



Equity Issues in Farmland Preservation

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Abstract

The literature dealing with farmland preservation has concentrated on program effectiveness and legal aspects. Equity issues, and to a lesser extent political issues have been neglected in these discussions. This major paper discusses equity issues involved with this topic: Basically who benefits and who is adversely effected by implementing farmland preservation measures. It relates these equity issues to both the legal and political issues of farmland preservation. It is argued in this major paper that to understand any one of these issues, all three must be fully addressed. The paper starts out by describing the following farmland preservation techniques: Exclusive agricultural zoning, large-lot zoning, fixed-area based zoning, slide-scale zoning, cluster zoning, Urban Growth Boundaries (UGBs), Purchase of Development Rights (PDRs), Transfer of Development Rights (TDRs), conservation easements, Smart Growth programs, use-value taxation, and agricultural districting. It also describes their relative effectiveness. The next section describes the equity, legal, and political issues and relates these issues to the preservation techniques previously described. This section is followed by a conclusion that brings the previous two sections together and comes up with a final effectiveness rating for each farmland preservation technique.

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Chapter One – Introduction

The topic of farmland preservation has been covered fairly extensively by recent literature in the planning field. These critiques, however, have largely concentrated on program effectiveness and have only considered the legality and political feasibility of the techniques in a cursory manner. Legal issues are often covered thoroughly by themselves, but rarely in combination with political feasibility or program effectiveness. Political issues in farmland preservation are normally not covered in a comprehensive manner. Moreover, there is a fourth consideration, equity, which has been almost completely overlooked by most of the literature. Equity refers to basic fairness: Who gains and who loses when a certain farmland preservation program is implemented. These gains and losses can be either monetary or non-monetary. Changes in property or home values are examples of a monetary gain or loss. Reductions or increases in the provisions for more abstract societal benefits such as a pleasant rural atmosphere or recreational opportunities would be a non-monetary example. Equity issues deal with how these gains and losses are distributed and affected by farmland preservation techniques. This paper argues that until fully addressed, the lack of understanding concerning equity issues will continue to hamper effective farmland preservation efforts in this country.

Equity issues may be major determinants in farmland preservation success. The more equitable a technique is, the less likely it will be legally challenged or politically opposed. A particular technique may have great potential at preserving farmland, but if it can not gather political support or fend off legal challenge, it will be useless. Thus, equity issues play a key role in determining the ultimate utility of a farmland preservation technique. It will be further argued in this major paper that by better understanding equity issues and their interrelations with legal and political issues, the ultimate success of a particular farmland preservation technique can be better assessed.

Equity, or fairness, is normally considered in both the actual political and legal decisions involving farmland preservation. However, the literature that often drives the techniques used for farmland preservation is all too often silent on this issue. To ignore equity issues will result in an incomplete understanding of the legal and political aspects.

These three aspects, in turn, ultimately have implications on overall program effectiveness. If we are to implement truly effective farmland preservation programs, to preserve usable farmland instead of parcels of open space, we must consider all four aspects farmland preservation in a holistic manner: Program effectiveness, legality, equity, and political feasibility.

Equity issues concern many groups of people, but for farmland preservation programs we will typically look at those groups of people that advocate the preservation of farmland and why, as well as those groups that oppose preservation efforts. Oftentimes, farmland preservation is initiated, not necessarily to help farming communities, but to preserve the rural lifestyles of suburban and ex-urban residents. Farmland preservation programs usually have a negative impact on farmland values, sometimes substantially, because they restrict the development potential of the land. In these situations of course, farmers and other landowners are likely to oppose those programs that decrease their property values. This opposition can manifest itself in both the courts and political arenas and ultimately hamper the effectiveness of the program or even lead to its removal. Thus the first question we must ask is why and for whom are we preserving farmland? The second question is who will pay for this preservation? These questions become paramount when equity issues are addressed.

This major paper opens with a background section documenting the need for farmland preservation in this country. The substantive portion of the paper will begin with a section on farmland preservation effectiveness. This section will define what successful preservation really means as well as examine the various preservation techniques and their relative effectiveness. These techniques will include exclusive agricultural zoning, large-lot zoning, fixed-area based zoning, slide-scale zoning, cluster zoning, Urban Growth Boundaries (UGBs), Purchase of Development Rights (PDRs), Transfer of Development Rights (TDRs), conservation easements, Smart Growth programs, use-value taxation, and agricultural districting. A matrix will be included at the end of this section to help put in perspective the various strengths and weaknesses of these techniques. These tools effectiveness will be rated on their ability to preserve working farms as opposed to providing open space. Land that is preserved as open space

may indeed provide benefits to a community. However, this paper concentrates on the actual preservation of farmland.

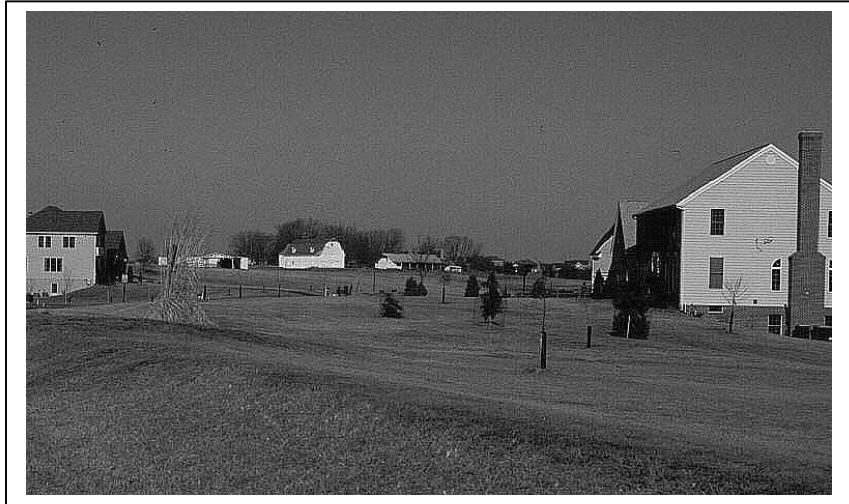
After the effectiveness issue is addressed the paper will then concentrate on the legal, equity, and political issues. One of the main objectives of this paper is to show how all three issues are interconnected. To truly understand any one issue, all three must be carefully considered. This section will concentrate on the equity and to a lesser extent political issues. It will touch on the legal issues just enough so that equity and political issues can be more fully understood. It is not the intent of this paper to give an exhaustive survey of all the legal issues and implications involved in farmland preservation. As with the effectiveness section, a matrix will be included to cross reference the various preservation techniques to help the reader better understand these issues. Finally, in the conclusion, this paper brings together all four issues; program effectiveness, legality, equity, and political feasibility. This final section aims to help predict likely success of farmland preservation efforts as well as provide possible guidance in implementing preservation programs.

The Need for Farmland Preservation

This section addresses the need for farmland preservation in this country. It first shows the significance of the rate of loss of our agricultural lands. Next, it points out the present and future benefits that are lost with agricultural land conversion. Lastly, I show that government intervention is needed because the free market does not always produce the most socially beneficial results and also because past government policies have encouraged farmland conversion.

The rates of loss for agricultural land have been documented by the 1981 National Agricultural Lands Study (NALS) and also by a resource inventory conducted by the Department of Agriculture. The NALS estimated that the annual rate of loss at this time period was 875,000 acres of farmland out of a total of 540 million acres (Lehman 1995). The USDA resource inventory report figures were slightly higher, concluding that the annual rate of loss between 1957-1967 was 1,000,000 acres per year, between 1967-1977 the rate increased to 2,000,000 acres, but by the end of the 1970's the rate dropped back down to 1,000,000 acres (Lehman 1995). Between 1982 and 1992, the Natural

Resources Conservation Service estimated that 8.75 million acres of agricultural lands where lost to development in this country, or an average of 875,000 acres per year (NRI 1992). Thus the rate of farmland loss seems to have leveled off just under one million acres per year.



Using this base figure for farmland loss may not seem significant in the short term, but added up over the course of decades these losses could have serious effects on the resource base for our food supply.

Because these statistics are for the entire country, they should be put into the context of individual states and regions to have more meaning. There are many areas in the country that have very little development pressure such as the great plains and western rangelands (NRI 1992). Because of these and other areas with low development pressures skew the overall figures, the rate of farmland loss has been held to a fairly constant 1% per decade. This means at this rate we would lose only 10% of our farmland over the course of the next century. However, the rate of loss for region's experiencing heavy growth, such as New England and the Mid-Atlantic States, can be alarming. Individual states rate of loss per decade include: Delaware (6.9%), New Jersey (6.5%), Massachusetts (4.8%), Rhode Island (3.9%), New Hampshire (3.1%), Connecticut (2.7%), and Maryland (2.5%). Florida, one of our leading producers of fresh fruits and vegetables, lost 3.9% of their farmland between 1982 and 1992 (NRI 1992). If continued, these high rates of farmland loss will have significant impacts over the course of a single generation. Calvin Beale, a USDA demographer, has also noted that the very regions we depend on for our fruits and vegetables such as Southern California, the lower Rio Grande valley, and the previously mentioned Florida are precisely the areas that are

experiencing the heaviest population growth and development (Daniels and Bowers 1997).

Possibly even more significant is the loss of prime farmland with class I and II soils, our soils that have the best productivity. There are 384 million acres of this type in the continental U.S., much of it near metropolitan areas that are often located in prime agricultural areas (Nelson 1990a). About 1/5 of this prime farmland is located in metro counties and this figure increases to over 1/3 of the total acreage when adjacent counties are included (Daniels 1991). This means that over 125 million acres of our best farmland is located in the very areas that are likely to receive the greatest development pressures from expanding urban areas. This fact should not be taken lightly as over 50% of our nation's farm product sales come from these areas (Daniels 1991).

It should be noted that the serious erosion rates we are experiencing today on our nation's farms, if continued, will likely render large amounts of agricultural land unusable and put increasing pressure and value on our remaining farmland. These erosion rates may also cause much farmland to fall below prime classification. For example, between 1982 and 1992, two million acres of previously classified prime farmland dropped out of this category (NRI 1992). The USDA uses a soil loss rate of 8 tons per acre per year as the cutoff rate for acceptable soil loss. Using this figure in 1992, 28% of the nation's farmland had unacceptable soil loss rates (NRI 1992), which by itself should be alarming. However, the actual percentage of farmland that is losing soil faster than it can regenerate is much higher than the USDA would lead people to believe. This is because the 8 tons per year figure is a "acceptable" loss, not a rate that can be sustained indefinitely. Actual rates of soil formation are generally below 1.65 tons per year (Encyclopedia of World's Problems and Human Potential 1999). Using this figure, over 80% of our nation's farmland is losing soil faster than it can be replenished. The continuation of these erosion rates may exacerbate the effects of farmland loss in the future.

Negative consequences with conversion of farmland include losses in food production, environmental benefits, and social benefits. With today's level of agricultural surpluses in this country it is hard to argue that the current rates of farmland conversion will be detrimental to our food supply. However, this may change in the future. With population growth expected to increase by 58% by 2050, from 5.9 billion to 9.3 billion

(U.S. Bureau of Census, 1998) much pressure will be put on the United States to try to meet the increased demand for food. Surplus food stocks will most likely quickly disappear. Also, we may someday find ourselves unable to economically ship food thousands of miles across the country and between nations, as often occurs today. If this happens, we will have a real need to have an adequate supply of farmland close to our urban areas, the very lands that are being converted today. The northeast United States, for example, has 18 % of our nation's population (U.S. Bureau of Census 1998) but only 2% of our remaining cropland (Daniels and Bowers 1997). Just as subsidizing domestic oil production provides a strategic insurance policy against a reliance from outside regions, it would be equally precautionary to retain key agricultural reserves around our urban areas. Preservation of agricultural lands would hedge against future uncertainties.

Other negative consequences of farmland conversion include reductions in environmental and social benefits. These environmental benefits include flood control, air quality, habitat for wildlife and native vegetation, and groundwater recharge areas. Social benefits provided by farmland include open space and scenery as well as recreational opportunities such as hunting, fishing, hiking, and photography. Farms make up an important foundation of many regions tourist industry (Daniels and Bowers 1997). In this light, many of the previously described benefits could also be classified as economic.

Even when confronted with these arguments for farmland preservation, some still oppose regulation. They claim that market forces will protect farmland if and when it actually needs protection and that government intervention will only lead to inefficient outcomes. Arthur Nelson points out one flaw of this view, saying:

"Some argue that an unregulated land market would result in the most efficient use of land because property owners are best able to determine the appropriate use of their land. This is true only if owners face up to all their marginal social costs. But markets do not operate in an ideal way and so they are imperfect. The purpose of government intervention in the market is to offset many conditions causing inefficiencies" (Nelson 1992).

According to idealized economic theory, marginal social costs should be equal to marginal social benefits at a given output level (Weimer and Vining 1999). However, because marginal social benefits such as aesthetic values, water quality, pollution buffers, recreational opportunities, etc., are not properly valued in our market system (the owners

of the farmland are generally not paid for them), the supply curve for farmland will shift downward, resulting in a lower supply of the commodity (in our case farmland) than would otherwise be offered if the benefits were internalized. Put simply, if farmlands' social benefits were commodified and farmers were compensated for this provision, the value of undeveloped farmland would rise correspondingly. This increase in agricultural value might be enough, in certain situations, to make the option of keeping farmland intact more financially attractive than developing it. Correspondingly, many social costs associated with development are not internalized into the cost of developing land. This would be an example of a negative externality and would result in a market failure in which development is priced too low (Juergensmeyer et al 1998).

Finally, there is much skepticism that the free market adequately values future generation's use of the land (Jacobs 1999, Nelson 1990a). Today's market doesn't incorporate the benefits derived by preserving farmland for future generations. This is another example of a market failure; the price of farmland is undervalued. The fairness of this type of system toward future generations is highly questionable. Thus, farmland that may have great value from the viewpoint of future generations would be judged to have a much lower value by our current market system. For these two reasons, not internalizing all social and environmental benefits and not fully considering future generation's benefits, the market that would protect the ideal amount of farmland ends up preserving a much lower amount than that which would be most beneficial to our society. From this standpoint, government intervention could be viewed as perfectly acceptable and can help retain an optimal amount of farmland from a social standpoint.

Furthermore those that claim the government has no business in trying to prevent farmland conversion conveniently ignore the fact that government has already been involved in the other side of the equation, that of contributing to the development of farmland. The National Agricultural Lands Study identified 37 federal agencies that had over 90 programs that directly added to farmland loss (Lehman 1995). Examples of these programs include highway projects, grants for sewer and water projects, and home mortgage deductions (Daniels and Bowers 1997).

