FUNDAMENTAL PLANNING KNOWLEDGE

History
A Trail Across Time

American Environmental Planning From City Beautiful to Sustainability

Thomas L. Daniels

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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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
millions of 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;...
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 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 (Spirk, 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 (Duany, 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 MacKay 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.

References


Design by the Rules

The Historical Underpinnings of Form-Based Codes

Emily Talen

At the start of the 21st century, urban planning has rediscovered how to regulate the design of cities with rules about building form called form-based codes (FBCs). The Form-Based Codes Institute (2008), a nonprofit group devoted to their advancement, provides the following definition:

...a method of regulating development to achieve a specific urban form. Form-based codes create a predictable public realm primarily by controlling physical form, with a lesser focus on land use. ... Form-based codes address the relationship between building facades and the public realm, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks. ... Not to be confused with design guidelines or general statements of policy, form-based codes are regulatory, not advisory. Form-based codes are drafted to achieve a community vision based on time-tested forms of urbanism.

FBCs constitute a significant departure from the way development has been regulated in the United States in the last century. Instead of concentrating on bulk and use, these codes focus on the dimensions and locations of buildings, streets, frontages, and other elements that constitute the physical design of place (Katz, 2004).

Many desirable urban places are the result of explicit rules. Urban historians tell us that beloved urban places like Boston’s Back Bay and Edinburgh’s New Town were not random accidents, but were the result of “a unified control of land and buildings” (Rybczynski, 1989). This leads to the question of whether American cities could regain a higher quality urbanism by utilizing a different kind of coding. Figure 1 is a page from the SmartCode, a model FBC developed by Duany Plater-Zyberk and Company, showing how building height, type and disposition can be regulated in addition to function.
Figure 1. An example of a form-based code, showing regulation of building height, type, disposition, and function.

Source: Duany, Sorlien, & Wright, 2008. (© Duany Plater-Zyberk & Co., Image used with permission.)
In this article, I aim to understand the historical context of FBCs. Is their current popularity a return to historical approaches? What experience do we have with the regulation of urban form, and how does this current interest relate to it? By recounting the history of codes and putting the current popularity of FBCs in a broad historical context, I hope to reveal what is new and what is unchanged about the attempt to implement vision and design through coding. I also hope that this will support what seems to be a promising redirection of the way coding is done in the United States.

Defining Codes

In order to understand the history of FBCs we must define what they are as well as the source of their authority. However, development codes, which include FBCs, are extremely varied. They exist at a variety of scales and may apply to small-scale, incremental change at the parcel or individual building level, or to much larger issues and areas, such as layouts of entire towns. Carmona, Marshall, and Stevens (2006) uncovered 13 separate definitions for design code.

The authority to create and enforce a development code most often belongs to government, but under some circumstances could also be derived from the powers of religious leaders or be based on social and cultural customs. Though a modern code is normally legally enforceable, unlike a plan, the difference between the two is not as straightforward as it would seem. Idealized models of human settlement can sometimes act like codes. One example is Clarence Perry’s neighborhood unit concept, which planning textbooks, government regulations, chambers of commerce, and social service agencies promoted after it was implemented at Radburn and Baldwin Hills Village, and which was widely accepted (Dahir, 1947; Patricios, 2002).

Some rules that are not intended as development codes have indirect effects on physical form nonetheless. For example, those that dictate the existence of particular facilities affect urban form, such as the requirement that every town in ancient Greece contain an agora. Napoleon I’s 1807 law permitting towns to draw boundaries (Hall, 1997), England’s 1847 Markets and Fairs Clauses Act regulating where markets and fairs could be located and how big they could be, and Britain’s Public Health Act of 1875 requiring paved streets, street lighting, and better quality construction are all examples of how laws affected urban form indirectly. A law prohibiting unsanitary and fraudulent commercial practices in 15th-century England required that cooks buy only from local common markets, and not “by waiting at the ends of the town or in the highway” (Coventry City Record Office, 1907/1421), likely affecting the form of places significantly.

Although it is sometimes difficult to distinguish FBCs from other types of rules, guidelines, standards, court cases, and legislation, all of which play important roles in city form, the historical trajectory traced in this article defines FBCs as having the following attributes:

• significant enforceability;
• the intent to prescribe the public realm, often by regulating private building; and
• the direct or indirect production of “time-tested forms of urbanism” (Form-Based Codes Institute, 2008).

With regard to the last criterion, the Form-Based Codes Institute (2006) advocates codes that shape the public realm “to invite pedestrian use and social interaction” and produce “walkable, identifiable neighborhoods that provide for daily needs.” Such codes produce the streets, squares, and other public spaces that make up the public realm. Historically, they often did so by ensuring the production of a building wall that could adequately define the public realm, typically with a unified and consistent building frontage.

For this article, I consider the FBC lineage to include any code, law, or rule that meets these three criteria. Thus, I exclude modern design guidelines and design review processes because they tend to be advisory rather than regulatory. I exclude codes governing private building that does not impact the public realm (such as modern codes regulating the interiors of buildings) because they do not meet the second criterion. I exclude conventional zoning because it has little to do with prescribing “time-tested forms of urbanism,” but produces urban form as a byproduct of regulating something else, such as separation, property value, traffic flow, or perceived harmful effect. However, many of these excluded elements, like design review guidelines and conventional zoning, contributed to the evolution of today’s FBCs, for example by breaking down legal and political barriers.

