

# **Talking Smart in the United States**

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## Smart Talk in the United States

As in many countries around the world, concerns about contemporary urban development patterns and their effects on the natural and social environment are high and rising in the United States. Though these concerns are not new, the recent period of sustained economic growth has led to both rapid urban expansion and falling relative concerns about other problems like crime, unemployment, and government deficits. Urban sprawl is now a major public policy issue (U.S. Office of Technology Assessment 1995, U.S. General Accounting Office (GAO) 1999, GAO 2000).

How to address -- even define -- the problem, however, remains unresolved and contentious. Some view urban sprawl as a major threat to environmental quality, fiscal stability, and human health. Those with this point of view support policy reforms sometimes called smart growth, new urbanism, and sustainable development (Ewing 1997, Smart Growth Network 2002). To others, sprawl is simply the result of increases in population, rising real incomes, and the expression of consumer demands (Brueckner 1999). To those with this point of view, there is little evidence that urban sprawl has adverse social or environmental consequences or warrants a policy response (Gordon and Richardson 1997, Urban Futures 2002). In a nation rich in land resources and steeped in traditions of private property rights, this view is not easily dismissed.<sup>1</sup>

### What is Smart Growth?

Like urban sprawl, smart growth is difficult to define.(Burchell et al. 2000). In general, smart growth addresses three inter-related problems: the density of development, the spatial separation of land use, and the lack of transportation mode choice. Remedies under the first category include urban growth containment and infill development. Remedies under the second include mixing land uses and creating functional public spaces. Remedies under the third also include mixing land uses and creating transit and pedestrian friendly environments. Implementation of these ideals involves concentrating rather than dispersing employment and services, increasing pedestrian access, clustering housing, and mixing land use types (rather than segregating them in Euclidean fashion). Such policies are intended not only to mitigate urban sprawl, but also to support an urban development pattern that is “balanced in function; creates inclusive housing;

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<sup>1</sup> Kahn (2000) quotes the following from Garreau (1991, p390) “If you house every household in the United States in that beloved urban sprawl density of a quarter acre each lot, that would still only take about 23 million acres, 1.222 percent of all land in the United States, even if Alaska were excluded.”

supports home-based business; spatially defines the public realm; facilitates pedestrian accessibility; minimizes use of the car; [and] supports transit” (Duany, 1998).

### **Why grow smart?**

Support for smart growth reflects rising concerns with specific problems caused by the existing pattern of urban development. In the name of smart growth, for example, the American Planning Association seeks to enhance the efficacy of planning; the U.S. Environmental Protection Agency (EPA) seeks to protect environmental quality; the Urban Land Institute seeks to facilitate large-scale development; and the National Association of Home Builders seeks to remove land use restrictions. These differences notwithstanding, five objectives remain central to the land use debate. These include farmland preservation, environmental protection, infrastructure cost saving, improved human health, and social equity. These are all laudable goals, but the extent to which the objectives can be furthered through land use reform remains controversial.

### To Preserve Farmland

Perhaps the most common justification for containing urban growth, encouraging infill, and increasing urban densities -- all central elements of smart growth -- is to preserve farmland. The United States has a long agrarian tradition that continues to shape its culture and self-identity. It also has a sizable agricultural economy and remains the world’s largest exporter of food (Nelson 1998). According to public opinion polls, U.S. citizens strongly support farmland preservation (Libby 1997). Farmland preservation is also favored by many advocacy organizations. Strong supporters of protecting farmland include the American Farmland Trust and many environmental organizations. Organizations that represent farmers, (such as the Farm Bureaus of various states) and the U.S. Department of Agriculture are, however, decidedly ambivalent.

Concerns about farmland losses are not new; acres in U.S. farms have been falling since before World War II. Farm populations have similarly declined. About every ten years, however, concerns about farmland spike, often following the release of new data. The National Agricultural Land Study (NALS) was published in 1981. This study claimed that the rate of farmland conversion to urban use increased dramatically in the 1970s and that if this rate were to continue, the United States would soon have insufficient farmland to feed the world’s growing population. This report was the primary basis for the Farmland Protection Policy Act of 1981, intended to minimize the extent to which Federal programs contribute to the irreversible conversion of farmland to non-agricultural uses. It was also widely criticized. Fischel (1982)

Similar spikes of interest in farmland preservation occurred following the release of the National Resources Inventory in 1992 and 1997. Both the Sierra Club and the American Farmland Trust (AFT) used these data to analyze the loss of farmland in the United States. American Farmland Trust's analysis shows that between 1982 and 1992, every state lost some of its high quality farmland to urban development. When AFT analyzed 181 geographic regions in the United States, 70 percent had high quality farmland in the same areas where rapid development was occurring. The greatest loss of prime or unique farmland occurred in 20 regions representing 7 percent of the land in the continental United States. The AFT (1997) concludes that, "the long-term implications are troubling." The Sierra Club raises similar concerns concludes that, "the seemingly unstoppable march of development across fertile, high quality farmland is quickly undermining the nation's agricultural productivity."

