin Gersten, Commissioner of Purchase and Jerome Kretchmer, Environmental Protection Administrator, City of New York at Hearings of the Subcommittee on Fiscal Policy of the Joint Economic Committee, U.S. Congress, Ninety-Second Congress, First Session, November 8 and 9, 1971. Hearings on the Economics of Recycling Waste Materials, p. 95 text.

3. "City Wants Waste Dumped in the Ocean," New York Times, September 27, 1972.

4. Testimony of Marvin Gersten and Jerome Kretchmer at above hearing.

5. Malcolm Pirnie, Inc., Central New York Regional Comprehensive Solid Wastes Management Plan, Prepared for the Central New York Regional Planning and Development Board and the New York State Department of Environmental Conservation, October 27, 1971, Vol. I, pp. 28, 108-110.

6. Ibid., p. 110.

7. Ibid.

8. New York City Environmental Protection Administration, "Solid Waste Operations...", pp. 8-9.

9. Council on Environmental Quality, Environmental Quality: The Third Annual Report of the Council on Environmental Quality, (Washington, D.C: Council on Environmental Quality, August, 1972), p. 204.

10. Ibid., pp. 131-32.

11. Interview with William D. Ruckelshaus, Administrator, U.S. Environmental Protection Agency in Catalyst For Environmental Quality, Vol. 2, No. 2.

12. Testimony of M.J. Mighdoll, Executive Vice-President, National Association of Secondary Material Industries at above hearing, pp. 15-17, text.

13. Ibid., p. 17.

14. Statement of Thomas A. Davis, tax attorney, at above hearing, p. 41, text.

15. Statement of Jeffrey S. Padnos, NYC EPA, on behalf of Jerome Kretchmer, Administrator, at above hearing, p. 109, text.

SECTION IV

EPA AND LAND USE: FUTURE GOALS

If EPA is to be effective in meeting its mandate to protect the environment, it must focus its efforts on two different levels. First, the agency must be prepared to act quickly to combat pollution as it occurs, and second, the agency must attempt to prevent future environmental crises from occurring. It is the opinion of the Youth Advisory Board, that thus far the U.S. Environmental Protection Agency has been focusing its efforts too much on reaction to immediate crisis situations. There is some justification for this approach in light of the newness of the EPA and its difficulties in countering a large backlog of environmental problems that had not been dealt with. However, this trend cannot continue if EPA hopes to function successfully in the future.

The Third Annual Report of the Council on Environmental Quality states that:

> Throughout society, there is a growing need to turn from management by reaction to management by anticipation of problems. This anticipatory approach to management requires a substantial amount of forecasting.[1]

To implement an "anticipatory approach," EPA must rely increasingly upon new forecasting and environmental simulation techniques made possible by the computer to predict potential environmental problems. Increasing

emphasis should be placed upon the forecasting of pollution from proposed residential, commercial, and industrial developments within this context.

The rationale for future increased EPA involvement with land use is compelling. As has been demonstrated, development of the land largely determines what type and quantity of environmental pollution occurs. The Youth Advisory Bd., recognizes that EPA has no direct authority to design or regulate urban or suburban developments at this time. However, EPA could have significant input into the process by which our landscape is shaped if it followed the recommendations that the President's Water Pollution Control Advisory Board and the President's Air Quality Advisory Board made earlier this year:

> That the Environmental Protection Agency move purposefully to improve coordination with other Federal agencies whose activities affect or are affected by air and water quality standards; provide more environmental planning guidance to Federal, State and local agencies together with close coordination and cooperation with local, regional and State land use planner and policy makers; and make full use of present authority to affect land use decisions with respect to all environmental quality.[2]

At the joint meeting of the President's Air and Water Advisory Boards held in March, 1972, many testified to the effect that although most professional planners would be willing to cooperate in developing land use plans which paid extensive attention to environmental effects, planners need to be taught how to include these factors into the planning process. EPA could play a vital role in this education process. Any parcel of land or any community can be developed in numerous ways. EPA must take the responsibility of teaching planners how to evaluate alternative development plans for environmental impact.

However, if EPA is to perform this function, it must hire planners who understand both land use and environmental quality and their interrelationships. Although this region has made some progress towards that point by hiring "land-use people" within the Air Programs Division, significant progress is required beyond that initial step.

There is as great a need for the employment of planners in Water Programs and Solid Waste Programs, as there is in Air Programs. Little research has been done upon the effects of various land uses on the water quality of a watershed. Part of the reason for this is the difficulty of relating land uses to water and soil systems. Scientists are only beginning to discover the pathways through the soil that the pollutants take, eventually polluting the water.

In general, our ignorance of the relationships between land use and most environmental pollution is appalling. However it is not difficult to see why we know so little. Coordination between the agencies that monitor development, the scientists, the environmental control agencies and the agencies that provide the impetus for which development is almost nonexistent. Even if uneasy alliances existed, it would be extremely difficult to use this coordination fruitfully. Each agency speaks its own language and lacks the type of personnel who are capable of breaking through interdisciplinary barriers to use results from another field. If EPA wishes to become involved in a land use approach to prevent pollution, then it must hire individuals with hybrid backgrounds. One type of ideal background would be an ecologist with another degree in resource planning or an economist with a degree in chemistry. People are needed who have diverse backgrounds, particularly in the fields of systems analysis and management, who can provide unique solutions because of their holistic approach.[3]