Responding to the perceived importance of farmland preservation, states and localities passed a flurry of referenda in the November 1998 elections. These

referendums reinforced the importance of farmland preservation. Among the most significant of these changes included:

- Florida - designated \$3 billion for land conservation bonding.
- New Jersey - 68% of the voters decided to spend \$1 billion over the next decade to finance bond issues to preserve half of the remaining 2 million acres of farmland and open space.
- Massachusetts - 15 towns approved a 3% property tax assessment increase to finance community land banks.
- Austin, Texas - voted to spend \$76 million in park and greenway bonds.
- Rhode Island - designated \$15 million for open space.
- Arizona, Minnesota, and Michigan - extended their current land conservation programs (Peirce 1998).

Voters in these states clearly showed that farmland preservation is of great importance to them. Ohio joined the legion of states expressing concern for farmland preservation in 1999 by passing a farmland preservation bill that gives county governments much more authority in implementing farmland preservation programs (Williams 1999). It appears likely that this trend will continue in the future.

Hopefully, it is now evident that farmland preservation is important in this country to its present and especially its future generations. Without efforts to correct for market failures that improperly value farmland and the benefits that it provides, we will end up with a supply of farmland that does not maximize our total societal benefits. We must next ask what techniques will best protect our remaining farmland. This is a complex question that involves actual effectiveness, political feasibility, and ability to withstand legal challenges. The effectiveness of different preservation techniques will be discussed in the next section.

Chapter 2 - Farmland Preservation Methods and Effectiveness

Thomas Daniels (1997b) believes there are four main goals that need to be accomplished in order to have effective farmland preservation programs: 1) Protect a critical farmland mass. 2) Maintain affordable farmland prices for expansion and entry. 3) Provide reliable protection in the future. 4) Achieve results in a cost-effective manner. The *first goal*, protecting a critical mass of farmland, is important because farming requires many support businesses such as feed and seed stores, parts stores, spraying services (herbicides and insecticides), lime spreading (to lower acidity of the soil), fuel distributors, specialty welding, equipment repair, and large-animal veterinary services. Farmers also depend on each other, to a large extent, in borrowing equipment or getting help at key times during the farm year. Contrary to popular opinion, loss of equipment dealers is not always a major impediment to the farming community as much of this equipment is routinely transported hundreds of miles to farmers anyway (Stewart 1998). However, the loss of these other support businesses can make farming much more difficult and can force some borderline operations out of business.

The *second goal*, maintaining affordable farmland prices for entry and expansion, rarely gets the attention that it deserves. Although farming is a way of life for many, it is still a business, and like other businesses it must generate an acceptable return on investment or risk

conversion to non-farm uses that have a higher return on investment. Many people confuse profitability with return on investment.



Profit, which is basically a function of revenues minus costs, is only the first part in determining return on investment. Return on investment takes the profit for the year (assuming there is a profit), and divides this number by the value of the total assets to come up with a percentage. This is where the price of farmland comes into the equation. The price of the farmland, with the exception of very intensive farming operations such as poultry farms, pig farms, and possibly some dairy operations in the southwestern states, is normally the highest contributor to a farm's assets. The higher the land price, the lower will be the return on investment. In situations where land values appreciate after a farmer has already bought land this may not be a problem. The farmer may use his initial purchase price as the basis for the fixed costs, even though from a strict financial standpoint the opportunity cost should be used (the highest price that it could be sold for today).

The importance of return on investment will become more apparent when a farmer tries to buy additional land for expansion or when a farmer retires and sells the farm. In these situations, the farmer, or potential farmer, would in most cases require a loan to finance the purchase. If the return on investment cannot cover the rate of the loan plus enough of a profit to justify making the investment, the land will not be bought for farming purposes. Daniels and Bower emphasize the importance of this point stating "Once the price of farmland rises above what a farmer will pay for it, development is only a matter of time" (1997 p133). This is when conversion to more profitable uses will become inevitable. The average farmer age has been increasing for years now. With many of the nation's farmers approaching retirement age, the affordability of farmland for the next generation may become the paramount issue in farmland preservation.

Figure 1 - Example of Return on Investment as Related to Land Prices

Corn Production (per acre):

Revenue (100 bushels) @2.90/bushel	\$290.00
Variable Costs	
Seed, fertilizer, herbicides	\$100.50
Machinery Costs	\$13.50
Labor	\$14.20
Harvesting	\$45.00
Interest on Operating Capital	<u>\$8.66</u>

Total Variable Costs	\$181.86
Fixed Costs	
Machinery	\$32.60
Overhead	\$13.86
Property Taxes	<u>\$7.31</u>
Total Fixed Costs	\$53.77
Total Variable and Fixed Costs	<u>\$235.63</u>
Gross Profit	\$54.37
Net Profit (after taxes)	\$43.50

Return on Investment (\$500/acre land cost):

$$\$43.50 / \$500 = \mathbf{8.7\%}$$

Return on Investment (\$1000/acre land cost) :

$$\$43.50 / \$1000 = \mathbf{4.4\%}$$

Return on Investment (\$2000/acre land cost) :

$$\$43.50 / \$2000 = \mathbf{2.2\%}$$

Source: ICA Agricultural Products on all variable and fixed costs less property taxes. Data for property taxes and calculation for net profit and return on investment by the author.

Daniels' *third goal*, reliable protection in the future, is important because once converted for development, land is unlikely to be converted back into farmland in the future. If farmland protection programs falter for even a few years every decade (as could happen with a change in political climate), the critical mass needed to sustain farming will eventually be lost. The *fourth goal*, cost-effectiveness, is self-explanatory. The benefits (effectiveness) of the program should be higher than the costs (financial, time, and other resources) to a local community to implement.

Although partially incorporated into the first three goals, I believe that because of its importance, a *fifth goal* should be added to this list: *Elimination of the impermanence syndrome*. The impermanence syndrome has been defined as "a lack of confidence in the stability and long-run profitability of farming in urbanized areas, leading to disinvestment of human and capital resources" (Heimlich 1989, p457). Causes of the impermanence syndrome include regulation of farming activities deemed nuisances by suburban neighbors, increases in property taxes, destruction of crops by trespassers, and eminent domain (Nelson 1990a). Other causes of the impermanence syndrome include the loss of farm support businesses and increases in land prices (Pfeffer and Lapping 1994).

Two main effects result from the impermanence syndrome. The first is the decision to forgo needed investments such as in machinery, equipment, and land improvements (e.g. drainage, liming, fertilizing). A planner interviewed about this subject had the following to say:

"For commercial agriculture in our area, the trend is definitely out. Folks who are in agriculture in our area are looking and saying, well, how long do we have? Should we go buy that new milking machine? Should we make investments in the parlor? Should we buy that new combine that's going to set us back \$150,000? They're not making those kinds of capital investments because of the impermanence thing" (Pfeffer and Lapping 1994, p239).

The second effect of the impermanence syndrome is the idling of land, removing part of the land base from production. This may happen when farmers expect to develop land in the near future. It has been estimated that for every acre of farmland converted to non-farm uses, one acre will be idled and two more acres will have reduced investments on them (Daniels and Bowers 1997). If the impermanence syndrome infiltrates into a farm community, it will most likely only be a matter of time before much of the land is sold for development and the critical mass of land needed to support a farming community is lost. Agricultural support businesses will further weaken or disappear and the process will then start spiraling with little hope of recovery.

Unfortunately, little empirical research exists that critically examines the effectiveness of farmland preservation programs, particularly when viewed from the five previously listed goals. Landis pointed out that there has been no real consensus as to the effectiveness of growth controls, which farmland preservation programs fall under (1992). David Godschalk and Mike Bower, two leading figures in land use planning from the University of North Carolina, believe that objective, in-depth data and research into the subject is largely unavailable (Weitz and Moore 1998).

Part of the reason for a lack of objective data may be that it is almost impossible to control for experiments or case studies looking at farmland preservation effectiveness. No two local jurisdictions have the same current development patterns, development pressures, or political climate and constraints. Thus it is difficult to determine why a particular technique was successful or unsuccessful in a given situation. There are simply too many variables that go into the success or failures of actual farmland preservation programs to determine if the success of a program was because of a particular technique

or because of the localities circumstances. Therefore, this paper examines each technique on an individual basis and uses the available research to put the effectiveness of the various preservation techniques into context with one another. These techniques will include exclusive agricultural zoning, large-lot zoning, fixed-area based zoning, slide-scale zoning, cluster zoning, Urban Growth Boundaries (UGB's), Transfer of Development Rights (TDRs), Purchase of Development Rights (PDRs), conservation easements, Smart Growth programs, use-valuation property taxes, and finally, agricultural districts. Since these techniques are not normally used in isolation, this paper also critiques various combinations of these programs that are either currently in use or advocated by leaders in the farmland preservation field. Finally, this section concludes with an evaluation of the general effectiveness of the techniques and a summary matrix using the five previously listed goals for effective farmland preservation.

Agricultural Zoning - General

Agricultural zoning is the most common technique used for farmland preservation (Caughlin 1991). This tool relies on the zoning ordinance to limit development in designated agricultural areas. Agricultural zoning was first used in California, Washington, and Pennsylvania in the mid 1970's. In 1981 there were 270 counties nationwide that were using this zoning technique. In 1995, this number increased to almost 700 (AFT 1998), giving testament to the popularity of this technique. Agricultural zoning can be broken down into two broad categories, exclusive zoning and nonexclusive zoning. *Exclusive agricultural zoning*, with few exceptions, restricts construction of non-farm buildings (Daniels and Bowers 1997). *Nonexclusive agricultural zoning*, on the other hand, allows a limited amount of non-farm development to occur. I have identified four main types of agricultural zoning in this second category: Large lot, fixed-area based, slide-scale, and cluster.

Exclusive Agricultural Zoning

The main feature of exclusive agricultural zoning is that it basically prohibits all non-farm development in the designated area. Napa County in California has implemented this technique to preserve its prized vineyards. Santa Cruz County, also in

California, has preserved its rich farmland with this type of zoning (Duerksen et al 1995). To develop exclusive agricultural zoning, a local government must designate an area it would like to keep in agricultural production, and also show agriculture is both viable and an important natural resource. As such, the technique has the potential to protect the critical mass of farmland needed to maintain a strong farming community. In theory at least, exclusive agricultural zoning won't allow further development to occur within the agricultural district. In practice, development usually occurs by granting variances (allowing exceptions to the zoning ordinance) or by rezoning portions of the agricultural district to other categories by the planning commission.

Exclusive agricultural zoning tends to eliminate the speculative value of farmland, and helps to keep the land prices close to its productive value (Daniels and Bowers 1997). This will occur, however, only if the zoning regulation is strong and if landowners perceive that no changes are likely to occur to the zoning ordinance (Nelson 1990a). Costs for this type of program are extremely low, possibly explaining its popularity. Because suburban development would be kept out of this district, it avoids conflicts between farmers and suburban neighbors. The exception might be at the interface of the agricultural district with a residential district. Exclusive agricultural zoning has the potential to protect the greatest amount of agricultural land at the lowest price. Its main weakness in terms of effectiveness is probably its dependence on a stable zoning ordinance and also the political will to avoid rezoning portions of the agricultural district to other uses. Also, in Oregon this approach has led to the creation of thousands of hobby farms of less than 50 acres (Daniels 1991).

Large Lot Zoning

Large-lot agricultural zoning requires a minimum lot size, usually 10 acres or more, before a residence can be constructed (Nelson 1990a). This zoning technique is often used because it guarantees that a certain percentage of land will be left undeveloped. There seems to be two main instances where local governments use large-lot zoning. The first being in an attempt to protect farmland, the second to preserve open space. Large lot zoning can be very effective in preserving open space in situations where high growth rates have all but eliminated future agricultural viability (Daniels and

Bowers 1997). However, when it is used as a primary tool to protect farmland, it is likely to fail miserably. It has been documented that when minimum lot sizes are used that are less than 40 acres,

the tool will actually cause more sprawl than would otherwise happen (Nelson 1992). This is because many people who would otherwise buy smaller lot sizes without this ordinance (1-5 acres



for example), will be forced into buying 10-20 acres rural estates, or whatever the minimum lot size requires, that for the most part will be taken out of farming anyway. For this reason large lot zoning, unless very large acreage's are used, is unlikely to preserve a critical mass of farmland.

If the land is in demand for rural estates (large acreage residential homes), or hobby farms (small contribution to overall income), farmland will not be kept at affordable prices. Farmers cannot compete for land that also has significant residential value. Affordable land to expand current operations will be non-existent where development pressure are even moderate. When the current generation of farm owners turn over, these farms will most likely be sold for development unless taken over by a member of the family. The land will simply be too expensive to buy for farming purposes. This type of zoning would not be expensive to administer but would also not be considered cost-effective because it is unlikely to preserve much farmland. If the minimum lot size was large enough to prevent development for rural estates, these concerns would be minimized. However, there would be heavy pressure to reduce acreage requirements in the future as development pressure increases. Thus the

impermanence syndrome would likely remain a problem. Large lot zoning works best in rural areas that have yet to experience much development pressure (Duerkson 1995).

Fixed-Area Based Zoning

A fixed-area based zoning ordinance is similar to large-lot zoning ordinance as it also relies on granting a development right for each specified number of acres. The difference between the two is that whereas the development right goes with the acreage in large lot zoning, the development right is separated from the acreage in fixed-area based zoning. To be effective, lots should have a maximum size restriction, the smaller the maximum lot size the more effective the ordinance will be in preserving farmland (Coughlin 1991). As an example, consider a 100 acre farmland parcel that develops under a fixed-area based zoning ordinance that allows one development right per 20 acres. Depending on the maximum lot sized used (if any), the end results of development may be very different. If completely developed with a maximum lot size of ten acres, you would most likely end up with five 10-acre residential lots and one 50-acre lot. If completely developed with a maximum lot size of two acres, however, you would likely end up with five 2-acre residential lots and one 90-acre lot. This would conceivably allow the bulk of this 100-acre tract to stay in farming (90 acres). However, it is unclear as to whether additional (non-developable) land from the 90 acres could be sold to the residents of the two-acre lots, in effect creating rural estates with the same end result as with large lot zoning. It would depend on how stringent the zoning ordinance was as well as the political will of the zoning officials. However, it does give the farmer the option to sell off lots but keep ownership of the bulk of the property, which under large lot zoning isn't possible.

