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## **Other CEQ Land Use Publications**

### **Available at U.S. Government Printing Office:**

The Costs of Sprawl: Environmental and Economic Costs of Alternative Development Patterns at the Urban Fringe

Executive Summary

Detailed Cost Analysis

Literature Review and Bibliography

prepared for CEQ, HUD, and EPA by Real Estate Research Corporation, 1974

The Taking Issue—An Analysis of the Constitutional Limits of Land Use Control, by Fred Bosselman, David Callies, and John Banta, 1973

The Quiet Revolution in Land Use Control

The Quiet Revolution in Land Use Control—Summary Report, by Fred Bosselman and David Callies, 1971

### **Available at National Technical Information Service U.S. Department of Commerce:**

Interceptor Sewers and Suburban Sprawl

Volume 1: Analysis

Volume 2: Case Studies

by Urban Systems Research and Engineering, Inc., 1974

Recreational Properties: An Analysis of the Markets for Privately Owned Recreational Lots and Leisure Homes, by Richard L. Ragatz Associates, Inc., 1974

Total Urban Water Pollution Loads: The Impact of Storm Water, by Enviro Control, Inc., 1974

Potential Onshore Effects of Deepwater Oil Terminal-Related Industrial Development

Volume I: Executive Summary

Volume II: Mid-Atlantic Region and Maine

Volume III: Gulf Coast Region

Volume IV: Appendices

by Arthur D. Little, Inc., 1973

Land Use Change and Environmental Quality in Urban Areas: Some Comparative Studies [Denver, Los Angeles, Kansas City, Baltimore, Riverside/San Bernardino], by Earth Satellite Corporation, 1973

### **In Preparation:-**

Delaware River Basin

Recreational use of water supply reservoirs

Land use impacts of highway, mass transit, and sewer investments

Leisure homes and recreational properties

Preferential assessment for open space preservation

Land use impacts of federal taxes

Energy consumption and land use

COUNCIL ON ENVIRONMENTAL QUALITY  
WASHINGTON, D. C.

ERRATA: Land Use

- p. 8, third full paragraph, line 2  
should read: "subdivisions and  
more clustered developments  
typical of many sub-"
- p. 11, second full paragraph, line 3,  
the last word should be "the",  
not "by"
- p. 47, footnote 117 should be placed at  
the end of the previous sentence
- p. 61, footnote 179 should be moved to  
the end of the third full para-  
graph on p. 63
- p. 74, footnote 14, "213" should be "231"
- p. 80, footnote 106, "244" should be "224"
- p. 83, footnote 162, "Newman" should be  
"Noonan"
- p. 83, footnote 169, "polities" should be  
"policies"

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December 1974

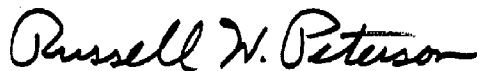
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## Preface

Land use is perhaps the most complex and pervasive environmental issue of all. Pollution levels, agricultural productivity, housing patterns, and recreation are a few of the manifestations of the way that we use our land. But unlike many of the other environmental issues, there is no common scale upon which to measure progress toward good land use. Planners can suggest some better ways to design and locate development; economists can tell us what patterns are most efficient from the point of view of land consumption, energy use, industrial location, etc.; and lawyers can advise on what is legal and constitutional in the way of land use regulations. Yet it is really the community itself—whether locality, region, or state—which must try to pull all these considerations together into coherent land use planning and regulatory policies in order to preserve those things that the community values and to foster the growth and change that the community wants.

This booklet is intended to identify issues and options for citizens to consider in formulating such land use policies for their communities. It is a reprint of Chapter 1 of the Council's 1974 Annual Report. Those interested in further information and reports on land use or other environmental issues are invited to write the Council with their requests.

A handwritten signature in black ink, reading "Russell W. Peterson". The script is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

RUSSELL W. PETERSON  
*Chairman*

# Contents

	Page
Effects of Development .....	3
Development in Metropolitan Areas .....	3
Land Use .....	8
Economic Costs .....	9
Environmental Costs .....	12
Energy Costs .....	15
Water Use .....	19
Social Costs .....	19
Balancing Costs .....	20
Leisure Homes and Recreational Development .....	21
How, Where, and When? .....	26
Development Stimulants .....	27
Federal Taxes .....	28
Pollution Regulations .....	31
Air Pollution Regulations .....	31
Water Pollution Regulations .....	34
Public Infrastructure Investments .....	36
Sewers .....	36
Highways .....	39
Mass Transit .....	42
Energy Development .....	44
Stimulants as Controls .....	47
Land Use Controls .....	49
Quiet Revolution Revisited .....	49
Controlling Development .....	51
Zoning .....	51
Review of Development Proposals .....	54
Development Rights: Donation, Purchase, and Transfer .....	55
Land Banking .....	59
No-Growth and Slow-Growth Policies .....	61
Preferential Assessment .....	64
Open Space as a Land Use Control .....	68
Controls as Stimulants .....	70
Conclusion .....	70
References .....	72
Appendix—Recent State Land Use Legislation .....	87

# Land Use

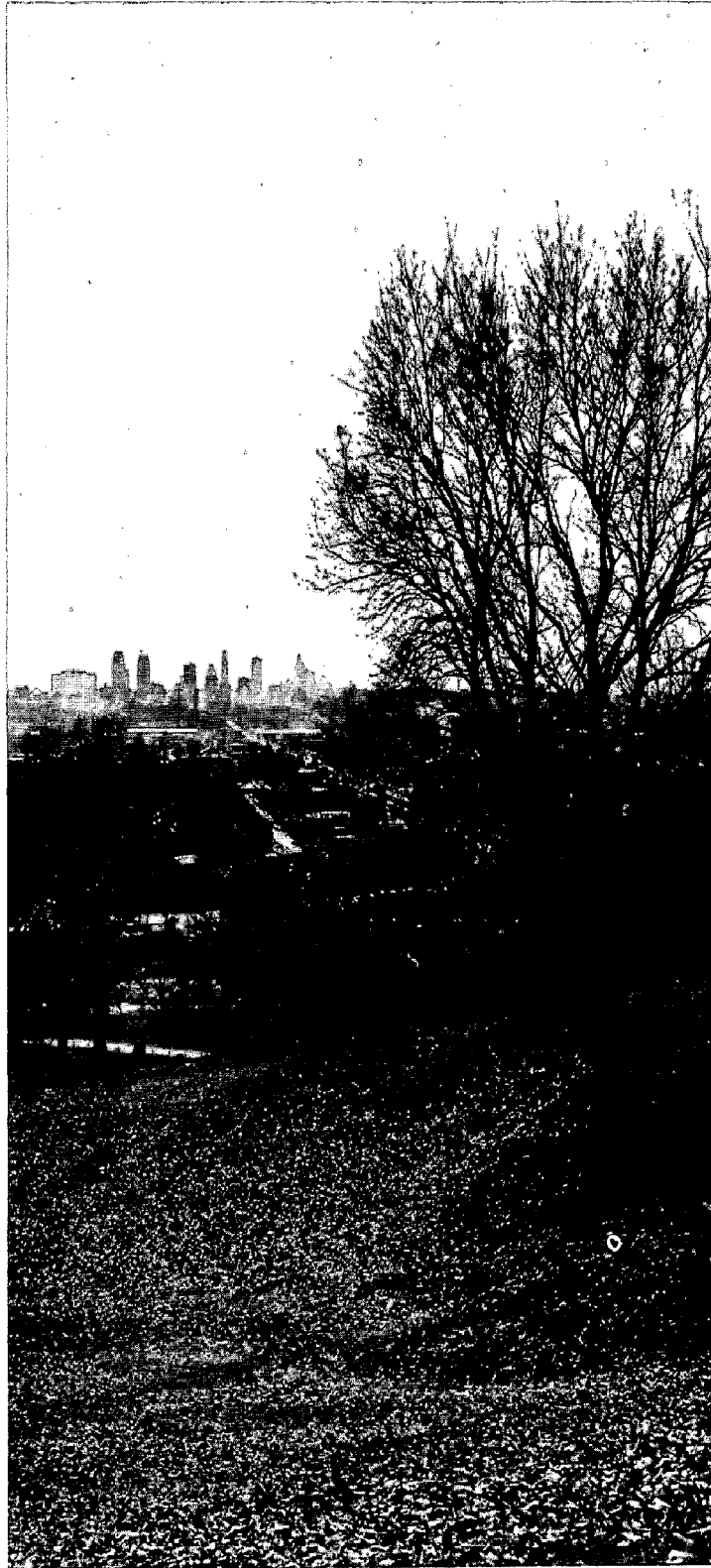
To define and achieve good use of land may well be the most fundamental of all environmental objectives. In the broadest sense, the way in which we use our land determines the way in which our society functions. Land is the basic source of our food, fiber, shelter, water, and oxygen. Sound land use is fundamental to preserving stable ecosystems, to controlling pollution, and to creating the political, social, and economic structure of our society.

Land reflects our history and traditions; the values we place on its use show a great deal about what we cherish from our past. A debate over land use is a debate that quickly turns to basic rights of citizens and basic powers of government that must be accommodated under our Constitution. Land is seen as a measure of the wealth, power, and status of an individual in our society. Our present use of land reflects how we have thought about these things. How we permit changes in its use indicates the direction of our thinking today and tomorrow.

In the early years of environmental awakening in the late 1960's, land use was seldom treated as an issue on a par with air and water pollution or solid waste management. But all that has changed. A recent survey found that officials in American cities identify "land use" and "growth" as the two most serious environmental problems.<sup>1</sup> Similar concern is reflected in increasing citizen involvement in deciding how land will be used, and manifested by the many local land use and land development referenda. Finally, this concern is expressed by the increasing number of local, state, and Federal laws and regulations which explicitly recognize the need for improved evaluation of and control over land use.

But the issue of proper land use is as complex as it is fundamental. An attempt to control pollution may stimulate land use changes that result in the creation of more pollution. Efforts to control growth and sprawl in one place may stimulate worse sprawl in another. An under-





The way we use our land reflects the values and traditions of our society.

standing of land use requires an understanding of law, economics, sociology, ecology, and many other disciplines.

This chapter attempts to deal with some of these complexities by compiling and analyzing current knowledge about a number of important land use issues. It is not an attempt to provide a comprehensive analysis of how all the pieces fit together, but neither does it approach the subject from a strictly legal, or economic, or social, or ecological viewpoint.

The subject of land use includes a broad range of topics—from redevelopment in cities to strip mine reclamation and wilderness preservation. We have decided to focus on those places where development and land use changes are most intense—the urban fringe of our cities and those rural areas being impacted by the boom in leisure homes and recreational developments. While this selection may seem to ignore other areas where land use problems exist, conditions there are different more in degree than in kind, and the same principles and interrelationships apply everywhere.

The chapter is organized into several sections. “Effects of Development” summarizes what is known about the environmental, economic, social, and natural resource implications of land development, documenting the importance of the land use issue. The next section analyzes some of the stimulants to land development, particularly those that result from actions by the Federal Government. There follows an analysis of some of the tools available to control the impacts of land use stimulants and to mitigate unfavorable impacts from land development. The conclusion discusses how all these perspectives and considerations fit together and suggests some changes that might improve the effectiveness of land use planning and control.

## **Effects of Development**

More and more people are recognizing that land use—good or bad—affects a wide spectrum of environmental, economic, social, and political concerns. In many cases these effects can be essentially irreversible. Until recently, very little information has been available on how significant the various effects are. The purpose of this section is to summarize some of the most recent information available on this question.

### **Development in Metropolitan Areas**

Urbanization and suburbanization have been the predominant characteristics of population shifts in the United States over the past two decades. Approximately 70 percent of all Americans live in metropolitan areas, and over half of those in the suburbs alone.<sup>2</sup> While the population of central cities increased 5 percent in the 1960's,



We are just now beginning to understand the process of urban development. These photos show what occurred in one area of the Philadelphia metropolitan area over the period of a few years in the 1950's.



that of the suburbs increased by 28 percent (see Table 1). This population shift resulted in a 31 percent increase in the number of dwelling units in suburban areas. As a result, 35 million acres of land is now in urbanized areas (see Table 2), and from 1960 to 1970 over 2,000 acres a day shifted from rural to urban use. Much of this development has taken place in an uncoordinated, scattered fashion which leaves many parcels of vacant land within urbanized areas.<sup>3</sup> Owing to this "leapfrogging" and the fact that the single family house has been the most common type of dwelling unit, the population density

**Table 1**

**U.S. Suburban Population and Housing, 1960 and 1970**

[In millions]

	1960	1970	Percent change <sup>1</sup>
Total metropolitan areas			
Population	120	139	17
Housing units	39	46	20
Central cities			
Population	61	64	5
Housing units	20	23	11
Suburbs			
Population	59	76	28
Housing units	18	24	31

<sup>1</sup> Percentages may be inconsistent with previous columns due to rounding.

Source: U.S. Bureau of the Census, *Census of Population and Housing: 1970, General Demographic Trends for Metropolitan Areas, 1960 to 1970*, Final Report (Washington: U.S. Government Printing Office, 1971), p. 1-33 and p. 15.

**Table 2**

**Selected Uses of U.S. Land, 1959 and 1969**

[In millions of acres]

	Special uses		
	1959	1969	Change
Urban areas <sup>1</sup>	27.2	34.6	7.3
Transportation areas <sup>2</sup>	24.7	26.0	1.3
Recreation and wildlife areas <sup>3</sup>	61.5	81.4	19.9
Public installations and facilities <sup>4</sup>	27.5	27.4	-.1
Farmsteads and farm roads	10.1	8.4	-1.7
<b>Total</b>	<b>151.0</b>	<b>177.8</b>	<b>26.8</b>

<sup>1</sup> Includes urbanized areas as defined by the Bureau of the Census, and other incorporated and unincorporated places of 1,000 or more population.

<sup>2</sup> Rural land in highway, road, and railroad rights-of-way, and airports.

<sup>3</sup> Federal and state parks and related recreation areas and Federal and state wildlife refuges.

<sup>4</sup> Federal land used for national defense and atomic energy purposes and state land in institutional sites and miscellaneous other uses.

Source: U.S. Department of Agriculture, Economic Research Service, *Major Uses of Land in the United States: Summary for 1969*, Agricultural Economics Report Number 247 (Washington: U.S. Government Printing Office, 1973).

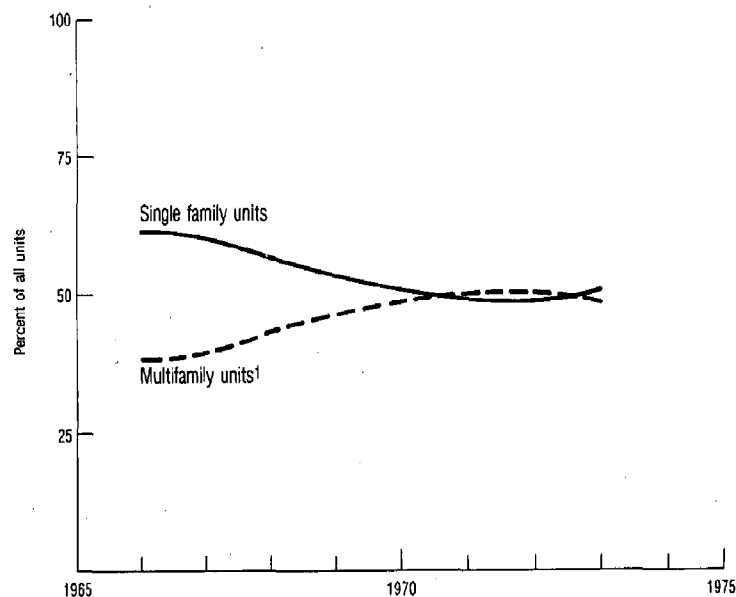
in our newly developed areas has typically been low. These and other land use trends were documented in our Fourth Annual Report.<sup>4</sup>

However, the most recent pattern of urbanization has not been as uniform as the averages might suggest. Subdivisions, more than ever, are likely to differ substantially from one another. One might be a traditional single family home subdivision, a second a high density development with townhouses and highrise apartments. As Figure 1 indicates, multifamily housing is becoming increasingly popular in the suburbs, first exceeding 50 percent of all suburban housing units constructed in the Nation in 1971.

While development patterns have been changing, local officials and the public have become more concerned about the economic, environmental, and social costs associated with the urbanization process. High taxes to pay for services to new residents, congestion, silted streams, polluted air, and the destruction of unprotected open space and natural features are all common characteristics of many of our suburban areas. More and more people are becoming concerned about these costs and are beginning to take a hard look at each new development proposal in their communities. At the same time, little information is available about the actual magnitude of these costs and how they vary among alternative development types.

This year the Council on Environmental Quality, in association with the Department of Housing and Urban Development and the Environmental Protection Agency, published a study, *The Costs of*

**Figure 1**  
**Housing Starts in Metropolitan Areas Outside Central Cities**



<sup>1</sup>Multifamily units have two or more dwelling units per building.

Source: U.S. Bureau of the Census, *Housing Authorized by Building Permits and Public Contracts*, Various Issues.



One important recent trend is the shift in new development from single family homes on individual lots to clustered and multi-family units surrounded by public open space. These photos show Levittown, Long Island, soon after it was built over 20 years ago, and a modern development of suburban townhouses.



**Table 3**

**Types of Costs Analyzed**

<b>Economic Costs (capital and operating)</b>	<b>Environmental Effects</b>
Residential (capital only)	Air Pollution
Open Space/Recreation	Water Pollution, Erosion
Schools	Noise
Streets and Roads	Vegetation and Wildlife
Utilities (sewer, water, storm drainage, gas, electric, telephone)	Visual Effects
Public Facilities and Services (police, fire, solid waste collection, library, health care, churches, general government)	Water and Energy Consumption
Land	<b>Personal Effects</b>
	Use of Discretionary Time
	Psychic Costs
	Travel Time
	Traffic Accidents
	Crime

*Sprawl*, which for the first time documents many of these costs and estimates how they vary among different patterns of land development.<sup>5</sup> The study, oriented toward new housing developments on the fringe of urban areas, considers a wide range of economic, environmental and social effects (see Table 3) associated with alternative development patterns on both the neighborhood and the community level. The results discussed below refer to two types of prototype communities, defined as follows:

"Low density sprawl"—A community made up of detached single family homes, 75 percent sited in a traditional grid pattern and the rest clustered. Neighborhoods are sited in a "leapfrog" pattern with little contiguity.

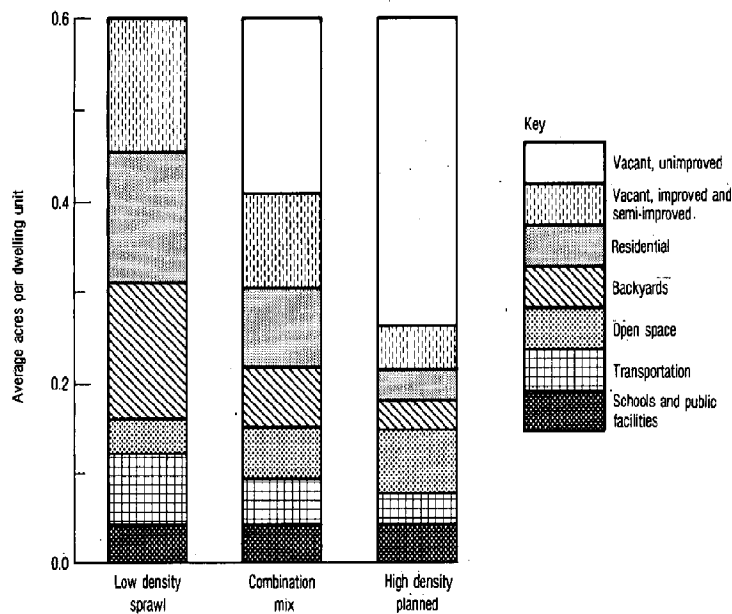
"High density planned"—A community composed of 40 percent 6-story highrise apartments, 30 percent walkup apartments, 20 percent townhouses, and 10 percent clustered single family homes. All of the dwelling units are clustered in contiguous neighborhoods, much in the pattern of a high density "new community."

In addition, an intermediate pattern including both traditional subdivisions and more clustered developments and in many suburban areas, entitled "combination mix," is included in the figures for illustrative purposes. The following sections summarize the results of the study.

**Land Use**—As indicated above, urbanization consumes significant amounts of land, much of it valuable for agriculture or wildlife. *The Costs of Sprawl* study shows that even with quarter-acre lots, the low density sprawl community may consume over one-half an acre per dwelling unit, more than twice as much land as the high density planned community. In the low density community, much of the land has been provided with such infrastructure as roads and sewers but has been left vacant. This category of land, "vacant, improved, and semi-improved," is an indication of the amount of leapfrogging and waste of land that occurs within a development pattern.

Figure 2

## Community Land Use



Source: Real Estate Research Corporation, *The Costs of Sprawl: Executive Summary* (Washington, D.C.: U.S. Government Printing Office, 1974), p.3. Referred to by title in subsequent figures.

Figure 2, shows the amount of land assumed to be used for different purposes in the different community types.

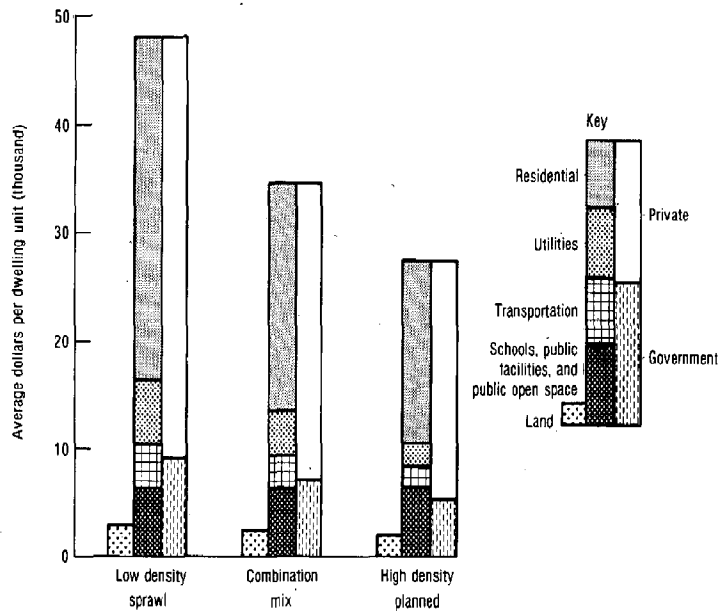
Although four times as much land is used for residential purposes in the low density sprawl community as in the high density planned community, only two-thirds as much is dedicated to public open space. (Note, however, that if backyards are included, the low density sprawl community has twice as much as public *and private* land dedicated to open space as the high density planned community.) The amount of land used for schools and other public buildings is the same in all communities. However, the high density community uses only about half as much land for transportation as the low density community.

**Economic Costs**—Any type of land development is expensive, but there is substantial evidence that the economic costs are strongly affected by development patterns. In terms of total public and private investment cost to occupants, taxpayers, and municipal governments, the *Costs of Sprawl* study found that the high density planned community costs 21 percent less than the combination mix community and 44 percent less than the low density sprawl community. The largest savings are in the cost of constructing residential dwellings, although important savings are also attributable to reduced



Figure 3

### Community Cost Analysis Capital Costs



Source: *The Costs of Sprawl, Executive Summary*, p.3.

costs for roads and utilities (about 55 percent lower in the high density than in the low density community).

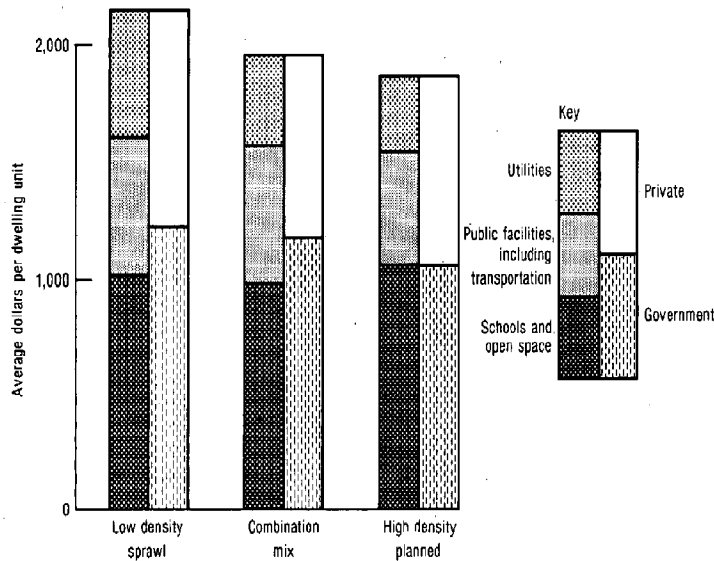
Figures 3 and 4 summarize the investment and operating costs for the three communities and show once again that sprawl is the most costly development pattern. The total investment costs do not include the cost of the land; that is indicated separately in Figure 3. Figure 3 also shows the difference in investment costs which are borne privately (initially by the developer) and publicly. Not only does the high density planned community cost less to construct, but a lower proportion of the development cost is likely to be borne by government.

The difference in operating and maintenance (O&M) costs (see Figure 4) is less noticeable than the difference in investment costs because O&M costs are related more closely to the population served than to the pattern of development. However, the higher density communities are again somewhat less costly in terms of the total operating and maintenance costs and in the costs paid by government.<sup>6</sup>

Many of the conclusions reached in this community level analysis are applicable to an entire metropolitan area. Planning and increased density can reduce costs. This is borne out by results of a well-known analysis of the economic implications of the new town of Columbia, Maryland, summarized in Figure 5. The analysis was concerned with alternative development patterns in Howard County, which

Figure 4

### Community Cost Analysis Annual Operating and Maintenance Costs



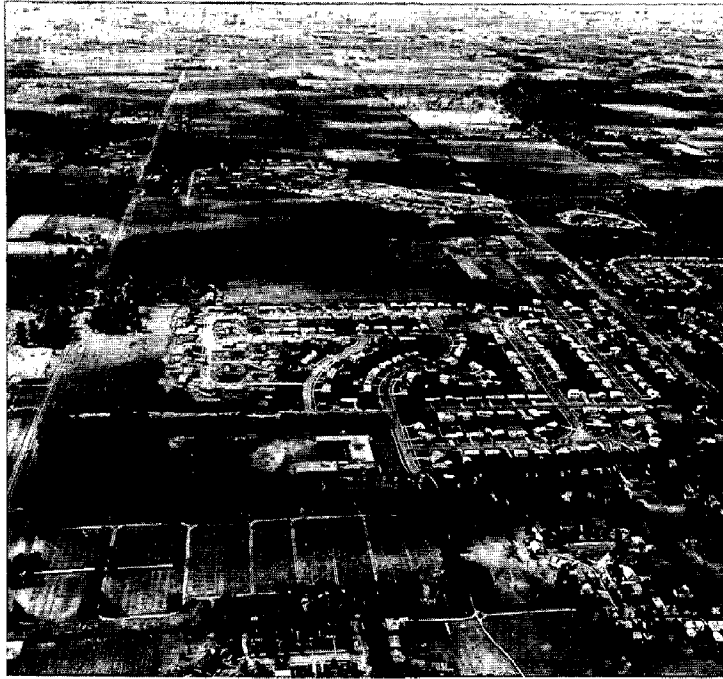
Source: *The Costs of Sprawl, Executive Summary*, p.4.

lies southwest of Baltimore. Three development patterns were analyzed: (1) random growth along the sprawl patterns which had already begun; (2) concentrated development in a new planned city; and (3) a new planned city in association with continued random growth. Continued sprawl was significantly more expensive than either of the alternatives.

