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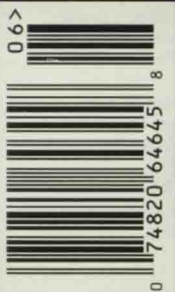
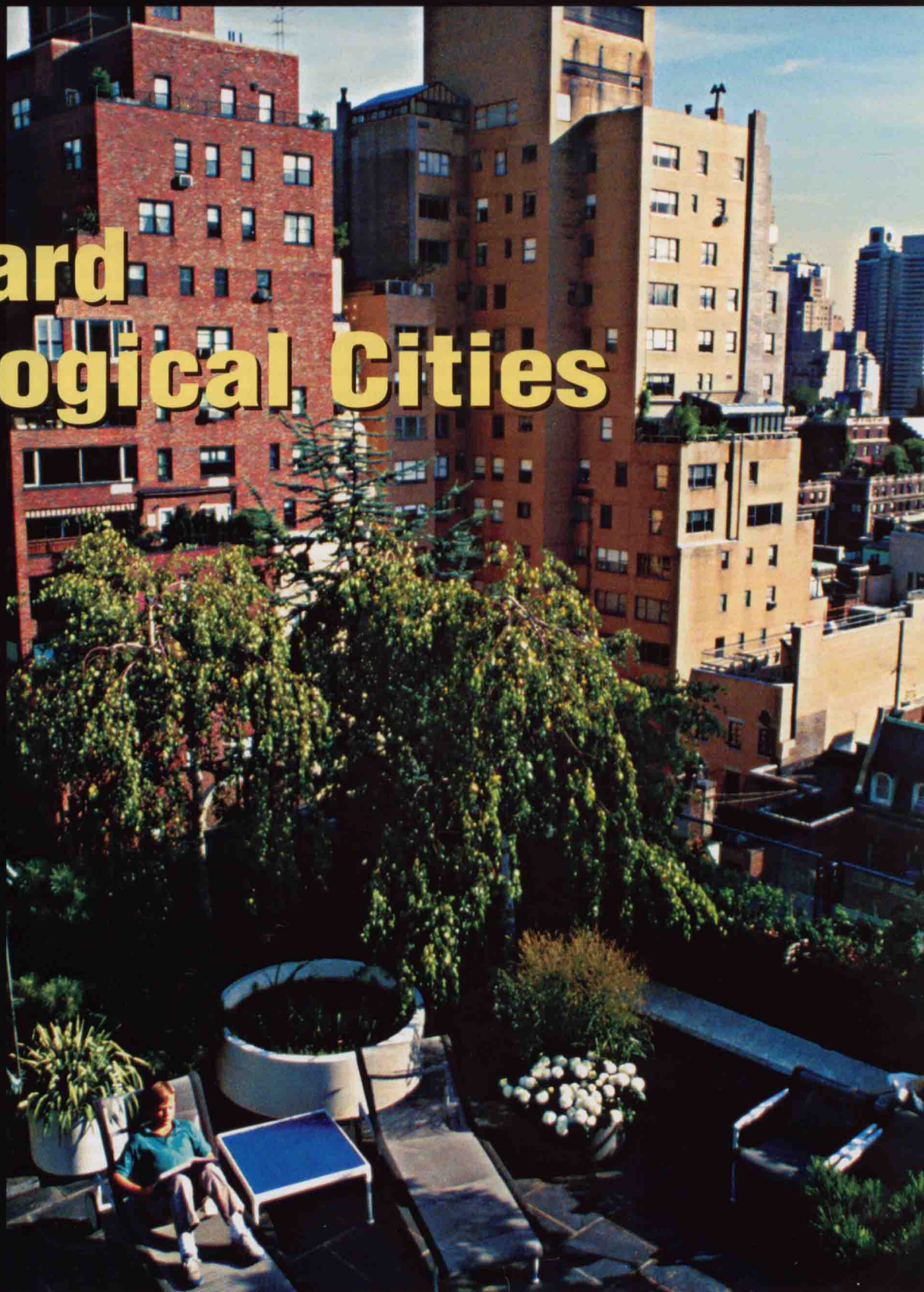
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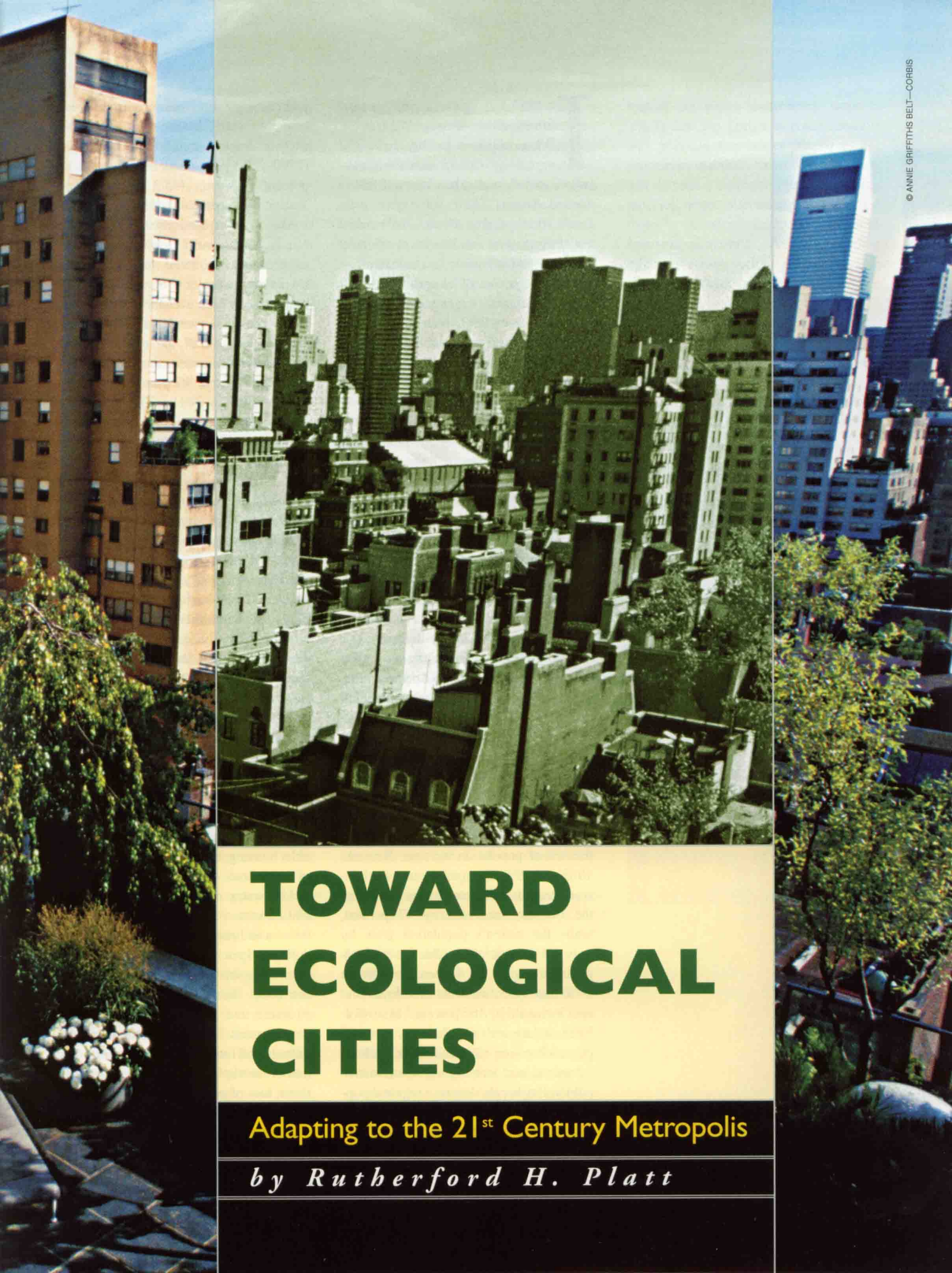
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TOWARD ECOLOGICAL CITIES

Adapting to the 21st Century Metropolis

by Rutherford H. Platt



In 1957, two upstart journalists (and future urban sages), William H. Whyte and Jane Jacobs, challenged prevailing wisdom on postwar suburban growth and urban renewal in the United States. Their subversive little book, *The Exploding Metropolis*,¹ marked the starting point for decades of effort by planners and urbanists to combat urban sprawl and revive older communities. It helped to inspire the urban open space movement in the 1960s, which in turn led to zoning reform proposals in the 1970s, growth management in the 1980s, and most recently, the smart growth and new urbanism movements.