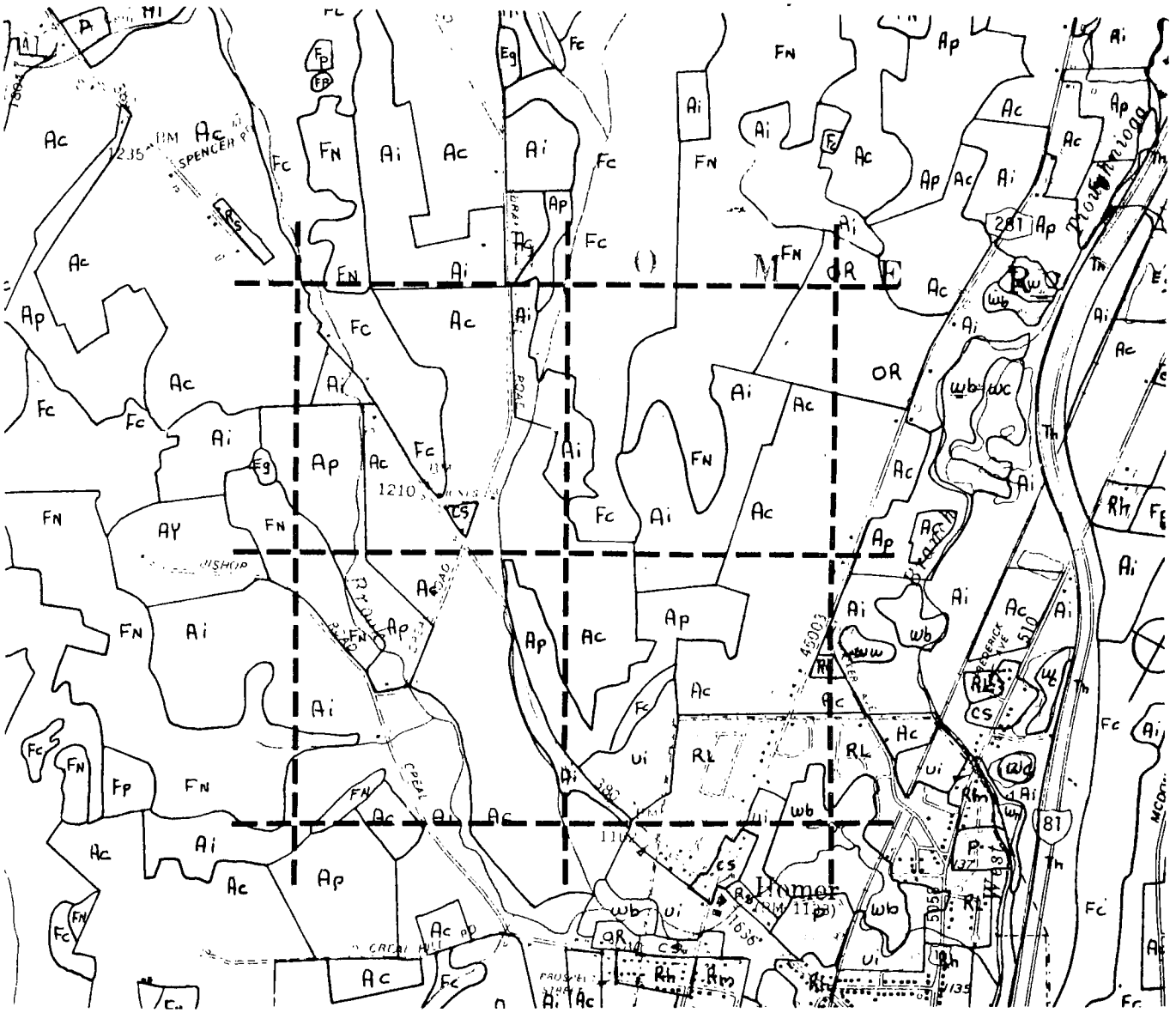
However, there are a number of systems already developed that could conceivably improve coordination between agencies, and hopefully lead to improved environmental quality. The New York State Office of Planning Services has developed an information system that shows in detail how the land resources of New York State are being utilized. This system, LUNR (Land Use and Natural Resource Inventory), collects and assembles its data by transposing land use and natural resource information from aerial photos (at a scale of one inch equals 2,000 feet) directly onto overlays for each 7½' USGS quadrangle map. The information is subsequently recorded for each one-kilometer square grid cell within the quadrangle, producing three primary products:

1. LUNR Inventory overlays, which may be reproduced on transparent ozalid, for example;

2. Graphic displays of the information in map form by means of a computer graphic program; and

3. Computer analyses and tabular summaries of classification items, prepared concurrently with or independently of the map printout.[4]

Currently, two separate types of applications have been found for LUNR. The first type is for representing the pattern of land uses for a village, town or county. LUNR has assisted local planners, private developers, local government officials, etc., in performing such functions as drafting zoning ordinances. The second type of application for the overlays that LUNR produces is in analyzing specific potential project



Agriculture

Areas:

- Ao – Orchards
- Av – Vineyards
- Ah – Horticulture, floriculture
- Ay – Specialty farms
- At – High-intensity cropland
- Ac – Cropland and cropland pasture
- Ap – Permanent pasture
- Ai – Inactive agricultural lands
- Ui – Other inactive lands
- Uc – Lands under construction

Point data:

Specialty farms (Ay): types present

- Mink (y-1)
- Pheasant and game (y-2)
- Aquatic agriculture (y-5)
- Horse farms (y-6)

Dairy operations (d): number

Poultry operations (e): number

Active farmsteads (f): number

Forest Land

Areas:

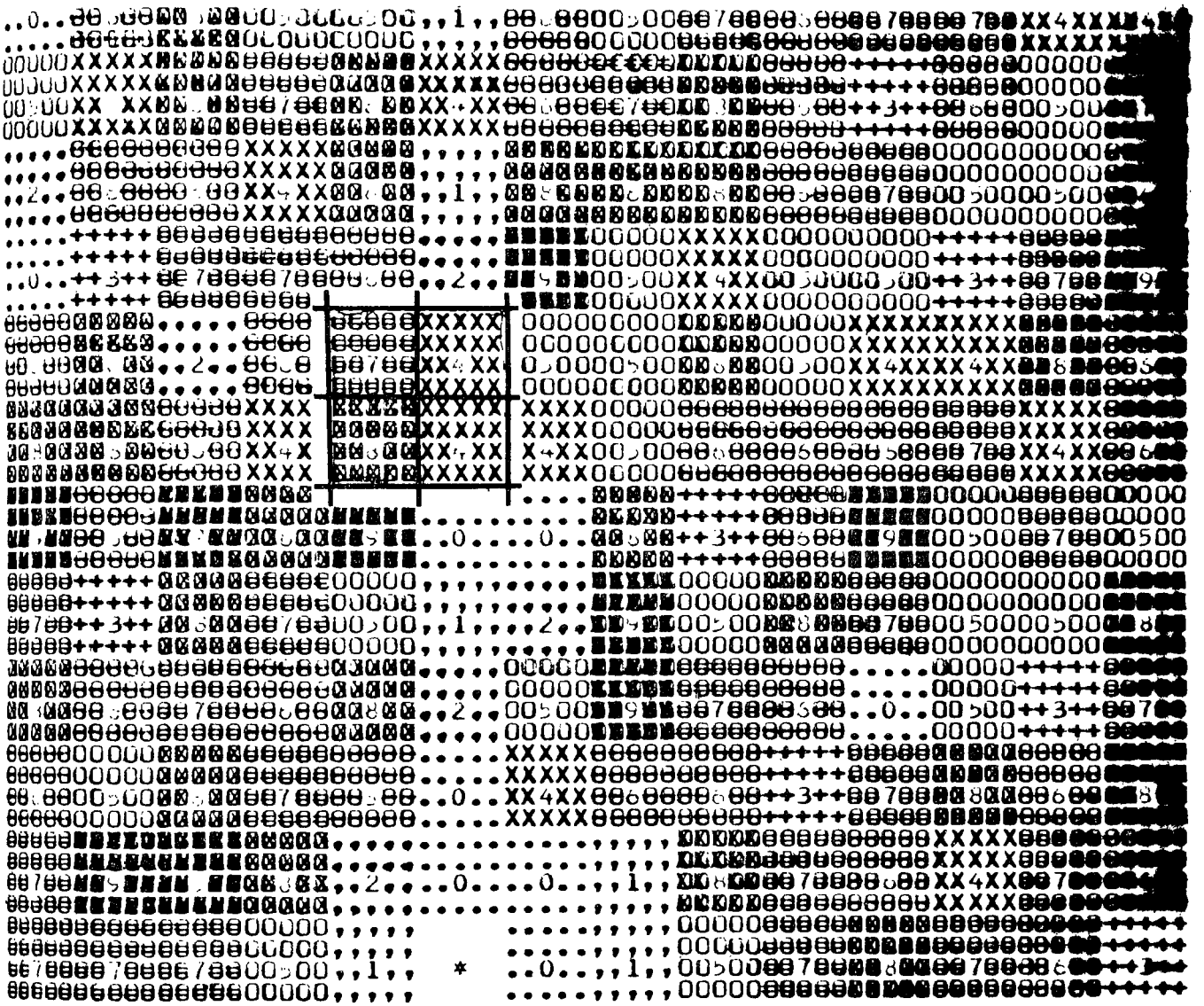
- Fc – Forest brushland
- Fn – Forest land
- Fp – Plantations

Water Resources

Areas:

- Wn – Natural ponds and lakes (1 acre +)
- Wc – Artificial ponds and reservoirs (1 acre +)
- Ws – Streams and rivers (100' +)

Figure 9
Computer Graphic Printout
"Total Agricultural Land Area (A)"
Scale 1" = 2 km.



Wh – Hudson River
Wm – Marine lakes, rivers, and seas
Wb – Shrub wetlands, bogs, marshes
Ww – Wooded wetlands

Point data:
Natural ponds and lakes (n): number
Artificial ponds and reservoirs (c): number
Ponds less than 1 acre in size (p): number
Lake shoreline (l): miles
Streams and rivers (s): miles

Nonproductive Land

Areas:
Ns – Sand (unstabilized)
Nr – Rock (exposed)

Residential Land Use

Areas:
Rh – High density (50' frontage)
Rm – Medium density (50 -100' frontage)
Rl – Low density (100' + frontage)
Re – Residential estates (5 acres +)
Rs – Strip development
Rr – Rural hamlet
Rc – Farm labor camp
Rk – Shoreline cottage development

Point data:
Shoreline developed in cottages (k): miles
High-rise apartment buildings (z): number
Trailer parks (v): number

Rural non-farm residences never a farm residence (x): number
Rural non-farm residences once a farm residence (o): number

Commercial Areas

Areas:
- Cu - Central business district
- Cc – Shopping center
- Cs – Strip development
- Cr – Resorts

Industrial Areas

Areas:
- Il – Light manufacturing
- Ih – Heavy manufacturing

Extractive Industry

Areas:
- Es – Stone quarries
- Eg – Sand and gravel pits
- Em – Metallic mineral extraction
- Eu – Underground mining

Point data:
- Underground mining (Eu): types present
  - Oil and gas (u-1)
  - Salt (u-2)
  - Other (u-3)
  - Abandoned (u-4)

Outdoor Recreation

Areas:
- OR – All outdoor recreation facilities

Point data:
- Outdoor recreation facilities (OR): types present
  - Golf courses (OR-1)
  - Ski areas, other winter sports (OR-2)
  - Beaches and pools (OR-3)
  - Marinas, boat launching sites (OR-4)
  - Campgrounds (OR-5)
  - Drive-in theaters, race tracks, amusement parks (OR-6)
  - Fairgrounds (OR-8)
  - Public parks (OR-9)
  - Shooting, archery (OR-13)
  - Private company facilities, community areas (OR-16)

