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ABSTRACT

The preservation of land for working rural landscapes, wildlife habitat, urban parks, recreational trails, and protecting water supplies and floodplains is emerging as an integral component of smart growth programs. Both the general public and non-profit organizations have been willing to spend billions of dollars on land preservation because of a perception that traditional land use planning and regulation are not successfully accommodating growth or protecting valuable natural resources. The literature on smart growth has largely overlooked the potential of land preservation to curb sprawl and to foster livable communities. On the other hand, the literature on land preservation has focused on the mechanics of conservation easements and land purchases rather than on how land preservation can fit in the comprehensive planning process to achieve community smart growth goals. More research needs to be done on the strategic use of land preservation in shaping and directing growth as part of a comprehensive planning effort.

INTRODUCTION

The term “smart growth” became popular as part of Maryland’s 1997 legislation, which provided financial and planning incentives to combat sprawl and promote compact development (Daniels, T.L. 2001a). Development was to be concentrated in growth areas known as Priority Funding Areas; and hundreds of thousands of acres of rural lands were to be “preserved” as farmland and open space through the Rural Legacy Program, which authorized millions of dollars for the purchase of development rights from willing landowners. Thus, land preservation should be seen as an integral part of Maryland’s—and indeed any major Smart Growth effort (Daniels, T.L. 2001a; Downs 2001).

Smart growth has been difficult to define precisely. Downs (2001) offers 14 potential elements of smart growth, from regional tax base sharing to compact, mixed-use development to preserving open space. Downs notes there is little agreement among anti-growth forces, pro-growthers, and the inner city residents about the desirability of most of the smart growth elements. Yet, the need for land preservation is one of the few issues on which the three groups agree.

A number of states and communities were undertaking growth management efforts prior to 1997 that could be considered smart growth (Porter 1997). But the name “smart growth” afforded a catchy, politically acceptable alternative to “dumb growth” and offered the promise of continued development and economic growth *coupled with* environmental improvement and greater social integration. Dumb growth can be broadly defined as sprawling, haphazard, and poorly planned development in the outer suburbs and ex-urbs which also draws the economic and social vitality out of cities and older

suburbs (Libby and Bradley 2000, 260). Sprawl has been identified as America's leading land use problem, causing premature and excessive conversion of farmland, open space, and natural areas (Freilich 1999). Moreover, sprawl's dispersed land use patterns contribute to automobile dependence, consumption of imported oil, air pollution from vehicle-miles traveled, increased public service costs, and water pollution from on-site septic systems and increased storm water runoff from the paving of open space with roads and parking lots (Daniels and Daniels 2003; Freedgood 2002). Equally important to limiting the outward expansion of development is creating attractive and efficient cities and suburbs to accommodate growth and development (Gratz and Mintz 1998, Langdon 1994). Much of the debate about smart growth has focused on designing pedestrian-oriented communities that have human-scaled buildings and can be served by mass transit (Calthorpe 1993, Katz 1994, Calthorpe and Fulton 2001). But parks, greenways, and open space are also crucial for making cities and suburbs attractive for residents (Schuyler 1986).

The preservation of privately-owned land should be considered a necessary part of smart growth both for controlling sprawl and for creating livable communities (Pruetz 1998; Daniels, T. 1999; Wright and Czerniak 2000). Private land preservation may involve any of the following techniques: the purchase or donation of land in fee simple, the purchase or donation of conservation easements (also known as development rights), the transfer of development rights, or limited development. The three common features of these land transactions are: 1) they are voluntary on the part of willing sellers or donors; 2) there are negotiations between buyer and seller or donor and donee; and 3) the seller or donor receives compensation in cash and/or through tax benefits (Wright and Czerniak 2000). For

governments, this last feature, in particular, is crucial in avoiding a “taking” of private property without just compensation.

There are two main types of land preservation associated with smart growth: 1) the preservation of land for parks, recreation, and greenways within built-up urban and suburban areas; and 2) the preservation of rural land for the production of food and fiber, to maintain valuable natural areas—such as wildlife habitats and water supply sources—and to channel development to more appropriate locations.

Most of the preservation of privately held land has occurred only since 1980 (Gustanski and Squires 2000). A fundamental question is whether government land preservation administrators and private land trusts have a strategic vision for land preservation or whether land is being preserved at random with little effect on metropolitan development patterns and land use change (Gustanski 2000; Heimlich 2001; Hollis and Fulton 2002).

Because land use planning is largely under the jurisdiction of state and local governments, this paper focuses on land preservation programs operated by state and local governments and private nonprofit organizations, and not on federal land preservation programs. The paper first reviews the literature on why land preservation is used in smart growth efforts rather than only land use regulations, and then evaluates the literature on the mechanics of conservation easements and land purchases. The paper next analyzes the literature on how land preservation has performed as part of smart growth efforts, and finally suggests areas for future research.

WHY LAND PRESERVATION AND NOT ONLY LAND REGULATION?

