TDRs and Other Market-Based Land Mechanisms: How They Work and Their Role in Shaping Metropolitan Growth

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EXECUTIVE SUMMARY

Transfers of development rights (TDRs) seem an ideal solution to the incessant conflict between land conservation and property rights. They also can serve as a useful tool to reconcile urbanization pressures and the desire to preserve rural and exurban land.

Using case studies and a national survey, this paper examines TDRs and other market-based land preservation techniques like mitigation banking and density transfer fees.

Overall, the authors find:

- **TDRs and market-based land mechanisms are established to achieve a wide variety of goals**. These goals vary from general farm preservation, to historic preservation to the protection of land above valuable mineral resources. The paper's appendix contains a national catalogue of TDRs, mitigation banks, and fee programs and their mechanisms and goals.

- **Successful TDR programs must have a healthy market mechanism for a number of factors**. These include strong incentives for landowner participation and viable development options in the areas receiving additional density or units from the preserved land. Also because land is highly illiquid and players are often few, clearinghouses often are necessary to stabilize the market for TDRs.

- **Mitigation banks, serving mostly federal environmental ends, require clear rules on who may participate and what constitutes the criteria for ameliorating habitat loss.** Mitigation banks act as the flipside of TDRs, transferring development obligations instead of development rights (density or units) into a tradable commodity.

- **Despite their recognized potential for doing so, TDRs and mitigation banks are not generally coordinated with more broad efforts to manage metropolitan growth.** Large scale TDR programs in local jurisdictions may control growth for just that area, but often lead to the leapfrogging of development. Mitigation banks have more regional growth effects because they are frequently created in response to the environmental laws at the federal or state level.

In order to truly succeed, it is critical for TDRs and mitigation banks to be placed in the context of a larger, comprehensive land use plan that has specific regional goals for urban development and land conservation. Such a plan must have strong political support and an air of endurance, so that neither landowners nor neighbors will believe it can be easily changed.

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I. Introduction: The Conflict Between Property Rights and Land Conservation

Throughout the United States, the pressure of urbanization and the goal of land conservation are often strongly at odds. According to the U.S. Department of Agriculture's Natural Resources Inventory (NRI), the nation's urbanized land increased by 50 percent between 1982 and 1997 (from 51 million to 76 million acres) and that percentage only accelerated in the 1990s over the 1980s. By comparison, the nation's population grew by 17 percent during that period. In most parts of the East and the Midwest, urbanization grew at two to five times the pace of population growth (Fulton and others, 2001).

At the same time, several trends—including environmental protection laws, the farmland preservation movement, and popular votes to protect open space—have accelerated efforts to protect land against urbanization. In the process, they are beginning to profoundly affect metropolitan growth patterns. Since 1991, most states that have adopted or greatly expanded open space protection programs were ranked by the NRI as among the most rapidly urbanizing states in the nation (Hollis and Fulton, 2002). The result of these twin pressures is a flow of many billions of dollars toward open space.

Adding to the mix are federal and state environmental regulations, as well as regional and local farmland and open space regulations, creating additional pressure to set aside land for open space purposes either by restricting its use or by requiring "mitigation" to compensate for urbanized lands. Unlike the open space purchase programs, these mitigation programs do not compensate landowners monetarily for the land set aside, but, rather, require the landowners to deed over some property in exchange for permission to build on adjacent property.

This lack of compensation is especially important because, at the same time that pressure for urbanization and land conservation has been growing, legal protection for property owners against a "taking" of their property without compensation has been growing as well. In a series of cases over the last 25 years, property owners have reasserted their rights to be compensated when government land-use regulation imposes an unfair burden on them. Although property owners have not achieved a clear-cut victory in each case, government agencies today must be more sensitive to the possibility of "taking" property, or dramatically reducing its value (sometimes called a "partial taking"), when imposing a regulatory scheme such as a land-use plan.

Such conflicts between community goals and private rights are almost inevitable in an arena such as land-use planning, which by its very nature seeks to restrict the use of private property for the community good. Indeed, the entire rationale for land-use planning is based on the assumption that individual property owners sometimes act in ways that benefit themselves but harm the entire community, and that through the "police power" (power to regulate), government agencies have the

right to place restrictions on private activities in order to limit community harm and promote the common good.

Increasingly, the conflicts inherent in this system have manifested themselves as a geographical mismatch between the rights of private property owners and the broader goals of communities in conserving farmland, open space, and managing or controlling metropolitan growth. Community-wide planning goals may require the permanent preservation of large swaths of land such as prime farmland, land along river corridors, or land that contains concentrated natural resources such as hillsides.

But the geographical pattern of land parcelization and land ownership may not— indeed, usually do not—match the geographical patterns of conservation envisioned in land-use plans. These mismatches also become much more important in the context of large-scale metropolitan growth patterns.

This paper deals with two related tools that are used to address these mismatches—transfers of development rights (TDRs) and mitigation banking. Both programs protect farmland or significant environmental resources at risk because they are in the path of metropolitan growth. They are designed to shift development from an area being protected to an area being developed. In this way, TDRs and mitigation banks work with other mechanisms such as zoning and open space protection as important implementing tools that help shape overall metropolitan growth patterns.

In essence, they can be tools available to implement large-scale growth management plans, allowing counties and metropolitan areas to shape the geographical pattern of growth within the context of private property rights.

Yet, in many ways, TDRs and mitigation banking remain more popular as ideas than as actual implementation tools and their full potential in managing metropolitan growth has not yet been realized (Lincoln Institute, 1998).

TDRs and mitigation banking are rooted in a logical and appealing intellectual concept that inevitably emerges from an analysis of the property rights-land use planning conflict. These tools hold the promise of making everyone happy—compensating some landowners for losses, facilitating additional development profits for other landowners who can move forward, and achieving significant public land planning and land conservation objectives at little public cost.

But such mechanisms do not always succeed as advertised. It requires great skill and the appropriate conditions for government agencies to create successful markets of any kind, especially for commodities that are created as the by-product of regulation. Land-based markets are especially difficult to manage, because it is extremely hard to predict the number of landowners in the marketplace, the strength and depth of their interest in the market, and the time frame in which they are likely to make their decisions about developing or conserving land.

In addition, political circumstances often change over time, meaning that residents, environmentalists, and landowners may be unwilling to accept the outcomes of the market as such mechanisms are implemented. For these reasons and many others, market-based efforts at land conservation often lay unused—serving the political purpose of having a program on the books without doing much to actually accomplish the policy goal at hand.

Furthermore, even though development markets and conservation systems function at a metropolitan or regional level, TDR programs and mitigation banks do not always operate at that same level. TDR programs in particular tend to operate at the level of local jurisdictions—most often at the level of a rapidly urbanizing jurisdiction on the metropolitan fringe. Regional and interjurisdictional programs remain relatively rare, although they are on the rise. Thus, TDR programs can reorganize growth within a county but sometimes do not address sprawl problems on the metropolitan level.

Nevertheless, such mechanisms hold great promise and are sure to continue to be part of the land use and land conservation policy debate in the future. This paper is an attempt to describe these market-based mechanisms and outline what is required for them to succeed—both as technical mechanisms to implement land-use policy, and as tools to implement more broad-ranging metropolitan growth policies.

II. BACKGROUND: MARKET-BASED POLICY TOOLS IN NATURAL RESOURCE PROTECTION

Market-based policy tools for natural resource protection or land conservation have been in use for many years -- decades in some cases. The precursor concept of "cluster development' has been used since at least the 1950s. The concept of transferring development rights was first proposed and implemented in the 1960s and is now in use in more than 130 different jurisdictions in the United States.

Mitigation banking first came into use in the 1980s, after conservation agencies began requiring environmental mitigation under the environmental laws passed in the 1970s. Today there are hundreds of mitigation and conservation banks in existence throughout the United States.

In recent years, policy interest has grown in market-based tools that treat certain rights and obligations as a commodity that enable owners to buy, sell, and trade them. These efforts try to overcome the economic inefficiencies of a command-and-control regulatory system that imposes a uniform standard on sources whose costs to control pollution might be different.

In other words, factory A may control air pollution far more inexpensively than factory B, but under a regulatory system both must control the same amount of pollution, irrespective of their differing costs. In contrast to direct regulation, a market-based system allows factory A, which controls pollution efficiently, to sell its "right to pollute" to factory B, which finds the same pollution control more expensive. Under this model, the total combined cost of controlling pollution is lower than under the regulatory scheme, where both factories would have to reduce the same amount of pollution, without attention to their different costs.

Most of the theoretical work on market-based instruments as an alternative to straight regulation has involved air and water pollution trading.

Air pollution trading programs are the oldest and best-known example of market-based trading instruments. Over the last decade, environmental regulatory agencies such as the U.S. Environmental Protection Agency (EPA) adopted tradable air permit programs with increasing frequency (Environmental Protection Agency, 1992; Teitenberg, 1997). These programs consist of two basic types: credit programs and cap-and-trade programs.

Under credit programs, credits are assigned (created) when a regulated pollution source (e.g., industrial boiler) reduces certain emissions below levels that existing, source-specific limits require. The resulting credits enable the same or another firm to meet its emission control target. Examples of credit programs include the EPA's 1994 emissions trading program to improve local air quality; the phase down of leaded gasoline in the United States; and heavy duty motor vehicle engine emissions.

Under a cap-and-trade system, an allowable overall level of pollution is stated as a clear environmental goal. The Environmental Protection Agency then allocates this cap, or total limit,

among polluting firms in a specified area in the form of permits, which can be freely exchanged among sources participating in the program. Examples include the trading of ozone depleting substances, and EPA's sulfur dioxide allowance trading program.

Water pollution trading programs, in contrast, have limited experience in the U.S. (Stavins, 2000). However, environmental managers view these as among the most promising of methods to reduce non-point source pollution (e.g., sedimentation, agricultural runoff), which constitutes a major remaining American water pollution problem (Peskin, 1986).

Water trading systems tend to be credit-based approaches. Credits are assigned (created) when a regulated pollution source reduces effluents below that which is required by existing, source-specific limits; these credits enable the same or another firm to meet its control target. Water trading systems in the United States include experiments at the Dillon Reservoir in Colorado, the Tar Pamlico Sound in North Carolina, and Wisconsin's Fox-Wolf Basin (EPA, 2000).

For both air and water, regulators agree that successful elements of market-based trading programs include:

1. Clear, enforceable goals;
2. A large number of potential buyers and sellers, and
3. A number of different abatement options to reduce emissions and/or effluents.

These elements of success, however, are more difficult to maintain in a market-based policy focusing on land.

Although the market-based model for land turns on a different set of conditions and assumptions than air and water based trading programs, certain basic concepts are the same. At its heart, the conflict between developing and preserving land is, as we stated above, a conflict between the community interest in land preservation versus the private interest in maximizing land value through development.

One important difference in conditions involves the rights associated with the different activities concerned. Under environmental law, the release of significant quantities of air and water pollutants is not generally recognized as a "right" even when it is a longstanding practice. But under land-use law, it is generally recognized that the ownership of land carries with it the right to develop in a manner consistent with existing zoning regulations. Thus, air and water based trading programs are often viewed as *creating rights which can then be traded*, while development-right trading programs are typically viewed as *creating a market for the trading of existing rights.*

The issue of property rights has important consequences for the construction of regulatory programs, and has been a major impetus to the development of alternatives to regulation, including development-right trading programs. Regulatory programs that are seen as infringing on property rights are inherently controversial. Moreover, the Fifth Amendment of the U.S. Constitution, and

similar provisions of state constitutions, prohibits the taking of private property for public use without payment of "just compensation" to the property owner.

Courts have had no difficulty concluding that a factory's emissions may be regulated to the point of closing the factory if its emissions are a threat to the public health, safety, and welfare. But because regulation of land is commonly viewed as the restriction of, or even the removal of, a pre-existing right, courts have struggled to determine the extent to which land development may be regulated.

In addition, the nature of land ownership and land markets presents a different set of challenges to policymakers seeking to create effective market-based policies. There are at least three practical differences (all related to each other) between markets for land and other environmental media that make creation of market-based land policies more difficult (McConnell, Kopits, and Walls, 2003). These are:

1. *Permanence.* Unlike the trading of air or water pollution rights, the decision to develop or sell development rights is permanent and irreversible.
2. *Timing.* Because the decision to develop or sell development rights is a permanent one-time decision, it is often difficult to assess or predict when any given landowner will choose to make that decision.
3. *Thin Markets.* Land markets, and hence the market for land-based policy commodities such as development rights, are often dominated by a few buyers or sellers and may come with high transaction costs.

Perhaps for these reasons, land conservation policy has embraced an usually broad range of implementation tools, from complete purchase of the property itself by a government agency to strict regulation by the government of a private property owner's development activities.

