

A Trail Across Time

American Environmental Planning From City Beautiful to Sustainability

Thomas L. Daniels

Problem: It would be useful to identify and connect the major ideas of American environmental planning from the late 19th century up to today, to show its evolution over time and anticipate its potential future direction.

Purpose: I aim to tie together the major ideas of American environmental planning, showing how they have evolved, and suggest what additional changes will be required to progress further toward sustainability.

Methods: I review the literature, defining five time periods that are useful for understanding and analyzing environmental planning successes and shortcomings.

Results and conclusions: Environmental planning has its roots in the physical design of cities and the tension between conserving natural resources for human use and protecting wilderness. In the 1920s, regional environmental planning emerged. Federal environmental impact statements were first required in the 1970s, along with efforts to clean up and prevent pollution. A backlash against government command and control began in the 1980s, leading governments to use incentives to address environmental problems. The current era makes sustainability the goal, tying together the ideas and practices of the previous eras and blending regulation and financial incentives to address national and global environmental problems, such as climate change. To reduce carbon footprints and increase water and energy conservation in the face of significant population growth in the United States will require making environmental planning a political priority, with the goals of curbing sprawling land

Environmental planning is the theory and practice of making good, interrelated decisions about the natural environment (natural resources, wildlife, and natural hazards), working landscapes (farms, forests, and lands from which minerals are extracted), public health (air and water pollution, toxics, and waste disposal), and the built environment (Daniels & Daniels, 2003). This article is organized around five time periods, in each of which I argue that American environmental planning defined the most pressing environmental problems of the day; exhibited public and private strategic capacity and willingness to plan responses to those problems; and developed and used scientific knowledge and planning technology to manage the environment. I judge environmental planning in each of these eras by whether it did or did not improve environmental quality (Fiorino, 2006; Mazmanian & Kraft, 1999; Ndubisi, 2002).

Each era that I identify in American environmental planning has distinct problems and presents new ideas and approaches to managing the environment. Each brought thought and practice further along, closer to what it would be in the next period. Taken together, they define the trail toward planning for sustainability and for the entire global biosphere (see Figure 1). This trail has

development, and changing lifestyles and business practices.

Takeaway for practice: Environmental planning ideas have been around for the past century and underlie the currently popular concept of planning for sustainability. However, environmental planning has been only modestly effective at influencing business practices and lifestyles. To change this, federal and local governments will have to lead by example, pursuing environmental sustainability as seriously as they pursue economic growth.

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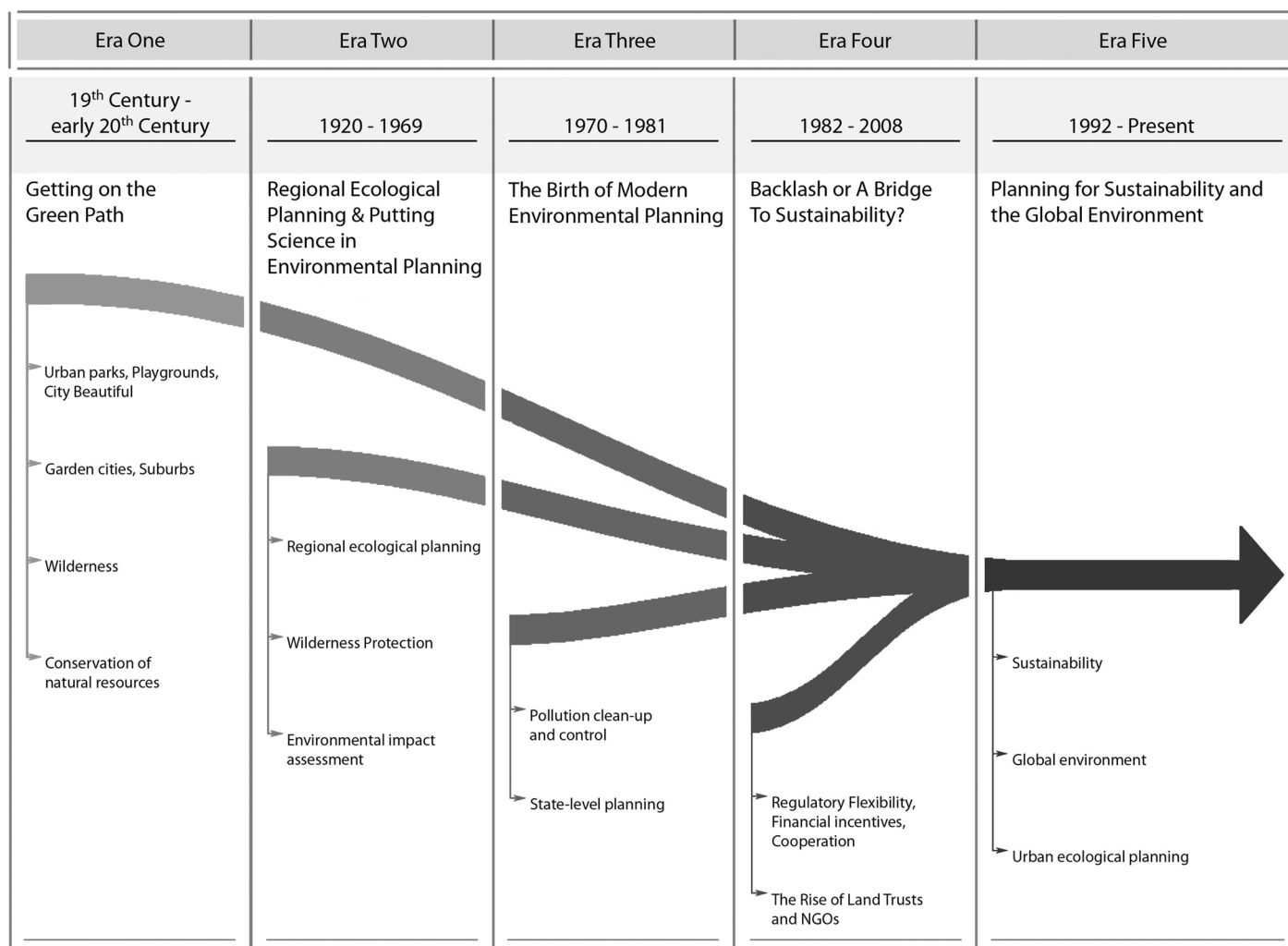


Figure 1. Five eras of environmental planning in the United States.

much to teach planners and policymakers. Following it into the future, I conclude by suggesting the kinds of programs and policies needed if the goals of sustainability and worldwide environmental protection are to be achieved.