All to little avail: At the dawn of the twenty-first century, metropolitan areas in the United States have sprawled beyond the wildest imaginings of *The Exploding Metropolis* authors. Between 1950 and 2000, metropolitan areas designated by the U.S. Bureau of the Census increased in number from 169 to 347 and in population from 84 million to 226 million (see Table 1 on page 13). Suburbs have grown from 55 million residents in 1950 to more than 141 million in 2000, and now are home to slightly more than one-half of the entire U.S. population. Metropolitan areas as a whole (including central cities) today account for four-fifths of the nation's population. By comparison, in 1960, central cities, suburbs, and nonmetro areas each represented about one-third of the nation's population (see Figure 1 on page 13).

Recent urban sprawl has far outpaced the rate of population increase. Between 1982 and 1997, the total extent of urbanized areas (as delineated by the Bureau of the Census) increased by 47 percent, while the nation's population grew by only 17 percent.² The Chicago region's population grew by 48 percent between 1950 and 1995, while its urbanized land area increased by 165 percent.³ Metropolitan Los Angeles's population grew by 45 percent between 1970 and 1990, while its urbanized land area tripled.⁴ Even metropolitan Pittsburgh, despite a regional population loss of 8 percent, expanded by 43 percent in urbanized area between 1982 and 1997.⁵ The fastest growth in metro-

politan population has occurred where nature is clearly hostile to development, such as the desert cities of Las Vegas (1990–2000 population increase of 83.3 percent), Phoenix (45.3 percent), and Tucson (26.5 percent).

The trend toward ever-larger single-family homes and lots on the suburban fringe has exacerbated sprawl: Average floor area per capita in new single-family homes has tripled over the last 50 years, and average lot sizes have grown correspondingly.⁶ Overall, the average density of metropolitan areas in the United States has declined from 407 persons per square mile in 1950 to 330 in 2000—although surprisingly, recent metro growth in western states is at higher average density than other parts of the country.⁷

As urban sprawl has enveloped ever more of the nation's population and accessible land area, perception of its harmful impacts—on society, the economy, and the environment—has broadened as well. Early critiques by open-space activists such as Whyte, Charles E. Little,⁸ and others in the 1960s focused principally on efficiency and aesthetics, decrying the wasteful, costly patterns of fringe development and the loss of picturesque rural landscapes near cities. To those still-salient concerns has been added a variety of further harms identified in subsequent research and common experience, including air and water pollution; wasted energy and time; traffic congestion and highway accidents; lack of affordable housing near jobs; the emergence of exclusive, gated suburbs;⁹ brownfields; water scarcity; natural hazards; disturbance of natural drainage systems; and loss of biodiversity.

Beyond such direct consequences are secondary sets of implications including the fiscal burdens of providing infrastructure and public services to fringe development;¹⁰ emotional stress on individuals and families due to separation of home, workplace, and other destinations; loss of sense of community;¹¹ and social and environmental justice issues, such as minority communities' disproportionate exposure to environmental

hazards and unequal access to housing, jobs, schools, and health services.¹²

To a considerable degree, the social pathology of inequality in American society is reflected in the spatial geography of

its contemporary cities and metropolitan areas: Older core cities and inner-tier suburbs, particularly in the Northeast and Midwest, tend to be in decay and are typically populated by low-income house-

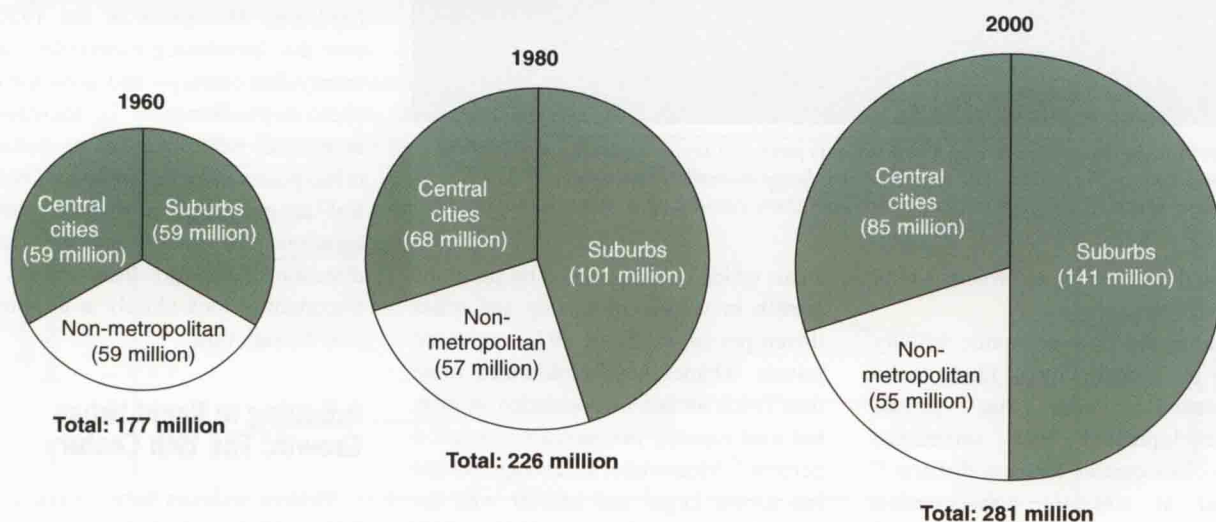
holds; newer communities on the urban fringe tend to be predominantly white and relatively wealthy—and are more likely to benefit from federal tax policies and other public subsidies to sprawl.

Table 1. Contrasts between metropolitan United States in 1950 and 2000

	1950	2000
U.S. population	152 million	281 million
Number of metropolitan areas	169	347
Metro population	84 million (55 percent of U.S. total)	226 million (80 percent of U.S. total)
Number of metro areas with more than one million residents	14	49
Total population of metro areas with more than one million residents	45 million (30 percent of U.S. total)	161.5 million (57 percent of U.S. total)
Average metro population density	407 persons/square mile	330 persons/square mile
Central city population	49 million (32 percent of U.S. total)	85 million (30 percent of U.S. total)
Suburban population	35 million (23 percent of U.S. total)	141 million (50 percent of U.S. total)

SOURCE: U.S. Census Bureau, *Statistical Abstract of the United States: 2002*, <http://www.census.gov/statab/www/>; and W. Fulton, R. Pendall, M. Nguyen, and A. Harrison, *Who Sprawls Most? How Growth Patterns Differ Across the United States*, Survey Series Monograph (Washington, DC: The Brookings Institution, 2001).

Figure 1. Distribution of U.S. population



SOURCE: Adapted from R. H. Platt, *Land Use and Society* (Washington, DC: © Island Press, 2004). Reproduced by permission of Island Press.

Adding to the downward spiral of older central cities, new jobs have been created predominantly in suburban locations, thus requiring core city residents to have a car and to spend additional time for lengthy reverse commuting. In the case of Atlanta, the central city's share of the metropolitan job market dropped from 40 percent in 1980 to 19 percent in 1997. From 1990 to 1997, the central city gained only 4,503 new jobs, just 1.3 percent of all jobs created in the region during that period, while 295,000 jobs—78 percent of all jobs—were added to Atlanta's northern suburbs.¹³ Furthermore, poor public transportation impedes residents of low-income neighborhoods from even reach-

ing jobs but do not provide affordable housing, schools, parks, community health facilities, or other community needs. Employees often must commute long distances from the inner city or lower-income suburbs, very likely without adequate public transportation.¹⁵

The Interstate Highway System and other postwar limited-access highways at first seemed modeled on "Broadacre City," Frank Lloyd Wright's 1930s utopian model for the future American landscape.¹⁶ But the "dream highways" of the 1950s became the nightmares of metropolitan living today. The problem stems from the unfeasibility of continuing to build new highways in already crowded