Disputes over data notwithstanding, a near consensus has formed on one key fact. Food security is the United States in not threatened by urban expansion (Heimlich and Anderson 2001). Farm productivity continues to rise, growth in demand continues to slow, and commodity prices continue to fall (Gordon and Richardson 1999). Even the American Farmland Trust (2002) concedes that, "of all the possible reasons to be concerned about the quality of land lost to urban development, its impact of aggregate United States productive capacity appears to be the least well founded."

Thus, the case for smart growth of protecting farmland -- if smart growth means compact and mixed use development -- is weak from a U.S. perspective. In the United States, there is no current or impending shortage of farmland, and much of the farming that takes place is propagated by federal farm subsidies. This, of course, does not mean that prime and unique farmland should be squandered or readily replaced with trophy homes and large manicured lawns. For some specialty crops that are perishable and costly to transport, there is reason to set aside land near the urban fringe. There is also good reason to protect open spaces in and around built up urban areas. Open space, however, need not be farmed. From a farmland perspective, there is no good reason to prevent urban areas from expanding.

### To Protect the Environment

Perhaps the second most common justification for containing sprawl is to protect the environment. The argument is that low-density, unplanned development results in diminished air and water quality and loss of wildlife habitat. The leading proponents of this argument include national environmental organizations -- the Sierra Club, the Open Lands Project, and the Natural Resources Defense Council, and the EPA.

According to Benfield, Raimi, and Chen (1999, p. 30), “the impacts of unmitigated, ever-outward urban sprawl threaten to undermine much of the environmental progress that our American society has made and must continue to make in order to secure a sustainable, healthy, and productive future for our children and our country.”

*Air Quality.* The argument that sprawl increases air pollution is based on two propositions: 1) sprawl increases automobile travel, and 2) automobile travel increases air pollution. There is evidence to support both propositions, but both relationships are more complicated than they first seem.

Total vehicle miles traveled per year in the United States grew by 250 percent between 1960 and 1997 (Bureau of Transportation Statistics 1999). According to Calthorpe (1993), a typical suburban household in the United States owns two-point-three cars, takes 12 automobile trips per day, and drives 31,300 miles per year. U.S. citizens now spend more on transportation than anything else in their budget, excluding housing (U.S. Department of Transportation 1997). Despite increases in vehicle miles traveled, nearly every measure of air pollution in the United States has improved in recent decades, including criteria air pollutants, toxics, greenhouse gases, and chlorofluorocarbons. Much of this seeming contradiction can be explained by improved fuel efficiency and better pollution control equipment (Kahn 2000).

Numerous studies have found that vehicle miles traveled increase with specific factors related to urban form. (Newman and Kenworthy (1989) Dunphy and Fisher (1996). Cervero (1999) Steiner (1994, p. 38) Factors other than density also have been found to affect travel, though again, the evidence is mixed. Frank and Pivo (1994) find that mode choice is affected by density and land use mix, even after controlling for non-urban factors. Ewing, Haliyer, and Page (1994) find that households in traditional neighborhoods generate only two-thirds as many vehicle miles traveled as residents in newer suburban neighborhoods. Friedman, Gordon, and Peters (1994) report similar findings. Crane (1996), however, argues that traditional mixed-use neighborhoods increase the demand for both automobile and non-automobile travel, rendering the relationship between mode choice and urban form ambiguous. Pucher (1988), in a comparison of transportation behavior in Western Europe and North America, finds the relationship most strongly affected by differences in automobile taxation and gasoline prices.

The relationship between automobile transport (or vehicle miles traveled) and air quality would seem unassailable. More automobile travel should mean more air pollution; however, reducing automobile travel by controlling density tends to concentrate automobile trips spatially. This slows traffic speeds and concentrates automobile emissions. Cox (2000) shows that traffic intensity is higher, traffic speeds are lower, and air pollution is greater in dense European and Asian cities than in their lower-density U.S. and Australian counterparts. Still, highly developed transportation-land use models suggest that ambient air

pollution levels can be reduced by containing urban growth, increasing densities, mixing land uses, and offering alternative modes of transportation (California Environmental Protection Agency 1997). In perhaps the most widely cited use of such a model, opponents of a new freeway in Portland, Oregon, demonstrated that transportation oriented development in the study area would have the following effects: one-third less solo automobile travel; triple the transit use; double the share of walking and bicycling; and less air pollution than the freeway alternative (Cambridge Systematics 1992).

*Water Quality.* Urban development patterns can affect both surface and ground water quality (Harbor 1994). Surface water quality is affected by storm water runoff; ground water quality is affected by wastewater treatment, especially septic water systems. Controlling urban sprawl would appear to mitigate both sources of water quality degradation.

Low density development requires more investment in infrastructure for automobiles, such as roads, highways, and parking lots -- all made with impervious surfaces. That impervious surfaces alter the water cycle is well established. Impervious surfaces prevent storm water absorption and accelerate stream water flows (Arnold and Gibbons 1996). The results can include flooding, soil erosion, and increases in toxic depositions. Models of the relationships between impervious surface cover and surface water quality show that water quality can be impaired when the extent of imperviousness reaches 10 percent (Benfield, Raimi, and Chen 1999). As in the case of air pollution, however, increased urban concentration can reduce the spatial extent of surface water disruption, but increase the extent of disruption in the areas of urban concentration.

