



PDR programs affect landowners' conversion decision in Maryland

PDR programs pay farmers to give up their right to convert their farmland to residential and other non-farm uses. Does having the option to enroll in such a program affect the a landowner's conversion decision? Does it encourage land conversion or delay it? And if a farmer does enroll in a PDR program, will the decisions of neighboring landowners be affected? Dr. Towe at the University of Maryland finds out.

AT A GLANCE

- Purchase of development rights (PDR) programs provide a landowner with cash payments or tax benefits in exchange for their land conversion rights (often called development rights); after selling their development rights, i.e. enrolling in a farmland preservation program the land can never be converted to residential, commercial, or industrial uses even if the land is sold to a new owner.
- In Howard County, the PDR program enrolled about 16,000 acres between 1980 and 2001, about 30% of the farmland in 1980 and 10% of the county's total acreage. As of 2012, 21,637 acres of land in Howard County have been permanently preserved.

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If there is already a house on the land, probably occupied by the landowner, there is a 78% lower chance that it will be converted to a subdivision compared to farmland without a farmhouse.

Introduction

Ex-urban and suburban housing development comes at the cost of converted farmland, decreasing open space and altering the environment. While landowners have the right to convert their land to housing or other development up to the legally permitted density, this conversion is often not what society would find the highest and best use. In many areas, communities would like to keep farmland and other types of open space

for their environmental, agricultural, cultural and amenity benefits. As such state and local governments develop general plans to manage the pace and pattern of housing development and the conversion of agricultural land. While counties have utilized zoning and other regulatory measures, they have also implemented programs to provide incentives to landowners who choose what the local community might deem the socially desirable land use option. One such voluntary and incentive based

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- Preserving land does increase the conversion of neighboring parcels due to the desirability of being next to permanently preserved open space.
- When returns from development become more uncertain, farmers are less likely to convert the land.
- Having the option to preserve farmland delays land conversion by about six years; not all farmers enrolled their land in the PDR program but having this choice slowed conversion.
- This six-year delay allows governments to improve infrastructure for higher density development; do more planning to re-orient growth or implement growth control measures: and raise more money to preserve farmland. These might also give further incentives to delay development of farmland.

program is a purchase of development rights (PDR) program under which landowners remove their rights to develop their land for perpetuity.

These voluntary-enrollment programs apply conservation easements to the farmland property that restrict the current and all future owners from converting the farmland into residential, commercial, or industrial use. The owner is compensated with cash payments and/or income and estate tax benefits for the lost opportunity to develop.

Because these programs are fairly expensive, averaging \$2,000 per acre nationally, the government wants to evaluate how efficient they are. Do they actually slow conversion of farmland? Liu and Lynch found they did on a county level, see Research Brief, 1(12) <http://agresearch.umd.edu/CANRP/CurResearch/index.cfm>. But what about at a local level; do they have unintended consequences? It is possible that they make the land next to preserved farms more desirable for housing consumers. Who would not want to live next to a farm that will stay open space forever? The presence of permanent open space is appealing to homeowners, so housing prices next to the open spaces are higher than they would be without the preserved land. This gives farmers more incentive to

sell their land to developers as the price of their land increases. Thus preserving some land can actually cause an overall increase in farmland conversion.

Various studies have been done on such topics, but how does the mere existence of a PDR program affect the decision to sell land to developers? Even if a landowner eventually chooses not to preserve the land, having the option to sell their development rights may delay the decision to convert. Dr. Charles Towe of the University of Maryland and his coauthors, Drs. Cynthia J. Nickerson and Nancy Bockstael, study the effect that the existence of a PDR program has on the timing of conversion.

Most studies involving land preservation assume that a property will be sold for development as soon as the landowner has more to gain from developing than she receives from farming the land. This assumption ignores two things: the irreversibility of the decision and the uncertainty of the return from development. If an investment can be reversed in the future, as one can both buy and sell a stock, there is less reason to delay the investment, but once a property has houses constructed on the farmland, the landowner cannot return the land to farming without a huge cost.

- As of May 2011, 25 states have state-level purchase of development rights (PDR)/purchase of agricultural conservation easement (PACE) programs. In addition, 88 local government entities in 20 states have established PDR programs.
- These programs have protected 2.56 million acres at a cost of \$7.15 billion.
- Maryland and New Jersey are spending \$10.73 per capita and \$11.43 respectively. Others spend much less (\$0.00) per capita.