Only FBCs meet the three criteria directly, so that their intentions and effects are the same, but codes, laws and rules that meet one or more of these criteria indirectly may be part of the FBC lineage, though they are not FBCs themselves. Figure 2 illustrates this difference.

The history below is based on my reading of what FBCs are trying to achieve and what kinds of endeavors, historically, had a similar effect, even if not directly intended. Determining what is or is not part of the FBC
lineage is thus an important aspect of defining FBCs.

**A Brief History of Codes**

To organize the discussion, I divide the lineage of codes into five categories. The first, “big interests and main lines,” is a title borrowed from Raymond Unwin’s 1909 treatise *Town Planning in Practice* (p. 379), and concerns codes and laws affecting the larger urban realm. I then discuss regulations for streets, frontages, and buildings, all of which are significantly smaller in scale. A final category concerns generative codes, Islamic codes, and other types of rules based on customs and social laws rather than predetermined designs. These affect urban form through rules governing behavior, offering a significantly different approach to the coding of urban form, but one that has some connection to today’s coding reform efforts.

**Big Interests and Main Lines**

The earliest written laws that affected city form include the code of Hammurabi from 2100 BC, which focused on ensuring quality building by exacting penalties if damage occurred (loss of life due to faulty construction was punishable by death). But other very early laws affected the form and pattern of the urban public realm on a large scale, especially the layout of streets and the placement of public buildings. Indian laws dating back 4,000 years established rules for laying out towns, streets, and houses (Dutt, 1925). We know from the writings of Plato and Aristotle there were laws governing streets and public squares (agora) in Greece in the 4th century BC. Roman laws included specifications for street layouts in military installments, laws intended to avert harm to neighbors, and laws regulating the use of land in central parts of cities.

Rules for laying out and building towns are an obvious example of large-scale urban coding. The *Laws of the Indies* promulgated by the Spanish monarchy in its colonies in the 16th century dictated street arrangement and width and the location of important buildings. The planned city of Savannah, GA, founded by James Oglethorpe, had rules for streets, lots, and buildings, some of which were enforced through deed restrictions in the 18th century. Figure 3 shows a town plan from the 18th century.

The system put in place by surveyor-architect Daniel Stolpaert in Amsterdam in the 17th century is often offered as an example of successful coding on a large scale. Stolpaert made use of a regulating plan that dictated the locations of public buildings, streets, canals, and private residences. A corresponding ordinance established rules for building, including where the privies could be located, who paid for the streets, and rules about drainage. The ordinance was in effect for some 400 years, and Lewis Mumford called the plan and implementing ordinance “the final expression of a more thoroughgoing attention to the conditions of health and social life” (Mumford, 1961, p. 441).

Regulating plans pay close attention to the aesthetics of
Figure 3. An 18th-century plan for a one-square mile town.

Note: This plan, which would have functioned like a code, showed land use, including common land, and dimensions of streets and parcels.

Source: Sharp, 1794.

In ancient Greece, the dimensions of streets, blocks, and public squares were made law in what Gallion and Eisner (1983) called “the final test of civic responsibility” (p. 23). In 13th-century Florence, laws intended mainly as aesthetic interventions compelled owners to give up property in order to enlarge public spaces (Girouard, 1985, p. 65).

The 1865 regulating plan for Naples, Italy, laid down rules for rebuilding that were literally the “guiding blueprint” for 25 years (Kostof, 1992, p. 57).

Plans for new towns also clearly affect the form and
pattern of the urban public realm on a large scale. Rules
guided the founding of Mormon towns, American railroad
towns, British new towns, and the medieval *bastides* in
France (Reps, 2002), establishing building rules that pro-
duced particular urban forms. Regulating plans for Garden
Cities and other kinds of complete planned communities
established rules for development that included street
layout, public space allocation, and building placement.
Planned communities like Shaker Heights, OH, Chatham Village, PA, and Venice, FL, all have rules guiding the
urban form of their developments in precise terms, and
thus I consider them part of the FBC lineage.

The American landscape architect and early city planner
John Nolen produced regulating plans that specified the
exact locations and dimensions of public streets and build-
ings. Modern FBCs have emulated this practice. Figure 4
shows an example of one of Nolen’s plans regulating the
form of public space and surrounding buildings on the left,
a plan that inspired the modern FBC-regulated new town
in Huntersville, NC, of which an aerial photograph is also
shown on the right.

Laws restricting where development could take place
also had a significant, though indirect, effect on urban
form at a large scale. One common theme was to prevent
new development from spreading into previously undevel-
oped areas. In 16th-century England under Elizabeth I,
new buildings had to be built on top of old foundations
(Larkham, 2001). The Prussian Building Land Act of 1875
prohibited construction on greenfields that lacked public
utilities and infrastructure, which meant that German cities
avoided the “squalid belts of privately owned shanties” that
surrounded French cities (Kostof, 1992, p. 57). Germany
enacted a law in the early 20th century that forbade build-
ing on “virgin plots” and restricted development to lots
that had been built on prior to 1887 (Arntz, 2002). When
U.S. historic preservation laws of the 20th century affect
the public realm and the creation of urbanism they continue
this same tradition.