Ground water quality can be affected by wastewater disposal. At low development densities residents often dispose of wastewater via septic systems -- that is, systems in which wastewater is temporarily stored then released on site. At extremely low densities, such disposal can be readily absorbed without damage to ground water quality. When densities rise, however, ground water quality can begin to suffer. Preventing this kind of environmental disruption is one of the major objectives of urban growth containment.

*Wildlife Habitat.* The effect of urban sprawl on wildlife habitat and natural ecosystems is another major issue in the smart growth debate. Leading advocates for habitat preservation include the National Wildlife Federation, the Nature Conservancy, the EPA, the U.S. Geological Survey, and the U.S. Fish and Wildlife Service (FWS). Despite the concern about the effect of sprawl on habitat and ecosystems, "there is no published literature that addresses directly the relationship between outward development and ecosystems"

(Benfield, Raimi, and Chen 1999, p. 69 Although comprehensive national data are lacking, there is considerable anecdotal evidence to suggest that urban sprawl is having an impact. As of 1997, the FWS reports that over 1,000 species of plants and animals were listed as threatened and endangered with more than 100 to be listed (FWS 1998). The Nature Conservancy reports that more than one third of 20,000 native plants and animals are of “conservation concern” (Nature Conservancy 2002, cited in Benfield, Raimi and Chen 1999).

In sum, the case for smart growth for the purpose of environmental protection is mixed. Contemporary urban development patterns have significant and detrimental impacts on environmental quality; however, the means by which to minimize such impacts remains in doubt. From an air quality perspective, compact cities with mixed land uses and transportation options make sense. Compact cities reduce trip lengths and mixed land uses and mode choices reduce automobile emissions. Such policies may lead to greater congestion and concentrated emissions, but the overall all air quality impacts may be smaller. From a water quality perspective, compact cities with mixed land uses and multimodal transportation also make sense. Compact cities lower the cost and increase the efficiency of wastewater treatment. Fewer impervious surfaces (highways, roads, and parking lots) to accommodate automobility and high density-mixed use developments minimize disruptions to the storm water cycle, though low-density conservation subdivisions also have such effects. How land is used outside the urban fringe, however, also matters. Farmland in fact is a major source of nonpoint pollution, soil erosion, and wetland destruction. From a habitat perspective, increasing densities and mixing uses are perhaps less important. What is important is the protection of large, contiguous areas of natural habitat. Compact cities minimize the urban footprint and thus increase the potential for large areas of natural habitat. Again, however, it depends on how land outside the city is used. As Alberti (2001) argues compellingly, what matters from an ecosystem perspective are large patches of relatively undisturbed natural land cover. If that is the case, it is unclear that compact urban cities surrounded by large industrial farms is less environmentally disruptive than polycentric cities interspersed with urban forests, prairies, and other natural patches. To quote Williams, Burton, and Jenks (2001, p. 352-3) from their review of studies on urban sustainability, “... new research does not weaken arguments about the relationship between urban form and sustainability: it strengthens them by sharpening our understanding of the interactions of the components of the urban system.” But, “it is a reminder of the dangers of taking causal relationship about forms and their consequences at face value. It is also a salutary warning for policy makers that some key sustainable development strategies may not achieve their aims, and may have unforeseen consequences which could jeopardize sustainability.”

#### To Reduce the Cost of Infrastructure

The cost of providing urban infrastructure has been examined in great detail and for a long time. Some of the early studies date to the 1950s and new studies appear everyday. The methods used in these studies vary widely and, not surprisingly, so do the results. The central questions in this literature are these: 1)

does it cost more to provide urban infrastructure to low density, discontinuous forms of urban development?; and 2) does single family development cover the full cost of providing urban infrastructure? The literature provides indisputable answers to both questions. It depends (Knaap et al 2002).

- The relationship between the cost of infrastructure and the type and density of development depends on many factors, none of which is easy to isolate. As a result, it is easy to find studies to support a particular point of view.

The number of variables that affect infrastructure costs makes it difficult to draw general conclusions about how costs might vary with urban form, but three studies offer several insights.

In 1989, James Frank (1989) conducted a comprehensive review of studies focusing primarily on infrastructure costs at the subdivision level. Based on his review of several studies, he estimated that the cost of on-site and off-site infrastructure for a low-density, single-family dwelling unit came to about \$50,000 (in \$1998), but that costs depend heavily on the distance of the development from central treatment facilities, the level of service standards, and the density of development. Higher density developments had lower infrastructure costs per housing unit. Frank also notes that marginal costs depend critically on the degree of capacity utilization. Cost savings are possible when developments can utilize existing capacity.

Robert Burchell published a number of papers based primarily on his analysis of alternative statewide development patterns in New Jersey. According to Burchell (1998), the on-site and off-site costs of infrastructure come to approximately \$37,000 to \$41,000 per housing unit (in \$1998), where infrastructure includes roads, water, sewer, and schools. Further, Burchell argues, the costs of “compact” development as a percent of “sprawl” development is about 75% for roads, 80% for utilities, and 95% for schools. Burchell’s documentation is not sufficiently detailed, however, to determine the source of these cost savings.