The land preservation literature persuasively explains several reasons why land

preservation has gained in popularity over the past 25 years. In the 1980s, the Reagan Administration's attacks on environmental laws and cuts in federal land acquisition programs, such as the Land and Water Conservation Fund, touched off a widespread increase in the number of private nonprofit land trusts (Myers 1993a). The land trust movement has also grown as a result of frustrations with the rapid pace of growth in many communities and the ineffectiveness of local planning to protect important landscapes and natural resources. Between 1980 and 2002, the number of land trusts rose threefold from about 400 to more than 1,200, and there is at least one land trust in every state (Land Trust Alliance 2003).

Land preservation is often necessary because of impending development pressures (Richardson 2000). The landowner is ready to sell; the question is who will buy it and what will the buyer do with the land. Land markets have repeatedly failed to create satisfactory land use patterns, and instead have fostered residential and commercial sprawl that wastes land resources, provides too little public open space, and destroys wildlife habitat (Freilich 1999; Healy and Short 1981). Land markets are influenced by public infrastructure investments in roads, schools, and sewer and water facilities, and by local governments whose primary interest is often the hunt to expand the property tax base. This growth bias is inimical to the retention of open space, farmland, and natural areas, or the creation of tax-exempt public parklands. Private developers have traditionally found little incentive to create public parks, trails, or greenways. Local governments often avoid creating these public areas because they prefer private development that will expand the property tax base. But the hunt for property tax base is often misguided: most residential development pays less in property taxes than it

demands in public services. The American Farmland Trust has conducted more than 80 Cost of Community Services studies that indicate that residential development demands more in public services than it generates in property taxes, whereas farmland generates more in property taxes than it demands in services (Freedgood 2002).

A chief attraction of land preservation is that it provides greater permanence in the landscape. Land use regulations are notoriously impermanent, subject to variances, rezonings, special exceptions, and conditional uses (Whyte 1968, Langdon 1994, Daniels, T. 1999). In many parts of the United States, annexation of county land by cities has furthered sprawling development patterns. Some communities have used large lot “conservation zoning” to limit the amount of development that can occur on private land in an attempt to protect natural features. But five-acre and ten-acre lots do little to protect wildlife habitats, and larger lot sizes for conservation zones will likely face legal challenges as exclusionary (Daniels and Daniels 2003). Ineffective land use regulations are an example of “government failure.” That is, government land use regulations may actually result in more sprawl and a greater loss of natural areas and working rural landscapes than if the land market had been left alone.

The threat of lawsuits against local governments over Fifth Amendment “takings” of private property value through land use regulations has deterred many local governments from adopting stronger land use regulations (Geisler and Daneker 2000, xiii; Wright and Czerniak 2000). As a result, local land use regulations alone are unlikely to produce long term sustainable land use patterns. Moreover, since 1991, 26 states have enacted so-called “takings” laws, which require governments to pay compensation to landowners if a new government regulation would devalue a landowner’s property beyond a certain percentage

(Jacobs 1999). Thus, for example, enacting stricter zoning to protect farmland in these states is seen as simply not legally or politically possible. In short, except in a very few cases such as Oregon, land use regulations have not been aimed at protecting a critical mass of natural areas to support biodiversity or maintain working farm and forest landscapes (Beatley 2000, Daniels and Bowers 1997). Finally, Geisler and Daneker (2000, xiv) make a compelling case that the preservation of private land results in land ownership that is a “hybrid” of both public and private ownership, better in some ways to meet social desires as well as private needs through generally local control and decentralized land management.

WHAT DOES LAND PRESERVATION DO AND HOW IS IT DONE?

The literature on land preservation has focused on the mechanics of conservation easements and land purchases rather than on how land preservation can fit in the comprehensive planning process to achieve community Smart Growth goals (Brenneman and Bates 1984, Diehl and Barrett 1988; Small 1988, 1992, 2002; Wright 1994; Trust for Public Land 1995). Part of the reason for this is that in many communities land preservation efforts have preceded planning for smart growth (Brewer 2003; McQueen and McMahon 2003). Still, there have been few assessments of the effectiveness of land preservation in influencing growth and development.

Land preservation simply means restricting the uses of a property over a long time. The uses are limited when private property is acquired in a fee simple transaction by a government agency, such as land for a county park, or by a qualified nonprofit organization, such as land for a nature preserve. Whereas land owned by a government agency is almost always open to the public, land owned by a nonprofit organization is private property and

may not be open to the general public. Also, it is fairly common for a non-profit organization to purchase land and then sell it subject to restrictions on use to a government agency.

Another way to restrict the use of property is when a landowner willingly sells or donates a conservation easement either to a government agency or to a qualified private organization (Diehl and Barrett 1988). As a nonprofit charitable organization that has received 501(c)(3) status from the Internal Revenue Service, a private organization—usually a land trust, conservancy, or sports group—may accept donations of land, conservation easements, and money, and donors may claim donations as income tax deductions (Small 1987, 2001).

The terms conservation easement and development rights are used interchangeably, but as a convention, conservation easements are acquired by non-profit organizations and development rights are purchased by government agencies in purchase of development rights programs or by developers in transfer of development rights programs. Development rights are often explained as one of the rights in the bundle of rights that make up the ownership of land (Geisler and Daneker 2000). A development right may be separated from the rest of the bundle and given away or sold. A conservation easement is in many ways the opposite of a right-of-way easement, which grants a neighboring landowner a right to cross another's property. A conservation easement is technically a "negative easement in gross," which spells out specific restrictions that apply to the use of an entire piece of land (Daniels, T.L. 1991). In general, all residential, commercial, industrial, and institutional uses are prohibited unless expressly allowed in the Deed of Easement. Permitted uses may include farming, timber harvesting, maintaining

open space, or building a limited number of dwellings. The Deed of Easement is a legally binding document that is recorded at the county courthouse and runs with the land, so if the land is sold or transferred to heirs, the restrictions in the Deed of Easement apply to subsequent landowners. Land subject to a conservation easement is still private property, usually without any right of public access.