**Streets**

Only the regulation of building height is more common
than regulation of streets, especially street width. Given
that streets make up the largest part of the public realm,
how they have been regulated is particularly pertinent to
the lineage of FBCs. The public realm of the streets has
been most frequently regulated by controlling street width,
which became “habitual” after the 17th century (Kostof,
1992, p. 205). In the 5th century BC, architect Hippo-
damus called for straight, wide streets in his plans for Greek
cities. In Rome in 100 BC, a written law required a mini-
mum street width of 15 feet (Southworth & Ben-Joseph,
2003). About the same time, Vitruvius’ *Ten Books on
Architecture (n.d.) laid down principles of street width and direction that would later influence Renaissance codes like the Laws of the Indies. In the 1st century, Vitruvius specified rules about siting new towns and laying out street directions to minimize wind. Figure 5 shows the names and directions of eight winds he identified. Often street standards were practical, such as the law in medieval Germany requiring streets to be the width needed for two carts to pass each other (Arntz, 2002). In Islamic towns around the Mediterranean basin, main streets were to be wide enough to allow two loaded beasts of burden to pass (Hakim, 1986).

Street width was frequently specified in order to make cities more open. Beginning in the 17th century, it was believed that wide streets helped ventilate the city and keep it healthy, according to the "miasma theory" that stagnant air caused disease (Girouard, 1985, p. 227). During the medieval period buildings sometimes encroached so far into the street that "it was literally possible to shake hands between opposite windows" (Morris, 1979, p. 73). After the great fire of London in 1666, the London Building Act of 1667 specified wider streets in part to keep fires from jumping across streets. In Dublin in the 18th century, a Wide Streets Commission made sure street widths remained between 75 and 100 feet. Girouard (1985) argues that since the widths being advocated in Dublin went well beyond what was needed to accommodate carriage traffic, the commission must have been motivated by visual as well as health reasons (p. 227).

Street widths were often regulated to accord with building height, but the location and importance of the street was also considered. The Roman emperor Augustus imposed a law that specified street widths ranging from 40 to 15 feet, depending on location relative to the central core. Immediately after the French Revolution, four categories of width were created based on streets’ lengths and primary functions. In his original plan for Washington DC, L’Enfant specified that grand avenues like the one leading to the White House should be 160 feet wide, streets leading to public buildings or markets should be 130 feet wide, and all other streets should be 110 feet wide (Brown, 1900).

Rules about who was required to pay for the construction, drainage, and lighting of streets had an indirect effect on street width and urban form. In Paris in the 14th century, for example, households were required by law to clean the streets in front of their dwellings (Girouard, 1985). This had the effect of encouraging encroachment into the street, since residents felt a sense of entitlement in exchange for this responsibility, but it was also a motivation to keep streets narrow and to minimize frontage. On the other hand, where street width was firmly set and maintained at private expense, as in 19th-century Germany, there was an incentive to maximize the value of abutting property by building taller buildings. In response to the 1875 Law of Building Lines which set street widths in Germany, developers of the Berlin Meitskaserne "filled every inch of property with huge buildings; . . . inhabitants had no benefit whatever of the light and air of the ample streets, as they breathed through narrow courtyards and less" (Kostof, 1992, p. 206).

Frederick Law Olmsted Sr. advanced an entirely different approach. He used parkways that included specifications for a flanking street system, alleys, blocks, and lots as “city-shaping devices” (Macdonald, 2005, p. 296). By the middle of the 20th century, regulations on streets in the United States were the exclusive province of traffic engineers focused almost solely on the flow of cars and the prevention of accidents. Codes for street design were therefore de facto consequences of manuals published by the Institute of Transportation Engineers (ITE; see, e.g., Hammond & Sorensen, 1941; ITE, 1964). This effectively ended consideration of the relationship between street width and urban form.
Frontage

Frontage is what defines the public realm. It includes both the public elements of curb, sidewalk, and tree, and regulations governing the private frontage of the building façade and its setback. Codes about how buildings were to meet the street were essentially rules prescribing the public realm. This recognition prompted William Penn to declare in the 17th century, “let the houses built be in a line, or upon a line, as much as may be” (Hazard, 1850, p. 530). Jefferson and L’Enfant also included rules about street frontage in their plans for laying out Washington DC in the late 1700s: “houses shall range even and stand just six feet in their own ground from the street” (Reps, 1965, p. 126). In some cities, the effects were lasting: In Winchester, England, building frontage rules remained unchanged from the 11th to the 20th centuries (Kostof, 1992).

Uniform frontage was required for centuries in Germany. The earliest German regulations concerning building setbacks were recorded in the 13th century, and Berlin regulated building location to ensure continuous façades as late as the early 20th century. Such codes aimed to form a deliberate frame around streets and squares, always distinguishing between public and private responsibilities for the public and private realms. Public space was ordered, but behind the building line regulation concerned itself only with fire safety and the rights of neighbors (Arntz, 2002).

