

**DRAFT**

**Fiscal Impact of Conversion of Prime Lands**

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Nationally and in South Carolina, prime agricultural and forest land has been undergoing rapid conversion to other uses, primarily residential and to a lesser extent commercial. This conversion has important implications for economic development, community amenities, environmental protection, survival of agriculture, and other public policy questions. The focus of this paper is on the impact of such conversion on local government finances, as well as a preliminary inventory of the fiscal tools that governments can and do use to minimize any negative impact.

The total amount of prime land converted and the speed of conversion is heavily impacted by alternative patterns of land development. The same amount of population growth can be accommodated with very different patterns. One pattern has been described as “ranchette”—large lots with scattered housing. Another pattern is dense development that may or may not be surrounded by open space. A third is a random distribution with patchwork developments on moderate sized lots separated by undeveloped land. A fourth pattern is infill development, making use of scattered lots within the developed urban and suburban areas. These alternative land use patterns have very different implications not only for the loss of prime lands to other uses but also for local government service costs.

### **Economic versus fiscal impact**

Projects involving the development of agricultural, forest, or “idle” land are often promoted in the name of economic development. That is, proponents argue that the project will generate jobs and income that will enhance the economic well-being of area residents. The additional jobs and income are referred to as economic impact. Economic impact studies measure the impact of development on the private sector—new businesses, retail sales, housing construction, employment opportunities, and increases in personal income. For the last fifty years, economic development has been a primary goal of the state and local public sector in South Carolina. In many areas of the state, where job opportunities are limited, there is still great demand to attract employers of any kind. Citizens may be willing to accept a negative fiscal impact in exchange for the opportunities provided by new employers ranging from a new prison in Allendale County to a retirement community in McCormick or a chip mill in Laurens.

In other areas, however—along the coast and the I-85 corridor in particular—the promised positive impact of continued new development is increasingly being questioned on several grounds. While environmentalists and farm interests have joined forces to argue the benefits of farmland preservation, there are also many other voices challenging

existing development patterns on pragmatic grounds of costs and benefits to the local communities themselves. These arguments involve the costs of congestion, increasing demands on infrastructure for expansion, replacement and maintenance, changing real estate values for established areas, and fiscal impact on local governments.

Increasing congestion and pressures on physical and social infrastructure may negatively impact the quality of life for both established and new residents. Rapid population growth may slow police and fire response time, exhaust the capacity of the landfill too rapidly and require expensive and more remote landfill space, crowd the schools and force new construction, or require significant outlay for new roads as well as water and sewer lines and treatment capacity.

In counties where unemployment rates are low and have been for several years, there is often a concern that the added jobs will just result in in-migration because the local labor market is already tight. In-migration may further speed up population growth to a faster pace and level than the area is willing or able to accommodate at the same level of public services. If the jobs are entry-level, they are likely to attract families with young children living in relatively modest housing (often mobile homes in South Carolina), resulting in pressures on the schools without a comparable rise in tax revenues. In some of those areas economic developers are more selective, concentrating their efforts on attracting firms that offer better jobs at higher wages.

Economic development can affect amenities beyond congestion and pressures on the infrastructure. The disappearance of green space and the alteration of the landscape from rural to urban has not only a visual impact (and in some cases a thermal one, raising the average summer temperature) but also has a direct measurable impact on land and real estate values. Loss of open space also disturbs wildlife habitats and limits biodiversity, which is an amenity that is difficult to quantify but important to many urban and suburban residents.

One of the costs that are not counted in a market-driven land use development pattern is the impact of new development on both private and public physical capital in older developed areas. When land is cheap outside the developed core, it is easier and less expensive to start fresh than to maintain or rehabilitate older buildings and facilities. As these privately-owned assets deteriorate, there is a loss of both economic activity (income and jobs) in the core and tax revenues to the local government. Despite the loss of population in urban areas, local governments must still maintain infrastructure and provide services to a declining population supported by a deteriorating property tax base.

Finally, there is considerable research evidence indicating the long-term negative effect of most kinds of development (but especially housing) on local government. Both operating costs and infrastructure construction and maintenance expenditures are impacted, more so in the case of low-density residential developments that are not closely contiguous to developed urban areas (sprawl). Rarely do such developments generate enough local revenue to cover the additional costs, but the discrepancy varies greatly with the type of development.

## **Markets, incentives, and nonoptimal choices**

Existing and emerging land use patterns are the result of individual choices, influenced heavily by both market forces and constraints imposed and incentives offered by governments at all levels. Left to the individual buyer and seller, the ownership and use of land would be determined by the highest present value in terms of projected future revenues and costs, discounted at prevailing private market rates of interest. In some instances, leaving land “idle” while awaiting a future more attractive use may be the most attractive alternative, an outcome familiar to those who are aware of the workings of any futures markets. The actual pattern of land use may be less than the socially desirable optimal pattern of land use for several reasons. Among the major sources of distortions in land use choice are imperfect information, overdiscounting future costs and benefits where benefits are immediate and costs are delayed, spillover effects (externalities), and public policies that create perverse incentives.

**Imperfect information** on the part of developers, new residents, established residents, and/or local officials can lead to a misallocation of the actual cost of development among the relevant parties. All investments contain elements of uncertainty, and even if relevant information exists, the parties involved may not be able to willing to make the necessary effort to access and process that information. Most people, but particularly those for whom these decisions are not as central (existing residents, for example) live in a world of bounded rationality or rational ignorance because of the high time cost of obtaining perfect information. The nation is littered with abandoned strip malls that suggest developers operated on less than perfect information even on their own future revenues and costs, let alone costs that they may be indifferent to because they are able to impose those costs (see below). New residents may be unaware of the future public sector costs that their arrival will create, resulting in higher local tax burdens on themselves as well as on established residents.