Table 1
Fixed-Area Based Agricultural Zoning of 100 acre lot with 20 acres per development right

Option	<i>Developable Lots</i>	<i>Total land developed</i>	<i>Remaining Land for Agriculture</i>
<i>No max lot</i>	5 - 20 acres	100 acres	0 acres
<i>10 acre max lot</i>	5 - 10 acres	50 acres	50 acres
<i>2 acre max lot</i>	5 - 2 acres	10 acres	90 acres

Thus the success of this technique in preserving farmland will depend on the number of acres required per development right, whether the ordinance has a maximum lot limit, the maximum lot size, as well as the strength of the market for rural estates. If the ordinance requires a large number of acres per development right, has a small maximum lot size, and the area has a low demand for rural estates, the ordinance could prove moderately successful in preserving farmland. In this case, protection of a critical mass of farmland could occur and moreover it would be cost-effective. It would be difficult to predict how this approach would effect farmland prices or how long this protection would last as future rezoning could always allow for more development. Without a small maximum lot size or low demand for rural states however, the long-term success of the program would certainly be minimal.

Slide-Scale Zoning

Slide-scale zoning is another type of area-based, non-exclusive agricultural zoning. However, instead of using a set acreage as in fixed-area based zoning, the acreage required per development right with slide-scale zoning changes depending on the size of the farmland tract. The allowed density of the developable lots decreases, or slides, as the tract size increases (Daniels and Bowers 1997).

**Table 2 - Example of a Slide-Scale Zoning Ordinance
Proposed Slide-Scale Zoning Ordinance for Montgomery County, Virginia**

Parent Parcel Area	Total Lots Permitted on Parent Parcel
0.0 – 10.0 acres	Up to 3 Lots
10.1 – 40.0 acres	Up to 4 Lots
40.1 – 70.0 acres	Up to 5 Lots
70.1 – 100.0 acres	Up to 6 Lots
100.1 – 130.0 acres	Up to 7 Lots
More than 130.0 acres	One additional Lot for every 20 acres over 130 acres

Source: Montgomery County, VA Planning Department

The justification for this method is that smaller lots are less useful for agricultural purposes, and if development is to occur, more of it should be allowed on lots that are less critical for agriculture. The dynamics of how the development actually occurs can take on two forms depending on if a maximum lot size is set up.

With a maximum lot size, the buildable lots will generally be separated from the bulk of the acreage. If for example, the slide-scale zoning ordinance allows four development rights on 100 acres with a maximum lot size of two acres (as in Clarke County, Virginia), the maximum amount of land in buildable lots would be 8 acres. Thus 92 acres of land would be left over that could not be developed and theoretically, would be available for agricultural uses.

Many authors believe slide-scale zoning has very good potential in preserving agricultural land. Robert Coughlin analyzed the sliding scale zoning ordinance in Clarke County and predicted that the maximum



development with two acre building lots would be 14%, leaving 86% of the original land base left for agriculture (1991). This figure does indeed sound encouraging in preserving farmland. The problem with Coughlin's results, however, is that he assumes all of the undeveloped land will be used for agriculture. He does not consider the possibility for the granting of variances, parcels of twenty acres or more that can be excluded from this ordinance (and used as rural estates), and a clause that exempts land that has been placed under conservation easement, regardless of size (Clarke County Zoning Ordinance 1998). All of these possibilities could increase the average size of residential lots and lead to the formation of rural estates.

Furthermore, even assuming that the formation of rural estates could be prevented, how can the designers of this ordinance determine with certainty that large enough farmland units would be left over to keep commercial agriculture a viable land-use option. It is easy to look up a farm with a particular acreage on the slide-scale zoning chart and roughly determine how much land would be left over for farming after developing the allowed units. The problem with this approach, especially with larger farms, is that they are rarely composed of a single tract of land. Coughlin admits that this is a fault of slide-scale zoning, saying:

"Zoning regulations apply to individual tracts or groups of contiguous tracts under one ownership, not to entire farms, which may be made up of a number of scattered and rented tracts in addition to a core of contiguous tracts. Therefore, the extensive literature on the economics of farm size is of little direct use in determining the minimum acreage that should be permitted" (1991 p 186). Thus there is the danger of constructing a slide-scale zoning ordinance, that when developed out, results in acreage's that are too small to farm profitably.

The other way a slide-scale zoning ordinance can be developed is in absence of a maximum lot size. Without a maximum lot size, the ordinance's effectiveness will likely be greatly reduced. When confronted with the various choices of developing 50 acres with 5 development rights for instance, would a developer build five homes on two acre lots and try to sell the remaining 40 acres to a farmer? Or would the developer build five homes on 10 acre lots? My guess is that the latter choice would usually be pursued. Although it would seem like common sense to include a maximum lot size in a slide-scale zoning ordinance, it does not always happen. For example, Montgomery County in southwest Virginia recently proposed such an ordinance without a maximum lot size requirement.

The overall effectiveness of slide-scale zoning would best be described as moderate in the best cases and limited in the worst cases. If an ordinance of this type can be developed with a high average acre requirement per development right, if the municipality can prevent developers from creating rural estates, and if the designers can do a decent job at predicting the average number of tracts that various farms sizes are made up of, then slide-scale zoning might do a reasonable job at protecting a critical mass of farmland. But because the zoning could change in the future, its ability to maintain affordable farmland prices or significantly reduce the impermanence syndrome is

questionable. At the other extreme, a slide-scale zoning ordinance that has a high density of buildable lots and no maximum lot size is unlikely to preserve anything but open space by itself.

Cluster Zoning

The technique of cluster zoning has been advocated by many planners as a way to both accommodate growth and preserve land. Although there is no single model or definition for what constitutes cluster zoning, there are some generalizations that can be made. The basic concept behind this method is that an area will have a housing unit density similar to typical subdivision development, except that these houses are concentrated in a small portion of the area and the rest of the land remains undeveloped. In some cases, such as when a zoning ordinance provides "bonuses" to encourage cluster zoning, this overall housing density can be even higher (Daniels 1997b). To accomplish this, individual housing lots must be much smaller than would otherwise be found in conventional development. No set standards exist as to how concentrated this development must be to qualify for cluster zoning, it varies from locality to locality.

There seems to be much consensus that cluster zoning can be effective at preserving open space for a community, but much doubt about how well it can preserve farmland (Arendt 1997, Daniels 1997b). In fact, some people claim that cluster zoning is not a true farmland preservation technique at all, and is only a second-best strategy for conserving open space (Arendt 1997). Bob Wagner of the American Farmland Trust has the following opinion about this technique:

"There's no way you can guarantee that the remaining open space will be usable for farmers. Cluster development should be a last-ditch effort for use in urbanizing areas" (Daniels 1997, p122).

There is evidence that cluster zoning does not produce land parcels that are large enough to farm effectively (Daniels 1997), which raises serious doubts about its ability to protect a critical mass of farmland. Also, because of the potential close proximity between farmers and residential development, this technique can lead to serious conflicts between these two groups (Daniels 1997). Farmland prices will likely be out of reach for agricultural uses in all but the lowest development pressure situations and what little agricultural land cluster zoning protects could be further reduced by future rezoning. It

should be concluded that cluster zoning should not be used for serious farmland preservation efforts. It may, however, have some potential to provide a buffer between agricultural and residential areas (Arendt 1997), or could be used in conjunction with



other farmland preservation techniques. Randall Arendt further believes that the failure of cluster zoning to protect farmland so far has been the result of applying residential densities that are much too high for agricultural use (1997).

Agricultural Zoning Conclusions

The agricultural zoning techniques receive mixed reviews when it comes to effective farmland preservation. Non-exclusive farmland zoning, except in a few very specific cases, doesn't appear to have much potential for serious farmland preservation. In fact, there is some evidence that suggests there is more subdivision activity and an extension of the impermanence syndrome over a broader area than without any zoning (Nelson 1990a). The instances where this zoning technique may prove effective include the use of fixed-area based and slide-scale zoning where lot densities are low and the pressure to develop for rural estates or hobby farms is minimal. Although not very effective in isolation, cluster zoning, when combined with fixed-area based or slide-scale zoning may provide additional protection.

Exclusive farmland zoning can have good to excellent short-term results. The problem with relying on exclusive zoning to preserve farmland (and also non-exclusive) is that the zoning ordinance can be easily changed with increased development pressure (Caughlin 1991). Most zoning ordinances also provide mechanisms for granting variances, weakening the preservation abilities (Peddle 1997). Thus agricultural zoning, in general, is politically vulnerable and is not permanent. Agricultural zoning may therefore be more appropriate in areas that have large amounts of farmland and where

development pressures are minimal. In such cases, exclusive agricultural zoning could be viewed as a transition toward more permanent preservation techniques.

Urban Growth Boundaries

The Urban Growth Boundary (UGB) is a method that can protect farmland by promoting compact development and infill in expanding urban areas. The UGB accomplishes this by demarcating a boundary that limits where public services such as sewer and water will be extended to and by implementing strict agricultural zoning outside of this boundary (Daniels and Bowers 1997). Typically, UGBs rely on a twenty year growth boundary. At the end of the twenty years another 20 year boundary will be constructed to control the next wave of growth. Some people believe that the UGB should also have an intermediate growth boundary for current development and an ultimate growth boundary to limit the final expansion of the urban area (Nelson 1992). The UGB system seeks to prevent low-density and decentralized development that uses large amounts of farmland. It also adds greater certainty into the development process and, as a result, speculation is reduced (Daniels and Bowers 1997).

The first UGB was set up in Lexington, Kentucky, in 1958. It provided capital improvement incentives (infrastructure that makes building less expensive) to build within its growth boundary and implemented a 10 acre minimum lot size outside of the boundary to discourage residential development (Daniels and Bowers 1997). Probably the best known example of this technique was set up in Oregon in 1973 through a statewide mandate. Results were not immediately seen as it took 13 years to establish all of the UGBs. Today, the average new lot size has decreased from just under 1/3 of an acre to 1/5 of an acre. Multi-family housing has increased from 30% of new developments to 50%. The Oregon approach hasn't been without problems, however. Many local governments outside the UGBs have been lax in enforcing agricultural zoning laws, leading to additional low density development and a loss of productive farmland (Daniels and Bowers 1997). Also, Oregon led the nation in the creation of hobby farms (less than 50 acres in size and with sales less than \$10,000 per year), possibly the result of people wanting to live out in the countryside but not having the option of small

acreage building lots (Daniels 1991). Oregon's northern neighbor, Washington, has also starting to implement UGBs in its 19 fastest growing counties. These UGBs, mandated by the 1990 Washington State Growth Management Act, however, have not been around long enough to determine the success of the program.

Some proponents of UGBs claim the technique provides the most effective farmland preservation method currently available (Nelson 1992). UGBs keep the price of farmland outside the ultimate growth boundary at its productive value for farming as well as protecting a critical farmland mass (Daniels and Bowers 1997, Nelson 1990a). As long as the final UGB is not extended or zoning changed outside the UGB, this technique will provide protection into the future and should reduce or eliminate the impermanence syndrome.

However, Nelson asserts that additional improvements can be made with this technique. Since some residential development is likely to occur outside the UGB anyway (much of this in the form of hobby farms), pockets of 1-2 acre residential lots should be allowed. This would theoretically reduce the number of larger acreage hobby farms as many people would buy smaller lots instead, if available. In the intermediate growth boundary, homes should be placed on lots that allow subdivision at a later date when lawmakers decide that density should be increased (sometimes called infill). Also, at the edge of the UGBs, 20 acre tracts of "farmettes", or hobby farms, should be established to buffer farms against residential development (Nelson 92). These would help limit the number of conflicts between residential and farm uses.

Although not thoroughly tested in this country, UGBs do seem to have significant potential for farmland preservation. There are a few potential problems with the tool, however. UGBs are very complex and can take years to set up, partly because of the political approval that is needed (National Farmland Trust 1998) The big question seems to be whether the example from Oregon can be transferred to other regions such as the Northeast. One of the UGBs biggest weaknesses is its need for political commitment to maintain its boundaries against development pressures (Alterman 1997). In areas where development pressure has already infiltrated parts of the countryside, this commitment may be difficult to achieve. A related problem can occur when multiple local governments such as cities and counties must work together to decide on how to structure

a UGB. Political fights over boundaries often results and the entire process may prove overwhelming (Daniels and Bowers 1997).

Purchase of Development Rights

Purchase of development rights (PDR) programs have gained increased attention in the last decade as a way of preserving farmland. This tool allows farmers (or other landowners) to voluntarily sell the development rights to their land. This can occur because the ownership of property entails with it, a variety of separate rights such as the right to farm or mine the land, use for recreation, deny trespass, and develop or subdivide the land, among others. Generally, once these development rights are sold the land can never be developed as the PDR applies to all subsequent owners. The owner, however, retains the title to the land and most of the other rights that go with ownership. A PDR does not give the public the right to use the land for recreational or other uses (American Farmland Trust 1998). There may be on occasion, some other minor restrictions to encourage wise stewardship of the land such as using Best Management Practices for both agricultural and forestry activities, but for the most part there is no real change in terms of how the farmer can use the land once PDRs have been sold. The land is usually just restricted from being developed for residential and other non-farm uses. This system provides a financially competitive alternative to development of the land.

The process for implementing a PDR program is somewhat more complicated than that of agricultural zoning, and can occur at both the state and local levels. The state or municipality must first decide on an area or areas that it wants to target for farmland protection. This would usually be done by considering where current development pressures exist, where future development pressures will occur, the productive capacity of various areas for agriculture, and future agricultural viability. The ultimate goal of the PDR program should be to preserve enough farms in the area or areas to retain a critical mass of farmland (Daniels 1991). Once an area has been targeted, farmers must be convinced that the program would benefit them. Convincing farmers may involve substantial effort because the program is a new concept for many of them.

There are two basic ways that farmers are compensated for relinquishing their development rights. The first is by paying the full difference between the fair market value (what it is worth if developed) and the fair agricultural value (what it is worth as agricultural land). An appraiser is usually retained to determine these figures. As an example, if development rights were being purchased on farmland that had a \$2000 per acre development value and a \$500 per acre agricultural value, the development rights would sell for \$1500 per acre.

However, many localities offer less than the full difference between the development value and the agricultural value (Daniels and Bowers 1997). Presumably this is because many farmers would rather not develop land that they have been working for decades and may have belonged to their family for generations. Thus a third value enters into the PDR price equation: *The sentimental value of the farmland*. The existence of this third value is why many farmers choose not to develop their land when, from a strict financial standpoint, they would be much better off to do so. Thus our modified PDR pricing system becomes the development value less the agricultural value and sentimental value of the farmland: $PDR\ price = Development\ Value - (Farmland\ Value + Sentimental\ Value)$. In reality, however, the PDR price would probably be the lowest price at which the program administrator would still expect to preserve enough farmland to keep a critical mass.

PDRs were first used in the mid-1970's by Suffolk County in New York state and quickly spread to other municipalities throughout the country. Most of these early programs proved only marginal effectiveness until the past decade. In the Northeast states for instance, there were only 172,000 acres protected by PDRs prior to 1991. By 1998, the acreage had almost doubled to 337,820. Throughout the country over 600,000 acres are now protected by state and local PDR programs (American Farmland Trust 1998).