The donation or bargain sale (part cash, part donation) of a conservation easement is the main way that private nonprofit land trusts preserve land (Daniels and Bowers 1997). Many federal agencies have also acquired conservation easements by purchase or donation, including the National Park Service, the Fish and Wildlife Service, the Natural Resources Conservation Service, the Farm Service Agency, and the U.S. Forest Service. Several state departments of natural resources have programs to acquire conservation easements, and dozens of counties and local governments have acquired conservation easements, primarily through purchase (American Farmland Trust 2002).

A conservation easement may restrict land in perpetuity or for a certain number of years—known as a term easement. For instance, the federal Wetlands Reserve Program, the Farm and Ranchland Preservation Program, and the Grasslands Reserve Program may acquire conservation easements in perpetuity or for a 30-year term (Wiebe et al. 1996). Heimlich (2001, 6) notes that easements have proven to be durable, rarely being reversed. Daniels and Bowers (1997, 151) describe the stringent conditions under which some states allow landowners to repurchase easements. Also, land subject to a conservation easement can be condemned for a public purpose, but this has rarely occurred.

There are several potential tax benefits from donating a permanent conservation easement (Small 2001, 2002). The landowner may use the value of the easement as an

income tax deduction, subject to certain limits defined in Section 170(h) of the Internal Revenue Code. There may be estate tax benefits depending on the size of the landowner's estate. A few states offer state income tax credits for people who donate a conservation easement on their land (e.g. Salkin 2002, 278). In some states, the landowner may receive a reduction in the assessed value of the property for property tax purposes. For instance, the Maryland Environmental Trust, as state agency, has the authority to grant a 15-year property tax abatement on any property on which it receives a conservation easement donation (Daniels and Bowers 1997, 214).

Estate and land transfer planning have become necessary because of the increased value of real estate, especially in metropolitan regions (Small 1988, 1992, 2002). Federal estate taxes begin at 37% on estates valued at more than \$1 million in 2004. The personal exemption from the estate tax rises to \$3.5 million by 2009. There will be no estate taxes in 2010, but in 2011 the estate tax returns at 2003 rates and exemptions (Small 2002).

One way for a landowner to reduce the value of an estate, and hence reduce estate taxes, is to donate a permanent conservation easement to a land trust or government agency (Small 2001, 2002). The value of a conservation easement is determined by a professional appraiser in a written appraisal. The value is the difference between the estimated fair market value of the property if it were sold today and the estimated value of the property subject to the restrictions of the conservation easement (Diehl and Barrett 1988).

Conservation easements have dominated the land preservation literature because they are a less costly way to preserve land than fee-simple acquisition, much more complicated than outright purchase, and do not require a government role. William H.

Whyte (1959) wrote the initial major work on conservation easements, noting that conservation easements were first used in Massachusetts by the Trustees of Reservations to protect the parks that Frederick Law Olmsted designed around Boston. Coughlin and Keene (1981) produced a seminal work on farmland preservation, including conservation easement acquisition efforts by the public and private sectors, for the federally-sponsored National Agricultural Lands Study. Brenneman and Bates (1984) edited an important set of essays covering the legal aspects of conservation easements, creating a land trust, and how conservation easements work in practice.

Diehl and Barrett (1988) presented an excellent and widely-used guide to the use of conservation easements. Topics in their book include federal laws regulating the donation of conservation easements, how to draft a Deed of Easement, and the importance of monitoring easements. Attorney Stephen Small (1988, 1992, 2002) has authored short but very informative books that walk landowners through the logic and basics of preserving land using the sale and donation of conservation easements. He demonstrates how conservation easements can be an effective part of an estate plan or land transfer plan. Small also has written very helpful summaries of the federal tax laws relating to conservation easements (1987, 2001).

The Land Trust Alliance (LTA), a national organization devoted to promoting the creation and development of land trusts, serves as a clearinghouse of information about land trust practices and has published a variety of useful books and reports on land preservation (Barton and Hijikata 1997; LTA 1989-2003; LTA 1990). Numerous land trusts have produced publications on conservation easements, and the annual reports of the larger land trusts make interesting reading about land preservation strategy and impact on

local land use patterns (e.g. The Conservation Fund 2003; Montana Land Reliance 2003; The Nature Conservancy 2003; The Trust for Public Land 2002; Vermont Land Trust 2003).

Land trust organizations have been increasingly drawn into land use planning because they recognize that land preservation alone will not produce smart growth. Wright (1993) makes a persuasive case that land trusts are conducting “de facto” land use planning through their preservation of land. Daniels and Bowers (1997) make the important observation that some of the most effective land preservation programs, such as Sonoma County, CA and Lancaster County, PA, are essentially public-private partnerships where public and private land preservation efforts occur within a framework of comprehensive planning.