Established residents and local public officials are persuaded that growth will reduce their tax burdens through sharing the cost of public services among more citizens, an expectation that is rarely fulfilled in practice. Residential development in particular tends to add more to the cost than the revenue side of local government budgets. Loudon County Virginia, just outside Washington D.C., offers one good example:

“In Loudon County, Virginia, officials in 1994 estimated that a new home must sell for at least \$400,000 to bring in sufficient property taxes to cover the cost of all the services the county provides. By contrast, the average home sold that year for less than \$200,000. The fastest selling properties in 1995 were town homes averaging between \$120,000 and \$160,000.”<sup>1</sup>

<sup>1</sup> Diamond, Henry L. and Patrick F. Noonan, 1996: *Land Use in America*, Lincoln Institute of Land Policy, Cambridge, MA., p. 35.

This estimate confirmed an earlier study in Culpepper County, Virginia, which found that residential development cost \$1.25 in county services for every \$1 of revenue, while service costs were only 19 cents per dollar of revenue generated for industrial, commercial, or agricultural land.<sup>1</sup> Likewise, Benfield cites an earlier study by the American Farmland Trust that found a revenue to cost ratio for residential property is 1:1.11, while the ratios are 1:0.29 for commercial and industrial property and 1:0.31 for farmland, forests and open space.<sup>2</sup> However, as Benfield notes, these ratios may overstate the benefits of nonresidential development:

“A 1991 study by the DuPage County, Illinois Development Department found that, between 1986 and 1989, areas of the county with significant nonresidential development experienced a *greater* increase in taxes than did areas without nonresidential development...commercial development may create a demand for additional nearby residential development which...brings a fiscal drain that offsets the benefits.”<sup>3</sup>

**Discounting the future.** Developers, tenants in new malls, industrial firms, home buyers, and renters are all private, self-interested individuals. They are not expected, required, or even encouraged to consider the long-term community impact of their choices, unless they expect that future taxes and service levels will directly impact on the market value of their investment before it is substantially depreciated, i.e., that those community impacts will be capitalized into the present value of their property. Until recently, the average American household moved every seven years, which in many cases leads to a very short-term perspective about the local community. Homeowners may invest in their own homes in order to preserve the value of a private asset, but may be less concerned about investing in the long-term future of a community where they do not plan to remain. This attitude toward community investment is particularly likely to prevail if they believe that the benefits of low taxes will enhance property values and the costs of deferred capital investment and maintenance will not surface in time to affect the value of their property. Many of the costs of development appear only gradually over time as service costs rise, property values decline or at least fail to keep pace with service costs, infrastructure must be replaced, etc.

An essential role of government is to offer incentives (both positive and negative) to offset these higher private rates of discounting the future (compared with a social rate of discount that takes into account future generations and future residents). However, government officials themselves face perverse incentives to engage in short-run behavior

<sup>1</sup> *ibid*, p. 36.

<sup>2</sup> Benfield, F. Kaid, Mathew D. Raimi, and Donald D. T. Chen, 1999, *Once There Were Greenfields: How Urban Sprawl is Undermining America's Environment, Economy, and Social Fabric*, Natural Resources Defense Council, New York, p. 107.

<sup>3</sup> Benfield, F. Kaid, Mathew D. Raimi, and Donald D. T. Chen, 1999, *Once There Were Greenfields: How Urban Sprawl is Undermining America's Environment, Economy, and Social Fabric*, Natural Resources Defense Council, New York, p. 113.

that has long-term detrimental effects. Elections are frequent, taxes and regulations are unpopular, maintenance can be deferred. Economic development strategies have often run counter to the government's responsibility to consider intergenerational issues. These strategies often maximize the short-term, up-front incentives offered to firms in order to locate in a particular area for reasons of employment and income. In the short-term even local governments may engage in short-run maximizing behavior at the expense of longer term negative consequences. Trott notes this kind of behavior in the case of California:

“Since Proposition 13, one of the few ways remaining to local governments to raise local revenue is by cashing in on farmland. Studies showing that in the long run this kind of development doesn't pay for itself notwithstanding, local governments in California largely persist at what has become popularly known as 'zoning for dollars' to survive financially from one budget to the next...To be successful at stemming the loss of farmland...we need different ways to finance local government where there is no nexus between local revenue and land development.”<sup>1</sup>

**Spillover effects or externalities**, positive and negative, between adjacent landowners or between neighborhoods or larger groupings are another important source of decisions that are appropriate from an individual perspective but not from the larger perspective that considers all the impacted parties. Spillover effects are particularly significant in the matter of the cost of providing public services privately owned developments. Broadly speaking, the private cost of development varies little from one site to another within a given area. However, the cost of providing public services to different kinds of development in terms of both location and density varies enormously from one site to another. Because private developers are not required to take these external costs into account, the pattern of development may diverge substantially from the pattern that is most efficient and cost-effective in terms of providing public services.

A second set of spillover effects comes from the interaction between incompatible uses when commercial, industrial, and urban or suburban residential development invades space that was previously agricultural. Nelson notes a variety of spillover effects from urbanization as it encroaches on agricultural areas. There is increasing regulation of farm activities that affect nonfarm residents (e.g., use of fertilizer, disposal of manure, smells, more restrictions on use of farm chemicals, irrigation and runoff); higher property taxes on farmland to pay for urban services; air pollution damage to crops by cars and industry; increasing destruction/theft/vandalism; and greater use of eminent domain to acquire farm land to service residential developments. All of these effects make agricultural land close to urban areas less attractive to use for farm and forest purposes. Agricultural land also offers benefits to urban areas that are unpriced and therefore undervalued, including groundwater recharge and water purification, flood and erosion control, air cleansing, and scenery. These factors tend to drive down the market price of