The First Era: Getting on the Green Path

The origins of environmental planning in America preceded the first national planning conference of 1909, largely coinciding with the reform movement of the Progressive Era, between 1890 and 1920 (Hays, 1959; Schuyler, 1986). Population growth and industrial development

were well underway in American cities by the latter half of the 19th century, producing extensive environmental change. Laissez-faire capitalism, lack of popular support for state or federal government action, and corrupt local governments all contributed to poor environmental quality in the United States. Cities, particularly in the Northeast and Midwest, suffered from air-polluting factories, copious manure from horse-drawn transport, and minimal sewage treatment that resulted in chronic water pollution. Green spaces were in short supply, and housing was often crowded and unsanitary. These problems were exacerbated by a surge in immigration, mainly from southern and eastern Europe, between 1890 and 1910 (Peterson, 2003). By 1910, nearly half of America's 92 million people lived in urban places and the nation had added a stunning 16

million net residents in the decade of 1900–1910 (U.S. Census Bureau, 2008). New York City was a major entry point for immigrants, and thus it comes as no surprise that New York's Committee on Congestion of Population was a prime mover behind the initial national planning conference (Reps, 1965).

During the first era of environmental planning, the parks and playgrounds, city beautiful, and garden cities

movements all attempted to use physical planning and urban design to respond to the deplorable conditions of industrial cities (see Table 1).

Urban Parks and Playgrounds Movements

Beginning in the latter half of the 19th century, urban reformers called for parks that served entire cities as well as neighborhood playgrounds (Girardet, 2004; Marsh, 1864;

Table 1. Five eras in U.S. environmental planning.

Era and issues	Purposes	Actors
Progressive era		
Urban parks, playgrounds, city beautiful	Aesthetics, social gathering places, sense of place	Frederick Law Olmsted, Daniel Burnham
Garden cities, suburbs	Public health, sense of place	Ebenzer Howard, Frederick Law Olmsted
Wilderness	Nature protection, sense of place	John Muir
Conservation of natural resources	Efficiency, sustainable yield	Gifford Pinchot
Regional ecological planning and putting science in environmental planning		
Regional ecological planning	Balance nature with built environment, economy with wilderness, sense of place	Lewis Mumford, Clarence Stein, Benton MacKay, Ian McHarg, regional commissions
Wilderness protection	Nature protection, sense of place	U.S. Dept. of Interior, Wilderness Society, National Wildlife Federation
Environmental impact assessment	Public health, natural resource conservation	Ian McHarg, U.S. EPA, state environmental agencies, regional commissions
Modern environmental planning		
Pollution cleanup and control	Public health, remediation	U.S. EPA, state environmental agencies, private sector, NGOs
State-level planning	Manage growth, protect natural resources	State planning offices, state environmental agencies, local governments
Backlash or a bridge to sustainability?		
Regulatory flexibility, financial incentives, cooperation	Impede environmental progress, change regulations	Federal government, U.S. EPA, private sector
The rise of land trusts and NGOs	Preserve land, protect environmental quality	Land trusts, NGOs, Nature Conservancy, Natural Resources Defense Council, Environmental Defense, Sierra Club
Sustainability and the global environment		
Sustainability	Long-term economic, environmental, and social viability; sense of place	Cities, land trusts, private sector
Global environment	Human prosperity, survival of living beings, maintaining global ecosystems	Al Gore, federal government, private sector
Urban ecological planning	Public health, sense of place, protection of city as ecosystem	Cities, land trusts, private sector

Schuyler, 1986). According to Frederick Law Olmsted, Sr., parks were places where nature and the built environment met in harmony, where all classes of society could interact peacefully, and where environmental services like drainage, water filtration and flood control occurred naturally (Girardet, 2004; Schuyler, 1986).

Olmsted and Calvert Vaux's 1857 design for New York City's Central Park and Brooklyn's Prospect Park, authorized by the New York legislature in 1859, were sufficiently large to serve as green refuges from urban life (Schuyler, 1986). Olmsted's Emerald Necklace, the Boston metropolitan area's 1,100-acre system of parks and parkways begun in 1878, reflected a more regional plan. Notably, the Emerald Necklace gave rise to the land trust movement in America, and provided the original model for the involvement of nongovernmental organizations (NGOs) in environmental planning when landscape architect Charles Eliot formed the Trustees of Reservations in 1891 in part to protect the Boston parklands (Brewer, 2003).

Urban reformers also called for the construction of small playgrounds in slum neighborhoods and adjacent to schools to provide places for children (especially immigrant children) to have wholesome, supervised recreation, keeping them off the streets and out of trouble. First supported by philanthropists, nearly 2,000 supervised playgrounds existed in more than 300 U.S. cities by 1910 (Nolen, 1910).

City Beautiful

To celebrate the 400th anniversary of Christopher Columbus's voyage to America, Congress chose Chicago to host the World's Columbian Exhibition in 1892–1893. Designed by Frederick Law Olmsted, Sr. and architect/planner Daniel Burnham, the 600-acre site included classical-style exhibition buildings, a wooded island park, and the Midway Plaisance, a forerunner of the modern amusement park (Reps, 1965). The fair (also called the White City for its architecture) initiated the city beautiful movement, which was characterized by the construction of civic centers, tree-lined boulevards, and public spaces; by the imposition of order on chaotic industrial cities; and by including nature in the city (Peterson, 2003).

In the early 20th century, Cleveland and Columbus, OH, Washington, DC, Harrisburg, PA, Philadelphia, and San Francisco embarked on city beautiful planning (Peterson, 2003). The most ambitious city beautiful plan, the *Plan of Chicago*, was unveiled in July 1909, shortly after the first national planning conference. Commissioned by the city's Commercial Club and overseen by Daniel Burnham, the Chicago plan featured a massive park system extending from the city into the larger region, with parks of varying scales and miles of tree-lined boulevards knitting the

system together (Peterson, 2003; Reps, 1965). Among the Chicago plan's accomplishments were the creation of the lakefront park developed between 1917 and 1930 and the establishment of the Forest Preserve District (1914) that today encompasses more than 30,000 acres (Encyclopedia of Chicago, 2008).