Helen Ladd (1998) examined the relationship between government expenditures and urban growth working primarily at the metropolitan scale using statistical analysis (most others rely on engineering cost estimates). Ladd finds a U-shaped relationship between the rate of population growth and growth in government spending per capita. Spending declines for metropolitan areas growing at less than 1 percent per year then rises at an increasing rate for metropolitan areas growing at more than 3.8 percent per year. Among the reasons: fast growing counties do not maintain their share of shared revenues from the state, and fast-growth counties incur greater infrastructure costs. Ladd also finds a U-shaped relationship between government spending and density. Government spending initially falls as densities increase; but eventually, “the harshness of the environment” requires higher levels of government spending.

A recent report by Governor Kitzhaber's Task Force on Growth in Oregon (1999) provides a comprehensive, objective, and clearly written assessment of the direct costs of providing public facilities. Among the conclusions of that evaluation are the following:

- Lower costs may be possible for large scale or denser developments, though the potential for cost savings decline as storm water retention and open space dedication increase.
- Because on-site costs do not vary much by subdivision design, any large differences in cost per single-family housing unit are usually a result of differences in off-site costs, which are more heavily dependent on location than design.
- For operation and maintenance, it appears that new development, with its higher value and occupancy by households with higher than average incomes, pays more (through property taxation) than its fair share of operations and maintenance costs.
- Total on-site costs of neo-traditional development do not cost less than traditional development in the aggregate, at the subdivision level, but smaller lot size means more lots and less cost per lot.

Combined, the research suggests that the location and density of urban development can indeed affect the cost of public infrastructure. Some cost savings are possible by concentrating development and by developing at high densities. The cost savings, however, are likely to be small. What is more, from a purely economic point of view, the case for smart growth depends not on whether the costs of infrastructure to support low-density, mixed use developments are less than those for high-density, single-use developments. It depends, instead, on whether those who prefer low density, single use developments pay their fair share of infrastructure costs. It is clear that U.S. citizens continue to value low-density living (Myers and Gearin 2001). Whether they pay the full cost of such living depends on the structure of infrastructure finance.

#### To Promote Human Health

Advocates for public health are the most recent and perhaps now the most active proponents of smart growth. These include organizations that advocate walking and biking (such as the National Center for Bicycling and Walking), environmental organizations (Sierra Club, STPP, and Natural Resources Defense Council) and organizations that focus on public health in general (including the Centers for Disease Control and Prevention [CDC] and the Robert Wood Johnson Foundation, a major funder of health-related

programs and research). Urban form can affect human health in many ways, but the primary relationships are thought to involve air and water quality, physical activity, and traffic safety,

*Air and water quality.* The effects of urban form on air and water quality are reviewed above. The evidence suggests that there is a significant relationship. Further, to the extent that air and water quality affects human beings, there can be effects on human health. The evidence again is compelling. A study conducted for the CDC (Friedman 2001) during the summer Olympic games in Atlanta showed that when vehicular traffic was kept artificially low by city authorities, ozone concentrations decreased by 27.9 percent and the number of asthma-related emergency medical events dropped by 41.6 percent (non-asthma medical events did not drop). In a study conducted by Abt Associates (1999), asthma attacks directly attributed to excessive ozone pollution numbered approximately 86,000 in Baltimore, 27,000 in Richmond, and 130,000 in Washington, D.C. According to Delucchi (1995), vehicle-related air pollutants are responsible for 20-40 thousand annual cases of chronic respiratory illness and 50-70 million respiratory-related restricted activity days per year.

Water quality degradation has also been shown to have significant public health effects. According to a study by the Johns Hopkins University, more than 50 percent of waterborne disease outbreaks between 1948 and 1994 were preceded by extreme rainfall events (Jackson and Kochtitzky 2002). According to (Currio, Parx, Rose, and Lele 2001) these outbreaks can in part be related to the increase in impervious surfaces in areas of population concentration.

*Physical activity.* According to the CDC (2002) obesity has reached epidemic proportions in the United States. From 1976 to 1994, the incidence of adult obesity rose from 47 to 56 percent, and by 1999, had reached 61 percent (Jackson and Kochtitzky 2002). Over the past three decades, the percentage of overweight children has doubled (Smart Growth Online 2002). Automobile accidents are the leading cause of death among children under 18. These health risks, the argument goes, are in part the result of development patterns that encourage automobility and discourage exercise.

Like the relationship between urban development patterns and air pollution, the relationship between urban development and human health is linked primarily via transportation mode choice. Sprawl encourages automobility, which increases air pollution and decreases exercise. The notion that changing urban form can increase exercise thus also depends on the presumption that urban form can alter transportation mode choice toward a mode that involves exercise. This includes, of course, walking and biking, but could also include waking or biking to a transit stop. According to (Killingsworth and Schmid 2001), the minimum daily recommend level of exercise -- 30 minutes of walking per day -- could be met by a walk to and from the transit stop and a walk during lunch

As suggested above, the relationship between urban form and travel behavior is complex. The link to human health adds to the complexity. From an air quality perspective, the focus is on vehicle miles traveled; from a health perspective, walking and biking are key. Increasing densities and mixing uses might lower automobile trip lengths and thus vehicle miles traveled, but not increase walking or biking. What is more, for walking and biking, the scale at which density and land use mix are measured matter a great deal. Frank and Engelke (2001) note that the pedestrian and cyclist are more sensitive to urban design features than the motorist -- regardless of density or land use mix. Further, for the pedestrian and cyclist, trip purpose matters a great deal as well. Boarnet and Sarmiento (1998), for example, find that for non-work trips, retail job density lowers automobile trips, but service employment density increases such trips. Crane and Crepeau (1998) find little evidence that land use affects travel behavior in ways suggested by proponents of new urbanism.