Statewide and national land trusts have professional staff and increasingly are using GIS systems to identify and evaluate important environmental areas and resource lands and to monitor properties they own or on which they hold conservation easements (Leavitt 2002). These large land trusts have become serious players in local and regional land use planning efforts; there are many examples of public-private easement purchases and other partnership efforts involving land trusts and government agencies (Endicott 1993). On the other hand, most land trusts are small and locally focused (Foti and Jacobs 1989; Brewer 2003). They are often are staffed by volunteers, and have generally preserved no more than a few thousand acres. The shortcomings of most land trusts are a lack of staff and financial resources, and the ability to create only "islands" of protected land, often amid encroaching development. Islands of preserved land are often insufficient to protect entire ecosystems or working landscapes (Daniels and Daniels 2003). Whittaker (1999) makes the key point that

many local land trusts are established in response to a short-term land use crisis. As a result, she observes, many land trusts lack a long-term strategy for land preservation.

Financing Land Preservation

Public financing of land preservation has relied upon a variety of sources, including the federal Land and Water Conservation Fund, state and local general fund revenues, the sale of bonds by state and local governments (such as New Jersey's Green Acres Program)—often with voter approval, and earmarked sales-tax revenues (Myers 1993a, McQueen and McMahon 2003). Land purchases have protected recreation areas, parks, wildlife habitats, and sensitive environmental lands, such as flood hazard areas. Thus, land acquisition has helped to achieve a variety of community goals. McQueen and McMahon (2003) have documented a number of these achievements as part of their excellent summary of financing options for governments and land trusts to purchase land in fee simple. Significantly, many nonprofit land trusts have been able to receive public funding to help carry out public land preservation efforts (Myers 1993b).

Orfield (2002) argues that land preservation efforts have not been able to keep pace with land development. Yet, state and local taxpayers have been remarkably willing to raise taxes to pay for land preservation (Lindsey and Knaap 1999). In the five years, 1998 to 2002, voters approved more than 500 ballot measures involving more than \$20 billion (TPL 2003). As of 2002, land trusts had protected more than 6 million acres nationwide (LTA 2003). Still, the literature needs more examples of how land preservation can be made more effective by combining it with community goals and programs. For instance, McQueen and McMahon (2003) advocate green infrastructure planning in which land preservation serves to “integrate land use planning and biodiversity, or to shape and direct growth” (134).

PRESERVING LAND IN CITIES AND SUBURBS

The land preservation literature makes strong arguments in favor of preserving three types of land within cities and suburbs: parklands, greenways, and trails. These lands are typically lumped together under the rubric of “green infrastructure.” Some researchers have made persuasive arguments that the provision of green infrastructure should be equated with the provision of sewer and water lines, roads and schools (so-called “gray infrastructure”) (Beatley and Manning 1997; American Planning Association 2000; McQueen and McMahan 2003). But land preservation within cities and suburbs has not been explicitly linked to overall smart growth efforts.

Parklands

The literature for preserving land for parks in cities and suburbs inevitably emphasizes Frederick Law Olmsted’s design for Central Park in New York City and the increased value of private property near or adjacent to the park (Spirn 1984; Schuyler 1986; Fox 1990). Parks offer areas for both passive recreation, such as walking, and active recreation, such as baseball fields, tennis and basketball courts, volleyball, and other sports. The President’s Commission on Americans Outdoors (1987) reported that the highest need for open space was in metropolitan areas, where most Americans live. The National Recreation and Parks Association suggests levels-of-service for five different kinds of parks: mini-park, neighborhood park, school park, community park, and large urban park (Mertes and Hall 1995).

Brabec (1992), Lerner and Poole (1999), Crompton (2002), Geoghegan (2002), and Tajima (2003) made important contributions to the literature by conducting and

summarizing studies that document higher real estate values closer to parks, greenways, and preserved open space in urban areas. These studies indicated that land preservation can actually expand the property tax base. In the long run, land preservation can end up costing residents less than they would pay to provide public services to developed land (Crompton 2002).

Since 1972, The Trust for Public Land has been active in acquiring land in urban areas for public use, especially for parks (Poole 1993). Daniels (Daniels, T. 1999) describes how voters in greater Portland, Oregon in 1995 approved \$65 million for acquiring up to 6,000 acres of parkland and open space within the region's urban growth boundary as a way to maintain and enhance the quality of life. The Project for Public Spaces (1999) carries on the pioneering work of William H. Whyte in promoting the creation of parks and small public urban spaces. Bonham et al. (2002, Ch. 8) profile how Philadelphia is attempting to manage a large inventory of vacant lands and restore them for use as gardens, parks, and open space as part of the city's revitalization efforts. Garvin (2001) profiles a number of case studies in making a strong argument for creating and maintaining parks and open space in urban redevelopment. Daniels and Daniels (2003) offer a general comment that a growing number of communities are adopting mandatory dedication standards for parks in their subdivision and land development ordinances. Developers of residential subdivisions are required to set aside land or fees in-lieu-of-land for parks. It is helpful if communities have identified desired future locations of parks, trails, and greenways in a specially adopted open space plan. Mertes and Hall (1995) in their standard and very accessible book explain how an open space plan can help facilitate the interconnection of parks with trails and greenways.