Garden Cities

The appalling pollution and congestion of British industrial cities, especially London, prompted Englishman Ebenezer Howard to set out an alternative regional settlement pattern in *Tomorrow: A Peaceful Path to Real Reform* (1898) later published as *Garden Cities of Tomorrow* (1902). Howard envisioned a series of self-sufficient satellite cities connected to each other and to a central city by rail lines. Encircled by greenbelts designed to limit growth and provide space for recreation and agriculture, each garden city would have a maximum population of 30,000, and all residents would live and work within the city (Howard, 1902; Parsons & Schuyler, 2002). The goal was to combine the best features of country and city life, balancing development with nature. Howard helped build two experimental garden cities: Letchworth and Welwyn, on the outskirts of London, which have since become attractive commuter suburbs. Register (2006) refers to these garden cities as the world's first "ecocities" because of their harmony with nature (p. 100).

Americans experimented with garden cities in the 1920s and 1930s, notably through the Regional Planning Association of America, founded by architects Clarence Stein and Henry Wright and supported by Lewis Mumford and Benton MacKaye, among others. Stein and Wright designed and garnered financial support for two private developments, Sunnyside Gardens in Queens, NY, and Radburn, NJ. Due to the Depression, Radburn was only partially realized, but stood as a model for later planned unit developments featuring clustered housing arranged around large open spaces (Stein, 1951). During the New Deal, Stein served as an advisor to the Resettlement Administration, which built three greenbelt cities: Greenbelt, MD, Greenhills, OH, and Greendale, WI (Arnold, 1971).

Wilderness Protection and Conservation of Natural Resources

A fourth movement within the first era of environmental planning involved federal policies promoting the wise use of natural resources and the preservation of wilderness areas instead of the rapacious resource exploitation common in the 19th century (Hays, 1959). But a debate arose between those advocating wilderness protection and those advocating conserving natural resources for human

use. Under President Theodore Roosevelt, who would leave office early in 1909, the federal government greatly expanded its efforts to protect wildlife and conserve natural resources. Roosevelt, widely acknowledged as America's most conservation-minded president, created the National Wildlife Reserve System in 1903 and the U.S. Forest Service in 1905 (Hays, 1959). However, these two acts showed Roosevelt's ambivalence toward the federal government's role: How much of the environment should be set aside in its natural state, and how much should be used for human consumption? This longstanding debate culminated in the struggle over whether to build a dam in the Hetch Hetchy Valley of Yosemite National Park, beginning in 1901. The dam was eventually built, but marked the first of many arguments over damming western rivers that continue today (Hays, 1959).

The debate about the use of natural resources pitted the wilderness preservationists, led by John Muir, founder of the Sierra Club in 1892, against conservationist Gifford Pinchot, who believed that natural resources should be managed for sustained yields and used wisely for human benefit (Hays, 1959). Muir shared the sentiments of Henry David Thoreau, who famously stated that, "In wildness is the preservation of the world" (Thoreau, 1862/1967). Pinchot was mindful of the warnings of George Perkins Marsh (1864), who in *Man and Nature* described human activity, such as overharvesting timber, that led to soil erosion and flooding. Roosevelt had appointed Pinchot as the first head of the Forest Service, yet he also was greatly impressed with Muir (Shabecoff, 1993). This debate continues to this day, especially over planning the multiple uses (timber harvesting, recreation, watershed protection, livestock grazing, and wilderness) of the 191 million acres of national forests (Daniels & Daniels, 2003).

First Era Assessment

The first era of environmental planning provided a strong basis for future urban and regional ecological planning, natural resources planning, and the balancing of nature and development. The construction of parks, playgrounds, and central sewer and water systems led city officials to recognize their responsibilities for the quality of the environment and public health. The federal government began to act as a steward of the nation's natural resources through the National Forest, National Wildlife Refuge, and National Park systems.

The early emphasis on physical planning and urban design did not come close to controlling air pollution, solving water pollution problems, or dealing with solid and hazardous waste. Business interests continued to impose the external costs of their production processes on the public

in the form of air, water, and land pollution, underscoring local government's tendency to value economic growth above the quality of the environment. Yet, led by Los Angeles and New York, cities began to adopt zoning to separate conflicting land uses to better protect public health, safety, and welfare (Reps, 1965). Concentrating noxious uses in industrial zones, for instance, reduced the threat that industrial air and water pollution would cause health problems for inhabitants of separate residential zones.

The garden city movement enjoyed only minor success as an alternative to the new residential suburbs, which were the precursors of automobile-dependent suburban sprawl, and the broad visions of the city beautiful movement were not realized as widely as those of the site-specific parks and playgrounds movement.

The first era of environmental planners employed only limited technology and scientific knowledge. One important contribution was the overlay, a series of maps that could be layered one on top of the other to record and communicate data for analyzing a site or region. The overlay was pioneered by Charles Eliot and later widely used by planner and landscape architect Ian McHarg (1996). Water supplies for large cities were increasingly developed in the hinterlands, such as New York City's Catskills reservoirs and San Francisco's Hetch Hetchy source in the Sierras (Daniels & Daniels, 2003). Sewerage systems and treatment plants were built, but storm sewers were not separated from sanitary sewers, leaving waterways vulnerable to combined sewer overflows during rain storms. These continue to plague hundreds of cities to this day (Daniels & Daniels, 2003).

The Second Era: Regional Ecological Planning and Natural Science

During the second era of U.S. environmental planning, from the 1920s to 1969, planners pursued regional ecological planning, balanced development and wilderness protection, and conducted environmental impact assessments, combining the preservation and conservation principles of the first era with the garden city ideal. But the main innovation of the second era was incorporating science into environmental assessment. Ecology, the study of relationships within natural systems of hydrology, geology, biology, and botany, grew into a body of knowledge (McHarg, 1969). The efforts begun at this time to plan sites and regions so as to fit humans unobtrusively into ecological systems continue today (McHarg, 1996; Randolph, 2004).

Regional Ecological Planning

In the 1920s, members of the Regional Planning Association of America (RPAA) combined garden city ideas with the conservation of natural resources and wilderness protection to create regional ecological planning. The RPAA saw the spread of urban development into the countryside as a serious threat to the natural environment. RPAA members argued that maintaining and enhancing natural systems was essential and that humans must fit compatibly within watersheds and plant and animal communities.