If these tools were laid out on a continuum, market-based policies would fall in between full purchase and full regulation. The subsequent sections will deal with specific market-based policies, including TDRs and mitigation and conservation banks.

One definite trend, however, has been to find ways to separate the value of the potential development from the value of the property itself. In some cases – especially with regard to farmland – land trusts or government agencies have created *purchase of development rights* programs (PDRs), in which the landowner retains title to the underlying property but the government or a land trust obtains title to the development rights.[1] Transfer of development rights is a variation that allows private landowners to buy and sell their development rights to each other, rather than to a government agency or a land trust.

[1] Although these rights should probably be transferred elsewhere, they are often used to block most types of development. See Dan Berman, "Loudoun County Buys Up Development Rights." Land Letter 10 (9) (2002).

III. TRANSFERABLE DEVELOPMENT RIGHTS PROGRAMS

Transferable development rights (TDRs) programs are distinguished from other land conservation instruments by their focus on the concept of a right to develop as separable from other property rights. TDRs resemble tradable air and water programs because they create a market through the reassignment of rights. Whereas air and water systems assign rights to emissions and/or effluents, a TDR program assigns rights for future development to landowners.

TDR programs allow public agencies to restrict allowed development in areas targeted for land preservation by transferring as yet undeveloped density to preferred development areas. Restricted areas are known as "sending sites," while preferred or targeted areas are the "receiving sites."[2] The managing public agency permits landowners in the sending area to sell the "right to build" to landowners in the receiving area.

The potential development value of the sending site is then permanently restricted, usually by a recorded deed restriction. The value of the transferred right is theoretically the discounted difference between the sending site's net developed and undeveloped value.[3] Under this system, landowners receive compensation for the value of the foregone development.

Sending areas can be agricultural land, open space, historic properties or any other properties that are important to the community. In a traditional TDR program, sending area properties are rezoned to a form of "dual zoning" mechanism that gives the property owners a choice. The owners can choose not to participate in the TDR program and instead use and develop their land as allowed under the baseline zoning option. Alternatively, they can voluntarily elect to use the TDR option where the sending site owner enters into a deed restriction that spells out the amount of future development and the types of land use activities that can occur on the property.

When that deed restriction is recorded, the sending site owner is able to sell a commodity created by the community's TDR ordinance. The commodity created is the development right itself. In a traditional TDR program, the number of commodities that the sending site owner can sell is usually limited and, typically, the price is established by the market. By selling their development rights, sending site owners can be fully compensated for the development potential of their property without having to endure the expense and uncertainty of actually trying to develop it. Also, when the sending sites have non-development income-producing potential, such as farming or forestry, the owners can continue to receive that income. In other instances, the sending sites may have little income-producing potential after the sale of development rights. Some TDR programs give the owners of such properties the option of conveying title to governmental agencies or private land trusts.

[2] Sending sites may also be called "selling sites' and receiving sites called "purchasing sites."
[3] Of course, as in any market, the actual market value is whatever a seller and a buyer can agree on.

Receiving areas are places that the community has designated as appropriate for development. Often these areas are selected because they are close to existing development, jobs, shopping, schools, transportation, infrastructure, and other urban services. Traditionally, these receiving areas were undeveloped locations that were regarded as more desirable for intense development than the sending areas. For example, in Montgomery County, Maryland, perhaps the most active TDR program in the nation, development rights have been transferred from the rural northern part of the county to the more urban southern part of the county, adjacent to Washington, D.C., and often near existing subway stations. The King County TDR program in Seattle has permitted at least one density transfer from the rural eastern part of the county to a dense neighborhood adjacent to downtown Seattle.

Among the most difficult technical aspects of a TDR program is calibrating the market between buyers and sellers, and motivating both parties—especially sending-area landowners —to participate in the program. Not surprisingly, sending area landowners are not likely to participate in a TDR program unless they see more financial benefit than in developing under conventional zoning. For this reason, many jurisdictions with TDR programs offer a "bonus" of development rights for sending-area landowners who sell their rights. So a sending-area landowner might have one development right per acre onsite, but four or five development rights per acre if they are sold to receiving-area landowners. Low TDR prices, then, may the result of not enough demand for additional density in receiving areas. In addition, many jurisdictions create or work with governmental or nonprofit land banks that can serve as an intermediary by buying, holding, selling, or retiring significant amounts of development rights in ways that will stabilize the market.

A. Legal History of TDR Programs

The density transfer concept evolved from the idea of clustering. Clustering allows developers to concentrate development on one portion of a single parcel. This allows developers to avoid building on another portion of the property that contains environmentally sensitive land, prime agricultural soils or some other resource that the community wants to save.

In 1961, Gerald Lloyd wrote an article for the Urban Land Institute that proposed this new technique (Lloyd, 1961). Instead of clustering development on the same property, the concept of transferring development rights would allow developers to concentrate development on other properties that were better suited to accommodate the additional development. The first TDR program, New York City's Landmark Preservation Law, was adopted in 1968. This law prevents the alteration or demolition of a historic landmark. However, it allows landmark property owners the option of transferring unused development rights from the landmark site to adjacent properties. Using this law, the city's Landmarks Preservation Commission subsequently denied permission for the Penn Central Transportation Company to build an office tower on top of Grand Central Station, a designated landmark.

Penn Central sued the City, claiming that the Landmarks Preservation Law had taken its property. This lawsuit served as the basis for the first U.S. Supreme Court ruling on property rights in

more than 50 years. In Penn Central Transportation Co. v. New York City, 436 U.S. 104 (1978), the U.S. Supreme Court ruled that the city had not taken Penn Central's property. Furthermore the Court gave the TDR concept some legitimacy by adding that if a taking had occurred, the TDRs "undoubtedly mitigate whatever financial burdens the law has imposed on appellants, and, for that reason, are to be taken into account in considering the impact of the regulation."

During this time, a series of other court cases—stemming from *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304 (1987)—have reaffirmed the rights of property owners to sue for monetary damages if their economic rights are regulated away completely. A series of other court cases beginning with *Nollan v. California Coastal Commission*, 483 U.S. 825 (1987), clarified that mitigation measures imposed on a development project must have a direct relationship to the public burden imposed by that same development project. The U.S. Supreme Court has declined to lay down a hard-and-fast rule about when a taking occurs, except to say (in *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992), among other cases) that if a property owner is deprived of all economic value, then, with a few exceptions, a taking has occurred.

Property rights lawyers have frequently argued that the concept of TDRs is unconstitutional or, alternatively, that the implementation of TDR programs violate the constitution because the markets created by them do not function well enough for property owners to retain property value.[4] Generally speaking, the courts have not accepted these arguments. However, until the U.S. Supreme Court rules directly on this issue, communities are in uncharted waters if they rely entirely on a TDR program to provide compensation for regulations that deprive properties of all economic use.

B. Incidence of TDR Programs in the United States

Although the TDR concept is widely discussed among planning practitioners, it is not common planning practice. A national scan by one of the authors of this paper has found that 134 different local jurisdictions and regional entities have adopted TDR programs (See Appendix A.)[5]

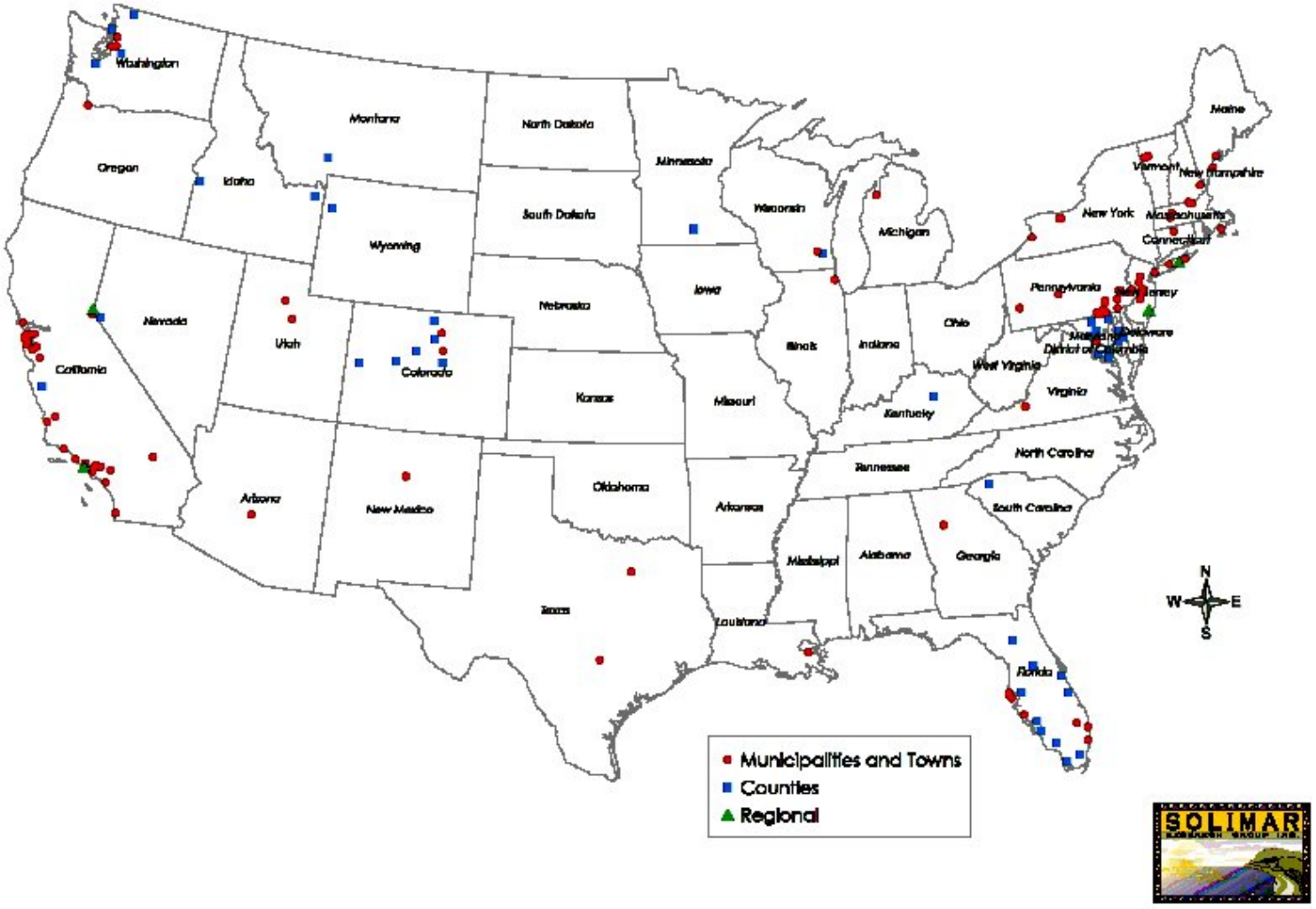
More than half of the programs are located in four states: California and Florida, where environmental protection issues are of major importance, and Pennsylvania and Maryland, where farmland protection issues are important. In general, TDR programs, like many other innovative land-use planning ideas, are concentrated along the West Coast, the Northeast corridor, and in

[4] Many of the most important legal challenges along these lines have involved the regulatory program around Lake Tahoe, NV.

[5] That scan found a total of 142 programs in place among the 134 jurisdictions (Pruetz, 2003). The following analysis uses data from the survey, but, to simplify the analysis, has identified only one primary TDR program in each of the 134 jurisdictions.

Florida. Although TDR programs hold the potential to help manage growth on a metropolitan-wide level, most TDR programs are adopted and administered by municipalities and towns. Some are county-level programs, especially in Florida and Maryland, and only a few are regional—such as the programs in the New York and New Jersey Pine Barrens (Map 1).