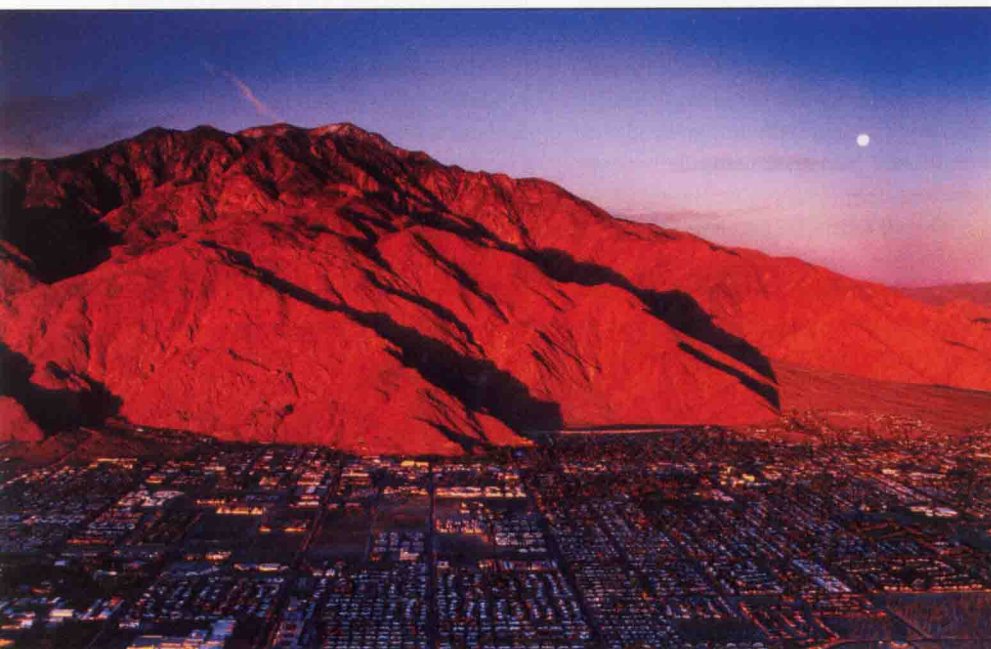
metropolitan regions. For instance, in Atlanta in 1992, the average commuter spent 25 hours a year stuck in traffic. By 2000, this figure nearly tripled, growing to 72 hours.¹⁸

It has long been an American tradition to leave place-based problems behind and seek "greener pastures" through relocation—to the frontier, to the suburbs, to the Sunbelt, and to coasts, mountains, and deserts. In the process, however, the metropolis has become an unwelcome hitchhiker. Quasi-metropolitan conditions have overwhelmed such traditional vacation and retirement meccas as Cape Cod, Maryland's Eastern Shore, the Outer Banks of North Carolina, and the golf course utopias of the Southwest. As the urban fringe moves indefinitely further in travel time and distance, once-treasured destinations increasingly resemble what people are trying to escape from: traffic congestion, billboards, shopping malls, and general roadside schlock—*The Exploding Metropolis* writ large. Meanwhile, the less fortunate, the unemployed, the infirm, and the elderly are sentenced to live and die in the metropolitan environment, come what may.

As Lewis Mumford sardonically observed in 1961, "The ultimate effect of the suburban escape in our time is, ironically, a low-grade uniform environment from which escape is impossible."¹⁹ *The Exploding Metropolis* of the 1950s is now the "enveloping metropolis" of the twenty-first century—and as escape from such a phenomenon is increasingly unfeasible, new initiatives to make our urban places more habitable and "ecological" are emerging in countless forms and locations. To understand the current direction of some of these efforts, it is important to look closely at their evolution through time.

Adjusting to Rapid Urban Growth: The 19th Century

Western societies have sought to cope with rapid urban growth since the advent of large industrial cities in the first half of the nineteenth century. The increasing magnitude and concentration of manufac-



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Palm Springs, in Riverside County, California, is part of a region considered one of the most sprawling in the nation. The region is also home to numerous threatened and endangered species; however, an innovative plan there could help protect them.

ing jobs downtown or elsewhere within their own cities.

Much of the new economic activity outside the central city is likely to be concentrated in "edge cities"—private megadevelopments that sometimes eclipse older central business districts.¹⁴ Situated at strategic transportation nodes, edge cities contain opulent retail shops, office towers, convention hotels, restaurants, and high-end residential units. They create many low-wage ser-

vice jobs, which is compounded by sustained growth in vehicle ownership and miles driven per capita. Since 1970, registered private vehicles have proliferated more than twice as fast as population growth, but road capacity has increased by just 6 percent.¹⁷ Meanwhile, the average vehicle has grown larger and heavier with the craze for sport utility vehicles and non-commercial trucks. The result is that time and fuel wasted in getting from point A to point B are becoming prohibitive in many

turing activities in that period caused an astonishing increase in size and populations of cities in England, Europe, and the United States (see Table 2 below). In 1899, the demographer Adna F. Weber identified three elements of urbanization during that century: the unprecedented rates and absolute numbers of urban population growth; the emergence of numerous new urban places; and the phenomenal expansion of very large cities such as London, New York, and Paris.²⁰

The construction of dwellings to accommodate rural and foreign migrants to industrial cities and milltowns lagged far behind demand. The prevailing building practices of the time produced inhuman levels of overcrowding. Unfettered by any public regulations, the construction of tenements was a joint result of the need to be within walking distance to factories and mills and builders' greed for profit. The resulting slum districts were wracked with human misery: disease, accidents, poverty, all kinds of wastes, crime, and fires. Such conditions were the result of raw capitalism, the apotheosis of laissez faire.

Remarkably, however, in the face of the worsening squalor, there would gradually develop new social capacities to equip and govern cities, to eventually make them safer and healthier. Essential to this development was the birth of a reform movement, initiated in England by the radical utilitarian philosopher Jeremy Bentham and his followers, that viewed avoidable human distress as the burden of society to alleviate through public mea-

sures where necessary. Over the course of the nineteenth century, three primary strategies of social adjustment to urban squalor emerged: regulation, redevelopment, and relocation. Each of these strategies laid a foundation for subsequent policies and programs in the twentieth century.

Regulation

Governmental regulation of private building and land use was antithetical to nineteenth-century capitalism, as it is to many property owners and public officials today. Private ownership of land, buildings, and the means of production (including slaves where applicable) was enshrined in English common law as a "sole and despotic dominion," in the phrase of the eighteenth-century jurist William Blackstone.²¹

The advent of limited public intervention in the private land market to remedy the worst abuses resulted from research by Edwin Chadwick in the 1830s. His studies of sanitary conditions in slum neighborhoods were conducted on behalf of the British Poor Law Commission, pursuant to agitation from Bentham and other reformers. Using maps and statistics, Chadwick linked the geographic incidence of infectious disease to conditions of housing, sanitation, and population density.²² And since cholera, as well as crime and urban fire, spread from slum areas to the Georgian terraces of the wealthy, Chadwick's reports motivated the elite to acknowledge slums as a social problem. The ensuing British Public

Table 2. Growth of selected cities, 1800–1890

City	1800	1850	1890	1850–1890 annual growth rate
London	860,000	1.7 million	5 million	4.8 percent
Paris	547,000	1.0 million	2.4 million	3.5 percent
New York	62,500	660,000	2.7 million	7.7 percent
Boston	25,000	137,000	448,500	5.6 percent

SOURCE: A. F. Weber, *The Growth of Cities in the Nineteenth Century: A Study in Statistics* (Ithaca: Cornell University Press, 1963).