Public and Semi-Public Land Uses

Areas:
- P – All public and semi-public areas

Point Data:
- Public and semi-public areas (P): types present
  - Educational institutions (P-1)
  - Religious institutions (P-2)
  - Health institutions (P-3)
  - Military bases and armories (P-4)
  - Solid waste disposal (P-5)
  - Cemeteries (P-6)
  - Water supply treatment (P-7)
  - Sewage treatment plants (P-8)
  - Flood control structures (P-9)
  - Correctional institutions (P-11)
  - Road equipment centers (P-12)
  - Welfare centers, county farms (P-16)

Transportation

Areas:
- Th – Highway interchanges, limited access right-of-way, et
- Tr – Railway facilities
- Ta – Airport facilities
- Tb – Barge Canal facilities
- Tp – Marine port and dock facilities
- Ts – Shipyards
- Tl – Marine locks
- Tt – Communication and utility facilities

Point data:
- Highway category (h): highest present
  - None (h-o)
  - Unimproved, gravel, town roads (h-3)
  - Two-three lane highway (h-4)
  - Four-lane highway (h-5)
  - Divided highway (h-6)
  - Limited access highway (h-7)
  - Limited access interchange (h-8)
- Railway facilities (Tr): types present
  - Abandoned right-of-way (r-1)
  - Active track (r-2)
  - Switching yards (r-3)
  - Stations and structures (r-4)
  - Spur (r-5)
- Airport facilities (Ta): types present
  - Personal (a-1)
  - Non-commercial (a-2)
  - Commercial (a-3)
  - Airline (a-4)
  - Military (a-5)
  - Heliport (a-6)
  - Seaplane base (a-7)
- Barge Canal facilities (Tb): types present
  - Channel (b-1)
  - Lock (b-2)
  - Abandoned channel (b-3)
- Communications and utilities (Tt): types present
  - TV-radio tower (t-1)
  - Microwave station (t-2)
  - Gas and oil – long-distance transmission (t-3)
  - Electric power – long-distance transmission (t-4)
  - Water – long-distance transmission (t-5)
  - Telephone – long-distance transmission (t-6)

sites from the point of view of environmental impact, costs of purchase or development, means of preservation, etc. LUNR has been used to help locate parks and sanitary landfill sites, to route utility lines, to select alternate highway corridors, to conduct watershed studies, etc. For example, watersheds have been studied using the LUNR overlays to pinpoint potential sources of pollution.[5]

The New York State Office of Planning Services feels that:

> The major benefits of the computerized LUNR information system are its ability to produce a clear graphic output quickly, at low cost and with great flexibility. The display of data is the simplest task for computer graphic programs. Its complete capability is yet to be realized in land use planning. Its ability to handle huge amounts of data in analyses opens new horizons...the LUNR system can be a dynamic analytical tool with great potential for policy makers and technicians.[6]

It is vital that EPA fully cooperate with the New York State Office of Planning Services in utilizing the capabilities of LUNR as extensively as possible. Potential applications are numerous and would help EPA expand its capabilities designed to prevent environmental damage before it occurs.

Another system that could help EPA evaluate future environmental impacts is the Environmental Evaluation System (EES) developed by Battelle-Columbus Laboratories for the Bureau of Reclamation. Designed to assist in assessing environmental impacts of water resource development projects proposed by the Bureau, the EES is based upon a hierarchical arrangement of environmental quality indicators. This arrangement classifies the major areas of environmental concern into major categories, components, and ultimately into parameters and measures of environmental

quality. The intent is to provide a balance between too little and too much detail, thus, environmental impact evaluations are made in four major categories (ecology, environmental pollution, aesthetics, and human interest) which are further broken down into 18 components and finally, 78 parameters.

There are a number of features of the EES which makes it particularly suited for EPA use. First, the EES is interdisciplinary in nature, and development of the system was performed by a team consisting of civil engineers, water resource management specialists, sociologists, ecologists, landscape architects, management experts, etc. Thus, the EES can represent a step towards improved communications with a number of other specialized agencies. Second, the EES provides a means for measuring or estimating selected environmental impacts in commensurate units. This can help EPA to more intelligently allocate its resources according to where need is the greatest in terms of potential environmental impact. Third, the EES helps to indicate fragile elements of the environment which must be studied in more detail. The system does this by measuring differences in the environmental quality of a parameter with and without a proposed project. EPA could then attempt to measure the direct environmental benefits of a proposed project before it is begun.

The use of these type of systems could lead not only to a preventative approach to environmental quality control, but to a more integrated effort in which problems are dealt with in context as being part of a system. Unfortunately, however, not only is insufficient attention paid by EPA to a system approach to environmental problem solving, the divisions of EPA also do not function as if they were part of one large environmental

problem solving system. Based on the contact that the Land Use Task Force have had with EPA, it appears as if there is poor communication and coordination between program divisions of EPA. Few members of the staff have an integrated view of the forces affecting the problem they are assigned to solve, and consequently they devise inadequate solutions. Some divisions are attacking components of the same problems, while operating under different assumptions. One simple example of the general lack of awareness within EPA that it is an environmental problem solving organization is the absence of any pollution saving actions by the agency as it goes about its daily functioning. Countless buttons are turned out urging "Clean Air"--made of hard to dispose of metal alloys, electric pencil sharpeners are present while the agency makes no effort to collect for recycling its own waste papers and newspapers (let along those of the entire Federal Building complex).

If inter-division communication is poor, communication between EPA and state and local agencies in this region is poorer still. For example, it has come to the attention of the Youth Advisory Board that water data is not exchanged between EPA and the New York State Department of Environmental Conservation.[7] It would seem that exchange of such information would make the functioning of both agencies more efficient and effective.