RPAA member Clarence Stein served as chairman of the New York State Housing and Regional Planning Commission, which produced the nation's first state-level land use plan in 1925. It called for transportation corridors, settlement nodes, and the preservation of rural land. Lewis Mumford was the chief spokesperson for the RPAA and took the lead in promoting the concept of regional ecological planning. Inspired by Scottish botanist and planner Patrick Geddes, he saw the region as a set of environmental relationships among terrain, climate, and soils which in turn shaped human culture (Mumford, 1927). Mumford envisioned a region deliberately settled in an organic, decentralized fashion that balanced nature with the built environment (Luccarelli, 1995). But it remained unclear what level of government could adopt and implement a settlement policy for multistate regions, such as that surrounding New York City. Fellow RPAA member Benton MacKaye incorporated Mumford's regional ideas into his own thinking (Parsons, 1994).

MacKaye, a trained forester, combined Mumford's idea of the ecological region with Pinchot's ideas about conserving natural resources and Muir's love of wilderness. He called for regional economic development linked with ecological planning, so that residents and visitors could "pass from civilization into the wild" (Luccarelli, 1995, p. 88). MacKaye envisioned regions as networks of villages or small cities, connected by highways that ran through the countryside without inducing sprawling development (MacKaye, 1928). Today, MacKaye is best known as the father of the Appalachian Trail, which he proposed in 1921 to act as a natural buffer against what he saw as a metropolitan invasion of the countryside (MacKaye, 1921, 1928). In 1937, MacKaye helped forge a coalition of hiking organizations, states, and the federal government to make the more than 2,100-mile trail from Maine to Georgia a reality.

Federal environmental policy during the New Deal expanded federal involvement in planning settlements, restoring degraded environments, and making better use of natural resources. A number of New Deal agencies combined Pinchot's idea of wise use of natural resources with regional ecological planning. The plowing up of fragile

soils together with a prolonged drought in the Great Plains devastated millions of acres of farmland during the infamous Dust Bowl years of the 1930s. In response, Franklin Roosevelt's administration created the Soil Conservation Service to work with farmers on conserving soil and water resources through better farming practices (Steiner, 1990). The National Resources Planning Board (1934–1943) was formed as a federal economic planning and development office and compiled numerous reports on the condition of the nation's land and water resources with an eye toward the wise use of those resources for economic growth (Clawson, 1981). The short-lived Resettlement Administration was created to move people away from the Dust Bowl, but the federal government fell short of adopting regional settlement policies on a national scale to balance population with the carrying capacity of the environment. The Tennessee Valley Authority (TVA) used reforestation, better farming methods, and dam construction to restore regional ecology and pursue economic development in one of the nation's most backward regions.

The successes of regional ecological planning occurred mainly in rural areas, and included the programs of the Tahoe Regional Planning Agency (1969), Adirondack Park Agency in upstate New York (1971), the Land Use Regulation Commission in the Unorganized Territories of northern Maine (1971), and the New Jersey Pinelands Commission (1979). These regions are now managed to balance human activities with ecological health, much as Lewis Mumford and Benton MacKaye had advocated. More recently, New York City joined this tradition, purchasing land and development rights, replacing failing septic systems, and promoting improved conservation practices on farms and in forests to protect its water supply sources in the Catskill and Delaware watersheds at a cost of about \$1 billion, rather than building a \$6 billion water filtration plant (Daniels & Daniels, 2003).

Balancing Development With Wilderness Protection

In the 1960s, wilderness protection was the main concern of most environmentalists, in the tradition of John Muir, and they wanted the federal government to take action (Shabecoff, 1993). They scored a major victory with The Wilderness Act of 1964, which set aside more than 30 million acres of national forest as wilderness and created a process for designating additional federal lands as wilderness (Daniels & Daniels, 2003). In 1965, Congress created the Land and Water Conservation Fund, funded by annual revenues from oil and mineral leases on federal lands, to purchase lands for wilderness and recreation. In 1968, Congress passed the Wild and Scenic Rivers Act to protect

wilderness and other largely unspoiled areas from development. The theme of balancing development and wilderness protection appeared in the 1973 Endangered Species Act, probably the most far-reaching federal environmental law, which applies to all public and private land and requires the identification of critical habitat and recovery plans for plants and animals on the endangered species list (Daniels & Daniels, 2003). Shortly before leaving office, President Carter signed the Alaska National Interest Lands and Conservation Act of 1980, which designated 56 million acres as wilderness. And in 2001, President Clinton declared 58.5 million acres of the national forests as roadless areas, in effect making them off limits for timber harvesting and development (Daniels & Daniels, 2003).

Environmental Impact Assessment

In January of 1970, President Nixon signed the National Environmental Policy Act (NEPA), which also created the Council on Environmental Quality to oversee implementation of the act itself. NEPA established a process for the review of federal policies and projects that could affect environmental quality and irreversibly alter natural resources. The heart of NEPA is the Environmental Impact Statement (EIS) process that screens all proposed federal projects, funding, permits, policies, and actions for potential environmental effects.

This requirement opened up a demand for environmental planners with training in geology, biology, botany, and hydrology (Ndubisi, 2002). They used landscape architect Ian McHarg's pioneering system of land classification based on layering information on soils, slope, drainage, water supplies, wildlife, and vegetation (Wallace-McHarg Associates, 1963) to analyze sites and landscapes for development potential and constraints (McHarg, 1969). This method was the precursor of GIS, now widely used to for environmental evaluation and to determine environmental carrying capacity.

Assessment of the Second Era

The federal government played a significant role in environmental planning during the New Deal by creating new agencies and programs, such as the Soil Conservation Service and the TVA. This activism resurfaced in the 1960s with the passage of The Wilderness Act, the Wild and Scenic Rivers Act, and the Land and Water Conservation Fund. Of special note in the second era is the rise of NGOs in environmental planning and their ability to influence environmental thinking and outcomes. The RPAA, the Wilderness Society, the Nature Conservancy, and others got their start in this second era. Meanwhile, business continued to ignore the environment, and the

nation's environmental quality declined, especially after World War II, as urban sprawl spread and the chemical industry expanded rapidly.

The technology and science of planning were still rather basic, but the creation of county soils maps by the Soil Conservation Service and McHarg's layers approach, which built on Eliot's overlays, were noteworthy achievements. From the early 1920s to the end of the 1960s, America's population doubled from 100 to 200 million. But deteriorating air and water quality, contaminated industrial sites, suburban sprawl, and loss of wildlife habitat suggested that the nation's most pressing environmental problems were not being successfully addressed. Although local government planning became more widespread after the Standard Zoning and Planning Enabling Acts of the 1920s, the impact of local development decisions on the environment was not fully appreciated, and economic growth remained the top priority in most localities.