Map 1. TDRs by Jurisdiction



TDR programs are used in both urban and rural settings to achieve a wide variety of community goals. But the overwhelming majority of TDR programs in the United States are used either for environmental protection or farmland preservation or a combination of the two.[6] Based on the Pruetz survey, the authors have divided TDR programs into the United States into eight broad categories:[7]

1. ***General Environmental****:* Programs designed to achieve general environmental goals rather than focusing on one specific environmental objective. For example, the sending area in the St. Petersburg, Florida TDR program is land zoned "Preservation Area", which includes salt marshes, deciduous forest, mangrove swamps, freshwater and tidal marshes, beaches, natural drainage areas and floodplains.
2. ***Specific Environmental****:* Programs that focus on the preservation of one specific environmental resource such as coastal areas, groundwater, hillsides, minerals, scenic views, surface water quality, wetlands and wildlife habitat. Whatcom County, WA, for example, uses a TDR program to protect the watershed of Lake Whatcom, which provides drinking water for over half of the county's population.
3. ***Farmland****:* Programs that are designed exclusively to preserve agricultural land. These programs have been differentiated from those in the next category, which combine farmland and environmental preservation goals. Most of the TDR programs in Maryland, including Montgomery County's, fall in this category.
4. ***Environmental and Farmland****:* Programs that give roughly equal importance to the goals of environmental and farmland protection. For example, Fremont County, ID uses TDRs to preserve farmland, wetlands, wildlife habitat, stream corridors and scenic vistas.
5. ***Rural Character****:* Programs that use TDRs to protect rural areas from inappropriate development. The original Boulder County, CO TDR program encourages the protection of any land with rural zoning in accordance with program requirements.
6. ***Historic Preservation***: Programs that encourage the owners of historic landmarks to deed restrict their properties for historic preservation purposes. Some of these programs also encourage the rehabilitation of the landmarks. Large cities such as Atlanta, Dallas, Denver, Los Angeles, New Orleans, New York, and Pittsburgh all have such programs.
7. ***Urban Design and Revitalization****:* These are TDR programs intended to implement a jurisdiction's urban design and revitalization goals. Washington DC, for example, offers transferable floor area bonuses to downtown developments that incorporate certain features such as retail, art-related uses and legitimate theater.
8. ***Infrastructure Capacity****:* Programs that limit development within a planning district in order to keep future development from overwhelming the capacity of the transportation system and

[6] Obviously, programs classified as "rural" in this discussion, such as farmland and environmental protection, have a significant impact on metropolitan growth because they are frequently used in outlying counties in the path of suburban expansion.

[7] These categorizations are admittedly broad but they are designed to provide a general understanding of the use of these tools. In jurisdictions where more than one TDR program is in place, the jurisdiction was characterized by what we considered to be the primary purpose.

other public service systems. Using TDRs, property owners can shift development potential from one site to another while still maintaining an overall level of development that can be accommodated by the planned infrastructure.

Table 1. Number and Purposes of TDR Programs in the U.S., by Geography, 2003

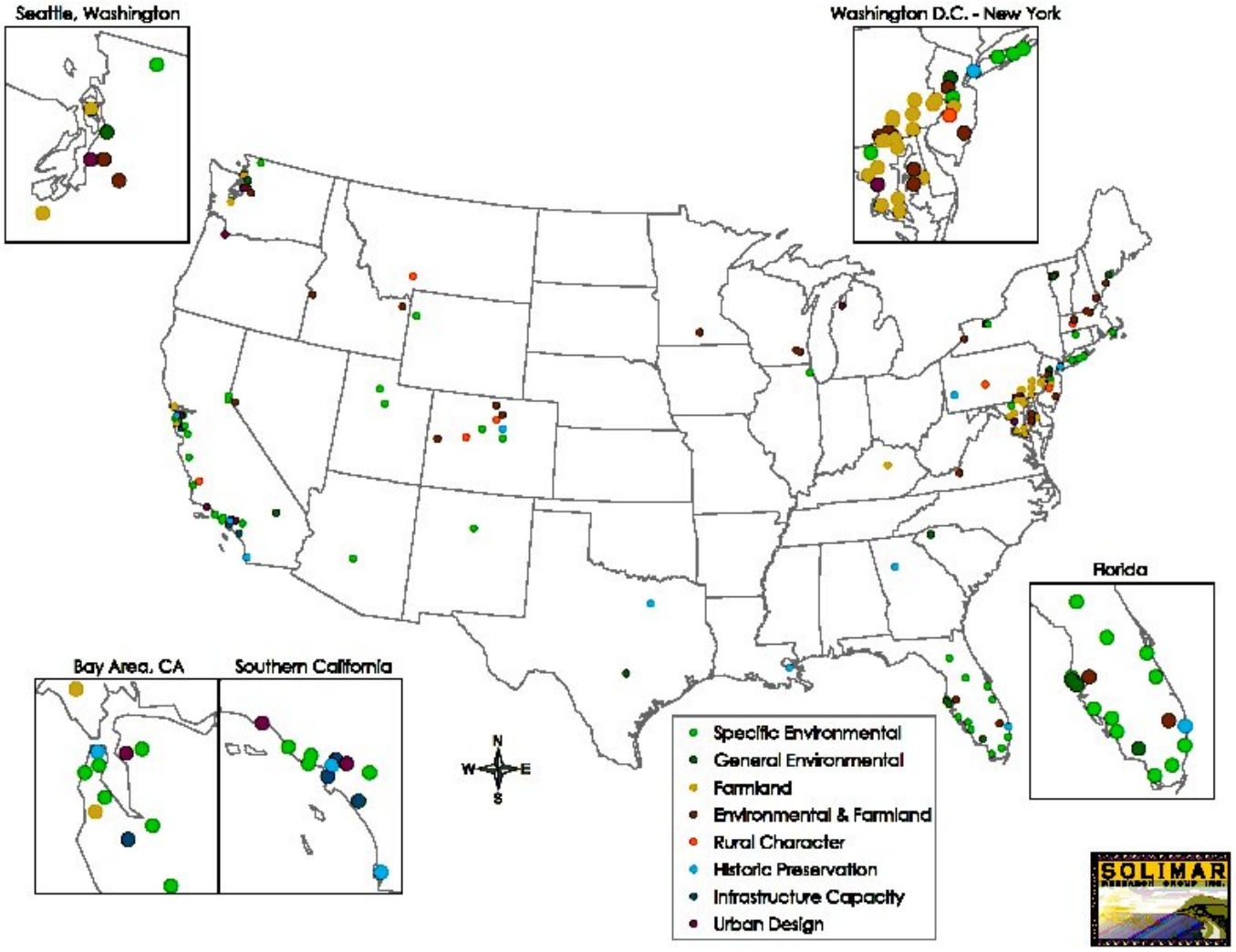
	MidAtlantic (NY, NJ, PA, MD)		California		Florida		Rest of U.S.		Total	
	Total #	% of category	Total #	% of category	Total #	% of category	Total #	% of category	Total #	% of category
General Environmental	1	2.6%	1	3.4%	3	17.6%	5	10.0%	**10**	7.5%
Specific Environmental	6	15.8%	14	48.3%	11	64.7%	11	22.0%	**42**	31.3%
Farmland	18	47.4%	2	6.9%	0	0.0%	3	6.0%	**23**	17.2%
Environment and Farmland	9	23.7%	0	0.0%	2	11.8%	19	38.0%	**30**	22.4%
Rural Character	2	5.3%	1	3.4%	0	0.0%	4	8.0%	**7**	5.2%
Historic Preservation	2	5.3%	4	13.8%	1	5.9%	4	8.0%	**11**	8.2%
Urban Design /Revitalization	0	0.0%	3	10.3%	0	0.0%	4	8.0%	**7**	5.2%
Infrastructure Capacity	0	0.0%	4	10.3%	0	0.0%	0	0.0%	**4**	3.0%
Total (% of total)	38 28.4%		29 21.6%		17 12.7%		50 37.3%		134 100.0%	

Although 43 of the 134 programs have been collapsed into the category of "specific environmental," for the purposes of this table, in fact, that category encompasses a wide variety of environmental goals, including protection of open space, wetlands, and a wide variety of other natural resources. In one jurisdiction—Carroll County, Maryland—the county uses the TDR program to protect underground stone deposits that are important to the local economy (Pruetz, 2003).

TDR programs are also used for specific urban purposes. For example, Denver and at least three other cities use TDRs to encourage the rehabilitation as well as the preservation of historic landmarks. Seattle created a TDR system to retain varied building scale, encourage low-scale infill development and preserve/restore historic landmarks as well as retain low-income housing. Pasadena uses a TDR program to provide compensation to the owners of property that experienced reductions in development potential as a result of the Downtown Urban Design Plan.

It is important to note that the purposes of TDR programs vary widely by region within the United States. This variation is best illustrated by comparing the purposes of programs in the three most active parts of the country -- California, Florida, and the Mid-Atlantic states (New York, New Jersey, Pennsylvania, and Maryland) (Map 2).

Map 2. TDR Programs by Type



In the Mid-Atlantic states, where low-density urbanization on the metropolitan fringe is encroaching on long-established agricultural regions, more than 70 percent of all TDR programs focus either on farmland preservation or on environmental protection and farmland preservation together. (Indeed, of the 23 programs nationally that focus only on farmland, 17 of them are located in either Pennsylvania or Maryland.) Some programs do focus on specific environmental issues; for example, two programs on Long Island in New York State focus on groundwater protection, a major issue in that region.

In California, farmland preservation is less important than protecting a wide variety of environmental values and achieving urban goals. Almost half of all TDR programs in California are designed to protect a specific environmental resource. Nine of California's 29 programs, for example, are designed to protect hillsides from development. California also uses TDR programs for goals such as historic preservation, urban design, and infrastructure capacity far more than any other state.

Florida presents yet a different picture of how TDR programs are used. In a state where protection of groundwater, open space, and related resources is a high priority, almost all of the TDR programs in place are used for some type of environmental protection. Most are designed to protect a specific environmental resource. For example, four of Florida's 17 TDR programs are primarily designed to protect wetlands and three are aimed at protecting coastal resources.

Most TDR programs are not created with the express purpose of managing metropolitan growth. Rather, they are designed to protect certain types of lands that the state or local governments have concluded are important to preserve – most usually, environmental protection or farmland preservation. These programs tend to target land that is on the metropolitan fringe but in the path of growth and, if successful, will divert growth either back into the existing urban area or to another part of the metropolitan fringe. Few programs deal specifically with urban development, and when they do they tend to focus on moving already permitted development away from sensitive resources such as historic districts.

C. Case Studies

1. Montgomery County, Maryland

Montgomery County operates the most active TDR program in the United States. The program is designed to protect farmland from development. Initiated in 1980, the program now protects more than 40,000 acres. Located immediately north of Washington, D.C., Montgomery County today has a population of almost 900,000 people contained in 323,000 acres of land (about 500 square miles). The county is also one of the most affluent in the United States. In general, urban and suburban growth has occurred in the southern part of the county while farming has continued in the northern part of the county.

Montgomery County recognized early that it would lose its agricultural open space to urban development if market forces directed the county's future. In 1956, the state adopted tax rules that provided tax incentives to landowners to keep land in agricultural production. However, growth proceeded largely unhampered by these tax incentives and other planning efforts.

In 1980 the County Council adopted a master plan with allowances for Rural Density Transfers. Zoning regulations allow landowners within the designated open space zone (sending site) to build one dwelling per 25 acres. The TDR program, however, allows owners who transfer development rights into one of the nine designated receiving sites to transfer at a rate of one unit per five acres, creating a 5 to 1 incentive to transfer.

In 1982, Montgomery County established a County Development Rights Fund. The fund was intended to serve as a buyer of last resort in the event sellers could not find buyers in the private market. The county designed the fund to bank TDRs and auction them to the highest bidder. The bank languished for eight years because the private market was sufficient to successfully match buyers and sellers. Montgomery County eventually terminated the fund.

Since 1980, the transfer program has protected 40,583 acres of farmland -- almost half of the 92,000 acres originally designated. Another 13,000 acres has been preserved through other state farmland preservation programs (American Farmland Trust, 2001). In most cases, farmland in northern Montgomery County had been saved by transferring development rights to the older suburbs and developing areas in the southern part of the county, closer to the District of Columbia. [8]

Although the program suffered from declining prices and low demand for a long period, the Montgomery County program has recently been active for several reasons:

First, the county developed a comprehensive land use plan that included economic analysis and TDR program impacts, so that there was a "reality check" regarding the real estate market.

Second, the TDR program's 5:1 ratio provides buyers and sellers with significant incentives to transfer development rights.

Third, Montgomery County did not try to protect farmland that was in the path of growth. Its sending area is at the opposite end of the county from urbanization, where landowners are likely to believe that farming has a future and where development value has not been driven up by land speculation (See Map 3).