*Traffic and pedestrian safety.* The most direct relationship between health and urban form occurs directly on the streets. According to a report by the STPP (1997), approximately 6,000 U.S. residents die every year after being hit by cars and more than 110,000 are injured. Approximately 1,500 of these fatalities are children. Senior citizens (over 65 years old) represent only 13 percent of the population but account for 23 percent of all pedestrian fatalities -- making them almost twice as likely to be killed by an automobile as the general public. Although U.S. citizens make only 6 percent of their trips by foot, 13 percent of all traffic fatalities are pedestrians.

The STPP report attributes most of the pedestrian fatalities to faulty street design. Sixty percent of pedestrian deaths, where information was recorded, occurred in places where no crosswalk was available. More than half of all pedestrian deaths by automobiles occurred on neighborhood streets. The most dangerous places to walk were found to be sprawling cities in the southern and western cities where transportation systems are most strongly oriented to the automobile. In such environments, cars travel fast, crosswalks are rare, and pedestrians die.

The research reviewed above suggests that there is a relationship between health and urban form, but the relationship is complex. Though the evidence is mixed, there is empirical support for the proposition that compact and mixed land uses can discourage automobility and encourage walking and bicycling. At some level, however, increased densities increase congestion, concentrate automobile emissions, and increase health exposures. Without attendant care for bicycle and pedestrian safety, increased densities can also decrease bicycle and pedestrian safety. From a public health perspective, the relationship between health and even moderate physical activity is unequivocal. How to achieve health-improving physical activity by urban design, however, will require significant additional research. Fortunately, the public health community in the United States now views urban design as an important vehicle for advancing public health. Thus the prospects for continued progress in this direction remain very promising.

### To Further Social Equity

The final objective of smart growth reviewed here is the pursuit of social equity. Critics of sprawl contend that sprawl leads to racial polarization and social injustice (Bollier 1988). Such critics include a variety of organizations dedicated to social justice -- such as PolicyLink and Habitat for Humanity -- and to some extent, the U.S. Department of Housing and Urban Development.

Evidence of social inequity manifest in urban spatial structure in the United States is abundant. Cities in the United States are among the most racially divided in the world. Eighty-five percent of residential blocks in U.S. cities are racially segregated (Massey and Denton 1993). Such social segregation has had severely negative impacts on minorities -- unemployment, drug abuse, crime, poverty, and destruction of the family. Majority white neighborhoods, meanwhile, have enjoyed rich cultural amenities, high quality urban services, good schools, and safe, crime-free environments.

The process of social segregation works through a variety of mechanisms linked to urban sprawl. White families with high incomes flee central cities for homes in the suburbs. Minorities and poor families are trapped in central cities by exclusionary zoning, discriminatory lending practices, and political fragmentation (Jackson 1985). Pendall (2000) for example, shows that exclusionary zoning can lead to a "chain of exclusion" whereby existing income and racial disparities are reinforced by exclusionary land use controls. When jobs similarly leave the central city, inner city residents are further burdened by lack of access to jobs (Cervero 1996).

Smart growth and new urbanism are offered as a remedy to these social ailments. Mixing housing types in residential developments enables the poor to live among the rich (National Neighborhood Coalition 2002). Mixing commercial with residential land uses improves the jobs and housing balance (APA 1998). Providing public transportation options improves job accessibility (Chen and Jakowitch 2001). Regional approaches to land use control and public services mitigate the segregation effects of political fragmentation (Rusk 2000). Human scale urban design also enhances sense of community and breaks down social barriers (Ewing 1997).

Critics of new urbanism and smart growth, however, offer an alternative perspective. Such critics, for example, offer considerable evidence that efforts to contain urban sprawl lead to high and rising land and housing prices (Staley and Gilroy 2001). Policies that mandate inclusionary housing benefit a few at the expense of many (Burchell and Galley 2001). High density developments cost more than low density developments per square foot of housing space (Bogart 1998). Regional approaches to land use and social

services lead to inefficiency, higher public service costs, and less responsiveness to consumer demands (Morgan and Mareschal 1999, Boyne 1992). Most new urbanist developments include only high cost housing and are no more racially integrated than traditional forms of development (Kahn 2001). Finally, there is little evidence to suggest that sense of community can be created by urban design (Talen 1997, 2001, Freeman, 2001).