There are many advantages to PDR programs. First, PDRs provide permanent protection. Local municipalities can not yield to development pressure at a later date and allow development as often happens with agricultural zoning methods. Secondly, the program is voluntary and does not infringe on private property rights (Daniels 1997). Third, PDRs provide a financially competitive alternative to developing the land. The

compensation paid to farmers can provide working capital for farm operations and rejuvenate local farming economies (American Farmland Trust 1998). This compensation, however, only provides a one-time benefit. When trying to preserve farmland, long-term benefits are paramount; future generations of farmers will not benefit from this initial payment. Finally, and possibly most importantly, because the development value of the land is essentially eliminated, PDR programs will keep farmland at affordable prices for both current farm expansion or for beginning farmers entering the market (Pfeffer and Lapping 1994). The price of the land will be dictated by farmers bidding on it for its worth as productive agricultural land, not its worth for development.

There are, however, some disadvantages with PDR programs. First of all, they can be very expensive. State PDR programs have spent an average of \$1488 per acre to acquire development rights while local programs have spent an average of \$1704 (American Farmland Trust 1998). Obviously, this may prevent a significant amount of farmland from being preserved. At \$1500 per acre, a PDR program requires \$30,000,000 to preserve 20,000 acres or roughly 50 medium sized farms in the eastern United States. Although most programs use general bonds (that increase property taxes) to fund PDR programs, it appears that most of the successful programs rely on more creative means such as real estate transfer taxes (taxes on the sale of real estate), agricultural transfer taxes, and sales tax increases (American Farmland Trust 1998). Hanford and Howard Counties in Maryland for example, use a 1% and .5% real estate transfer tax respectfully to help fund their local PDR programs. The state of Maryland also has a 5% real estate transfer tax and 5% farmland conversion tax that goes to statewide PDR programs. Sonoma County California increased their sales tax by $\frac{1}{4}$ % to help pay for their PDR program which preserved 21,000 acres in the first three years (Daniels and Bowers 1997). The timing of a PDR program can also help to reduce costs. The earlier it is implemented, all other things being equal, the lower will be the PDR price.

Often, as a result of limited funding, farmer demand to participate in PDR programs exceeds the supply, a second major disadvantage. Excess demand often leads to long waiting lists and the potential that some of this land may be developed before PDRs are available. In Lancaster County, Pennsylvania for example, there were 170

landowners waiting to sell PDRs (Daniels and Bowers 1997). PDR programs should use such situations to their advantage by decreasing the price paid for the development rights (especially if currently using the full difference between development value and farm value). Or better yet, let the market dictate what price should be paid for the development rights. Farmers have different levels of sentimental value for their land. Farmers whose sentimental values are highest would be willing to sell PDRs at a lower price ($PDR\ price = Development\ Value - (Farmland\ Value + Sentimental\ Value)$). In the state PDR program in Maryland and in some of the individual county programs, landowners bid in this competitive process. The lower bids are selected for PDR purchases (Daniels and Bowers 1997). Another method to even out the supply-demand imbalance is to downzone the area to be targeted for the PDR program. This effectively reduces the development value of the land. Virginia Beach, Virginia, for example, downzoned 20,000 acres south of the city before implementing its PDR program (Daniels and Bowers 1997).

A third disadvantage of PDR programs is that because they are voluntary, targeted farmers may choose not participate. This could also result in protecting scattered parcels without preserving the critical mass needed to keep farming viable (Daniels 1991). Additionally, a contingency plan is needed if farming becomes unprofitable in the areas with PDR programs. Fortunately, all of the states except New Jersey allow a buyback of PDRs if it can be demonstrated to the program administrators satisfaction that farming can no longer be profitable or if there are too many conflicts with suburban neighbors (Daniels and Bowers 1997). A fourth disadvantage is the administrative costs involved. These include setting up the program, implementation, monitoring, and enforcement. A final disadvantage is that although development would be restricted, there may be pressures to use these lands for rural estates or recreational lands (hunting clubs come to mind here). This would have the tendency of driving up the land prices beyond what farmers can afford to pay (productive value). To get around this possibility some programs require notification of all proposed sales and have the first right of refusal, giving the government agency the option of buying the land at that time, with the intent to resell for agricultural use (Freedgood 1991).

Overall, PDR programs possess a number of attributes that lend themselves to effective farmland preservation. On lands that have been protected, they maintain affordable farmland prices, provide permanent protection, and eliminate the impermanence syndrome. However, many argue against their cost-effectiveness and their ability to preserve a critical mass of farmland. I will cover the cost-effectiveness argument in the equity section of this paper, but there is indeed much concern about PDR programs' ability to preserve a critical mass of farmland. For this reason alone, a PDR program, standing by itself, cannot be expected to effectively protect a viable farming economy. However, if combined with other preservation techniques it may have much potential.

Transfer of Development Rights

Transfer of Development Rights (TDRs) is a farmland preservation tool that creates a mechanism to transfer potential development from areas that a community wants to preserve to areas that are more suitable for development. This is accomplished through a process similar to PDR programs where development rights are separated from the other ownership rights. The main difference between the two programs is that in PDR programs, development rights are bought by the public and retired. With TDR programs, on the other hand, development rights are generally bought by developers who will use them to increase the amount of units they can develop in the areas designated for growth.

Conceptually the process is fairly simple. Development rights are created and assigned per a specified number of acres (e.g. one TDR per 10 acres) and these can be sold to developers in areas the county wants to steer growth toward. This is usually done through the zoning ordinance. The land where the development rights originate is called the sending area. When the rights are transferred from the sending area, the land is restricted with a permanent conservation easement. The land to which the rights are transferred is called the receiving area, the area that the community wants to steer growth toward. Buying these rights generally allows owners in the receiving zone to build at a higher density than is ordinarily permitted by the base zoning. Downzoning is often used in the sending area, preferably to a rate of one unit per 25-50 acres to encourage the sale

of development rights. Development rights are allotted so that there are more rights allowed than the zoning actually permits development on in the sending area. The difference between the number of development rights and what is allowed by zoning, can be transferred (sold) to developers in the receiving area where higher densities are allowed. Once these rights are sold, the land is restricted with a permanent conservation easement. (Daniels and Bowers 1997 and American Farmland Trust 1998)

The first use of TDRs for farmland preservation was in 1975, by a municipality in Pennsylvania and two in New Jersey. Other programs were implemented shortly after, but none had major

impacts in preserving farmland. The first programs that had significant effects in preserving farmland were implemented in the 1980's in Maryland and New Jersey (Pruetz 1997). Preservation of farmland has increased in



these areas, but not as quickly as in those areas implementing PDRs. As of 1997, only 67,495 acres were preserved through TDR programs, with 75% of this coming from the state of Maryland (American Farmland Trust 1998).

TDR programs have a number of inherent advantages. As with PDR programs, the protection offered by TDR programs is permanent for the most part, although it isn't completely clear if sending areas could be rezoned at some future date to allow increased development. The program is voluntary from the standpoint that farmers are not required to sell their development rights and can hold them for future sale (American Farmland Trust 1998). Another advantage is that the public does not have to fund the program. TDRs are market driven and normally work through the use of private funds. When development pressures are high, more land will be protected. The compensation paid for the development rights will inject cash into the farming community, but again, this will

only be a one-time benefit. As with PDRs, farmland will be kept at affordable prices (Daniels and Bowers 1997). One of the main advantages over PDR programs (aside from the cost issue) is that because of the designation of sending zones, TDR programs have the potential to protect large blocks of farmland, hopefully keeping a critical mass intact.

There are also a number of disadvantages with TDR programs. Setting up the program can be very complex and require significant time and staff resources to implement (American Farmland Trust 1998). Setting up effective markets for the sale of the development rights has proven difficult in many localities. In some instances, localities have had to set up banking programs to buy TDRs and then facilitate the sale to developers in the receiving areas. Once a program is in place there may be much administrative record keeping as farmers can sell their development rights on a piecemeal basis (Daniels and Bowers 1997). TDR is also an unfamiliar concept, not just to farmers but to the public at large. Due to this unfamiliarity, there could be considerable opposition until farmers and the public are educated on the process. Many critics claim that because of its dependence on the market, few TDRs would be bought and that little farmland would be preserved during economic downturns (American Farmland Trust 1998). This is probably true, but this view ignores the obvious fact that land in the sending area would be protected from development by the zoning ordinance. Furthermore, developers would have an incentive to buy development rights during economic downturns, if available, as they could be purchased for a cheaper price and used when the economy picks up.

Another potential problem would be that residents in the receiving areas may oppose the program as densities would be increased in this area. Also, if the baseline zoning (the development that is actually permitted in the sending zone) isn't restrictive enough, maintenance of agricultural operations may not be ensured (Nelson 1990a). A related problem might be that if there is already scattered development in the proposed TDR area, it may prove difficult to find a viable sending area (Daniels and Bowers 1997). Thus to be effective, TDR programs require relatively large, unbroken blocks of agricultural land to be used as the sending area. Finally, one of the biggest problems with TDRs and possibly the main reason why preservation efforts have not proven overly successful so far, is that most current TDR programs are very localized and do not

interface well across political boundaries such as counties, townships, and cities (Pfeffer and Lapping 1994).

Daniels and Bower believe that TDRs are ripe for improvements and overall effectiveness stating:

"Few planning concepts could benefit more from innovation than TDR. The transferring of development potential from one area to another is a powerful land management technique. But the obstacle to accomplish protection of land resources is the political capital and courage necessary to start and maintain the process" (1997 p186).

One example of innovation involves transferring development rights to commercial or industrial sites instead of just residential sites. Another possibility is to link sending and receiving areas so that the people in the receiving areas also benefit from the program (Daniels and Bower 1997). This linkage requires adjacent and comparatively small receiving and sending zones. Another obvious improvement would be the integration of TDR programs at the regional level where these programs could be more effectively administered across political boundaries. I believe this will be required before the technique is able to reach its full potential.

Overall, TDR programs appear to have all the necessary ingredients to be effective at preserving farmland. If set up and administered properly, they have the potential to protect a critical mass of farmland, maintain affordable farmland prices, offer permanent protection, and be cost effective to boot. The problem, however, is that outside of Maryland and possibly New Jersey, these programs have not preserved very much farmland. The reasons for this failure can usually be traced to poor program development and implementation such as having receiving zones that are insufficient in size (Juergensmeyer et al 1998). TDR programs are not as simple to develop and administer as agricultural zoning, and many municipalities are not willing to devote the time and resources necessary to make the program work.

Conservation Easements

Conservation easements are basically deed restrictions voluntarily placed on property by their owners to protect the land from future development or other undesired uses. For our purposes here, I will narrow the definition to those instances that the deed restrictions protect farmland from future development. Deed restrictions can also be sold

and although these are sometimes referred to as conservation easements, these types really fall under the category of PDRs (Wright 1995). There are a number of financial benefits that result from granting easements including possible reductions in federal and state income taxes, state and local real property taxes, and federal and state estate taxes. But although benefits may help make conservation easements a more attractive option to those that are considering long-term stewardship of the land, it is doubtful that conservation easements would be used strictly because of the monetary benefits. The monetary benefits will be less than the value of the development rights they are giving up.

The main advantage of conservation easements from a farmland preservation standpoint is that like PDR, the deed restriction is permanent and applies to all subsequent owners. Consequently, the land will be kept affordable for future generations of farming. However, because of their voluntary nature, there is almost no way that conservation easements are going to protect a critical mass of farmland or reduce the impermanence syndrome in an area. Because there is usually very little cost involved, this tool can certainly help when combined with other farmland preservation techniques, but by itself can't be considered a valid tool for preserving farmland on a large scale.

SMART Growth and Level of Service Programs

SMART growth and Level of Service (LOS) programs are similar concepts that are directly related to growth management and indirectly related to farmland preservation. SMART growth is statewide program that was passed in 1996 in Maryland that provides financial incentives to local governments and developers to concentrate development where infrastructure already exists and can better accommodate growth. This growth is channeled into "Priority Funding Areas" that are designated by local governments but must meet certain criteria such as average residential densities and public water and sewer services. Development outside these areas will not receive state assistance for transportation projects, economic development grants and loans, financing for water and sewage treatment projects, and other state assistance (Frece 1997). This will most likely have the effect of decreasing the amount of development in farming

areas. However, because it is an incentive program, it does not prohibit development of farmland. It simply makes it less attractive, from a financial standpoint, to do so.

LOS, on the other hand, is a growth management tool used in a number of states at the local level. In order to gain approval for various development projects, minimum level of services must exist or be provided by the developer. These levels are determined by the individual localities and can consist of sewer, water, fire and police protection, and road capacity. LOS doesn't necessarily prohibit development of farmland, but may reduce the allowed densities and the ability of a developer to make a profit from the property.

By themselves, either SMART growth or LOS programs will not directly preserve farmland. There may be indirect preservation that occurs because growth is directed into areas that are already lost for future agricultural use. They have no mechanism, however, to protect a critical mass of farmland, keep this land affordable, guarantee permanent protection, or keep the impermanence syndrome out of agricultural areas. When combined with other farmland preservation techniques, it does appear that both techniques have potential to help preserve farming areas. By themselves, however, they cannot be considered true farmland preservation tools.

Property Tax Policies

Reasonable observers generally concede that farmers pay out more in property taxes than the benefits they receive, whereas homeowners typically receive more in benefits than they pay out. In fact, property taxes often consume a substantial portion of a farmer's income for a given year, up to 15-20% in many cases (Nelson 1990a). Part of the reason that farmers pay such high property taxes is because farmland is often assessed at its highest use value instead of its productive value as farmland. It is because of this inequality that many localities have tried to level out the playing field by lowering the property tax rates that farmers pay. There are two main ways to help accomplish this: Preferential assessment and restrictive agreements.

Preferential assessment programs tax property at its productive value as farmland or forest rather than its highest use value. The two basic forms of preferential assessment are pure preferential assessment and deferred taxation with rollback penalties. With pure

preferential assessment, there is no penalty for conversion to non-farm uses. Of course, the land will then be re-assessed at a higher level. The problem, however, is that this program does little to discourage farmers from developing their land. In fact, it has been claimed that it actually subsidizes farmers and developers would have already decided to develop the land but are waiting for an optimal land market to develop (Nelson 1990a).

Deferred taxation with rollback penalties tries to get around the problems associated with pure preferential assessment by imposing a penalty, often called a rollback tax, upon conversion based on the past tax savings. In theory, this tax should discourage speculation based on tax savings. However, the rollback tax is often far from 100% of the dollar amount actually saved. Thus, although deferred taxation with rollback penalties may do a better job at discouraging conversion than pure preferential assessment, the technique is not perfect. Neither technique will help preserve a critical mass of farmland where development pressures are high, keep farmland affordable, or reduce the impermanence syndrome (Nelson 1990a).