At first, frontage regulations mostly ensured that buildings did not project too much into public space. In Amsterdam, 16th-century decrees regulated even the maximum size of front steps to ensure an accessible public realm. Dutch decrees also limited lean-tos, benches, and displays of goods on the street, suggesting problems keeping streets free of encumbrances (Wheelock & Seeff, 2000). In some cities in Italy in the 15th century, laws regulated building projections by zones, with more strict control on primary streets. In addition to setting maximum building heights, London’s Rebuilding Act of 1667 prohibited building projections and required consistent setbacks and cornice lines. This created relatively uniform, flat-fronted buildings. A set of 18th-century Prussian laws allowed building freedom only if the building did not lead to “disfigurement of the towns or public squares” (Allgemeine Landrecht, 1794, quoted in Arntz, 2002, p. 7), a concern aimed at unsightly projections.

Arcades were an important mechanism for regulating frontage and ensuring a uniform, dignified public realm. The social and environmental value of requiring a covered public walkway was recognized in the Roman period, and in rules guiding city building in 6th-century Palestine (Hakim, 2001). In the 15th century, Alberti imagined how porticoes could promote social interaction and even play among youth (Alberti, 1988/1452). In Bern, Switzerland, arcades were precisely regulated by building codes, being required for the fronts of all houses on main streets as early as the 16th century (Braunfels, 1990). At the same time, the Laws of the Indies prescribed arcades around central plazas to encourage sociability and trading and provide protection from the elements.

Figure 6 shows a drawing from a 19th-century code regulating building height and setbacks in London. Such codes regulated building form based on street width, and had the effect of creating a uniform street frontage.

Buildings

Regulation of individual buildings has had a profound effect on urban form. Rob Krier (2003) identified 24 different ways in which buildings affect urban space, asserting that the failure to recognize these effects “shows a society in cultural crisis” (p. 329). Regulations about where buildings could be placed, their height, and the spacing between them all already existed in ancient Roman times. Restrictions on height were the most ubiquitous. In 15 BC, the Roman emperor Augustus imposed a law limiting the height of buildings to 66 feet (Southworth & Ben-Joseph, 2003) in an effort to keep the city more open. But in the 18th century, German cities imposed regulations on minimum height (Kostof, 1991, p. 200), and after World War II, residential buildings in German cities were required to be at least four stories high in an effort to make cities more urban and dense.

In the medieval period, codes regulated structure placement, height, and setback. The first building regulations in England are from 1189, and dealt with issues such as obstruction of views, blockage of light, party walls, and projections (Larkham, 2001). A famous book of German building regulations known as the Sachsenspiegel, formulated in the early 1200s, allowed construction of a three-story building without a judge’s permission, but specified laws governing minimum distances between buildings, maximum heights, and rules about fencing property (Arntz, 2002). It also prohibited windows that overlooked a neighbor’s yard and buildings that overhung streets.

Some codes varied building height rules according to urban location. One version of this practice was to connect building height and street type. London’s Rebuilding Act of 1667, for example, specified three building heights based on type of street. Some differentiated between inner and outer parts of a town, as did 1891 building requirements in Frankfurt am Main, Germany.

Fire safety concerns were often the reason for restricting building materials and specifying windows and other features, but such requirements could also be imposed for
aesthetic reasons. A law from 1344 required that all buildings on the Piazza del Campo in Siena, Italy, have the same size windows, a ruling that was driven by a desire for visual harmony (Girouard, 1985). In Nuremberg, Germany, in the 15th century, codes stipulated how much ornamentation a building could have, how many oriel windows were permitted, and that buildings had to be lined up to create an “undeviating building line” (Kostof, 1992, p. 201). As early as 1607, French building regulations limited ornamentation (falling entablatures were a significant problem) and promoted a classically proportioned, flat building line. English law dictated in 1618 that windows had to be taller than they were wide and brick arches over windows were strongly encouraged (Ayers, 1998), while a Parisian law of 1882 gave exact dimensions “for every decorative element, including columns and pilasters, friezes, cornices, consoles and capitals” (Evenson, 1979, p. 149), clashing with 19th-century notions of artistic freedom.

Most American building codes that affected urban form did so indirectly, for example, limiting height or increasing setback as part of protecting health and welfare rather than out of a desire to create a particular urban form. The classic example is New York City’s 1916 zoning resolution, which limited building mass at different heights (Ford, 1917). The intent was to prevent large buildings from blocking light and air on the streets below. This, coupled with owners’ desires to maximize building volume in this desirable location, created a distinctive, stepped-back architecture.

Generative Codes

Generative codes have a less direct connection to current coding reform efforts. These are rules guiding construction decisions, rather than rules designed to achieve specific physical forms. They allow certain freedoms, but only within a framework of prohibitions focused on preventing damage to neighbors. They have been described as “a bottom-up system of self-regulation, and thus democratic in spirit” (Hakim, 2001, p. 22). Islamic codes are the clearest example, and the method is most prevalent in
Mediterranean cultures, although through Roman law such codes affected much of Europe. In fact, many historical rules dictating frontage, street width, and building height can be viewed as generative in the sense that one variable (like street width) generated the other (like allowable building height). In the United States, the idea of a generative code has been popularized by Christopher Alexander, whose work on the organic city-making process follows in the tradition of Jane Jacobs’ process-oriented ideals (Alexander, Neis, Anninou, & King, 1987). This approach rejects predetermined forms and patterns in favor of “the stepwise process by which a form might emerge from the evolutionary actions of a group of collaborators” (Mehaffy, 2008, p. 57).