<sup>1</sup> Trott, Kenneth E., 1998: *Impact of the California Land Conservation (Williamson) Act*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 200-204.

agricultural land and make it more attractive to developers. As the future of agricultural use of land becomes more uncertain, farmers may be more reluctant to invest in the land, improvements, and equipment, further depressing its value as agricultural land relative to other uses.<sup>1</sup> As Grossi observed in the case of New York's farmland preservation policies,

“...the economics of the marketplace were simply too powerful...land protection programs would not be successful without consideration of the disparity between the land's value for farming and its fair market value for houses.”<sup>2</sup>

**Government incentives.** Government is not always the solution: sometimes it is the problem. There are a variety of perverse government incentives at all levels that have the effect of overstimulating some kinds of land use and understimulating or even discouraging others. The Federal (and often state) deduction for property taxes and mortgage interest for homeowners has encouraged investment in housing—more housing, less dense housing, more expensive housing than would have otherwise occurred. State homestead exemptions from the property tax have the same effect.

Nelson summarizes some of the policy actions by government that have exacerbated the problems associated with conversion of prime lands to other uses:

“One of the problems with prime farmland preservation is that such land is sometimes made more valuable in the market for urban uses through subsidies such as (1) inefficient inducements to industrial development through tax concessions and subsidized utility extensions; (2) inefficient home construction caused partly by tax concessions given to homeowners through the federal income tax system; (3) inefficient urban land allocation caused by local government planning policies oversupplying land for lower densities while undersupplying land for higher densities thereby forcing more lower [density] residential development than is efficient; and (4) inefficient public facility pricing resulting in higher density development in urban areas—where facility costs are relatively low per unit—paying the same rates and thereby subsidizing suburban lower density development—where facility costs are relatively high per unit...”<sup>3</sup>

Grossi, likewise, notes that a significant part of the problem in managing land use in and around urban areas is the result of both government inaction and inappropriate government policies:

<sup>1</sup> Nelson, Arthur C, 1998: *Farmland Preservation Policies: What Works, What Doesn't and What We Don't Know*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 19.

<sup>2</sup> Grossi, Ralph, 1998: *The Next Generation of State Policy*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 106.

<sup>3</sup> Ibid, p.17.

“There is no “free market.” All markets are shaped by government policy, inherent in which are regulations and subsidies that favor one behavior over another, and affect value in the marketplace...there would be a lot less pressure on this nation’s farmland if we could somehow quite subsidizing sprawl and start subsidizing urban quality of life. It would also make conservation a whole lot cheaper.”<sup>1</sup>

## Measuring fiscal impact

This paper is not concerned with the broader economic or social impacts of land conversion, important as these questions are. Our focus is on a much narrower question, changes in the revenues and expenditures of cities, counties and school districts. These changes are referred to as fiscal impact. The initial reaction might logically be that a positive economic impact that results in more jobs, houses, sales and income would generate more revenue for state and local government. While this outcome is generally true, more revenue does not always translate into a net gain for state or local governments and the residents/taxpayers already there. In some cases development adds more to local government revenues than it does to local expenditure demands or costs, which is defined as a positive fiscal impact. Unless the revenue structure is designed to capture revenue from the new stream of private incomes that flow from economic development, and unless some of the costs of new development are shifted back to the developers or buyers, state and/or local governments may find that a stronger private sector is quite compatible with an increasingly fiscally stressed public sector. The case studies summarized in a later section show predominantly negative fiscal impact from most kinds of development of agricultural, forest, or idle land for industrial, commercial and residential uses.

In fact, greenspace itself contributed to property values and thereby indirectly to property tax revenues. According to one study,

“...distance from the greenbelt has a statistically significant negative impact on the price of residential property. Specifically, other things being equal, there is a \$4.20 decrease in the price of a residential property for every foot one moves away from the greenbelt.”<sup>2</sup>

**Contributing factors to negative fiscal impact.** Development can have a positive economic impact on the economy and on the developer and yet have a negative fiscal impact. One of the primary reasons is that the **relevant factors that enter into locational preferences** are different for developers and for local officials. Developers encounter somewhat similar building costs anywhere in a given region. They make their

<sup>1</sup> Grossi, op. cit, p. 106.

<sup>2</sup> Correll, Mark R., Jane H. Lillydahl and Larry D. Singell, “The Effects of Greenbelts on Residential Property Values: Some Findings on the Political Economy of Open Space,” *Land Economics* 54(2), May 1978, pp. 207-17.



locational decisions based on the price and availability of vacant land and its potential attractiveness to buyers based on such factors as highway access. A large part of the costs created by such development do not fall directly on either the developer or the buyer, but on the local government. No one pays much heed to costs that they create that are imposed on others unless those other parties can find ways to internalize those costs, i.e., to make sure that those who create the costs are made to bear them. The costs of development, which may be virtually identical from one site to another in a given area from the developer's standpoint, are likely to be very different in the eyes of local government depending on the location, the density, and the kinds of improvements (residential, commercial, industrial) that are being built. In Robert Frank's summary of the literature in 1989, he notes that

“...costs typically borne by the municipality fluctuated much more dramatically with location (and available capacity) than did on-site frontage costs, typically financed privately in the purchase of a house, making the municipality's stake in infill development greater than that of the builder.”<sup>1</sup>

Second, the **local revenue structure** is not designed to fully recover the additional costs of development. The property tax system and other local revenue sources do not penalize low density development or reward high density development. There are no rewards for locating in areas of excess capacity for water treatment, sewerage treatment, or public schools. There are no penalties for locating far out and increasing the traffic congestion, parking problems and air pollution by increasing traffic congestion. Local governments, especially in South Carolina, are constrained in their use of one of the potentially most useful tools, impact fees, to attempt to direct development in appropriate channels. The availability of incentives to industrial and commercial location by fee in lieu of taxes (FILOT) agreements and other forms of property tax relief further aggravates the attempts by local governments to obtain revenue from the industrial and commercial tax base in order to support services for residential property owners.