Restrictive agreements are long-term contracts where in exchange for reduced property tax rates, farmers agree to keep their land in agriculture for a certain number of years, usually around ten. This type of property taxation has been used in California, New Hampshire, Pennsylvania, and Vermont (Daniels and Bowers 1997). If the land is converted to non-farm use, a cancellation fee will be levied against the farmer. This cancellation fee could theoretically be greater than the tax savings that were accrued by the farmer. In California for instance, the cancellation fee is levied at 12.5% of the full market value of the land (Nelson 1990a). Thus this program would likely do more to discourage conversion than preferential assessment. However, it is unlikely that land would be enrolled in this program if development was planned in the near future and it does nothing to prevent conversion when the contract expires.

Lowering property taxes for farmers will certainly help to keep farming a viable economic activity. However, the savings from these tax programs will not compare to the possible gains from developing the land in high growth areas. Thus these programs will do little to prevent conversion of farmland that has high development potential (Nelson 1990a, Coughlin 1991, Pfeffer and Lapping 1994, and Daniels and Bowers 1997).

Agricultural Districts

Agricultural districts are voluntary associations created by farmers to take advantage of certain opportunities. The advantages often include ability to receive use-value property taxation, protection from nuisance ordinances, limits the annexation of farmland by municipalities, and exemptions from sewer, water, and drainage taxes (Daniels and Bowers 1997). As with property tax reduction, agricultural districts will offer farmers who wish to continue farming a better chance to do so. However, these districts will do little to prevent farmland conversion in areas with high development pressures (Nelson 1990a, Coughlin 1991).

Review of Farmland Preservation Programs

Montgomery County, Maryland has what many consider a highly successful farmland preservation program. Despite being under intense development pressure because of its close proximity to Washington D.C., the county has been able to preserve a surprising amount of farmland. They have permanently protected over 45,000 acres, or roughly 70 square miles of farmland (American Farmland Trust 1998). How have they been able to accomplish this? To begin with, Montgomery County has a very effective citizen participation program that involved the formation of county-wide comprehensive plan and 26 area master plans. Serious preservation efforts began when the county downzoned 78,000 acres of agriculturally zoned land to one development right per 25 acres. A TDR program was then set up that gave one additional development right for every five acres of land that could only be used by transferring to the receiving area. The county had already been purchasing development rights and has continued this practice. Farmers were allowed to create voluntary agricultural districts and reduce property taxes through use-value assessment. The county was also, to a certain extent, able to influence the location and timing of development through a capital improvement program (CIP) that dictates where infrastructural spending would occur. Thus the highlights of the Montgomery County farmland preservation program are:

- Fixed-area based, non-exclusive agricultural zoning; downzoned the agricultural district to one development right per 25 acres.

- TDR program that gave additional development right per five acres that could be used in the receiving zone.
- Active PDR program at both the local and state level.
- Partial SMART growth program (directing location and timing of infrastructure).

The results of the program have been quite successful. Of the 78,000 acres originally downzoned in the agricultural reserve area, 45,000 acres have been protected by the TDR and PDR programs. Only 4000 acres have been converted for non-farm uses. In addition, 13,000 acres of parkland now buffer the agricultural reserve area (Daniels and Bowers 1997).

Thomas Daniels, the Director of the Agricultural Preserve Board in Lancaster County, Pennsylvania, advocates what appears to be a modification of this successful program. Daniels promotes three different strategies depending on the current farming situation and potential development pressure. The difference between the first two strategies is minor.

His first strategy tries to *maintain a strong farming community*. Much of the potential growth would be contained by UGBs or village growth boundaries. A fixed-area based, non-exclusive agricultural zoning system would allow one development right per 25-50 acres. A maximum lot size should be no larger than two acres. A PDR and / or a TDR program should be set up to help compensate landowners for lost development rights. Strong agricultural districts would help bring a sense of permanence to the farming community. Use-value taxation with a stiff rollback penalty would reduce property taxes to fair levels but discourage using the tool for speculation purposes (Daniels and Bower 1997).

Daniels second strategy, *maintaining some farming in an increasingly suburban community*, is almost identical to the first. The only real change is decreasing the fixed-area based, non-exclusive agricultural zoning system to one development right per 20 acres. His third strategy, *maintaining some rural character in a suburban community*, has far fewer controls. He recommends using large lot rural zoning of 2 - 10 acres or the use of cluster zoning techniques. Use value taxation would be given only to farmers with annual gross revenues over \$20,000, presumably to avoid subsidizing hobby farmers (Daniels and Bower 1997). Although not included in Daniels third strategy, it seems that

a PDR program used on a limited basis would also be of benefit in this situation by providing permanent protection of open space.

Arthur Nelson, a professor of City Planning at Georgia Tech, advocates what appears to be a modification of the Oregon approach to farmland preservation. Nelson relies on a strict UGB to contain growth and development while depending on exclusive farmland zoning to prohibit development in agricultural areas. Nelson further advocates setting aside some of the marginal agricultural areas for development as villages and low density residential development. He reasons that development will somehow find a way to infiltrate the agriculture district anyway. With this approach development can at least be contained and directed to the least productive agricultural areas. He also believes that a buffer should be set up consisting of 10-20 acre residential lots and "farmettes", to reduce conflicts between residential development at the edge of the UGB and commercial farming operations in the agricultural district. Nelson doesn't believe TDRs or PDRs are necessary or even desirable, presumably because farmers should not be paid for value they did not create (1990a). This approach, however, misses a perfect opportunity for using TDR in directing growth toward the marginal agricultural areas that Nelson believes would be perfect for villages and residential development.

Effectiveness Conclusion

In comparing the effectiveness of the previously examined tools with the five goals that should be achieved in farmland preservation, it becomes apparent that most of the tools' effectiveness are severely limited when used alone. The only preservation technique that has the potential to meet all five of the goals (if set up and administered properly) is the TDR program. Exclusive agricultural zoning and UGBs can be even more effective in the short-term but unfortunately cannot guarantee future protection. The other agricultural zoning techniques can be effective at preserving open space but their effectiveness at preserving actual farming communities is highly questionable. PDR programs can do a good job at preserving key farmland tracts and open space, but their voluntary nature and funding limitations severely limit their effectiveness for preserving a critical mass of farmland. Smart Growth programs by themselves will only indirectly prevent farmland conversion but would appear to enhance effectiveness in conjunction

with other techniques. Property tax reduction programs and agricultural districts will certainly help keep farming economically viable in many areas but by themselves will do little to prevent the loss of farms in communities where development pressure is high.

Both the preservation programs advocated by Daniels and Nelson appear to be promising in protecting farmland. The two approaches are quite different in that Nelson would rely on an exclusive agricultural zoning ordinance whereas Daniels advocates non-exclusive zoning. PDR and TDR programs would be used in Daniels proposal as compared to Nelson who doesn't believe they are necessary. It is likely that Nelson's approach would do a better job in the short-run but would be more vulnerable to politically change in the future. The next section will hopefully help shed light into these political pressures.

Let us not forget a final critical element to look at in determining the effectiveness of any farmland preservation program, namely that farmers need to make a living off the land. Daniels and Bower state:

"The key ingredient [for successful farmland preservation] is that farmers need some assurance that if their land is going to be restricted for development, especially through zoning, they will be able to make a living on the farm. If farmers cannot make a living in farming, no amount of farmland protection efforts will be successful" (Daniels and Bowers 1997, p103).

There is the real danger that we can become so focused on preserving farmland that we fail to look at the economics of farming. Even the best designed program to protect farmland resources will ultimately fail if farming is not profitable.

Matrix # 1 - Effectiveness of Farmland Preservation Techniques

	<i>Protect Critical Mass</i>	<i>Keep Land Affordable</i>	<i>Future Protection</i>	<i>Cost Effectiveness</i>	<i>Reduce the Impermanence Syndrome</i>	<i>Overall Effectiveness Score</i>
<i>Zoning:</i>						
<i>Exclusive</i>	Excellent	Excellent	Fair	Good	Good	Good
<i>Large-Lot</i>	Fair	Fair	Fair	Good	Fair	Fair
<i>Fixed-Area</i>	Fair - Good	Fair - Good	Fair	Good	Fair - Good	Fair - Good
<i>Slide-Scale</i>	Fair - Good	Fair - Good	Fair	Good	Fair - Good	Fair - Good
<i>Cluster</i>	Poor - Fair	Poor - Fair	Good	Good	Poor - Fair	Fair
<i>UGBs</i>	Good - Exc.	Good -Exc.	Fair-Good	Good	Good -Exc.	Good
<i>PDRs</i>	Fair	Fair ***	Fair ***	Poor - Fair	Fair ***	Fair
<i>TDRs</i>	Good - Exc.	Excellent	Excellent	Fair - Good	Good -Exc.	Good - Exc.
<i>Cons. Easements</i>	Poor - Fair	Poor - Fair ***	Poor-Fair ***	N/A	Poor - Fair ***	Poor - Fair
<i>SMART Growth</i>	Poor	Poor	Poor	Good	Poor	Poor - Fair
<i>Property Tax Policies</i>	Poor	Poor	Poor	Poor	Poor	Poor
<i>Agricultural Districts</i>	Poor	Poor	Fair	Good	Fair	Fair

Note: ratings were evaluated on a subjective basis relative to one another. The context for the ratings came from the discussion in the text.

Note for asterisks(*):** Although PDRs and Conservation Easements keep land affordable for future generations of farmers on those lands, the overall farmland base is only slightly affected because of the high cost per acre for PDRs and the voluntary nature of conservation easements.

Chapter 3 - Equity, Political, and Legal Considerations in Farmland Preservation

Unfortunately, simply identifying effective farmland preservation tools or programs is not enough. The best tool at preserving farmland may not be implemented if it cannot gather political support or withstand legal challenge. Or alternatively, the tool may be implemented but later be invalidated in the courts or lose political support and be rescinded. For these reasons, we must also look at the political feasibility of the various preservation tools and programs as well as how the court system will likely view the legalities of the approaches. There is also a third factor that has implications with both the legal and political considerations: Equity issues. Equity issues deal with who benefits and who is adversely affected by various farmland preservation programs. Equity issues have implications in political considerations because if a particular tool benefits a majority of voters or the most influential portion of the electorate, it may be implemented, regardless of how unjust it may be to a certain segment or segments of the population. Equity issues may also have implications in legal decisions because the courts review political decisions involving farmland preservation to see if any groups are being forced to bear a disproportional cost for a public good. The courts look at who benefits and who is adversely affected by these programs in deciding these cases. I will try to link all three additional considerations by first analyzing the legal considerations, then looking at the equity issues, and finally looking at how these factor into political considerations. The implications these three issues have with the previously discussed farmland preservation techniques will then be assessed. As with the effectiveness section, a matrix will be included to help put the various techniques into context with one another.

Legal Considerations

The legality of farmland preservation programs has not yet come directly before the United States Supreme Court. As such, it is not clear to what extent the denial of development rights would be considered a taking at this level. Although it is commonly conceded that some portion of development rights can be restricted without risking being

considered a taking, the Supreme Court has been vague in defining a percentage or some other measurable amount of the potential value that would serve as a cutoff point (Alterman 1997, Coughlin 1991). The decisions have thus been left to the state courts in defining what particular farmland preservation programs would be considered a legitimate use of the police power. Before getting into these state cases, the paper briefly reviews the takings issues and also the purpose for government regulation of land.

Takings issues have come out of the 5th Amendment which basically states that private property cannot be taken for public use without just compensation. This amendment was created to prevent government from putting disproportional public burdens on a small group of people that should be borne by the public at large (Stephans 1993). The whole takings issue, one could argue, has come down to what constitutes “disproportional public burdens” and what is a legitimate use of police power. For farmland preservation programs, most of the police powers currently used fall under the broad category of zoning. It has been stated that those police powers, including zoning, that are implemented to protect the public health and safety will likely be upheld, even if it amounts to a substantial loss in property value (Strong et al, 1996). Floodplain regulations would be an example of this case. However, it is doubtful that farmland preservation programs fall neatly into the category of "public health and safety". This question may hinge on the purpose of the farmland preservation measure. Was it enacted to retain vital and necessary food resources for present and future generations or was it enacted for aesthetic reasons? If the answer to this question is the latter response, it may prove difficult to argue that the program falls into the “public health and safety” category and should thus prove more difficult to legally justify.

In cases where regulations do not specifically fall into the public health and safety category, more uncertainty remains. The United States Supreme Court on two occasions issued guidelines for a general takings test. In *Penn Central Transport Company v. New York City* the court stated that there were three factors to consider in testing a regulation for a taking: The character of the government action, the economic impact on the landowner, and the existence of investment backed expectations for the landowner. In determining the economic impact to the landowner, one should look at the effect on the entire property, not just a portion of it, and you must determine if all reasonable use has

been taken from the property. *In Keystone Bituminous Coal Association v. DeBenedictus*, the court upheld that a taking has occurred if the regulation doesn't advance a legitimate government purpose or if it takes away the economically viable use of the land (Strong et al, 1996). Outside of issuing these general guidelines, however, the United States Supreme Court has generally left the determination of specific takings cases up to the individual states. The Supreme Court has ruled that once a taking has occurred, the constitution requires full compensation to the owner (Juergensmeyer 1998).

There are six legal requirements that need to be addressed in agricultural zoning. These include that the regulation: 1) must serve a legitimate public purpose; 2) should be based on a comprehensive plan; 3) can't result in a taking; 4) must be reasonable; 5) can't exclude certain groups of people; 6) the regulation must be applied fairly and consistently (Daniels and Bowers 1997). To show that the zoning serves a legitimate public purpose it must be demonstrated that the farmland is a valuable natural resource by showing that it is fertile, that the land holdings are large enough to be farmed efficiently, that there is currently a strong farming economy, and allows for a reasonable amount of development (Coughlin 1991). The legality of agricultural zoning has been upheld in many state court cases. New Jersey, Pennsylvania, Illinois, and Maryland have all ruled that agricultural zoning serves a legitimate public purpose. California, Oregon, New Jersey, Illinois, and Wisconsin have ruled that agricultural zoning is not unduly restrictive and doesn't constitute a taking. In Oregon for example, agricultural zoning was found to be legitimate without compensation if at least some economic value remains with the land (Coughlin 1991). Nevertheless, in most states it appears that the takings issue as related to farmland preservation has not yet been fully decided.

There have not been many cases involving exclusive agricultural zoning, probably because there are few examples of "pure" exclusive agricultural zoning in this country. A recent decision affirming this zoning practice in Ventura County, California by the state Supreme Court gives some credence to the validity of this technique (MacGregor 1997). However, it should be noted that the California courts system is very liberal with land use issues and the decision should thus not be taken as indicative of the rest of the country. Daniels and Bower assert that the overly restrictive nature of exclusive agricultural zoning leaves it vulnerable to takings issues (1997).