The Third Era: The Birth of Modern Environmental Planning

From the start of World War II to the 1960s, environmental issues took a back seat to international conflicts, though the metropolitan countryside suburbanized and central cities declined as Mumford and MacKaye had predicted, especially in the Rust Belt. Resistance to suburban sprawl began to emerge in the 1960s (Rome, 2001). Large development projects, such as the proposed electric generating plant at Storm King Mountain on the Hudson River, galvanized opposition. Rachel Carson's (1962) famous book, *Silent Spring*, described the destruction of nature wrought by the chemical industry. In short, the modern environmental movement was born (Shabecoff, 1993).

In its first phase, from 1970 to 1981, the driver of the modern environmental movement was not the individual thinker and practitioner, as had been the case previously, but the institutional framework of government policies and laws. The modern environmental movement initially emphasized federal command and control measures to force industry and governments to clean up polluted air, water, and land (Fiorino, 2006; Mazmanian & Kraft, 1999). States created environmental agencies to help implement the federal laws, 22 states created state environmental policy acts, and some states adopted statewide plans featuring natural resource protection (Healy & Rosenberg, 1979).

Pollution Clean Up and Control

During the 1960s, environmental problems became so serious that they cried out for action, and the public and

Congress took note. The first Earth Day on April 22, 1970, brought national attention to the poor environmental quality: 60% of America's waterways were not fit for swimming or drinking and many city dwellers choked in smog (Daniels & Daniels, 2003). The problems were simply too big for cities, metropolitan regions, or even states to handle. Moreover, the private sector had to be included in environmental planning and regulation (Fiorino, 2006). Beginning in 1970, Congress and President Nixon responded with the most sweeping environmental legislation in the history of the United States.

The Clean Air Act of 1970, the Water Pollution Control Act of 1972 (better known as the Clean Water Act), and the Safe Drinking Water Act of 1974 enabled the U.S. Environmental Protection Agency (EPA; created by President Nixon in 1970) to combine a command and control regulatory approach with infrastructure funding to clean up pollution and maintain environmental quality (Mazmanian & Kraft, 1999). Finally, the funding and regulation necessary to plan for the environmental restoration and protection of cities and regions had begun at a level beyond what Olmsted, Burnham, Howard, Mumford, or MacKaye could have imagined. National air and water quality standards were established to protect the public health. Polluters faced fines or, in the case of water, had to obtain a National Pollutant Discharge Elimination System (NPDES) permit to discharge pollutants into waterways. Section 201 of the Clean Water Act provided more than \$150 billion in funding for municipal sewage treatment plants and sewer lines and required states to do sewerage facilities planning (Shabecoff, 1993). Even so, some 40% of America's waterways remain unfit for drinking or swimming (Daniels & Daniels, 2003).

Through the 1980 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; commonly known as Superfund) and the 1984 amendments to the Resource Conservation and Recovery Act (RCRA), the EPA began to address the problem of cleaning up hazardous waste sites and improving the disposal of solid waste. CERCLA authorized federal funds to clean up a list of severely contaminated sites. The redevelopment of less contaminated brownfield sites (of which there may be as many as 500,000 across the nation) for commercial, industrial, or residential uses is crucial for urban revitalization, especially in Rust Belt cities (Daniels & Daniels, 2003).

State-Level Planning for the Environment

In the 1970s, a number of states began to require local governments to adopt comprehensive plans that incorporated state goals, including the protection of air, water, coasts, and other natural resources (Bosselman & Callies,

1972; Healy & Rosenberg, 1979). Slowly, these environmental issues started to appear in local plans, and local governments drafted zoning provisions that protected environmental features such as steep slopes and floodplains. A few states, notably Vermont and Florida, established state guidelines for reviewing developments of regional impact (Healy & Rosenberg, 1979). In 1973, Oregon instituted a sweeping state planning law that required local comprehensive plans be consistent with statewide planning to protect farm and forest lands, coastal resources, and natural areas, and to concentrate most development within urban growth boundaries (DeGrove, 2005).

Assessment of the Third Era

The initial phase of the modern environmental movement led to spending hundreds of billions of dollars each year on pollution cleanup and control (Fiorino, 2006). It was starting to become apparent that environmental quality was linked to economic growth, as well as to public health and the general quality of life. The results have been impressive; air and water pollution have been much reduced (Daniels & Daniels, 2003; Speth, 2008). Many, though not all, hazardous waste sites have been remediated. The disposal of solid waste became safer and more orderly. Private industry developed the capacity to comply with environmental laws and recognized the need to cut pollution and waste (Fiorino, 2006). Popular awareness of the environment rose, thanks to both federal legislation and the annual celebration of Earth Day. The emergence of state and local environmental planning was a noteworthy achievement, and led localities to plan and implement policies to create healthier, more attractive places to live, work, and recreate (Healy & Rosenberg, 1979).

But the federal environmental legislation did not emphasize place-making, a fundamental concern of planning (Shutkin, 2000). And the command and control approach assumed that government had adequate data and scientific knowledge to set standards for air and water, which was not always the case (Fiorino, 2006; Speth, 2008).

The Fourth Era: Backlash or a Bridge to Sustainability?

The fourth era of environmental planning, which began in 1982 and stretched through the George W. Bush administration, ending in 2008, was also the second phase of the modern environmental movement (Mazmanian & Kraft, 1999). The primary environmental problem in this phase was a backlash against government environmental regulation, which was seen as too costly, inflexible, and

burdensome to private industry. During this period, two Republican administrations, those of Ronald Reagan and the second President Bush, tried vigorously to roll back federal environmental regulations; but it was under Democratic President Clinton that the shift of federal control over many environmental regulations to the states began in earnest (Fiorino, 2006). During this period the Montreal protocol on substances that deplete the ozone layer, ratified in 1987, also showed the limits of federal influence in environmental matters by making it clear that some global environmental challenges go far beyond national politics. Meanwhile, the term *smart growth* came to describe states and local government policies to allow economic and population growth while protecting the environment and quality of life.

A New Model of Federal Environmental Planning

Planning is a political process, as was evident at the beginning of the Reagan administration in 1981. In spite of air and water quality improvements, Reagan reined in the Department of the Interior and the EPA, whose environmental regulators had been criticized as bureaucratic, punitive, and adversarial toward industry and private property owners (Fiorino, 2006). The Reagan administration also required cost-benefit analyses of proposed new environmental regulations, and characterized environmental regulation generally as a drag on economic growth (Speth, 2008).