Another tool that might be useful in directing development into the least costly channels is **regulation**, but there is strong resistance to using zoning, land use planning, and other techniques to channel development as an infringement on property rights. There is a strong constituency for a somewhat absolute concept of property rights, as evidenced by takings legislation proposed in South Carolina and elsewhere (the *Lucas* case on the South Carolina coast being one of the better known instances). Fear of litigation makes land use planners somewhat cautious. These regulatory tools of growth management have been employed to a limited degree in most states, but are relatively new and lightly utilized in South Carolina. In some states, cities have extra-territorial zoning, or (in North Carolina), can easily annex contiguous areas that are becoming urbanized and bring them within the taxing and zoning powers of the city. In Tennessee, county land use plans included designation of urban growth areas around cities. Only in those areas can cities provide services and annex additional land. In the West, cities and counties

<sup>1</sup> Frank, James E. 1989. *The costs of alternative development patterns: a review of the literature*, Washington, D.C.: Urban Land Institute, p. 18.

frequently control development by limiting access to water rights, an option that works well in the dry mountain states, most of which have a separation of water rights from property ownership that is largely unfamiliar in the East.

Yet another factor in the development-local government equation is **fragmentation of governments**. Cities and their counties rarely consult, adjacent counties even less so. Development tends to be viewed as a series of isolated events defined by city or county boundaries, rather than in regional terms where more efficient use of facilities (roads, schools, water and sewer systems) might help to control the costs of development. And fragmentation often allows developers to play one local government against another for favorable tax treatment or additional services, further aggravating the negative impact of development on local governments.

Fragmentation also extends to the separation between state and local governments. Often the fiscal impact of development (non-residential, at least) is positive for the state, which receives additional income and sales tax revenues but provides relatively little additional services. There may be some redistribution of state aid to growing areas using the formulas for distribution of state aid to school districts (tied partly to school population) and cities and counties (total population). In the case of school districts, the additional aid to accommodate more pupils may be more than offset by reduced aid because of the increase in the property tax base from commercial and/or industrial development, which also enters into the aid formula.

**Methodologies.** The methodologies for fiscal impact studies are fairly clearly defined, the result of three decades of development of techniques to assess a variety of situations. For the issue of conversion of prime lands, Burchell's 1994 Handbook offers a useful summary of the three basic methods. One method is simple per capita projections, which works well for small individual projects but fails to capture the differential costs of different kinds or levels of development. A second method is case studies, which provide a rich literature on which to draw in terms of measured costs and benefits. A third method is econometric studies, in which models are developed to project costs and revenues from a single scenario or alternative scenarios over a period of twenty years or more.<sup>1</sup>

**Interested parties.** Much of what has been written about the fiscal impact of conversion of prime lands comes from two groups of interested parties. One group consists of the American Farmland Trust, the Natural Resources Defense Council, and other organizations that represent the interests and concerns of farmers, environmentalists, and their allies. Their primary goal is to create and/or defend a tax and regulatory environment more favorable to preservation of prime agricultural lands and environmentally sensitive areas, such as wetlands and prime wildlife habitats. The second group includes some public finance economists and land use planners, mostly connected with local governments or state agencies, who are concerned about service costs and the resources with which to pay for new service demands. The literature of land use planning is heavily focused on the cost of providing public services, especially

<sup>1</sup> Robert W. Burchell et. al, Development Impact Assessment Handbook The Urban Land Institute, 1994.

local public services, to these new residents. Less attention is paid to the revenue consequences of development. In part, this imbalance may reflect that fact that revenue effects are more state-specific, being tied to the particular revenue structure of a state and its political subdivision. However, the problems of using the property tax as a primary local revenue source is an essential part of the challenge of managed growth that slows the conversion of prime lands to developed uses while also protecting the fiscal health of local governments.

### **Case studies and empirical findings**

The literature from both of these sources speaks with a consistent voice. Unplanned, unregulated development is costly to local and to state governments, almost always increasing costs of service provision more than the revenue that results from the development. The evidence that development of most kinds has a negative fiscal impact on local governments ranges from anecdotal to highly sophisticated econometric studies. Different scholars find different cost and revenue figures for different kinds of development, but the message is consistently clear. If one clearly and carefully assesses the full costs of servicing new developments, particularly residential developments, then city and county governments are better off with farm land than they are with housing developments. And while industrial and commercial developments, taken in isolation, often more than pay their own way in terms of local service costs and demands, the full impact of the industrial and/or commercial development and the associated housing developments that follow is almost always negative. Benfield et. al report that

“According to the American Farmland Trust, farmlands and open space actually provide a fiscal surplus for municipal governments. Although residential developments generate more total revenues than farmland, forests, and open space, residential land uses also require more in public services. The net result is that residential development produces a fiscal loss, while farmland, forest, and open space produce a fiscal benefit. This is a strong argument for managing growth and maintaining open spaces, including farmland.”<sup>1</sup>

“Specifically, AFT has analyzed data from at least 40 communities in the Northeast and Midwest during the last decade, using the information to create a ratio of annual revenues generated from property taxes to annual expenditures for each land-use type. In a summary of this work, AFT concludes that residential land uses generally cost more in services than they generate in property taxes, and that they are subsidized by commercial and residential developments and by farmland, forests, and open space.”<sup>2</sup>

<sup>1</sup> Benfield, F. Kaid, Mathew D. Raimi, and Donald D. T. Chen, 1999, *Once There Were Greenfields: How Urban Sprawl is Undermining America's Environment, Economy, and Social Fabric*, Natural Resources Defense Council, New York, p. 107.