THE LAND USE AND SOCIETY MODEL

Human habitats, particularly urban ones, are artifacts created and transformed over time through cumulative social choices by private and public entities that share authority over the use of land and the city-building process. Such choices may be influenced by changing perception and understanding of the natural environment as well as feedback on the socioeconomic consequences (pro and con) of existing land use and building practices. This relationship is described by the "land use and society model" figure below, the keystone of *Land Use and Society: Geography, Law, and Public Policy*.¹

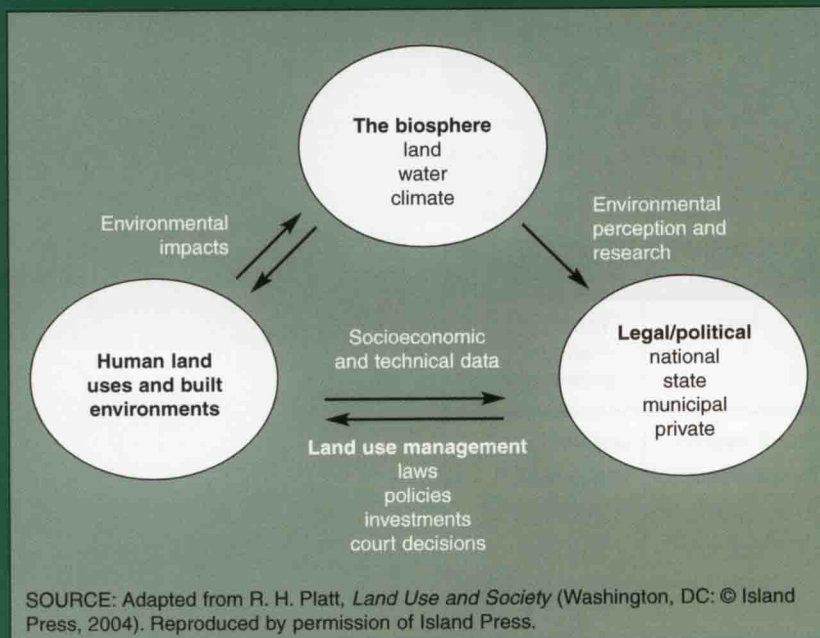
History provides encouraging evidence that societies may, in times of proven need, adjust their rules and institutions to reorder the range or outcomes of social choices concerning building, land use, and interaction with the natural environment. An early example was the English Parliament's "Act for Rebuilding London" adopted after the 1666 Great Fire of London, which called for wider streets and access to water for firefighting and banned wooden exterior walls and overhanging upper floors. This set of restrictions, imposed by Parliament

pursuant to a special Royal Commission investigation (the forerunner of the modern "blue-ribbon committee"), has been characterized as "astonishingly modern A true piece of town planning, a programme for the development of the town."²

Contemporary U.S. examples of legal response to improved perception of geographic conditions are fortunately numerous. For example, research by geographer Gilbert F. White and his colleagues since the 1930s has helped promote "human adjustments" to floods and other natural hazards. The establishment of the U.S. Environmental Protection Agency's Superfund program by Congress in 1980 responded to the tragic disclosures of toxic waste contamination at Love Canal and elsewhere. But the failure of the Bush Administration to support the Kyoto Protocol on reducing greenhouse gases represents a negative case where scientific research findings on global warming are being ignored for political reasons.

1. R. H. Platt, *Land Use and Society: Geography, Law, and Public Policy* (Revised Edition) (Washington, DC: Island Press, 2004).

2. S. E. Rasmussen, *London: The Unique City* (Cambridge, MA: MIT Press, 1967), 117.



Health Act of 1848 and its successors asserted at least limited public control over urban building practices and sanitation (as per the land use and society model illustrated in the box on this page).

Redevelopment

The swelling industrial cities of the early nineteenth century first required basic improvements such as street paving, lighting, and drainage. As advances in civil engineering, landscape design, and public finance allowed, more ambitious upgrades included water and sewer systems, urban parks, gas and electric service, streetcars and, later, commuter railroads and subways. Many of these were privately financed and constructed with sometimes disastrous results. The failure of private water providers in New York City, leading to shortages, epidemics, and fires, persuaded the city to construct a new water system under public auspices. New York City's Croton River reservoir and 40-mile aqueduct opened in 1842 as the largest external water diversion since the Roman Empire.²³ This was soon followed by Boston's Lake Cochituate water supply using the same engineer (John Jervis) and technology. In the 1890s, the city of Chicago reversed the flow of the Chicago River to protect Lake Michigan, its primary water source, from sewage contamination.

New York's Central Park was the crown jewel of nineteenth-century urban public improvements. In the 1840s, poet and newspaper editor William Cullen Bryant and landscape architect Andrew Jackson Downing presciently called for a large park to be established before development claimed the entire island of Manhattan. Under a special state law, the city acquired 843 acres smack in the middle of Manhattan and selected the famous 1858 *Greensward Plan* by Frederick Law Olmsted and Calvert Vaux as the design for the new park. Central Park would be the exemplar for subsequent urban parks across the United States and elsewhere. Boston's famed Emerald Necklace park system, proposed by Olmsted in the 1880s, would

similarly inspire the modern “greenways” movement.²⁴

The transformation of Paris from a medieval to a modern city, beginning in the 1850s under the direction of Georges Haussmann, involved all of the foregoing types of improvements—new streets, parks, water and sewer systems, and mass transportation—as well as schools, housing, la Sorbonne, and l’Opéra de Paris. Although controversial at the time, Haussmann’s Paris soon became one of the world’s most beloved and imitated cities.²⁵

Relocation

The third strand of nineteenth century urban reforms, relocation, sought to encourage people to move from overcrowded industrial cities to planned “ideal communities” in rural surroundings. Such utopian schemes took many forms: religious “New Jerusalems,” model industrial towns, “garden cities,” and other variants that appeared between the early 1800s and the 1920s. Common to most such communities, actual or theoretical, were the following elements: centralized control over the use of land and buildings (usually through ownership of the site by sect or nonprofit organization); proximity of work and residence; population limits with overflow to be accommodated elsewhere; a rural setting with much open space within and surrounding the community; and facilities and programs for social, cultural, and moral betterment.

Two leading British exponents of ideal communities, whose visions differed radically, were Robert Owen (1771–1858) and Ebenezer Howard (1850–1928). Owen moved from practical experience gained in a preexisting community—New Lanark, Scotland—to articulate a general theory of cooperative socioeconomic organization. In contrast, Howard first formulated his theory—the “garden city”—and then successfully applied it in the establishment of new, north-of-London communities at Letchworth and Welwyn. Both proselytized public opinion but with quite different styles and results. Howard’s “peaceful path to reform” promised a humanitarian experiment involving “no direct attack upon



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New York’s Central Park was an astounding accomplishment among nineteenth-century urban improvement projects and to this day provides beautiful relief for New Yorkers and tourists from around the globe.

vested interests.”²⁶ He was rewarded with a knighthood in 1927. Owen’s more strident advocacy of labor organization earned him the adulation of subsequent socialists but no knighthood.

One of the best-known planned model communities in the United States was Pullman, Illinois, constructed by industrialist George M. Pullman to accommodate his sleeping-car factory and its employees.²⁷ Like Robert Owen at New Lanark, Pullman was a capitalist entrepreneur who recognized that a worker is likely to be more productive if he or she is well housed, well fed, healthy, and entertained. The town gained renown for its decent housing, shops, library, and other amenities (except taverns; it was a dry town). In addition, it was a major tourist attraction during the 1893 Columbian Exposition. However, the epic Pullman labor strike the following year clouded its reputation. This proved that even “ideal” towns could fail under excessive paternalism.

All three strands of nineteenth century urban reforms—regulation, redevelopment, and relocation—were at best tentative, gradual, geographically uneven, and sometimes counterproductive (as in New York’s early building reform laws, which replaced one form of slum with another²⁸). But urban improvement gradually transpired, not through blind chance or sympathy for the wretched, but through objective evaluation of measurable threats and assessment of options for remedial actions. Through these lines of action, the late-medieval towns and colonial towns of 1800 became the nascent World Cities of 1900.

Adjusting the Public-Private Balance: Planning and Zoning

The first third of the twentieth century—roughly marked by the inaugurations of U.S. Presidents Theodore Roosevelt in 1901 and his distant cousin, Franklin D.

Roosevelt, in 1933—was the golden age of the American city. It was a period of tall new “skyscrapers,” high-speed and luxurious intercity railroads, convenient and affordable commuter rail service, the spread of national radio networks, the advent of big city sports rivalries, and the convenience of buying and selling stocks via “wire,” or telephone. After the nation’s two-year involvement in the First World War and the raging influenza pandemic that immediately followed, the nation’s cities rebounded as the stageset for the Roaring Twenties and the Jazz Age. The exuberance of the period lingered even into the Great Depression in the striking (but empty) 102-floor Empire State Building in New York and the 1933 Chicago “Century of Progress” Exposition. The nation was 56 percent urban according to the 1930 census, and the preponderance of those city dwellers—rich, poor and middle class—still lived in the nation’s central cities.