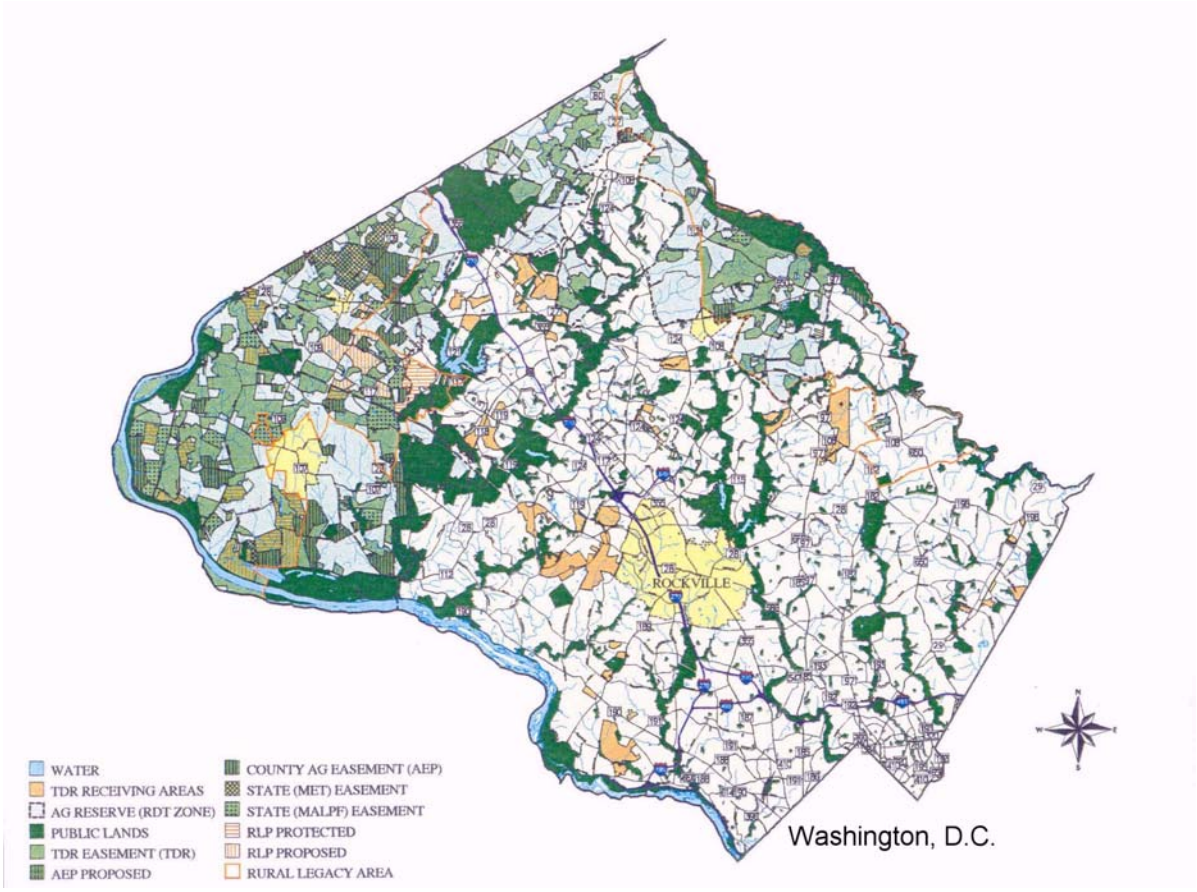
Finally, the program is straightforward and relatively simple to administer and landowner and public confidence in the process is high. Both TDR and non-TDR projects have the same entitlement process.

[8] Personal communication from Judy Daniel, Maryland National Capital Park and Planning Commission, February 2, 2001.

On the other side of the coin, the permitting process can take up to one year and there is criticism that the allocation of TDRs to sending areas does not take into account differences in land value (Banach and Canavan, 1983). It should also be noted that the few incorporated cities within the county are not included in the program.

Ironically, the achievements of the Montgomery County program also highlight the shortcomings of a local program in the context of overall metropolitan growth. In its own terms, the program has been extremely successful—protecting farming in the northern part of the county and supporting quality growth in the southern part. Over the past 20 years, however, growth in the Washington, D.C. metropolitan area has simply leapfrogged over the protected farmland into outlying Maryland counties. Thus, in the larger metropolitan sense, the Montgomery County program has not bounded urban growth but, rather, protected a large swath of farmland from the urbanization that has swept across the entire region.

Map 3. Montgomery County Agricultural Preservation, 2000



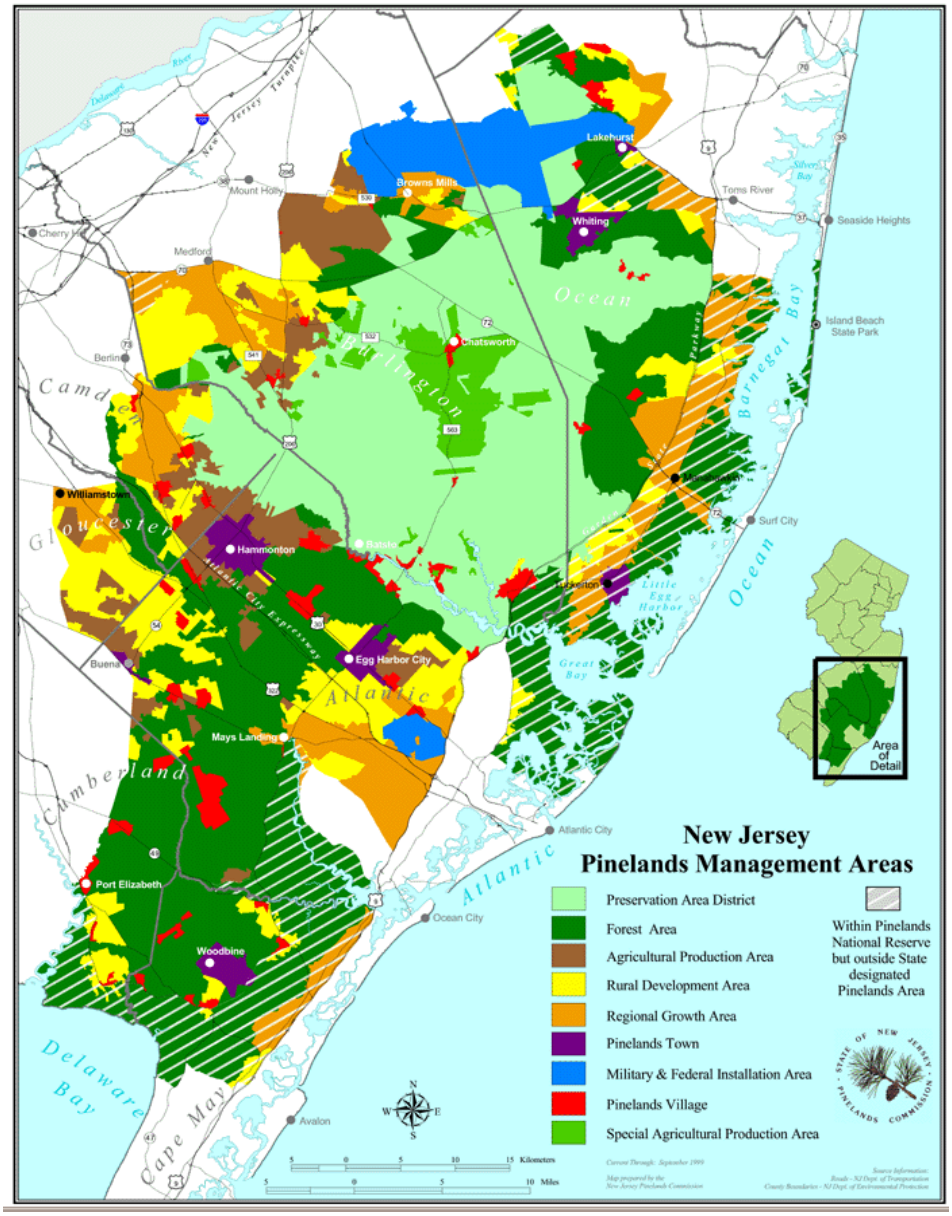
Source: Geographic Information Systems, Department of Information Systems & Telecommunications, Montgomery County, MD.

2. New Jersey Pinelands

In contrast to the Montgomery County TDR program where the emphasis is on maintaining active agriculture, the goal of the New Jersey Pinelands program is to protect environmentally sensitive areas and specialty agriculture such as cranberries from development. The state's "Pineland" region occupies roughly 1.1 million acres in the southeastern portion of the state spanning seven counties and 56 municipalities. The Pineland region features pine and oak woodland, cedar and hardwood swamps, pitch pine lowlands, and includes unique areas of "pygmy forest." To date the program has preserved more than 31,000 acres of land. The market is active, with more than 40 trades per year occurring.

The New Jersey Pinelands Commission controls land uses within a very large area, as shown in Map 4. The Pinelands area includes more than 60 different jurisdictions, making the Pinelands TDR program one of the most extensive in the nation. The multi-jurisdictional nature of the Pinelands TDR program is probably its most important aspect.

Map 4. New Jersey Pinelands Management Areas, 1999



Source: New Jersey Pinelands Commission, www.state.nj.us/pinelands/lcm.htm.

The program designated nine planning management areas with allowed uses specific to each area. Like Montgomery County, New Jersey sends development out of sensitive sending sites to less sensitive receivership sites and employs a transfer credit at a ratio greater than one to one to encourage transfers. Each management area generates Pineland Development Credits (PDC) at a specific rate based on the land's development potential and environmental sensitivity. Credits are generated at a maximum rate of two PDCs per 39 acres to a minimum of 0.2 PDC per 39 acres (no PDC can be transferred from land that has been mined).

If an owner keeps the PDC on site, it can be used to build one unit. However, if the PDC is transferred to a receiving site the landowner may build four units. Once a PDC is transferred, the property is deed restricted and only uses that are specifically authorized by the management plan are allowed. Pruetz (2003) cites the TDR program's consistent and thorough self-examinations as one reason it has succeeded.

Pizor (1983) evaluated the Pinelands program and found a critical flaw in the program – namely, that it lacked sufficiently suitable receiving sites. No-growth sentiments in many communities, restrictions on transfers to sites not serviced by public sewer systems, and other planning considerations often made transfers difficult. There is a consensus that the program was so complex and time consuming that building at lower density was preferable to dealing with the regulations and procedures.[9] In addition, the state has created a PDC purchase program through which a state-created bank buys and retires some credits.

The Pinelands program has been successful for several reasons:

First, it applies to the entire Pineland region with the help of a well thought-out comprehensive plan. Indeed, the program is one of the few in the nation that involves many different jurisdictions and functions on a regional basis.

Second, the 4:1 transfer ratio provides buyers and sellers with incentives.

Third, due to the authority of the state's Pinelands Commission, local jurisdictions cannot increase density without using PDC transfers.

And finally, the public outreach program proved instrumental in the program's long-term success.

3. Boulder, Colorado

For more than 40 years Boulder County and the city of Boulder, Colorado—located some 30 miles outside of Denver—have been home of some of the most innovative open space programs in the nation. Boulder City has had limitations on urban expansion since the 1950s; locally funded open space acquisition programs since the 1960s; and a TDR program since the 1980s. Boulder County started a rural 'Planned Unit Development (PUD)-clustering' program in 1981 that was the pre-cursor to the TDR program, which is now county-wide and inter-jurisdictional. All these programs have worked together—and interacted in significant ways—to shape both open space protection and urban development in the Boulder area.

Boulder's open space preservation efforts began in 1959 with the establishment of a policy known as the "blue line"—a growth boundary beyond which the city would not supply water (Pendall

[9] Many of these issues were addressed during program revisions.

and others, 2002). In the 1960s, city voters passed a sales tax to acquire open space—a move that was later followed by Boulder County as well. Since the 1970s, the two entities have had a joint open space plan.

In 1981, Boulder County introduced a development 'clustering' program named "Non-Urban Planned Unit-Development" (NUPUD). This program encouraged landowners with 35-acre lots to cluster development and preserve at least 75 percent of the property for farming or grazing. The process was not extensively used at first. In 1989, this program was expanded to include the possibility of transferring to a non-contiguous parcel, thus creating a real TDR for the first time. In 1994, the city and county of Boulder reached a joint agreement to permit inter-jurisdictional transfers of development rights; this agreement was later extended to include several other cities as well.

The NUPUD clustering procedures have been used about 250 times as of 2001, resulting in over 10,000 acres set aside with a conservation easement. This is about 14 percent of the 73,000 acres in easements owned by the city or county of Boulder. Much of the land is in active farming or grazing and makes up part of the 60,000 overall cultivated acres in the county. [10]

One unusual aspect of the Boulder program is the way the TDR system is sometimes used in combination with city and county open space acquisition funds. In many cases, landowners sell their development rights to other landowners, placing a conservation or agricultural easement on their property. Then the landowner will sell the property itself to the city or the county at a much lower price that reflects the remaining agricultural value of the property. The city or the county may initially manage the outlots or sell them to area farmers while retaining the easement. The county grosses about $350,000 a year from leases.[11]

So far, the interjurisdictional transfer program has produced 15 transfers with somewhere between 3,200 and 4,700 acres of land conserved. Several interjurisdictional agreements allow residential development rights to be converted to other uses provided the net effect is no worse than the residential uses. The conversions are negotiated as part of the approval process.

In 1998, the county concluded that there were several reasons for the TDR program's success. Including the following:[12]

1. The interjurisdictional transfer program increases public credibility.
2. County officials are aggressive in promoting the TDR program.
3. Program refinements over time have resulted in the TDR program being viewed by landowners as the preferred option to rural development.
4. Receiving-site developers have considerable latitude in site design and density.