Greenways and Trails

Greenways and trails are linear open space areas through woods, fields, and along highways, rail or utility corridors, and waterways. Little (1990) wrote the first major book on the importance of greenways, which included several compelling case studies; and Flink et al. (2001) produced a useful guide to creating trails. Greenways and trails provide a variety of recreational opportunities, such as walking, running, biking, and horseback riding, and can link residential areas with schools, parks, and commercial areas to minimize the use of cars. Greenways along waterways provide important buffers to keep the impervious surfaces of developed areas at a distance from water resources, to intercept and filter stormwater runoff, and to absorb floodwaters and thus protect built-up areas. Greenways along highways help to absorb exhaust fumes, noise, and bright lights. Greenways also break up monotonous roadsides and can reduce the number of curb cuts for commercial or residential areas. Greenways can provide important wildlife habitat corridors and promote a variety of recreational pursuits, such as boating, canoeing, fishing, and bird watching (Little 1990).

Daniels and Daniels (2003) note that the creation of regional trails and greenways can be a catalyst for counties and municipalities to undertake other beneficial regional planning efforts such as water resources planning, habitat conservation, floodplain management, and recreation plans. Efforts to create trails and greenways have generally enjoyed widespread public support. Funding to buy land to create greenways have come from federal Land and Water Conservation Fund, some state programs, many communities, and several nonprofit organizations (Little 1990; Flink et al. 2001).

Platt (2000) explains how in 1990, Maryland created a Greenways Commission to foster and connect green corridors across the state. Over the next 10 years, more than 900

miles of greenways had been established, with many more miles in progress (Platt 2000, 19). In 1998, Florida took the lead among states in the creation of a statewide greenway system including recreational trails. The system will connect natural areas and landscapes to support the "ability of these ecosystems to function as dynamic systems" (Florida Dept. of Environmental Protection 1998, 11). At the local level, Greater Chattanooga, Tennessee, which has been recognized as one of the nation's leading environmentally-conscious cities, is creating a 75 to 100 mile riverside greenway and trail system (Beatley and Manning 1997).

Many communities have taken advantage of established rights-of-way along utility corridors to create trail networks. Waterways make especially attractive locations for trails because of their scenic and recreational qualities and because most other types of development are not permitted within flood plains. Abandoned railroad corridors make excellent rails-to-trails projects because of the established rights-of-way and linkages among neighboring communities. At least 700 rails-to-trails projects have been developed nationwide, according to Daniels (Daniels, T. 1999). Platt (2000) notes that the Transportation Equity Act of 1998 (TEA-21) required ten percent of its surface transportation funds to be set aside for transportation enhancements such as greenways and trails.

Since the early 1980s, Boulder, Colorado has spent millions of dollars to buy up a 27,000-acre greenbelt that separates the city and Boulder County as well as preserves city land above the 5,750 foot mark (Pollock 1998). The greenbelt has helped to limit urban expansion and complements restrictive zoning in the countryside. Correll et al. (1978)

reported that the average value of properties adjacent to Boulder's greenbelt were 32 percent higher than those just over half a mile away.

PRESERVING LAND IN THE COUNTRYSIDE

Land preservation in the countryside has focused on three types of land: natural areas, farmland, and forestland. As in the case of parks, greenways, and trails, the question arises whether rural land preservation is taking place as part of a Smart Growth strategy or simply as a general effort to protect unique environmental features and some productive farms and forests lands (McQueen and McMahon 2003; Brewer 2003).

Natural Areas

Morisette (2001) makes a strong case for the role of land preservation in maintaining environmental quality and wildlife habitat on private lands. Johnston and Madison (1997) have produced the leading article on the use of transferable development rights (TDRs) to preserve natural areas of critical state concern, particularly in the New Jersey Pinelands and the Lake Tahoe region between California and Nevada. The Pinelands covers more than 900,000 acres in southern New Jersey, overlying one of the largest aquifers along the East Coast. In 1979, the State of New Jersey established the Pinelands Commission which then drafted a comprehensive plan designating most of the Pinelands as a "preservation" area with only very limited development. The plan also included a "protection" area where more development could occur. A crucial part of this plan was a transfer of development rights program, established in 1983, to compensate landowners in the preservation area and to move potential development into the protection area (Pizor 1986; Gottsegen 1992; Mason

2004). As of 2000, more than 19,000 acres of land had been preserved through the transfer of development rights program (Brennan et al. 2000).

The Lake Tahoe Regional Planning Agency was jointly established in 1969 by California and Nevada. A prime concern of the Agency is regulating development so that runoff from septic systems and roads does not pollute Lake Tahoe, which is also a major tourist attraction. In the 1980s, the Agency evaluated all lands within the 207,000-acre basin and set categories for how much impervious surface would be allowed to cover a property. The Agency also established a quota of about 300 new dwellings per year (Twiss 2004).

Pruetz (1997) has written the leading book on transfer of development rights (TDRs) and describes how, in 1987, the Tahoe Regional Planning Agency created a TDR program to allow the transfer of underused impervious surface from one property to another. Also, the TDR can be used to enable property owners to remove existing structures. The Agency's TDR program was unsuccessfully challenged as a taking under the 5th Amendment in 1997 (Pruetz 1997, 12-13; Twiss 2004).