There is considerable evidence of social inequity in the United States that is manifest in the spatial pattern of urban development. Minorities and the poor tend to live in high-density inner cities while the rich live in low density suburbs. Inequalities are readily apparent in access to jobs, amenities, social services, education, and environmental quality. How to address these inequities, however, remains unresolved. Greater mixing of land uses and housing types would seem to offer potential gains in social justice; the benefits of development at greater densities with more costly forms of public transportation, however, are less clear. As stated by Burton (2000, p. 29), "research provides evidence that support[s] the view that the compact city *may* support equity, but only if it is implemented in a way that maximizes the benefits and ameliorates the potential problems."

### **How do you Implement Smart Growth?**

The review above suggests that the case for smart growth varies in strength. No matter how compelling, however, smart growth cannot be achieved without effective strategies for implementation. Options for the implementation of smart growth are numerous, but four are most common; these include regional governance, land use plans, land use regulations, and investments and incentives.

#### Regional Governance

Any approach to land use reform, no matter how smart, must overcome institutional barriers to implementation. In the United States, these barriers are formidable. According to the U.S. Constitution, land use authority derives from the authority of states to provide for the health, safety, and general welfare of the public. Following the model state planning and zoning enabling acts, drafted by the U.S. Department of Commerce in the 1920s, nearly every state delegated such powers to local governments. Part of the land use dilemma lies here. The United States has many local governments. The Chicago metropolitan area alone has over 250 local governments, most small with parochial land use interests. Most land use issues, however, are regional or metropolitan in nature.

Attempts to resolve the incongruence between the scope of land use problems and the units of government empowered to address those problems are not new. The United States has seen fits of regionalisms since World War I. Seeds of regional governance were planted in the 1920s and 30s, when the federal government established the National Planning Board, the Resettlement Administration, and the Area Redevelopment Commission (Wannop 1995). Federal support for these institutions ebbed and flowed, however, with successive presidential administrations. Lacking state support, most of these entities eventually died. New federal support for regional governance arose in the 1960s and 1970, often in the form of federal grants. The origins of many councils of governments and regional port authorities can be traced to this period (Knaap 1998). None of these regional governments, however, gained sufficient authority to resolve regional land use issues.

States developed their own forms of regional governance in the 1960s and 70s. In what came to be known as the Quiet Revolution, several states, including Oregon, Florida, and Vermont usurped some of the powers previously delegated to local governments and required local governments to plan and zone, conform with statewide land use goals and guidelines, and adopt more restrictive forms of land use controls such as urban growth boundaries and concurrency requirements. A second wave of states, including Maryland, New Jersey, and Georgia joined the revolution in the 1980s and 1990s (Salkin 2000). To a significant degree, the APA's Growing Smart project is an attempt to keep the revolution alive, and represents the institutional foundation for the smart growth movement of today (APA 2002).

Federal support for institutional reform regained momentum in the 1990s with the passage of the 1990 amendments to the Clean Air Act and the Intermodal Transportation Efficiency Act. In brief, the 1990 amendments to the Clean Air Act set new standards for air quality, provided guidelines for meeting those standards, and authorized incentives and sanctions the EPA can use to enforce those standards. The 1991 Intermodal Surface Transportation Efficiency Act delegated responsibility for transportation planning to states and Metropolitan Planning Organizations (MPOs), required states and MPOs to develop short- and long-term integrated transportation plans, and required such plans to further the goals of the Clean Air Act. The confluence of these acts fundamentally shifted the emphasis in transportation planning from local to regional governments and away from projects that impair air quality towards those projects that improve it. Still, with the exception of a few isolated examples, the prospects for meaningful regional governance in the United States remain slim.

### Land Use Plans

Land use planning is common in the United States, but not as common as zoning. The statutes of many states still allow local governments to adopt a zoning ordinance without adopting a land use plan. Most

states also still do not require zoning ordinances to have any systemic relationship to a plan. Thus, despite state and federal incentives for making land use plans, many such plans ultimately have little influence on land use decision-making. Plans in the United States come in all shapes and sizes. Some focus on design; some focus on policy; and some focus on process (Kaiser and Godschalk 1995). In part, as a result of state mandates and guidelines, certain elements have come to dominate plans. Most comprehensive plans, for instance, include elements that address land use, transportation, implementation, agriculture and open space, and housing (Cobb 1999). Research on the effects of plans is surprisingly scarce. Prior research on the effects and effectiveness of planning has followed three distinct general approaches. One approach is to ask whether the spatial pattern of urban development is congruent with the plan. Alterman and Hill (1978) Talen (1996) Calkins (1979) McLoughlin (1969). A second approach is to focus on the quality of the plans themselves, assuming that good plans yield desired effects. Berke and French (1994) Dalton and Burby (1994) The third approach is based on the theoretical work of Hopkins and his colleagues. Hopkins (1981) Schaeffer and Hopkins (1987) Knaap, Hopkins, and Donaghy (1998) Knaap, Ding and Hopkins (2001). In general, the research on planning suggests that plans -- under certain conditions and to some degree -- can affect development processes and ultimately urban form. Whether plans have a significant impact on shaping the character of urban form, however, remains in considerable doubt.

### Land Use Regulations

The appropriate role of land use regulations in the United States remains highly controversial as support for individual property rights remains strong. Additionally, powerful interest groups, including homebuilders, developers, and financial institutions, are skilled and powerful opponents of regulatory expansion at all levels of government.