At the same time, it also became apparent to environmentalists that regulation alone was not necessarily the most cost-effective or politically acceptable strategy. Federal policy stressed financial incentives, cooperation, regulatory flexibility, and negotiation rather than the command and control regulatory approach, hoping to encourage markets to produce more environmentally beneficial outcomes (Mazmanian & Kraft, 1999). The federal government aimed to work more collaboratively with industry and local governments. The 1990 Clean Air Act Amendments, enacted during the first Bush administration, exemplified this approach, creating a cap-and-trade program that gave industry incentives to reduce sulfur dioxide emissions (Fiorino, 2006; Speth, 2008). A company that could reduce emissions below a set cap could then sell pollution credits to a company that was not able to reduce emissions below its cap. The cap-and-trade approach did not specify how companies should reduce emissions, but emphasized the goal they should meet, and the cost of failing, providing them with a strong financial incentive.

The Clean Air Act Amendments together with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 linked transportation planning with air quality

improvement through Metropolitan Planning Organizations (MPOs). By their roles in MPOs, local governments gained the power to influence how federal transportation dollars would be spent, as long as compliance with the Clean Air Act standards or progress toward those standards was maintained (Daniels & Daniels, 2003).

During this same period the federal government began paying landowners to improve land management in the Conservation Reserve Program (1985), and for conservation easements to preserve their land through the Wetland Reserve Program (1990) and the Farm and Ranchland Protection Program (1996; Daniels & Daniels, 2003).

The Rise of Land Trusts

The Reagan years were a watershed for nonprofit environmental planning organizations. In 1980, there were about 400 private, nonprofit land trusts in the United States. Today, more than 1,600 land trusts have preserved nearly 40 million acres, thanks in part to large national land trusts like The Nature Conservancy and the Trust for Public Land (Land Trust Alliance, 2005). Large land trusts with statewide, regional, or national scopes can implement regional environmental planning by permanently preserving land for natural areas, farmland, or forestland.

Assessment of the Fourth Era

The backlash against federal environmental regulation and planning in the Reagan and George W. Bush administrations retarded environmental progress (Speth, 2008). Economic growth and business interests were given top priority, and federal environmental regulation was relaxed. By contrast, the George H. W. Bush administration emphasized financial incentives for environmental planning in the 1990 Clean Air Act Amendments and ISTEA.

During this period energy became an important environmental issue. The oil price shocks of the 1970s should have spurred the federal government to promote energy conservation and mass transportation systems and develop domestic supplies of renewable energy. Instead, the United States now imports more than half of its oil, and only a small fraction of the nation's energy consumption comes from renewable sources (Speth, 2008). Approximately 80% of federal funding from ISTEA and subsequent transportation legislation has been spent on road construction and maintenance, and only 20% on mass transit (Daniels & Daniels, 2003). As a result, few of the nation's metropolitan regions possess much dense, mixed-use, transit-oriented development clustered around bus, rail, or subway stations. MPOs have had little influence on local and regional land use planning, a serious flaw that undermines regional environmental planning and public health.

On the positive side, environmental planners and the land trust movement used financial incentives to encourage positive environmental results and make markets more efficient. For example, the cap-and-trade model worked well in reducing sulfur dioxide emissions, and became the model of choice for reducing carbon dioxide emissions under the Kyoto protocol on climate change (Speth, 2004). Planning knowledge became more widely available thanks to the expansion of the Internet, remote sensing, computer modeling, and the growing use of GIS. And companies gradually became aware that going green could reduce operating costs and boost their profits (Fiorino, 2006).

The Fifth Era: Planning for Sustainability and the Global Environment

Sustainability

The 1987 World Commission on Environment and Development report, *Our Common Future*, defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 43). Thus, stewardship is fundamental to the principle of sustainability, which requires leaving the earth at least as well off as one found it. The report also noted the limits of the biosphere to absorb the effects of human activities and the need for wealthier countries to “adopt lifestyles within the planet’s ecological means” (p. 9). In particular, the report emphasized that “sustainable development can only be pursued if population size and growth happen in harmony with the changing productive potential of the ecosystem” (p. 9). Thus, planning for sustainability must minimize waste and pollution, conserve natural resources, and reflect the carrying capacity of ecosystems.

Although we did not realize it at the time, the previous four eras of environmental planning led us to our current concern for sustainability. The first era showed how to create a quality physical environment with a sense of place, and that natural resources are finite and must be used wisely. During the second era, ecological regional planning learned to balance a region’s long-term environmental and economic health. The third era showed that governmental command and control measures can change business and consumer behavior and reduce pollution. The fourth era proved that financial incentives can produce more sustainable lifestyles and business practices.

This latest era first, sees environmental planning as a process, and sustainability as something to work toward rather than something that will soon be achieved. Second, it requires a holistic view of a city or region that includes equal concern for environmental, economic, and social sustainability (Newman & Jennings, 2008). It is simply not possible to have one kind of sustainability without the others. Campbell (1996) warned that planners must consider environmental and social justice as they implement urban greening projects. This new perspective also considers environmental quality to be of the same importance as economic growth. Third, under the sustainable planning model all levels of government must work with the business community and individuals to shape behavior and lifestyles to be in harmony with nature (Register, 2006).

Topics of concern to sustainable environmental planning include ecological planning, low-impact site design, Leadership in Energy and Environmental Design (LEED)–certified buildings and neighborhoods, public health and settlement patterns, hazard mitigation and disaster planning, conserving water supplies and protecting water quality, alternative energy systems, biodiversity, access to green space, promoting green jobs, environmental justice, multimodal transportation, and, of course, climate change (Girardet, 2004; Register, 2006).

President Clinton appointed a Council on Sustainable Development in 1993 and the Council’s report was published in 1996 (President’s Council on Sustainable Development, 1996). Even so, the United States has no clear national policies on population, settlement, energy, or water supply although increasing population will place greater demands on natural resources and the ability of the environment to assimilate pollution and waste. There are now more than 300 million Americans, and by the end of the 21st century it is projected that there will be more than 570 million (U.S. Census Bureau, 2004). As one environmental historian put it, “It is clear enough that our current ways are ecologically unsustainable” (McNeill, 2000, p. 358).