The Nature Conservancy has been the leading non-profit preserver of natural areas, with more than 12 million acres preserved in the United States alone (TNC 2003). The organization's Last Great Places campaign is targeting special ecosystems for preservation, but not necessarily in concert with state or local smart growth strategies.

Daniels and Daniels (2003) note that since the late 1980s, many states, often with voter approval, have substantially increased expenditures for buying environmentally significant open space, parklands, easements on farmland, buffers for drinking water sources, and natural areas. In 1988, California voters approved \$776 million in bonds to protect natural areas, farmland, and Pacific coastline. Twelve years later, California voters

approved more than \$4 billion in state bonding for purchasing land for parks to protect watersheds, drinking water supplies, and coastal areas. In 1990, the Florida legislature earmarked \$3 billion for the Preservation 2000 Initiative, which resulted in the purchase of about 900,000 acres of environmentally sensitive lands and riparian areas. In 1999, the legislature repeated itself by passing the \$3 billion Florida Forever measure for natural land purchases over the next ten years (Beatley 2000, 13). In 2001, the Maryland legislature approved a \$35 million GreenPrint program to create an integrated system of greenways especially along stream corridors (Daniels, T.L. 2001a).

Farmland Preservation

The preservation of privately-held farm and rangeland was not considered a serious land use issue before 1980. In 1981, Coughlin and Keene authored the landmark publication on farmland protection techniques as part of the National Agricultural Lands Study. Lapping (1982) emphasized the importance of protecting a critical mass of farms and farmland in order to keep the agricultural support businesses in operation. Lapping et al. (1989) pointed out the fundamental split between federal farm income support programs and local control of land use planning decisions about the protection of farmland. But most of the emphasis in the 1980s was still on the regulation of farmland, especially through zoning (Toner 1984).

Since the early 1990s, the leading source of current information on farmland preservation has been provided by *Farmland Preservation Report*, a monthly newsletter (Bowers 1990-2004). The newsletter tracks farmland preserved by counties and states, as well as the latest preservation legislation. Farmland Information Library (Farmland Information Library 2003) has provided a useful on-line source of information about

farmland preservation research. American Farmland Trust (2002) has created useful technical reports on land preservation techniques, such as the purchase and transfer of development rights, but data in the reports about the acreage preserved by state and local governments is not reliable.

Daniels (Daniels, T.L. 1991) provided a major overview of the purchase of development rights to preserve farmland, including the pros and cons of the technique, and why it was growing in popularity. He cites the main benefit as greater long term protection of land; yet he recognizes the potential high cost of purchasing development rights, the possibility of landowner hold-outs who leaves holes of unpreserved land, and the fact that landowners and local governments may be closing off future options by preserving land. Freedgood (1991) lists the purposes of purchasing development rights as: 1) keeping farmland affordable by limiting the development potential; 2) providing working capital for farms; and 3) overcoming estate planning problems that could result in the conversion of farmland. Daniels (Daniels, T. L. 2001b) contends that the purchase of conservation easements is basically paying landowners for the “unearned increment” in land value—that portion of land value caused by public investment in infrastructure. He observes that Henry George advocated taxing away the unearned increment in his famous “Single Tax.” Daniels suggests using the Single Tax within growth boundaries to encourage development and the purchase of development rights to preserve lands outside the boundaries. The Single Tax on land forces landowners to develop open land or build more intensively, and thus can help to concentrate development in urban areas; purchasing development rights removes development potential and thus can curb sprawl in the countryside.

Daniels and Bowers (1997) and American Farmland Trust (1997) have produced the leading guidebooks on farmland protection and preservation. Bick and Haney's guide to conservation easements (2001), distributed by the American Farm Bureau Federation, is an extremely cautious description of what landowners need to watch out for in preserving their land.

Daniels (Daniels, T. 1997) warned that cluster development was not a form of farmland preservation, but rather a suburban type of development aimed at allowing residential development while protecting some open space and "rural character." By contrast, Arendt (1994) has advocated clustering as a farmland preservation technique. Yet clustering has not been used in the leading agricultural areas, but rather in suburbanizing communities (Daniels 1997). Corser (2003) describes the use of limited development with land preservation in Routt County, Colorado, noting that developers, rather than ranchers, have been the ones to negotiate bonus lots in return for land preservation.

In one of the few analyses of a farmland preservation program, Conaway (1987) provides a frank assessment of the Carroll County, Maryland program and suggests improvements. Lyons (1989) profiles a case study of Suffolk County, New York—the eastern end of Long Island—where the purchase of development rights to farmland was pioneered, starting in the mid-1970s. Lyons calls the program a success, even though relatively few acres had been preserved and at a fairly high cost. American Farmland Trust (1996) discusses the process of getting a purchase of development rights program started in Peninsula Township, Michigan. Nickerson and Lynch (2001) unexpectedly found no significant difference in the prices of preserved and unpreserved farmland in Maryland.