Traditionally, city building in the Mediterranean region has been guided by codes based on a widely shared set of values including respecting one’s neighbor, acknowledging the inevitability of change, and respecting local customs (Hakim, 1986, 2008). The result is a low, compact urban form with abutting buildings, narrow streets, private courtyards, and connecting archways above the street. Rules that protected adjacent properties against negative effects, but allowed great latitude in property use, were codified as early as the 6th century by the Byzantine emperor, Justinian I, whose code had roots in even earlier laws of the ancient Near East (Hakim, 2001). Traditionally, local judges decided compliance with these codes one case at a time, aiming to rule equitably, and leading urban form to evolve “naturally,” as a “self-regulating and adaptive system” (Hakim & Ahmed, 2006, p. 19). Figure 7 shows Granada, Spain, a city resulting from generative coding.

Islamic codes yield fine-grained urbanism and many courtyards. They are driven primarily by concern for privacy, prevention of damages, and decorum. Koranic laws that apply to buildings emphasize respect for proximate neighbors, privacy, and equity, and have a transparent effect on urban form because their origins and impacts are known (Davis, 1999). For example, a rule that doors on alleys should not face one another is motivated by the need for privacy rather than a specific aesthetic obligation. A rule that courtyards are to be symmetrical is motivated by the centrality of the courtyard in social life, not by an abstract notion of the beauty of classical proportions.

An example of generative coding in English common law known as the Doctrine of Ancient Lights came from the document whose title page is shown in Figure 8. It stated that a new building could not block the light from an ancient window, defined by William Blackstone (1768) as having “subsisted there time out of mind” (p. 134). This had the effect of limiting building heights. This doctrine survived in the United States until it was struck down in 1838 by a judge in upstate New York who declared that the practice would limit economic return and prevent the highest and best use of a piece of land (Davis, 1999).

The American Experience: From Zoning to Form-Based Codes

These European coding traditions did not take root in the United States, though there were some restrictions on building materials in the North American colonies as early as the 17th century, and a few colonial settlements were regulated by urban codes like the Laws of the Indies, as mentioned earlier. During the 18th and 19th centuries some American cities passed sanitation laws designed to protect public health and private investment and some well-known housing codes, such as New York’s Tenement House Act of 1867, though the latter largely perpetuated the status quo. Planned communities had codes regulating form, but these were uncommon. As American urbanization increased in the second half of the 19th century, few development controls were specifically about form. Regulations establishing street widths, frontage, and building height were rare. Boston only regulated building height limits in 1903. This is not to say that urban form was unaffected by law, only that the effects were largely indirect. For example, the tenements in Chicago were three stories tall, while those in New York were six stories tall, because above these heights buildings were required to be fireproof (Williams, 1919).

The codes established by the late 19th century were quickly subsumed by zoning regulations in the early 20th century. By 1918, zoning had taken the country “by storm” (Kimball, cited in Simpson, 1985, p. 126). Herbert Hoover’s enabling legislation pushed it even further, and by 1929 nearly 800 cities in the United States had zoning ordinances (Hubbard & Hubbard, 1929). Hoover was an engineer, and promoted zoning as a tidy and technically efficient approach to city building, largely without concern for its effects on urban form. Hoover’s 1926 publication, A Zoning Primer, likened the unzoned city to “an undisciplined daughter making fudge in the parlor” (Advisory Committee on Zoning, 1926, p. 1).

Zoning was designed to remedy the negative externalities of the industrial city, stabilizing residential property values while keeping industrial areas efficient and functional. Thus began American planners’ adaptation of German zoning laws from the 1890s to very different ends, maximizing separation and mobility (Scott, 1969; see also Logan, 1976). The New York zoning ordinance of 1916 was the first such comprehensive scheme, but the suggestion to separate the city into zones had been made earlier.
Figure 7. Granada, Spain.

Source: Photo by Michael Mehaffy, published with permission.
Decentralization and separation were emphasized at the First National Planning Conference in 1909, where Robert Anderson Pope argued for “wider dispersal of the laboring class” (Sies & Silver, 1996, p. 462). George Kessler’s plan for Dallas in 1910 emphasized dividing the city into zones, “each devoted to its own particular purpose” (Scott, 1969, p. 124).

Later, FHA regulations on mortgage lending had a significant impact on urban form, setting standards for street widths, block lengths, and dwelling sizes (Federal Housing Administration [FHA], 1935). Suburban restrictive covenants imposed building rules designed to exclude (Fogel, 2005). In The Rise of the Community Builders: The American Real Estate Industry and Urban Land Planning, Weiss (1987) demonstrated that development was not simply unfettered sprawl, but was orderly, controlled, and designed. The community builders helped put in place the deed restrictions, zoning, subdivision regulations, and other land development controls that engendered the segregated pattern of postwar suburbanization.