[10] Personal communication from Boulder County staff at various times during 2000 and 2001; and Pruetz (1999).
[11] Personal communication from Boulder County staff at various times during 2000 and 2001; and Pruetz (1999).
[12] Personal communication from Peter Fogg, Boulder County Planning Manager, December 29, 1998.

5. High credibility has led to continued public support for the program, thus blunting receiving-area opposition.

As with Montgomery County, however, the Boulder program is successful in internal and technical terms but is not part of a metropolitan-wide growth strategy in the greater Boulder/Denver area. The TDR program and the open space acquisition programs used by both the city and county of Boulder have bounded Boulder's urban growth, but more typical suburban development has occurred beyond Boulder's open space reserve – much of it housing development to support continued job growth in Boulder itself.

D. Components of Successful TDR Programs

No matter what scale or level a TDR program is designed for, it can be costly and difficult to design and administer, and demand for TDRs is often mismatched with supply. One study found that supply and demand conditions for development rights did not conform to planners' expectations, leading either to too few transfers or insufficient supply to meet demand (Thorsnes and Simons, 1999). This is not surprising given the unusual nature of land markets. If TDRs are not affordable, developers will not buy them because TDR costs will make the TDR option less profitable than the baseline option. Similarly, if the TDR ordinance does not allocate enough TDRs to sending areas, the property owners may decline to sell their TDRs.

Nevertheless, many TDR programs are successful, including the three highlighted in the case studies. The experience of more than 100 TDR programs nationwide reveals a consistent set of components required for success. These are:

1. *Viable receiving areas.* It is usually easy for a community to identify which land it wants to preserve. It can be much more difficult for a community to identify which neighborhoods or areas should be developed at higher densities as part of that trade-off. In many cases, communities designate too few receiving areas or the TDR program cannot withstand political opposition from neighbors in the receiving areas. Successful programs designate adequate and viable receiving areas and stick by them.
2. *Good balance of demand and supply.* Because of the unusual nature of land markets—including few players and the unpredictability of timing decisions—it is very difficult to balance demand and supply. TDR programs work best when there are many land players in the marketplace and when development pressures (and economic incentives) are such that those players are likely to be motivated to participate. In addition, it is very important to maintain a stable supply of the "currency" (density). In many communities, it has been common practice to approve upzonings routinely in the absence of a TDR program. In such situations, it is understandable that landowners are not likely to think they should "buy what they can get for free."
3. *Sustainable sending areas*. Unfortunately, many programs attempt to save areas that are under immediate threat of development, such as land flanking highways or on the developing urban fringe. Land under immediate threat of development will typically have a high

development value, forcing high TDR allocation rates in an attempt to motivate owner participation.

4. *Strong incentives for landowner participation.* Many programs fail because of an assumption that the value lost in not developing a house in the sending area is equal to the value increase created by the ability to build one extra house in the receiving area. Successful programs allocate sufficient TDRs in the sending area so that the TDRs remain affordable for receiving area developers while also offering sufficient compensation to motivate sending area owners to participate.
5. *Presence of clearinghouses or banks.* Many successful TDR programs have a public or nonprofit clearinghouse or bank that can help to stabilize the market. In the California TDR programs, this role is often played by state-chartered conservancies, such as the Coastal Conservancy or the California Tahoe Conservancy, which engage in a wide variety of land acquisitions and transactions, including the buying and selling of TDRs. In Calvert County, Maryland, the market stabilized after the county entered the market to buy and retire many TDRs (McConnell, Kopits, and Walls 2003).
6. *Low transaction or administrative costs.* Again because of the unusual nature of land markets, especially the small number of players in some cases, transaction costs can be high, thus discouraging landowner participation. In many TDR programs, there are so few sales that private brokers do not appear to find the market profitable. In active TDR programs, which usually occur when there are many small landowners, the buying and selling of TDRs may actually become an adjunct to the regular real estate market. Government can sometimes play a role by providing information about transactions and prices if no private company chooses to do so.
7. *Strong community support.* It should go without saying that strong community support is essential to the success of a TDR program. Such a program will be subject to considerable political pressure over the years—not only from neighbors who oppose higher densities in the receiving areas, but also from landowners who will seek upzonings without participating in the TDR program. Strong community support is necessary to withstand these pressures.

So, in general, it is fair to conclude that TDR programs are difficult to administer because they require many players and a healthy market balance not always found in land markets. Furthermore, they are not always created with the express purpose of shaping or channeling metropolitan growth.

In some cases, such as Montgomery County, they seek to protect specific geographical areas, thus carving out no-development zones in the metropolitan area. However, in other areas such as Boulder, the goal is to protect land wherever it is found, with no pre-determined geographical pattern in mind. But since TDR programs are administered on a sub-metropolitan level (the New Jersey Pinelands program being one of few exceptions), their impact on metropolitan growth varies.

IV. MITIGATION BANKING AND DEVELOPMENT OBLIGATIONS

Generally speaking, TDR-type mechanisms are programs that deal with the trading of *rights*—that is, the ability of a landowner to develop property as determined by a government regulatory agency with the power to issue development permits. However, *rights* are not the only thing that regulatory agencies confer on landowners when issuing a development project. In many cases, regulatory agencies also confer *obligations* on landowners as well—that is, requirements that the landowner must fulfill in order to obtain the right to develop. Such *obligations* are usually referred to as *mitigations*. Just as *rights* can be banked and traded, so too can *mitigations*.

Mitigation banking (and its close cousin, *conservation banking*) involves establishing a program around what might be called a *transferable development obligation*—essentially, the mirror image of certain TDR programs.

One major distinction between development rights and development obligations, at least as they have emerged in the trading context, is that they are controlled by different levels of governments. TDR programs have almost always been created by local governments, which issue most land-use permits that permit urban development. Mitigation banks and other transferable development obligation systems have almost always been created as the result of federal environmental regulations, notably endangered species and wetlands regulations, which hold the power to restrict urban development as a means of protecting a natural resource.[13]

As with region-level TDR programs such as the New Jersey Pinelands, mitigation and conservation banking programs tend to function on a regional level, but their goal is to protect and restore regional environmental systems. Their impact on metropolitan growth patterns, while indirect, is real. By aggregating mitigation in specific large parcels, mitigation banking—like TDR programs—tends to carve out no-development zones. Sometimes these no-development zones occur in the service of a regional plan while at other times the impact occurs on a piecemeal basis and the impact on metropolitan growth is harder to measure.

It is also worth noting that mitigation banking programs, unlike most TDR programs, almost always operate in the context of a public acquisition program as well. Many TDR programs (Boulder and Lake Tahoe being exceptions) exist primarily because there is no public source of funds to purchase land or development rights. However, mitigation banks often exist in conjunction with public acquisition programs; public funds are used to acquire the core properties, while trading programs are used to protect other land.

Most commonly, under a variety of laws—especially the federal Clean Water Actmitigation requirements have been applied to projects that disturb wetlands. In wetlands mitigation, projects should first seek to avoid destruction of wetlands. If that is not possible, then projects should

[13] Occasionally, transferable mitigation requirements are used to achieve local goals such as farmland preservation. This has been the case in Yolo County and South Livermore, California.

minimize destruction. Finally, in cases when a project could not be reconfigured to avoid or minimize damage to wetlands, project applicants were required either to restore degraded wetlands or to acquire healthy wetlands and deed them over to public agencies as compensation.

Over time as well, the notion of "off-site" mitigation gained in popularity; that is, the applicant could perform the mitigation on a different location so long as regulators approved. But because individual projects often involve small pieces of land, it was sometimes difficult to determine whether the mitigation requirements were resulting in meaningful conservation. For this reason, both state and federal policies have evolved over time to encourage broader goals of watershed and habitat planning and the use of mitigation banks to help achieve those goals.

Perhaps the best definition of mitigation banking (provided in the wetlands context) comes from Cylinder and others (1995): "A mitigation banking program uses a credit system to enable the purchase of compensation credits, with each credit representing a unit of restored or created wetlands which can be withdrawn to offset impacts incurred at a development site. In most cases, wetlands are created at a mitigation bank site prior to the removal of wetlands at a project site."

Thus, mitigation banking is relevant in the discussion of TDRs and metropolitan growth in the sense that it seeks to take an individual landowner *obligation* (the mitigation requirement) and convert it into a *unit of currency* that can be bought or sold so that the landowner can realize financial value while the land is protected.

Federal wetlands mitigation banks are governed by 1995's "Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks."[14] Also in 1995, California adopted a similar policy for establishing "conservation banks," specifically for land affected by endangered species. The chief difference is that whereas restoration is an important component of wetlands mitigation banks, California's endangered species conservation bank program places high priority on preservation.

Since Section 404 of the Clean Water Act requires compensation in order to mitigate for lost wetland functions due to development, wetlands mitigation banking dominates the discussion of current mitigation banks. There are approximately 100 wetland mitigation banks already in operation or being constructed in 34 states across the country (North Carolina State University, undated). In California, where wetland loss has been dramatic, there are 19 approved mitigation banks and 18 more pending approval.

Endangered species represent a somewhat different mitigation problem than wetlands. In general, not every member of a species' population need survive for the species recovery goals to be achieved, meaning not every location needs to be saved. At the same time, however, species populations tend to occur over a much broader "habitat" area. In certain ways, therefore, species

[14] Federal Register 60 (228), November 28, 1995, pp. 58605-58614.

habitat is well-suited for banking efforts, because, across a broad area, some locations can be “lost” and others “saved” and the recovery program can still meet its objectives.

California has led the effort to coordinate habitat mitigation banking with mitigation efforts under the Endangered Species Act through its official policy regarding the establishment and implementation of "conservation banks." Since the adoption of the conservation banking policy in 1995, more than 40 conservation banks have been created and certified by the state. Approximately half of these banks are in San Diego County.

A. Case Studies

1. Carlsbad Highlands Conservation Bank, San Diego, California

In 1985, the Bank of America established the prototype for the state’s conservation bank, the Carlsbad Highlands Conservation Bank. This 260-acre bank, located in the eastern portion of Carlsbad in northern San Diego County, has been a financial success and also a test case for many other conservation banks that came after it.

Bank of America came by the Carlsbad Highlands property through a foreclosure. The property is part of an 800-acre area of undeveloped land that is mostly surrounded by residential subdivisions in both Carlsbad and Oceanside. Besides the bank, some of the property is owned by a local environmental trust; other land is owned by the California Department of Transportation, which acquired it for mitigation for an expansion of Highway 76, which runs through the area. Some of the property has been disturbed, but most of it remains in its natural state, including coastal sage scrub, chaparral, oak, and native grassland.

The land originally became attractive as mitigation property when the California gnatcatcher, a bird, was considered for an endangered species listing by the state in 1991. The bank’s “service area”—that is, the area to which mitigation credits may be transferred—includes the entire coastal portion of San Diego County (Later banks have a smaller service area). Landowners who are required to obtain mitigation for their own development projects may purchase credits from the Carlsbad bank and apply them on a one-for-one basis to their own property. Land management has been an issue for property obtained by public agencies through mitigation banks.

The mitigation requirement for these other landowners is either determined on a case-by-case basis through the regulatory process, or else it is spelled out in the Multiple Habitat Conservation Plan. In essence, the Carlsbad Highlands bank represents “pre-mitigation,” in the sense that landowners buying credits are paying for mitigation that has previously been set aside. In Carlsbad and other San Diego County banks, bank owners are required to set aside all the land permanently as soon as they sell one credit.

It is important to note that the Carlsbad Highlands conservation bank is one of many tools used in northern San Diego County to implement a sub-regional conservation plan designed to

protect endangered species. Surrounding land—and other land targeted for preservation by the plan—has been protected through acquisition by federal and state agencies and by private land trusts.

2. Big Island Mitigation Bank, Marion County, Ohio

The Big Island Mitigation Bank near Marion, Ohio, provides a good example of a successful wetlands mitigation bank that has operated in the service of the federal guidelines. The bank is one of several created and operated by the Ohio Wetlands Foundation, an organization founded by homebuilders in Ohio to facilitate development by making it easier for builders to meet wetlands mitigation requirements.

The Big Island Wildlife Area is located five miles east of Marion and approximately 60 miles north of Columbus. The Wildlife Area consists of more than 5,000 acres of former wetland prairie that was drained for farming but was never agriculturally productive (Ohio Department of Natural Resources). Several efforts have been undertaken to restore Big Island to a more natural state, including wetlands restoration funded by the Big Island Mitigation Bank.