Large lot zoning ordinances also fall into potential legal problems. If the acreages are too large, courts can rule them exclusionary and not achieving a public purpose (Daniels 1997b). However, the actual sizes are difficult to predict. The New England states and Ohio have generally used five acres as a maximum legal size (Daniels and Bowers 1997). For years, the largest lot sizes upheld for New Jersey was also five acres. But in 1990 a state Supreme Court decision upheld a 40 acre lot size (Kanige 1990). Pennsylvania courts have upheld maximum lot sizes up to 50 acres (Daniels and Bowers 1997). However, the U.S. Supreme Court has used the five acre size limit for large lot zoning in the *Agins II* case (Kanner 1998).

The legality of TDRs has been better addressed by the state courts than most other farmland preservation techniques. The first important case involving TDRs was the *Fred French Investing Company v. the City of New York* that occurred in 1976. This zoning law was ruled invalid because there were no specific receiving parcels to sell the development rights to and was thus considered “floating.” A year later a TDR ordinance was upheld in *Penn Central Transport v. the City of New York* because the development rights were attached to specific parcels of property. TDRs gave value to property even if development on site was not allowed. In 1998, another case in New York affirmed the use of TDRs (Armentano 1998). However, there may be some potential legal problems with TDRs as Strong et al points out:

“... is the developer who purchases the development rights allowed to exceed the zoning that would otherwise apply to the property being developed? If so, how can that be justified? Presumably that zoning was established at a level necessary to protect the public health, safety and welfare. Yet, if the development rights do not allow the development to exceed the zoning otherwise applicable, why would a rational developer pay anything for such rights?” (1996 p14).

A recent Supreme Court case involving the use of TDRs, *Suitum v. Tahoe Regional Planning Agency* (1997), has raised further questions (or possibly just more confusion) on the use of TDRs. The U.S. Supreme Court stated that the lower courts should first decide if a takings has occurred, then see if the TDRs compensate for the loss. In other words, if a taking occurs, the TDRs must fully compensate the owner for the resulting financial loss (Juergensmeyer 1998). Thus there is some potential that the legality of TDRs programs could be challenged.

Other farmland preservation tools either have been untested by the courts or do not have inherent legal problems. UGBs have not been directly addressed although their heavy reliance on strict agricultural zoning outside the UGB boundary may show the same potential legal problems as with zoning. PDR programs that first downzone agricultural areas in the hopes of reducing the prices for the development rights may be susceptible to court challenges. SMART growth programs haven't been directly challenged although I believe that because of their nature, there would be little grounds for takings issues. Conservation easements, property tax policies, and agricultural districting also have few legal issues involved with them.

Overall, there do not seem to be enough case precedents at either the state or federal levels to predict with certainty how the courts will view farmland preservation programs in terms of the takings issues. One can be fairly certain, however, that the more value that is taken away from the land, the more exclusionary the zoning is, and the further removed the ordinance is from legitimate public purpose, the more risk there is of being invalidated in court cases.

Equity Issues

Issues involving equity, or basic fairness, may be the least discussed aspect of farmland preservation programs. I have been somewhat puzzled about the lack of attention equity issues receive because it is often the perceived inequalities created from farmland preservation programs that can cripple program implementation. By more fully understanding equity issues we can create farmland preservation programs that are fairer to those people that they effect most. *By creating more equitable farmland preservation programs we are more likely to implement programs that are politically acceptable and legally defensible.*

Public hearings on proposed farmland preservation regulations predictably result with the participants divided into two factions. Those for farmland preservation measures are typically residents and environmentalists in the community who want to protect farmland and open space for a variety of reasons; aesthetic, wildlife habitat, to keep property tax rates under control, and to keep from being overrun by unchecked

development. Many of those that were most vocal seemed to be suburbanites who had only recently moved into the area.

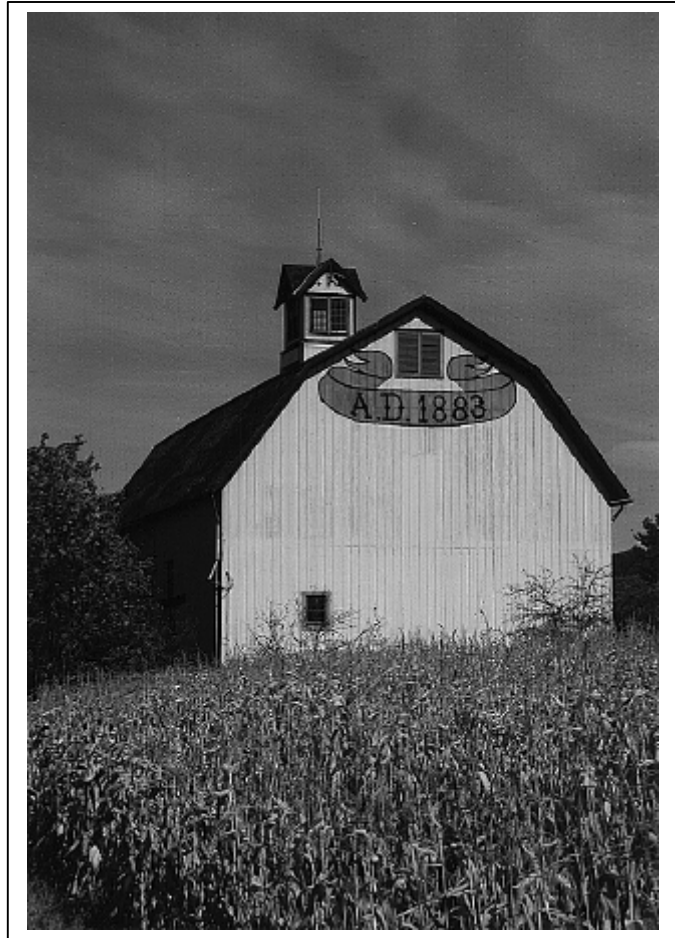
On the other side of the issue reside a temporary coalition of farmers (for programs that decrease land values), developers, builders, and to a lesser extent citizens concerned about future affordable housing prices. This group appears less unified because they possess very different reasons for opposing the proposed regulations. Farmers are concerned and upset that their land values will decrease, their future options will be limited, and that they are being unfairly asked to provide public benefits without compensation. Developers attempt to cast their reasons for opposition as a concern for the farmers who might otherwise be devastated financially and lose their "retirement funds" (the development rights of their land), not the possibility that it would reduce their own profitability.

The supporters of farmland preservation programs do not appear to fully realize the reductions in property values that could possibly result from enacting the ordinance. Nor do they seem to realize that in essence, they were asking another group (farmers) to pay for programs that would mostly benefit themselves. Put another way, it has been said that farmers and other landowners in developing areas will try to retain the development value of their land, while new residents who have recently moved to the edges of the suburbs will attempt to protect their "rural way of life" that they were attracted to in the first place (Pfeffer and Lapping 1994). The protection of this lifestyle is often done under the guise of farmland preservation, which along with other growth control measures have the effect of increasing the home values of the residents who seek these measures (Fischel 1991, Downs 1992). Kanner is even more critical of suburbanites intentions concerning farmland preservation writing:

"But wealthy, influential suburbanites love it, because it provides them with a highly agreeable, exclusive lifestyle, and with escalating home equities, simultaneously enabling them to exclude competing seekers of the good suburban life, while posturing as do-gooder defenders of the environment" (1998 p319). If these suburbanites can avoid compensating for the financial loss created by the regulations, they in effect, get to have their cake and eat it to. This brings us to a key issue in determining the validity of farmland preservation programs. Is the program actually being created to preserve farmland, a valuable natural resource, or is it simply

being used to protect open space and the “rural lifestyle” desired by many suburbanites? If the answer is open space it would be difficult to convince a court that the program was enacted to protect the "safety and welfare" of the people. Thus the ordinance would be more difficult to legally defend.

From my experience, farmers do not enjoy seeing farmland being developed. Most farmers, stewards of land that has often belonged to their family for generations, cannot possibly enjoy watching the land being planted into its final crop of houses and asphalt. They are, however, often against policies being imposed upon them that eliminates future options or reduces their property’s value. They are even more opposed at being forced to solely pay for collective societal benefits. This sentiment was framed nicely by lawyer Patrick McAndrew whose client had just lost a case



against the New Jersey Pinelands Commission over reductions in development rights:

“This case was never about saving the Pinelands... Everyone including my client, thinks the Pinelands should be preserved. But the question is how it will be preserved and by whom. If it’s saved for the benefits of all New Jerseyans, all New Jerseyans should pay something, not just the farmer” (Kanige 1991 p1). I believe this quote accurately reflects how many farmers feel about the preservation efforts of farmland.

One of the arguments often given against compensating farmers for a reduction in property value from farmland preservation programs is that the farmer did not create the original increases in their property values (Nelson 1990a). That is, the argument goes, infrastructure paid for by the general public allowed the development value of farmland

to increase above what it would otherwise be worth. By restricting the development of the land, the value is simply being brought down to what it would be worth without public spending on infrastructure. This argument has some validity. To a large extent, increased property values did result from policies and programs that the farmer had only a small part in paying for. However, this very argument that is used to justify decreasing farm values (i.e. - they didn't earn it, it was speculative) is quickly and conveniently forgotten in that home values in these suburbs also often increases in value for the same reasons. These values are likely to further increase when growth controls constrict the supply of housing. Using their logic, should we not take away the increase in home value of these suburbanites with say, a 100% capital gains tax on any increase in residential value that the homeowner did not create, adjusted for inflation? I hardly think that many suburban owners would support such a proposal but this is in essence, what they are asking of farmers with uncompensated farmland protection programs. Moreover, it negates the possibility that some farmers may have bought land after prices started to increase with the expectations that the land would remain stable or increase in value. Finally, in many states and localities without use value taxation or before its implementation, farmers may have been paying taxes on the development value of the land. If we suddenly reduce the value of the property through limitations on development, should we then have to compensate them for the speculative value of the taxes they have been paying for all of those years?

It is only natural that suburban and even some urban residents would want to keep areas on their periphery from being developed. After all, the existence of the farmland and open space was, in many cases, an important reason why suburbanites chose to move there. Farmland, and the forestland that often accompany them, provide a multitude of benefits to other segments of the area's residents including scenic and bucolic settings, groundwater recharge areas, pollution buffers, habitat for wildlife and native vegetation, and in some cases recreational opportunities such as hunting, fishing, hiking, and photography. For the most part, these benefits are provided free to the public. The farmer is not paid for their provision. Thus we have what is called in economics a positive externality because the benefits are not incorporated into the market (negative externalities are costs that are not incorporated into the market such as pollution). If

farmers were paid for these services, there would be more of an incentive for them to not convert the land to other uses. But since there is no compensation, these externalities are not factored into the "rational farmer's"



decision when confronting with the decision of developing the land. Suburban residents, however, are acutely aware of at least some of these positive externalities of farmland and thus have an incentive to oppose and prevent conversion. *These positive externalities are at the heart of the conflict between farmers who want to preserve their development rights and residents who want to restrict them.* Admittedly, there are also negative externalities associated with many farming operations such as noise, odors, water pollution, and traffic hazards. However, the very fact that many of the people who suffer from these externalities still strongly support farmland preservation programs shows that the positive externalities far outweigh the negative ones.

But aside from correcting these externalities, and creating a mechanism to pay the farmer for their provision, how can we resolve the problems created by these externalities? My guess is that it will prove difficult. As long as these positive externalities remain uncompensated by the market or by government intervention, there will continue to be conflict between those that value and use the benefits, and those that supply them at no cost. This aspect of farmland preservation needs to be further addressed.

Another equity issue that should at least be briefly introduced is that of affordable housing costs. It has been said that the restrictions on development caused by farmland preservation programs lead to both higher costs for equivalent housing types and also encourage building of higher-end housing than would otherwise occur (Landis 1992). By

enacting farmland preservation programs, it has been claimed, we are in effect making it more difficult for lower socio-economic groups to buy housing in these suburban areas. The studies looking into this possibility, however, have had mixed results. In California during the late 1970's and early 1980's, it was shown that housing prices increased 2 - 35% because of growth restrictions. However, a later study was non-conclusive on the correlation between growth controls and housing costs, partly because the programs restricting growth were local in nature, allowing for spillover effects into surrounding communities (Landis 1992). In other words, municipalities outside the areas with restrictions are likely to take on the additional demand for housing but the net effect would still be exclusionary zoning in individual localities. In general, however, it would be safe to say that the more restrictive a farmland preservation program is, and the larger the minimum lot size required by the ordinance, the less affordable housing will be available in a given area.

Political Feasibility

The political feasibility of farmland preservation programs will often be the ultimate test in terms of their effectiveness. If a particular farmland preservation technique, no matter how good it is at preserving farmland, cannot gather political support to be implemented locally, it will of course be academic. Political support from an area's constituents will be affected mostly by equity issues, whereas political support from the local governing body will come from both equity issues and legal considerations. Thus political feasibility could be considered a synthesis of both legal and equity issues, as well as issues that are more directly related to the political culture of a community.

The players in this political outcome are the same as described in the equity section with the addition of local government officials. Suburbanites, environmentalists, and others interested in preserving the benefits associated with farmland will of course be pushing for farmland preservation measures. These groups, especially in areas that are beyond the beginning stages of development, will usually outnumber those opposed to such ordinances. In some instances the raw numbers can sway the political pendulum toward their side.

However, farmers (for those programs that decrease land values), developers, realtors, and contractors will attempt to prevent or at least mitigate the effects of farmland preservation ordinances. Political opposition from farmers is of particular importance. Daniels and Bower claim that: "It will be difficult, if not impossible, to protect farmland if your local farming community is overwhelming opposed to protection" (1997 p21). This influence from farmers and other landowners is very real, especially when taking into account potential legal implications. Local attorneys often advise municipalities to use less-stringent zoning ordinances than would otherwise be desired to prevent legal challenges, even when past case law supports the ordinance they would rather enact. Local politicians fear potential court cases may cost their jurisdictions monetarily, and themselves politically (Daniels and Bowers 1997).

It should be noted that developers, realtors, contractors, and other groups that have a vested interest in preventing constraints to growth often have a disproportional influence with local governing bodies. These groups seem to fill local planning commission positions and other advisory positions to local governments that deal with land use planning issues. This influence can easily sway decisions concerning farmland preservation efforts. Therefore, it should be kept in mind that just about any type of farmland preservation effort will likely be opposed to some degree by these groups.