Within EPA, coordination should extend to frequent inter-departmental meetings, some of which could be held as an informal "brown bag lunch" in which topics that affect more than one department could be discussed. However, for the purpose of this report, in which the main concern is the

inter-relationship between land use and EPA's role and duties, suggestions will be directed at implementing a land use approach through and between Divisions.

One type of administrative restructuring that would lead to increased focusing on land use would be the creation of an entire Land Resources Division within EPA. There are obvious difficulties with this approach. It would require new legislation and would entail a drastic change in EPA structure. Further, there would be no guarantees that the Land Division could communicate with other Divisions more effectively than seems to be occurring now. A chief advantage of such a change would be, however, the recognition that EPA cannot take a systematic approach to environmental quality improvement without the consideration of land use. EPA should seriously consider the advantages that would come with the creation of such a Division.

Alternatively, or in the interim, EPA should consider establishing a Land Use Council at the regional level similar to the one that exists in the National EPA office. This would certainly be a more viable short-range solution to the lack of an entity charged with considering land use within EPA, and the lack of coordination between Divisions in relations to land use (and most other things). The Regional Land Use Council would be a body of representatives of each EPA Division that would meet regularly to coordinate the approach that the EPA is taking to regional land use problems. The representatives could either be the Division Heads, or else, could be the planners hired to work with each Division, as well as other representatives of the Divisions.

The duties of such a Land Use Council would be varied. They should include the following functions:

1. Making recommendations to the Divisions concerning the ways in which their actions are affecting, and are being affected by land use in the region.

2. Studying land use projections for Region II and recommending to the appropriate Divisions priorities for enforcement actions or grant monies based upon anticipated population growth trends and consequent developing land use patterns.

3. Recommending to the appropriate Divisions, specific research that is required in order to maintain land, air and water quality.

4. Recommending to the Divisions how they might more effectively coordinate their actions in all areas of EPA concern.

FOOTNOTES

Section IV - EPA and Land Use: Future Goals

1. Council on Environmental Quality, Environmental Quality: The Third Annual Report of the Council on Environmental Quality (Washington, D.C: Council on Environmental Quality, August, 1972), p. 51.

2. President's Water Pollution Control Advisory Board and President's Air Quality Advisory Board, Report to the Administrator of the EPA, "Statement on the Relationship Between Environmental Quality and Land Use," in The Relationship Between Environmental Quality and Land Use (March 31, 1972)

3. A number of interesting discussions of the need for interdisciplinary solutions and the obstacles to interdisciplinary working relationships with respect to improving environmental quality exist. Several which might be of interest follow.

   Andrew F. Euston, Jr., "Effects of the Physical Environment on Human Behavior," Planning '70 (Chicago: American Society of Planning Officials, 1970)

   Constance Perin, With Man in Mind: An Interdisciplinary Prospectus for Environmental Design (Cambridge: M.I.T. Press, 1970)

   Robert W. Kates, "Stimulus and Symbol: The View From the Bridge," Journal of Social Issues (October, 1966)

   Glenn L. Paulson, "Human Behavior and Buildings Over Roads," Planning '70 (Chicago: American Society of Planning Officials, 1970)

4. Roger A. Swanson, The Land Use and Natural Resource Inventory of New York State (Albany, N.Y: New York State Office of Planning Coordination, June, 1969), p. 3.

5. Robert Crowder, "New York State Land Use and Natural Resource Inventory: What It Is and How It Is Used," (Albany, N.Y: New York State Office of Planning Services, September, 1971), p.5. (Mimeographed.)

6. Swanson, Land Use...of New York State, p. 10.

7. According to Ron Maylath of the New York State Department of Environmental Conservation as told to Miguel Antonetti-Alvarez, member of the Youth Advisory Board, Region II-EPA.

Region II Land Use Task Force Report

Recommendations

Section I - Urbanization and Fringe Development

1. EPA should provide technical assistance to communities attempting to deal with their environmental problems through land use regulation. Special attempts must be made to assist those communities too small to support full-time professional staff.

2. EPA should provide financial assistance for research purposes to those communities seeking to weigh the environmental impacts of alternative land use plans.

3. EPA should continue to testify and lobby for Federal legislation concerning a comprehensive national land use policy and program.

4. EPA should testify and lobby for state legislation in New York or New Jersey designed to give increased land use regulatory powers to regional or statewide agencies. These agencies could then more effectively and efficiently control development patterns, and thus, help curtail regional environmental problems.

5. EPA should research, publish and disseminate information discussing land as a resource, its scarcity, and the implications for other environmental resources of its misuse.

6. EPA should consider land use and misuse more significantly in all environmental impact statement reviews, and in the statements which EPA prepares

7. EPA speakers can attempt to reach groups of land developers and explain the environmental consequences of sprawled and poorly planned development. The technical expertise of agencies such as HUD may be called upon to help give alternatives; especially, alternatives which are not only more environmentally sound, but more economical for the developer.

8. EPA should lend its resources and its authority to the movement to end the extreme dependence upon property taxes by municipalities in the States of New York and New Jersey. If community facilities, and particularly, schools were supported through other means, it would be far easier to implement rational land use plans. Thus, many of those environmental problems associated with poorly planned development could be eliminated.

9. EPA should consider the funding of research into the ways in which land speculation leads to the environmental pollution that EPA is expected to help control. The results of such research can be used to help document the need for the protection of land as a resource, as well as air and water.

10. EPA should make maximum use of its cooperative agreement with HUD concerning the dispersal of sewer grants. Sewer lines are a powerful incentive to growth. This growth can, and often does surpass the environmental capabilities of the land. EPA should assist HUD to the fullest extent possible in ascertaining what environmental resources are available in the area, and what types and amount of growth they can support. At the same time, HUD should be assessing the capability of the municipality to deal with sudden growth.