However, those cities were rife with slums, crime, and socioeconomic inequality. Beginning with Jacob Riis’s 1890 report entitled *How the Other Half Lives*,²⁹ a succession of progressive reformers documented the hideous state of tenement districts in New York and other cities. Also in 1890, social worker Jane Addams established Hull House on Chicago’s West Side to administer to the needs of the poor immigrants of the neighborhood, launching a national settlement house movement.³⁰ In 1898, the Reverend Josiah Strong warned that “. . . the new civilization is certain to be urban; and the problem of the twentieth century will be the city.”³¹ Between 1903 and 1912, more than 2,000 articles on social conditions appeared in American magazines and newspapers.³²

This outpouring of reformist sentiment influenced the political process to profoundly alter the respective roles of government and the private market—in particular, to constrain the scope of *laissez faire* in the city development process. The first National Conference on Planning was held in 1909 and the nation’s first zoning ordinance was adopted by New York City in 1916. These in turn led to

widespread adoption of planning and zoning legislation in many states, and in the 1920s, a full-fledged planning and zoning movement swept the country. In 1926, the U.S. Supreme Court upheld the constitutionality of municipal land use zoning in the seminal decisions of *Village of Euclid, Ohio v. Ambler Realty Co.*³³ In a stunning demonstration of the land use and society model, zoning advocate Alfred Bettmann persuaded the court to acknowledge that law must adjust to changing conditions in the real world. In the court’s own words: “Until recent years, urban life was comparatively simple; but with the great increase and concentration of population, problems have developed . . . which require . . . additional restrictions in respect of the use and occupation of private lands in urban communities.”³⁴ Thus land use zoning, for better or worse, became the law of the land.

A serious shortcoming of “Euclidean zoning” as approved in the Euclid case is its foundation in localism: Under this system, each city and suburb is endowed with its own zoning authority, which is widely used to promote the parochial interests of each municipal unit to the disregard of the larger region. A broader regional perspective in municipal land use and public works decisions has long been advocated by regionalists such as Lewis Mumford and Charles Norton and by civic organizations such as the Commercial Club of Chicago, which sponsored the 1909 *Plan of Chicago*,³⁵ and the New York-based Regional Plan Association, an outgrowth of the 1928 *Regional Plan and Survey of New York and Its Environs*.³⁶ Such regional plans have offered useful guidance in capital investments by state and regional entities but have not strongly reduced local parochiality in planning and zoning.

The redevelopment of cities and their infrastructure continued into the twentieth century largely as a local government or private function until the 1930s. With the onset of the New Deal in 1933, the federal government funded public-works projects at all scales, from dams to street paving. After World War II, federal construction programs vastly expanded in

flood control, urban renewal, interstate highways, and sewer and water systems, as overseen at the regional and city level by such latter-day Haussmanns as New York’s Robert Moses.³⁷

The relocation strategy to resettle urban population in planned communities outside large cities, as continued in the twentieth century, was most prominent in the English postwar New Towns and Greenbelt programs and their counterparts in other countries. The U.S. experience has been largely through suburban sprawl (planned mostly at the project scale), except for the New Deal Greenbelt towns program (which produced, for example, Greenbelt, Maryland); James Rouse’s Columbia, Maryland, in the 1970s; and a few other pilot projects.

Adjusting Development: Urban Open Space to Smart Growth

After World War II, the U.S. populace was far more interested in building houses than in planning, conservation, or social justice. Politicians and the media demanded federal housing programs to provide returning veterans and their families with affordable new homes. According to environmental historian Adam Rome, even *Fortune*—a magazine not exactly known for promoting governmental intervention—“published dozens of articles in 1946 and 1947 on the housing shortage. In a rare editorial—‘Let’s Have Ourselves a Housing Industry’—the editors supported a handful of government initiatives to encourage builders to operate on a larger scale . . . as the best defense against socialism.”³⁸

Congress rose to the challenge. In the late 1940s and early 1950s, it created a variety of new housing stimulus programs under the aegis of the Federal Housing Authority and the Veterans Administration. These helped to fuel a construction boom of some 15 million new housing units during the 1950s; in every year from 1947 to 1964, housing starts would exceed 1.2 million.³⁹ Most of these millions of new units were single-family homes built on agricultural or wooded land outside of the older central

cities and sold to middle-class white families with government mortgage subsidies. The expansion of suburbia was further encouraged by the federal Interstate Highway System authorized by Congress in 1956 and by federal tax deductions for mortgage interest, local property taxes, and accelerated depreciation for commercial real estate investments. Thus the federal government through its housing, highway, and tax policies actively supported, and to a certain extent mandated, a de facto apartheid nation with middle-class whites in the new suburbs and the poor and nonwhites relegated to the inner-city neighborhoods abandoned by departing whites.⁴⁰

The Exploding Metropolis voiced a new, more urgent and pragmatic call to stem urban sprawl and revitalize older urban communities. The deluge of federal incentives for suburban growth was overwhelming the capabilities of conventional, locally based planning and zoning. Although it was hardly a diatribe against the establishment, the book helped set in motion a series of counterweights to urban sprawl involving public programs to acquire urban open space, promote agriculture, and improve the planning of new development. One of those counterweights was the 1962 report by the Outdoor Recreation Resources Review Commission (ORRRC),⁴¹ which led to adoption of the federal Land and Water Conservation Fund Act of 1964,⁴² a mainstay of urban open space programs into the 1990s.

As a consultant to ORRRC, William H. Whyte further developed his interest in practical measures to save open space by working within the framework of local government and the development process. In collaboration with Laurance S. Rockefeller, who had chaired the ORRRC study, Whyte popularized such new land-saving techniques as conservation easements, cluster zoning, planned unit development, subdivision ex-

tions, and preferential tax assessment for farmland.

"Transfer of development rights" was yet another means to protect farmland (for example, in Montgomery County, Maryland), pine barrens in New Jersey, architectural landmarks in New York City, and other areas. First used in the 1970s, it is a legal technique that allows developers to build at higher density in designated locations if they pay the owners of other sites—sites that are desired for preservation—not to develop their property. The U.S. Supreme Court upheld this concept as applied to the protection of New York's Grand Central Station in *Penn Central Transportation Co. v. New York City* in 1978.⁴³


In the early 1970s, intense attention by planning lawyers was directed to reform the conventional ("Euclidean") munici-

pal zoning. Proposals to elevate certain kinds of land use decisions to regional, state, and even federal levels were circulated. In 1971, the newly formed U.S. Council on Environmental Quality released an influential report, *The Quiet Revolution in State Land Use Control*,⁴⁴ which documented diverse new state regulatory programs. This direction was endorsed in a 1973 report, *The Use of Land: A Citizens Policy Guide to Urban Growth*,⁴⁵ sponsored by the Rockefeller Brothers Fund. Closely related was the drafting of a "model land development code"⁴⁶ by the American Law Institute (ALI), which suggested ways to broaden land use decisionmaking without abolishing local administration of planning and zoning. State land use laws reflecting certain elements of ALI's proposed model code were adopted in Vermont,

Urban gardens, such as this one in Seattle, enhance cityscapes with productive green space.



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Maine, Florida, Oregon, Washington, and elsewhere. Proposals for a national land use act were not adopted, but part of the land law-reform agenda was incorporated into the Coastal Zone Management Act of 1972.

But acquisition in fee simple (outright ownership) or conservation easement (committing the property never to be developed) remained the most reliable and legally foolproof way to protect open space. As promoted by regional conservation organizations like the New York Open Space Institute and the Chicago Openlands Project, along with the fast-spreading land trust movement, urban greenspace protection and management evolved into a joint public-private venture distinct from traditional city parks. Also, over time, the focus on sizeable tracts of protected land expanded to embrace linear corridors such as greenways, rail trails, and the adaptation of traditional parks to new uses and cultural preferences.⁴⁷

The various techniques to improve the results of the urban development process have been repackaged over time as “open space conservation” in the 1960s, “growth management” in the late 1970s and 1980s, and “smart growth” and “new urbanism” in the 1990s. The latter incorporate legal and design approaches dating back to Whyte’s *The Last Landscape*:⁴⁸ planned suburban growth, revitalization and reinvestment in older communities, alternative transportation choices, and public-private partnerships. Land use regulation is less prominent in smart-growth lexicon than in the *Quiet Revolution*—era 1970s: The property rights movement in the 1990s stigmatized regulation as “command and control” (appropriating a Cold War term). But a healthy outgrowth of this reaction has been a greater stress on negotiation and mediation involving all stakeholders in preference to top-down solutions.

Smart growth and new urbanism, like their 1960s antecedents, are strongly concerned with design of the built environment, its spatial layout, visual appearance, and functional efficiency. They are also market oriented, focusing on areas undergoing new development or redevelopment.