There are also political implications at the state level. Many states such as Virginia adhere to "Dillion's Rule". Municipalities in Dillion's Rule states can only use those farmland preservation techniques that have been expressly allowed by the state. Oftentimes, this means that the options open for farmland preservation will be limited. Also, at least on state, Florida, has recently passed laws making it much more difficult to implement farmland preservation ordinances and other growth controls that diminish the fair market value of land (Dix 1995). However, these statewide political constraints will not be considered as they are beyond the scope of this paper.

Legal, Equity, and Political Implications

Agricultural Zoning - General

The principal reason the United States Supreme Court originally upheld zoning was to protect land values (Strong et al 1996). With farmland preservation programs however, the net effect is often a reduction in farmland values while suburban residences often increase in value from these restrictions. Agricultural zoning has been found to be negatively capitalized with farmland when development rights have been taken away (Hennberry and Barrows 1990). Put another way, land values generally decline after agricultural zoning is implemented. Consequently, farmers are not very enthusiastic about agricultural zoning, especially in urbanizing areas (Daniels and Bowers 1997).

There seems to be a catch-22 with all the agricultural zoning techniques. The less development is restricted, the less likely that farmers will oppose the ordinance but the less likely the ordinance will ultimately protect a critical farmland mass. Once a critical mass is lost and farming cannot be justified as economically viable, it would be difficult to continue to justify protecting any remaining farmland.

Zoning is by far, the most generally acceptable and common way to attempt to preserve farmland in a community. This is probably due to the familiarity of zoning by local officials and residents and also because this technique is much simpler to both understand and implement than the other major farmland preservation tools. Most residents have come to accept and expect that zoning will be used to guide and shape the way growth occurs in a community. The real question is to what extent this will occur.

Exclusive Agricultural Zoning

Exclusive agricultural zoning is probably the least equitable farmland preservation tool from a farmer's standpoint. It almost completely removes all development value and provides no compensation to the landowner. Additionally, it forces farmers on the edge of these zones to endure spillover effects such as litigation from neighbors and crop damage that may actually reduce the value of their farm (Nelson 1990a). Authors such as Heimlich have suggested that agriculture can adopt financially to these conditions and farming on the fringe of metro areas through the use of smaller

farms, intensive production, and higher value crops (1989). The problem with this belief is that the transformation can not take place overnight. Dairy farmers in particular have huge fixed costs that must be depreciated over decades and will bring only pennies on the dollar if sold (Crooker 1997). To say a shift to smaller, more intensive farming can make farming in these areas more profitable in an unjust simplification.

Residents in suburban and urban areas benefit from the positive externalities previously mentioned that would be retained with this type of zoning. They of course, would not have to pay for it. Property values in suburbs and urban areas adjacent to the exclusively zoned land should actually increase in value. Thus these residents have a high level of self-interest in supporting such a zoning ordinance. There is a good chance that affordable housing opportunities would be reduced as housing supplies would decrease.

Politically speaking, exclusive agricultural zoning would likely receive strong opposition from both farmers and local developers; it would completely take away the development value of the land that fell under this ordinance. Since most people sense that this type of zoning is not very equitable, it is unlikely that it would receive strong support from the majority of the community. If implemented, there would likely be continual opposition and opportunities for future change. Moreover, as described earlier, the legality of this type of zoning is uncertain. If zoning could be considered a balancing act in trying to accommodate the various groups desires for future growth in a community, exclusive agricultural zoning would fail miserably. It would be difficult to gather the needed political support for true exclusive agricultural in all but a few isolated cases.

Large Lot Zoning

Because large-lot zoning actually allows some development, in this case one unit per fixed amount of acreage, the value of farmland zoned in this category is not reduced as greatly as with exclusive zoning. The reduction in value will depend mostly on the specified acreage (the larger the acreage the greater reduction in value) and also by the perception of possible future zoning changes. This last point would be true with all agricultural zoning ordinances. If it is believed that future development pressure will

loosen acreage requirements, the present value will be closer to its development value. If it is believed that future zoning requirements will be more stringent, the property value may decrease even further. Spillover effects may occur that would make farming more difficult if there is a significant amount of residential growth in the form of rural estates. These would have the effect of lowering farmland property values.

Suburban homes and other rural residences in and surrounding the zoned land would likely increase in value due to the guaranteed (at least perceived) provision of positive externalities from the protected farmland. The smaller the minimum lot size, however, the greater reduction in positive externalities. Correspondingly, smaller lot sizes would also reduce the positive externalities for more urban residents who don't live adjacent to the zoned area. The larger the minimum lot sizes, the less affordable housing that would be available. In fact, it could be argued that any lot size that qualifies as large-lot zoning (usually greater than 10 acres) would be out of the price reach for disadvantaged groups. Thus there would be the distinct possibility that the ordinance could be legally challenged as exclusionary.

Large-lot zoning would have less effect on agricultural property values than exclusive agricultural zoning. This zoning type could be seen as a compromise between allowing unrestrained development and completely restricting development on agricultural lands. As such, large-lot zoning would be seen as much fairer than exclusive agricultural zoning and it would be much easier to gather general public support. It would be doubtful that farmers and other landowners would openly support such an ordinance unless acreage requirements per development right were very small. This is where the political feasibility of large-lot zoning would hinge on: Whether the general public support for this ordinance type would outweigh the opposition from farmers and other landowners. In an attempt to gain political support as well as reduce legal challenges, designers may be tempted to reduce the acreage requirements per development right, and may further weaken the already low farm-preserving abilities of this technique.

Fixed-Area Based Zoning

The reduction in farmland value with fixed-area based zoning would be similar to large lot zoning. It would ultimately depend on the amount of land needed per development right, the maximum lot size allowed (if any), and the perceptions of future zoning changes. The larger the acreage needed per development right, the smaller the maximum lot size, and less perception that zoning might change in the future, the greater would be the overall reduction in property value. In areas that would be in demand for rural estates, fixed-area based zoning with small maximum lot sizes would probably result in a greater loss in total value than large-lot zoning.

This type of zoning would have similar effects on values of established residential properties as does large-lot zoning. The more restrictive the zoning, the greater increase in surrounding residential values due to a greater retention of positive farmland externalities. With small maximum lot sizes, housing would be relatively more affordable than with large-lot zoning although it is still doubtful that it would be within reach of disadvantaged groups. However, the ability of fixed-area based zoning to withstand legal challenge seems fairly good.

The politically constraints would be very similar to large-lot zoning. Both would have less effect on agricultural property values than exclusive agricultural zoning, although all else being equal, fixed-area based zoning should decrease property values more than large-lot zoning. As such, opposition would be almost certain to come from farmers. The general public would likely support such an ordinance as it would seem like a compromise position. Overall, the political support for this zoning type would likely be fair to moderate.

Slide-Scale Zoning

Predicting the reduction in farmland values from slide-scale zoning is a bit more complicated than the other zoning types. This is because the development rights are not uniform for all properties; they depend on the number of parcels a farm is composed of, how large these parcels are, and development rights allowed by size classes that the parcels fall into. The larger the farm, the fewer the parcels that it is composed of, the fewer development rights allowed by size class, the greater will be the reduction in

farmland value. It is difficult to compare the reduction in value to the other zoning types because of the zoning type's complexity. What can be said with relative certainty is that the larger the lot size, the greater will be the total reduction per acre. And the smaller the lot size, the less reduction in total value per acre. In fact, the smallest lot sizes may actually increase in value if located near farmland because they will have guaranteed positive externalities from the adjacent farmland. These smaller lots would most likely not be owned by farmers but by rural residents, suburbanites, and speculators who could thus financially gain by such an ordinance.

Slide-scale zoning is often more politically feasible because it is likely to negatively impact fewer property owners than other zoning types. Caughlin notes this as follows:

"It is also important to note, as a policy issue, that the owners of small tracts are likely to outnumber the owners of large tracts significantly, and also that those small tracts make up a very small proportion of the total area. Politically speaking, these owners are the people who must be allowed enough development that they will be satisfied with the zoning proposal. In fact, considerable development may be allowed on their lands while still keeping large areas in open space uses and suited for agriculture" (1991 p189).

This type of system, of course, puts an even higher portion of the total community burdens on the farmers. Thus from a farmer's perspective, this is probably the least equitable zoning technique outside of exclusive agricultural zoning and it would thus have a corresponding amount of political opposition. Because slide-scale zoning has fewer negative effects on smaller land parcels it would likely receive less opposition from the majority of landowners than large lot and fixed area based zoning, everything else being equal. Thus this method would have a better chance of being politically palatable. As mentioned in the equity section, however, the ethical considerations of placing more of the negative effects on a smaller segment of the population is somewhat troubling. My guess is that when considering this type of ordinance for their locality, most people do not fully understand the equity implications it will have on the area's farmers. Nevertheless, slide-scale zoning ordinances can be set up so as to minimize political opposition, and can thus be quite successful from this standpoint. This success will, of course, depend on the actual system for defining development rights and how many people and to what extent they will be adversely effected.

Cluster Zoning

Since cluster zoning typically offers the highest densities of development out of all the farmland preservation zoning types reviewed, it will also have the smallest reduction in farmland value. The higher the overall density allowed, the lower the reduction in this value will be. The effect on property values of established rural residences and adjacent subdivision is uncertain. It would either increase or decrease these values depending on the densities allowed and whether the clustered housing or the open space is adjacent to a specific parcel. The positive externalities typically associated with agricultural land could be significantly reduced if densities are high although they would likely be more evenly distributed through the entire community than other zoning types. Cluster zoning would probably have the smallest negative effects on affordable housing, but again, whether or not homes in these areas would provide truly affordable housing for lower socio-economic groups is questionable. Thomas Daniels believes that the purpose of most cluster zoning programs is not to protect farmland but to protect the viewshed of upper-income residents (1997b).

As noted earlier, cluster zoning typically permits the greatest amount of development out of all the agricultural zoning types. In such situations, it would likely have less opposition from farmers than the other zoning types. However, any type of rezoning is likely to receive opposition from farmers and other landowners. The overall political support for this type of zoning would usually be quite good.

Urban Growth Boundaries

The effects of UGBs on farmland value will vary tremendously depending on where the farmland is located and how the UGB is set up. Land that had previous development value but has been rezoned to exclusive agricultural zoning or other highly restrictive zoning as typically happens outside the UGB, will of course have much of its development value taken away. However, farmland within the growth boundary should increase in value, provided that the boundary is not unnecessarily large. The bulk of the farmland, however, would presumably be located outside the UGB. If the UGB is set up with intermediate growth boundaries to contain current demand, 20-year boundaries to

contain long-term demand, and an ultimate growth boundary as Arthur Nelson advocates, the effects will be a bit more complicated. With this system, Nelson claims, there will be no interaction effects between the intermediate boundaries or the intermediate and 20 year boundaries (land values will be equal on both sides of the boundary). There will be interaction effects along the ultimate UGB, he notes: Land prices will be higher just inside the ultimate UGB as compared to the rest of the UGB, presumably because this area would be adjacent to agricultural land and the positive externalities that would accompany it. Land just outside the ultimate UGB would have a lower value than the rest of the farmland outside the ultimate UGB, presumably because it would suffer negative spillover effects from the residential section just inside the UGB (1992). Although Nelson shows a great ability for critical insight with his analysis on how land prices would be effected at both edges of the ultimate UGB, I believe he is wrong about the interaction effects between intermediate growth boundaries and between intermediate and 20 year growth boundaries. In the long-term there would be no interaction effects between these boundaries, as Nelson implies. However, in the short term, there may be substantial differences between their values. Let me offer the following example to help explain my point: If there is land say just inside a five year intermediate boundary and a similar parcel just outside this boundary, the value for the land inside this boundary will be worth more, at least until the five years expires. This is due to the time value of money in which future values are discounted into present dollars. The land inside the five year boundary can be developed immediately (all other things being equal), whereas the land outside this boundary can only be developed at the end of the five year period. The further away from the five year period, the greater will be the difference in these values, which will largely be determined by the discount rate being used, or expected by the developer.

Many of the positive externalities that accompany farmland would still be available for residents within the UGB. However, because development would presumably be denser within the UGB than would otherwise happen, there may also be some positive externalities that are lost within the UGB. It is not entirely clear how residential values would be affected within the UGB. Most literature suggests that home prices would rise because there would be a reduction in supply (Landis 1992). However,

if the 20 year UGBs truly provided enough land for city expansion during this time, the increase may not be that significant. And because parts of the UGB could be zoned for very high densities, the potential for affordable housing could be quite good.

UGBs would likely receive more political opposition than any other farmland preservation technique. This opposition would come from farmers outside of the proposed UGB as well as from some suburbanites and other residents who are located within the boundary. These farmers would experience a drop in property values because of a loss of development rights whereas the homeowners inside the UGB would see a loss of positive externalities that result from increased development density. Political opposition may persist even after program implementation as affluent residents living just outside the current UGB may try to prevent further boundary expansion to preserve their ex-urban way of life (Nelson 1992). Randal Arendt believes that although very effective at preserving farmland, UGBs are very difficult to implement for political reasons (1997).

Purchase of Development Rights

Farms that participate in PDR programs would experience a decrease in land values, actually the entire development value. However, unlike the other farmland preservation techniques just discussed, these farms are compensated financially for this loss. PDR programs are also completely voluntary. Thus from a farmers perspective, this type of program is very equitable. Farmers agree to permanently forego the development value of their land but continue to supply the positive externalities associated with farming, and in return are financially rewarded. Adjacent farms may benefit because they are assured that no negative spillover effects from the otherwise potential residential development will occur. If the PDR program is large enough and development pressures high, the value of the remaining farms may actually increase because there will be a reduction in supply of developable land. All of this would be beneficial from the farmer's standpoint. However, because there is often more supply to sell development rights than there is demand to buy them, many farmers that would like to participate in the program will be unable to do so. And if a PDR program is combined with downzoning as often happens to make development rights more affordable, there could result in a loss of property value for the farmer.

Adjacent residential property would benefit from PDRs because they would be guaranteed a permanent supply of positive externalities from the farm with the PDR easement. Other residential and nearby urban areas might also benefit because they may receive at least some positive externalities associated with agricultural land such as groundwater recharge and scenic views when travelling through the area.

Unfortunately, someone must pay for the high costs of this program and typically it is the suburban and urban residents in these areas. From this standpoint there may be an equity dilemma. A author Nelson believes PDR programs are highly unfair to the general public because they are, in effect, paying the farmer twice. Once for the infrastructure that increased the farmland value and a second time to retire the development rights (1990a). This argument is somewhat simplistic and again ignores the fact that much of the land and residential value increases throughout the nation have been due to infrastructure spending that the public at large paid for. To single out farmers and say they don't deserve to benefit from these value increases is somewhat unjust as well as undemocratic. Secondly, it also ignores the positive externalities that farmland supplies without any compensation whatsoever. In a way, part of the PDR could be considered as compensation for these externalities. Thomas Daniels points out that through PDRs, any future development value increases are given up plus the public benefits associated with open space are assured (1991).