11. EPA should assist in the education of governmental officials as to the potentially dangerous environmental effects of allowing developers to build extensive septic tank subdivisions (particularly in coastal areas) and other detrimental land use practices. Although municipalities are often hungry for tax base, the water pollution that can result from this practice can ultimately end up costing far more to control. Property tax reform would eventually help to alleviate this problem, but at this point time, communities should insist that the developer pay substantial portions of the cost of sewering.

12. EPA should cooperate with other concerned Federal agencies in funding research aimed at examining and producing methods by which residential, commercial and industrial development can proceed with the least environmental impact.

13. EPA should fund research into the establishment of government land banks such as exist in a number of other countries. This would enable all future land needed to be acquired in advance at government expense and eventually developed or preserved as deemed appropriate. The establishment of such land banks would make EPA's functioning much easier as:

    a) When development was required, a unified and appropriate parcel would be available. Development consistent with environmentally sound goals would not be dependent upon the whim of land speculators.

    b) Appropriate open space could be easily protected.

    c) Critical natural areas could be protected.

14. EPA should press for the establishment of state, and where possible, municipal level environmental impact review processes, with special attention paid to land use.

15) EPA should carefully monitor the environmental problems occurring in Puerto Rico, as haphazard and rapid development take place within an extremely limited eco-system. Because of its size and geography, future environmental problems of Puerto Rico may help alert us to what problems the mainland may face in the coming generations.

16) EPA should fund research into planning systems such as the one that Ian McHarg uses which relies upon the natural features of the land in determining the location of facilities and settlements. If urban developments were located with greater care, much long-range environmental damage could be avoided.

Section II - Transportation and Environmental Pollution

1. Although EPA should continue to press for increasingly strict legislation concerning automobile emission controls, it should begin devoting more time to preventative air pollution control methods that also further rational land management. That is, efforts should be increasingly oriented towards discouraging unnecessary automobile use or highway construction, rather than towards preventing pollution by simply controlling emissions from individual vehicles. EPA should use a variety of tactics in working towards that goal.

2. EPA should initiate the creation of an extensive education program for various groups within the population.

   a) First, EPA should fund programs designed to educate the public at large. EPA could offer free courses under the auspices of adult education centers, community centers, and civic associations.Alternatively, EPA could conduct training classes designed to teach those who could then conduct the courses. The subject matter should include information as to the benefits of land use development patterns that do not require the continuous use of the automobile, new forms of residential development, and other information that helps the public to understand that their behavior patterns and preferences contribute to the environmental pollution that they must live with.

   b) EPA should prepare instruction curricula that could be distributed to school teachers for school levels through first year college. These curricula should contain information about land, how cities evolve, how people get from one place to another. At lower grades, children must be taught as soon as possible that land is a resource that demands protection and that there are real alternatives to the ways in which land is now exploited, instead of carefully used. Included in school instruction should be a new perspective on the automobile, so that perhaps the next generation need not grow up thinking of the automobile as a status symbol or as a necessity, but as something that some people must use to travel with. Possibly all such environmental education programs should be placed under EPA's auspices rather than those of HEW.

3. EPA must conduct an education program for the highway planners within this region. They are currently responsible for significant portions

of the environmental damage that EPA is charged with preventing, yet many of them regard environmental concern as a mere fad. A course outlining the environmental effects of automobile use and highway use and construction would be in order, as well as current Federal and state environmental law as it relates to automobile use. Within this education program should be a section devoted to the environmental impact statement process as it relates to the role of the highway planner. The 102 Statement ostensibly exists to prevent governmental agencies such as EPA and DOT from working at cross purposes with each other. Yet, it has not proved to be as effective as it could be, partially due to the huge volume of statements submitted in relation to highway construction, and the inadequacy of the statements prepared on many highway projects. EPA must help clarify for the highway planners when an impact statement is required, and how one should be written.

4. If the ambiguity of the current law prohibits such clarification, EPA should seek legislative definition of environmental impact guidelines.

5. EPA must seek to expand communication channels with DOT, FHWA (Federal Highway Administration), and state agencies concerned with transportation, environmental protection and land use planning, as such agencies could work more effectively in assuring that transportation and land development were planned cooperatively for improved environmental quality. In working towards that goal, Transportation Control Meetings such as the one that EPA-Region II held in September, 1972 should occur more frequently. Frequent and regular meetings of all major transportation, land use and environmental agencies within a small area could be held.

6. EPA must lobby, testify for, and otherwise use all of its influence to assist in the effort to release Highway Trust Fund money for mass transit. Compelling evidence for the environmental necessity of this measure is readily available in Region II, particularly in the New York Metropolitan Region. In working towards this goal, EPA should cooperate with any agency or organization collecting information on environmental damage caused by automobiles to be used as evidence. Pressure should be applied by EPA upon the legislators whose motivations for voting against measures to release such funds revolve around the financial benefits that they derive from the highway lobby and the construction industries.

7. EPA should fund research into innovative transportation modes, particularly those that do not seem to be getting the attention that they deserve, especially from state transportation agencies. Dial-a-bus, people movers, and many other forms of personal rapid transit seem deserving of EPA funds, which could help finance a joint research effort with HUD and DOT.

8. EPA should fund research designed to minimize the air, noise and land pollution that existing transportation modes cause. Such transit systems as the New York City subway represent too substantial a capital investment to be replaced for many years to come. However, it could be made far quieter. Automobile-caused pollution could be reduced much further. Such research should be funded on a cooperative basis with DOT and with concerned city and state agencies.

9. EPA should apply all possible pressure upon the Port Authority of New York and New Jersey to begin funding transit in the New York Metropolitan Region.