The negative effects of such controls, particularly zoning, were recognized from the outset. In 1909, Raymond Unwin, the great British town planner, described the building regulations he was confronting as little more than “needless harassment and restriction of really good building” (p. 388). Clarence Perry (1939) lambasted zoning as inflexible and not able to invest a residential district with “attractiveness” (p. 114). The solution proposed at the time was not to reform existing codes, but to place greater reliance on professional expertise. Charles Robinson’s 1901 city planning text included a chapter called “Centralized Control” that recommended putting every aspect of urban development in the hands of planners offering “the central viewpoint” who would “take, beyond the cavil of petty politics or local interest, the community standpoint” (p. 245). Thomas Adams (1935) echoed the same sentiment several decades later, noting that “the city planner must be guided by his own judgment rather than by any formulae” (p. 24). In Europe, Unwin (1909) proposed an approach allowing “something of that elastic character which belongs to natural restraints,” (p. 387) and “a little give and take, a little averaging of one part with another” (p. 393). He proposed submitting individual cases to a referee.

Dissatisfaction with land use codes grew throughout the 20th century, leading to the current intense interest in coding reform. A number of authors have tried to understand how planning regulations came to be so widely despised (Ben-Joseph & Szold, 2004; Davis, 1999). Critics pointed out inefficiencies, social inequities, and added costs of conventional zoning codes (Dowall, 1984; Levine, 2005), and noted that zoning was, “modified by bureaucracies, adapted to political exigencies, and otherwise thoroughly watered down for ease of application and administration” (Relph, 1987, pp. 74–75).

FBCs emerged as the antidote to conventional, use-based zoning, possessing the fundamental difference of being intended to affect urban pattern and form. Duany and Plater-Zyberk’s 1982 master-planned community of Seaside, FL, initiated the most recent wave of FBCs, specifying building use, height, permitted encroachments, and parking (see Krieger, 1991). Subsequently, the Congress for the New Urbanism advocated that codes focus on the visual harmony in the public realm; require continuous urban frontage to ensure a degree of uniformity; and be sensitive to context, factoring in spatial relationships to be

Figure 8. The source of the Doctrine of Ancient Lights.
at least partly generative. Transect-based codes such as the SmartCode are a subset of FBCs in which regulations vary depending on the type location, ranging from rural preserve to urban core (Duany & Talen, 2002).

**Assessment**

I aim to assess current efforts at code reform, particularly FBCs, given the historical trajectory, first discussing differences and similarities and then assessing the future prospects of code reform in light of what preceded it.

**Differences and Similarities**

It is widely believed that today’s codes are more heavy handed and exert a greater degree of control than previously seen. But laws regulating urban places have long been common. Regulations specifying building type, height, embellishment, window size, and setback already existed in medieval times. Citywide regulations often went even further, dictating appropriate dress and specifying curfews, for example. As Girouard (1985) summarized it: “The city government watched over the way people behaved, and made the appropriate regulations” (p. 73). Many of these rules were more prescriptive and generative than today’s FBCs, though some proponents claim that FBCs could be generative, perhaps with “stepwise layout guides” (Mehaffy, 2008, p. 72).

Historic codes were not exclusively about achieving ideal physical configurations, as might be imagined, but have long sought to control land use. Islamic codes, for example, are rooted in principles governing the acceptable use of land. Ancient Romans enacted laws to keep industry out of certain areas (Ben-Joseph, 2005), and in the Middle Ages, noxious industries like tanning establishments were kept out of the city center. In 17th-century London, shops were not allowed on main public squares nor on the streets leading toward them. Regulations in Italy from the mid-16th century ordered that gaps between houses be filled in with buildings (Girouard, 1985). Ancient Rome, 17th-century London, and 19th-century Germany all had regulations meant to be applied differently to different parts of the city (i.e., zoning). Land use zoning in the early 20th century only expanded on these earlier coding traditions.

Codes have recognized the importance of aesthetics since the Renaissance. Girouard (1985) wrote that the medieval period had “only a few recorded instances of aesthetic awareness” (p. 76), but others have argued that regulations on such things as bridge ornamentation, street trees, the protection of admired buildings, and the cleanliness of canal banks in the 16th century were intended to protect the aesthetics of the public realm (Kistemaker, 2000). Although architectural style was often affected indirectly by codes created to prevent fires or protect public health, for example, the effects on aesthetics were also known in the early 18th century (Larkham, 2001). Royal proclamations in France in 1783–1784 introduced rules that made house height a function of street width, and forbade any roof greater than half the width of the house. Both rules were motivated by urban aesthetics and the desire to create scenic views. Baron von Haussmann’s 1859 decree regulating building height and street width grew out of these and was “more an evolution than a revolution” (Cognot & Roux, 2002, p. 10).

Throughout history, urban codes imposed order and uniformity to protect public health and safety and property values, and at times to provide social control. Such uniformity was often superficial, masking great social and economic complexity, and sometimes disconnecting form from function. In the Baroque era, for example, strictly controlled building frontages concealed speculative development. Kostof (1991) points out that codes requiring uniform street frontage often accompanied other social controls. In St. Petersburg in the 18th century, codes required uniform streets and houses at the same time that Peter the Great required Western dress and shaved beards. Urban order was supposed to make people more civic-minded and, according to Catherine the Great, “more docile and polite” (cited in Kostof, 1991, p. 256).