Global Environmental Planning

In 1972, the authors of *The Limits to Growth* (Meadows, Meadows, Randers, & Behrens, 1972) caused an uproar by predicting when the world would run out of some natural resources and suggesting that economic growth based on the exploitation of finite natural resources could not go on forever. In 1989, McKibben claimed that there was virtually nowhere on earth that had not been altered by human influence, and hence, that the end of true nature had been reached (McKibben, 1989). Figure 2 lists what Gus Speth, Dean of the Yale School of Forestry and Environmental Studies, considers to be the top 10 global environmental

challenges, which, cumulatively threaten global ecosystems and the very existence of the world's inhabitants.

So far, the United States has responded slowly to these global environmental challenges (Speth, 2008). For instance, the United States has long been a major producer of greenhouse gases (Speth, 2008). The Kyoto protocol of 1997 proposed a global cap-and-trade system to reduce carbon dioxide emissions in 2012 to at least 5% below 1990 levels (Speth, 2004). As of 2008, America was the lone industrial nation that had not signed the Kyoto protocol, under the reasoning that the protocol would harm the U.S. economy (Speth, 2008).

In the absence of federal environmental leadership, more than 900 U.S. cities have signed the Sierra Club's cool cities pledge to reduce greenhouse gas emissions by 7% or more below 1990 levels by 2012 (Sierra Club, 2008). Several cities have gone a step farther by drafting sustainability plans that emphasize the curbing of greenhouse gases (Wheeler, 2008). By early 2008, 23 states and at least a few cities had adopted renewable portfolio standards requiring local electricity providers to obtain a certain amount of their electricity from renewable energy sources (Daniels, 2008).

Threats to sustainability are now matters of national security because as a nation we have become dependent on importing more than half of the oil we consume to support our carbon-intensive lifestyle, and global climate change poses potential threats to water resources from more frequent and severe droughts, to wildlife from hotter temperatures, and to coastal settlements from rising ocean levels (Gore, 2006).

Urban Ecological Planning

Within the first decade of the 21st century, more humans will be living in cities than in villages and the countryside for the first time in history (Girardet, 2004). Urban areas are expected to increase in size and population throughout the current century, underscoring the need for safe, healthy, efficient, and attractive places for people to live, work, and recreate (Newman & Jennings, 2008). At the heart of urban environmental planning is the push for air and water quality, energy conservation, walkability, multimodal transit, green spaces, social inclusiveness, economic success, and ultimately, sustainability (Alberti, 2008; Farr, 2007; Newman & Jennings, 2008; Register, 2006). A key concept is a city's *ecological footprint*, defined as the total amount of land resources used to support the city's residents (McNeill, 2000; Rees, 1992; Speth, 2008). The lower the ecological footprint, the more harmony with natural systems and the less energy and natural resources consumed and waste generated. One way to reduce a

1. Climate change and global warming
2. Loss of crop and grazing land and soil erosion
3. Loss of tropical forests
4. Extinction of species
5. Ozone depletion by chlorofluorocarbons (CFCs) and other gases
6. Population growth
7. Freshwater shortages
8. Overfishing oceans
9. Pesticides
10. Acid deposition

Figure 2. The 10 leading global environmental challenges.

Source: Adapted from Speth (2004).

locality's environmental footprint is to reduce its dependence on cars (Kenworthy & Newman, 1999; Register, 2006). In addition, urban environmental planners are applying McHarg's environmental layers as opportunities and constraints, to understand the urban setting as a living ecosystem with a sense of place rather than as simply a collection of buildings (Spirn, 1984).

Comprehensive plans, zoning ordinances, and building codes should be rewritten to enable practical models for incorporating sustainability principles into urban environmental planning (Beatley, 2000; Beatley & Manning, 1997; Farr, 2007; Girardet, 2004; Jepson, 2004; Newman & Jennings, 2008; Register, 2006). For example, Beatley and Manning describe how Chattanooga, TN, the nation's most polluted city in 1969, became the greenest city in America while developing a strong economy and providing a substantial amount of affordable housing.

The new urbanist movement stresses the importance of design in creating attractive, livable communities (Duan, Plater-Zyberk, & Speck, 2001; Katz, 1993). New urbanism does not place a strong emphasis on the natural environment, and the movement has been criticized for building on greenfield sites (Gordon & Richardson, 1998), yet the density, mixed uses, pedestrian-friendliness, green spaces, and transit-oriented developments of new urbanism promote better air and water quality and healthier residents. Architect Peter Calthorpe and planner William Fulton advocate bounded dense settlements surrounded by open countryside to curb sprawl (Calthorpe & Fulton, 2001).

Although far from achieving this vision, several cities are stepping up their environmental planning efforts. Chicago's aggressive programs to plant trees and promote green roofs and solar energy is a well-known example. New York City's watershed protection program and its latest

planning document, PlaNYC (City of New York, 2007), promote environmental quality while strengthening the urban economy and transportation system, improving quality of life even as the city's population grows.

Assessment of the Fifth Era

Sustainability in environmental planning is a far-off but worthy goal to work toward. Despite the achievements of the command and control approach in the third era and the introduction of financial incentives in the fourth era, many environmental challenges remain (Speth, 2008). Particulates from burning coal are still a leading cause of air pollution, supplies of clean fresh water are becoming increasingly precious, and automobile emissions are the primary source of air pollution in many metropolitan regions (Daniels & Daniels, 2003; Speth, 2008), and the United States is adding over three million new residents each year (U.S. Census Bureau, 2004).

American environmental planning is just beginning to address sustainability. Part of the reason is the long-standing tension between whether to give higher priority to economic growth or environmental quality. Many decisions that affect the environment are made at the local or regional level where economic growth often gets more attention than do environmental concerns. Practicing planners have long struggled with politicians over incorporating environmental issues into local comprehensive plans and promoting zoning and subdivision codes that regulate development while protecting environmental quality (Berke & Manta, 2001; Jepson, 2004). Indeed, we lack evidence on how well the goals of federal laws like the Clean Air Act and Clean Water Act have been incorporated into urban and regional environmental plans (Daniels & Daniels, 2003).

To address their environmental problems, urban areas will need significant reinvestment, which does not appear to be forthcoming from the federal government. Thus, state and local governments along with the private sector and NGOs have begun to forge responses to climate change and other environmental problems. But adequate funding for environmental programs will continue to be a major obstacle.

Changes in business practices and consumer behavior are beginning to benefit the environment. Businesses are recognizing that green products and green processes can increase profits and reduce costs (Speth, 2008). Many consumers want to buy products that produce minimal environmental impact, and saving water and energy and minimizing waste and pollution help companies' profitability.