A 1968 study of the San Francisco region focused on the other side of the urbanization process, namely the cost of preserving open space.<sup>7</sup> Using a housing location and land use model, the study investigated the implications in terms of settlement patterns and economic costs of preserving large tracts as open space, with all anticipated development occurring in unpreserved areas.

The results of the study indicated that such large-scale land preservation might well make sense economically as well as environmentally. The purchase price of open space actually exceeded by savings in public facility costs that derived from more compact development.<sup>8</sup>

These and other studies indicate that there may well be substantial cost savings involved in exerting more community control over the type of development and the pattern of urbanization.<sup>9</sup> The possibility of such savings has stimulated cities such as San Diego, California, and Boulder, Colorado, to seriously analyze their long-



The *Costs of Sprawl* study shows that leapfrog subdivision patterns such as that shown here are significantly more costly to communities than carefully planned extensions into undeveloped areas immediately adjacent to already urbanized areas.

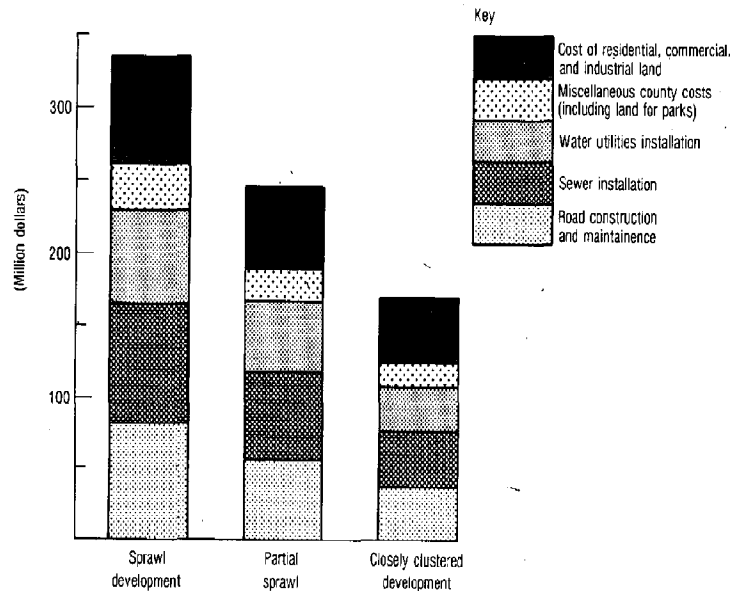
term growth options and the associated economic implications.<sup>10</sup> We can expect to see this trend continue.

**Environmental Costs**—Urbanization also generates substantial environmental costs. One of the Nation's most difficult problems, for instance, is the control of air pollution in our urban areas. *The Costs of Sprawl* analyzed air pollution from two major sources: automobiles and residential heating. Here again, the amount of air pollution is strongly affected by the development pattern. Higher density development requires less energy for heating, and high density and well-planned communities require considerably less automobile use. Overall, the high density planned community generates about 45 percent less air pollution than the low density sprawl community housing the same number of people (Figure 6). The simple clustering of houses alone can reduce the amount of air pollution from automobiles by 20 to 30 percent.<sup>11</sup>

On the metropolitan area scale, several recent studies have also indicated that air pollution can be affected by broader patterns of urbanization. There is, for instance, a strong relationship between automobile use—and therefore pollution emissions—and land use and urban form.<sup>12</sup> Urban form can also affect the way in which pollutants disperse, thus affecting air quality even beyond any impact on the quantity of pollutants emitted.<sup>13</sup>

Figure 5

# **Howard County, Maryland: Land and Public Service Costs for Alternative Development Patterns<sup>1</sup>**



<sup>1</sup>Cumulative costs from 1965 to 1985.

Source: Howard County Planning Commission, *Howard County: 1985 (1987)*.

With respect to the problem of water pollution, several studies have documented adverse impacts on water quality from land development, quite aside from the generation of wastewater by new residential or industrial development. Urbanization, for example, results in substantially increased amounts of stormwater runoff, which leads to high pollution loads and erosion of exposed soil.

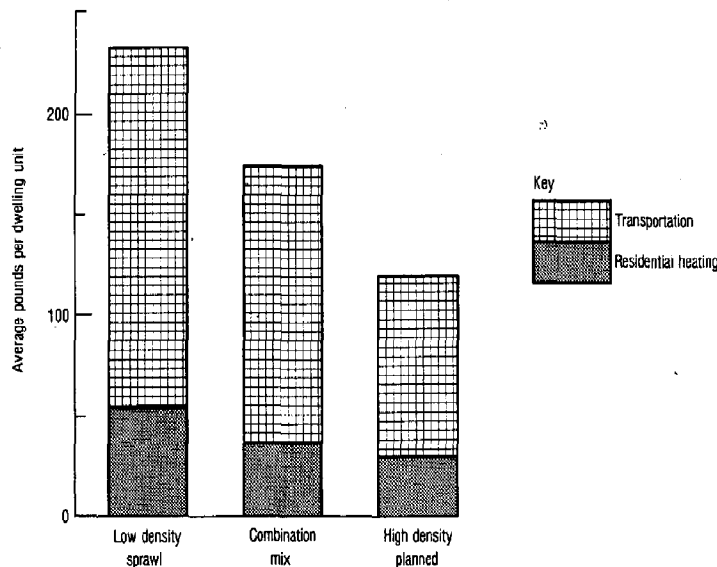
A recent study undertaken for the Council on Environmental Quality<sup>14</sup> indicates that stormwater runoff is a major source of water pollution in urban areas. Comparing stormwater runoff with wastes processed by municipal sewage treatment plants, runoff becomes the major source of pollution in most cities as soon as secondary treatment (85 percent BOD removal) of municipal wastes is achieved. It will also be the major source of settleable solids, pathogens, and bacteria and a major contributor of such toxic pollutants as lead and mercury.

Figure 7 shows water pollutants generated by different community development patterns. The type of housing has no effect on the amount of sanitary sewage generated, since this is a function of population.<sup>15</sup> More pavement and less vegetation result in increased stormwater runoff, and soil erosion will occur.

Air and water pollution are not the only environmental problems associated with urbanization. Noise caused primarily by air and

Figure 6

### Community Cost Analysis Annual Air Pollution Emissions



Source: *The Costs of Sprawl: Executive Summary*, p.4.

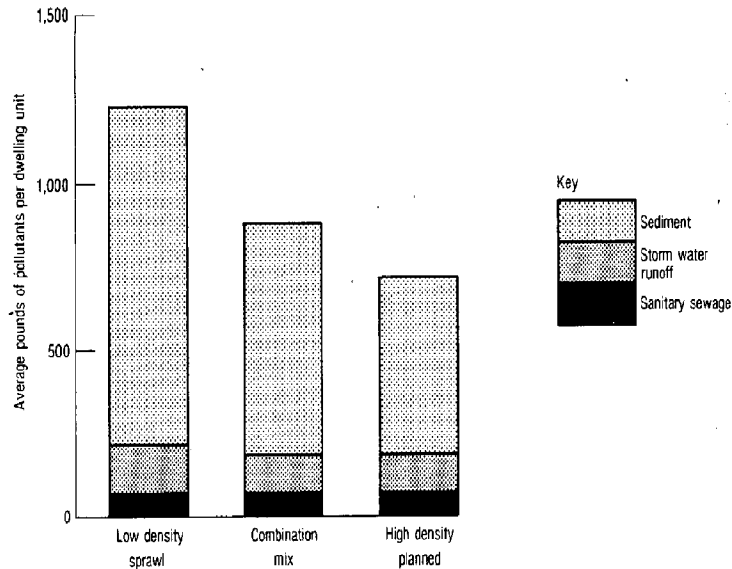
highway transportation is difficult to abate, although its impacts can be reduced by providing for compatible land uses.<sup>16</sup> Proper planning is also the key to conserving open space and preserving unique natural areas as well as creating visually attractive development.

Higher densities provide the planner with greater opportunity to mitigate many of the environmental costs associated with development. However, increased density also concentrates noise-generating activities and puts added demands on the designer to create aesthetically pleasing environments. It is also true that higher densities, although generating less air and water pollution per dwelling unit, concentrate these emissions in a smaller area. This results in a somewhat higher amount of pollution generated for a given developed area.

Similar environmental effects are related to the urbanization pattern for the broader metropolitan area. A general compactness of development results in lower pollution levels. One recent study compared U.S. urban areas which tended to have a high orientation towards the central city (typically with high core city densities and a radial transportation network) with other more dispersed U.S. urban areas.<sup>17</sup> The former have more intensive use of land overall, lower percentages of land devoted to residential and commercial development, more open space, and better opportunities

Figure 7

### Community Cost Analysis Annual Water Pollution Generation



Source: *The Costs of Sprawl: Executive Summary*, p.5.

to abate air and water pollution. The study goes on to conclude, "All trends point in the same direction: increasing size, increasing dispersion, and increasing automobile usage are producing the very urban forms and land use patterns that will increase rather than decrease environmental pollution."<sup>18</sup>

**Energy Costs**—Urbanization in its various forms can also affect the demands placed on energy and other scarce natural resources. Over half of our total energy consumption occurs in the transportation and residential sectors, both of which are significantly affected by housing types and development patterns. The interrelationships between energy consumption and development begin at the design and construction of the individual building and continue through the whole pattern of metropolitan area development.

The amount of energy consumed by stoves, appliances, and lighting is essentially constant among housing types, any variation being related to different family sizes or to different floor areas. However, the major source of energy consumption is in cooling and heating the house, and this is affected by the type of dwelling unit. Highrise apartments are estimated to consume about 44 percent less energy per dwelling unit for all "residential" purposes than detached single family houses. (See Figure 8.)

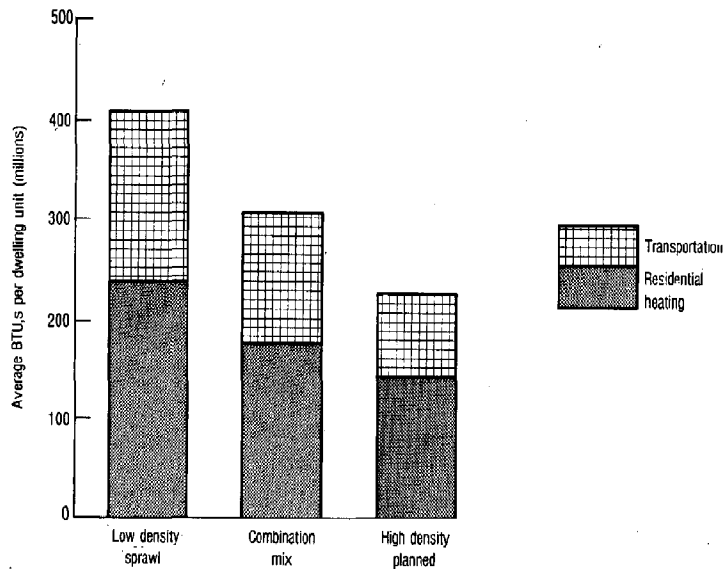


Poor planning and inadequate controls on urban fringe development can be costly to the community and to the natural environment. The photos show the effects of erosion, runoff, and sedimentation in Nebraska and Maryland.



Figure 8

### Community Cost Analysis Annual Energy Consumption



Source: *The Costs of Sprawl: Executive Summary*, p.5.

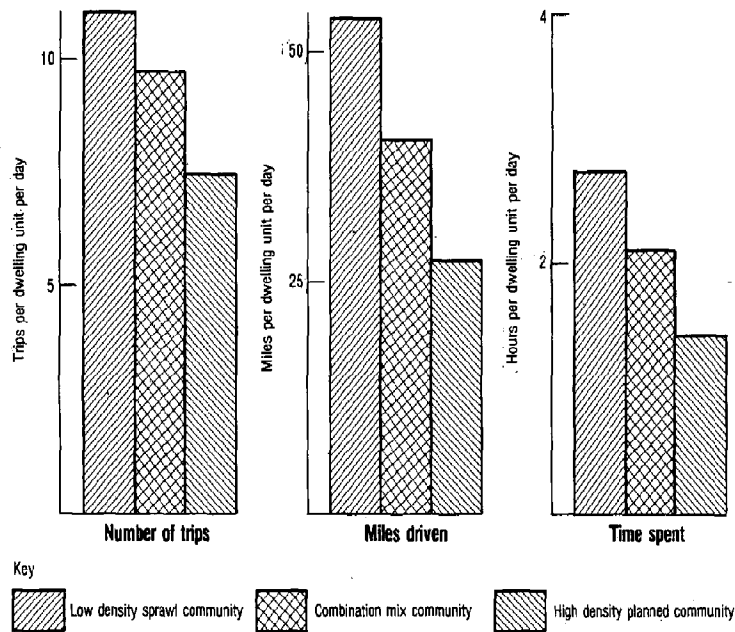
The community development pattern can also have significant impacts on energy consumption through affecting how much automobiles are used. Results from *The Costs of Sprawl* and other studies indicate that better planning, clustering, and higher density can all significantly reduce reliance on auto travel in terms of number of trips taken, number of miles driven, and amount of time spent in a car, as indicated in Figure 9.<sup>19</sup> These relationships hold true even when the amount of energy consumed in commuting to work is excluded, since commuting may not be directly affected by the development pattern of the residential community. The resulting energy savings are indicated in Figure 8. Increased density also reduces the amount of transportation required for the delivery of urban goods and services, as indicated in Figure 10.

There are additional, and perhaps even more important, savings in auto use (and therefore energy consumption) related to the pattern of urbanization at the metropolitan area level. Certain metropolitan configurations may result in reduced commuting and shorter automobile trips for shopping, recreational activities, etc.<sup>20</sup> and increase the viability of public transit. Even on the neighborhood level, transit can more efficiently service better-planned, clustered developments than those that are diffuse and random. For the same reason, the clustering of employment becomes important. Present urban growth patterns work against the use of public transit because both



**Figure 9**

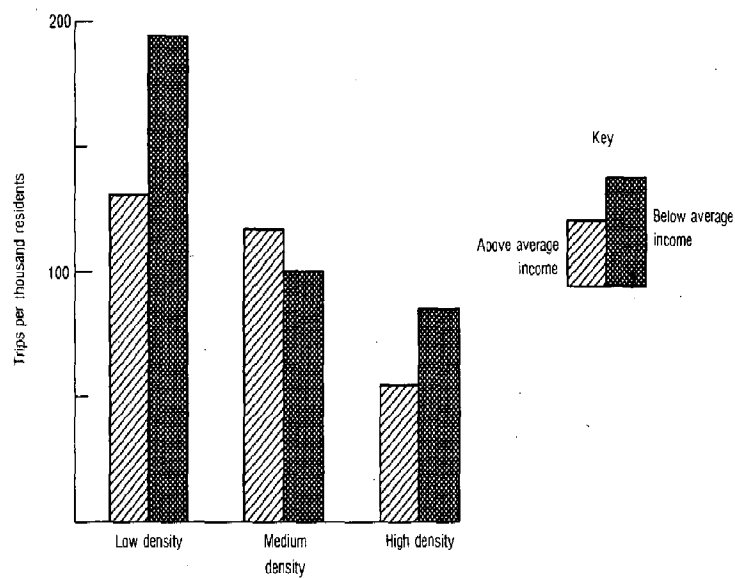
### Automobile Use Related to Community Development Pattern



Source: *The Costs of Sprawl: Detailed Cost Analysis*, pp. 150, 151.

**Figure 10**

### Use of Trucks Related to Residential Density



Source: Wilbur Smith and Associates, *Motor Trucks and the Metropolis* (1969), based on data from three U.S. cities.

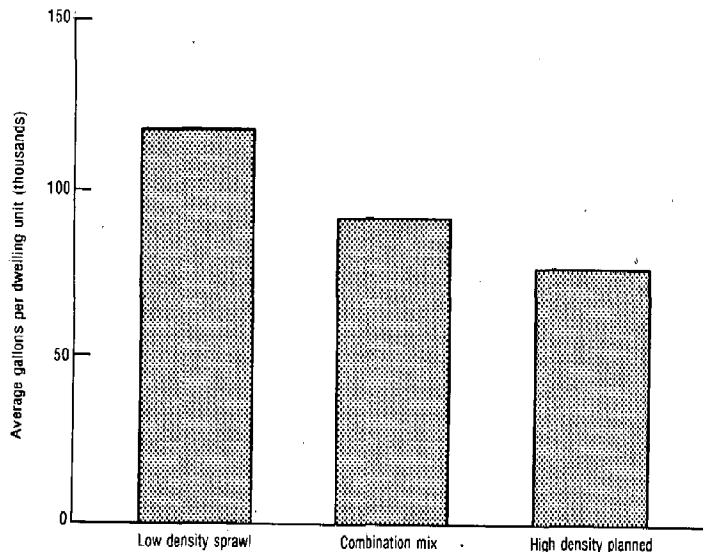
residential areas and employment centers are dispersed throughout the suburbs and on the urban fringe, where they are not easily served.

**Water Use**—Water is another valuable natural resource whose use may be significantly affected by urbanization. In some parts of the country, excessive urbanization in water-short areas (e.g., Southern California) has required substantial importation of water supplies. The amount of water consumed in cooking, drinking, and the like is not affected by either planning or density. However, water for lawns is affected by both.<sup>21</sup> For this reason, clustering alone can save 6 percent of total water consumption and, as indicated in Figure 11, overall high density planned development requires only 65 percent as much water as the low density sprawl development.

**Social Costs**—Many personal and social considerations are associated with patterns of urbanization, quite aside from the economic and environmental costs already discussed. These social effects are difficult to estimate. They are also strongly affected by the particular quality of planning and dwelling unit design. As noted earlier, good planning and clustering can reduce travel times by conveniently locating commercial and public facilities in relation to residential areas. Apartments and other high density housing require less time

Figure 11

### Community Cost Analysis Annual Water Consumption



Source: *The Costs of Sprawl: Executive Summary*, p.6.

for home maintenance than single family homes.<sup>22</sup> Good planning can also reduce the number of traffic accidents.<sup>23</sup>

The relationship of other social effects to housing types or development patterns is less clear. Denser developments, particularly those with a high proportion of rental units, seem to be characterized by less friendliness among neighbors than less dense forms.<sup>24</sup> People also seem to prefer to own their own land and to have private space surrounding their home. Furthermore, there is some indication that denser developments have higher crime rates, although it is impossible to separate the effects of the physical housing on these statistics from the numerous socioeconomic factors affecting crime, and the question of design from the question of density.<sup>25</sup>

Opinion surveys have indicated that Americans prefer to live in a rural or semirural setting, but many also prefer to have ready access to the services and other amenities associated with urban areas.<sup>26</sup> Given the size of most urban areas, these preferences are clearly incompatible. However, the provision of compact neighborhoods and communities interspersed with readily accessible open space throughout the urban area may provide an acceptable compromise for many. Present trends in new housing indicate a growing willingness to live in such an environment.

Other social issues which must be addressed in analyzing the effects of urbanization include employment opportunities, racial distribution, low income housing, and cultural and educational programs. Many aspects of traditional urban growth patterns in the United States appear to be working against articulated goals in these areas. Would other patterns be more compatible with these goals? Are these issues best addressed on the regional or on the local level? If the latter, how can we insure that the broader goals of society will be satisfied by local decisions?

We need to learn a great deal more about the relationships between land use patterns and social goals. Is this because the pattern of land use reflects the general state of our society, or is it because the way we use our land helps determine that state? There is increasing concern that the latter may be true.

**Balancing Costs**—The foregoing analyses show that different types and patterns of urbanization can have significantly different impacts on economic costs, environmental costs, natural resource consumption, and personal costs. *The Costs of Sprawl* study indicates that on neighborhood and community levels, for a given number of dwelling units, many of these costs can be reduced by better planning and increased density.<sup>27</sup> However, it should be emphasized that these results should not be interpreted as recommending one type of development over another; too many costs and benefits have not been included, among them those associated with personal preferences and those related to the revenues generated by different development types.<sup>28</sup> Nor should the results be considered to be directly applicable

to any specific development, either existing or proposed. The features of a particular site, community, or region need to be addressed individually.

Much still remains to be learned about these costs. In the meantime, development proposals are being made and approved. The urbanization process is continuing. Implicitly tradeoffs are being made among the various types of costs which have been discussed in this section. While there is no general methodology available for rigorously assessing these complex tradeoffs—for making an integrated analysis of economic costs, environmental costs, social effects, energy consumption, and personal preferences—progress is being made through studies such as *The Costs of Sprawl*.

### **Leisure Homes and Recreational Development**

As incomes and leisure time have increased over recent years, there has been a growing demand for recreational facilities in rural areas. Out of this demand have come the phenomena of leisure home and recreational lot developments—high density developments in rural settings. These phenomena create the same types of costs as the forms of urbanization described above. With recreational developments, in fact, the long-term costs of development to both property owners and the public may be greater than in most urban areas, and there may be more urgent need for effective controls.

Leisure home developments, of course, are not a new phenomenon. The Florida east coast, Cape Cod, Estes Park, and Lake Tahoe have been the sites of second home construction for many decades. Originally, these homes were owned almost exclusively by wealthier Americans, and houses were often expensive and built on large sites.

The more recent boom in second homes and recreational lots has involved a far broader stratum of society. Increased affluence has given more Americans the opportunity and desire to obtain such properties for themselves. This, combined with a widespread belief in the profitability of investment in land and reinforced by favorable income tax laws, has provided the ingredients for the recreational land and leisure home boom. The lots are smaller, the houses are more spare than traditional summer homes, and demand is many times greater than it was even a few years ago. Today approximately 3.4 million American families own second homes. Including owners of recreational lots, a total of 5 to 7 million American families are estimated to own recreational properties of some kind.<sup>29</sup>

Table 4 presents a number of characteristics of households owning leisure homes. It shows clearly that these homes are no longer the province of the very wealthy. They are owned by families somewhat wealthier and somewhat older than the average but still comprising essentially a cross section of society. (Corresponding infor-

Table 4

### Selected Characteristics of U.S. Leisure Home Owners and Total U.S. Population

Characteristic	Percent of all households	Percent of leisure home-owners	Leisure home-owners as a percent of total households
<b>Annual family income</b>			
Less than \$5,000	29.4	18.8	2.9
\$5,000 to \$9,999	30.9	24.5	3.6
\$10,000 to \$14,999	22.6	23.7	4.7
\$15,000 to \$24,999	13.2	20.9	7.2
\$25,000 or more	3.9	12.1	14.1
<b>Value of primary home</b>			
Less than \$15,000	41.3	31.3	3.4
\$15,000 to \$19,999	20.2	17.8	4.0
\$20,000 to \$24,999	14.7	13.5	4.1
\$25,000 to \$34,999	14.1	18.1	5.8
\$35,000 to \$49,999	6.5	10.7	7.4
\$50,000 or more	3.2	8.6	12.2
<b>Tenure of primary home</b>			
Owned	59.3	73.1	5.6
Rented	35.4	22.7	2.9
Co-op or condominium	0.5	1.1	11.0
Other	4.8	3.1	2.9
<b>Primary residence</b>			
Inside SMSAs	69.1	68.0	4.4
Central city	34.1	31.0	4.1
Urban balance	24.7	26.2	4.8
Remainder	10.4	10.8	4.7
Outside SMSAs	30.9	32.0	4.7
Urban	75.1	75.2	4.5
Rural	24.9	24.8	4.5
Rural-nonfarm	20.0	20.3	4.6
Rural-farm	4.9	4.5	4.1
Places 10,000 to 50,000	20.4	21.9	4.8
<b>Age of head of household</b>			
Less than 25 years	7.1	4.0	2.5
25 to 34 years	21.0	10.0	2.1
35 to 44 years	21.2	18.5	3.9
45 to 54 years	20.1	25.9	5.8
55 to 64 years	17.5	22.7	5.9
65 years or older	13.1	18.9	6.5
<b>Family size</b>			
1 person	17.6	13.3	3.4
2 persons	29.6	35.0	5.3
3 persons	17.2	18.1	4.7
4 or 5 persons	25.2	24.8	4.4
6 or more persons	10.4	8.8	3.8

Source: Richard L. Ragatz Associates, *Recreational Properties: An Analysis of the Markets for Privately Owned Recreational Lots and Leisure Homes* (Springfield, Va.: National Technical Information Service, 1974).

mation about owners of recreational lots is not available, although there is evidence that they tend to be less affluent.)

The material on leisure homes and other recreational properties was obtained from a study on leisure homes undertaken by the American Society of Planning Officials for the Council on Environmental Quality in association with the Department of Housing and

Urban Development and the Appalachian Regional Commission.<sup>30</sup> The study indicates the importance of distinguishing between two separate aspects of the phenomenon: (1) the purchase of recreational lots, which are usually part of large subdivisions of plotted land where few of the lots may ever be developed; and (2) the ownership of leisure homes, which may be built by the owner in a subdivision or on a separate site, or built in large numbers by a developer.

Recreation lot sales often result from mail solicitation or telephone calls, and many buyers sign sales contracts without ever seeing the land. The Interstate Land Sales Act requires most lot sales in interstate commerce to be registered with the Office of Interstate Land Sales at the Department of Housing and Urban Development. Table 5, showing the regional breakdown of projects so registered, and Table 6, showing leisure homes by region, indicate a heavy concentration of lots in the South and in the West. Six states—Florida, Texas, California, New Mexico, Arizona, and Colorado—contain over 80 percent of the acreage in registered recreational lot sales projects.