Not all historic codes raised aesthetic quality. Before World War I, Dutch architect Berlage encouraged Amsterdam to require uniform block frontages, creating a “system of definite proportions” which many say yielded especially beautiful urban form (Banham, 1960, p. 142). But English law created oppressively uniform bye-law streets more to reduce costs than to achieve visual harmony, like standardized terrace or row housing. Where requirements for uniform building frontage were intended to hide class distinctions, as was the case in the 19th century and later in Garden City design, uniformity of design may have seemed more legitimate.

It has always been important to balance uniformity, order, and control with flexibility and the ability to adapt to changing circumstances. Historically, codes often required case-by-case problem solving involving an intermediary. Disagreements over the implementation of Islamic codes, for example, were adjudicated by a local judge. In medieval London, building disputes were dealt with at quasigovernmental public meetings. A London proclamation in 1618 specified that “the beauty and uniformity of the work [was] to be agreed by the builders at the discretion of the Commissioners” (Ayers, 1998, p. 230). This was the
kind of flexible adjudication and generative process that planners like Unwin, Robinson, and Adams would have endorsed.

Codes have always been subject to change. In Rome, when tall buildings made narrow streets dark, Julius Caesar reduced allowable building heights. Widespread European support for wide streets was replaced in the 19th century by the view that wide streets were unhealthy, creating wind and dust (Kostof, 1992, p. 206). Rules also often applied to only a few aspects of urban form, with the rest left to change as desired. The codes of medieval cities, for example, required that some streets would be wide enough for clear passage, and protected the public square, but left the remainder of the city unconstrained.

Today’s code reformers also specify a few simple rules while leaving everything else to adapt, innovate, and remain culturally distinct within a coding framework. This approach existed almost from the beginning of American city planning. Early 20th-century planners like Frederick Law Olmsted Jr. wanted codes to be adaptable and responsive (Scott, 1969). Lewis Mumford said that because the Laws of the Indies followed the standard bastide pattern and prescribed exact dimensions (e.g., plazas were to be 400 by 600 feet), they produced towns that “looked backward, not forward” (Mumford, 1961, p. 330). Julian of Ascalon’s 6th-century treatise, which modern writers say combined “a large measure of performance outcome and a small dose of prescribed rules” (Ben-Joseph, 2005; Hakim, 2001), would likely appeal to current code reformers.

Future Prospects

In the past, a code could produce a coherent visual framework for the city because it was supported by what Witold Rybczynski (1989) called “a collective wisdom and a shared consensus about what constituted good architectural manners.” In Urban Design in Western Europe, Wolfgang Braunfels (1990) asked why “the most comprehensive and precise codes no longer suffice to maintain” an ordered urban framework previously achieved by just a few simple rules (p. 1). He did not blame this on architects and urban designers, but explained it as the result of political change, saying that cities are now too disparate and lack commonality among competing actors and interests.

For this reason, modern FBCs cannot simply resurrect past codes. Rather, they must substitute something for a consensus about urban form that no longer exists. Some earlier urban codes were the product of constraints, so that the uniform street width, frontage lines, and building heights they required were rarely disputed. But modern FBCs attempt to move development in a new direction, and what they require is not already in place. Absent vernacular building traditions, or a clear memory of them, FBCs must break new ground.

Codes also require transparency and a shared, easily understood set of principles. When zoning codes are unresponsive to local conditions and do not explain the reasons for their requirements (why must a building be set back 15 feet?), they may prevent development that fails to comply with the letter of the law even though it satisfies the law’s intent (Davis, 1999).

And code reform also requires shared ideals. Without these, a code becomes one element in a multitude of what Waller (1983) described as idiosyncratic “secular influences” dictating city form. Building cycles, the behavior of speculators and lenders, taxation, capital investments, and topography all have influence. While coding was previously supported by culture and technological limits, FBCs must now build consensus around what Ben-Joseph (2005) termed “place-based norms” (p. 24). Such norms may be dormant. Some planners have been accused of relying on conventional zoning codes precisely because design sensibilities and norms about place are missing.

That codes will have to be the substitute for place-based norms, or at least the mechanism through which they occur, is not a completely new viewpoint. Writing in 1909, Raymond Unwin said that town planning “and the powers conferred by legislation” were evidence that the “spirit of association” (p. 375) that may have once existed in feudal times was making a comeback. It was a matter of a new order taking the place of an old one, a solution to the problem of the individual in “helpless isolation of his freedom” (p. 375). Some decades later, the 1942 “Dedication of Principles” of the Building Officials Conference of America (BOCA) proclaimed commitment not only to better methods of construction and to relief “from the uncertainty and confusion of conflicting building laws and regulations,” but to “the promotion of civic pride and community well-being” (BOCA International, Inc., 2002, p. 4).

Modern code reformers aim to help communities uncover shared attitudes toward urban form by engaging the public in the code-making process. Requiring meaningful public participation in the code-making process, as strongly urged by FBC advocates, is new. The new book Form-Based Codes (Parolek, Parolek, & Crawford, 2008) stresses the importance of public participation, calling for a community visioning process as a key source of code content.