There also seems to be a fair amount of public support for PDR programs. A survey in the northeast states found that over 70% of the public had a moderate to very strong support level for PDR programs, as compared to 80% of the farmers interviewed (Pfeffer and Lapping 1995). Part of this support may result from the realization that it is somewhat unfair to ask farmers to bear all the costs of foregoing development and providing benefits that others enjoy. This hypothesis is backed up by Collins who believes:

"The broad segment of the public feels somehow that the loss in speculative value should not be borne disproportionately by the farmer. Thus, the perception of an ethical dilemma: Who should pay for the losses in economic value..." (1991 pp417, 418).

PDR programs allow the public to help pay for this loss in speculative value.

There is however, another equity issue that could be potentially troubling. Some local governments are starting to use real estate transfer taxes to help pay for PDR programs. For the most part I have no problem with this, as long as it is only a partial source for the funding. Otherwise you are forcing future residents to exclusively pay to protect farmland that other residents will also benefit from. In many cases, these residents may have just moved in before the tax was imposed, adding to the need for PDR programs. The potential for abuse can be seen by a statement by the president for the Board of Calvert County Commissioners who was commenting on a proposed .5% real estate transfer tax to buy PDRs:

"The cost of farmland preservation would be borne by new developments and, to me, that makes perfect sense... The people who are here, this is not a tax imposed on them. That's the beauty of it" (Layton 1999 pM01). Although in this case the .5% tax is probably not unreasonable, if carried too far, this type of program could lead to housing price increases and possible exclusionary effects.

Since PDR programs usually have strong farmer support, the main political obstacles will be paying for the costs of the program as well as from developers, realtors, and others who benefit from development. Also, if funding must come directly from the area's residents there may be considerable opposition. Funding is more likely to be approved in areas that are experiencing rapid growth (Kline and Wichlens 1994), which may be the result of having more people to help pay for the program and also a more urgent need to permanently preserve the remaining farmland and open space. It would also seem that if a mechanism was developed to pay for purchasing development rights that shifted the burden to others such as real estate transfer taxes, PDRs would be more politically acceptable. However, this shift in funding would raise equity concerns. Finally, developers and others who benefit from unrestrained development would at some point perceive PDR programs as a threat to their livelihoods and try to resist further preservation of farmlands. (Pfeffer and Lapping 1994). Overall, there may be moderate political opposition to PDR programs.

Transfer of Development Rights

The effect of TDR programs on property values is somewhat similar to that of PDR programs. Both compensate farmers when they give up the development rights to

the land. However, TDR programs have additional benefits not found with PDR programs. TDR programs generally cover large, contiguous land areas when setting up the sending zone. The effect here is that all farmers in this area would be given the chance to be compensated for their loss by transferring development to the sending zone. Farmers who don't sell their development rights would not necessarily be hurt financially. This is because the value of their land would include the market value of the development rights that could be transferred to the sending zone. When such land is put on the market buyers would bid on the property with the expectations that these development rights could be sold after buying the property. Therefore, TDR programs have the effect of maintaining property values near what they would be worth if developable.

Suburban and other residential owners in and surrounding the sending area would benefit because they would be guaranteed a continuation of many of the positive externalities associated with the farmland. These effects would be similar to PDR programs except that TDR programs have the potential to protect much higher percentage of the farmland and thus the positive externalities would be correspondingly greater.

TDR programs also have the ability to more fairly distribute property value increases brought about because of public infrastructure spending and zoning. Because the location of the infrastructure spending or rezoning will to a large degree determine who benefits and who loses financially, it would be desirable to come up with a way to help balance out these "windfalls" and "wipeouts" as they are often called. TDR programs can help balance these gains and losses because the development rights that can be transferred out of the sending area are generic; it doesn't matter if they come from property that is right next to a newly paved road (which would have the effect of increasing the development value) or on a rough dirt road that was overlooked by county officials. Development rights sold from either property would sell at the same price. Property that is downzoned (reduction in development rights that would decrease the property value) can be compensated for in a TDR program by giving additional transfer of development rights to make up for this loss. Thus, various areas of the county could be zoned differently, but their land values would remain intact (or at least reduced by a similar amount).

There are some potential equity problems with TDR programs. The argument that farmers are being compensated for something they didn't create is also sometimes used by those that oppose these programs. However, the same argument that counters this that was detailed in the PDR section also holds true here (i.e. other segments of society also benefit from increases in property values that they didn't create etc.). Moreover TDR programs can be constructed to maintain a portion of the original development value instead of the full development value, if it is so desired. This is done by manipulating the number of acres required per TDR and also by the allowed zoning densities in the receiving area. However, the legality of this approach is uncertain because of the recent Supreme Court Suitum case.

Possibly one of the most serious problems from an equity standpoint of TDR programs is who pays for these programs. Because TDR relies on the market to carry out the program, new residents will end up paying for the development rights in the receiving areas. Thus residents who moved in just before TDR implementation (and added to the need for farmland preservation) would not have to pay for it. Actually, the net effect here would be very similar to a PDR program that is funded through a real estate transfer tax. There would thus be a similar possibility for exclusionary effects

This brings us to the last major equity problem with TDR programs. Current residential property in the receiving zone could experience a decrease in property values. This is because, typically, TDR programs will try to concentrate development in these areas by zoning the building lots at a denser level than what was originally anticipated by current residents. The net effect could be a reduction in property values for current residents in these areas.

Since the TDR programs are not paid for by current residents, there would likely be little political opposition from the general public. The main problem here would probably be the unfamiliarity of this tool to most people. Since downzoning in the sending area often occurs with TDR programs, there may be opposition from farmers and other landowners in these areas. The biggest political obstacle facing TDR programs, however, would seem to come from current residents in the proposed receiving area. These residents might perceive the program as concentrating development near their homes while providing open space elsewhere. This could turn into a classic NIMBY

example. Political opposition would probably be slightly greater than with PDR programs.

Conservation Easements

There are few pressing equity issues involved with conservation easements. They don't compensate the landowner (at least directly) for giving up their development rights but because they are voluntary there is no real equity issue. Adjacent property may very well increase in value because they will have guaranteed farmland or open space next to them and all of the positive externalities that come with it. There are also few political or legal problems with conservation easements.

SMART Growth Programs

SMART Growth programs (at least the Maryland system) does not prohibit the development of any land, it just does not pay for public infrastructure in areas where growth is not desired (Frece 1997). As such, the main equity issue seems to be in how growth areas are designated. Because SMART Growth programs must designate areas that will receive public infrastructure funding, the process would likely be very political. Property in the areas to receive infrastructural funding would increase in value while those outside such areas would decrease in value. Thus there would likely be a hotly contested political debate on which areas would receive funding. For this reason, localities may avoid the controversy associated with this program. If SMART growth was combined with a mechanism to capture "windfalls" and "wipeouts" this potential problem would be solved.

Property Tax Policies and Agricultural Districts

Use value taxation seems inherently fair to the farmers of this country. It could be argued that anything less would be an equity problem. There is however, a possibility that developers could use this tool for speculation purposes as discussed in the effectiveness section. I could also find no real equity issues involved with agricultural districting. These two techniques would have few inherent reasons for political opposition. Use-value taxation could possibly face opposition because it would raise

property taxes for the rest of the community, but I suspect this opposition would be minimal.

Legal, Equity, and Political Conclusions

In terms of potential legal problems, there only appear to be two techniques, exclusive and large-lot zoning, that may run into problems. The rest of the techniques, at least presently, seem fairly safe from legal challenge. Equity problems are a completely different issue. Seven of the techniques have potential problems in this category. PDRs, TDRs, conservation easements, property tax policies, and agricultural districts are the only techniques that do well in this category. In terms of political feasibility, the results are much less distinct. Agricultural districts and property tax policies rank the best, exclusive agricultural zoning ranks the lowest, and the rest of the techniques fall in between. The techniques that had the best overall results for legal / equity / political issues are agricultural districts, property tax policies, conservation easements, PDRs, TDRs, and cluster zoning. Exclusive agricultural and large-lot zoning had the lowest overall results.

Matrix # 2 - Legal / Equity / Political Issues

	<i>Legal</i>	<i>Equity</i>	<i>Political</i>	<i>Overall Rating</i>
<i>Zoning:</i>				
<i>Exclusive</i>	Fair	Poor	Fair	Poor - Fair
<i>Large-Lot</i>	Fair - Good	Poor - Fair	Fair - Good	Fair
<i>Fixed-Area</i>	Good	Fair	Fair - Good	Fair - Good
<i>Slide-Scale</i>	Good	Poor - Fair	Good	Fair - Good
<i>Cluster</i>	Good	Fair - Good	Good	Good
<i>UGBs</i>	Good	Fair	Fair - Good	Fair - Good
<i>PDRs</i>	Excellent	Good - Exc.	Fair - Good	Good - Exc.
<i>TDRs</i>	Good	Good - Exc.	Fair - Good	Good
<i>Conservation Easements</i>	Excellent	Excellent	N/A	Excellent
<i>SMART Growth</i>	Good	Fair	Fair - Good	Fair - Good
<i>Property Tax Policies</i>	Excellent	Excellent	Good – Exc.	Excellent
<i>Agricultural Districts</i>	Excellent	Excellent	Excellent	Excellent

Note: ratings were evaluated on a subjective basis relative to one another. The context for the ratings came from the discussion in the text.

Chapter 4 – Conclusions

Hopefully, the reader now appreciates the importance of equity issues and how they are interconnected with legal and political concerns. The next step is to use the overall rating for these three issues to compare against a particular technique's effectiveness determined in chapter 2. In doing so, it is important to first conceptualize how the two different "ratings" for legal, equity, and political issues as well as the tool effectiveness would likely combine for an overall rating, or ultimate effectiveness. It was decided that the best way to determine this ultimate effectiveness was to take the lower of the two ratings for this final score. This was done because the lowest rating will be the limiting factor. To help illustrate this point consider the following: A particular technique may have the potential to be very effective at preserving farmland but if it cannot gather political support, or survive legal challenge, it will be ineffective. Thus it will have a poor overall rating. Conversely, a technique that has a high rating for legal, equity, and political issues but is not effective at preserving farmland will still be ineffective. Therefore, I would argue that the lower of the two ratings will ultimately determine how successful a particular tool will be.

Matrix # 3 summarizes the results from the first two matrices and lists the overall rating for each technique. Again, this was done by simply taking the lower of the two ratings. When viewed in this manner, some interesting results emerge. All of the top three tools from the effectiveness section dropped in their overall rating. Exclusive agricultural zoning dropped significantly from "Good" to "Poor - Fair", UGBs dropped from "Good" to "Fair - Good", and TDRs declined slightly from "Good - Excellent" to "Good". The rest of the techniques either increased in rating or remained the same, although none of these tools overall rating was above "Fair - Good". In fact, the only overall rating above this level was for TDRs.

This is not to say that any of the other techniques will not do a good job at preserving farmland in certain situations. Exclusive agricultural zoning, for instance, can do an excellent job at preserving farmland in the short run, but because of its susceptibility to political pressures it is unlikely to last long where development pressures are high. UGBs may prove moderately successful at preserving farmland for longer periods of time

but can be extremely difficult to set up as well as being susceptible to zoning changes. Fixed-area based zoning and slide-scale zoning may prove somewhat successful at preserving farmland where development pressures are low.

However, the other techniques, at least by themselves, will not preserve a significant amount of farmland. Agricultural districts and property tax policies will certainly help make farming more viable and possibly slightly more profitable, but their overall success at preserving farmland is highly questionable. PDRs and conservation easements can permanently protect small amounts of farmland but because of their voluntary nature and funding limitations, should not be used by themselves, at least for serious farmland preservation efforts.

Furthermore, to retain some semblance of control, these farmland preservation techniques were rated in isolation. In reality, of course, combinations of these techniques could be used. A mix that would seem to have a synergistic effect would be combining UGBs and TDRs. This approach would help mitigate weaknesses that these techniques experience in isolation. The two main weaknesses of UGBs, future protection of farmland and equity issues, would be substantially improved by incorporating TDR into the program: Farmers outside the growth boundary would be compensated for a reduction in development rights by being able to transfer development rights into the UGB. Once these development rights are sold, the resulting conservation easement would provide permanent protection. One of the main weaknesses of TDR programs, its difficulty being implemented across political boundaries, would be less of a concern if incorporated into the UGB process. Other synergistic combinations are also possible. Cluster zoning, when used with other farmland preservation techniques, would likely result in a greater percentage of the land left over for agricultural production compared to the amount left over without cluster zoning. Smart Growth programs are yet unproven but may have potential at preserving farmland in conjunction with other techniques.

Ultimately, though, all of the farmland preservation techniques described are somewhat reactive. It was through researching and writing this paper that it became apparent that there lies an underlying problem that will likely continue to hamper farmland preservation efforts in this country. A problem that results from relying on an economic system that that does not follow all of its own rules. One of the assumptions of

neo-classical economics is that all costs and benefits are internalized into the market. In practice, however, this has not been the case. Farmers, in general, are not compensated for their provision of numerous social and environmental benefits as well as benefits to future generations. As a result, farmland is undervalued. I believe that until we can come up with a mechanism that will properly value these uncompensated benefits, or externalities, farmland will continue to be developed at a rate far in excess of what it would if all benefits were internalized.

Matrix # 3 - Overall Rating

	<i>Effectiveness Rating</i>	<i>Legal, Equity, and Political Rating</i>	<i>Overall Rating</i>
<i>Zoning:</i>			
<i>Exclusive</i>	Good	Poor - Fair	Poor - Fair
<i>Large-Lot</i>	Fair	Fair	Fair
<i>Fixed-Area</i>	Fair - Good	Fair - Good	Fair - Good
<i>Slide-Scale</i>	Fair - Good	Fair - Good	Fair - Good
<i>Cluster</i>	Fair	Good	Fair
<i>UGBs</i>	Good	Fair - Good	Fair - Good
<i>PDRs</i>	Fair	Good - Exc.	Fair
<i>TDRs</i>	Good - Exc.	Good	Good
<i>Conservation Easements</i>	Poor - Fair	Excellent	Poor - Fair
<i>SMART Growth</i>	Poor - Fair	Fair - Good	Poor - Fair
<i>Property Tax Policies</i>	Poor	Excellent	Poor
<i>Agricultural Districts</i>	Fair	Excellent	Fair

Note: The overall rating was determined by taking the lowest rating for the two other sections. This was done because the lowest rating will be the limiting factor (i.e. An effective technique that cannot gather political support will have a poor overall rating. Conversely, a technique that has a high rating for legal, equity, and political score but is not effective will still be non-effective).

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