These figures demonstrate that recreational land and leisure home developments have become very important in the United States. With them have come a host of problems. Some problems are consumer-related, such as fraudulent advertising and high pressure sales tactics used to take advantage of naïve buyers. Attempts are being made to curb these unethical practices through implementation of

**Table 5**

**Recreational Properties Registered with the Office of Interstate Land Sales**

	Acres in projects		Lots in projects	
	Total	Per 100 acres of region's area	Total	Per 100 families in region
<b>United States</b>	<b>7,146,229</b>	<b>0.5</b>	<b>3,375,821</b>	<b>5.3</b>
<b>Northeast</b>	<b>231,555</b>	<b>0.2</b>	<b>133,671</b>	<b>0.9</b>
New England	77,251	0.2	36,766	1.0
Middle Atlantic	154,304	0.2	96,905	0.8
<b>North Central</b>	<b>279,214</b>	<b>0.1</b>	<b>224,886</b>	<b>1.3</b>
East North Central	168,634	0.1	132,389	1.1
West North Central	110,580	0.04	92,497	1.8
<b>South</b>	<b>3,370,140</b>	<b>1.0</b>	<b>2,037,908</b>	<b>10.6</b>
South Atlantic	2,243,119	1.4	1,113,146	11.8
East South Central	127,291	0.1	123,022	3.2
West South Central	999,730	0.4	801,740	13.5
<b>West</b>	<b>3,265,320</b>	<b>0.8</b>	<b>979,356</b>	<b>8.8</b>
Mountain	2,489,408	0.9	750,270	29.8
Pacific	775,912	0.6	229,086	2.6

Source: Richard L. Ragatz Associates, *supra* Table 4, pp. 84, 87, 500.

Table 6

**U.S. Leisure Homes by Region, 1970**

Region	Total housing units	Leisure homes <sup>1</sup>	Percent of all housing units in region	Percent of all leisure homes in United States
<b>United States</b>	<b>68,418,094</b>	<b>2,143,434</b>	<b>3.1</b>	<b>100.0</b>
<b>Northeast</b>	<b>16,641,954</b>	<b>556,790</b>	<b>3.4</b>	<b>26.0</b>
New England	4,031,531	221,806	5.5	10.4
Middle Atlantic	12,610,423	334,984	2.7	15.6
<b>North Central</b>	<b>19,018,773</b>	<b>667,148</b>	<b>3.5</b>	<b>31.1</b>
East North Central	13,323,755	421,225	3.2	19.7
West North Central	5,695,018	245,923	4.3	11.5
<b>South</b>	<b>20,730,508</b>	<b>631,242</b>	<b>3.0</b>	<b>29.5</b>
South Atlantic	9,970,059	287,374	2.9	13.4
East South Central	4,184,006	127,039	3.0	5.9
West South Central	6,576,443	216,829	3.3	10.1
<b>West</b>	<b>12,026,859</b>	<b>288,254</b>	<b>2.4</b>	<b>13.5</b>
Mountain	2,762,783	115,901	4.2	5.4
Pacific	9,264,076	172,353	1.9	8.0

<sup>1</sup> "Leisure Homes" are enumerated by combining the Bureau of the Census categories "Rural Seasonal Vacant" and "Other Rural Vacant." This combination basically includes housing units which are intended for occupancy during only certain seasons of the year.

Source: Richard L. Ragatz Associates, *supra* Table 4, p. 91.

the Interstate Land Sales Act at the Federal level and through similar laws in some states.

Other problems arise because such development brings what amounts to instant urbanization to rural communities—communities where local governments have little experience with the impacts of large-scale development and few land use controls or regulatory bodies to deal with them.

Many leisure homes are being built in subdivisions that differ little in appearance from typical middle income suburban developments. Yet they are often built to much lower standards. If the home remains a summer weekend retreat, this may not create serious problems. But experience shows that seasonal homes are often converted into year-round homes and leisure home developments into permanent communities. This process may take a few years or decades, depending on the proximity of the homes to urban employment areas. In the mountains of northern Virginia, some homes in recreational subdivisions are being occupied as first homes from the time they are built, with their occupants commuting two hours or more to jobs on the fringes of Washington and Baltimore.<sup>31</sup> School buses can be seen serving these developments soon after the first houses go up. In short, the leisure home subdivision of today is likely to become the permanent settlement or suburb of tomorrow and should be viewed as an early form of urbanization.

This being true, it is necessary for a community to consider very carefully what development standards are appropriate for these subdivisions, particularly in communities with little growth experience, where officials are not equipped to cope with rapid growth and change. Many rural communities initially welcome second home developments in the expectation that they will provide property tax revenue and income for the local economy. They usually do, but they also create costs. Local governments often end up bearing the cost of increased demands the developments place on such public services as fire and police protection, road maintenance, water supply, solid waste disposal, and sewers. As long as recreational subdivisions remain seasonally occupied, these costs are likely to be lower than the property tax revenues generated by the development. However, as soon as residences become permanent, costs to the host communities will rise rapidly as schools, medical facilities, and other public services are required.

The eventual public costs will be particularly high if the development was originally built to low standards. Septic fields may have to be replaced by a sewer system; poorly constructed roads may have to be rebuilt. Replacing such facilities is very expensive, often more expensive than building adequate facilities at the time of the initial development.

Not only will the costs of low quality development be higher to the government, but they will also be higher to the homeowners. Inadequate insulation, poor drainage, and insufficient heating capacity may be small problems during summer weekends, but they become major concerns at other times of the year.

The developments may also create serious environmental problems, although many of these can be avoided by careful design and review. Inadequate septic systems can pollute streams or aquifers and thus cause public health problems. Serious erosion can clog streams with silt. Demand for water can overtax local supplies. These environmental problems can cause particular difficulty because the most desirable sites for recreational developments are often in fragile environments unsuitable for housing development, such as steep mountain slopes, coastal dunes, or marshes.

In addition to such environmental problems, the developments also present potential conflicts with public recreation goals. The crowding of seasonal homes along the coast or around the shore of a lake often denies access to those resources for public recreation. And developing land adjacent to national parks and forests guarantees the owners that they will always have ready access to natural areas, but it prohibits the later expansion of public land holdings for the benefit of the general public.

Many of these problems are very similar to those faced in urban areas. The CEQ's study of second homes, mentioned above, will



attempt to help rural communities in dealing with proposed developments. One specific product of the study is an impact evaluation handbook for local officials to use in assessing the costs and benefits of proposed recreation developments.

### **How, Where, and When?**

The discussion of the urbanization process at work in the United States indicates that we are just beginning to understand the significant environmental, economic, natural resource, and social implications of development patterns in our cities and outlying areas. While we are nowhere near developing a truly accurate methodology to foretell these implications in a given case, we have learned that some long-held beliefs about the development process need to be seriously questioned.

In part this is due to changing times and new information available about our society. It is striking to realize, for example, that more multifamily housing units than single family housing units have been built in our suburbs since 1971. And with the recent boom in recreational lots and seasonal homes has come the participation of a much broader spectrum of society than could have been anticipated, so that today such landowners are a virtual cross section of our whole society. Both of these trends are very important to the way our land will be used in coming years.

In part, the need to question earlier assumptions rests on a growing realization that some of these assumptions were wrong, or, at best, serious oversimplifications. It can no longer be assumed that single family homes are the cheapest and most efficient development pattern for localities on the urban fringe. The savings in public costs from higher density development, and the payoff from planning programs which set aside open space and provide public facilities as part of a rational plan established for the benefit of the whole community, are becoming clearer and clearer. Nor can the savings in energy consumption and the ability to reduce pollution levels through improving the pattern of urbanization be overlooked. These issues are equally important in areas impacted by second homes and recreational lot sales. The long-term economic and environmental impacts on the community are becoming increasingly difficult to brush aside in the rush to invite developers with their promise of new tax revenues and economic growth.

None of this should lead us to conclude that growth is wrong or that land development should not occur. On the contrary, the market will demand new housing and new recreation opportunities for a population that, even at current low birth rates, will continue to expand (for at least the next few decades) and become more affluent. The issue is not growth or no growth. Rather, it is how and where and under what conditions growth should occur. The sections which

follow deal with this issue, first by identifying major stimulants to development and then by discussing growth control mechanisms available to communities.

## **Development Stimulants**

What causes development to occur in a particular location, in a particular pattern, and at a particular time? In the past these would have been considered academic questions. The answers would be interesting, perhaps, but of little importance to public policy. We accepted development as something that occurred naturally. The major concerns of government agencies were to see that development was well nourished with infrastructure and that it did not upset the fiscal viability of the community. This is no longer the case. As we become more concerned about where, how, and when, we become increasingly interested in the question of why.

There are, of course, a very large number of factors that interact to influence development decisions. Many of these factors—for instance, the state of the economy and the rate of population growth—cannot be significantly influenced by governments at the local level where most control over land use is exerted. But we are beginning to realize that it is possible to identify major stimulants to growth which can be controlled, and we are beginning to learn how to predict some consequences of these stimulants before they occur. While much work remains to be done in improving these predictive techniques, there is increasing interest in taking a hard look at the way such major decisions stimulate surrounding development of all kinds.

For example, the development of Cape Canaveral stimulated tremendous growth over a short period of time in Brevard County, Florida during the 1960's.<sup>32</sup> Likewise, the location of the Atomic Energy Commission and the National Bureau of Standards along an interstate highway north of Washington, D.C. has stimulated development along a 60-mile corridor leading to Frederick, Maryland. Defense expenditures have strongly affected the growth of cities such as Seattle as well as smaller communities surrounding military bases.<sup>33</sup> National parks have stimulated intense commercial development along their access highways.<sup>34</sup>

Even within already developed areas, government actions can affect the pattern of development. Some impacts of urban renewal projects on the viability of communities have been analyzed widely.<sup>35</sup> On a smaller scale, the location of the Kennedy Library near Harvard Square in Cambridge, Massachusetts, raises similar issues. The library facilities are expected to attract thousands of visitors a day to an already highly congested area. Traffic control and parking are big issues, but equally important to residents are the changes in land use

that will occur in the Harvard Square area as older shops and stores give way to fast-food chains and souvenir stands.

The importance of such actions, at least in the present discussion, lies not in their direct effects upon society and the environment but in the way they influence decisions in the private sector. Because it will attract many visitors, the Kennedy Library will increase the relative profitability of tourist and quick-food shops, forcing out stores that serve the local populace. By reducing transportation costs, a new highway may induce private industries to locate in the suburbs rather than the central city. Locating government offices and private industries on the urban fringe increases the profitability of converting the nearby land into housing developments. In most cases, the private sector undertakes the development which follows, and it is the private sector which decides where, how, and when this development will occur. But the original governmental action, by significantly affecting the relative profitability of alternatives, has a primary role in stimulating these private sector decisions.

It is impossible, of course, to analyze here all stimulants to development, for such a discussion would have to cover most activities in both the private and public sectors. This section is limited to governmental actions because they are the actions that can be most directly controlled by the public. There is particular emphasis on actions by the Federal Government. After beginning with a brief analysis of Federal tax laws, the section analyzes another relatively new set of Federal regulations—those directed at reducing air and water pollution. This is followed by a discussion of the effects of different infrastructure investments—sewers, highways, and mass transit. Finally there is an analysis of the potential impacts of new energy facilities—stimulants of great importance in coming decades.

## **Federal Taxes**

Federal taxes are widely recognized as having substantial impacts upon development decisions and land use, primarily because they treat some types of development more favorably than others.<sup>36</sup> Most widely known is the alleged preference in the income tax provisions for homeowners over renters. By allowing the homeowner to deduct interest payments and property taxes from his income, the Federal tax code may inadvertently provide an incentive favoring the construction of expensive, low density, detached single family homes.<sup>37</sup> The incentive is stronger for more expensive housing because high income families obtain more tax relief from deductions than low income families. It favors single family homes because they are generally preferred by homeowners, being viewed as more private and easier to protect and maintain than higher density forms of housing. The owner of rental property, in contrast, usually prefers multifamily structures because they are easier to supervise and main-

tain. Of course, the owner of rental property can deduct expenses and depreciation, and these tax advantages may be passed on in the form of lower rents.<sup>38</sup> Nevertheless, to the extent that homeownership has been encouraged, low density housing patterns have been encouraged. More recently, there has been a rapid trend toward obtaining many of these same tax breaks for higher density housing by creating owner-occupied dwelling units through cooperatives or condominiums. Condominiums now account for over one-third of all housing units under construction in many urban areas.<sup>39</sup>

Tax provisions on depreciation affect different types of property differently, because there are different depreciation rates for different types of investment. For investments in residential structures, the depreciation schedules favor investment in new construction over rehabilitation of older housing by allowing the former to be depreciated more rapidly.<sup>40</sup> The rules also encourage a rapid turnover of ownership of buildings because the major advantage of depreciation for tax purposes occurs during the early years of ownership, and accelerated depreciation (although at a lower rate than with a new building) begins anew with each subsequent owner.<sup>41</sup> Since the profit in a building can result from the depreciation deductions as much as from the income it generates, there is a disincentive to maintain the building in expectation of long-run income-producing potential.<sup>42</sup> The incentive is to build, depreciate, sell, and then build again. This creates an inducement to continue constructing new buildings where land is cheap—the land cannot be depreciated—while allowing older buildings to decay.

The Environmental Protection Tax Act, included in President Nixon's environmental legislative program for the past 2 years, would partially remove the discrimination in depreciation rates by providing the same rates for older buildings that have undergone substantial rehabilitation as for new buildings.<sup>43</sup> Even more favorable treatment would be given to older buildings registered as historically or architecturally valuable.

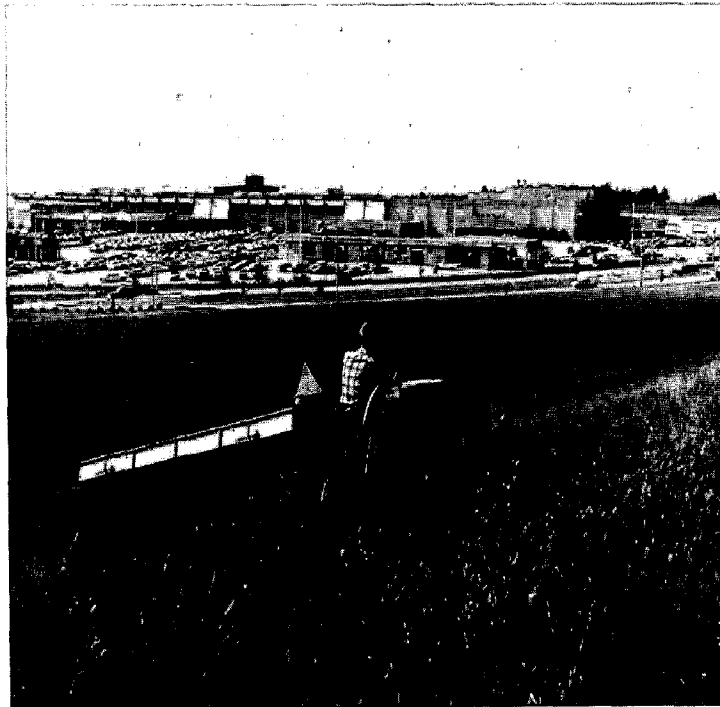
The fact that profits from buying and selling land are treated as capital gains and taxed at a lower rate than other types of income serves as a stimulus for land speculation. Some observers identify this capital gains treatment as perhaps the most important Federal tax provision in stimulating the conversion of open rural land to development.<sup>44</sup>

Tax provisions can also take some of the responsibility for the boom in the construction of leisure homes.<sup>45</sup> Although the regulations have been significantly tightened in recent years to remove many of the earlier incentives, it was formerly true that the owner of a leisure home, by renting the house out while he was not using it, could claim it as an income-producing property and therefore deduct, for tax purposes, many of the costs of owning the house (including accelerated depreciation) even beyond any rental income he re-

ceived.<sup>46</sup> These provisions reduced the real cost of owning second homes and thereby stimulated their construction.

Among other Federal tax provisions affecting land use is a provision that eliminates capital gains taxes on any appreciation in the value of the property occurring before an owner's death when that property is transferred to his heirs.<sup>47</sup> This provision establishes a strong incentive for families owning farmland that has increased substantially in value (usually at the urban fringe) to hold onto the land until the original owner dies. If the heirs then sell the land, they avoid capital gains taxes on its substantially increased value, a savings which would have been impossible for the original owner. This creates an incentive to keep land undeveloped longer than might otherwise be desirable to accommodate and direct urbanization best; it may be one major factor promoting leapfrog development patterns.<sup>48</sup>

Another Federal estate tax provision which may affect land use patterns requires farmland, woodland, and open space to be valued at full market value in determining the value of an estate.<sup>49</sup> Especially in the case of a farmer, whose main assets may consist of the land, the relatively high value placed on the farm property may force his heirs to sell it off to pay the estate taxes, even though they may want to keep the land in agricultural production.<sup>50</sup>



Some Federal tax policies encourage the retention of farmland, while others encourage its sale to developers. The result interferes with the normal incentives at work in the land market in urban areas and may be one cause of leapfrog development patterns.

This brief review of some provisions of the Federal tax code indicates that it may be a powerful force in determining the pattern of metropolitan and rural development.<sup>51</sup> It is reasonably safe to assume that most of these provisions have had development impacts that were not anticipated at their enactment. They were adopted for other reasons, such as stimulating the construction of residential units, or stimulating investment in general—valid goals which the provisions help to attain. However, some of the unintended side effects may not be desirable. It is important to identify these side effects and to determine whether they can be eliminated or mitigated without damaging the effectiveness of the provisions in accomplishing other intended purposes.

### **Pollution Regulations**

A number of environmental protection laws enacted in recent years provide another important example of Federal legislation and regulations which, adopted to attain desirable goals, may have significant inadvertent effects on land use. This analysis focuses on the two most important of these laws—the Clean Air Act Amendments of 1970<sup>52</sup> and the Federal Water Pollution Control Act Amendments of 1972.<sup>53</sup>

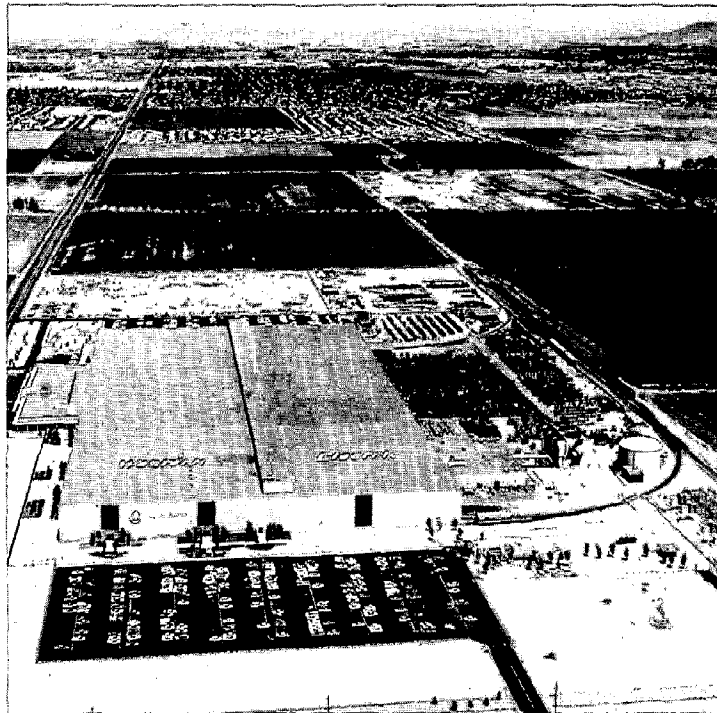
It is too early to assess with high accuracy what the land use impacts of various regulations under these laws may be or the extent to which they are controllable. Few impacts have yet appeared, and in some instances the final regulations have not been issued. Nevertheless, it is instructive to look at the incentives established in the legislation with respect to land use and to analyze the likely direction, if not the magnitude, of the resulting developments.

**Air Pollution Regulations**—Several facets of the Clean Air Act of 1970 are likely to have significant land use impacts.<sup>54</sup> Although some may be minor in terms of their land use effects, others appear to be potentially very important. The major legislative provisions are those which establish ambient air quality standards. Important regulations include: (1) those formulating transportation control plans for selected metropolitan areas to meet ambient standards;<sup>55</sup> (2) those providing for the approval of “indirect sources,” facilities which, although not pollution sources themselves, attract large amounts of traffic;<sup>56</sup> (3) those attempting to define the meaning of “significant deterioration” of air quality in areas which presently have relatively pure air;<sup>57</sup> (4) those defining new source performance standards, which determine the amount of pollution that new facilities such as factories or power plants can emit;<sup>58</sup> and (5) those establishing the process and requirements for air quality maintenance through 10-year air quality maintenance plans in metropolitan areas.<sup>59</sup> Each of

these regulatory powers needs to be examined with respect to the way in which it affects development.

The ambient air quality standards, operating alone, would tend to induce polluting industries to locate in areas with relatively clean air, in order to reduce the costs of pollution abatement. This incentive to locate away from existing industrial areas, however, is at least partially offset by both the "new source" performance standards and the non-degradation regulations. The first requires all new plants, regardless of location, to employ a very high level of pollution control. This means that, in most cases, the cost of pollution abatement will not be affected by the location of a new facility. Although there is still some uncertainty about their final form, the non-degradation regulations may require more stringent abatement measures in relatively unpolluted regions than in regions presently attempting to meet primary and secondary air quality standards.

Although state and local planning agencies are expected to have the major role in defining what entails "significant deterioration" in any location, the regulations could interfere with what otherwise might have been a normal and often desirable relocation of manufacturing activity into new communities or small towns in rural areas. This may become a serious problem in the development of new western energy sources. Growing energy needs have made more



By influencing the location of new industries, many air and water pollution regulations will have significant land use impacts related to the industry itself and to related commercial and residential development pressures it causes in surrounding areas.

attractive the large deposits of coal and oil shale which lie in Montana, Colorado, and other western states. Those areas have relatively high quality air which will almost certainly be degraded if the energy development takes place.<sup>60</sup>

Of the other air quality regulations likely to affect land use within metropolitan areas, transportation control plans have received the greatest attention. These plans are aimed at reducing the amount of automobile traffic in order to meet ambient air quality standards. They involve, most commonly, implementation of some combination of the following strategies: (1) improved transportation control; (2) diversion of through traffic around central cities; (3) improved mass transit facilities; (4) special bus and car pool lanes; (5) elimination of on-street parking in the central business district; and (6) at local option, a parking tax on off-street parking in the central business district.<sup>61</sup>

The first two measures are aimed at reducing congestion and improving traffic flow to the central business district. Although, on a short-term basis, this should reduce the amount of air pollution generated by automobiles commuting to downtown, over the longer run improved access to the central city might well encourage people to live farther from their jobs and commute longer distances in their cars. This in turn could actually increase the generation of air pollutants.

The third and fourth measures are directed toward attracting more travelers to use public transit. They will tend to encourage increased development in areas served by mass transit facilities and to discourage sprawl development at the urban fringe.

The fifth and sixth measures are designed to make automobile commuting relatively more expensive and thus encourage more commuters to ride public transit. If these regulations are not vigorously enforced throughout the metropolitan area, they might also have the effect of encouraging the dispersal of employment centers out of the central city. Such dispersal could in turn affect the economic viability of the central city, as well as make it more difficult for lower-income central city residents to get to their jobs. It would also adversely affect the viability of the public transit systems that are supposed to be encouraged by other measures and would tend to encourage more development at the urban fringe. However, if the regulations are applied with the same force in the suburbs as in the central city, as EPA encourages, the effect could be just the opposite. Locations near the mass transit facilities would become more attractive, and development would tend to concentrate along public transit routes.

All of these transportation control measures, therefore, could have land use impacts. In some instances—for example if parking controls cause residential and industrial location patterns that discourage mass transit use—the incentives may work against each



other and result in land use patterns that actually increase the amount of air pollution generated.<sup>62</sup>

Another air quality provision relates to the control of indirect sources—facilities which, while they do not generate large amounts of pollution themselves, attract traffic which may create air pollution problems. They include major roads, shopping centers, stadiums, and other large public facilities.<sup>63</sup>

In most instances the indirect source review will focus on ways to mitigate traffic congestion and reduce air pollution levels (particularly for carbon monoxide). However, the review agency has authority to require the developer to undertake remedial action such as the provision of public transportation to his facility as a condition of the permit.

The indirect source regulations may have a significant impact on development decisions. They will tend to provide some incentive to the developer simply to avoid building the specific types and sizes of facilities covered by the regulations.<sup>64</sup> The resulting impact on land use is uncertain, but it could be perverse in terms of the goals of the act. For instance, prospective shopping center developers might turn to strip commercial development along highways as an alternative to uncertain project review procedures. Such a shift could avoid the permit process if it resulted in each store's parking lot being small enough. But this might mean more use of automobiles if shoppers drive from one store to another, simultaneously increasing congestion and air pollution.

Another set of regulations with possible direct impact on land use in metropolitan areas relates to air quality maintenance. These regulations require air quality agencies to prepare plans for metropolitan areas to ensure that the air quality, once it satisfies the ambient standards, is not degraded by future development. These plans may limit certain types of development in parts of the metropolitan area. In developing the guidelines for these plans, EPA is recognizing the importance of their being integrated with other planning efforts for environmental, economic and social goals.<sup>65</sup>

In sum, most of these air quality regulations appear to have the potential to affect land use patterns. In some cases it is not clear what the ultimate effect will be. Further analyses are obviously needed to ensure that the ensuing regulations as a whole will work together to meet the air quality purpose of the act, will affect land use in a desirable or at least neutral way and, further, will be consistent with the water pollution regulations described below. The recent decision by EPA to prepare and circulate environmental impact statements on major regulatory actions is a step in the right direction.<sup>66</sup>

**Water Pollution Regulations**—The 1972 Amendments to the Federal Water Pollution Control Act placed increased emphasis on the

control of the effluents from point sources. This shift in emphasis from ambient to effluent standards tended to remove the incentive to disperse new facilities which was similar to that associated with the ambient air standards described above.

However, there are at least three requirements of the amendments which will still affect industrial location decisions: <sup>67</sup> the effluent standards requiring the use of the best practicable or the best available technology; <sup>68</sup> the requirement that industries pay the full cost of treating wastes discharged to municipal plants; <sup>69</sup> and the requirement that industries pretreat their wastes before discharging them into municipal systems.<sup>70</sup>

Because it is generally less expensive to build pollution abatement technology into a new plant than to add it to an old one, and because abatement devices require space which may not be available at older congested industrial sites, the effluent standards may induce firms to abandon old plants, particularly those located in high density urban areas, sooner than they otherwise might have. Usually a new plant will be located outside the central city where more land is available at a lower price. However, new plants may be required to satisfy stricter standards than old plants, thus providing a countervailing incentive.