In places where no significant building or rebuilding is occurring, smart growth and new urbanism have little traction.

Adjusting Cities to Nature: A New Chapter

Even as urban design professionals continue to manipulate the physical form and appearance of the built environment, another type of social adaptation to the enveloping metropolis is emerging, one which focuses on the unbuilt elements of the urban environment. Such adjustments are concerned less with the way urban places *look* and more with the way they *function*—ecologically and socially. Fundamental to this new perspective are four premises:

- metropolitan regions are essentially inescapable—so we might as well make them as habitable, safe, and pleasant as possible;
- the first premise applies to most metropolitan inhabitants, rich and poor alike;
- the laws of nature are not suspended within urban areas; and
- respecting and restoring natural systems within urban places is often more cost-effective than using technological substitutes.

The incipient urban ecology movement differs from earlier forms of adaptation discussed above, chiefly in terms of the fourth premise—which implies a more vigorous appreciation of the role of nature and its functions within the metropolis. Here again the land use and society model is validated: Research across the spectrum of natural, physical, and social science offers new insights on the relationship between humans and nature in urban settings. These insights in turn stimulate new strategies to nurture and restore ecological services in urban places.⁴⁹ Such approaches have been described variously as green urbanism, green infrastructure, and natural cities, as well as variations of urban sustainability.⁵⁰ Building on the book *The Ecological City: Preserving and Restoring Biodiversity*, the term “ecological city” is a convenient descriptor for communities and regions that seek to become more green, more healthy, more efficient,

and more socially equitable than conventional urban places.⁵¹

Whatever the term, something new is happening. Until approximately the 1980s, cities and nature were widely viewed as mutually exclusive.⁵² Lewis Mumford in 1956 deplored the tendency of the modern city: “. . . to loosen the bonds that connect [its] inhabitants with nature and to transform, eliminate, or replace its earth-bound aspects, covering the natural site with an artificial environment that enhances the dominance of man and encourages an illusion of complete independence from nature.” (emphasis added).⁵³

One reason for this illusion has been the professional disdain of natural scientists for cities. For instance, an influential Conservation Foundation book of the mid-1960s, *Future Environments of North America*,⁵⁴ virtually ignored urban places—although they were certainly the future environments of most North Americans. In 1971, ecologist Eugene P. Odum viewed cities as being parasitic: “Great cities are planned and grow without any regard for the fact that they are parasites on the countryside, which must somehow supply food, water, air, and degrade huge quantities of wastes.”⁵⁵ (Many of those functions also can occur within urban areas with appropriate land use allocation.) As recently as 1988, a prominent National Academy of Sciences book, *Biodiversity*,⁵⁶ devoted a mere 7 out of 520 pages to “urban biodiversity.” The view of nature as existing only beyond the urban fringe or in exotic and distant places accessible only to scientists and the affluent ecotourist is perpetuated by some well-meaning natural history museums, zoos, public aquariums, and television nature documentaries.

The seed of a different perspective on cities and nature was planted by landscape architect Ian McHarg in his seminal 1968 book *Design with Nature*.⁵⁷ McHarg urged urban designers to evaluate and incorporate natural factors such as topography, drainage, natural hazards, and microclimate into their plans, rather than overcoming such constraints through technology—



MARY RICKEL PELLETIER

Chicago has installed a number of ecological features, including a green roof on its city hall (pictured here), urban gardens throughout the city, and planters of prairie grasses and other native plants in the central business district.

which often incurs high costs and has an uneven record of success. McHarg's advice was directed primarily to the planning of new and often upscale suburban development. However, the proposition would be significantly expanded, geographically and functionally, by fellow landscape architect Anne Whiston Spirn in her 1985 book *The Granite Garden*: “The city, suburbs, and the countryside must be viewed as a single, evolving system within nature, as must every individual park and building within that larger whole. . . . Nature in the city must be cultivated, like a garden, rather than ignored or subdued.”⁵⁸ In 1987, *The Greening of the Cities* examined British experience with “cultivating nature in cities,” proposing that ecology offers “a way out of manmade aesthetics and proprietorial landscapes.”⁵⁹ In a more emotional voice, evolutionary biologist Lynn Margulis and her son Dorion Sagan put it this way: “The arrogant habitat-holocaust of today may cease; in its wake may evolve technological-

ly nurtured habitats that re-bind, re-integrate, and re-merge us with nature.”⁶⁰

The dawning perception that cities and nature are not mutually exclusive (and that urban ecology is not an oxymoron) did not lead ipso facto to rewriting the ground rules for urban growth and redevelopment. An essential step in that direction was the development of the concept of “ecological services” by biologists Paul Ehrlich and Gretchen Daily⁶¹ and also by the international Scientific Committee on Problems of the Environment.⁶² “Ecological services” are benefits nature provides to human society—in both rural and urban settings—including

- purification of air and water;
- mitigation of floods and drought;
- detoxification and decomposition of wastes;
- generation and renewal of soil and soil fertility;
- pollination of crops and natural vegetation;
- control of potential agricultural pests;
- dispersal of seeds;

- maintenance of biodiversity;
- protection from solar ultraviolet rays;
- moderation of urban microclimate (such as the urban heat island effect);
- support for diverse human cultures; and
- aesthetic and intellectual stimulation.⁶³

To the extent that these natural functions are disrupted or eliminated by human activities, they often must be replaced through technical substitutes such as flood control, water filtration, irrigation, agricultural chemicals, air conditioning, or sun block. More ecological forms of urban adaptation use nonstructural measures where possible. In place of steel and concrete, greater reliance is placed on law, economics, education, science, the arts, and even spirituality to improve metropolitan habitability. For example, New York City and metropolitan Boston are employing watershed management in preference to building costly filtration plants to protect the quality of their drinking water, an option available under the federal Safe Drinking Water Act.⁶⁴

Evaluating the cost-effectiveness of ecological approaches such as the New York watershed management strategy is complicated by the difficulty of assigning monetary values to ecological services. The field of ecological economics, pioneered by Robert Costanza, seeks to develop rough quantitative measures of the monetary value of nature's bounty. However, independent of such a dollars-and-cents approach, the qualitative value of ecological process and biodiversity to a sense of urban place is also gaining influence, as in this statement by urban naturalist Michael W. Klemens:

*Biodiversity is inextricably part of our sense of place, the very fabric of our comfort and our "being" at a particular locus. The natural world provides the texture and variety that define where we live, work and play. So defined, biodiversity is the tapestry of colors on a wooded hillside in October, the interplay between water and reeds, the chirping of crickets on a summer's night, the ebb and flow of natural systems evolving over time. And it is that natural template, the very foundation upon which our society is built, that I define as biodiversity, or more simply stated, nature.*⁶⁵

Unlike large-scale structural projects, "ecological adjustments" are often localized, ad hoc, and informal. According to planner Timothy Beatley, "green urbanism" in European cities includes such elements as green roofs, community gardens, car-free neighborhoods, pavement removal, passive solar heating, and cohousing.⁶⁶ Many of these are beginning to appear in American cities at various scales and encompassing a broad spectrum of goals and means as depicted in Figure 2 on page 23. Some strategies that have been identified by the Ecological Cities Project (www.ecologicalcities.org), based at the University of Massachusetts Amherst, include

- rehabilitation and adaptation of older parks and urban green spaces;
- protection and restoration of urban wetlands and other sensitive habitat;
- preservation of old growth trees and forest tracts;
- development of greenways and rail trails;
- urban gardening and farm markets;
- green design of buildings, including green roofs and green schools;
- brownfield remediation and reuse;
- urban watershed management;
- riverine and coastal floodplain management;
- endangered species habitat conservation plans;
- urban environmental education sites and programs; and
- environmental justice programs.

Such efforts are typically led by non-governmental or quasi-governmental organizations such as museums and botanic gardens, schools and colleges, community groups, watershed alliances, regional planning bodies, and local chapters of national organizations like The Nature Conservancy, Trust for Public Land, Sierra Club, and National Audubon Society. Such organizations provide vision, persistence, and sometimes volunteers to work in the field. Public sector agencies at all levels may play supporting roles, providing funding, staff resources, technical know-how, and (where applicable) regulatory muscle. Funds also may be contributed by businesses, foundations,

and individuals, especially for projects in localities of particular interest to the donor. Researchers in universities, public agencies, and nongovernmental organizations help to define the scientific and social goals and means.