Source: American Farmland Trust, Status of State PACE Programs, July 2011 and Status of Local PACE Programs, August 2010

Uncertainty also makes the decision to convert the land harder. If returns are increasing, the landowner could wait to receive the higher return in the future. If returns are highly uncertain, the landowner could wait to get a better sense of what the actual return to housing development would be. However; a landowner may fear that other farmers will develop first and receive a high returns, in which case competition may counteract the uncertainty. To add more complications, a landowner's decision is more likely to be delayed if the landowner has multiple options, especially if the options offer similar returns or one offers more certainty. Irreversibility and uncertainty, therefore, result in waiting to see and gathering more information.

The decision to convert can be viewed as a “whether or not” decision and one can determine how the attributes of each property affect the conversion decision. However, as the land market and other aspects of the landowner's world are ever-changing, the timing of the conversion decision is also of interest. Thus, one can examine the rate of land conversion as it is affected by the property's eligibility for preservation, the rate of change in expected returns to development, and the uncertainty of returns to development.

If the probability of conversion stayed constant over time, it would not be important to consider the timing of development. As time passes, however, some agricultural properties do become subdivisions, leaving less land available for development. One would think, therefore, that the probability that

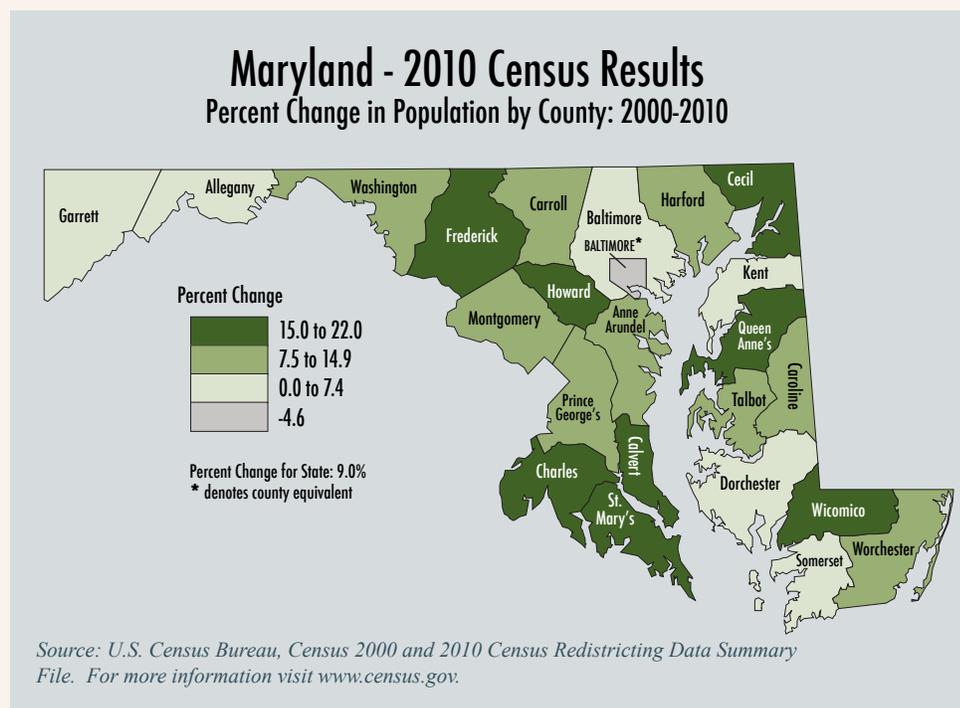
any given remaining property would be converted would increase, simply because there are fewer properties on which developers could build. On the other hand, the best land for housing may have been converted first, so the remaining properties may have a much lower probability of being converted.

Dr. Towe and his co-authors assembled a data set of properties in Howard County to study the land conversion decision. The eastern part of Howard County is well-developed, but the western side is mostly farmland. Because of Washington, D.C. to the south, Baltimore City to the east, and Frederick, MD to the west, many housing consumers find Howard a desirable place to live and as such

developers may seek to convert the remaining farm land.

Neighboring counties passed regulations in the 1970's that decrease the number of houses permitted on land used for agriculture or forestry. This makes it less profitable to convert land out of agricultural use, restricting urban expansion. Fewer houses per acre may result in lower profit for developers in neighboring counties. So, developers are more likely to be interested in properties in Howard County. Instead of focusing on downzoning to slow the conversion of agricultural land, Howard County established a PDR program in 1980 to allow farmland owners to voluntarily preserve their land and restrict its development.

Figure 1:
Percent Change of Population



Howard County has higher density zoning in its rural tier that many other counties at one house per 3 to 4.25 acres compared to one house per 25 acres or more. It saw high population growth between 2000 and 2010.