The combination of cost sharing and pretreatment requirements for industrial use of municipal treatment plants could also lead firms to conclude that they can more cheaply treat and dispose of their wastes themselves. If so, new industrial siting decisions would be influenced less by the availability of public sewers than they are currently, and this would be likely to result in wider dispersal of new industrial sites. If this stimulates industry to locate in small towns and new communities, it could be beneficial. If it leads industry to spread into undeveloped areas near cities, it could counteract desirable planning and regulatory efforts. Among other problems, the dispersal could promote inefficient development patterns from an air pollution and energy consumption point of view, development which would eventually come in conflict with the goals of the Clean Air Act.

Another regulation which may stimulate dispersed development is the requirement that every point source of pollution obtain a discharge permit. If water quality at a particular location presents a severe problem, as may occur in heavily built-up areas, the guidelines would suggest that permits not be issued unless the industry adopts very stringent pollution abatement techniques, perhaps even exceeding best available control technology. This again may tend to stimulate the dispersal of industrial and manufacturing activity. Again, it could be beneficial if it encourages industry to locate in smaller towns or new communities which need jobs, but detrimental if it simply contributes to metropolitan sprawl.

One opportunity to evaluate (and rectify if necessary) the location incentives created by these provisions is the requirement in

Sections 208 and 303(e) of the Act for wastewater management planning. These plans are intended to provide overall coordination of the many provisions of the Act as they apply to a given metropolitan area. They will also provide the mechanism for implementing Section 304(e) of the Act, which deals with the control of pollution from "nonpoint" sources. One major category of nonpoint pollution is stormwater runoff from land rendered impervious to water by streets, highways, parking lots, and commercial and residential development.<sup>71</sup> Regulating this form of nonpoint pollution could have significant impacts on development patterns.

In summary, it is clear that the Clean Air Act and the Federal Water Pollution Control Act have potentially significant land use impacts. It is not yet clear how serious these will be, or even what direction they may take. Much more analysis is required. But this brief review of the incentives established under the laws suggests that in some cases the impacts may not only conflict with other social and environmental goals but may also be perverse in terms of the attainment of the pollution control goals of the Act from which they derive.

EPA recognizes many of these problems and calls for integrated and comprehensive planning in its guidelines and policy statements.<sup>72</sup> However, analyzing all the potential land use effects, developing complementary guidelines, and overseeing the responsibility for preparing integrated plans which balance off the various environmental, economic, and social objectives is an extremely complex undertaking. In the meantime there is a danger that regulations issued before sufficient analysis can be completed will result in many of the problems outlined above.

### **Public Infrastructure Investments**

While tax and regulatory policies may have significant effects on broad development patterns, the funding of new public facilities probably has the most direct and immediate impact on specific land areas. The influence of highways on land values and development decisions is understood best. Mass transit facilities also induce land use changes, particularly around stations. But new sewers are becoming in many metropolitan areas the prime determinants of where and how fast new development occurs.<sup>73</sup> Investments in water resource and water supply projects can also be powerful stimulants in the western United States.

**Sewers**—Sewers and sewage treatment plants are replacing highways as prime determinants of the location of development, in part because most of the major interstate highways segments located on the urban fringe have been built and additional highways have only

marginal effects on access. This replacement has also occurred because new concerns over water pollution have made it costly and sometimes impossible to build adequate septic tank systems and very difficult to receive approval to tie into existing overloaded sewage systems. And in part the replacement has taken place because new legislation makes billions of dollars in Federal aid available each year to communities to build new sewers and treatment facilities. Among other things, under the new program the Federal Government contributes 75 percent of the costs of these facilities, which substantially reduces the per unit cost of local sewer tie-ins.

The importance of sewers to the development process has been studied very little in the past. An examination of growth in the Far Northeast section of Philadelphia over the period 1945 to 1962 indicated that access to trunk sewers and high density zoning were the two most important factors influencing the price of residential land, and that the absence of sewers tended to restrict development.<sup>74</sup> Similarly, a more subjective analysis of the development process in Fairfax County, Virginia, concluded that the installation of interceptor sewers and the general pro-growth attitude of county officials were the prime determinants of the pattern of development in that area.<sup>75</sup> Another more quantitative study of the entire Washington, D.C., area also documents, though somewhat ambiguously, the importance of sewers in determining the location of the extensive development that has surrounded the city over the past decade.<sup>76</sup>

The location and rate of extension of interceptor sewer lines through previously undeveloped areas seem to have more impact on land use than any other set of decisions on wastewater facilities. Interceptor sewers are defined as the major lines that run from the collector sewers to the treatment plant. Because the location of a new interceptor significantly increases the number of buildable lots along its right of way, a key issue is its capacity. There is a general tendency for such lines to be oversized in order to assure the necessary capacity for future development, but the oversizing itself can contribute to the extent of development that occurs. Such oversizing thus becomes a self-fulfilling prophecy.

A related land use impact caused by large interceptor sewers is their tendency to be designed to run for long distances between existing towns before reaching the treatment plant. Such lines open up large areas of what may have been previously undeveloped land between the towns. While this may be in line with overall regional land use planning, it could also run counter to desirable development patterns, particularly if sewers are placed only with an eye toward wastewater treatment efficiency. In one recent case, a proposed interceptor was slated to run through a large undeveloped coastal area of Delaware that was on the state plan for eventual purchase as recreational land.<sup>77</sup> The proposal would have used public funds to build a sewer that would have substantially raised the purchase cost of the land to the public.



Major sewer lines have become the prime determinants of where and when new development occurs in many metropolitan areas. In addition to the land use impacts of new sewers, the developments they spur, if not properly controlled, can cause worsened problems of water pollution.



Another phenomenon related to the construction of large interceptors is the tendency for developers to move immediately to the end of the new line in order to take advantage of both the available sewer service and the low land costs on the far urban fringe.<sup>78</sup> The result is a costly leapfrog and fill-in development pattern, which increases the difficulty of properly planning the timing and size of other public facilities and spreads the urban area out in a pattern that is wasteful of land and energy resources.

Many of these problems could be avoided if the construction

of major interceptor sewers were phased to the extent feasible to coordinate with the extension of other public facilities in accord with a comprehensive land use plan. While annual or biennial extensions of such interceptors might make the sewer cost somewhat higher and the funding mechanism more complicated, it would probably result in overall cost savings to the community and would significantly reduce adverse land use impacts.

Similar issues arise when the analysis shifts from an individual interceptor to the design of an entire wastewater treatment system, including the treatment plant. Once again, cost factors favor the choice of large regional treatment plants with associated sewers. So far as water quality is concerned, these systems present economies of scale in construction and operation and require less monitoring and fewer highly trained personnel than a number of smaller treatment plants. But, as with sewers, the overdesign of capacity in the regional plant becomes a self-fulfilling prophecy. Coastal and other areas of seasonal home construction may be particularly affected because only a limited amount of land may be available for high density development, and because the potential buyer of a seasonal home or a recreational lot has greater freedom of locational choice than with his primary home. While a series of smaller but individually expandable plants might be more costly in such circumstances, the community could retain more control over development. Such a course would also give communities broader options to coordinate the expansion of wastewater treatment facilities with other public service programs. It is important to assure that such options are considered and the potential land use impacts are recognized prior to Federal funding.<sup>79</sup>

**Highways**—The major public investment program which has been analyzed most extensively in terms of growth-inducing effects is the Federal Highway Program.<sup>80</sup> Of course, the direct environmental impact of highway construction is also substantial. Each mile of interstate highway consumes up to 48 acres; over two-thirds of the land area in some of our cities is consumed by streets, roads, and parking; 26 million acres of America's rural land is consumed by transportation systems.<sup>81</sup> (See Table 2 above.) The earth moving required in the construction of such systems is a major source of soil erosion and increased sediment loads in rivers and streams. The paved area results in increased stormwater runoff, which can be heavily polluted with organic materials, oil, nutrients, and toxic substances. Air pollution, noise, community disruption, and the loss of parks, natural areas, and structures of architectural or historic significance are other direct effects of highway construction. But the effects on urban development patterns have been even greater.<sup>82</sup> Cheap energy, the automobile, and the highway have been major factors in determining the physical character of American metropolitan areas.



The impact of highways on development patterns, illustrated here by U.S. 89 in Arizona, has been rather extensively studied, but still too little is done to analyze such impacts prior to construction.

A number of studies, many of them conflicting, have been conducted on the impact of highways. In terms of interregional effects, the construction of highways seems to have had at most only a moderate impact on growth. For instance, an analysis of over 200 metropolitan areas which differed widely in the amount and type of highway construction indicated no significant effect of highway construction on population growth rates.<sup>83</sup>

Within a region, however, highways may have more important effects. A major highway linking a satellite city to a nearby major metropolitan area may induce a higher growth rate for the satellite city and for the corridor between it and the metropolitan area.<sup>84</sup>

Manufacturers consider highway transportation to be an important factor in their location decisions, once they have decided upon a region. Other factors such as availability of raw materials, the existence of markets, and supplies of adequately skilled labor have more influence in the choice of region, but highways become important in the site location decision within a given region.<sup>85</sup>

Commercial facilities, particularly those involved in wholesale and retail trade, show even greater sensitivity to the presence of highways in location decisions. Over the past two to three decades, wholesale trade has migrated steadily and significantly to suburban locations. Wholesale employment in the suburbs was negligible in the immediate postwar years; by 1963, it accounted for about 4 percent of suburban jobs.<sup>86</sup> Several studies have documented the significant impact of the interstate highway network, especially circumferential beltways, in this decentralization process.<sup>87</sup>

Retail trade may have an even stronger attraction to highways. Many of our modern regional shopping centers would not be financially feasible were it not for their ability to locate near the intersection of major highways.<sup>88</sup> In addition, certain categories of retail businesses—service stations, motels, restaurants, and drive-in establishments—are very strongly oriented toward highways.<sup>89</sup> The central business districts appear to have been hurt by improvements in the highway network of most metropolitan centers.<sup>90</sup>

Case studies show that highways introduce pressures for commercial development of nearby land.<sup>91</sup> Arterial streets and radial highways tend to promote strip commercial development, while circumferential highways tend to promote large-scale commercial, industrial, and residential developments.<sup>92</sup> Circumferential highways may also lead to accelerated commercial development along major arterials intersecting them.<sup>93</sup> Such interchanges provide the strongest stimulant for rapid land use changes, particularly into very high density development.<sup>94</sup>

Residential use of land is not related to highways in a simple way. Other factors (type of neighborhood, zoning protection, natural amenities, schools) have important influences, as do other types of public service infrastructure investments, such as sewers.<sup>95</sup>

The impact of highways on residential location depends to a great



extent upon the relative supply and demand for different types of housing, and the availability of accessible vacant land. Land especially close to the city and near an interchange will increase substantially in price and often can only be economically developed in an intensive way—either with businesses or high density housing.<sup>96</sup> Farther out at the urban fringe, where farmland is available for development, radial highways from the beltway promote conversion to low density single family subdivisions.<sup>97</sup>

Efforts to distinguish among the impacts of different types of highways indicate that circumferential highways may result in more diffuse metropolitan areas than radial highways.<sup>98</sup> However, this conclusion is called into question by other studies, particularly those of the Washington, D.C., area.<sup>99</sup> Several studies indicate that circumferential highways stimulate more intensive development along their immediate corridor than would occur otherwise, and probably accelerate the amount of development between radial routes.<sup>100</sup>

Most observers agree that the large-scale highway construction during the 1950's and 1960's has had substantial impact on the development pattern of our metropolitan areas. However, most of the evidence indicates that the effect of new highways in metropolitan areas will be much less than the effect of those constructed earlier. The impact of a highway—particularly on residential development—is strongly influenced by the amount of vacant land it opens up for development relative to what is already accessible. The first interstate highways in metropolitan areas had substantial impact because they opened up relatively large amounts of land. Later highways may have less impact because they are built in areas that already have some access. But new roads on the urban fringe, especially beltways, may still be an exception to this rule.

In summary, under some conditions highways can affect how and where development occurs, and the possible impacts should be carefully considered in planning and reviewing proposed new projects. Control of these impacts through better planning and staging of the highway and its interchanges should be investigated.

**Mass Transit**—There is evidence that some of the new mass transit facilities being planned or constructed in U.S. cities may stimulate very important growth effects. This is not a new phenomenon. The early growth pattern of many metropolitan areas was established by the trolley lines radiating out from the central business district.<sup>101</sup> Residential development was concentrated in a narrow band along these lines, and its spread was determined by their expansion.

Unfortunately, very little information is available to predict the impacts of more recent mass transit systems. Few facilities have been constructed in recent years, and their impacts have been very difficult to separate from the many other factors influencing urban growth. There are only a few studies available which analyze the types of impacts to be expected, and these depend less on a rigorous analysis



The growth effects of mass transit facilities are primarily related to the development of high density residential and commercial facilities around stations.

of empirical data than on a qualitative description of what is expected or has been observed.

The characteristic of rapid transit facilities which distinguishes them from new highways is the degree of high density residential and office building development they stimulate around stations. Rapid transit facilities are used for moving people but seldom for moving goods. Therefore, they have more effect on activities that are people-oriented—residences, office buildings, cultural and recreational facilities—than on those that require the transportation of goods.

The construction of rapid transit facilities into the downtown area can have a significant impact on building activity and land prices in the central business district and along the transit corridors leading into it, as has been demonstrated in Toronto and San Francisco. An analysis of real estate changes in Toronto indicates that two new subways, constructed in 1954 and 1963, increased property values along their routes substantially.<sup>102</sup> About half of all highrise development and the bulk of office building construction occurred in areas within a 5-minute walk of the stations.

Such comparisons should not be taken as proof that the subway (or any other investment) is responsible for increasing the total assessed valuation of the city. It is just as likely that the subway did nothing more than concentrate along its path the increase in values that would have occurred throughout the city in any case.

The BART line in San Francisco appears also to be stimulating

a rapid increase in the number of highrise office buildings and apartment houses being built along its route. While recognizing the overall benefits to the vitality of the city, many San Franciscans are concerned about the changes in the aesthetic, social, and cultural character of their downtown resulting, at least in part, from the subway.<sup>103</sup>

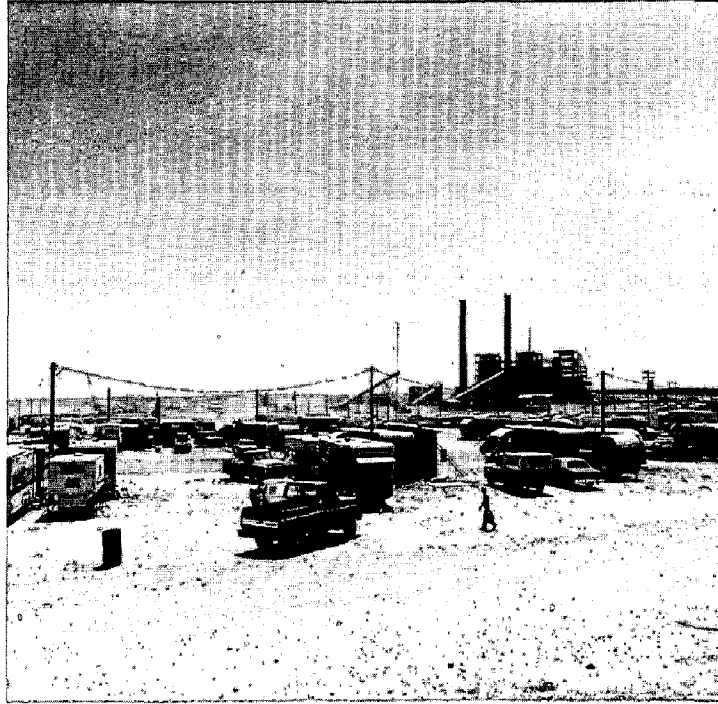
Such effects also occur elsewhere than in the central city. Studies of the Philadelphia-Lindenwold High Speed Line (which currently connects Philadelphia with the suburbs and a satellite city across the Delaware in New Jersey) indicate that since its opening in 1969 the facility may have accelerated the movement of enterprises out of Philadelphia into other communities along its route.<sup>104</sup> Similarly, there is some indication that San Francisco's BART is stimulating the construction of office buildings along its route in otherwise suburban communities.

### Energy Development

Whereas the provision of public services determines where development is likely to take place within a particular area, there are some decisions that may have an impact on regional growth. This is exemplified by proposed energy-related developments—deepwater ports for supertankers, outer continental shelf (OCS) oil and gas production, extensive strip mining of western coal, the Alaska pipeline, and the production of crude petroleum from oil shale. In addition to affecting air and water quality, water supplies, marine resources, wildlife, and land resources, these facilities are expected to generate substantial industrial, commercial, and residential development. This development will often occur in rural areas where relatively little growth could be expected in the absence of the energy facilities.

The mining and shale oil developments in the West and the Alaskan pipeline are likely to have severe impacts on small towns. They will bring with them large numbers of workers, first for the construction of the facility, then for its operation, and finally for the construction and operation of associated industries. The population growth will often place great stress on the ability of the community to finance and provide the required services. Some public and private groups are studying these problems and are attempting to prepare in advance for the developments in order to avoid impacting local communities so that they take years to recover.<sup>105</sup>

The Council, in association with other Federal agencies, has completed detailed studies of the secondary development expected from two types of energy developments—deepwater ports<sup>106</sup> and OCS oil production on the East Coast and in the Gulf of Alaska.<sup>107</sup> Both studies, which are discussed in Chapter 6, project heavy onshore investment resulting from the offshore production or importation of crude oil. While this investment may bring a welcome economic boost



Energy facilities in rural areas generate nearby development to accommodate first construction workers and later employees and their families. This development can be either like the unplanned trailer park surrounding a new power plant in Wyoming (top), or like Boulder City, Nevada (bottom) which was started in 1931 as headquarters for the Hoover Dam construction and is known today as "Clean Green Boulder City".



to many coastal areas which have grown little in recent years, it will also cause tremendous physical changes in the natural and man-made environment. The initial effect will be the construction of refineries to handle the crude oil, followed probably by petrochemical industry complexes which require oil and gas as raw materials. The industries will create a substantial demand for workers, first for their construction and then for their operation. The workers, in turn, will require housing, stores, schools, and other services, which will stimulate rapid development and strain the ability of local governments to provide the services required. The physical environment of the coastal area may be transformed as much or more by this development process as by the energy facilities themselves.

The scale of these changes can best be understood by looking at the potential impacts in a specific area. The counties of Cape May and Cumberland in southern New Jersey provide a good example. These counties are decidedly rural, containing only 2.5 percent of the state's population but 10 percent of its land.<sup>108</sup> Per capita income is less than half the state average.<sup>109</sup>

The CEQ superport study concluded that, even if oil imports are low and are refined mostly at existing facilities located elsewhere, a major expansion of petroleum-related industry in the Mid-Atlantic states by the end of this century will still have a strong impact on the two counties.<sup>110</sup> Under other assumptions concerning the level of imports, dramatic changes could occur much sooner.<sup>111</sup> From a purely economic standpoint, such development would benefit the two counties. By the year 2000, twice as many jobs as expected under normal conditions could be created and average per capita income might be more than 20 percent higher.<sup>112</sup>

On the other hand, the environmental impacts on the region would be alarming. The amount of developed land in the two counties would triple in less than 30 years. Crude oil storage, refining, and petrochemical operations alone would cover over half of Cumberland County's bay shore, permanently changing its character and causing major conflicts with recreation, wildlife, and wetland preservation. Some of these effects might be avoided by locating major industrial facilities farther inland or at existing industrial centers in the Delaware Valley.

In addition to these land use impacts, massive amounts of water would be needed for industrial cooling and processing and for the increased residential population and subsidiary commercial development.<sup>113</sup> The potential for air pollution would increase significantly as well.<sup>114</sup>

The Council also looked closely at these two counties in its study of the onshore impacts of outer continental shelf (OCS) oil development and found similar impacts. OCS development would increase the number of jobs by 20 to 30 percent over the base created by superport development, more than doubling the 1970 population.

Industry would replace tourism, fishing, and agriculture as the economic base, and large numbers of new public facilities, especially schools, hospitals, and waterworks, would have to be built. These facilities would have to be provided by small towns and especially the fishing villages along the shore of the Bay, localities which often lack the economic capability to support, and the land use planning and regulatory tools necessary to control, such a volume of growth.

For most public officials at the state and local levels these induced impacts appear to be the most important effects that can be expected from the development of new energy facilities. The various studies referred to here attempt to provide officials and the public with information and analytical tools to predict and adequately plan for such developments. There is a significant need for more of these analyses and for cooperation among Federal, state, regional, and local bodies in carrying out the required planning and its implementation.<sup>115</sup>

### **Stimulants as Controls**

This section has dealt with only some of the more important Federal actions that can significantly affect where, how, and when development will occur. But not even all the relevant Federal programs have been covered. There has been no discussion of the Federal Housing Administration regulations and mortgage guarantees, for example, which, in addition to stimulating the construction of single family detached homes, have had a very important impact on the quality and form of much of our suburban development.<sup>116</sup> Nor have the effects of defense and space expenditures, which have contributed significantly to the development of certain regions of the country, been more than briefly mentioned. The role of water resource projects both as a determinant of land use on a local level and as a development catalyst for many areas in the western United States has been ignored. Finally, being focused predominantly on metropolitan areas,<sup>117</sup> the analysis has ignored the many programs, particularly those implemented by the Department of Agriculture, which determine the whole structure of American agriculture and greatly influence development around small cities and towns in rural America.

By concentrating on Federal actions, even in this limited way, this section has also omitted, except for some facilities jointly funded with the Federal Government, the many state and local actions which are development stimulants. The county or community's willingness to provide infrastructure—particularly water, roads, sewers, and schools—for new developments is a significant determinant of where, how, and when that development will occur.

There are many other examples of local stimulants. Sales taxes, particularly when local governments receive their proceeds, provide an

incentive for the promotion of commercial facilities.<sup>118</sup> Many local land use planning and regulatory efforts stimulate sprawl and increased automobile use. For example, a basic tenet of zoning has been to segregate land uses—to keep residences apart from industries and commercial areas. With such development patterns, people must travel farther to get from one type of area to another; hence, the need for more automobile travel. Parking requirements, normally included in commercial zoning ordinances, also encourage use of vehicles. Easy parking makes easy driving.

There is increasing recognition of all these effects, and of the fact that actions usually undertaken for specific limited purposes ultimately have wide-ranging economic, social, and environmental impacts. In some instances, because of their influence on land use, the effects of such actions may end up being more environmentally, economically, and socially undesirable than the problems that they were originally intended to correct.

For these reasons, such impacts cannot be ignored in analyzing the desirability of proposed actions. They should weigh heavily, for example, when an agency is considering alternative public works investments or the best means of implementing a legal requirement through regulations.

But predicting such effects is not easy. The significance of any stimulant may change over time, as witness the apparently decreasing importance of highway investments and the increasing importance of sewer investments in affecting urban fringe growth patterns. The significance will also vary from place to place. A highway may be an important stimulant in one area but not in another. Sewer investments may lead to increased sprawl in one community, but a lack of adequate sewer investment (by forcing increased use of septic tanks and hence low density development) may have the same effect in another. And finally, the importance of these effects will depend not only upon their physical dimensions but also upon the values of the particular community in which they occur, values which change greatly from place to place and from time to time.

Because of the importance of the stimulants and the way their effects vary from case to case, the Council believes strongly that their analysis (with respect to Federal actions) should be included as part of the environmental impact statement.<sup>119</sup> As a first step the Council is working with several Federal agencies to develop tools which will allow the better prediction of such "secondary effects."

At the same time, local planning officials are beginning to recognize how the stimulating effects of infrastructure investments can become a tool in controlling development. By carefully planning where the investments will be made and how they will be staged, local, regional and state officials can strongly influence where, how, and when. This use of stimulants as controls is discussed in the next section.

## Land Use Controls

Every community has tools available to it to control and direct the development process. Some of these land use controls are well-established and well-known, although even the most traditional have undergone changes and refinements in recent years. Others are new and relatively untried, some offering promise, and others having some obvious pitfalls.

### Quiet Revolution Revisited

In 1971, the Council on Environmental Quality documented the movement toward more effective land use controls in its report, *The Quiet Revolution in Land Use Control*.<sup>120</sup> This report analyzed innovative land use controls in a number of states, including Hawaii, Maine, Vermont, Massachusetts and Wisconsin. It also examined regional efforts such as those of the San Francisco Bay Conservation and Development Commission and the Twin Cities Metropolitan Council.

Since the publication of *The Quiet Revolution*, efforts to strengthen the role of the states and their regional governments in regulating the use of land have continued. Forty-eight states have now enacted legislation or are seriously studying proposals to expand the previously limited role of state government in the regulation of land use. (See the Appendix to this chapter.)<sup>121</sup> Initiatives undertaken by the states include review of major industrial location decisions such as power plants, assistance to localities to plan better for the siting of growth-inducing public facilities, controls on surface mining, and protection of important natural areas—particularly coastal zones, wetlands, floodplains, and mountain regions—and historical areas from undesirable development. In all cases, most land use decisions continue to be made by local governments. But the states are creating procedures in which the broader state perspective is applied to the development process.

Six states (California, Delaware, Maine, New Jersey, Rhode Island, and Washington) have enacted particularly broad state authority over land use decisions in defined coastal zones, where the conflicts among competing uses of limited land resources are often most severe. Six others (Connecticut, Georgia, Maryland, Massachusetts, North Carolina, and Virginia) have singled out wetlands for state protection; most now require permits for any draining, dredging, filling, or construction in such areas. Minnesota, Michigan, and Wisconsin have strong shoreland and floodplain protection laws. Utah has enacted critical areas legislation.

Three recently enacted state laws deserve particular mention. The 1972 Florida Environmental Land and Water Management Act<sup>122</sup> (Act 380) provides for state designation of "areas of critical state



concern," which are regulated by local government under state guidelines or directly by the state if the localities fail to live up to guideline requirements. The 1973 comprehensive act in Oregon (Senate Bill 100)<sup>123</sup> takes a similar approach to state and local roles in land use planning and regulation, with a state land use commission developing policies and goals to be implemented by local governments. The State of New York in 1973 amended its Adirondack Park Agency Act to provide state-level control over development on privately owned holdings comprising over one-half the acreage within the park area.<sup>124</sup>

At the same time, many communities have taken a more aggressive role in attempting to bring about better land use. There is increasing citizen pressure, particularly in suburban areas of major cities, to improve planning, to evaluate more fully the effects of development, and to strengthen local development controls.<sup>125</sup> An increasingly sophisticated public has come to realize the point made throughout this chapter—that major development significantly affects the local economy, the tax burden, and the environment. In a recent study for EPA, the International City Management Association found that 36 percent of all counties with populations of over 400,000 and nearly one-fourth of all cities with populations of over 10,000 have created citizen environmental commissions to confront these and other issues.<sup>126</sup> Further, the study found that approximately half of the cities and counties cited citizen support for environmental issues as being a major factor in the creation of environmental protection programs. As noted in last year's Annual Report, emphasis on growth and change is being replaced by a concern for stability, for protection of the environment and for a greater sense of community.<sup>127</sup>

A new appreciation of the importance of land use issues is also beginning to influence thinking at the Federal level. In the past the Federal role in land use was focused primarily on the management of that one-third of the Nation's land comprising Federal lands, forests, and parks.<sup>128</sup> Now, as indicated in the previous section, there is general recognition that many Federal policies and programs influence other land use and development decisions.