Despite strong support for property rights, the rapid adoption of zoning following Supreme Court approval speaks to the power of exclusionary interests. As described by Mills (1979), zoning has been frequently used to exclude unwanted neighbors, whether such neighbors are minorities, poor, or some nonresidential form of land use. Today, zoning remains the principle tool of Not In My Backyard (NIMBY) interests.

The effects of zoning on land markets and urban development patterns have been a favorite topic of research among economists (Fischel 1998). Often using property values as a dependent variable in regression equations, economists have provided considerable support for the proposition that zoning results in development densities that are lower than those dictated by the market and an excessive separation of land uses (Knaap 1998). Planners have recently come to similar conclusions (Talen and Knaap forthcoming) conceding that minimum lot size and Euclidian zoning; excessive parking, set back, and street width requirements; and poorly integrated land use and transportation plans contribute to sprawl. Breaking down such regulatory barriers has become a major feature of the smart growth agenda.

The efficacy of regulatory reform in fostering smart growth, however, remains in doubt. Many studies have shown that development often takes place at densities less than allowed by zoning. Further, more recent studies by economists suggest that zoning follows the market (Wallace 1988, McMillen and McDonald 1991). This implies that the removal of regulatory constraints may be insufficient to produce higher density and mixed land use developments. For this reason, some local governments have experimented with minimum density zoning regulations and maximum parking requirements (1998). The effects of these types of instruments have yet to be examined.

### Incentives and Investments

From a continental perspective, no form of policy instrument has had more influence on land development patterns than incentives and public investments. The Eastern seaboard attracted its primary settlers by the promise of free land, the Midwest rose to prominence following the opening of the St. Lawrence Seaway, and the Great Western migration followed public investments in railroads. Current booms and busts in regional economies can still be traced to large federal defense and civic expenditures (Markusen et al. 1991).

The role of public expenditures in shaping urban development patterns, however, also remains controversial. Much of the debate focuses on the role of highways, especially those funded by the federal government. Many believe that highway construction stimulates urban sprawl (Bollier 1998 Center for Neighborhood Technology 1998). Others disagree (Urban Transportation Center 1998). A recent report by the GAO (1999) is ambivalent. According to this report, the role of the federal government in promoting sprawl is ambiguous, including federal expenditures on highways. In the place of highways and freeways, smart growth advocates prefer rail transit and transportation-oriented development (APA 1998). By building high density housing and commercial developments near transit stations, the intent is for rail transit to relieve automobile traffic congestion and high-density development to facilitate transit ridership. Many times the results have been disappointing (Huang 1996), though the evidence from Portland, Oregon, is more encouraging (Knaap, Ding, and Hopkins 2001). Other smart growth strategies reflect a more enlightened and spatially explicit use of the public purse. The key feature of Maryland's approach to smart growth that has made it so popular is its foundation on incentives as opposed to a regulatory approach. Instead of growth boundaries, Maryland has priority funding areas; instead of exclusive farm use zoning, Maryland has transferable development right; and instead of density limitations, Maryland offers live-near-your-work tax abatements (Knaap undated).

In many respects, Maryland's approach represents an extension of the use of impact fees. Economic theory suggests that if the marginal cost of public infrastructure is increasing, and new residents pay only average

costs, then old residents subsidize new residents, and urban areas become excessively large (Brueckner 1997). The logic of this argument is sound, but there is virtually no empirical research to confirm that the marginal (capital) cost of public services is typically -- or ever -- increasing with urban size. Despite this lack of empirical foundation, many communities have imposed impact fees on new developments. By statute, these fees are required to reflect a rational nexus between the consumption of public services and level of fees imposed (Nelson 1988). In practice, these fees typically equal per capita (or per housing unit) capital replacement costs and thus bear little resemblance to marginal cost pricing (Knaap, Ding, and Hopkins 2001). In other words, most impact fees help defray the cost of new infrastructure, but do not direct growth toward locations with greater service capacity. Such fees have, however, been shown to increase housing costs and slow housing construction without much impact on housing density (Nelson 1992, Skaburskis and Qadeer 1992). Skidmore and Peddle (1998), for example, using data from DuPage County, Illinois, find that impact fees reduce the rate of residential development by more than 25 percent. It is also likely that DuPage County fees increased development rates in neighboring counties. Thus, differentials in fees between communities have the potential to exacerbate uncoordinated development and they contribute to urban sprawl.

### **Where Do We Go From Here?**

What is called multiple and intensive land use (MILU) in the Netherlands, *Nachhalter Stadtebau* in Germany, and Urban Renaissance in the United Kingdom, is part of the agenda in the United States called urban growth management, smart growth, and new urbanism. Popular support for these agendas is growing, at least in principle, but severe obstacles to implementation remain. To overcome widely held sympathies for property rights and local land use control, the case for smart growth must be based on sound, defensible policy objectives. In some respects, the case for smart growth is quite strong; but in others, the case is less than compelling.