Between 1980 and 2001 the program enrolled about 16,000 acres, which was about 30% of the 1980 farmland acres and 10% of the county's total acreage. Over the same period, about 20,000 acres were developed.

To be eligible for the county PDR program, a property must be at least 50 acres, or be 20 acres and adjacent to other preserved land. The property must also meet minimum soil qualifications making it productive as agricultural land, and must satisfy the criteria to legally subdivide the land. The PDR program offers an easement price determined by a formula based on property characteristics. Landowners can figure out the price they will receive to a high degree of accuracy. However, the program has a limited budget and cannot always accept everyone who would like to enroll.

The landowner considers several elements when making the decision of when to develop his land. First he considers the return he or she will get from the sale to a housing developer, which is based on property and neighborhood characteristics and regional demand for new housing. Examples of these characteristics include commuting costs to Baltimore, MD and Washington, D.C., surrounding land use, area population density, and the rate of development in the region. Zoning regulations also affect the possible returns to development. Second, the landowner will consider the expected agricultural returns on the property, determined by the soil quality and size of the property. If the development returns are low or the expected agricultural returns are high, a landowner is less likely to convert the land.

The landowner will also consider the costs of development. Costs increase if the land is steeply sloped, if the roads in the area are of low quality, if heavily forested, and if it has inadequate sewers or septic systems. There are also transaction costs associated with the time it takes to get from the beginning of the development process to the sale of the lots. Finally, a landowner needs to consider local regulations such as the adequate public facilities moratoria (APFOs), which halts residential development if schools become overcrowded.

Previous studies have suggested that this is all the landowner thinks about when making the conversion decision, but Dr. Towe and co-authors argue that just the presence of a PDR program may affect the timing of the decision. If a property is eligible to sell an easement, and the Howard County budget can afford it, then the landowner has the option to sell the development rights to the county.

Dr. Towe finds that if an additional 1% of surrounding land is preserved, the rate of development increases by 3.2-3.6% which he attributes to the higher desirability of the land near permanent open space (people are willing to pay more for these properties); similarly, if there are legal requirements to maintain open space on the developed land, the rate of development increases. An increase in the proximity and number of nearby roads also increases the rate of development because of lower construction costs and the appeal to homeowners of having road access. Larger properties and a higher number of lots per acre also increase the rate of development.

It sounds like everything speeds up development; does anything slow it down? Planned sewer expansions cause landowners to wait. Following such an expansion farmers would get a higher price for the land because sewer access would lower the cost of development. If there is already a house on the land, probably occupied by the landowner, there is a 78% lower chance that it will be developed compared to land without a house. Uncertainty regarding the returns to development also slows conversion, at least on

The Howard County Easement Price Increases with:

- the size of the lot
- the soil quality
- the road frontage
- adjacency to preserved land
- the viability of future agriculture on the land
- the history of sustained agriculture on the land
- the presence of significant natural resources
- the absence of erosion or drainage problems





Dr. Charles Towe



PHOTO: EDWIN REMSBERG

A landowner needs to consider many things when choosing to preserve or develop land, and sometimes there can be conflicting forces. For example, costs to develop increase if the roads in the area are not paved or of poor quality slowing development, but in Howard County, lack of road frontage may also lower the easement price offered by the PDR program making that option less attractive.

properties that can only develop into a small number of lots (less than 11 lots). Such uncertainty seems to speed up development on properties with a higher lot capacity, however; fear of downzoning and competition among the limited number of properties of this type that remain in Howard County probably account for this effect.

What about the PDR question? i.e. how does the presence of a PDR option affect development? Towe finds that such an option significantly delays land conversion, slowing the development rate by at least 50%. The median time to conversion for properties with an easement option is twenty to forty-six years depending on the size (shorter for larger properties), compared to fourteen to forty-one years for properties that can't enroll in the PDR program. Towe determines that the existence of a PDR program accounts for a six year delay on average in Howard County.

Although six years might be lower than a local government would hope, the finding does imply that in an area

with less development pressure, a PDR program may have benefits beyond those gained from the properties that enroll in the program. In such an area, even properties that eventually develop may not convert as soon as in other areas because of the easement option. In addition, the program can impact the delay length. The closer the easement value is to the market price of the land, the longer the delay will be. Even a few years delay can help if a local government is struggling to build roads in time or if the government wants to enact down-zoning regulations before too much land is converted. Towe and his co-authors conclude, therefore, that PDR programs may confer benefits beyond just the land that is preserved by delaying the conversion of land that is eventually developed. ■

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