Recent laws define a new Federal role in dealing with land use issues. The Coastal Zone Management Act of 1972, administered by the National Oceanic and Atmospheric Administration, provides assistance to 34 coastal states and territories wishing to establish resource management plans in defined coastal areas.<sup>129</sup> In its first year of operation, the program was able to fund eligible programs in all but one of the designated states. The Flood Disaster Protection Act of 1973<sup>130</sup> empowers the Department of Housing and Urban Development to work with 15,000 flood-prone localities in the United States to upgrade regulation of development in floodplains as a condition for disaster relief and insurance for structures now existing on floodplains.

## Controlling Development

It is rare to find a locality where only one type of land use control is in effect. More commonly, there are several controls, and it is their interaction—the way in which they complement or counteract one another—which effectively determines the degree and character of control exercised. It is useful to analyze the effectiveness and impacts of the individual control mechanisms.

**Zoning**—Zoning, the most common system of land use control, attempts to predesignate the purposes for which land can be used. In doing so, it serves to segregate uses into assigned geographic areas, keeping, for example, heavy industries apart from residences, or even single family housing apart from multifamily housing.<sup>131</sup>

Zoning can have significant impact on land values, though the direction and significance of the impact depends on how well zoning is administered and on supply and demand situations in the land market. The character of a residential neighborhood, for example, is a major determinant of the value of its houses. Zoning assists in the creation and preservation of these characteristics by excluding conflicting land uses, such as industry and large-scale commerce.<sup>132</sup> Zoning may also increase property values by restricting the amount of land available for particular uses. For example, if there is a large



Some land use controls require no compensation because they protect the public health and welfare; residential development, for example, should have been barred from this floodplain.

demand for multifamily housing but very little land zoned for that purpose, the small supply of land is likely to find a very high market price.<sup>133</sup>

Zoning can also reduce property values. Land that is permanently zoned for less profitable uses, such as agriculture or large-lot single family homes, will bring a lower price than land zoned for higher density uses. The degree to which land can be restricted to less profitable uses is an issue of constitutional law dealt with in *The Taking Issue*, a report issued by the Council last year and discussed in Chapter 4 of the Fourth Annual Report.<sup>134</sup>

Zoning has certain inherent problems as a land use control. Inasmuch as it can change the price of land from its free market value, zoning may create economic incentives which work against the successful implementation of the desired development patterns. For example, if two parcels of land, alike in every other respect, are zoned for different purposes—e.g., one for multifamily and the other for single family housing—and if the land prices differ because multifamily development is more profitable, then a potential developer of multifamily units has an incentive to buy the cheaper land and use his influence in the locality to get the zoning changed.<sup>135</sup> When this “spot zoning” occurs, it results in such land use aberrations as garden apartments surrounded by farms—not where proper land use planning would locate apartments nor even where they would be built were there a completely free market.

A second problem with zoning derives from its underlying assumption that different uses should be segregated. In terms of convenience, environmental effects, and energy consumption, there are often significant advantages to locating neighborhood facilities such as a grocery store or a pharmacy within a residential area. Traditional zoning, however, generally prohibits such an intermingling of uses. Recent trends in planning and zoning seek to remedy this deficiency by moving toward a more beneficial integration of different land uses at the proper scale.

An even more basic question in zoning is whether it is possible, or even desirable, for a community to establish firm criteria for land use that are expected to remain unchanged over a long period of time. Experience suggests that it is not. Commonly, zoning regulations are transformed. Amendments and variances which were originally intended as rarely used safety valves often become the rule. As a result, zoning provides neither stability of use nor a logical mechanism for definition of use. Some new techniques being used to overcome these problems are discussed later in this section.

Aside from various inherent problems, the manner in which communities actually implement their zoning ordinances is often criticized. It is said that many communities have intentionally or unintentionally adopted zoning regulations which effectively bar low or even middle income housing from the community,<sup>136</sup> pri-

marily through regulation of lot size, frontage, living space, and setback.

It is generally, though not unanimously, accepted that zoning plays a part in the determination of housing costs.<sup>137</sup> Because housing costs and lot size have a direct and positive relationship to municipal tax revenues, while public service costs per given household are relatively constant regardless of housing costs, municipalities have an incentive to engage in "fiscal" zoning—attempting to maximize the revenue provided by the land and improvements, while limiting the number of new families entering the community.<sup>138</sup>

Many communities have adopted large-lot zoning in the belief that it will preserve open space and slow development. Under these ordinances, a house may be built only if it is on a lot of several acres. But large-lot zoning may increase environmental problems and create undesirable economic and social consequences.<sup>139</sup> It is damaging to environmental quality in that it takes low density development farther and farther into the countryside. This requires more roads because of the greater distances and necessitates more travel by car, thereby increasing energy consumption and air pollution. As a result of the greater distances between houses, large-lot zoning forces communities to pay more per resident for sewer, electric, water, and other infrastructure systems, which in turn leads to increased property taxes and provides additional stimulus for "fiscal" zoning.

Fortunately, there are new zoning techniques available which deal more efficiently with some of the problems of traditional zoning. Two of the most important are the planned unit development (PUD) and the special purpose district.

The PUD technique is seeing increased use across the country, particularly in communities at the urban fringe. Usually embodied as part of the local zoning ordinance, it provides increased flexibility for the design and siting of residential development. Under the PUD technique, the builder is permitted to aggregate the total density permitted for his tract into clusters of higher density development. The specific plan is determined through negotiation between the developer and the planning board, working within broad legislative guidelines.<sup>140</sup> For the developer, this results in savings in building costs. For the community, it preserves relatively large unbroken areas of open space (usually 10–20 percent of the total) and reduces many of the costs caused by typical sprawl development.

The PUD technique can apply equally well to luxury developments or moderate priced housing. Some of the most desirable housing in many communities is located in the PUD's where savings in housing costs are applied to better community facilities. Or the cost savings can be used to provide a greater diversity in housing to serve better the individual needs and economic capabilities of potential residents.<sup>141</sup> Smaller units for elderly residents, for example, can be interspersed with larger residences.

The second innovative technique is the special purpose district. Like the PUD, the special district is typically a part of the local zoning ordinance, designed generally to give greater leeway in development and to break traditional zoning's inflexible focus on the single lot. Whereas the PUD is designed for new developments, the special purpose district generally is created to protect existing desirable uses in particular areas of social, cultural, or historical importance that are threatened by pressures for redevelopment. The special purpose district is subject to controls on design and use, and it provides various incentives and bonuses to complying developers.

The technique has been used most often in the preservation of historic districts, such as New York City's Greenwich Village. But it has found application as well in other areas of that city, where it has helped to revitalize the Broadway theatre district, to encourage the continued existence of luxury shops along Fifth Avenue, and to preserve low income housing.<sup>142</sup>

Special purpose districts and PUD's attempt to come to terms with the problems and potentials of a specific area. Both techniques grow from a recognition that normal zoning ordinances are often too clumsy to deal with the delicate process of preserving and enhancing environmental quality.

**Review of Development Proposals**—Traditional zoning ordinances attempt to control land use by determining before development occurs what every piece of land will be used for. As long as any proposed development satisfies the designated land uses, it is allowed. But to assure that it does, most communities have also adopted laws for the review of major development proposals. These laws vary from the simple requirement to file a map of platted acreage for a new subdivision to highly sophisticated techniques and reporting schemes with guidelines, regulations, and provisions for public review.<sup>143</sup> There is an increasing recognition that development proposals must be examined on an individual basis under a system of review that has both clearly defined standards and the flexibility to take into account changing community values and the special characteristics of each project.

A typical project review ordinance establishes very general guidelines for development and leaves certain choices concerning the design and location of the development to case-by-case negotiation between the developer and the municipal officials. The Ramapo, N.Y., law takes a somewhat different approach, establishing a point system based on the location of development with respect to existing infrastructure and on the developer's willingness to supply various public facilities himself.<sup>144</sup>

Environmental impact statements required by the National Environmental Policy Act and by laws enacted in numerous states and localities are another form of project review, requiring that governmental agencies review in a public document the impacts of projects

they propose to approve or undertake. In California, state legislation on impact statements has been interpreted as applying to significant private actions as well.<sup>145</sup> Increasing emphasis is being given in impact statements to both direct land use impacts and changes in surrounding land uses likely to be induced by the proposed action.

Other state laws have created procedures and special boards for reviewing development proposals. California's Coastal Zone Act set up a statewide commission and regional panels to analyze impacts before approving development proposals.<sup>146</sup> Vermont's Environmental Control Law (Act 250) requires a review by a regional environmental board for all subdivisions over 10 acres, any commercial or industrial development of substantial size, and any development above 2500 feet in elevation.<sup>147</sup> Comprehensive state review of power plant siting has been established in a number of states, including Arizona, Arkansas, California, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Hampshire, New York, Ohio, Oregon, Virginia, and Washington.<sup>148</sup> Texas and Louisiana require project review before construction of superports.<sup>149</sup> Delaware, in addition to banning heavy industry from its coastal zone, has established a permit system to review and approve other types of industry there. On the local level, the Association of Bay Area Governments in San Francisco has established "Project Review Criteria for Growth," which are applied in order to analyze the environmental and social impact of proposed development.<sup>150</sup>

Each of these approaches seeks to resolve a very important question in land use regulation: to what extent should controls be exercised through traditional zoning methods of predesignating permitted uses, and to what extent should each development proposal be given special review? Most procedures being adopted at present include a mixture of both. Traditional zoning is less likely to cause delays in development and may provide less opportunity for arbitrary or capricious actions by public bodies. On the other hand, it tends to be inflexible and unresponsive to public opinion, and it often interferes with solutions that best serve the longer-term interests of both the private developer and the public. The consequences of poor design and improper site location are long-term losses for the residents and the community. Hence, the current trend is clearly toward more case-by-case review as the only way to assure adequate sensitivity to community and environmental impacts. This move away from preregulation toward more thorough review of development proposals is also reflected in two other new development control techniques which are discussed below: development rights and land banking.

**Development Rights: Donation, Purchase, and Transfer**—The Constitution places limits on the taking of private property by public authorities without just compensation. Under a series of court cases in the early part of this century, the concept of "taking" was held to apply to government regulation of land.<sup>151</sup> This limits the severity

of land regulation which can be applied in the name of the general welfare without requiring that the owner be compensated for the taking. For the most part, the determination of what constitutes a compensable taking has been left to state courts,<sup>152</sup> and, as might be expected, the line between legal and illegal regulation varies among the states, as well as over time within the same state. Some state courts have held that restricting development to 1 house per 5-acre minimum lot size is a reasonable use of public power but draw the line at a 10-acre minimum lot.<sup>153</sup> To some extent, of course, the land itself dictates reasonable uses. Public authorities can be more restrictive with respect to floodplains because development there poses potential dangers to residents, and with respect to wetlands because of their value as natural breeding areas.

What is left to the landowner after the community has placed such legal restrictions on his ability to use his land is seen by the law as a bundle of rights. When the landowner subsequently sells or gives away his land, he is actually transferring this bundle of rights. However, there is a longstanding right to split off some of the rights from the bundle and sell or donate them separately from the rest. Often in the past, for example, one farmer would sell to another the right to cross a strip of his property to reach fields with no direct access. That strip would then be subject to a right or easement held by the other farmer and as a result might not be fully usable by the landowner.

Over the years, the separation of such rights has become more common as a land use control technique. Various agreements have been formulated whereby landowners sell, donate, or transfer limited rights from their bundle to private groups or public authorities. Sometimes such rights are called conservation easements or scenic easements. The more common generic term is "development rights" because the rights split off and transferred usually include most of the rights to develop the land.

There is no doubt that the community can purchase those development rights it feels it needs to control land use beyond the point permitted by the Constitution. It may even condemn such development rights under eminent domain laws and compensate an unwilling seller, although the public benefit derived from such strong action must be clearly demonstrated. But the purchase of development rights can be expensive, particularly if it is used as a stopgap in areas subject to heavy development pressures. An added cost, as in the case of publicly owned lands, is that the value of rights held by the community is removed from the tax rolls.

Despite these legal intricacies and the financial limitations, there is increasing interest in a wide range of approaches to development rights as a part of the community's land use controls. New approaches include donations, transfers, and other devices in addition to purchase of these rights.<sup>154</sup>

The donation of development rights is a valuable approach in cases

in which landowners are agreed that they would all benefit from restricting or preventing further development. Each owner deeds his rights to a public body or a private nonprofit preservation group. Landowners continue to use their property and can sell it, subject of course to those rights now held by the donee. Such donations can reduce the owner's property taxes and may be deductible as a charitable gift in computing Federal income taxes.

Some development rights donation agreements have been in force for many years. Residents of the Mill Creek Valley in suburban Philadelphia have had an agreement in effect for nearly 35 years; it withstood the pressures of surrounding suburbanization and nearby freeway construction and preserved the natural character of the valley.<sup>155</sup> Large portions of the Brandywine Valley in Delaware and southern Pennsylvania have been similarly set aside as permanent open space.<sup>156</sup> The donation approach has also worked in conservation areas in New England.<sup>157</sup>

Where donation of development rights does not appear possible, a community may wish to purchase and hold development rights when it desires to restrict development to a degree not permissible through regulation. The community can choose the amount of rights it wishes to purchase according to a variety of factors. In the case of some parcels, for example, it may be enough to buy only the rights to higher density development; in other cases, the right to prevent all further development might be purchased. A recent example of this selectivity is the proposed plan for the Brandywine Valley in Chester County, Pennsylvania. This plan calls for the Chester County Water Resources Authority to purchase development rights to the edge of the floodplain of the Brandywine River or to a distance of 300 feet, whichever is greater, and the rights to develop at density greater than 1 house on each 4 acres on wooded or steep slopes.<sup>158</sup>

As with donation of development rights, their purchase is not a new and untested development. Such purchases have been used to protect wetlands and other environmentally critical areas and have also been used extensively around airports.<sup>159</sup> Nevertheless some public officials are still reluctant to purchase development rights on an extensive scale. One criticism is that development rights often cost nearly as much as titles to the land. This is indeed the case where efforts to purchase development rights are initiated after the land has come under the pressure of urbanization; in such circumstances, most of the value of the land derives from its development potential. On the other hand, the State of Wisconsin purchased development rights in rural areas adjacent to the Great River Road along the Mississippi River over 30 years ago for a few cents per front foot; today the road is fully protected from billboards and extensive development.<sup>160</sup>

Another criticism is that the purchase of development rights causes enforcement problems and makes the land difficult to manage.<sup>161</sup> But the Nature Conservancy, which has considerable experience in



the receipt and purchase of such partial estates in land, has found that the landowner continuing to live on the land is the best manager and law enforcement officer of all.<sup>162</sup>

An important new concept is "transferable development rights."<sup>163</sup> Traditional land use controls assume that the development potential of a site may be used only on that site. The new concept proposes to break this linkage between a piece of land and its development potential by permitting the transfer of the development rights to land where greater density will not be objectionable. In freeing the development rights for use elsewhere, the technique would avoid current inequities by enabling the owner of a restricted site to recoup lost economic values by selling the site's development potential.

Under this concept, as it is generally envisioned, all land would initially be assigned the same number of development rights per acre. Then a plan would lay out zones for low, medium, and high density development. Landowners in high density zones, needing more rights in order to build to permitted levels, would buy those rights from landowners in low density zones. Thus the development rights would be bought and sold on an open market. Any landowner could take part, but he could develop his land only to the degree that he had accumulated development rights and only to the extent permitted by



Many land use control devices—zoning, review of development proposals, development rights purchases, land banking, and timed development plans—are available to localities to help direct the pattern and pace of new growth and to reduce its adverse environmental effects.

the zone he was in. Unlike current zoning practices, the boundaries of the zones or the degree of development within a zone could not be changed.

There is still a great deal of uncertainty about the details of how such a system would work and the extent to which it would be associated with more traditional land use controls such as zoning. Some concrete proposals, however, are being developed.<sup>164</sup> Given the gaps in existing research and the obvious problems of implementing poorly conceived transfer programs, extensive investigation, research, and experimentation are necessary before such a system is widely adopted.

The public costs of such a program should be limited to organizing the development rights market and making sure it works. If the rights are transferrable only within a community, the tax base remains constant, for the increased tax payments of the purchaser of development rights will offset the reduced payments of the seller. One substantial benefit for the community is that land from which the development rights are sold is effectively preserved in low density or open space use in private lands without cost to the public.

Transfer of development rights has been attempted on a limited basis by some cities, and it has proven particularly useful in preserving historic buildings in neighborhoods under redevelopment pressure.<sup>165</sup> Such buildings may be saved if the owner can transfer the right to build a higher structure on the site to a nearby property he owns. In this way, he is permitted to build higher on the latter site in return for preserving the lowrise historic building on the former. This assumes, of course, that there are height restrictions in the neighborhood beyond which the developer wishes to build and that a building of such height is not undesirable.

Whether the development rights transfer approach should achieve wider application and even replace zoning and other traditional land use controls may soon become a major topic of debate. At this point, the transfer concept is still in its infancy. As with any other innovation, it will be widely adopted only if it is clearly proved superior to more traditional methods. However, some parts of the development rights transfer concept may prove useful in the long run. They may provide a way to alleviate the unfair "windfall" and "wipeout" effects brought on landowners by current land use controls.<sup>166</sup>

**Land Banking**—Another potential mechanism for public control over development is land banking. This approach involves the acquisition by the community of extensive undeveloped land surrounding the community with subsequent resale of parcels and tracts to developers in a way that effectively controls the rate and pattern of urbanization.

New communities such as Columbia, Maryland, and Irvine, California, demonstrate the simplest form of land banking. The developer acquires a large tract of undeveloped land, prepares a land use plan,

and provides major infrastructure investments such as roads, sewers, and utilities. He then controls development of the community so that the construction of residences, commercial centers, recreational areas, and public facilities are efficiently staged and coordinated. In this way the community developer creates a more orderly growth process and is able at relatively low cost to preserve lands for future public facilities and for open space.

Public land banking schemes, though uncommon in the United States, are used in many other countries. Programs of land acquisition and banking have been implemented in Australia, Canada, Denmark, England, Germany, the Netherlands, Hong Kong, Israel, Norway, and Sweden.

Several examples bear particular mention. The English new towns have been built on land acquired for that purpose by public corporations which undertook the development, planning, land acquisition, and construction.<sup>167</sup> Sweden's municipal land reserves have particularly impressed urban American planners.<sup>168</sup> After World War II, Stockholm undertook a very aggressive program to control the process of urban growth, which resulted in attractive, well-planned suburban communities, separated by green space from the core city and from each other, and efficiently linked by public transportation and highways.

The applicability of much of this foreign experience to the American situation is limited.<sup>169</sup> However, land banking which has been in effect since the 1930's in the Canadian provinces of Alberta and Saskatchewan may be more directly relevant because of the similarity between U.S. and Canadian property laws and traditions. It is interesting to note that a Canadian Government task force studying the Saskatchewan experience found that the prices charged for housing in and around cities using land banking were significantly lower than those around comparable cities that had not adopted such a program.<sup>170</sup>

As with zoning, the economic effects of land banking depend on how it is administered. The act of withholding land from the market should increase land prices.<sup>171</sup> This escalation in land prices is particularly severe during the initial public acquisition of the land. After initial acquisition, land prices are determined essentially by the amount of land released for development. The initial inflationary effect can be avoided by purchasing land sufficiently distant from the urban fringe that it is not yet effectively a part of the urban land market and thus is much less expensive. However, such an approach would prevent land banking from having any significant short-range impact on the urban growth process.<sup>172</sup> The Swedish experience suggests that land for a reserve should be acquired at least three decades in advance of its anticipated development.<sup>173</sup>

Land banking undertaken nearer to urban areas can have a positive effect by assuring the development of previously passed-over parcels. Such parcels, leapfrogged by developers for larger and

cheaper tracts farther out, sometimes amount to a substantial proportion of the total urbanized area. By preventing such leapfrogging, land banking can force the filling in of passed-over land and create more efficient land use patterns, although the financial advantage of banking in advance of urbanization is lost to the public.<sup>174</sup>

There has been some experimentation in land banking in the United States, not only through recent new communities, but also in the creation of a few "greenbelt" towns during the 1930's and government towns such as Los Alamos and Oak Ridge during the 1940's. More important, a number of communities have implemented what amounts to "land banking" by advance acquisition of land later used for schools, open space, and highway corridors. While this does not result in control over large land areas, such policies appear to benefit localities in two ways. Needed land is acquired while it is still cheap, and prior knowledge of such public facility location permits more effective planning and more informed private development decisions.<sup>175</sup>

There remains strong interest in the possible use of more extensive land banking schemes.<sup>176</sup> Two Presidential Commissions, a special Congressional committee, and numerous other official, quasi-official, and private organizations have recently undertaken analyses of the problems of providing for more orderly urban growth.<sup>177</sup> Almost without exception, their reports call for the public acquisition of land in order to reduce the cost of public facilities and to guide and control urban development more effectively.

**No-Growth and Slow-Growth Policies**—As this chapter indicates, the interrelationships of community goals, economic forces, tax policies, and land use controls are extremely complex and little understood. As a result, citizens in many communities share a feeling that the development process is out of control, that decisions are made which benefit only the influential developers' interests, and that piecemeal changes are having an unpredictable cumulative effect on the quality of life.<sup>178</sup>

The reaction in many localities is a strong citizen effort to slow or stop growth. In its most extreme form, communities have decided that they want no more growth and will allow no more development.<sup>179</sup> Such an approach is futile as a long-term solution. Among other problems, it may deny some the right to a reasonable use of their land, a denial which is in violation of the Constitution unless the owner is compensated for his loss by the community. Few communities have the wherewithal to buy out all the development rights surrounding them. Such an approach also tends to have the effect of merely pushing growth elsewhere.

When such flat bans on development have been imposed for unlimited periods, they have run afoul of the courts.<sup>180</sup> On the other hand, there is at least some evidence that in those areas in which a community has imposed a temporary halt on development in order

to plan its future, the courts will be more receptive. In one recent Federal court case, a small town in New Hampshire, faced by a large seasonal home subdivision, rezoned the land to 6-acre minimum lots to halt the project until a town plan could be developed and adopted.<sup>181</sup> In upholding the community's right to call a halt to the development, the court emphasized the temporary nature of the locality's action, the relative size of the proposed development compared to the existing town population, and the fact that the action denied no one housing, since the proposed development was clearly for second homes.

Many communities have imposed moratoria on various phases of development. One recent study found that nearly one-fifth of all local governments surveyed had imposed some type of moratorium, most frequently on building permits.<sup>182</sup> Another type of moratorium often used is on new sewer connections. This is usually done upon the order of state health or water pollution control authorities to prevent overloading of treatment plant capacity. Over 200 such moratoria were in force during 1973.<sup>183</sup> They are generally upheld when challenged in court, being temporary and necessary for compliance with state and Federal water quality laws. There is usually a schedule for the construction of new treatment facilities which provides assurance that the moratorium will be lifted in the foreseeable future.

Some communities, however, have adopted such moratoria in a more open attempt to control rates or patterns of population growth.<sup>184</sup> Although the actions may well limit the amount of growth taking place in one community, that growth will probably occur somewhere else, perhaps with more adverse economic, environmental, and social effects. For example, if the moratorium prevents hook-ups to existing sewers, desirable in-fill development on previously skipped-over land cannot take place. This may contribute to continued urban sprawl by narrowing the development alternatives to single family housing on large lots with septic tanks, usually feasible only in undeveloped areas far from the central city. Alternatively, the moratoria may force developers to install "package treatment systems" which add to the cost of housing in the short run and create substantial maintenance and monitoring costs for the locality in the future.<sup>185</sup> In short, rather than controlling urban development, sewer moratoria can accelerate sprawl.

Sewage treatment moratoria can have other counterproductive impacts as well. For example, in Tacoma, Washington, the State Department of Ecology in May 1971 imposed a ban on further septic tank installation in order to prevent greater pollution of ground and surface water. But during the 4-month delay between the announcement of the ban and its implementation, builders stockpiled septic tank and building permits and built a great many units with septic tanks which might well not have been built otherwise.<sup>186</sup> A related phenomenon occurred in 1970 in Montgomery County, Maryland, when some areas of the county were placed under a moratorium

while others were not. A run on permit applications took place, and the development of the county was distorted by the high amount of construction in the unrestricted areas.<sup>187</sup>

Sewer moratoria can also have a serious effect on low and moderate income groups by tightening the housing market and increasing housing costs, since package plants and septic systems are costly and the latter require large lots.

The difficulties of sewer moratoria are succinctly stated in a report of the County Executive's staff in Montgomery County: "The results [of the moratorium] have been disappointing. The increase in sewage flows has not tapered off. The residential construction rate has actually increased . . . The price of housing, both rental and sale, has risen extraordinarily in recent years, making it increasingly difficult for people in lower and moderate income ranges to obtain housing in the county. The end result is that both water quality and socioeconomic problems have gotten worse."<sup>188</sup>

In contrast to these difficulties with no-growth policies, a number of new concepts of slow growth or timed development have been successfully implemented, usually by small communities with skilled land use planning staffs and progressive elected officials. The general approach of these communities has been to define a rate of expansion compatible with the desires of the community and projected growth of the region and to implement land use strategies to control new construction and direct it to designated areas in such a way that public services can be provided most efficiently.

The Town of Ramapo, New York, is perhaps the best-known example of the timed development approach.<sup>189</sup> The community has established a 17-year plan to accommodate and direct anticipated growth. The community evaluates development proposals on a point system that emphasizes the availability of public services, which are extended in planned stages. While it has been criticized for not providing sufficient low and moderate income housing, the Ramapo plan has been upheld in court as a reasonable exercise of community land use authority.

It is interesting to contrast the Ramapo decision with a recent California decision which threw out the plan of the town of Petaluma for limiting development to annual increments of 500 housing units, holding the plan to be a violation of the Constitutional right to travel.<sup>190</sup> The case is being appealed. Under the Petaluma plan, a competition is held each year to decide which proposed developments should be approved. As in Ramapo, a point system is used to evaluate development proposals. But one distinction worth noting is that the majority of the points in Petaluma are allocated to design and other subjective criteria, while in Ramapo the emphasis is on availability of public services readily identifiable in the plan.