The Big Island Mitigation Bank was created prior to the adoption of the Federal Guidance in 1995. It required the cooperative approval of four different state and federal agencies.[15] The five agencies originally agreed on an 80-acre site along the Scioto River, and later expanded that to 348 acres (246 restored, 102, enhanced). The agencies agreed to permit the Ohio Wetlands Foundation, which had already had experience with another wetlands mitigation bank, to oversee construction of the wetlands restoration and financing through the bank (Kerr et al 2000).

The mitigation bank was used mostly by developers seeking a federal permit to disrupt wetlands along the Scioto River 60 miles south in Columbus, a metropolitan area which has experienced considerable urbanization. According to a previous Brookings study, Columbus urbanized more than 100,000 acres of land between 1982 and 1997 -- a 36 percent increase. The metropolitan area's population increased only 20 percent during this time (Fulton and others, 2001).

Because of the great distance between Columbus and Big Island, the Army Corps of Engineers placed some restrictions on how the mitigation bank could operate. For developers seeking permits to disrupt Category 1 wetlands—wetlands which "support minimal functions" and do not have high wetlands value—the Corps required a 1.5:1 mitigation ratio and permitted wide geographical flexibility. For Category 2 and 3 wetlands—higher functioning wetlands—the Corps required a higher mitigation ratio and required mitigation in the same watershed. These requirements allowed Columbus developers to buy credits in the Big Island Mitigation Bank.

[15] Ohio Department of Natural Resources, Ohio Environmental Protection Agency, U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers.

Although the agreement between the Ohio Wetlands Foundation and the regulators permitted the market to determine the price for mitigation credits, the foundation created a set price of $16,000 per acre for most sales. Most deals were for four acres or less and involved a mitigation ratio of at least 1.5:1. Regulators permitted the Ohio Wetlands Foundation to pre-sell 30 percent of the mitigation credits so that construction of the wetlands restoration effort could begin immediately.

The Ohio Wetlands Foundation sold all available wetland mitigation credits at Big Island between 1995 and 1998, in more than 80 different transactions. When the restoration work is complete the property will be transferred to the Ohio Department of Natural Resources, along with a $1,000-per-acre payment to the department's wetland habitat fund.

By organizing a transfer of mitigation obligations from central Columbus to an area some 60 miles away, the Big Island Mitigation Bank has actually helped to shape growth in metropolitan Columbus, albeit in a somewhat minor way. Development projects have moved forward in central Columbus that might not otherwise have occurred. At the same time, wetlands on the metropolitan fringe that might otherwise have been disrupted by development have been preserved. In that sense, the mitigation bank has served as a small tool to centralize growth in an otherwise sprawling metropolitan region.

B. Making Mitigation Banks Work

Both state and federal agencies now have many years—and, in some cases, decades—of experience in managing mitigation and conservation banks. As with TDR programs, this experience with banking programs reveals a small but common set of design and operational issues. A review of bank programs by the Environmental Defense Fund (1999) prepared to determine what type of federal endangered species habitat banking program would be most appropriate, identified the following issues as both important and common to most banking situations.

These issues are:

1. Rigid Requirements or Loose Guidelines?

Federal wetland mitigation policy requires the creation of banks according to uniform rules. However, greater activity and entrepreneurialism may be encouraged by use of loose guidelines to create banks.

2. Public or Private Banks?

Both exist, but in many cases private bankers complain that regulators do double-duty as bankers and/or undercut their prices. In some cases, a bank may be created specifically to meet the mitigation needs of a public agency; in other cases, a private bank may be more appropriate in order to put private buyers and private sellers together.

3. Compensate Rather Than Avoid or Mitigate?

Many practitioners and critics suggest that, in fact, the entire banking idea will inevitably tilt toward compensation rather than avoid or mitigate, which are higher priorities under federal regulations.

4. Proximity of Sending and Receiving Areas

This is always an issue in any mitigation program that permits off-site mitigations. The bias in wetlands mitigation banking is toward mitigation within the same watershed. However, individual wetlands mitigation deals have been done as far as 150 miles apart in California when equivalent wetlands are hard to find.

5. Strict or Loose "Monetary Policy"?

In a situation analogous to TDR credits, this is a fundamental question that is not always well answered in mitigation or conservation banking programs. In many cases, bank programs create credits but do not create criteria for them, thus leaving this important question up to the judgment of individual regulators. Ideally, the credit system would be based on assessment of the property's true mitigation value in the context of protecting the entire ecosystem.

6. Does Preservation Constitute Mitigation?

Originally, mitigation was defined as an effort to avoid, alleviate, or compensate for actual losses. In general, this has meant either affirmative effort to improve environmental conditions in the context of the project or actual restoration of land that has been environmentally degraded. Increasingly, however, the term "compensation" has come to mean, setting aside land "at risk" as mitigation for a project that degrades the environment on other land, without necessarily improving the land being used as mitigation. California officials, who argue more aggressively for preservation than officials elsewhere, claim that preservation of intact natural systems is preferable to attempts to restore or create wetlands or natural systems, which may fail.

7. Can Public Landowners Play?

The question of whether to allow a mitigation bank to create credits by mitigation activities on publicly owned land is a sticky one. In general, publicly-owned land is required to meet environmental regulations in any event; hence, the use of public-land mitigation as a credit bank for private activity would seem to be allowing private permit applicants to buy credits for activities that would take place anyway. On the other hand, not all public agencies have the resources required to perform the mitigation activities they are supposed to perform. Federal wetlands policies have generally not permitted this type of mitigation credit.

8. Should Credits Be Sold Before They Are Earned?

In some cases, mitigation credits can be sold before the mitigation has been successfully carried out. This, essentially, is what an in-lieu fee system such as Riverside County's does. However, this creates a typical "market versus results" issue.

* * * * *

Mitigation banks and similar tools serve as the flip side of transferable development rights programs because they seek to convert development obligations—as opposed to development rights—into tradeable commodities. Like TDRs, they are designed to protect natural resources rather than shape metropolitan growth. But because they are driven largely by federal environmental policy, they tend more often to operate in service of a regional plan. Although that regional plan is usually environmental rather than urban in its orientation, it does serve to shape metropolitan growth by creating predictable no-development zones.

V. MIX AND MATCH: CONVERTING RIGHTS AND OBLIGATIONS INTO CHARGES AND FEES

In typical practice, both TDRs and conservation or mitigation banking operate purely as market mechanisms—meaning that the actual price of either the development credits or the mitigation credits is determined by the marketplace. This is one of the reasons why calibrating supply and demand is so important and so difficult.

An alternative, however, is to combine the development or mitigation transfer idea with a more traditional notion—the development or mitigation fee. In this alternative, buyers and sellers need not find each other. Instead, applicants who either seek additional density or must provide mitigation can simply pay a "sending" fee instead of engaging in a transaction with a "receiving" landowner. In the case of development rights, this is sometimes known as a density transfer charge; in the case of mitigation, it is often simply known as a mitigation fee.[16] The fee goes to a government agency or another intermediary that then uses the resulting funds to buy the land.

This approach has the advantage of lowering transaction and administrative costs and making the entire transfer system more flexible. Funds received can be pooled with other land conservation money to buy land when the opportunity arises. Also, for receiving-area landowners, the concept of selling land or development rights to an agency or land conservancy may be simpler to understand than a transfer program. The downside, however, is that land conservation does not necessarily occur at the time that the fee is paid. The time lag depends on many factors, including government agency speed and efficiency and market opportunities to purchase land. If land prices are going up over time, this may mean that the fees, when used, will not purchase as much land as anticipated.

Case Study: Density Transfer Fee Case Study: Berthoud, Colorado

The density transfer fee in the town of Berthoud, Colorado provides a good example of the density transfer charge concept. Berthoud is an incorporated town of 4,800 people situated in Larimer County, Colorado, 20 miles south of Fort Collins and 45 miles north of Denver.

In 1999, the town tried to develop a traditional TDR program but found itself unable to quickly resolve important issues. For example, participants had trouble agreeing on the town's ultimate limits. This made it difficult to identify either sending or receiving areas. The town also foresaw problems with government-initiated re-zonings of the receiving areas as well as the sending areas. It became clear that substantial time would be needed to resolve all these issues. Furthermore, participants realized that while they tried to make these decisions, a significant amount of development would likely occur without preservation. This motivated the town to find a simpler technique than a traditional TDR program.

[16] In this sense it is a variation on an "impact fee," which seeks to extract from developers the cost of mitigating problems created by new development.

As a result, the town adopted a density transfer charge, which they call a “density transfer fee”. The fee applies to additional housing units permitted as a result of re-zonings initiated by developers. The proceeds of the density transfer fee are reserved for the preservation of farmland, environmental areas and open space. Since sending areas are not designated, as in a traditional TDR program, the town will initially decide how to use these fees based on priorities found in the Town Land Use Plan. These priorities include watershed protection, community separators, view corridors and agriculture in larger sections that have the greatest likelihood of long-term viability.

The ordinance itself explains that the density transfer fee is designed to be simpler than a traditional TDR program, which “requires significant administrative cost and effort…” The fee is $3,000 per single family house and $1,500 per multiple-family residential dwelling unit. Six percent of the fee revenues are spent on administration and the remaining 94 percent is separately accounted in the town’s annual budget and reserved exclusively for open space acquisition. As another advantage, the ordinance explains that a fee allows the town itself to make the acquisitions, thereby controlling the quality of the transfers. However, the town also offers one single-family residential unit of credit for every acre of agriculture, environmental or open space land permanently deed-restricted either on site or off-site in areas approved by the Town Board of Trustees.

The conclusion here is that creating market-oriented tools to deal with development rights and development obligations does not necessarily require the creating of tradeable rights or obligations. Those rights and obligations can also be converted into cash commodities through the use of fees.

VI. CONCLUSION

When looking at the broad range of policy issues associated with urbanization and environmental policy, it is hard to escape the conclusion that land use is somehow "different."

Land markets are different than other resource markets because they often contain few players who must make a one-time decision about whether to develop or not, and because the knowledge required to "play" effectively in land markets is extremely local. Land regulations also vary widely between local jurisdictions and are often idiosyncratic. Thus, it can be difficult to take lessons from other areas of urban and environmental policy and apply them to land, and it can be difficult to take lessons about land use policy from one locale and transplant them to another.

Yet the conflict between land conservation and property rights is so enduring and powerful that the concept of market-based regulatory policy is always near the top of any land-use agenda. Even as communities have struggled to devise TDR programs that function well, interest has only grown because of the increasing pressure for urbanization, land conservation, and protection private property rights. At the federal level, even as a Republican Congress and a Republican administration have debated weakening both legal requirements and administrative regulations regarding wetlands and endangered species, interest in mitigation banking has grown. Thus, market-based regulatory programs such as TDRs and mitigation banking should continue to attract a great deal of attention.

In examining such programs, however, two questions arise. The first one has to do with effectiveness: Given the program goals, do these programs succeed on their own terms? The second has to do with impact: Given the regional nature of both ecosystems and metropolitan growth, do these programs have an impact on regional growth patterns—and could they be better used to achieve such goals?

Perhaps the biggest lesson from this review of TDRs and mitigation banking is simply that such mechanisms are implementation tools, and therefore they function best in the context of a comprehensive land-use or land conservation plan that has strong goals.

If a jurisdiction or a region has an overall goal for urban development or land conservation—and a set of specific objectives about what to build and what to save—then a trading system is an appropriate vehicle to achieve a public policy goal. This will encourage market players to participate, and it will also shore up political support for the system.

If, on the other hand, a TDR or mitigation banking mechanism is being used in the context of a weak comprehensive plan with no clear goals, it will be more difficult to justify its continued existence. Credits of one sort or another may be traded or moved around, but it will not be clear what the purpose is. This will make public support for such a program more difficult to sustain, and it

will also create the political temptation to eliminate the program—or, more likely, to weaken it by "devaluing the currency."[17]

To some extent, all market-based regulatory mechanisms are based on the assumption that the regulatory system creates only a limited supply of the "right" in question—whether that is a right to develop, a right to pollute, or a right to disrupt the natural environment. The best air pollution trading programs work because there is an overall cap on emissions that can be altered only by an act of Congress.

In the case of land, however, it is often easier to change the supply of the commodity being traded. Upzonings by cities and counties are so common that it is often hard to persuade landowners that they must participate in a trading program to increase the amount of development they will be permitted. Federal regulatory systems regarding wetlands and endangered species are harder to change, but the resulting mitigation requirements have often been determined by the judgment of field biologists and other federal staff, meaning they too are frequently negotiable.

So, in order to succeed, it is critical for TDRs and mitigation banks to be placed in the context of a larger, comprehensive land use plan that has specific goals for urban development and land conservation. Such a plan must have strong political support and an air of endurance, so that neither landowners nor neighbors will believe it can be easily changed.