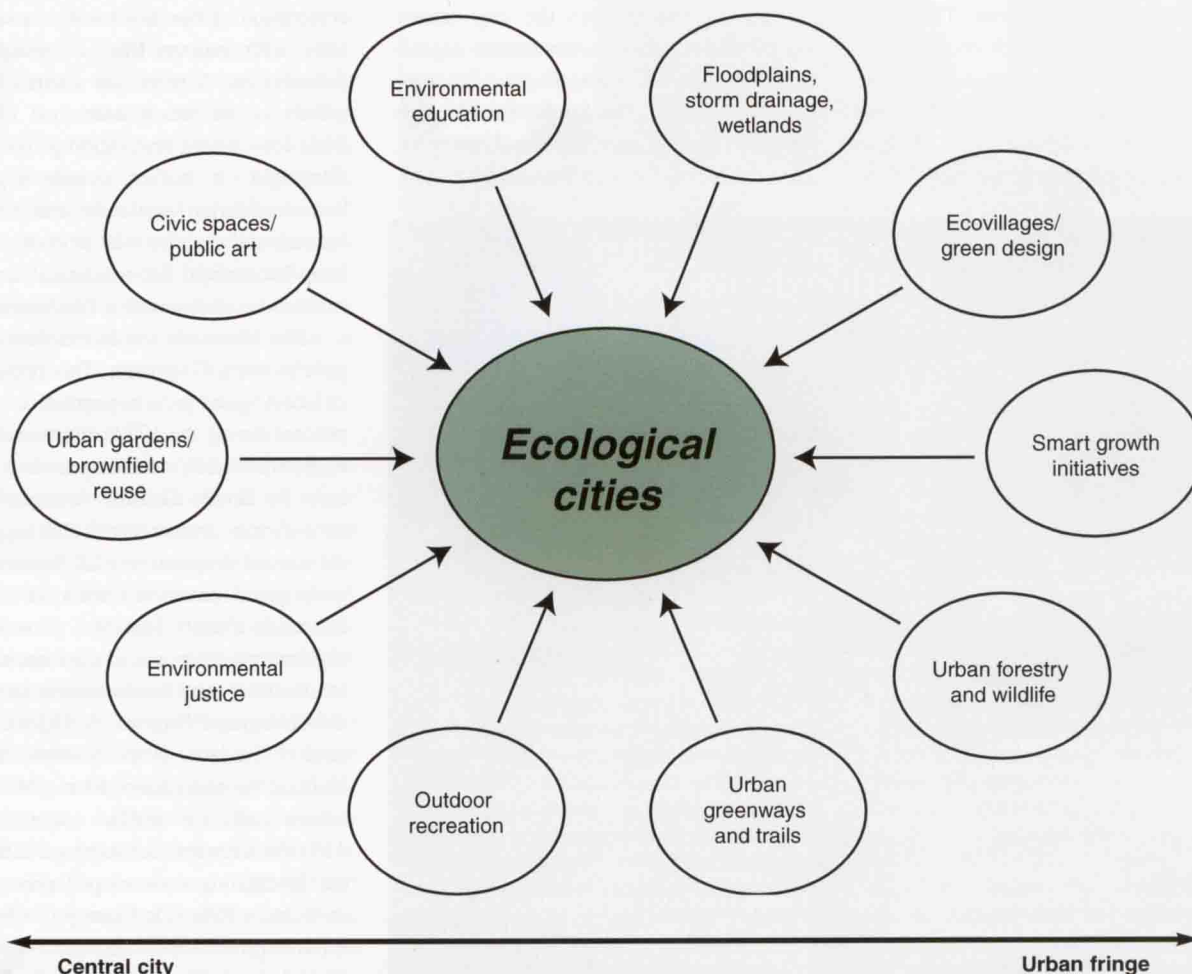
Local ecological cities activities are often scattered, uneven, and underfunded. But like ecological organisms, they thrive on diversity: diversity of goals, of means, of participants, of disciplines, and (one hopes) of viewpoints. Some are closely related to parallel movements concerning social and environmental justice, affordable housing, physical fitness, public health, natural disaster mitigation, animal rights, and environmentalism writ large. They depend on spontaneous and often voluntary local leadership. They are pragmatic and creative in stitching together existing program resources, available funding, and donations of money, time, and office space. Most involve public-private partnerships, some of which are local alliances to save a particular site or pursue a single goal, such as environmental education or urban gardening. Others have evolved into influential regional networks such as Chicago Wilderness (see the box on page 24).

The range of ecological cities projects under way or in planning is remarkable. In Chicago alone, under its proactive mayor, Richard M. Daley,

- the City Hall now has an experimental "green roof" with pathways, a beehive, and some 200 species of plants;
- the city, state, and federal government are drawing up an ambitious plan for the economic and ecological revitalization of the vast Calumet Lake industrial zone on the city's South Side;
- planters with native species of grasses and prairie plants are scattered around the central business district;
- urban gardens and neighborhood greenspaces are being established on vacant lots in city neighborhoods; and
- Lake Shore Drive was relocated to create a walkable "museum campus" bordering Lake Michigan.

These are but a few recent examples of Chicago's long tradition of urban greening, dating back to the 1909 Burn-

Figure 2. Ecological cities: A shared vision



SOURCE: Adapted from R. H. Platt, *Land Use and Society* (Washington, DC: © Island Press, 2004). Reproduced by permission of Island Press.

ham and Bennett *Plan of Chicago*, and nurtured vigorously by such regional NGOs as the Openlands Project.

Many other cities have their own homegrown ecological cities initiatives in progress. For example:

- *Manhattan, New York.* On Manhattan's West Side, an abandoned elevated rail structure extends 1.5 miles from 34th Street to Greenwich Village. Known as the "High Line," the broad steel structure now supports abundant plant life, described as "an amazing example of a self-seeding self-sustaining urban landscape" with no human contribution to the formation of soil and

biodiversity.⁶⁷ At the urging of a local NGO, "Friends of the High Line," New York City in 2002 officially began to convert the trestle into a pedestrian greenway traversing one of the most densely built-up districts of the city. An international design competition was held in 2003 to solicit alternative visions for a High Line linear greenway and park (www.thehighline.org).

- *New Haven, Connecticut.* The "Livable City Initiative" was formed in 1995 as a collaboration between the City of New Haven and the Community Foundation of Greater New Haven to assist neighborhood organizations with the

design, planting, and maintenance of community gardens and greenspaces. Closely related is the Urban Resources Initiative (URI) (www.yale.edu/uri) based at the Yale School of Forestry and Environmental Studies. According to the *URI Newsletter*, the initiative's objective is to "foster environmental stewardship and human development in the New Haven area by promoting citizen based management of natural resources through education, institutional cooperation, and professional guidance." URI and the Livable City Initiative have jointly assisted community groups to convert dozens of vacant tracts in lower-income

neighborhoods to flower and vegetable gardens and community mini-parks.

- *Pittsburgh, Pennsylvania.* The Three Rivers region of Pittsburgh encompasses the area where the Allegheny and Monongahela Rivers unite to form the Ohio and includes the local tributaries of all three rivers. These waterways have been redis-

covered as amenities supporting water-based recreation and ecological habitat reaching virtually into the city center. Local and regional environmental organizations like the Pennsylvania Environmental Council, the Studio for Creative Inquiry at Carnegie Mellon University, and the Nine Mile Run Watershed Associ-

ation (www.ninemilerun.org) are collaborating in ecological monitoring and restoration of riparian habitat in selected sites with support from Pittsburgh-area foundations. A particular focus of these efforts is the urban watershed of Nine Mile Run where restoration projects will "daylight" a buried stream segment, restore riparian wetlands and fisheries habitat, and reclaim a 20-story-high slag-heap brownfield for residential development close to downtown Pittsburgh.