Daniels (Daniels, T.L. 2000a, 2000b) evaluates the farmland preservation effort in Lancaster County, PA where in recent years more farmland has been preserved than developed and where farmland preservation complements the widespread use of agricultural zoning and urban growth boundaries. Hollis and Fulton (2002) fail to understand how the purchase of development rights to farmland can help to create permanent parts of growth boundaries and channel development toward areas with adequate infrastructure as demonstrated in Daniels and Bowers (1997) and Daniels (Daniels, T.L. 2000b). It is somewhat ironic that the success of Calthorpe and Fulton's approach to smart growth in *The Regional City* (2001) to create livable cities and suburbs is predicated on growth boundaries and limits on development in the hinterlands, yet they do not recognize that this can perhaps be done more effectively with a combination of land preservation and regulation than simply Oregon-style regulation.

Identifying which land to preserve is an important part of farmland preservation. Daniels (Daniels, T.L. 1994) discusses the use of a modified Land Evaluation and Site Assessment (LESA) system to prioritize applications for easement sale. Tulloch et al. (2003) present a case study of using a parcel-specific GIS system to rank farmlands in importance for preservation.

An integral part of Maryland's 1997 Smart Growth legislation is the Rural Legacy Program which has resulted in the purchase of conservation easements on more than 39,000 acres at a cost of roughly \$100 million (Bowers 2003a). Rural Legacy areas are designated by county governments with the goal of preserving as much of these areas as possible. The lands typically include a mix of farmland, forestlands, and natural areas. The Rural Legacy

Program complements the state farmland preservation program which has preserved more than 200,000 acres (American Farmland Trust 2002).

Public funding for farmland preservation has been strong. For instance, in 1998, New Jersey voters approved spending \$1 billion over the next ten years to preserve an anticipated one million acres of farmland, recreation land, and open space (The Conservation Fund 1999). In 2002, Congress approved \$985 million in grants to state and local governments and land trusts to preserve farmland (Daniels and Daniels 2003). As of 2002, about 850,000 acres of farmland had been preserved through public programs at a cost of about \$1.2 billion (Bowers 2002).

Heimlich and Anderson (2001) estimate that it would cost \$130 billion to preserve the 94.7 million acres of cropland under the pressure of urbanization. Heimlich (2001) argues that “we are not going to solve the farmland protection problem by purchasing easements” (1). Jacobs (2000, 425) echoes this sentiment by contending that land preservation should be seen as a supplement to and not a replacement for public-sector land use planning.

Tustian (1983) and Banach and Canavan (1989) boast the success of Montgomery County, Maryland’s transfer of development rights program. As of 2003, Bowers (2003b) notes that Montgomery County had preserved more farmland (59,415 acres) than any other county in the United States. Brabec and Smith (2002) try to make the case that transfer of development rights is superior to purchase of development rights, but their comparison between Montgomery County, Maryland and two towns in Suffolk County, New York is too narrow, and not convincing. Daniels and Bowers (1997) and Macheimer and Kaplowitz (2000) contend that transfer of development rights is far more difficult to put into practice

than a purchase of development rights program. Indeed, no other county has come anywhere close to preserving as much farmland with transferable development rights as Montgomery County (Johnston and Madison 1997, Bowers 2003b).

Preservation of Forestland

The preservation of working forestland has not been high on the land preservation agendas of most states or land trusts, and has been addressed only sparsely in the land preservation literature. But as with the preservation of farmland, it is also necessary to secure a critical mass of forestland in order for the industry to survive. Rural residential sprawl fragments forestlands into smaller tracts that may not be large enough or sufficiently contiguous to support commercial forestry. As nonforesters purchase forestlands, they drive up the price of land and reduce active forest management (Mansius 2002). This increases the potential for forest fires as well as diseases that affect trees, animals, and humans (Society of American Foresters 2003). A study in the South concluded that “urbanization will have the most direct, immediate and permanent effects on the extent, condition and health of forests” in the region (U.S. Forest Service 2002, 91). Many forests are prime water re-charge areas and are important for long term water quality and supplies. Several studies indicate the negative impacts of land-fragmenting sprawl on wildlife habitats (DeGraaf and Healy 1988). Taken together, these issues suggest that there is justification for preserving forestlands in areas experiencing sprawl.

The federal government spurred interest in forestland preservation when Congress enacted the Forest Legacy Program in 1990. The Program allows the U.S. Forest Service to purchase permanent conservation easements on forest land, purchase forest land, or make

grants to states for acquisitions of forest land or easements. First, a state forester must draft an assessment of need—identifying forestlands with important commercial timber or riparian or ecological values that are threatened by development—for approval by the U.S. Forest Service. A state must provide at least 25 percent of project costs. As of 2001, the Forest Legacy Program had resulted in the purchase of conservation easements on more than 200,000 acres in 15 states (Daniels, T.L. 2001c). The 2002 Farm Bill authorized another \$60 million for the program (Daniels and Daniels 2003).

Daniels (Daniels, T.L. 2001c) reported that a few land trusts have preserved large amounts of forestland. The Society for the Protection of New Hampshire Forests has helped to protect over one million acres of New Hampshire forestlands through the purchase and donation of conservation easements and outright land purchases. The Vermont Land Trust holds conservation easements on more than 100,000 acres of forestland, and has often joined with the state agencies, private foundations, and other conservation groups to preserve large tracts of forest lands in northern Vermont. The Pacific Forest Trust in Boonville, California has preserved more than 25,000 acres through conservation easements in California, Oregon, and Washington and has consulted on conservation practices on more than 750,000 acres (Pacific Forest Trust 1999, 2001).