The United States has ample land and is not running short on food production capacity. Thus the case for urban growth containment must be based on local land characteristics, local demands for farm products, and local preferences for the visual benefits of open space. As a general proposition, there is no reason to protect farmland. Urban development does have significant effects on air quality, water quality, and wildlife habitat; but so does farming. Thus, while there is evidence that environmental protection can be served through better landscape management; better landscape management must involve more than simplistic calls for urban containment, high-density development, or open space protection. From a wildlife habitat and water quality perspective, it is imperative that large open spaces remain undeveloped and free of impervious surfaces. From an air quality perspective, it is imperative to encourage non-automobile transportation choices. There is some evidence that non-automobile transportation can be

encouraged by increasing densities and mixing land uses. The evidence is mixed, however, and will likely require additional changes in urban designs and public attitudes to realize significant air quality improvements.

Support for smart growth is growing among those concerned about public health, as many measures of human health in the United States continue to deteriorate. Some of these are clearly associated with automobility. But many health benefits derive from improvements in environmental quality and pedestrian safety, which may be only indirectly related to density and mixed use. The proposition that changes in urban design will cause US citizens to walk and bike enough to improve their health awaits empirical support. Finally, infrastructure cost savings are possible by paying more attention to urban design. The savings, however, may be small in relation to U.S. preferences for low-density, single family lifestyles.

Whatever its scientific merits, smart growth has both strong proponents and opponents in the United States. Recent public opinion polls suggest the proponents are winning the battle of popular opinion. Whether they are winning the battle of implementation, however, is less clear. Achieving significant change in metropolitan urban form will require policy intervention at a level much broader than the level of government at which land use control rests today. Also, while there is precedent for change in the structure of land use governance at both the state and federal levels, there is little evidence of weakness in support for local land use control. Plans -- even local plans -- in the United States continue to improve in quality and influence; still the extent of influence remains small. Regulations, on the other hand, remain influential. Under the control of local government, however, regulations are more likely to mandate growth that is far from smart. Incentives in the form of public investments and impact fees hold promise, but promise that is yet unfulfilled.

In conclusion, the smart growth debate in the United States is alive and well. From many corners of the country and from disparate interest groups there are calls for development that is more compact, mixed, and supporting of alternative modes of transportation -- despite continuing dispute over the potential gains. What is more, the obstacles to implementation remain formidable. Still, evidence of changing attitudes and habits is growing. In recent years the United States has seen a similar and remarkable change in public attitudes toward smoking. Smoking was once widely practiced and viewed as a valid expression of consumer choice. Today a smoker in a public place in the United States is a pariah; the consumption of cigarettes is falling, as are rates of smoking-related diseases. Progress has been slow but steady. There is hope that progress towards addressing urban sprawl will follow a similar trajectory. It will likely take powerful evidence and extensive public education to demonstrate that sprawl has similarly adverse environmental, social, and fiscal consequences.

**Table 1. Objectives of growth management.**

1. Preserve the character of the community and promote community identity.
2. Conserve agricultural land and preserve open space.
3. Encourage full utilization of existing facilities.
4. Control development of new areas to ensure coordination with existing and proposed facilities.
5. Maintain or improve the level of community services.
6. Improve housing opportunities, increase diversity, and promote better housing developments.
7. Avoid environmental problems.
8. Prevent sprawl.
9. Promote aesthetics and preserve historic and cultural features.
10. Reduce traffic congestion and improve the road system.
11. Promote public safety.
12. Provide for flexibility to meet future needs.

Source: DeGrove, John M. 1991. *Balanced Growth: A Planning Guide for Local Government*.

Washington, D.C.: ICMA.

**Table 2. Principles of Smart Growth.**

1. Make efficient and effective use of land resources and existing infrastructure by encouraging development in areas with existing infrastructure or capacity to avoid costly duplication of services and costly use of the land.
2. Provide a mix of land use to create a mix of housing choices and opportunities.
3. Make development decisions predictable, fair, and cost-effective.
4. Provide a variety of transportation choices, including pedestrian-friendly neighborhoods.
5. Maintain a unique sense of place by respecting local cultural and natural environmental features.
6. Conserve open space and farmland, and preserve critical environmental areas.
7. Encourage stakeholder participation rather than conflict.
8. Provide staged and managed growth in urban transition areas with compact development patterns.
9. Enhance access to equitable public and private resources for everyone.
10. Promote the safety, livability, and revitalization of existing urban and rural community centers.

Source: 1000 Friends of Minnesota. 2000. *Smart Growth Principles for Minnesota*. Online publication: <http://www.1000fom.org/>.

**Table 3. Principles of New Urbanism** (partial list).

1.	Development patterns should not blur or eradicate the edges of the metropolis.
2.	Where appropriate, new development contiguous to urban boundaries should be organized as neighborhoods and districts, and be integrated with the existing urban pattern.
3.	The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.
4.	The neighborhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution.
5.	Neighborhoods should be compact, pedestrian-friendly, and mixed-use.
6.	Concentrations of civic, institutional, and commercial activity should be embedded in neighborhoods and districts, not isolated in remote, single-use complexes.
7.	A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.
8.	Individual architectural projects should be seamlessly linked to their surroundings. This issues transcends style.
9.	Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form, because their role is different from that of other buildings and places that constitute the fabric of the city.

Source: Congress for the New Urbanism. 2000. *Charter of the New Urbanism*. New York: McGraw-Hill.

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