- *The Riverside-San Bernardino metropolitan area, California.* This region east of Los Angeles grew in population by 25.7 percent during the 1990s and was deemed to be the nation's most sprawling metro area by Smart Growth America.⁶⁸ The ecologically diverse region also supports a substantial proportion of all threatened or endangered species in California. In 1998, Riverside County launched an ambitious regional plan process to coordinate habitat, land use, and transportation known as the "Integrated Project." A major component of the latter is the Multiple Species Habitat Conservation Plan (MSHCP), which calls for public acquisition of 153,000 acres for additional wildlife habitat. Remaining undeveloped private land in western Riverside County is subject to wildlife protection conditions to be administered through narrative criteria for 160 acre "cells." According to the Endangered Habitats League, the plan balances new housing and highways with "an ambitious conservation plan whose enactment in the political climate of the Inland Empire is little short of miraculous."⁶⁹

- *Poughkeepsie, New York.* At the other end of the geographic scale, a single venerable butternut tree in the Hudson River city of Poughkeepsie, New York, inspired a local citizen crusade to save it from destruction at the hands of a developer. Determined opposition from neighboring property owners succeeded in gaining state money for the city to acquire the tree, and the small plot of land on which it stands, as the Forbus Butternut Park.⁷⁰

THE CHICAGO WILDERNESS: A MODEL REGIONAL ALLIANCE

The Chicago Wilderness (CW) network (www.chicagowilderness.org) was established in the mid-1990s to promote regional biodiversity and environmental education in the greater Chicago metropolitan area. CW is an open-access, public-private consortium of regional stakeholders concerned with the protection, restoration, and management of habitat sites, as well as research and education on biodiversity. While CW does not take positions on biodiversity issues per se, its value lies in facilitating collaborative efforts to analyze issues and formulate recommendations for public policy by subgroups of member organizations organized as task forces.

CW currently includes among its members about 160 governmental agencies, nongovernmental organizations, educational institutions, and business corporations. Its geographic reach loosely includes the six Illinois counties of the Chicago Metropolitan Statistical Area, Kenosha County in Wisconsin, and Lake and Porter Counties in Indiana. Office space and staff resources are provided by three Chicago area organizations: the Field Museum of Natural History, the Brookfield Zoo, and The Nature Conservancy's Illinois Field Office in Chicago. Startup funding was provided by grants from the U.S. Environmental Protection Agency, the U.S. Forest Service, and the U.S. Fish and Wildlife Service for research on biodiversity.

Chicago Wilderness, also known as the Chicago Region Biodiversity Council, is "governed" by three leadership entities established under its policies and procedures:

- an executive council comprising the above three federal agencies plus additional members that provide resources to CW;

- a steering committee that represents specified sectors and classes of governmental and private interest groups; and

- a coordinating group, established by the steering committee, which holds monthly meetings open to all CW members. The coordinating group implements steering committee decisions, oversees the CW workplan, sets agendas for meetings, and represents CW at professional meetings.

CW is not incorporated and does not have tax-exempt status; thus, it does not compete with its member organizations for funding. The work of CW is carried out through meetings of members, mission-specific task forces, a proposals committee, and a nominating committee. The CW Corporate Council includes participating business firms. CW supports ecological restoration activities through a network of citizen volunteers.

In its first few years, CW has become a respected voice for "ecological citizenship" in the Chicago region. In addition to its website, it has published the beautifully illustrated *Atlas of Biodiversity of the Chicago Region*.¹ CW coordinates environmental education programs for inner city and suburban school systems and is helping to protect and restore habitat sites in the Chicago region. It conducts research on biodiversity through various task forces and subgroups. It participates in regional planning initiatives such as the Chicago Regional Transportation Plan and the Green Infrastructure Regional Mapping Project, and it provides speakers for conferences in the region and around the country.

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Rediscovering Urban Watersheds

Local urban watersheds, like Pittsburgh's Nine Mile Run, are emerging as

important geographic foci of urban ecology efforts in many metropolitan areas. The Ecological Cities Project, under a grant from the National Science Foundation, is studying comparative regional experiences in pursuing multiple environmental, social, and economic goals at the small watershed scale. Typically, metropolitan-scale drainage systems flow from their headwaters in rural areas or suburbs, through lower-income urban districts, past (and sometimes under) central business districts, and then discharge into tidewater, lakes, or larger streams. Along the way, they cross numerous political and property boundaries, thus posing formidable challenges for multijurisdictional cooperation.

Although generalizations are dangerous, the internal diversity of metropolitan watersheds—socioeconomic, political, cultural, and ecological—challenges local activists to promote a “watershed perspective” to engender a more unified approach to problem solving. This perspective may be easier to develop when one or more specific problems—such as flooding, poor water quality, fish kills, shortage of drinking water, or lack of public access—loom large to many of the stakeholders. Once a watershed alliance is organized and possibly incorporated, it may accrue experience, visibility, and credibility. It may then become an ongoing voice for watershed issues not limited to the problem that initially brought it to life.

Such has been the case with the Charles River Watershed Association (www.crwa.org) in the Boston area, formed in the 1960s to promote wetland protection as an alternative to structural flood control. Since its founding, it has addressed issues of water quality, minimum flows, public recreation, and ecological restoration. A similar watershed group is the Houston-area Buffalo Bayou Association, which began primarily to dissuade the Army Corps of Engineers from channelizing the remaining natural streams in the area. Together with the Bayou Preservation Association (another Houston-area group) it recently released a 20-year master plan for the Buffalo Bayou watershed, including extensive

greenway and downtown esplanade elements (www.buffalobayou.org).

The Anacostia River watershed in suburban Maryland and the District of Columbia has been the focus of a series of planning initiatives dating back to the 1987 Anacostia Watershed Restoration Agreement between the District, the State of Maryland, Montgomery County, and Prince George's County. The National Park Service and the Army Corps of Engineers were added as parties and the overall planning process was assumed by the Washington Metropolitan Council of Governments. In 1991, six “restoration targets” were established: reduce pollutant loads; protect and restore ecological integrity in the watershed; restore the natural range of resident and anadromous fish; increase wetland acreage to promote natural filtering and habitat diversity; protect and expand forest cover; and increase public perception and involvement in watershed restoration activities.⁷¹ The watershed agreement was revised in 1999, calling for the development of specific restoration indicators to be achieved by 2010. These include setting total maximum daily loads for fecal coliform, nutrients, and suspended solids; wetland protection and creation; and indicators of public participation. In 2004, the D.C. Office of Planning completed a master plan for the District's Anacostia Waterfront and a public exhibit on the plan was held at the National Building Museum.

Toward “Urban Ecological Citizenship”

One of the potential fringe benefits of watershed restoration and urban ecology activities is the opportunity for social interaction among interested persons from diverse neighborhoods, backgrounds, and walks of life. New York University environmental ethicist Andrew Light has identified what he terms “ecological citizenship” that may arise from serendipitous contact among volunteers and others cooperating in ecological restoration and advocacy projects.⁷² This points to an important dimension of urban ecology strategies: They may relieve the sense of helplessness and loss of community that is a



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Connecting children with the ecosystems of their own cities is an important means to develop a sense of belonging.

widely lamented attribute of metropolitan growth. While the numerical results of urban ecological activities in terms of trees planted or protected, wetland hectares restored, invasive species removed, fish stocks revived, songbirds counted, and bugs discovered by children may be small, the ultimate outcome of such work may be a halo effect of good feelings and a sense of belonging that comes from direct personal contact with nature and each other. This may be a key element of social adaptation to life in the enveloping twenty-first century metropolis.

Rutherford H. Platt is a professor of geography and planning law in the Department of Geosciences and is affiliated with the Center for Public Policy and Administration at the University of Massachusetts Amherst. He specializes in public policy concerning urban land and water resources. Among many publications, he is the author of *Land Use and Society: Geography, Law, and Public Policy* (Revised Edition, Island Press, 2004) and *Disasters and Democracy: The Politics of Extreme Natural Events* (Island Press, 1999). He is the lead editor of *The Ecolog-*

ical City: Preserving and Restoring Urban Biodiversity (University of Massachusetts Press, 1994). He has served on many national panels, including the National Research Council Water Science and Technology Board and several of its committees. In 2002, he was honored as a lifetime national associate of the National Academies. He directs Ecological Cities, a national program of research and outreach based at the University of Massachusetts (www.ecologicalcities.org). He may be reached via e-mail at platt@geo.umass.edu or at (413) 545-2499. This article is adapted with permission of Island Press, Washington, DC, from the book by R. H. Platt, *Land Use and Society* (Washington, DC: Island Press, 2004).

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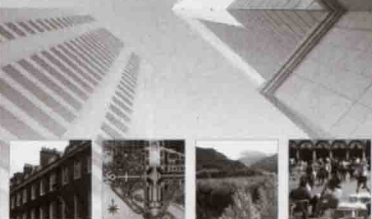
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