10. EPA should hire a staff designed to provide technical assistance to communities interested in using land use controls to aid in minimizing the effects of pollution from transportation systems and from other sources. Many communities lack the necessary staff and expertise, and often tend to be ignorant of many aspects of environmental pollution. EPA's services could be invaluable to such small communities. For example, EPA could also assist those communities interested in preventing such pollution through alternate land arrangements. This is particularly related to transportation, as unnecessary air pollution can be avoided when communities are planned so that much is within walking distance or easy public transportation.

11. EPA should attempt to hire more staff for its Noise Division, particularly staff with some skill in relating noise to land use. Regional staff level of one individual part-time is most inadequate to deal with the pressing needs of this region.

12. EPA should press New York City to require all future large developments in the city to incorporate their own environmental systems within the development, or pay for the city to develop what extra facilities will be needed. This should occur in advance of need, so that they will be ready on time. The aim would be to prevent the construction of facilities anywhere near the scale of the World Trade Center, without first making sure that their environmental effects can be adequately dealt with. EPA should

carefully monitor the impact statements of all such projects using Federal funds.

13. EPA should evalute extremely carefully the environmental impact statement on the Richmond Parkway, at the time that it is submitted for final review (if that time comes.) If possible, EPA should attempt to document the environmental damage that would result from construction of Section I of the Parkway in terms of the land use implications involved, as well as in terms of such criteria as air, noise and water.

14. In general, whenever possible, land use should be discussed within the impact statements that EPA prepares and evaluates, particularly when a statement is submitted for a proposed highway.

Section III - Open Land and Water Areas, Development Patterns and Environmental Quality

1. EPA should recognize the necessity of providing stronger support for resource recovery systems. EPA ambient air quality standards and stricter legislation governing ocean dumping have jeopardized much open space, particularly in the New York Metropolitan Region, as new sanitary landfill sites are sought.

2. EPA should reinvestigate the ways in which it allocates funds between program divisions. It is possible that reallocation could utilize the same sums more efficiently. For example, it is not inconceivable that if EPA provided markedly increased assistance in such areas as recycling programs within its Solid Waste Division, it could alleviate some of the strain being placed upon other EPA programs involving water resources. This could occur if water recharge areas, such as wetlands, were stringently protected from sanitary landfill, and at the same time were allowed to serve as natural water generating areas. In general, EPA should assist local, regional and state planning and environmental agencies in locating sanitary landfills more intelligently.

3. EPA should seriously evaluate the present policies governing the dispersal of research grants for resource recovery research. The National Resource Recovery Act specifically provides in Section 205 that no grants may be made to "profit making organizations." This is unrealistic in that the private sector must inevitably be deeply involved in a major national recycling effort, and that the young recycling industry still faces serious economic problems. There are strong precedents for research grant dispersal to private industry (notably in the area of war-related

research).

4. EPA must put increased effort into combatting those Federal policies which discriminate against resource recovery. These policies include differential transportation rates for virgin versus recycled materials and tax incentives for extractive industries.

5. EPA should study some of the tax proposals that have been made to lessen the solid waste waste burden and to support resource recovery programs. Among these proposals are suggestions for a recycling incentive tax and a reclamation allowance.

6. EPA should fund research into improved technical standard delineation that would aid a resource recovery effort. Attempts can be made, for example, to ascertain whether certain materials deter recycling when they are placed in a project, and whether they can be replaced.

7. EPA should fund research designed to examine more carefully the potential beneficial effects of open space and vegetation for air and water quality and for noise pollution control. EPA should also attempt to ascertain how severely such open space areas and the vegetation within them are affected by high pollution levels, such as those existing in many portions of New York City.

8. EPA should fund studies designed to investigate the possible economic benefits of preserving open space with particular applications to EPA programs and funding levels.

9. EPA should testify, lobby for, and otherwise assist in changing Federal allocation formulas governing open space grants. Current formulas dis-

criminate against urban areas and populous states. It would be extremely relevant for Region II EPA to seek a remedy to those unfair formulas, as lack of Federal funding for open space in the urban areas of New York and New Jersey may be having profound impact upon environmental quality in the region.

10. EPA should become familiar with all methods available for preserving open space, and assist local communities attempting to save open land by providing technical information to them and referring them to other sources of such information.

11. EPA should urge that Federal money be allocated as part of the commitment to Gateway National Recreation Area to assure that the environmental quality of the area is not harmed through extensive automobile commutation to this area. Federally subsidized transit improvements would not only help to retain the environmental quality of Gateway, they would enable the inner-city residents to reach Gateway who cannot afford the luxury of automobile use.

12. EPA should make special efforts to utilize the funds that will be forthcoming through the 1972 Water Pollution Control Act to upgrade the water quality of the Gateway National Recreation Area.

13. EPA should act more efficiently in utilizing Section 10 (a) of the Water Pollution Control Act to require that poultry farming industries abate their discharges. EPA should attempt to work with farmers to achieve voluntary abatement, and if this is not forthcoming, further action should be taken concerning the separation of the solid wastes and the treatment of the supernatant.

14. EPA should re-examine its allocation of construction grant money for waste water treatment facilities. New York City does not appear to be receiving nearly the amounts it should be entitled to.

15. For the purposes of water quality maintenance, flood control, and protection of a fragile eco-system, the EPA should place wetland protection as a highest priority when considering alternative lands for any usage.

16. EPA should urge the Hackensack Meadowlands Development Commission to adopt the land development recommendations of the New Jersey Department of Environmental Protection, in order to minimize the air and water pollution in the Meadowlands.

17. EPA should request the State of New Jersey to reform its State Implementation Plan to accommodate the projections of the impact from the proposed development within the Meadowlands.