<sup>2</sup> Diamond, Henry L. and Patrick F. Noonan, 1996: *Land Use in America*, Lincoln Institute of Land Policy, Cambridge, MA., p. 35

**Differential fiscal impact by type of development.** Certain kinds of development typically have a more positive fiscal impact than others, and many kinds have a negative fiscal impact. The outcome depends on both the kind of development that takes place and on the tax/revenue structure. Among types of development, industry often demands the fewest services and generates the highest revenues, while owner-occupied residences below a certain price level are likely to demand more services than they produce in additional revenue. Residential developments vary greatly in fiscal impact depending on density, number of school-age children, and taxable property value per resident. Commercial development in South Carolina (in the absence of special tax incentives) typically generates less revenue per dollar invested than industrial development and usually demands somewhat more local public services per dollar invested.

Burchell and Listokin offer a hierarchy of fiscal impacts based on experience in New Jersey. Within that hierarchy, it is generally true that there are different fiscal impacts (costs less revenues) for different kinds of development (scattered or isolated versus dense or infill).<sup>1</sup> Overall, however, the fiscal hierarchy ranges from research office parks with the most positive impact to mobile homes at the bottom, with unimproved land somewhere in the middle. Townhouses (3-4 bedrooms), inexpensive single family homes (3-4 bedrooms), garden apartments (3+ bedrooms) and mobile homes all had negative fiscal impact on school districts, while research office parks, office parks, industrial development, high rise garden apartments (studio or one-bedroom), age-restricted housing, garden condominiums (1-2 bedroom), open space, retail facilities, townhouses (2-3 bedrooms), and expensive single family homes (3-4 bedrooms) had a positive fiscal impact in descending order. Significantly, for municipalities, retail facilities, 2-3 bedroom townhouses, and expensive single-family homes also fell into the negative fiscal impact range of the hierarchy.

**Distributional impact.** When fiscal impact is negative, who pays? Frank argues that it is not the developer or the homebuyer in many cases, so that the cost implications are not part of the consumer's purchase calculation. In particular, development fees, impact fees, and tax assessments fail to consider such factors as distance from central facilities, which increases service costs. The result is overconsumption of housing in areas and densities that are costly to serve and underconsumption in areas that could be served at lower cost.<sup>2</sup> As Benfield notes, impact fees rarely reflect the full cost of development or even the full capital cost. User fees also tend to reflect average rather than marginal costs, so that there are cross-subsidies from central city to suburban residents and apartment dwellers to lower density residents.<sup>3</sup>

<sup>1</sup> Robert W. Burchell and David Listokin "Land, Infrastructure, Housing Costs and Fiscal Impacts Associated with Growth: The Literature on the Impacts of Sprawl versus Managed Growth," 1995, Working Paper, Lincoln Institute of Land Policy .

<sup>2</sup> Frank, op.cit. p. 42.

<sup>3</sup> Benfield, op.cit., p. 110.

## Fiscal impact by nature of development

There are three intertwined issues on the cost side of the fiscal equation that affect the fiscal impact of development. One is the type of development—residential or commercial, single or multi-family, etc. The second factor is density. The third factor is location—infill or contiguous versus distant or leapfrog (the pattern referred to as sprawl). A number of the earlier studies were summarized by Duncan *et al.* in 1989.<sup>1</sup> They found that studies that looked at a variety of densities and dwelling types consistently found that, for the same density and dwelling type, leapfrog development was more costly than contiguous development and in capital costs and farther out cost more than close in. Costs for public capital and operations ranged from \$9,252 to \$23,960 per dwelling unit, with the lowest costs in compact and contiguous developments.

A second review was done by James Frank in the same year.<sup>2</sup> This review summarized nine earlier studies of the impact of alternative development patterns. One of the earliest studies by Wheaton and Schussheim (1955) looked at both capital and operation and maintenance costs of development of single family houses, including the allocated cost of inherited facilities. They found that full capital costs ranged from \$27,224 to \$33,024 per dwelling unit, depending on service levels, population characteristics and lot size. Primary costs for streets, sewers, water and drainage fell primarily on the developer, but there was significant variation in the public costs. Because they assumed septic tanks rather than sewers, they found less variation related to lot size, but in general they found, as did others later, that increasing density in a particular development reduced service costs per household. A second study from the 1950s by Isard and Coughlin, also summarized by Frank, developed cost simulations for varying densities. They found that medium density (4 units/acre) was the most costly because it required both sanitary and storm sewers (unlike lower density) and was also the most expensive in terms of roads (unlike high density). Adjusted to 1987 prices, the total outlay per dwelling unit for public costs ranged from \$17,467 to \$24,041.

Still another of the early studies, by Stone, looked at alternative neighborhood sizes and configurations and found sharply different building costs (higher) and development cost (lower) with increasing density. Road costs were particularly significant contributors to this outcome. Frank also reported on the Real Estate Research Corporation study of the cost of sprawl from the same period. This study also examined the effects of alternative densities (3-30 units per acre), finding capital costs per dwelling unit (both public and private) ranging from \$76,629 to \$112,023 adjusted to 1987 prices. Net of the cost of the dwelling unit itself, the costs ranged from \$27,368 to \$38,331 per dwelling unit. Of that cost, the amount paid by the owner or developer ranged from \$6,854 to \$13,890 was cost paid by owner or developer for such items as streets, sewer, water, and drainage. The cost of schools, and open space/recreation ranged from \$8,513 to \$12,855 per dwelling unit, while broader public costs such as public facilities, roads, and the public part of sewer, water, and drainage expense ranged from \$6,512 to \$8,865 per dwelling unit.

<sup>1</sup> Duncan, James et al, 1989, *The search for efficient urban growth patterns*, Tallahassee, FL: Florida Department of Community Affairs.