Consensus will have to be balanced with flexibility. There is a continuing tension between infusing aesthetic goals into the planning process, and coding prescribed forms. One is about infiltrating a process with design sensibilities, the other about hardwiring a specific physical goal. One allows multiple interpretations, the other constrains
responses in order to achieve predetermined outcomes. This tension is an ongoing coding challenge.

One approach to resolving this dilemma is to code only the most essential elements. Codes can be all-controlling or they can stipulate a few key principles and, from there, "let it go" (Jacobs, 2002, p. 139). History provides ample evidence that a few simple rules can lead to desired urban forms while making adaptation less cumbersome. Mumford (1968) said that failure to adapt led to the "brilliantly sterile" urbanism of Le Corbusier and Mies van der Rohe (p. 162–163). Yet, code reformers must wonder whether it will be possible to guide urban form in desirable ways by focusing on small, incremental changes, given that big developers and large-scale developments often have the greatest influence.

Thus, there is ongoing disagreement over the degree to which incremental changes can or should be regulated. Jane Jacobs (1961) expressed "great wonder" at the intricate order that cities exhibited because of the countless freedoms available to urban dwellers (p. 391). Others have similarly extolled the virtues of loose controls. Richard Sennett, in The Uses of Disorder (1970), promoted an urban social life that is "disordered" and "unstable," because it causes residents to become more directly involved with the mitigation of neighborhood problems (p. 144). Absent land use laws, Sennett reasoned, residents would not rely on government to solve problems, but would take it upon themselves to effect change.

Urban planners generally disagree, and have not favored minimizing regulation. Unwin (1909) believed that any semblance of order or convenience in an unplanned place was due purely to chance (p. 2). As discussed earlier, the historic solution was to grant architects like Unwin great authority over the pattern and form of the built environment rather than to try to refine codes. Early 20th-century planners had little interest in regulating the small details of the built environment, and didn’t think it could be done in any case. Writing in 1901, Robinson concluded, "Rules and suggestions can be based only on practical considerations. The rest must be in the designer’s heart" (p. 126). While early planners promoted a theory of systematized planning (Birch, 1980), they failed to extend the system to physical design. As a result, urban form languished under a coding approach (zoning) that paid little attention to the quality of urban form. Modern code reformers, by contrast, believe they can use codes to achieve a better sense of place.

Conclusion

Current code reform is an interesting blend of old and new approaches. Codes have an illustrious history that reaches back at least 3,000 years, and much of what current code reformers are trying to do when they regulate urban dimensions like street width, building height, and frontage connects to that history.

Early 20th-century planners like Thomas Adams and Frederick Law Olmsted Jr. apparently had little confidence that using codes could achieve particular urban forms. Many prominent planners deplored the subordination of design to legal restrictions and thought attempting this was a chief weakness of planning. This view persisted even after it became clear in the 1930s that zoning codes were not producing good urban places. This way of thinking was in keeping with modernist sentiment. As Howard Davis (1999) summarized: “Modernism helped legitimize things that could be measured and tried to liberate the architect’s individual creativity with respect to things that could not” (p. 201).

Today’s codes must cope with complexity that was unknown in previous historical periods. Before the 20th century, urban form was limited by transportation, construction methods, and the need for defense, identity, and proximity to agricultural land. These constraints created urban form that today’s FBCs emulate in many ways: uniform frontage, small blocks and lots, pedestrian orientation, and emphasis on the public realm. With the emergence of modernism, the consensus about what constituted time-tested urbanism no longer held. Technological constraints and the limitations imposed by premodern institutions gave way to a variety of technological and stylistic freedoms that produced a much different kind of urban form.

Modern FBCs aim to impose limits that are no longer dictated by technological and other constraints, but instead rely entirely on public consensus. Thus, today’s codes must balance use, form, location, safety, and public process. This is unprecedented. And paradoxically, reformers are trying to simplify regulation at the same time, attempting to reverse trends evolving since the onset of modernism and conventional zoning. This is especially evident in the case of controls on land use, where zoning regulation has become a complicated set of prohibitions of all imaginable incompatibilities.

It is ironic that one century after the establishment of city planning as a profession, planners have reversed themselves on urban codes, one of their most fundamental tools. FBCs are an attempt to reverse the decentralization and separation advocated at the First National Planning Conference in 1909. Advocates of code reform can take comfort in the fact that their approach connects to a history that extends much further back than 1909. It is conventional zoning that has a decidedly weak historical record.
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Notes
1. FBCs are also sometimes known as urban design codes or typological codes.
2. Bastides were fortified new towns built mostly in France in the 13th and 14th centuries.
3. I do not consider modern traffic engineering regulations that focus on traffic flow rather than public space.
4. See Dowall (1984) on the effects of land use regulation; see Booth (1989), McMillen and McDonald (1990), and Natoli (1971) on the ineffectiveness of land use zoning; see Babcock on spatial impacts (1980); see Pogodzinski and Sass (1991) for the effect on the real estate market; see Talen and Knaap (2003) for counter-urban effects; see Pendall (1999) for the effect on low densities.
6. The bye-law streets instituted in England following the public health acts of the mid-19th century were very long, straight, and excessively wide, with few cross streets and no street trees or other vegetation. They were fronted by long rows of identical, attached houses.

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