Conclusions: The Trail Toward a Greener 21st Century

Environmental planning in America has evolved substantially in response to social, political, and environmental circumstances. Since the 1909 national planning conference, the nation's population has more than tripled, the economy has multiplied many times, government and corporate sectors have mushroomed, and threats to the environment have become more widespread and often cross political boundaries. In response, environmental planning has grown from a handful of thinkers and practitioners who emphasized physical planning and urban design to an institutional policy and legal framework that includes government, business, and nonprofit groups, as well as individuals. The problems that originally prompted environmental planning still exist: the need for parks and playgrounds, inadequate urban infrastructure for clean water and disposing of waste, the need for safe and healthy places to live, and the desire to balance wise use of natural resources with the preservation of wilderness. But modern environmental planning aims to go beyond protecting regional ecosystems and cleaning up local pollution to embrace national and international sustainability.

Government and private sector capacity to plan for the environment has increased enormously over the past 100 years. But the willingness to plan has wavered recently, particularly on the part of the federal government. Strategies have changed over the period from physical design, to command and control regulation, to financial incentives for pollution control, regional ecological protection, urban greening, and global cooperation.

Planning technology and scientific knowledge have made major strides from rudimentary overlays to GIS, remote sensing, computer modeling, and a far greater understanding of biology, botany, geology, and hydrology and how humans impact the environment. The biggest problem environmental planning faces may be lack of political will, not scientific uncertainty.

Have the theory and practice of American environmental planning been equal to the challenges? Not in the early years, when urban air pollution was hardly addressed. Water pollution from combined sewer overflows continues to be a major problem today. Suburban sprawl trumped the garden city movement, but wilderness preservation has been a noteworthy success. Regional ecological planning has had a few impressive achievements, but mainly in rural areas rather than metropolitan regions. Since 1970, pollution cleanup and control has been an expensive but largely successful effort. The blending of regulations with financial incentives and greater cooperation and collaboration has

produced some improvement in air quality. The goal of sustainability holds promise as a new paradigm for environmental planning. And greater awareness of human impacts on the global environment may spur action, particularly to address climate change. There is, in short, still much work to be done (Speth, 2008). Yet history may not have equipped us adequately for dealing with the host of serious challenges we face. It is not clear whether sustainability has truly achieved the same importance as economic growth, though the future of the planet may depend on it.

Planners can take action to make the future better both as professionals and as citizens. First, they should minimize sprawling development patterns and work to redevelop low density sprawl into urban places. Sprawling development depends heavily on cars and trucks which generate air pollution and climate-altering greenhouse gases as well as increasing America's dependence on imported oil. Sprawl also contributes to water pollution when septic systems fail and storm runoff is improperly managed. It is an unsustainable form of development. Environmental planners should blend command and control regulations (especially zoning and urban growth boundaries), financial incentives, and investment to promote sustainable settlement patterns.

Second, environmental planners can use regulations and financial incentives to promote environmentally friendly business practices and consumer lifestyles. It is important to use regulation to ensure basic environmental quality and to stop pollution at its source, but it is also important that prices signal consumers and producers the true costs of their choices, and enable them to make informed choices that promote sustainability (Speth, 2008). The principle that requires those who create negative externalities to pay for them must apply not only to polluters of air and water, but also to developers who build far from established settlements. Financial incentives, such as cap-and-trade systems to reduce carbon dioxide emissions and other greenhouse gases that contribute to climate change, and greater cooperation among levels of government, industry, and NGOs will be necessary.

Third, Americans must also adopt what Aldo Leopold called a *land ethic*. "A thing is right when it tends to preserve the integrity and stability and beauty of the biotic community. It is wrong when it tends otherwise" (Leopold, 1929/1977, pp. 224–225). The stakes of environmental planning are much higher now than they were in 1909. Potential catastrophes from climate change now threaten the entire planet, as well as America's national security. Thus, global environmental planning and sustainability are about long-term human survival as much as quality of life. Unless sweeping technological breakthroughs occur in the production of clean, carbonless energy, food, fiber, and

drinking water, Americans will have to learn to leave smaller ecological footprints in order to accommodate the projected increase of more than 250 million Americans over the course of the 21st century (U.S. Census Bureau, 2004). More compact settlements, urban revitalization, and stricter standards for new developments will be key to accommodating additional population with a minimum of environmental impact on air and water quality, wildlife, and energy consumption. Otherwise, the United States might consider adopting a population and settlement policy to limit population growth and better match the location of population with environmental carrying capacity.

Such changes in American culture and values will involve difficult investment choices, trade-offs, and political decisions. For example, better mass transit will be essential for the conservation of energy and reducing air pollution and greenhouse gas emissions in U.S. metropolitan areas (Yaro & Carbonell, 2007). But investing in mass transit will cost hundreds of billions of dollars and will compete with highway projects. The goal should be for the United States, the world's wealthiest country, to set an example for the world in environmental planning and environmental quality: act locally, think globally. And environmental planning must involve more international cooperation to manage the global biosphere and to address climate change and the other challenges listed in Figure 2.

Fourth, both major political parties should embrace environmental planning and sustainability. Republican Presidents Theodore Roosevelt and Richard Nixon pushed for major environmental legislation; and former Democratic Vice President Al Gore has been the leading spokesperson on climate change. Planning is fundamentally a political process, and electing political candidates who support environmental planning and sustainability is crucial. The federal government should guide the United States and the world toward greater sustainability, specifically:

1. Enact major controls, taxes or trading systems to retard climate change;
2. Change or end programs that subsidize sprawl and environmental degradation;
3. Increase funding for mass transit and the development of renewable energy;
4. Elevate the EPA to a cabinet department to give the environment its due place at the table in the national decision-making process, and to put the goal of a sustainable environment on a par with that of a sustainable economy.

Fifth, fragmented, uncooperative local governments compete to expand their property tax bases, often at the

expense of environmental quality and social cohesion. State and federal regulations should compel local governments to do better environmental planning, but more state and federal funding for local infrastructure and planning will be needed as well. For regional environmental planning to succeed, Americans must revamp local governmental structure and plan according to ecosystems, such as watersheds, rather than political boundaries, as MacKaye long ago advocated.

Finally, let us keep in mind that at the 2109 national planning conference, planners will look back at another 100 years of environmental planning and judge how well we have managed not only America's environment, but also the global biosphere.

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