<sup>2</sup> Frank, James E. 1989. *The costs of alternative development patterns: a review of the literature*, Washington, D.C.: Urban Land Institute.

Yet another study in the Frank review was a Rand (1975) study of municipal pricing. Concentrating on fire protection, streets, sanitary sewer, and flood control, this study projected costs for a 15 year period for three alternative scenarios, compact, scatter and leapfrog. In 1987 prices, the cost per dwelling unit for those four services was \$2,078 for compact development, \$9,885 for leapfrog, and \$11,581 for scattered development. Likewise, a 1977 study by Downing and Gustely, looking at costs for police, fire, sanitation, schools, water supply, storm drainage, and sanitary sewers, found that the cost per unit rose with distance. In summarizing all these studies, Frank noted that the major items and the ones most sensitive to building patterns are streets, sewers, water systems, storm drainage and schools.

“When all capital costs are totaled (neighborhood plus community) for streets, sewers, water, storm drainage, and schools, the total cost for low-density (three dwelling units per acre), sprawl (noncontiguous growth) is slightly more than \$35,000 per dwelling unit (for central sewerage and water, full curb and gutter, and urban drainage). Further, if that development is located 10 miles from the sewage treatment plant, the central water source, the receiving body of water, and the major concentration of employment, almost \$15,000 per dwelling unit is added to the cost, for a total of \$48,000 per dwelling, excluding housing and land costs. In the most extravagant circumstance, that of estate zoning at one dwelling unit per four acres with full improvement standards and located 10 miles from all central services, the total cost surpasses \$92,000 per dwelling unit. Costs of infrastructure can be reduced to about \$24,000 (the total cost of streets, utilities, schools and leapfrog development for 12 dwelling units per acre...) by locating developments close to central facilities and employment... and by including multifamily housing types...in equal proportion to single-family conventional and single-family cluster units. Further reduction to about \$23,000...is possible by planning a mixture of housing types instead of allowing sprawl, that is, by building in locations contiguous to existing development and avoiding costly facilities to span the bypassed vacant land. Finally, the cost can be reduced to less than \$18,000...by choosing a central location, using a mix of housing types in which single family units and townhouses constitute 30 percent of the total and apartments 70%, and by planning contiguous development instead of leapfrogging.”<sup>1</sup>

Burchell, like others before him, emphasizes the implications of planned versus traditional development on infrastructure, housing and public service costs, as well as the implication of both patterns for protection of prime lands:

<sup>1</sup> Ibid, p. 39.

“directing development to areas of excess service costs and away from those locations that would have to expand public services and infrastructure. Fiscal impacts thus involve initial capital improvement savings, as well as longer-run savings in operating costs relative to where development takes place, both regionally and in a single community...planned development or managed growth...seeks to contain most new growth around existing centers and limit development in rural and sensitive environmental areas. It also seeks to save more prime agricultural and fragile lands, prevent wetland encroachment, buffer streams and other water bodies, and protect open water and natural habitats. It further seeks to reduce road construction and water/sewer infrastructure provision through more contained cluster development...by increasing the share and density of development close in to existing development and decreasing the share and density of development in the outer, more rural and undeveloped areas of the county or metropolitan area.”<sup>1</sup>

The three major surveys of the literature of the costs of sprawl versus dense/contiguous development found cost differences as summarized in the following table.

	<b>Planned development capital costs as a percentage of costs of sprawl-type development<sup>2</sup></b>			
	<b>Roads</b>	<b>Schools</b>	<b>Utilities</b>	<b>Other Capital</b>
Duncan	40%	93%	60%	102%
Frank	73%	99%	66%	na
Burchell et. al.	76%	97%	92%	na

The Rutgers study examined the impact of alternative growth management strategies on conversion of acreage and impact on fragile lands from 1990-2010 in New Jersey to accommodate projected increases of 520,000 persons, 431,000 households, and 654,000 employees. The state had about 2 million acres of developable land. Planned development would consume 117,607 acres vs. 292,079 (a difference of 60%), including 30,000 fewer acres of fragile environmental lands (-80%) and 42,000 fewer acres (-40%) of prime agricultural land.<sup>3</sup> In addition, the planned development emphasizing contiguity, denseness, infill, and locating close to excess capacity in public capital, would

<sup>1</sup> Burchell, Robert W.,1997, *Economic and Fiscal Costs (and Benefits) of Sprawl*, The Urban Lawyer, Vol. 29, No. 2, pp. 160-1.

<sup>2</sup> Ibid., p. 173-5.

<sup>3</sup> Burchell, Robert W. et. al. 1992: *Impact Assessment of the New Jersey Interim State Development and Redevelopment Plan, Report II: Research Findings*, Trenton NJ: New Jersey Office of State Planning.

save about 2% a year in cost to cities and school districts (\$400 million) just in more efficient service delivery. There would be a 9% saving in road construction, water and sewer facilities, and school construction for the same number of housing units.<sup>1</sup>

**Mitigating fiscal impact.** Some of the negative fiscal impact of low-density development can be mitigated by adjusting service and development standards for lot size and density.<sup>2</sup> The presence or absence of sidewalks, the use of septic tanks rather than sewers, narrower street widths, and other adjustments depending on lot width seemed to “flatten” the cost curve over varying densities of development. Frank, likewise, noted that “Cost can also be held down by relaxing standards for roads, sewers, and storm drainage and by allowing narrower roads, septic tanks, and nonpiped drainage for large lot subdivisions...Finally, costs can be reduced ...*in the short run* by locating developments where existing capacity is already in place but not yet fully used.”<sup>3</sup>