It is important to recognize, however, that comprehensive plans rarely address the full range of issues associated with metropolitan growth, including both urban and environmental matters. Therefore, even an effective TDR or mitigation banking program—while it might be successful on its own terms—may have an inadvertent impact on metropolitan growth.

For example, the Montgomery County, MD program is the most active TDR program in the nation. It has successfully protected farmland in northern Montgomery County and concentrated new urban growth in the already mostly urbanized southern part of the county, closer to job centers, public transit, and the core city of Washington, D.C. But market-based mechanisms such as TDR programs have not been applied to the entire Washington metropolis. Hence, farmland in outlying counties without TDR programs continues to urbanize, which in some cases probably creates longer commutes than would otherwise be the case. As stated above, the effect of the Montgomery County program has not been to bound urban growth, but, rather, to protect one regionally important rural resource—farmland in northern Montgomery County—in the face of vast growth pressure that has urbanized land all around that resource.

The San Diego conservation bank—functioning as part of a regional habitat conservation effort—has had a similar effect. The impact has not been to bound urban growth in San Diego—in ways that might make it more efficient or more logical from the point of view of human settlement—

[17] See for example, recent debates in Loudoun County, Virginia: Michael Laris, "Loudoun Board Could Scuttle Land Program; Preservation Decried as 'Fluff'." Washington Post, January 4, 2004, p. C01.

but rather than protect a nationally significant environmental resource (endangered species habitat) from vast growth pressure that has urbanized all the land around it. Thus, in both cases, market-based land conservation mechanisms are functioning purely from the perspective of protecting certain resources with little consideration for the overall impact on metropolitan growth. This is consistent with previous findings that land conservation efforts generally have little policy relationship with growth management (Hollis and Fulton, 2002.).

This is true partly because it is much simpler, both politically and in technical planning terms, to devise and implement a program for one jurisdiction only. This is why many county TDR programs, for example, focus on shifting development from one undeveloped location to another, rather than from the undeveloped fringe to urban areas (typically located inside cities).

One encouraging trend is the rise of so-called "interlocal" agreements, in which counties and cities work together to use TDRs and similar mechanisms to move development from the fringe to urban areas where denser development has been targeted.[18] As metropolitan-wide efforts to manage growth increase, TDRs and similar mechanisms should be used more frequently on an "interlocal" basis to achieve regional or metropolitan wide goals linking land conservation in rural areas with higher density development in urban areas. States could encourage this trend by passing enabling legislation making such interlocal agreements easier to execute.

Once that framework is in place, the other pieces of the puzzle are fairly clear. The system must be devised so that there are an ample number of market players with access to information about the market. The regulators must stand back and permit the market to operate once they have designed it. And intermediary banking entities -- whether public, private, or nonprofit -- must be present to stabilize the market against the inevitable ups and downs. If all these characteristics are present, then trading mechanisms such as TDRs and mitigation banks can go a long way toward implementing thoughtful market-based growth management on a metropolitan basis.

[18] Even so, only nine programs nationwide involve interlocal agreements.

APPENDIX: TDR PROGRAMS NATIONWIDE

STATE	Jurisdiction	Description/Purpose	Category
AZ	Scottsdale	Preserves land in the McDowell Mountains and a second TDR program encouraging the preservation of historic landmarks.	Specific Environmental; Historic Preservation
CA	Agoura Hills	Offers TDRs as an alternative to on-site development for the owners of hillside land zoned Open Space.	Specific Environmental
CA	Belmont	Minimizes development of steep and sometimes unstable hillside areas to achieve public safety as well as environmental goals	Specific Environmental
CA	Brisbane	Promotes the transfer of development rights from the upper elevations of its hillsides to lower elevations adjacent to roads and other infrastructure.	Specific Environmental
CA	Burbank	Allows transfers to concentrate development at appropriate locations in its Media District while limiting district-wide development to a level that the transportation system can accommodate.	Infrastructure Capacity
CA	Claremont	Discourages the subdivision of environmentally sensitive hillside land but offers landowners the option of transferring development potential to receiving areas.	Specific Environmental
CA	Cupertino	Allows developers to transfer development potential within a commercial corridor in order to provide flexibility without exceeding the maximum capacity of the transportation system.	Infrastructure Capacity
CA	El Segundo	Reduces traffic congestion by allowing transfers of development potential between parcels under common ownership within the same transportation analysis zone.	Infrastructure Capacity
CA	Irvine	Originally used flexibility in downtown development concentrations while limiting overall development to a level that can be accommodated by the transportation system.	Infrastructure Capacity
CA	Los Angeles	Uses three TDR mechanisms to preserve historic landmarks, achieve urban design goals and implement the city's downtown redevelopment plan.	Historic Preservation; Urban Design and Revitalization
CA	Malibu Coastal Program	Requires the retirement of antiquated, substandard lots in the environmentally sensitive Santa Monica Mountains in order to create new lots in the highly-desirable Malibu Coastal Zone.	Specific Environmental
CA	Marin County	Uses TDRs to preserve farmland in one planning area.	Farmland
CA	Milpitas	Adopted a TDR program to redirect development away from a prominent hillside to a less conspicuous area that could not be seen from its downtown.	Specific Environmental
CA	Monterey County	Grants TDRs to landowners who record scenic easements on buildable lots within the Highway 1 scenic corridor of Big Sur.	Specific Environmental
CA	Moraga	Preserves hillsides by encouraging sending area landowners to transfer TDRs to receiving areas in the center of town.	Specific Environmental
CA	Morgan Hill	Encourages developers to preserve El Toro Mountain through an interjurisdictional program in which credits can be used to avoid the city's permit quota system as well as exceed baseline densities.	Specific Environmental
CA	Oakland	Allows developers to transfer density between abutting properties in order to preserve historic buildings and generally reduce development impacts	Urban Design and Revitalization
CA	Oxnard	Promotes the preservation of beachfront properties through a TDR program that offers a 6-to-1 transfer ratio and exemptions from selected fees as well as density bonus on the receiving sites.	Specific Environmental

STATE	Jurisdiction	Description/Purpose	Category
CA	Pacifica	Encourages the protection of coastal bluff tops by exempting developers from fees and other development requirements when they transfer TDRs from the sending area.	Specific Environmental
CA	Pasadena	Allows property owners to transfer development rights as a way of mitigating the economic effects of a 1984 plan which lowered height and density limits in the downtown.	Urban Design and Revitalization
CA	Pismo Beach	Uses TDRs in four Transfer Density zones to protect coastal bluff tops and mountains as well as increase open space and coastal access.	Specific Environmental
CA	San Bernardino County	Adopted a specific plan that allows development potential to be transferred out of lands designated as Development Sensitive due to steep slopes, significant visual land forms, geologic hazards or environmental sensitivity.	General Environmental
CA	San Diego	Adopted a TDR program for its Golden Hill District that allows development potential to be transferred from historic structures and used to achieve a density bonus in five receiving sub areas within the district.	Historic Preservation
CA	San Francisco	Preserves designated historic landmarks with a TDR program that makes the transfer of development rights the only way for developers to exceed density limits in the downtown.	Historic Preservation
CA	San Luis Obispo County	Operates one TDR program to protect the habitat of a rare pine tree and offers a second county wide TDR program that allows the owners of environmental areas, farmland and antiquated subdivisions to propose their properties as sending areas.	Rural Character
CA	San Mateo County	Allows development credits to be created when farmland owners combine contiguous agricultural parcels or build agricultural water impoundments.	Farmland
CA	Santa Barbara	Encourages developers to demolish larger, obsolete buildings and replace them with smaller buildings that comply with current codes for scale and design.	Urban Design and Revitalization
CA	South Lake Tahoe	Administers the Transfer of Existing Development Rights component of the Tahoe Regional Planning Agency within its borders, allowing development rights created by the removal of existing structures from Stream Environment Zones to avoid the permit quota s	Specific Environmental
CA	Tahoe Regional Planning Agency	Formed by the states of California and Nevada, uses four TDR programs to protect the clarity of Lake Tahoe, including a mechanism which allows TDRs created by the removal of structures in Stream Environment Zones to be exempt from building permit quotas.	Specific Environmental
CA	West Hollywood	Encourages the preservation and rehabilitation of historic landmarks.	Historic Preservation
CO	Berthoud	Preserves environmental areas and farmland under county jurisdiction using the proceeds of a density transfer charge required of every bonus unit achieved from the rezoning of land within the incorporated town.	Environment and Farmland
CO	Boulder County	Preserves rural lands through a countywide program as well as inter jurisdictional programs with the city of Boulder and seven other incorporated communities.	Rural Character
CO	Denver	Preserves and rehabilitates downtown historic structures by allowing development potential to be transferred to new downtown buildings.	Historic Preservation
CO	Douglas County	Encourages the preservation of open space with a TDR program requiring sending site protection and receiving site rezoning to occur concurrently.	Specific Environmental
CO	Larimer County and the city of Fort Collins	An inter governmental agreement in which the city agreed to delay annexation until the county had approved receiving area developments and retired TDRs from the county sending area.	Environment and Farmland

STATE	Jurisdiction	Description/Purpose	Category
CO	Mesa County	Protects environmental areas and farmland by creating TDRs when landowners deed restrict agricultural land, forests and environmentally sensitive areas for at least 40 years.	Environment and Farmland
CO	Pitkin County/Aspen	Allows only seasonal cabins on remote mining claims but permits owners to transfer development potential to Aspen, where TDRs can be used to exceed maximum floor area thresholds and building permit quotas.	Rural Character
CO	Summit County	Uses TDRs in four planning districts to maintain development limits and protect environmental resources, including open space and scenic vistas.	Specific Environmental
CT	Windsor	Uses TDR to appropriately locate development and preserve land with historic, ecologic, aesthetic, agricultural or recreational resources.	Specific Environmental
DC	Washington, D.C.	Uses TDRs to implement its downtown plan by preserving historic structures, promoting affordable housing and encouraging desirable uses including retail and art-related establishments.	Urban Design and Revitalization
FL	Alachua County	Preserves open space, agricultural land, recreation areas, sensitive environmental lands and wildlife habitat as well as the character of the Village of Cross Creek.	Specific Environmental
FL	Brevard County	Encourages the redirection of development away from barrier islands, beaches and oceanfront land by transferring TDRs to inland receiving sites under the same ownership as the sending sites.	Specific Environmental
FL	Charlotte County	Adopted a TDR program designed to preserve natural areas, historic landmarks and archeological/cultural resources.	Specific Environmental
FL	Clearwater	Encourages the protection of open space and environmentally sensitive land using a TDR program, which limits sending areas to an allocation rate of one TDR per acre.	Specific Environmental
FL	Collier County	Protects coastal islands, marshes and other environmentally sensitive land zoned Special Treatment, which overlays 80 percent of the County's land area.	General Environmental
FL	Dade County	Encourages developers to transfer development potential from the Everglades to the easternmost portions of the County though stringent requirements for on site development in the sending areas.	Specific Environmental
FL	Delray Beach	Uses TDRs as an incentive to preserve historic landmarks, conservation areas and land for public facilities.	Historic Preservation
FL	Hillsborough County	Encourages the preservation of environmentally sensitive land, historic landmarks, farmland, farm worker housing and waterfront access using a TDR program with a one-to-one transfer ratio.	Environment and Farmland
FL	Hollywood	Mitigates a reduction in beachfront development potential to preserve ocean views, protect coastal vegetation and keep future development within the capacity of the infrastructure system.	Specific Environmental
FL	Indian River County	Preserves wetlands and other environmentally sensitive areas using a TDR program with a 40-to-one transfer ratio.	Specific Environmental
FL	Lake County	Preserves water quality by allowing the owners of land near the Wekiva River sending area to transfer their development potential rather than build on site at densities of one unit per 20 or one unit per 40 acres.	Specific Environmental
FL	Largo	Offers economic relief by allowing landowners to transfer development rights from wetlands and floodplains, where development is prohibited.	General Environmental
FL	Lee County	Preserves wetlands using a TDR program in which developers are allowed some receiving site density through an administrative approval process and additional density though a public hearing procedure.	Specific Environmental