18. EPA should request that the Nixon Administration release all funds authorized by Congress under the Federal Water Pollution Control Act amendments of 1972. Until such funds are available EPA should discourage any further development within the Meadowlands.

19. EPA should provide financial and technical assistance to the Hackensack Meadowlands Development Commission towards the development of a resource recovery system. EPA should recommend to the Commission that they not accept more than the mandated amount of garbage, in order to extend the life of current landfills.

20. EPA should assist in any way possible in the creation of a Long Island Water Resources Board (and in the creation of such boards for other areas of the Region encountering the same rapid development). Mechanisms exist under current New York State law for such Water Resource Boards (Article V, Part V, New York State Conservation Law).

21. EPA should assist in any way possible, and continue to urge Nassau and Suffolk Counties to complete their sewering system in order to help abate water pollution on Long Island. Cooperation with HUD would be necessary in working towards this goal.

22. EPA should help to educate the public as to the consequences of uncontrolled growth in areas of limited and fragile natural resources. Long Island's water problem helps to indicate the folly of allowing growth to proceed ahead of resource planning.

23. EPA should continue its support for water recharge programs and studies in this region, such as the current Wantagh, Long Island study.

24. EPA should press for interpretation of the Water Pollution Control Act [Sections 11 (e) and 12 (a)] so as to forbid the storage of any toxic materials upon floodplains.

25. EPA should press for stringent state and local legislation restricting the use of floodplains for development.

26. EPA should require that communities seeking EPA funding for the construction of sewerage treatment facilities implement adequate floodplain protection policies. Among the rationales that EPA could use for this requirement would be Section 8 (b)(1) of the Water Pollution Control Act.

27. EPA should use its authority in reviewing impact statements written on development proposed for floodplain areas (that would utilize any Federal funding) to discuss the environmental hazards that can occur as a result of floodplain development. Special attention should be paid to statements prepared by the Army Corps of Engineers concerning proposed construction of dikes and dams in floodplain areas.

28. EPA should disseminate information concerning floodplain development and its dangers to the public, and to local land development agencies. Attempts should also be made to assist communities seeking to establish floodplain controls who lack the necessary technical expertise to implement such controls.

29. EPA should assist in any way possible in the establishment of statewide Agricultural Resource Commissions designed to help preserve agricultural land uses.

30. EPA should actively fight for the preservation of agricultural land uses as part of a program to preserve open space. In addition, EPA should be involved in attempts to channel any development that does occur along environmentally sound patterns. To this end, an educational and informational approach is needed. EPA should cooperate with HUD, the Department of Agriculture, and involved state agencies towards reaching this goal.

31. EPA should take an active role in pressing for land development reforms and for increased land use controls, including a reform of the real estate tax system.

32. EPA should lobby to have Executive Order 11296 revised to include environmental considerations.

Section IV - EPA and Land Use: Future Goals

1. EPA should place increasing emphasis upon efforts to prevent future environmental pollution. In working towards that goal, a land use approach is essential.

2. EPA should begin to rely more heavily, where possible, upon new computer technology and upon environmental simulation techniques to forecast pollution levels that can be expected from proposed alternative plans for land development.

3. Methodology developed at EPA's North Carolina research center should be continually utilized, and this region should make sure that adequate skilled manpower is available to make full use of those systems.

4. This region should hire both urban and regional planners to aid in the communication process between owners of the land, those who develop the land, those who regulate the land, and agencies charged with protecting the environment. Planners could also be of many other uses. They could help in the process of identifying likely environmental consequences of alternative land use plans, identify critical land areas that need protection, aid in citizen participation, as well as provide technical assistance to municipalities.

5. EPA should fund research into the process by which water pollutants are introduced into the soil as a consequence of varied land developments. An extremely complicated area, much is unknown about this aspect of water pollution. Cooperative research efforts could be coordinated with ongoing programs, and with other concerned Federal agencies, i.e., the Department of Agriculture.

6. EPA should coordinate research efforts concerning effects upon environmental quality of proposed development with those of the New York State Office of Planning Services (OPS). OPS has already devised the Land Use and Natural Resources Inventory (LUNR), a program to identify and record how the state's land resources are being utilized. Similar efforts should be made to cooperate with the environmental quality agencies of New York and New Jersey as well as the Puerto Rico Environmental Quality Board.

7. EPA should begin utilizing the Environmental Evaluation System (EES) developed by Battelle-Columbus Laboratories for the Bureau of Reclamation. This system could assist the regional office in working towards a preventative approach to pollution control, and in utilizing its resources more efficiently.

8. The Land Use Task Force has observed a need for greater coordination between the program divisions of EPA, and between EPA and other agencies of the Federal and state governments. Such improved coordination would lead to more productive output, less duplication of effort, and a greater understanding of the inter-relationships that exist between almost all endeavors.

9. Towards the goal of improved coordination within EPA, especially with regard to land use as it affects EPA's programs, several systems are possible. One alternative would be the creation of a land division within EPA. However, at this point in time, due to funding, staffing and reorganizational difficulties, it is recognized that this alternative would not seem to be immediately practical. However, it should definitely be considered a long-range possibility. Alternatively, or in the

interim, a Land Use Council could be created similar to the one established in the National EPA Office. Representatives of each EPA Division would meet regularly to coordinate land use implications for and of EPA programs. The Council would either be comprised of Division heads or of planners employed within each Division. Duties of this Council would be:

(a) To make recommendations to each Division concerning the ways in which divisional programs are affecting land use of the region or its component areas.

(b) To make recommendations concerning priorities for allocation of grant money and enforcement action based upon anticipated and burdgening industrial and population growth trends, and upon consequent developing land use patterns.

(c) To recommend to the appropriate Divisions specific research that might be required in order to maintain high land, air and water quality.

(d) To recommend to the Divisions how they might more effectively coordinate their actions in all areas of EPA concern.