Wayburn (1994) wrote a particularly helpful article on how land trusts can craft conservation easements to protect forest lands, and Lind (2002) has written a very useful and practical guide to using conservation easements to manage productive forestlands, yet protect wildlife habitat, wetlands, and streams.

FUTURE RESEARCH NEEDS AND DIRECTIONS

Most of the literature on land preservation has been generated by land preservation practitioners, rather than by planners or academics. Land preservationists have focused on acquiring land and conservation easements, rather than on how land preservation is influencing growth patterns (Diehl and Barrett 1998; Small 1987, 2001). Thus, practitioners have not determined whether land preservation has been a reactionary ad-hoc effort or an effective part of a comprehensive planning process and smart growth strategy. For instance, in his history of land trusts, Brewer (2003) calls for more planning to help guide land preservation but does not explain how to do this. On the other hand, planners have been slow to recognize the power of land preservation as a planning tool, and planning academics have generally avoided the topic (Danielsen et al. 1999; Szold and Carbonell 2002).

There several shortcomings in both the land preservation and smart growth literature. First, research needs to analyze of the effectiveness of smart growth programs and the role land preservation plays. For instance, the smart growth movement would benefit from several case studies of the successful uses of green space within urban and suburban areas to revive and improve these places (Spirn 1984; Bonham et al. 2002). Second, there is a dearth of evaluations of land preservation programs in metropolitan areas, especially over long periods of time (Hollis and Fulton 2002; McQueen and McMahon 2003). The prime question is whether a critical mass of land can be preserved to enable wildlife, farming, or forestry to survive and thrive (Daniels, T. 1999). Longitudinal studies are sparse, in part because most programs are young, and attempts to evaluate some preservation programs have been premature (Maynard et al. 1998). Third, private foundations are emerging as a significant source of funding for land preservation (Greene 1999). The impact and effectiveness of this funding source for land trusts has not been explored in depth (McQueen

and McMahon 2003). Fourth, a valid criticism of private land preservation is that it is voluntary and thus somewhat random, happening one parcel at a time, rather than encompassing large landscapes in one comprehensive program (McQueen and McMahon 2003). To refute this criticism, research would need to demonstrate timely and cost-effective ways to preserve large landscapes and how this preservation fits in smart growth programs. Fifth, how well are government agencies and land trusts meeting their obligations to manage the lands they own as well as monitor and enforce conservation easements? (Gustanski and Squires 2000). Land trusts and government agencies are discovering that preserved lands are changing hands and new owners need to be educated and advised about the restrictions on the land they own. These efforts will demand increasing attention and expense on the part of government agencies and land trusts. Legal challenges to conservation easements are a particular concern as to the durability of land preservation. Finally, a debate has arisen whether land preservation techniques are being taught in academic planning programs (Wright and Czerniak 2000; Jacobs 2000). A survey of planning programs could be undertaken to discern the breadth and depth of land preservation techniques in planning curricula.

CONCLUSION

Planning in America has traditionally meant "planning for development." But residents in hundreds of communities have recognized that it is also necessary to plan for the preservation of recreational land, natural environments, and working farm and forest landscapes. Striking a balance among the natural environment, working landscapes, and the built environment is one of the biggest challenges that local governments face. This means

that planning for smart growth is at least twice as challenging as planning for growth alone—a reality that the smart growth literature has not recognized (see Downs 2001); Szold and Carbonell (2002). On the one hand, the smart growth literature needs to show how smart growth efforts can benefit from land preservation. On the other, land preservation, as McQueen and McMahon (2003) point out, will have to become more proactive and less reactive. That is, land preservation must take place within the comprehensive planning process to work toward smart growth goals.

Smart growth ideally combines regulations, design guidelines, and financial incentives into a region-wide package (Daniels, T.L. 2001a). Planners have long preferred to use regulation and design guidelines to influence growth and development. But the preservation of land through cash inducements and/or tax benefits are not only here to stay, they are becoming increasingly popular in an era where land use regulations have been on the defensive both legally and politically.

Planners and academics, together with land preservationists, need to present more studies on how the acquisition of land and conservation easements can help to clarify where development should or should not go, and how land preservation can help to achieve the smart growth goals of curbing sprawl and reviving cities and suburbs. Because public and private dollars for land preservation are limited, government agencies and land trusts will need to be strategic about the land they decide to preserve (McQueen and McMahon 2003). A key objective is the formation of large blocks of preserved land to maintain core habitats and migration corridors, and to enable farm and forestry operations to continue with a minimum of complaints from neighbors. But just as important are the preservation of urban and suburban parks, greenways, and trails that enhance the built environment, encourage

alternative modes of transportation, and provide an attractive alternative to sprawling low density development.

Finally, an issue prevalent in much of the land preservation literature is a sense of urgency to preserve land (Brewer 2003; McQueen and McMahon 2003). Daniels and Daniels (2003) offer the opinion that many parts of the United States are in a race against time to protect important lands from development; and given current rates of population growth, development, and land protection, the race in many communities will be largely won or lost within the next 20 years.

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