STATE	Jurisdiction	Description/Purpose	Category
FL	Monroe County	Reduced development potential on environmentally sensitive land but allows property owners to offer their land as TDR sending areas as long as the proposed receiving area is less ecologically significant.	Specific Environmental
FL	Palm Beach County	Used a $100-million bond to buy environmentally sensitive areas and is reselling the TDRs from these sending areas through its TDR bank.	Environment and Farmland
FL	Sarasota County	Preserves land in antiquated subdivisions, environmentally sensitive areas, farmland, open space, historic landmarks and barrier islands.	Specific Environmental
FL	St. Petersburg	Mitigates the effect of a Preservation Area zoning classification imposed on marshes, forests, mangrove swamps, hammocks, beaches and floodplains.	General Environmental
GA	Atlanta	Preserves historic landmarks by allowing transfers between proximate buildings as long as the combined development of the sending and receiving sites stays within zoning limits.	Historic Preservation
ID	Fremont County	Uses TDRs in three planning areas to preserve cropland, wetlands, wildlife habitat, stream corridors and scenic views.	Environment and Farmland
ID	Payette County	Preserves prime agricultural land, open space, wildlife habitat and rural character by allowing landowners to transfer development rights to receiving sites, which are parcels that do not qualify as sending sites.	Environment and Farmland
IL	Northbrook	Encourages development to avoid land near an abandoned landfill by allowing receiving area densities to more than triple.	Specific Environmental
KY	Clark County	Encourages the transfer of density from farmland to receiving areas zoned as Crossroads Community.	Farmland
LA	New Orleans	Allows property owners to preserve historic structures and transfer the difference in floor area between the existing landmark and the maximum density allowed on the sending site under current zoning.	Historic Preservation
MA	Falmouth	Allows TDR transfers from lands with coastal ponds, groundwater recharge areas and other resource lands that qualify for tax relief associated with development restrictions.	Specific Environmental
MA	Groton	Preserves farmland and environmental areas by allowing developers to use TDRs to exceed building permit annual quotas as well as baseline density.	Environment and Farmland
MA	Northampton	Allows the administrative approval of additional density in planned village zoning districts when projects transfer units from its Farms, Forests and Rivers Overlay District.	Rural Character
MA	Sunderland Township	Ofers TDR as an alternative to development in three special resource districts: Prime Agricultural, Critical Resource and Watershed.	Environment and Farmland
MA	Townsend Township	Offers receiving area developments exemptions from various development requirements as well as density bonuses when they incorporate TDRs that preserve land for passive recreation, conservation, forestry and natural buffers.	Environment and Farmland
MD	Calvert County	Preserves farmland with a program in which sending area owners apply to change their land to an Agricultural Land Preservation overlay zone that permits less on-site development but allows the creation of TDRs.	Farmland
MD	Caroline County	Allows receiving area developers to double density by using TDRs from agricultural sending areas.	Farmland
MD	Carroll County	County prohibits the development of land with mineral deposits, particularly Wakefield Marble, but allows owners to transfer TDRs from these sending areas.	Specific Environmental
MD	Charles County	Encourages the preservation of farmland through a program in which sending area landowners can build one unit per five acres on site or transfer development potential at the rate of one TDR per three acres.	Farmland

STATE	Jurisdiction	Description/Purpose	Category
MD	Harford County	Protects farmland with a TDR program that features a one-to-one transfer ratio and a 900 percent density bonus on receiving sites.	Farmland
MD	Howard County	Encourages the preservation of farmland by offering two TDR options with slightly different transfer ratios.	Farmland
MD	Montgomery County	Preserves farmland in the northern part of the county by transferring density to the southern part of the county, adjacent to Washington DC.	Farmland
MD	Queen Anne's County	Offers receiving area developments a 25 percent density bonus and a 25 percent open space reduction for using TDRs from sending areas in the Agricultural and Countryside zones.	Environment and Farmland
MD	St. Mary's County	Preserves farmland by allowing developers who use TDRs in their receiving area projects density bonuses of up to 300 percent and relaxation of other development requirements.	Farmland
MD	Talbot County	Offers TDR and a TDR-cluster mechanism to preserve sending areas with wildlife habitat, park sites and open space.	Environment and Farmland
ME	Brunswick	Allows receiving area developers to achieve density bonuses of up to 1500 percent by transferring development rights created by the protection of water quality, natural features and historic landmarks.	General Environmental
ME	Cape Elizabeth	Permits a 200 percent density bonus in receiving areas to developers who preserve TDR sending areas protecting agriculture, water quality, natural areas, scenic view, greenbelts and historic resources.	Environment and Farmland
MI	Traverse City	Preserves the historic buildings and open space of a former state hospital as part of a redevelopment plan.	Urban Design and Revitalization
MN	Blue Earth County	Preserves farmland, woodlands, natural habitat, scenic view, open space and water retention areas using a program that requires sending and receiving sites to be contiguous.	Environment and Farmland
MT	Gallatin County	Uses TDRs in two planning districts to preserve farmland and forest land and in a third planning district to create appropriate concentrations of development at the base of a ski hill.	Rural Character
NH	Lee Township	Allows the transfer of density between contiguous sites to preserve rural character, farmland, open space, forest, watershed and other significant natural resources.	Environment and Farmland
NJ	Bernards Township	Allows TDRs to be transferred from environmentally sensitive lowland sending sites to dryland receiving sites.	General Environmental
NJ	Chesterfield Township	Protects farmland using a TDR program with receiving areas that only allow affordable housing or public buildings without the use of TDR.	Farmland
NJ	Hillsborough Township	Preserves farmland and environmental areas with a TDR program that evolved from the downzoning of land at the periphery of the township.	Environment and Farmland
NJ	Lumberton Township	Protects rural character by administratively approving up to eight-fold density increases for receiving site projects that retire TDRs from land zoned Rural Agriculture TDR Sending Areas.	Rural Character
NJ	New Jersey Pinelands	Seeks, through a state-sponsored TDR program, to preserve unique ecology and specialty agriculture within a one-million acre planning area and requires transfers between 60 different jurisdictions.	Environment and Farmland
NJ	West Windsor	Preserves a private golf course which was proposed for conversion to a residential subdivision.	Specific Environmental
NM	Santa Fe County	Allows developers to exceed baseline in specified community planning areas by using TDRs created by the preservation of natural areas and scenic views adjacent to two highway corridors.	Specific Environmental
NV	Douglas County	Protects a 104,000-acre sending area in the Agricultural and Forest Range zones.	Environment and Farmland

STATE	Jurisdiction	Description/Purpose	Category
NY	Eden	Preserves farmland and environmental areas with a TDR program that features transfer ratios as high as 15-to-1 and administrative approval of TDR in receiving areas.	Environment and Farmland
NY	Long Island Pine Barrens	A multi-jurisdictional TDR program facilitated by the State of New York that is designed to preserve an important environmental area and the aquifer that supplies water to much of Long Island.	Specific Environmental
NY	New York City	Preserves historic landmarks, a historic seaport and live theater on Broadway.	Historic Preservation
NY	Perinton	Preserves natural areas, prevent soil erosion and protect open space, particularly undeveloped parcels that allow for the expansion of its extensive trail system.	Specific Environmental
NY	Pittsford	Offers receiving area developments up to 100 percent density bonus for placing conservation easements on agricultural, open space, scenic, ecological or historic properties.	Environment and Farmland
NY	Smithtown	Allows transfers between properties in common ownership in order to preserve wetlands and other environmentally sensitive land.	Specific Environmental
NY	Southampton Township	Continues to offer its internal TDR program to protect groundwater and other resources even though Southampton now also participates in the Long Island Pine Barrens regional TDR program.	Specific Environmental
OR	Portland	Preserves environmentally sensitive land in two planning districts and to accomplish various downtown planning goals including the provision of open space and single room occupancy housing.	Urban Design and Revitalization
PA	Birmingham Township	Encourages the transfer of density from agricultural and open space sending areas to receiving site parcels in planned residential or institutional zones and land approved for retirement communities.	Rural Character
PA	Buckingham Township	Preserves farmland with a TDR program in which the sending area was downzoned but landowners are allowed to sell development rights at the rate for on-site development permitted by prior zoning.	Farmland
PA	Chanceford Township	Allows development potential to be transferred from agricultural land of higher quality to agricultural land of lower quality.	Environment and Farmland
PA	East Nantmeal Township	Gives owners of farmland a choice between building on site at a density of one unit per ten acres or transferring development potential at the rate one TDR per two acres.	Farmland
PA	Hopewell Township	Allows TDRs to be transferred from higher quality to lower quality farmland.	Farmland
PA	London Grove Township	Offers owners of farmland a choice between building on site at a density of one unit per ten acres or transferring density at the rate of one unit per 1.5 acres.	Farmland
PA	Lower Chanceford Township	Encourages the preservation of land in its agricultural and conservation zones by allowing the transfer of development rights from higher quality to lower quality agricultural land.	Environment and Farmland
PA	Manheim Township	Allows the owners of downzoned farmland to sell TDRs at a transfer ratio of over 14 to one.	Farmland
PA	Peach Bottom Township	Allows TDRs to be severed from farmland that qualifies for development and transferred to receiving sites that are agriculturally undesirable or at least less desirable than the sending site.	Farmland
PA	Pittsburgh	Offers receiving area developments up to 100 percent density bonus for restoring and maintaining downtown historic structures and performing arts theaters for at least 40 years.	Historic Preservation
PA	Shrewsbury Township	Allows development potential to be transferred from farmland with superior soils to lands with inferior soils.	Farmland

STATE	Jurisdiction	Description/Purpose	Category
PA	Springfield Township	Encourages the preservation of land in its Conservation and Agricultural zones though a TDR program that offers sending area property owners a three-to-one transfer ratio.	Environment and Farmland
PA	Warrington Township	Promotes the preservation of farmland by allowing sending site owners to transfer one TDR per three acres permanently preserved or one TDR per four acres protected for 20 years.	Farmland
PA	Warwick Township	Allows receiving area lot coverage to increase by 4,000 square feet for each TDR transferred from sending area parcels within the Agricultural Zone	Farmland
PA	Washington Township	Allows receiving sites density bonuses of up to 400 percent for preserving sending sites in the Agricultural District.	Farmland
SC	Greenville	Allows transfers on Paris Mountain to allow optimum development locations while limiting overall building to a limit that can be accommodated by the two-land road that serves this environmentally-sensitive district.	General Environmental
TX	Dallas	Encourages the preservation and rehabilitation of historic landmarks in its West End Historic District with a TDR program that provides administrative approval of a 4-to-1 floor area ratio bonus anywhere in the downtown.	Historic Preservation
TX	San Marcos	Allows density to be transferred to any residential zone in return for preserving floodplains, habitat and land with steep and erodible slopes along the San Marcos and Blancos rivers.	General Environmental
UT	Mapleton	Preserves its foothills by allowing sending area landowners to transfer TDRs to two receiving areas.	Specific Environmental
UT	West Valley City	Encourages the preservation of sending areas with wetlands and other environmental resources as well as potential for trail development.	Specific Environmental
VA	Blacksburg	Allows developers to proffer the preservation of natural areas and farmland when applying for a zone change that increases maximum density from one unit per acre to two units per acre.	Environment and Farmland
VT	Jericho Township	Allows the transfer of density from farmland and open space to receiving areas zoned for village scale development.	Environment and Farmland
VT	South Burlington	Preserves land in restricted areas limited to farming, forestry, recreation and open space.	Environment and Farmland
VT	Williston	Preserves potential parkland, conservation areas and open space using a TDR program with a negative transfer ratio based on the fact that development constraints prevent sending site owners from achieving nominal on-site density.	General Environmental
WA	Everett	Allows its Planning Director to administratively grant a transfer of development potential as a way of mitigating possible impacts from regulations imposed within Environmentally Sensitive Areas.	General Environmental
WA	Island County	Preserves farmland, originally offering a transfer ratio of 20-to-1 and receiving areas density bonuses of up to 2,900 percent.	Farmland
WA	King County	Allows inter jurisdictional transfers between agricultural and environmental sending areas in the County and receiving areas within Seattle, Issaquah and other cities willing to participate.	Environment and Farmland
WA	Redmond	Allows receiving area developments increases in surface coverage, elimination of park requirements and the ability to exceed maximum parking limits by using TDRs from sending areas with farmland and critical habitat.	Environment and Farmland

STATE	Jurisdiction	Description/Purpose	Category
WA	Seattle	Preserves and rehabilitates historic landmarks (particularly landmark theaters), provide affordable housing and promote appropriately-scaled infill development.	Urban Design and Revitalization
WA	Thurston County	Seeks to preserve farmland by transferring development rights from rural land under county jurisdiction into receiving areas within the incorporated cities of Lacey, Tumwater and Olympia.	Farmland
WA	Whatcom County	Protects the watershed of Lake Whatcom, which provides drinking water for over half of the county's population.	Specific Environmental
WI	Summit Township	Encourages the preservation of farmland and environmental areas by allowing density transfers at a one-to-one ratio.	Environment and Farmland
WI	Waukesha County	Allows land in four zoning districts to serve as sending or receiving sites as long as prime farmland and environmentally sensitive areas are preserved.	Environment and Farmland
WY	Teton County	Offers a one-to-one TDR transfer ratio in an effort to preserve environmental resources, wildlife habitat, scenic corridors and rural character.	Specific Environmental

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