### **Policies and their effectiveness**

States have created a number of policy tools that can be used at either the state or local level to accomplish two complementary objectives: slow the conversion of farm, forest and wetlands to development use, and minimize the negative fiscal impact of development on local governments. These tools fall into four categories. One is property tax relief for agricultural and related uses. The second is protective legislation for farmers, including right-to-farm laws and agricultural zoning, sometimes complemented by restrictions on urban expansion. The third, and most recent, is a series of quasi-market techniques involving conservation easements and transfer or purchase of development rights on either a permanent basis or for a period of years. The fourth technique is some kind of full-cost pricing wherein the costs of development that have been borne by all taxpayers are more correctly assigned to the developments that create the increased costs. Impact fees have a positive role to play in forcing local governments to develop and disseminate information about the costs of development as well as ensuring that some share of those costs fall on the developer or his/her customers. This fourth category will be explored in greater depth in a future report in this series. In this section, we focus on those tools that are aimed directly at preventing or discouraging conversion of prime lands by working with the farmer or other non-developer/owner, rather than those tools that emphasize assigning the costs of development appropriately.

**Tax relief.** Forty-eight states have differential assessment of agricultural land for property tax purposes, either with a lower tax rate or a lower assessment rate, or in valuing the land by current use rather than market value. This differential treatment is justified not only in the name of preservation of greenspace but also by the lower service demands from agricultural lands compared to other uses, as indicated earlier. In addition to the effect of differential taxation, in states that use conservation easements or transfer

<sup>1</sup> Ibid.

<sup>2</sup> Urban Land Institute, 1958, Effects of Large Lot Size on Residential Development (Technical Bulletin No. 32).

<sup>3</sup> Frank, op.cit, p. 40.



or purchase of development rights, the market value of the affected property will decline, reducing the tax burden on farmers. However, most observers regard tax relief for farmers as a relatively weak tool, because (as Nelson observes) the tax penalty for conversion is almost always less than the value of tax deferred or underpaid. Speculators can take advantage of tax relief for farm and forest land to reduce their holding costs until they are ready to develop.<sup>1</sup>

**Protective legislation.** A number of states have passed “right to farm” laws to protect farmers from various kinds of nuisance lawsuits that limit the use of chemicals and pesticides or challenge smells, noises, and other aspects of farm operation that are inconvenient to neighbors. These laws offer some marginal aid to farmers, but will not prevent conversion.

More powerful legislation comes in a variety of zoning regulations that not only protect farmland and open space but also encourage higher urban density. In Oregon, the use of Exclusive Farm Use (EFU) zoning was protecting over 16 million acres by 1986, although it still has not effectively prevented urbanization or conversion to rural residential uses. Oregon also has established urban growth boundaries (UGB) in which higher density urban growth (1,000 people per square mile or more) is encouraged. From 1980 to 1994, most of the land urbanized in Oregon was in UGBs.<sup>2</sup>

New York, likewise, created agricultural districts starting in 1971. An agricultural district overrides local land use authorities, requires states to modify regulations in order to facilitate retention of farmland, offers relief from benefit assessments or ad valorem taxes on farm land for certain improvements, and provides for special agricultural assessment for production land. By 1997, more than 8 million acres in 408 districts were offered some protection from through agricultural districts.<sup>3</sup>

**Market-based techniques for preserving farms and open space.** Increasingly, legislators, farmers, and environmentalists are turning to market-based methods to preserve farms and open space. Purchase of development rights, transfer of development rights, and conservation easements, all closely related techniques, have become popular in the last two decades as a way to slow the conversion of prime land to development uses.

The first major program using market incentives was the Williamson Act in California in 1965. This act had a dual purpose, to protect agricultural land, preserve open space as an asset to urban development, and “...to discourage dis-contiguous urban development

<sup>1</sup> Nelson, op.cit., p. 36.

<sup>2</sup> Liberty, Robert, 1998: *Oregon's Farmland Protection Program*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 49-72.

<sup>3</sup> Bills, Nelson and Jeremiah Cosgrove, 1998, *Agricultural Districts: Lessons from New York*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 73-104.

patterns and in so doing, decrease the cost of community services.”<sup>1</sup> Unlike most later programs, this Act provided for the lease rather than outright purchase of development rights, with rolling 10 year contracts. If a contract is negated taxes rise gradually over the next nine years until the contract expires. The Act applies primarily to agricultural land, although some open space is eligible and some uses compatible with agriculture are allowed (agricultural processing, wine tasting rooms, fish farms, utility lines, farm worker housing, etc.).

In Maryland, there are conservation easement programs run by four MD counties and the state to make irrevocable purchases of development rights. The system is incentive- based and voluntary, with prices reflecting both market appraisals and landowner bids. In some cases, development rights sold to developers who can transfer them to another area for higher density developments. Nongovernmental organizations (NGOs) can also accept transfer or make purchases of developmental rights and retire them.<sup>2</sup> The goals of this program are to preserve as many acres as possible with limited funds, with preference given to parcels bordering other preserved lands, operating productive farms, and/or land under immediate threat of conversion. Maryland actually uses three techniques: purchase of development rights (PDRs) and transfers of development rights (TDRs). One set of PDRs is operated by counties with rates based on a set formula. This program is more expensive on average than the state program (Maryland Agricultural Land Preservation Foundation, or MALPF), which uses two market appraisals and the capitalized value of expected future income to set a price on development rights. MALPF has limited funds and sets priorities based on the ratio of bid to development value. In 1997, TDRs in Montgomery County were selling at \$2,200 an acre, while county PDRs cost \$3,652/acre. In all cases the land can continue in its current use but cannot be developed. An alternative measure is a TDR unit, which is one right for each five acres less one acre for each dwelling unit on the land (e.g., a nine acre tract with four dwelling units). The price of one such right averaged \$9,000 in Montgomery County in 1997.<sup>3</sup>

Pennsylvania has chosen to use conservation easements within established agricultural security areas that meet certain soil class requirements, and contain crop, pasture or grazing land on 50% or more of the affected acreage. By 1997 977 farms containing 123, 423 acres were in the program with an average payment of \$1946/acre.<sup>4</sup>

<sup>1</sup> Trott, Kenneth E., 1998: *Impact of the California Land Conservation (Williamson) Act*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p.193.