In summary, it may be predicted that the efforts of communities to slow or stop growth will continue and probably spread. Among the important distinctions to be drawn are: (1) whether a proposed halt is temporary or permanent; (2) whether it is part of an attempt

by the community to get a grip on things or simply an effort to stop all growth; and (3) whether it is being done in the face of a relatively large influx of development. Efforts to use sewer moratoria or similar bans to stop growth, because of implementation timetables and enforcement difficulties, have not proven effective and may actually exacerbate some environmental, economic, and social problems. On the other hand, approaches which try to predict and accommodate growth through timed or staged development plans offer considerable promise and evidently can be accomplished within existing police power authority if carefully designed to assure the preservation of property rights.

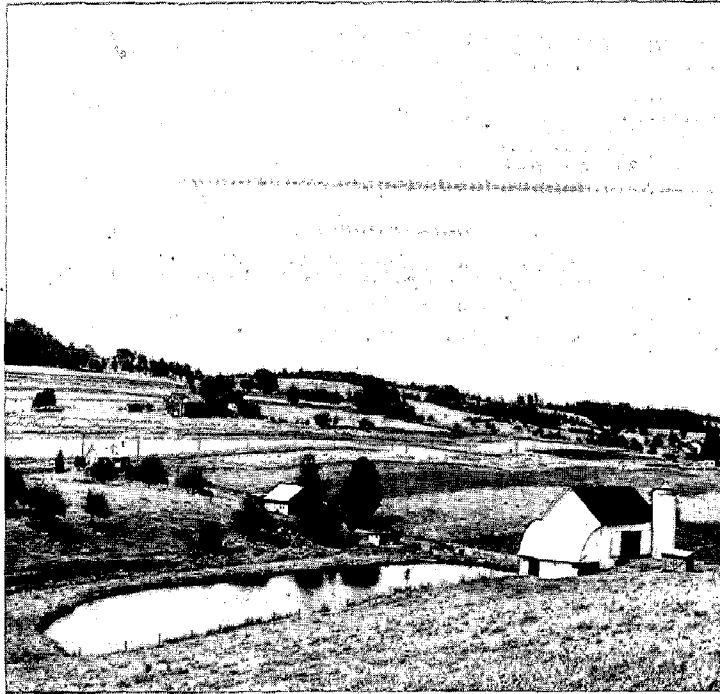
**Preferential Assessment**—Another land use control which has become popular in recent years is preferential tax assessments for certain types of real property. Preferential taxation is a method of lowering the tax burden on land such as farms or forests or historic districts which the community wishes to preserve by assessing at less than its full market value.<sup>191</sup>

Most often, preferential assessment programs are adopted in order to preserve current desirable uses of land.<sup>192</sup> Some states have adopted preferential taxation for reasons of equity after determining that farmers and other owners of open space had been paying higher property taxes in relation to public services received than other landowners.

But preferential taxation appeals to a wide range of groups with different goals, including farmers, environmentalists, large landowners, and even land speculators. As a result, 33 states have already adopted some form of preferential taxation, while others have it under serious consideration. (See Table 7.) However, there is some question as to the effectiveness of preferential taxation in accomplishing the desired goals. The best that can be said is that the effectiveness depends upon the goal sought and how the program is implemented.

Preferential assessment clearly does redistribute income, for it reduces the holding cost of land to the beneficiaries and requires increased taxes on others. Studies in California and Maryland have found that property tax rates may be increased 10 percent or more for property that is not afforded a preferential status.<sup>193</sup> Even if the payment per person is small, the aggregate payment may be large. A New Jersey study estimated that about \$48 million in extra taxes were paid by nonfarmers in 1972 because of the preferential taxation law.<sup>194</sup> Two States, California and New York, recognizing possible loss of local tax revenues, have passed laws instituting reimbursement for localities which suffer a loss as a result of preferential assessment.

Whether or not the transfer of income resulting from preferential assessment is equitable depends upon one's definition of equity, who is paying the increased taxes, and who is receiving the benefits of



Over 30 states have enacted some form of preferential assessment for property taxation in order to protect farmlands, preserve open space, provide for recreation, or help control urbanization.

the lower assessment. Although most laws include some restrictions on who can benefit, the requisites are usually loose enough that any large landowner can qualify. Thus land speculators as well as bona fide farmers find it cheaper to hold land under a preferential taxation program.<sup>195</sup> To the extent that this is the case, preferential taxation may do little to preserve open space or current use. Nevertheless, about 40 percent of a group of New Jersey landowners who participated in a preferential taxation program indicated that it helped in allowing them to continue to farm, and at least one analysis concluded that the scheme did slow the conversion of agricultural land into urban uses.<sup>196</sup>

Studies in other states are less encouraging with respect to the land use impact of preferential assessment. An analysis in California indicated that land included under the State's Williamson Act, was, for the most part, more than 10 miles from the nearest incorporated area.<sup>197</sup> In such cases, farmland is likely to remain undeveloped, regardless of preferential assessment. In order to avoid this problem, some state laws restrict land eligible for preferential assessment to specific areas, which are usually those which are under greatest development pressure and the preservation of which is in keeping with land use plans. (See Table 7, column headed "predesignation.")

Preferential assessment, by lowering the costs of holding lands for future development, can also stimulate leapfrog development on



Table 7

## State Preferential Assessment Programs

State	Eligibility criteria					Conversion controls	
	Agriculture <sup>1</sup>	Forest	General open space <sup>2</sup>	Special <sup>3</sup>	Pre-designation <sup>4</sup>	Rollback penalty <sup>5</sup>	Other penalty <sup>4</sup>
Alaska	•					•	
Arkansas	•	•					
California	•		•		•	•	
Colorado	•						
Connecticut	•	•	•		• <sup>7</sup>		• <sup>8</sup>
Delaware	•	•					
Florida	•		•				•
Hawaii	•	•	•	•		•	•
Illinois	•					•	•
Indiana	•						
Iowa	•				• <sup>9</sup>		
Kentucky	•	•			•	•	
Maine	•	•	•		•	•	•
Maryland	•			• <sup>8</sup>	• <sup>10</sup>	•	
Massachusetts	•	•				•	
Minnesota	•		•	•		•	
Montana	•					•	
New Hampshire	•	•	•		• <sup>11</sup>		• <sup>8</sup>
New Jersey	•					•	
New Mexico	•	•					
New York	•					•	
North Carolina	•	•				•	
North Dakota	•				• <sup>9</sup>		
Oregon	•					•	•
Pennsylvania	•	•	•		•	•	•
Rhode Island	•	•	•			•	
South Dakota	•				• <sup>9</sup>		
Texas	•					•	
Utah	•					•	
Vermont	•						
Virginia	•	•	•		• <sup>12</sup>	•	•
Washington	•	•	•			•	•
Wyoming	•						

<sup>1</sup> Agriculture—in addition to crop land includes pasture, nurseries, horticulture, and apiculture.

<sup>2</sup> General Open Space—includes land used for outdoor recreation in general.

<sup>3</sup> Special—land devoted to a specific category such as golfing, country clubs, and planned development.

<sup>4</sup> Pre-designation—land which has been designated for a particular use by a city, town or county. To receive preferential assessment land must fall within such a designated area and meet other eligibility criteria.

<sup>5</sup> With the rollback penalty, if the land is converted from its preferred use, the

(Continued)

the urban fringe. This form of development is generally more wasteful and more land-intensive than that which is likely to occur naturally.

To meet this problem, most states have established conversion penalties or recapture provisions to reinforce the incentive to preserve the land in its current use. (See Table 7, column headed "conversion control.") These penalties most commonly take the form of a "rollback" or a "deferred payment," requiring the landowner to pay an amount equivalent to several years' worth of tax savings, sometimes with interest, if he develops the land. They can also take the form of a conveyance tax whereby the owner pays some percentage of the land value if he sells his property to a nonfarmer or decides to develop it himself. If such penalties are sufficiently harsh, they will reduce the profitability of developing the land; but they will also reduce participation by landowners in the program.

A step beyond the penalty provision is a requirement that any landowner desiring preferential assessment sign a contract to keep his land undeveloped for a certain number of years. In California, the Williamson Act requires a contract of at least 10 years. It is automatically renewed annually unless either party to the contract requests nonrenewal. If the contract is not renewed, the assessment is gradually increased to the market value as the number of years remaining in the contract decreases. Because the contract effectively restricts those who might seek to sell their land in the foreseeable future, owners near urbanizing areas are less likely to take advantage of the preferential treatment than owners of more remote land. The contract technique is the exception, however. Some other states use informal negotiation between the landowner and government. The vast majority use neither technique but allow any landowner meeting legislated requirements to enlist in and withdraw from the program at his own discretion.

At this point it must be concluded that the various state preferen-

(Continued)

owner is required to pay an amount equal to several years worth of the additional property taxes he would have had to pay had his property not received the benefit of preferential assessment.

<sup>6</sup> "Other Penalty" is usually the assessment of interest charged on the rollback penalty.

<sup>7</sup> In Connecticut, open space land must be recommended for preservation and designated open space by a municipality's planning commission in its plan of development.

<sup>8</sup> Connecticut and New Hampshire have adopted a tax, similar to a conveyance tax, which is imposed at the time the land use is changed.

<sup>9</sup> In Iowa and North Dakota the land must be within the limits of a municipal corporation and in South Dakota it must be within a school district.

<sup>10</sup> In Maryland, the land to be assessed and taxed as planned development land must be in an area covered by a current master plan or otherwise designated as a satellite city or town.

<sup>11</sup> Open space must be pre-designated by a town or city, and floodplains by the Flood Plain Commission.

<sup>12</sup> In Virginia the land must be designated for its use (as agricultural land, timber land, etc.) in a town or county land use plan.

Source: Economic Research Service, U.S. Department of Agriculture, *State Programs for the Differential Assessment of Farm and Open Space Land* (1974).

tial assessment programs have had mixed results, at best, in achieving their objectives. Because of the popularity of this land use control technique and the controversy over how it can be made more effective, the Council has contracted with the University of Pennsylvania to undertake an evaluation of preferential assessment as it is now being carried out by states and to develop recommendations on improving its effectiveness as a growth control mechanism.

**Open Space as a Land Use Control**—Traditionally, open space has been considered a beneficial public expenditure in itself; there has always been substantial interest in preserving open space for visual amenity, outdoor recreation, natural resource conservation, flood prevention, and preservation of agricultural lands. But it is also recognized as a mechanism for the containment and guidance of growth.<sup>198</sup> The purpose of greenbelts, long used in England and other foreign countries, was to contain urban growth by preserving a belt of open space around the city.<sup>199</sup> But this approach was thought by Americans to be too costly.

The United States, of course, has never had a shortage of open space. The basic issue has been its location with respect to urban areas—the amount of open space that should be set aside and preserved within or near cities.<sup>200</sup> The proposal to preserve large wedges of open space in metropolitan areas has had some support in this country.<sup>201</sup> Such wedges serve to direct urban growth into corridors radiating from the central city. These corridors enable more efficient allocation of mass transit and other services than typical sprawl development. But few cities have been able to implement such plans.

Of the several methods for preserving open space, the most straightforward is public acquisition by which government takes title to the land and provides public access. But public acquisition has certain limitations. It is costly; it removes land from the tax base; it brings operation and maintenance costs; and it assumes that all open space should be put into public use. For these reasons, communities are turning to other techniques to supplement the purchase of land where public access or full public ownership does not appear necessary or even desirable.

The concepts of development rights and preferential assessment discussed above may help to accomplish this goal. These and similar devices can be used to acquire necessary rights through donation, purchase, or transfer to other land. In addition, many jurisdictions are finding that certain tracts can be preserved from development without public acquisition because they are in areas such as floodplains, where development would endanger human life, and thus fall under the police power authority to regulate land use for the public welfare.<sup>202</sup>

If the land must be purchased outright, the budget may allow only the acquisition of land which is remote from urban areas, not read-

ily accessible, and often not very attractive. The "best land," that is, the most suitable in terms of the community's needs, tends to be expensive. Nevertheless, a case can be made for buying it. There is increasing evidence that open space preservation is economically beneficial to all—the developer, the resident, and the local government.

Developers in increasing numbers are coming to understand this. If a developer "creates an outstanding environment, saves the trees, has a good street pattern, and then adds a pool and a modest recreation area, he might easily get \$500 to \$1,000 more per house than he would in an ordinary subdivision."<sup>203</sup> Developers who preserve open space and natural cover on one project often find it so successful that in their next development they tend to provide even more.<sup>204</sup>

The development of park facilities generally increases the value of surrounding realty; there is even some evidence that the increase in tax revenue can more than pay for the cost of the parks.<sup>205</sup> It is common practice throughout the United States for appraisers representing the Federal Housing Administration to place a higher value on house lots if the development contains a park or if it is near a public park.<sup>206</sup> Moreover, "today's home buyer is looking for features beyond the confines of the house and lot. . . . In the vicinity of park and recreation areas enhanced values of building sites up 15 to 20 percent . . . are not uncommon experiences."<sup>207</sup>

Individual case studies offer striking examples of the value of open space and parks. The classic study in Elizabeth, New Jersey, covering the period 1922 to 1939, showed that the assessed value of properties within a quarter-mile of the Warinano Park increased over six times while assessments in the city as a whole increased only two and one-half times.<sup>208</sup> Another study done in Oakland, California, compared two similar neighborhoods near parks and found that the mean assessment of property adjacent to the parks was from \$500 to over \$1,000 more than land a block or two away.<sup>209</sup> The study concludes that "parks do hold the value of their surrounding lands. Not only do parks influence assessed valuations, they also have an effect on how residents perceive their neighborhoods, and consequently a pride in the area is fostered by the presence of a park."<sup>210</sup>

A community gains other economic benefits from open space programs. Land set aside as open space will not have to be supplied with public service infrastructure. To the extent that open space directs and compacts development, the savings to the community are large. In a study done of the San Francisco Bay area, it was estimated that a carefully planned regional open space program, by reducing sprawl and channeling development, could reduce the growth of the city in coming decades by 327 square miles. The study estimated that reduced municipal costs for installation and maintenance of services such as roads, water, gas, and electricity would save \$318 million; it concluded that the total cost savings would

be of the same order of magnitude as the cost of purchasing the land.<sup>211</sup>

The timing, degrees of control purchased, and location of the open space appear to be the most crucial factors determining success in using open space as a growth control device. If too much of the wrong kind of land in the wrong place is preserved, the result may be no more than a few parks surrounded by poorly planned communities. Presumably the most suitable land for preservation is that land which fulfills the greatest number of open space functions. But often, as mentioned earlier, the land which is most suitable for and most in need of preservation is also the most expensive.<sup>212</sup> The resolution of this dilemma is not easy.

### **Controls as Stimulants**

A theme which consistently reappears throughout this section is that controls can, under particular circumstances or if instituted in particular ways, have effects contrary to the purpose for which they were adopted.

Limiting growth in one community may only push it to a less desirable location; the adoption of a preferential taxation scheme to preserve open space may primarily benefit land speculators; and sewer moratoria may result in more septic tanks causing more water pollution. Any of these actions taken to better control land development or improve environmental quality, if done wrong, can have the opposite effect. Just as the stimulants discussed in the second section of this chapter can be used as land use controls if they are properly planned and staged, the controls discussed in this section can become stimulants.

Once this interrelationship is understood—that stimulants like highways and sewers can be used to control growth, and that controls like zoning and preferential assessment can be used to stimulate the development of certain areas—a community can begin to formulate a strategy for land use regulation. Not all the stimulants will be under its authority; localities have little say about interstate highways or Federal tax policies, for example. And not all of the possible control mechanisms will be feasible, but at least some will be available. By using legal authority in these ways, most communities should be able to overcome uncertainty and frustration over growth and replace it with more confidence in the ability to influence where, how, and when development will occur.

### **Conclusion**

This chapter has identified and briefly discussed some of the major land use issues that the United States faces today. The focus is on issues of land development, particularly in urbanizing areas. Less

attention has been given to other important land use questions, including the definition and protection of "critical environmental areas," the preservation of wilderness areas, and the land use impacts of U.S. agricultural policies.

But the chapter has provided some indication of the importance and complexity of land use as an environmental issue. It shows how stimulants to growth can become controls of growth; how land use controls act as stimulants to development; and how pollution control programs may result in land use changes that in turn tend to increase pollution. Many actions undertaken with the best of intentions may, because of the way they affect the land, result in land use changes that are perverse in terms of the original goals.

The way in which some of these factors interact can be seen by looking at the relationship between automobile use and land use. We seem to have become an auto-dependent nation. There are many reasons why this has occurred, starting with the development of a new technology which made autos available to nearly everyone and allowed people much greater flexibility in their travel habits and their choice of residential location. Given our general preference to live in rural areas adjacent to urban centers, people who could afford to do so moved out of town and commuted to work. This made the city a less attractive place to live as cars with their pollution, congestion, and noise increasingly disrupted the stability of residential neighborhoods they passed through. These effects, combined with increasing social and economic problems in the central city (both also linked to the departure of the more affluent residents to the suburbs), accelerated the exodus, and more and more people moved farther and farther out, driving longer and longer distances in order to obtain their small piece of rural life.

As the suburbs attempted to adjust to this trend, they found it was necessary to require more parking, wider streets, and greater separation of congestion-inducing facilities in order to accommodate the automobile and to mitigate its adverse effects on residential areas. All of these adjustments, of course, resulted in more auto use. It is not uncommon now for the suburbanite to have to drive several miles to buy a loaf of bread.

This is not to say that we are wed to ever-expanding metropolitan sprawl. In fact, recently there have been some signs that this trend may be slowing and perhaps even reversing itself. Mass transit ridership is up in many metropolitan areas. People are returning to the central city, as noted in the CEQ's 1973 Annual Report. In mid-1974, whether because of high gasoline prices, limited availability of mortgages, or a deeper change in values, the market for development on the urban fringe and for leisure homes is slowing somewhat. The overall effect, taken with efforts to control air and water pollution and better land use controls at the local level, has been the emergence of significant new opportunity to look at how growth and change can best be accommodated.

This opportunity to look at some new trends in our cities, metropolitan areas, and rural regions comes at an appropriate time, when many Americans are questioning the inherent value of growth and when the desire for the new and for changes in surroundings is being balanced by a growing appreciation for the old and for the value of having roots in a definable community. It is easy to see that this attitude is expressed quite readily at the local level, where communities are deciding how to accommodate growth and change in land use from new development, especially at the urban fringe and in areas conducive to seasonal homes.

This chapter, it is hoped, throws some light on how communities can come to grips with these forces by understanding the long-term implications of development alternatives, by using public service infrastructure extensions and other growth stimulants intelligently to channel and pace growth, and by developing fair and effective land use regulatory controls. It goes without saying that all these approaches are governments' response to a free enterprise system in which the primary factors determining where, how, when, and what development takes place are the general state of the economy, people's preferences and values, and the costs of development to the builder. Governmental actions can influence decisions, but the private sector is the force that responds with capital and the desire to invest it.

Any progress toward better land use must therefore be measured not in terms of the sophistication of legal devices or the complexity of approval mechanisms developed by different levels of government. What is important is how such controls and stimulants can be used to influence the private sector in its decisions about how to use the land. The way this is done will necessarily differ from state to state, and from locality to locality. An informed public that understands the process of urbanization and what can be done to reasonably control it through legal and equitable land use planning and regulation has taken a major step in the right direction.

## References

1. Steve Carter et al., *Environmental Management and Local Government*, prepared by International City Management Association for Environmental Protection Agency under contract No. EPA-600/5-73-016 (Washington, D.C.: U.S. Government Printing Office, 1974).
2. U.S. Bureau of the Census, *Census of Population and Housing: 1970, General Demographic Trends for Metropolitan Areas, 1960 to 1970*, Final Report PHC(2)-1 (Washington: U.S. Government Printing Office, 1971), p. U.S. 1-33 and p. 15.
3. Grace Milgram, *U.S. Land Prices—Direction and Dynamics*, National Commission on Urban Problems Research Report #13 (Washington, D.C.: U.S. Government Printing Office, 1971), pp. 1-23.
4. Council on Environmental Quality, *Environmental Quality: the Fourth Annual Report of the Council on Environmental Quality* (Washington, D.C.: U.S. Government Printing Office, 1973), pp. 295-320.

5. Real Estate Research Corporation, *The Costs of Sprawl: Environmental and Economic Costs of Alternative Residential Development Patterns at the Urban Fringe*, prepared by the Real Estate Research Corporation for the Council on Environmental Quality; the Office of Policy Development and Research, Department of Housing and Urban Development; and the Office of Planning and Management, Environmental Protection Agency (Washington, D.C.: U.S. Government Printing Office, 1974). The study is in 3 parts: *Executive Summary*, *Detailed Cost Analysis*, and *Literature Review and Bibliography* (analyses, indexes and cross references approximately 1,000 publications). Parts are referred to below by short title.
6. The operating and maintenance costs do not include either the costs of maintaining the residential structures (although the operating costs for utilities comprise a substantial portion of this cost), the financing costs for the capital investments that have been made, or the costs of operating automobiles.
7. Development Research Associates, *The Case for Open Space*, prepared by Development Research Associates for People for Open Space in the San Francisco Bay Area (Los Angeles: Development Research Associates).
8. J. Richard Recht and Robert J. Harmon, *Open Space and the Urban Growth Process: An Economic Evaluation Using a Growth Allocation Model*, Research Report 31 (Berkeley: Institute of Urban and Regional Development, 1969). The economic costs of the open space preservation were assumed to be the market price of the land plus maintenance costs. The economic benefits were calculated as the savings in electric, gas, and telephone utilities, the cost of various government services, recreation benefits, and rent revenues for the lands that were preserved. Savings in sewer and transportation costs were not included as benefits.
9. See, for example, Charles E. Little, *Challenge of the Land*, (New York: Open Space Action Institute, Inc., 1968) and the section of this chapter on controls.
10. See, for instance, San Diego City/County Economic Analysis Project, *The Economics of Urbanization* (San Diego: Environmental Development Agency, 1973); Boulder Area Growth Study Commission, *Exploring Options for the Future: A Study of Growth in Boulder County* (Boulder: Boulder Area Growth Study Commission, 1973).
11. *The Cost of Sprawl, Detailed Cost Analysis*, p. 8.
12. See, for instance, Brian J. Berry et al., *Land Use, Urban Form and Environmental Quality*, prepared for the Office of Research and Development of the Environmental Protection Agency (Chicago: Department of Geography, University of Chicago, 1974); Alan M. Vorhees and Associates, Inc., *A Guide for Reducing Air Pollution Through Urban Planning*, prepared for the Office of Research and Development of the Environmental Protection Agency (National Technical Information Service #207510, 1971); Alan M. Vorhees and Associates, Inc., *Air Quality Considerations in Transportation and Urban Planning: A Five-Year Program Guide*, prepared for the Office of Air Programs, Environmental Protection Agency (National Technical Information Service #PB207111, 1970); Edward J. Kaiser et al., *Promoting Environmental Quality Through Urban Planning and Controls*, prepared for the Office of Research and Development, Environmental Protection Agency, Report Number EPA-600/5-73-015 (Washington, D.C.: U.S. Government Printing Office, 1974), pp. 376, 378, 380, 387.
13. R. C. Burriss et al., *Land Use Planning for Air Quality in the Pikes Peak Area*, prepared by Kaman Sciences Corporation for the Pikes Peak Area Council of Governments (Colorado Springs: Pikes Peak Area Council of Governments, 1972).



14. Anne M. Vitale and Pierre M. Sprey, *Total Urban Pollution Loads: The Impact of Storm Water*, study done by Enviro Control, Inc. for the Council on Environmental Quality (National Technical Information Service No. PB-213-730, 1974).
15. Sanitary sewage pollutants indicated are those remaining after tertiary treatment of the sewage. With only secondary treatment, which is more common, the volume of pollutants would be increased 5 to 10 times.
16. Brian Berry *et al.*, *supra* note 12, at 226, 258-259; Clifford R. Bragdon, "Noise Control in Urban Planning," *Journal of the Urban Planning and Development Division*, American Society of Civil Engineers 99: 15-23, March 1973; Samuel R. Lane, *Freeway and Highway Traffic Noise: An Information Base for Urban Development Decisions*, prepared by the Urban Mass Transportation Study, School of Architecture and Urban Planning University of California, Los Angeles for the Urban Mass Transportation Association (NTIS No. PB204-434).
17. Brian Berry, *supra* note 12, at 413.
18. *Id.*, p. 424.
19. Alan M. Vorhees and Associates, Inc., *Reston Transportation Study*, prepared by Alan M. Vorhees and Associates, Inc. for the Urban Mass Transportation Administration (NTIS No. PB197-836, 1970); John B. Lansing *et al.*, "Planned Residential Environments" (Ann Arbor: Institute for Social Research, University of Michigan, 1970).
20. Salvatore J. Bellom *et al.*, *Factors, Trends and Guidelines Related to Trip Length*, National Cooperative Highway Research Program Report 89 (Washington, D.C.: Highway Research Board, 1970); Wilfred Owen, *The Accessible City*, (Washington, D.C.: The Brookings Institution, 1972).
21. *The Costs of Sprawl: Detailed Cost Analysis*, *supra* note 5 at 146; F. P. Linaweaver *et al.*, "Summary Report on the Residential Water Use Research Project" *American Waterworks Association Journal* 3: 267-282, 59, March 1967.
22. *The Costs of Sprawl: Detailed Cost Analysis*, *supra* note 5 at 148-151.
23. Real Estate Research Corporation, *supra* note 5 at 152-153; William T. Baker, "An Evaluation of the Traffic Conflicts Technique," *Highway Research Record #384 Traffic Record* (Washington: Transportation Research Board, 1972); J. A. Fee *et al.*, *Interstate System Accident Research Study—I*, prepared for the Federal Highway Administration (Washington: U.S. Government Printing Office, 1970).
24. *The Costs of Sprawl: Detailed Cost Analysis*, *supra* note 5 at 50 and 76-77; John Lansing *et al.*, *supra* note 19.
25. *The Costs of Sprawl: Detailed Cost Analysis*, p. 154; Oscar Newman, *Defensible Space: Crime Prevention through Urban Design* (New York: MacMillan Company, 1972); Southern California Association of Governments, *Handbook of Crime Prevention Bulletins—Crime Prevention through Physical Planning* (Los Angeles: Southern California Association of Governments, 1971).
26. The Commission on Population Growth and the American Future, *Population Distribution and Policy*, Vol. 5. (Washington, D.C.: U.S. Government Printing Office, 1972), p. 620.
27. But costs *per acre developed* may increase. Most of the above results pertain to the costs of providing a given number of dwelling units. *The Costs of Sprawl* also includes an analysis of the costs of developing a given parcel of land, in which the number of dwelling units constructed on a site increases with the higher density neighborhood types. Because there are more dwelling units, the economic and several environmental costs associated with development of a given site tend to increase with the higher density development patterns, even though the cost per dwelling units decreases.