<sup>2</sup> Lynch, Lori and John K. Horowitz, 1998: *Comparison of Farmland Preservation Programs in Maryland*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 114-115.

<sup>3</sup> Criss, Jeremy, 1998: *Farmland Preservation Options in Montgomery County, Maryland-Transferable Development Rights*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 187.

<sup>4</sup> Kelsey, Timothy W. and Stanford M. Lembeck, 1998: *Purchase of Conservation Easements for Farmland Preservation*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 151-166.

In the state of Washington, the purchase of development rights program is based on bids by farmers. During the mid 1980s, prices ranged from \$480 per acre to \$18,975, with a mean of mean \$4250. The sale of development rights affected land values: unrestricted land sold for an average of \$1217 more per acre than restricted parcels. A 1996 estimate found that the cost of purchasing the parcels in the program was \$54 million to buy rights plus a \$279 million loss per year in assessed valuation, which must be counted as part of the fiscal impact.<sup>1</sup>

## Summary

The extensive literature on the experience of conversion and protection of prime lands against urban encroachment, and the impact on the fiscal condition of local governments, speaks with a remarkably consistent voice. The nation is experiencing a rapid pace of urban development, and particularly leapfrog, low-density, high-service cost development that places severe fiscal stress on local governments while accelerating the loss of prime agricultural and forest lands, wetlands and wildlife habitats. This process, which results in higher tax burdens and/or deteriorating public capital and public services, is the result of short-sighted public policy decisions and particularly the inability or unwillingness to insist that developers pay the full cost of new residential, commercial, and industrial development, differentiated by type and location of the development. Public policy can also make useful contributions on the side of current owners of farm and forest land and other greenspace with appropriate incentives to forgo development and retain land in its current use. South Carolina can draw useful lessons from the experience of many other states in both managing urban growth and protecting prime lands from unduly rapid conversion while at the same time accommodating expected population growth and protecting the fiscal health of its cities, counties, and school districts.

<sup>1</sup> Druffel, Sarah M. and Paul W. Barkley, 1998: *Is Selling Development Rights a Wise Economic Decision? The Case in Kings County Washington*, in *The Performance of State Programs for Farmland Retention*, Proceedings of a National Research Conference, Columbus, OH, p. 167-176.

## References

- Benfield, F. Kaid, Mathew D. Raimi, and Donald D. T. Chen, 1999, *Once There Were Greenfields: How Urban Sprawl is Undermining America's Environment, Economy, and Social Fabric*, Natural Resources Defense Council, New York.
- Bills, Nelson and Jeremiah Cosgrove, 1998, *Agricultural Districts: Lessons from New York*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 73-104.
- Burchell, Robert W. et. al. 1992: *Impact Assessment of the New Jersey Interim State Development and Redevelopment Plan, Report II: Research Findings*, Trenton NJ: New Jersey Office of State Planning.
- Burchell, Robert W. et. al, 1994: *Development Impact Assessment Handbook*, The Urban Land Institute.
- Burchell, Robert W. and David Listokin, 1995: *Land, Infrastructure, Housing Cost sand Fiscal Impacts Associated with Growth: The Literature on the Impacts of Sprawl versus Managed Growth*, Lincoln Institute of Land Policy Research Papers WP(95RB1) Cambridge, MA.
- Burchell, Robert W.,1997, *Economic and Fiscal Costs (and Benefits) of Sprawl*, The Urban Lawyer, Vol. 29, No. 2, pp. 159-181.
- Correll, Mark R., Jane H. Lillydahl and Larry D. Singell, "The Effects of Greenbelts on Residential Property Values: Some Findings on the Political Economy of Open Space," *Land Economics* 54(2), May 1978, pp. 207-17.
- Criss, Jeremy, 1998: *Farmland Preservation Options in Montgomery County, Maryland-Transferable Development Rights*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 183-192.
- Diamond, Henry L. and Patrick F. Noonan, 1996: *Land Use in America*, Lincoln Institute of Land Policy, Cambridge, MA.
- Druffel, Sarah M. and Paul W. Barkley, 1998: *Is Selling Development Rights a Wise Economic Decision? The Case in Kings County Washington*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 167-176.
- Duncan, James et al, 1989, *The search for efficient urban growth patterns*, Tallahassee, FL: Florida Department of Community Affairs.
- Frank, James E. 1989. *The costs of alternative development patterns: a review of the literature*, Washington, D.C.: Urban Land Institute.
- Grossi, Ralph, 1998: *The Next Generation of State Policy*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 105-112.

Kelsey, Timothy W. and Stanford M. Lembeck, 1998: *Purchase of Conservation Easements for Farmland Preservation*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 151-166.

Liberty, Robert, 1998: *Oregon's Farmland Protection Program*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 49-72.

Lynch, Lori and John K. Horowitz, 1998: *Comparison of Farmland Preservation Programs in Maryland*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 113-150.

Nelson, Arthur C, 1998: *Farmland Preservation Policies: What Works, What Doesn't and What We Don't Know*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 9-48.

Rominger, Richard, 1998: *A Federal Perspective on Farmland Retention Policy*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 177-182.

Trott, Kenneth E., 1998: *Impact of the California Land Conservation (Williamson) Act*, in The Performance of State Programs for Farmland Retention, Proceedings of a National Research Conference, Columbus, OH, p. 193-212.

Urban Land Institute, 1958, *Effects of Large Lot Size on Residential Development* (Technical Bulletin No. 32).