28. New Jersey County and Municipal Government Study Commission, *Housing and Suburbs: Fiscal and Social Impact of Multi-Family Development* (Trenton: New Jersey County and Municipal Government Study Commission, 1974).
29. Richard L. Ragatz Associates, Inc., *Recreational Properties: An Analysis of the Markets for Privately-Owned Recreational Lots and Leisure Homes*, prepared by Richard L. Ragatz Associates, Inc. for the Council on Environmental Quality, the U.S. Department of Housing and Urban Development, and the Appalachian Regional Commission, National Technical Information Service, PB-233 148/AS (Springfield, Va., 1974).
30. A study in preparation by the American Society of Planning Officials with the assistance of the Conservation Foundation, the Urban Land Institute, and Richard Ragatz, University of Oregon. It will be made available through the Council on Environmental Quality, the U.S. Department of Housing and Urban Development or the U.S. Government Printing Office.
31. William E. Shands, *The Subdivision of Virginia's Mountains: The Environmental Impact of Recreational Subdivisions in the Massanutten Mountain-Blue Ridge Area, Virginia—A Survey and Report*, prepared by Central Atlantic Environment Center for the Council on Environmental Quality and the U.S. Department of Housing and Urban Development (Washington, D.C.: Central Atlantic Environment Center, 1974).
32. Council on Environmental Quality, *Environmental Quality: The First Annual Report of the Council on Environmental Quality* (Washington: U.S. Government Printing Office, 1970), p. 193.
33. R. B. Rainey, Jr., *Seattle's Adaptation to Recession*, prepared by The Rand Corporation and the Institute of Governmental Research of the University of Washington for the National Science Foundation under contract No. GI-29763 (Santa Monica: Rand, 1973); Roger Bolton, *Defense Purchases and Regional Growth* (Washington, D.C.: The Brookings Institution, 1966); Gerald Breese *et al.*, *The Impact of Large Institutions on Nearby Areas* (Beverly Hills: Sage Publications, 1970).
34. A study in preparation by the National Park Service and the Office of Environmental Affairs of the U.S. Department of Transportation, Study of Transportation Alternatives to Parks, Recreation Areas, Historic Sites, and Wildlife Refuges, to be available through the National Park Service and the Office of Environmental Affairs of the U.S. Department of Transportation.
35. See, for instance, Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961); Martin Anderson, *The Federal Bulldozer* (Cambridge: MIT Press, 1964).
36. See, for example, Stephen Gurko, "Federal Income Taxes and Urban Sprawl" *Denver Law Journal* v. 48:329, 1972; and Richard E. Slitor, *The Federal Income Tax in Relation to Housing*, prepared for the National Commission on Urban Problems (Washington, D.C.: U.S. Government Printing Office, 1968).
37. Internal Revenue Code Sections 163 and 164.
38. Internal Revenue Code Section 167.
39. Bruce Leppla, Tax Incidents Contributing to the Growth of Condominium and Cooperative Housing: A Summary of Recent Developments, prepared by the Urban Institute for the Council on Environmental Quality under contract No. EQ4ACO31 (mimeograph).
40. Internal Revenue Code Section 167(a)(-1).
41. Internal Revenue Code Section 167(a)(b)(c).
42. Stanley W. Penn, *Wall Street Journal*, July 17, 1961; R. Slitor, *supra* note 36 at 38; Paul B. Anderson, *Tax Factors in Real Estate Operations* (Englewood Cliffs: Prentice Hall, Inc., 1956).

43. Council on Environmental Quality, *The President's 1973 Environmental Program* (Washington, D.C.: U.S. Government Printing Office, 1973), pp. 305-318.
44. Stephen Gurko, *supra* 36 at 346; John A. Prestbo, "Sprawl of Cities Stirs Fears that Agriculture will Run out of Space," *Wall Street Journal*, July 20, 1971, p. 1, col. 6.
45. R. L. Ragatz, *supra* note 29.
46. Internal Revenue Code Section 167(a)(1)(2); Internal Revenue Code Section 162(a)(2).
47. Internal Revenue Code Section 1014(a).
48. Land Use Center, A Proposal for Investigating the Land Use Effects of Federal Tax Policy, prepared by the Land Use Center of the Urban Institute for the Council on Environmental Quality, 1974 (mimeograph.)
49. For general background concerning the valuation of open land at full market value see the *Congressional Record*, S8981-S8986, May 28, 1974.
50. *Congressional Record*, S3541, May 28, 1974. This bill would value historic places, farmland, woodland, and open space lands at their current use value.
51. Richard E. Slitor, Taxation and Land Use, paper delivered before the Forty-Fifth meeting of the American Assembly on Land Use in America held at Arden House, Harriman, N.Y., April 18, 21, 1974. Proceedings in publication.
52. 42 U.S.C. 1857 *et seq.*, as amended by the Air Quality Act of 1967, P.L. 90-148; by the Clean Air Act Amendments of 1970, P.L. 91-604; by Technical Amendments to the Clean Air Act, P.L. 92-157, Nov. 18, 1971; and by P.L. 93-15, April 9, 1973.
53. 33 U.S.C. 1151 *et seq.*
54. For a similar analysis of land use patterns resulting from ambient air quality, new source, and non-degradation regulations, see F. Bosselman et al., "EPA Authority Affecting Land Use," report submitted to the Environmental Protection Agency under contract number 68-01-1560, March 12, 1974.
55. 40 CFR 51.14.
56. 40 CFR 52.22.
57. 40 CFR 52.21.
58. 40 CFR 60 § 60.1 *et seq.*
59. 40 CFR 51.1 *et seq.*
60. A concurring analysis projects energy facility siting, particularly mine-mouth location on major coal resources, in the western states. Harbridge House, Inc. "Key Land Use Issues Facing EPA," report prepared for the EPA Office of Planning and Evaluation by Harbridge House, Inc. (February 1974).
61. *Supra* note 55.
62. At a time when we have recognized that energy supplies are scarce, it is also disturbing that the regulations could in the long run result in a relative increase in energy consumption.
63. Under the proposed regulations the facilities that are to be reviewed within the SMSA's for impact include: new roads and highways expected to carry an average daily traffic volume of 20,000 or more vehicles per day within 10 years of construction, and modified roads expected to increase existing average daily traffic volume by 10,000 vehicles or more; and any new or modified airports expected to increase scheduled operations by 50,000 aircraft per year or have an increase of 1.6 million or more passengers per year; any new facility which includes parking for 1,000 cars or more or any modified parking facility which increases parking capacity by 500 cars or more. Outside SMSA's, facilities that are to be reviewed for impact include those having new parking capacity of 2,000 or more cars or modified capacity of 1,000 cars. For an analysis of

- the impacts of each type of facility (shopping centers, sports stadiums, airports and highways, parking lots, and garages, recreational centers and environmental parks, and commercial or industrial development) see Harbridge House, Inc., *supra* note 60.
64. Even if no modifications of the plan are required of the developer, the time involved in obtaining a permit will add to the cost of developing facilities which are covered by the regulations. The importance of the time factor has been supported by initial findings on developer decision-making in a study on the effects of complex source regulations on the development process undertaken by Harbridge House, Inc. for EPA, *supra* note 60.
  65. 40 CFR 51 and 52.
  66. 39 Federal Register, 37419 (1974).
  67. See *supra* notes 52 and 53.
  68. P.L. 92-500, Sections 301-303, October 18, 1972.
  69. *Ibid.*
  70. P.L. 92-500, Section 208(b)(2)(C)(iii).
  71. Anne M. Vitale and Pierre M. Spres, *supra* note 14.
  72. This is indeed the major thrust and conclusion of the Bosselman study, *supra*, note 54, at 183-184.
  73. Environmental Impact Center, Inc., *Review and Bibliography of Secondary Impacts of Major Investments: Highways, Mass Transit, Interceptor Sewers*, prepared by Environmental Impact Center, Inc., for the Council on Environmental Quality (Newton, Mass.: Environmental Impact Center, Inc., 1974).
  74. Grace Milgram, *The City Expands: A Study of the Conversion of Land from Rural to Urban Use, Philadelphia, 1945-62*, prepared by the Institute for Environmental Studies, University of Pennsylvania for the U.S. Department of Housing and Urban Development (Washington, D.C.: U.S. Government Printing Office, 1967).
  75. Jeffrey Stansbury, "Suburban Growth—A Case Study," *Population Bulletin* 28: 1-31, February, 1972.
  76. John Promise and M. Leiserson, "Water Resources Management for Metropolitan Washington: Analysis of the Joint Interactions of Water and Sewage Services, Public Policy and Land Development Patterns in an Expanding Metropolitan Area," prepared by the Metropolitan Washington Council of Governments for the Environmental Protection Agency and the U.S. Department of Interior (1973).
  77. U.S. Environmental Protection Agency Region III, Final Environmental Impact Statement Bethany Beach Regional Wastewater Treatment Plant 3-MGS-FS-D-1, (Philadelphia: U.S. Environmental Protection Agency Region III, 1972).
  78. *Supra* note 73.
  79. U.S. Environmental Protection Agency Region III, Draft Environmental Impact Statement: Valley Forge Area Wastewater Treatment Facility, Chester County, Pennsylvania (Philadelphia: U.S. Environmental Protection Agency Region III, 1973).
  80. Federal Highway Administration, "Social and Economic Effects of Highways," prepared for the Office of Program and Policy Planning, Federal Highway Administration, U.S. Department of Transportation (Washington, D.C.: U.S. Government Printing Office, 1974).
  81. Economic Research Service of the U.S. Department of Agriculture, "Our Land and Water Resources," Miscellaneous Publication #1290 (Washington, D.C.: U.S. Government Printing Office), table 9 on p. 10.
  82. Alexander J. Bone, "Economic Impact of Massachusetts Route 128," MIT Transportation Engineering Division, Cambridge, Massachusetts, 1958.
  83. L. F. Wheat, "Effect of Modern Highways on Urban Manufacturing Growth," *Highway Research Record*, Number 277 (1969); Gary

- Fromm, (ed.) *Transport Investment and Economic Development*, (Washington, D.C.: The Brookings Institution, 1965).
84. D. A. Grossman and M. R. Levin, "Area Development and Highway Transportation," *Highway Research Record*, Number 16 (1963), 24-31.
  85. William K. Kinnard and Z. S. Malinowski, *Highways as a Factor in Small Manufacturing Plant Location Decisions*, University of Connecticut, August, 1961; E. Y. Kiley, "Highways as a Factor in Industrial Location," *Highway Research Record*, Number 75 (1965); D. J. Bowersox, "Influence of Highways on Selection of Six Industrial Locations," Highway Research Board, Bulletin 268, 1960, pp. 13-28; Eva Mueller, A. Wieken, and M. Wood, *Location Decisions and Industrial Mobility in Michigan*, University of Michigan, Institute for Social Research, 1961.
  86. Edmond L. Kanwit and A. F. Eckardt, "Transportation Implications & Employment Trends in Central Cities and Suburbs," *Highway Research Record*, Number 187 (1967), pp. 1-14.
  87. Real Estate Research Corporation, *Highway Networks as a Factor in the Selection of Commercial and Industrial Locations*, prepared for the U.S. Bureau of Public Roads, U.S. Department of Commerce, 1958; Edgar M. Horwood and Ronald R. Boyce, *Studies of the Central Business District and Urban Freeway Development* (Seattle: University of Washington Press, 1959).
  88. Iowa State Highway Commission, *Newton Economics Study, Interstate 80 Bypass*, 1966 NTIS (PB-173-169); David K. Witherford, "Highway Impacts on Downtown and Suburban Shopping," *Highway Research Record*, November 187 (1967), pp. 15-20.
  89. William L. Garrison, B. J. L. Berry, D. F. Marble, J. D. Nystuen, and R. L. Morrill, *Studies of Highway Development and Geographic Change* (Seattle: University of Washington Press, 1959).
  90. D. K. Witherford, *supra* note 88.
  91. Julia A. Connally, *The Socio-Economic Impact of the Capital Beltway on Northern Virginia* (Charlottesville: Bureau of Population and Economic Research, University of Virginia, 1968); Walter C. McKain, *The Connecticut Turnpike—A Ribbon of Hope* (Storrs: University of Connecticut Agricultural Experiment Station, 1965); W. G. Adkins, "Land Value Impacts of Expressways in Dallas, Houston, and San Antonio, Texas," *Bulletin* 227, Highway Research Board, 1959, pp. 50-65; Donald D. Carroll, I. R. Borchert, I. Schwinder, and P. M. Raup, *The Economic Impact of Highway Development Upon Land Use and Value: Development of Methodology and Analysis of Selected Highway Segments in Minnesota* (University of Minnesota, 1958); J. H. Lemly, "Changes in Land Values along Atlanta's Expressway," *Bulletin* 227, Highway Research Board, 1959, pp. 1-20; University of Kentucky, *The Effects of the Louisville Watterson Expressway on Land Use and Land Value* (Lexington: University of Kentucky, 1960); Allen Philbrick, *Analyses of the Geographical Patterns of Cross Land Uses and Changes in Numbers of Structures in Relation to Major Highways in the Lower Half of the Lower Peninsula of Michigan* (East Lansing: Michigan State University, 1969); P. D. Cribbins, W. T. Hill, and H. O. Seagraves, "Economic Impact of Selected Sections of Interstate Routes on Land Value and Use," Number 75, Highway Research Board, 1965, pp. 1-31; F. Chapin, Jr., "A Model for Simulating Residential Development," *Journal of the American Institute of Planners* XXXI, pp. 120-125.
  92. J. A. Connally, *supra* note 91; Wilbur Smith & Associates, Inc., *Maryland Capital Beltway Impact Study: Final Report, Washington SMSA and Maryland Counties*, prepared for the Maryland State Roads Commission, June 1968.

93. J. H. Lemly, *supra* note 91.
94. Julia A. Connally, *supra* note 91; University of Kentucky, *supra* note 91; and J. H. Lemly, *supra* note 91.
95. W. C. McKain, *supra* note 91; W. D. Adkins, *supra* note 91; Donald D. Carroll et al., *supra* note 91; P. D. Cribbins, et al., *supra* note 91; University of Kentucky, *supra* note 91; F. Chapin, *supra* note 91.
96. Julia A. Connally, *supra* note 91.
97. Donald D. Carroll et al., *supra* note 91; University of Kentucky, *supra* note 91; Allen Philbrick, *supra* note 91; and F. Chapin, Jr., *supra* note 91.
98. Brian J. Berry et al., *supra* note 12; Barbara R. Williams, *St Louis: A City and its Suburbs*, prepared by the Rand Corporation for the National Science Foundation under grant no. GI-29763 (Santa Monica: Rand Corporation, 1973).
99. Julia A. Connally, *supra* note 91.
100. U.S. Federal Highway Administration, *supra* note 80.
101. Interdisciplinary Systems Group, *Land Use, Energy Flow and Decision-making in Human Society: Transportation in a Suburban Area: A Case Study of the Northeast Sacramento County Area*, prepared by the Interdisciplinary Systems Group, University of California, Davis for the National Science Foundation under contract No. NSF GI-27 (Davis: University of California, 1973).
102. G. Warren Hennan, "The Economic Effect of Rapid Transit on Real Estate Development," *The Appraisal Journal*, 36: 213-224 (April 1968).
103. San Francisco Planning and Urban Renewal Association, *Impact of Intensive High-Rise Development in San Francisco: An Evaluation of Alternate Development Growth Strategies*, 4 vols., prepared by the study team of Urban Economics Division of Larry Smith & Company, Inc., Keyser/Marston & Associates, David M. Dornbusch & Company, Inc., and Kaplan & McLaughlin Architects & Planners for San Francisco Planning and Urban Renewal Association with funds provided by the U.S. Department of Housing and Urban Development, the San Francisco Foundation, and the Mary A. Crocker Trust (San Francisco: San Francisco Planning and Urban Renewal Association, 1973).
104. Colin A. Gannon et al., *The Impact of Rail Rapid Transit Systems on Commercial Office Development: The Case of the Philadelphia Lindenwood Speedline*, University of Pennsylvania, June 1972.
105. The Colorado Department of Natural Resources is overseeing the following studies on the various impacts of oil shale development: C. Wayne Cook, *Surface Rehabilitation of Land Disturbances Resulting from Oil Shale Development*, prepared by the Environmental Resources Center for the Colorado Department of Natural Resources (Ft. Collins: Environmental Resources Center, 1974) under contract No. 2656; *Report on Economics of Environmental Protection for a Federal Oil Shale Leasing Program*, prepared by A Special Committee of the Governor's Oil Shale Advisory Committee for the Director of Natural Resources of the State of Colorado; *Report on Economics of Environmental Protection for a Federal Oil Shale Leasing Program*, prepared by a subcommittee of Governor John A. Love's Oil Shale Advisory Committee, the Special Committee on Economics of Environmental Protection, for the Director of Natural Resources of the State of Colorado (Denver: Colorado State Department of Natural Resources, 1970); THK Associates, Inc., *Impact Analysis and Development Patterns for The Oil Shale Region: Mesa, Garfield and Rio Blanco Counties, Colorado* prepared by THK Associates, Inc. for the Colorado West Area Council of Governments and the Oil Shale Regional Planning Commission (Denver: THK Associates, Inc., 1974); John F. Ficke et al., *Hydrologic Data From the Piceance Basin, Colorado*, Colorado Water Resources Basic-Data Release No. 31, prepared by the U.S. Geological Survey for

- the Colorado Department of Natural Resources (Washington: U.S. Government Printing Office, 1974).
106. Arthur D. Little, Inc., *Potential Onshore Effects of Deepwater Oil Terminal-Related Industrial Development*, 4 vols., prepared by Arthur D. Little, Inc. for the Council on Environmental Quality and other Federal agencies (NTIS No. PB-244-017-set).
  107. Council on Environmental Quality, et al., *OCS Oil and Gas—An Environmental Assessment: A Report to the President by the Council on Environmental Quality*, to be available from the U.S. Government Printing Office in January, 1975.
  108. A. D. Little, Inc., *supra* note 106, vol. II, "East Coast—Mid-Atlantic and Maine," p. 2-23.
  109. *Id.*, p. 2-23.
  110. *Id.*, p. 2-19.
  111. *Id.*, p. 2-26.
  112. *Id.*, p. 2-34.
  113. *Id.*, p. 2-55.
  114. *Id.*, p. 2-68.
  115. A handbook has been prepared for the Department of Housing and Urban Development by the Berkshire County Regional Planning Commission to assist local planning agencies to evaluate the potential environmental, economic, social, and legal impacts of electric power generation and transmission facilities. Entitled *Evaluation of Power Facilities: A Reviewers Handbook*, it is available from the Berkshire County Regional Planning Commission, 8 Bank Row, Pittsfield, Massachusetts.
  116. Christopher Tunnard and Boris Pushkarev, *Man-Made America, Chaos or Control? An Inquiry into Selected Problems of Design in the Urbanized Environment* (New Haven: Yale University Press, 1962).
  117. P. T. Cox, et al., "Effect of Water Resource Investment on Economic Growth" *Water Resources Research* 7, No. 1, pp. 32-38, February, 1971; G. S. Tolley, et al., *Estimation of First Round and Selected Subsequent Income Effects of Water Resource Investment* (Chicago: University of Chicago, 1970); C. L. Leven (ed.), *Development Benefits of Water Resource Investments* (Washington, D.C.: U.S. Army Engineer Institute for Water Resources, 1969).
  118. George Lefcoe, telephone conversation with Edwin H. Clark II, September 30, 1974.
  119. 38 Federal Register 20549 (1973).
  120. Fred Bosselman and David Callies, *The Quiet Revolution in Land Use Controls*, prepared for the Council on Environmental Quality (Washington, D.C.: U.S. Government Printing Office, 1971).
  121. James B. Coffin and Michael Arnold (eds.), *A Summary of State Land Use Controls: July 1974* (Washington, D.C.: Land Use Planning Reports).
  122. Florida Environmental Land and Water Management Act of 1972, chs. 72-317, Laws of Florida, 1972.
  123. Ore. Rev. S. ch. 80, October 5, 1973.
  124. N.Y. Laws of 1973, ch. 348 (May 22, 1973).
  125. See William K. Reilly (ed.), *The Use of Land: A Citizens' Policy Guide to Urban Growth*, (New York: Thomas Y. Crowell Company, 1973), chs. 2, 3, 5.
  126. Steve Carter et al., *supra* note 1.
  127. Council on Environmental Quality, *supra* note 4 at 1-40.
  128. Public Land Law Review Commission, *One Third of the Nation's Land* (Washington, D.C.: U.S. Government Printing Office, 1970).
  129. 16 U.S.C. Section 1451 *et seq.*
  130. P.L. 93-234, December 31, 1973, in 2 US Cong. & Admin. News '73, p. 3217.

131. See "A Standard State Zoning Enabling Act Under Which Municipalities May Adopt Zoning," prepared by the Advisory Committee on Zoning Regulations, U.S. Department of Commerce, Revised Edition, 1926 as cited in Edward M. Bassett, *Zoning: the Laws, Administration, and Court Decisions During the First Twenty Years* (New York: Russell Sage Foundation, 1940), p. 29; R. M. Haig, "Toward an Understanding of the Metropolis: The Assignment of Activities to Areas in Urban Regions," *Quarterly Journal of Economics* 40, 1926; and Daniel R. Mandelker, "A Rationale for the Zoning Process," *Land-Use Controls Quarterly*, Winter, 1970.
132. For a discussion of the relative importance of various factors in determining housing prices, see Marion Clawson, *Suburban Land Conversion in the United States: An Economic and Governmental Process* (Baltimore: The Johns Hopkins Press, 1971), ch. 7; Eugene F. Brigham, "The Determinants of Residential Land Value," *Land Economics* 41: 325-334, 1965; Paul Downing, "Factors Affecting Commercial Land Values: An Empirical Study of Milwaukee, Wisconsin," *Land Economics* 49, 1973; Paul B. Downing, "Estimating Residential Land Value by Multivariate Analysis," in D. M. Holland (ed.), *The Assessment of Land Value*, Publication No. 5 of the Committee on Taxation Resources and Economic Development (Madison: The University of Wisconsin Press, 1970); B. Goodall, "Some Effects of Legislation on Land Values," *Regional Studies* 4: 11-23, 1970; Benton F. Massell and Janice M. Stewart, *The Determinants of Residential Property Values*, unpublished manuscript prepared for the National Science Foundation under contract no. GS2942; G. Max Neutze, *The Price of Land and Land Use Planning: Policy Instruments in the Urban Land Market* (Paris: Organization for Economic Cooperation and Development, 1973).
133. The price of housing is also determined by the cost of developing the land and by the extent to which the local government has provided the necessary municipal services. John F. Kain, *Urban Form and the Costs of Urban Services*, prepared by the Program on Regional and Urban Economics of the M.I.T.-Harvard Joint Center for Urban Studies for the Committee on Urban Public Expenditures of Resources for the Future, 1967 (revised).
134. Fred Bosselman, David Callies and John Banta, *The Taking Issue: A Study of the Constitutional Limits of Governmental Authority to Regulate the Use of Privately-owned Land Without Paying Compensation to the Owners*, prepared for the Council on Environmental Quality (Washington, D.C.: U.S. Government Printing Office, 1973).
135. Ed McCahill, "Stealing: A Primer on Zoning Corruption" *Planning* 39: 6-8, December, 1973.
136. This question deserves serious attention to ensure that by trying to solve one problem—environmental degradation—zoning regulations do not at the same time exacerbate other social problems, such as the shortage of low income housing. For the social equity ramifications of land use controls, see G. Max Neutze, *supra* note 132; Lee Syracuse, "Zoning: Its Shortcomings and Potential," prepared by the Land Use and Development Section of the National Association of Home Builders (unpublished), 1972.
137. Lynn B. Sagalyn and George Sternleib, *Zoning and Housing Costs: The Impact of Land-Use Controls on Housing Price* (New Brunswick: Center for Urban Policy Research, Rutgers University, 1973); George E. Peterson, *The Effect of Zoning Regulation on Suburban Property Values* (Washington, D.C.: Land Use Center of the Urban Institute, 1973); John P. Crecine, Otto A. Davis, and John E. Jackson, "Urban Property Markets: Some Empirical Results and Their Implications for Municipal Zoning" *The Journal of Law and Economics* 10: 79-99, October, 1967;



- John A. Bruhn, "Zoning—Its Effect on Property Value" *Appraisal Journal* 37, October, 1969.
138. Richard F. Babcock, *The Zoning Game—Municipal Practices and Policies* (Madison: University of Wisconsin Press, 1966); Otto A. Davis, "Economic Elements in Municipal Zoning Decisions" *Land Economics* 39: 375–386, November, 1963.
  139. This conclusion is an extension of the findings of *The Costs of Sprawl* which shows in general that for a given number of dwelling units, lower density developments create higher economic and environmental costs than higher density developments. See the earlier section of this chapter, "Effects of Development."
  140. Maxwell C. Huntoon, Jr. *PUD: A Better Way for the Suburbs* (Washington, D.C.: Urban Land Institute, 1971).
  141. See John Delafons, *Land Use Controls in the United States* (Cambridge: M.I.T. Press, 1969), pp. 53–54, 133, 172–173; Jan Krasnowiecki and Richard F. Babcock, *Legal Aspects of Planned Unit Residential Development with Suggested Legislation*, Urban Land Institute Technical Bulletin #52, (Washington, D.C.: Urban Land Institute, 1965).
  142. See the New York City Building Zone Resolution (1916) 5 *Minutes*, Board of Estimate and Apportionment, pp. 4243–4268, July 25, 1916 as cited in Joseph Goldrick, S. Graubard, and Raymond J. Horowitz, *Building Regulation in New York City* (New York City: Commonwealth Fund, 1944); Norman Marcus and Marilyn W. Groves (eds.), *New Zoning: Legal, Administrative and Economic Concepts and Techniques*, prepared for the Center for New York City Affairs, New School for Social Research (New York: Praeger, 1970); John Delafons, *supra* note 141, at 57.
  143. Seymour I. Toll, *Zoned American* (New York: Grossman Publishers, 1969); Fred Bosselman and David Callies, *supra* note 120.
  144. Herbert M. Franklin, "Controlling Urban Growth—But For Whom?" Washington, D.C.: Potomac Institute, 1973.
  145. California Environmental Quality Act of 1970, Cal. Pub. Res. Code Secs. 21000–21001; Thaddeus C. Trzyna, *Environmental Impact Requirements in the States: NEPA's Offspring*, prepared by Washington Environmental Research Center for the U.S. Environmental Protection Agency under contract no. 68–01–1818 (Washington, D.C.: U.S. Government Printing Office, 1974).
  146. Council on Environmental Quality, *supra* note 4, at 216.
  147. Vermont Environmental Control Law (Act 250) Bill H. 417, April 4, 1970.
  148. See *supra* note 121.
  149. Bosselman and Callies, see *supra* note 143.
  150. The "Project Review Criteria for Growth" are contained in *Formulation of Regional Growth Policy*, Issue Paper #4 (Berkeley: Association of Bay Area Governments, 1973) which was adopted as Growth Policy Resolution 3–73, October 11, 1973. See also Issue Paper #5, *Economic Issues in Regional Growth Policy* (Berkeley: Association of Bay Area Governments, 1974).
  151. Fred Bosselman, David Callies, and John Banta, *supra* note 134.
  152. *Id.*, pp. 139–194.
  153. *Id.*, pp. 175–182.
  154. For a general reference as to the feasibility of marketing development rights see: John Costonis, "Development Rights Transfer: An Exploratory Essay," *Yale Law Journal* 83, November, 1973; John Costonis, *Space Adrift: Saving Urban Landmarks through the Chicago Plan* (Chicago: University of Illinois Press, 1974); John Costonis, "Which-ever Way You Slice It, DRT is Here To Stay," *Planning* 40, July, 1974; Jared B. Shlaes, "Who Pays for Transfer of Development Rights?," *Planning* 40, July, 1974. In relation to open space preservation see

- B. Bud Chavooshian and Thomas Norman, "Transfer of Development Rights: A New Concept in Land Use Management," *Urban Land* 32, December, 1973, pp. 11-16.
155. William Matuszeski, "Less Than Fee Acquisition for Open Space: Its Effect on Land Value," Institute for Environmental Studies, University of Pennsylvania, September, 1968 (unpublished manuscript), pp. 8-10.
  156. Ann Louise Strong et al., *The Plan and Program for the Brandywine*, (Philadelphia: Institute for Environmental Studies, University of Pennsylvania, 1968).
  157. Charles Little, *supra* note 9 at 60.
  158. John O. Keene and Ann Louise Strong, "The Brandywine Plan," *Journal of the American Institute of Planners* 36: 50-58, January, 1970.
  159. Edward J. Kaiser et al., *Promoting Environmental Quality through Urban Planning and Controls*, prepared by Washington Environmental Research Center for the U.S. Environmental Protection Agency under contract no. 801376 (Washington, D.C.: U.S. Government Printing Office, 1974) pp. 24, 361-369.
  160. Ann Louise Strong, *Open Space for Urban America*, prepared for the U.S. Urban Renewal Administration (Washington, D.C.: U.S. Government Printing Office, 1965); William H. Whyte, Jr., *Securing Open Space for Urban America: Conservation Easements*, Technical Bulletin No. 36 (Washington, D.C.: Urban Land Institute, 1959).
  161. William Matuszeski, *supra* note 155, p. 13.
  162. Personal communication from Pat Newman, Director of the Nature Conservancy, 1800 North Kent, Arlington, Va.
  163. For general references see articles by John Costonis, *supra* note 154.
  164. The literature on development rights transfer is sparse. The principal studies include the following: John Costonis, "The Chicago Plan: Incentive Zoning and the Preservation of Urban Landmarks," *Harvard Law Review* 85, no. 574, 1972; Norman Marcus, "Development Rights Transfers: Planning the Perspective," in Donald H. Sisskind, chairman, *Air Rights*, Commercial Law and Practice Course Handbook Series No. 103, (New York: Practising Law Institute, 1974), p. 41; and the literature in *supra* note 154.
  165. Costonis describes the feasibility of one such program in *Space Adrift*, *supra* note 154 at 89.
  166. For a more complete discussion of this relationship in the case of Chicago see *supra* note 154.
  167. See Peter Hall et al., *The Containment of Urban England* (London: Political and Economic Planning, 1973) 2 vols.; Kermit Parsons, *Public Land Acquisition for New Communities*, prepared for the Center for Urban Development Research, Cornell University (Ithaca: Cornell University, 1973).
  168. Shirley S. Passow, "Land Reserves and Teamwork in Planning Stockholm," *American Institute of Planning Journal* XXXVI, May 1970; and Goran Sidenbladh, "Stockholm: A Planned City," *Scientific American*, 213: 107-118, September, 1965.
  169. See Sylvan Kamm, "Land Banking: Public Policy Alternatives and Dilemmas," (Washington, D.C.: Urban Institute, 1970), for a discussion of the applicability of foreign experience with land banking policies to the United States.
  170. Canadian Task Force on Housing, *Report of the Federal Task Force on Housing and Urban Development*, prepared for the Minister of Transport as authorized by the Cabinet (Ottawa: Information Canada, no. NH61-1/1969).
  171. See Sylvan Kamm, *supra* note 169 at 11-12.
  172. A. Allen Schmid, *Converting Land from Rural to Urban Uses* (Washington, D.C.: Resources for the Future, 1968).
  173. See S. Passow, *supra* note 168.

174. The acquisition cannot occur only in a thin band at the urban fringe, for the urbanization process is likely to leapfrog over this area and create even more sprawl problems than existed before. The band has to be wide enough to effectively discourage such leapfrogging. This is the reason for the "three decades" rule-of-thumb mentioned above.
175. Donald C. Shoup and Ruth P. Mack, *Advanced Land Acquisition by Local Governments: Benefit-Cost Analysis as an Aid to Policy*, prepared by the Institute for Public Administration, New York, for the U.S. Department of Housing and Urban Development (Washington, D.C.: U.S. Government Printing Office, 1968).
176. See John William Reps, *The Future of American Planning: Requiem or Renaissance?* (Ithaca: Center for Housing and Environmental Studies, Division of Urban Studies, 1967).
177. U.S. National Commission on Urban Problems, *Building the American City*, Report of the U.S. National Commission on Urban Problems to the Congress and President of the United States (Washington, D.C.: U.S. Government Printing Office, 1968); the President's Committee on Urban Housing, *A Decent Home* (Washington, D.C.: U.S. Government Printing Office, 1969); National Committee on Urban Growth Policy, *The New City* (New York: Frederic A. Praeger, 1969); U.S. Advisory Commission on Intergovernmental Relations, *Urban and Rural America: Policies for Future Growth* (Washington, D.C.: U.S. Government Printing Office, 1968).
178. See Council on Environmental Quality, *supra* note 4 at 380-381; and William K. Reilly (ed.), *The Use of Land: A Citizens' Policy Guide to Urban Growth* (New York: Crowell, 1973), pp. 33-75.
179. Petaluma, California and Ramapo, New York are examples of communities that have adopted such policies. For discussions of these examples see Herbert M. Franklin, *supra* note 144; and Herbert M. Franklin, Memoranda 74-2 and 74-4 (Washington, D.C.: Potomac Institute, 1974).
180. The Interim Development Ordinances for Fairfax County, adopted in March, 1974 have been challenged in *M. S. Horne v. Fairfax County Board of Supervisors*, July 10, 1974.
181. *Steel Hill Development Inc. v. Town of Sandbornton*, U.S. Court of Appeals for the First Circuit, No. 72-1234, November 24, 1972 as discussed in Herbert M. Franklin, Memorandum 73-1 (Washington, D.C.: Potomac Institute).
182. Steve Carter et al., *supra* note 1.
183. Rivkin/Carson, Inc., *The Sewer Moratorium as a Technique of Growth Control and Environmental Protection*, prepared for the U.S. Department of Housing and Urban Development (NTIS PB230-293/AS, 1973), pp. 14, 15.
184. *Id.*, pp. 1-4.
185. *Id.*, p. 26.
186. See "Sewer Moratorium Case Study: Hagerstown, Maryland," and "Sewer Moratorium Case Study: Chambers Creek-Clover Creek Basin (Tacoma, Washington)," prepared by Municipal Permits and Operations Division, Office of Water Program Operations, U.S. Environmental Protection Agency (unpublished drafts, 1973).
187. *Ibid.*
188. Rivkin/Carson Inc., *supra* note 183, pp. 25-27.
189. Donald H. Elliott and Norman Marcus, "From Euclid to Ramapo: New Directions in Land Development Control," *Hofstra Law Review* 1: 56, Spring, 1973.
190. See *Construction Industry Association of Sonoma County v. City of Petaluma*, No. C-73-0763-LHB as cited in Herbert M. Franklin, *supra* note 179.

191. Economic Research Service, U.S. Department of Agriculture, *State Programs for the Differential Assessment of Farm and Open Space Land*, Agricultural Economics Report No. 256 (Washington, D.C.: U.S. Government Printing Office, 1974).
192. Irving F. Fellows, "The Impact of Public Act 490 on Agriculture and Open Space in Connecticut," in *Proceedings of the Seminar on Taxation of Agricultural and Other Open Land*, April 1-2, 1971 (East Lansing: Cooperative Extension Service, Michigan State University, 1971); A. Robert Koch, Harriet H. Morrill, and Arthur Hausmann, *Implementation and Early Effects of the New Jersey Farmland Assessment Act* (New Brunswick: Rutgers, Experiment Station Bul. 830); James C. Barrow, and James W. Thomson, *Impacts of Open Space Taxation In Washington*, Washington Agricultural Experiment Station Bulletin 772 (Pullman: Washington Agricultural Experiment Station, 1973); C. T. K. Ching and G. E. Frick, *The Effect of Use Value Assessment on Assessed Valuations and Tax Rates*, Research Report No. 13, Institute of Natural and Environmental Resources (Durham, N.H.: Agricultural Experiment Station, 1970).
193. Hoy F. Carman and Jim G. Polson, "Tax Shifts Occurring as a Result of Differential Assessment of Farmland: California, 1968-69," *National Tax Journal* 24, December, 1971; Sidney Ishee, "The Maryland Use-Value Assessment Law," in *Proceedings of the Seminar on Taxation of Agricultural and Other Open Land* *supra* note 192.
194. John Kolesar and Jaye Scholl, *Misplaced Hopes, Misspent Millions: A Report on Farmland Assessments in New Jersey* (Princeton: The Center for Analysis of Public Issues, 1972).
195. This does not necessarily mean that the farmer does not benefit from the program, for the speculator should be willing to pay a higher price for the land if his holding costs are lower.
196. A. R. Koch, H. H. Morrill, and A. Hausmann, *supra* note 192 at 10; Samuel Harrison, "Problems and Impact of the New Jersey Farmland Assessment Act of 1964," in *Proceedings of the Seminar on Taxation of Agricultural and Other Open Land*, *supra* note 192 at 35-47.
197. H. F. Carman and J. G. Polson, *supra* note 193, p. 449.
198. See Christopher Tunnard and Boris Pushkarev, *supra* note 116; and Stanley B. Tankel, "The Importance of Open Space in the Urban Pattern," in Lowden Wingo, Jr. (ed.) *Cities and Space: The Future Use of Urban Land* (Baltimore: Johns Hopkins Press 1963), pp. 57-72.
199. See Peter Hall et al. *supra* note 167; William K. Reilly, *supra* note 125; Royal Commission on the Geographical Distribution of the Industrial Population, Minutes of Evidence, Nov. 16, 1936 (London: His Majesty's Stationery Office, 1938); David Thomas *London's Green Belts* (London: Faber 1970); Peter Self, "Wise Use of Green Belts," *Town and Country Planning*, 30: 166-68, April 1962.
200. See Charles E. Little, *supra* note 9.
201. William G. Grisby, "Economic and Fiscal Aspects of Open Space Preservation," in D. A. Wallace (ed.), *Metropolitan Open Space and Natural Process* (Philadelphia: University of Pennsylvania, 1970); and Stanley B. Tankel, *supra* note 198.
202. See John L. Moore and Betty W. Cost, *Final Report on Development and Application of a Methodology for Estimating the Impact on Local Land and Property Values from Flood Plain Regulation in Ohio*, prepared by Battelle Columbus Laboratories for the State of Ohio Department of Natural Resources, Flood Plain Management Section (Columbus: Battelle, 1973); J. Costonis, *Space Adrift*, *supra* note 154, is good on the preservation of historic landmarks; and William H. Whyte in *The Last Landscape* (New York: Anchor Books, 1968) is helpful on the protection of valuable ecological areas.

203. Carl Norcross, *Open Space Communities in the Marketplace*, Technical Bulletin No. 57 (Washington, D.C.: Urban Land Institute, 1966).
204. *Id.*
205. Kenneth E. Daane, "The Economic Implications of the Regional Parks System in Maricopa County," (Tempe: Bureau of Business Services, College of Business Administration, Arizona State University, 1964).
206. Information supplied by the Acting Chief Appraiser, Single Family Valuation, Federal Housing Administration, U.S. Department of Housing and Urban Development, Oct. 11, 1974.
207. National Association of Home Builders, *Land Development Manual* (Washington, D.C.: The National Association of Home Builders, 1969).
208. Cited in Charles E. Little, *supra* note 157 at 87.
209. Robert L. Wonder, study done for Coro Foundation in San Francisco on Garland Parks, cited in C. B. Little, *supra* note 157, p. 88.
210. *Id.*, p. 89.
211. J. Richard Recht and Robert T. Harmon, *supra* note 8.
212. W. G. Grisby, *supra* note 201.

## APPENDIX

# Recent State Land Use Legislation

The following is a summary, as of July 1974, of recent State land use legislation prepared by Land Use Planning Reports.\*

**Alabama**—A bill to establish a study group to develop land use legislation recommendations has been proposed by the Land Use Legislative Committee. The state has a Coastal Area Act, a strip mining law, a property tax that permits some agricultural land protection, and has delegated planning and zoning authority to localities.

**Alaska**—As part of a "state strategy" Alaska is developing a comprehensive planning process that will include land use plans. Legislation to implement the strategy is expected to be introduced in the 1975 legislature. The Federal-State Land Use Planning Commission for Alaska is working with the state on the strategy and on planning for use of the 97 percent of the state's area owned by the Federal Government.

**Arizona**—The Arizona Environmental Planning Commission is conducting public hearings to gauge public attitudes toward state land use programs. It is to report recommendations to the 1975 legislature. Arizona has a power plant siting law, traditional local planning and zoning controls.

**Arkansas**—A major committee appointed by the governor is expected to report in October on general or specific proposals for land use legislation. Arkansas has a strip mining law and a "Utility Facility Environmental Protection Act." Local zoning and planning controls are little used, except in cities.

**California**—California has no single comprehensive land use plan. But several programs cover a total of about 75 percent of the state. The most important is the California Coastal Zone Conservation Act that requires permits for development along the coast. A land use bill (A.B. 2978) and a critical areas bill (A.B. 2979) are being considered by the legislature now; a strong power plant siting bill was passed this year; the 1965 Williamson Act is designed to preserve agricultural land and open space; and localities have full zoning and planning authority.

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\*This summary is based upon a report published by Land Use Planning Reports entitled *A Summary of State Land Use Controls—July 1974* (Washington, D.C.: Plus Publications, 1974).

**Colorado**—A new state law (H.B. 1041) went into effect May 17 giving the state control over development activities of statewide interest. Colorado has a relatively weak strip mining law, has a law permitting assessment of some agricultural land on its use value, and enacted a bill (H.B. 1034) this year to clarify the full zoning and planning controls now available to localities.

**Connecticut**—The state is conducting public discussions on a proposed Plan of Conservation and Development with legislative action on resultant proposals expected in 1975. The plan will probably call for local land use controls with state guidance. Agricultural land is taxed at current value and a conveyance penalty tax is assessed.

**Delaware**—A committee called Delaware Tomorrow is to look at growth and land use. In the coastal zone the state has banned heavy industry within 2 miles of the coast and state permits are required for other coastal uses. The state has a preferential assessment law for agricultural land. Each county has a planning and zoning commission.

**Florida**—The Florida Land and Water Management Act of 1972 authorized Florida's statewide land use policy. It provides considerable state control of critical areas and development of more than one-county interest. Florida has a preferential assessment tax for agricultural lands. Localities were given full zoning and planning authority in 1968.

**Georgia**—Vital areas bills (H.B. 1677 and S.B. 557) were defeated by the legislature this year. The state now controls activities in wetlands. Localities have full planning and zoning authority.

**Hawaii**—Hawaii enacted the first state land use program in the Nation in 1961. It zones the state into four land categories. At the legislature's direction Hawaii is now developing a 10-year growth policy. Coastal zone and other controls are bound into the state land use program.

**Idaho**—Four bills (S. 1434, S. 1328, S. 1376, and S. 1377) that would have provided a comprehensive land use program were defeated this year by one vote in the Senate. The state has a strip mining law. Localities have full planning and zoning powers.

**Illinois**—Three land use bills (H.B. 1123, S.B. 975, and S.B. 802) were introduced this year but went nowhere. The state does have a strong strip mining bill, a deferred taxation scheme for preserving agricultural land and open space, and full planning and zoning authority in its localities.

**Indiana**—A comprehensive land use bill was introduced and withdrawn this year. Indiana was the only eligible state not applying for Federal coastal planning grants in fiscal 1974. The state has a fairly strong strip mining bill, taxes agricultural land on a preferential basis to preserve farmland and open space, and gives full planning and zoning authority to localities.

**Iowa**—A comprehensive land use bill (H.B. 1422) was passed by the House this year but was rejected by the Senate. Ninety-five percent of the land is in agriculture; agricultural land is assessed at use value.

**Kansas**—A legislative committee and an advisory committee of state officials, scholars, and citizens are attempting to identify land use issues. Localities have full zoning authority.

**Kentucky**—A Land Use Planning Council was created this year by the state legislature and will report to the 1976 biennial legislative session. The state has a strong strip mining law, a new power plant siting law (H.R. 438), use-value assessment with deferred taxation to preserve agricultural land, and full local planning and zoning authority.

**Louisiana**—The Office of State Planning is drafting a growth and conservation policy as a first step toward a state land use policy. A special commission has proposed development of a coastal zone plan. Agricultural land can be assessed on its use value. Although localities have planning and zoning authority, planning is still relatively new around the state.

**Maine**—A site selection act requiring a state license for major development, a zoning control act for shoreland, state regulation of unorganized areas (over half the state), and registration and regulation of critical areas constitute most of the state land use program. Maine has deferred taxation for agricultural land and full authority for localities to plan and zone.

**Maryland**—Enacted this year was a critical areas bill (S.B. 500) that allows the state to add to a list of critical areas designated by localities and the state to intervene in local regulatory proceedings relating to such areas. A coastal zone planning bill was killed this year. The state has strong power plant siting and strip mining laws and an advanced use-value tax for preserving agricultural land. Localities are quite advanced in using full planning and zoning authority.

**Massachusetts**—There are proposals in the legislature for a bill (H. 5567) that could lead to a statewide land use program and a more comprehensive coastal zone bill. A power plant siting law was recently enacted. Localities have full planning and zoning authority.

**Michigan**—A land use bill (H.B. 5055, renumbered H.B. 6097) was killed by the House by one vote this year. Power plant siting bills were also killed. An agricultural Land and Open Space Act was passed this year allowing 10-year contracts with the state. Michigan has perhaps the toughest state land sales regulation law.

**Minnesota**—The Critical Areas Act of 1973 authorizes the state to identify areas, including coastal zones, that would be damaged by uncontrolled development. The state has a 1973 power plant siting law and a deferred tax for preserving agricultural land. Localities have fairly advanced zoning and planning authority.

**Mississippi**—A state Task Force on Growth is attempting to coordinate planning and set goals for the state. Local zoning and planning have been little used.

**Missouri**—Several state agencies are working on a report on growth and its impact on critical areas. The state has a strip mining law. Only 22 of 114 counties have enacted planning or zoning ordinances.

**Montana**—The Governor vetoed a bill (S.B. 625) this year to establish a State Department of Planning. The department would have begun developing a statewide planning process. The state has a tough strip mining law, a 1973 Utility Siting Act, and a 1973 law providing preferential assessment for agricultural land.

**Nebraska**—A state resolution (L.R. 148) by the legislature directs that hearings and studies be conducted to develop land use legislation. The legislature this year passed a use-value assessment act for agricultural lands and an act to forbid interpreting comprehensive plans as requiring compliance with zoning ordinances.

**Nevada**—The state Land Use Planning Act of 1973 is called a "mini-Jackson bill" after the U.S. Senate-passed bill. A referendum goes before the voters this year on preferential assessment for agricultural land. The state will impose a master plan and zoning regulations on any county not enacting them by July 1, 1975.



**New Hampshire**—A bill (H.B. 22) to identify critical environmental areas was defeated this year. An Open Space Land Use Commission and the State Planning Office continue to work on land use recommendations. The state has a power plant siting law and has use-value assessment for agricultural land. Few counties have operating planning commissions, and where they do operate they are weak.

**New Jersey**—In February a state planning task force submitted a report that is expected to lead to statewide legislation. Some land uses in the coastal zone are regulated by the state under a 1973 law. A 1964 Agricultural Assessment Act slowed the rate of urbanization of farmland significantly. The entire state is incorporated, and the 567 municipalities have zoning and planning powers.

**New Mexico**—With no statewide land use policy, the legislature voted this year to match Federal land use planning grants if they were available. The legislature also repealed the state's Environmental Quality Act of 1972. The state has a strip mining law, preferential assessment for agricultural lands, and authority for counties to regulate subdivisions.

**New York**—The New York State Environmental Plan, the Adirondack Park Agency, the Development Plan for Private Lands, and coastal zone authority give the state wide-ranging influence over land use. The state also has a power plant siting law, a strip mining law, a complex agricultural preservation law, and a mix of state and local control of zoning and planning.

**North Carolina**—A Land Policy Act and a Coastal Areas Management Act were passed this year. The land policy measure lays the foundation for a future land use process while the coastal measure requires land use controls along the coast. Full zoning and planning authority were given localities 4 years ago.

**North Dakota**—Land use bills are expected to be introduced in the legislature next year. A 1970 strip mining law was stiffened considerably last year. Within corporate limits, agricultural lands can be taxed according to their use value.

**Ohio**—A measure affecting key facilities was introduced this year. The state has a strong strip mining law, a one-stop permit power plant siting law, a law (S. 423) enacted this year providing use-value assessment of agricultural land, and full planning and zoning authority for localities.

**Oklahoma**—A Technical Land Use Advisory Committee is assisting in preparations for meeting a Federal land use bill. The state has a strip mining law and a variety of local land controls.

**Oregon**—A comprehensive land use measure (S.B. 100) was passed in 1973. Implementation is now going on. Oregon has a power plant siting law and a use-value assessment law for agricultural land. Other land use related programs are covered by S.B. 100.

**Pennsylvania**—An interagency task force is developing legislative proposals for introduction in the 1975 legislature. The state has perhaps the toughest strip mining law in the country. Voters in a 1973 referendum authorized the legislature to write laws to preserve agricultural land, but the legislature has not acted. Planning and zoning controls have been adopted for the most part by localities.

**Rhode Island**—The Department of Administration is developing a comprehensive plan for the state, and from it specific land use proposals should come for next year's legislature. A state permit system now regulates some activities in the coastal zone. The state permits use-value assessment for agricultural land with a rollback tax penalty.

**South Carolina**—A governor's committee recommended legislation for this year which was not acted on. Localities have been delegated full planning and zoning authority.

**South Dakota**—A bill (H.R. 706) to designate and regulate critical areas was defeated in the House this year, 29-40. A bill (H.B. 762) requiring counties to develop comprehensive plans was passed. Another bill (H.B. 667) to continue a legislative land use committee to recommend legislation was passed. The state has a permit system for strip mining and enacted this year a use-value assessment for agricultural lands.

**Tennessee**—A bill to create a Tennessee Land Use Study Commission did not make it to the floor this year. It will probably be reintroduced next year. The state has a strong strip mining law; TVA handles most power plants; and localities have full zoning and planning authority.

**Texas**—A major report on Texas land use commissioned by the governor's office was released in December 1973. Three legislative committees are assessing land use and are expected to recommend legislation in 1975. The state has some regulatory powers over coastal activities. Texas has use-value assessment with deferred taxes on agricultural land. Counties have little planning and zoning authority.

**Utah**—The Utah Land Use Act, providing for designation of and planning for critical environmental areas, was passed by the legislature this year. A petition has held it up and voters will have to approve it in a November referendum. The Greenbelt Act permits preferential agricultural land taxation with a deferred tax. Localities have zoning and planning authority, but the zoning ordinances are superficial.

**Vermont**—In a major shift in the state's approach to land use planning, the 1974 legislature rejected the third phase in the development of a comprehensive land use plan for the state, a mapping program which would have divided the state into five categories (urban, village, natural resources, conservation, and rural) with different use and settlement goals. A legislative study committee is, instead, investigating the possibility of regulating critical areas and developments of more than local impact. The first two phases of the state land use plan culminated in the Land Capability and Development Plan, a guide for regulating development according to present land use and capability for development.

**Virginia**—The General Assembly adopted a resolution this year opposing a Federal land use act, declaring that land use planning is a state function. The legislature killed all pending state land use legislation. The Advisory Legislative Council's Land Use Policies Committee is reporting this year; and the state is undertaking a coastal zone management program under a Federal CZM grant.

**Washington**—Two different land use proposals were killed in the 1974 legislature before reaching the floor of either house, but at least one committee is holding interim sessions to prepare legislation for next year. The 1972 Shoreline Management Act provides for land use regulation of a large part of the state, including the shoreline, marshes, bogs, swamps, floodways, river deltas, and floodplains. All 39 counties have undertaken some kind of planning effort, and an estimated 25 counties have adopted zoning ordinances.

**West Virginia**—The state Planning and Development Department is limited to providing advice and technical assistance to local governments. Only 6 of 55 counties have adopted zoning ordinances. Eleven regional councils created in 1972 are making inventories and analyses of state resources.

**Wisconsin**—In a referendum in April, voters approved preferential assessment and taxation of agricultural and open space lands. Implementing legislation is expected to be the main land use issue in the 1975 legislature. Proposals were killed this year for designation and regulation of critical environmental areas and developments of regional impact, acceleration of land use information gathering, protection of wetlands, and power plant siting. Under state guidelines and review, the Great Lakes shorelands are zoned into conservancy, recreational-residential, or general purpose areas.

**Wyoming**—The Conservation and Land Use Study Commission has drafted a state land use planning act for legislative consideration in 1975. Revenue from the Mineral Severance Tax enacted this year will be used to finance planning for boom-town growth expected to occur as strip mining operations increase.

