The Effects of Conservation Easements on Housing Prices and Development

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Abstract

Conservation easements are a commonly used tool to permanently conserve land with environmental and social importance. While they have the ability to provide local amenity value to nearby properties, conservation easements exist in perpetuity which ensures they will never be developed, potentially exacerbating housing shortages. I examine the effect of conservation easements on nearby properties using a nationwide dataset of over 34 million repeat sales of residential properties across 30 years. I find that conservation easements increase nearby property values on average between 0.35 and 1.32 percent. Homeowners particularly value easements for recreation purposes and those held by government agencies. These results are mainly driven by sales in metropolitan counties. I also find that at the county level, conservation easements have a small but significant effect in reducing new development, which is more pronounced in counties that are more developed. These results illustrate the value provided by permanent land conservation but also the role that land use restrictions play in local development.

Introduction

Permanent land conservation is an increasingly important tool used to protect environmentally beneficial land and ensure it is not lost to external threats like development or deforestation. In the last few decades, conservation easements have become a popular way to permanently conserve land. Conservation easements are a voluntary way for private landowners to conserve their land in perpetuity, which makes them an attractive alternative to land use regulations. Their popularity helps explain why Congress has allowed federal tax deductions on donations since the 1970s and why some states offer generous tax credits.

However, they are not without their critics. Opposition to conservation easements raise concerns over their erosion of local tax bases due to their role in lowering encumbered property values, especially in rural communities (Kalinin et al., 2023). On top of that, tax deductions that easement donors are entitled to reduce the ability of federal and state governments to fund other publicly beneficial programs. In 2019, easement donations totaled 8.5 billion dollars, many of which come from households that face high marginal tax rates.[1] Given the large amount of forgone tax revenue, skeptics question the additionality of many of these easements, concerned that money is being lost protecting land that is under no external threat. Lastly, easements exist in perpetuity which means that efficiency in land use may be lost as cities, towns, and villages grow and evolve, potentially exacerbating issues with housing shortages.

The main goal of conservation easements is permanent land conservation of environmentally beneficial land. However, their ability to play an important role in local housing markets increases their prominence in discussions over public policy. There is a big concern that easements are and will continue to affect affordable housing. Home ownership has become increasingly difficult as real estate prices skyrocket relative to wages which has coincided with surges in mortgage rates. This has coincided with a push by many groups for further conservation of wetlands, forests, wildlife habitats, and working farms, among

[1] https://www.irs.gov/statistics/soi-tax-stats-individual-noncash-charitable-contributions

others. This was reflected in previous governmental policy initiatives, such as President Biden's executive order aiming to conserve 30 percent of America's land by 2030 (Parker and Thurman, 2019).

Public policies toward conservation easements affect the extent to which private landowners have a financial incentive to permanently conserve land through donating or selling a conservation easement. Having this credible option affects how many easements are in an area, which can affect land development, land prices, and housing prices in the locale. The way that development and prices are affected results from the interplay between how nearby property owners value that land being permanently conserved and the local housing supply and demand conditions. Mainly, conserving land reduces the supply of housing through development restrictions and increases demand through individuals willingness to pay for the land's amenity value.

The level at which prices are affected provides information on the additionality of the land being placed in easement, as conservation easements do not change how the land is used, but instead provide assurance over its future use. If a prospective home buyer does not believe that the land is under threat of development, he would be unwilling to pay more if it were permanently conserved, even if the land provides a valuable amenity. Furthermore, if a conservation easement directly increases housing scarcity, the resulting price increase from a restriction in local supply reveals the additionality of that conservation easement.

Background

Conservation Easements

Governments have long acted to protect land from development, sometimes through direct acquisition and other times through land use regulation. However, less centralized, incentive based approaches are becoming more common across the globe. The United States' system of preferential tax treatment toward conservation easements held by government

organizations and land trusts — which are private, nonprofit organizations acting to conserve land — is a leading example of decentralized conservation. In it, the government's main role is to set tax policy and let landowners determine the quantity and patterns of permanent conservation (Parker and Thurman, 2019).

Conservation easements are voluntary form of land use zoning. They are legally binding agreements through which landowners permanently give up rights to subdivide and develop their land but still retain certain rights, some of which include the right to farm or harvest timber (Rissman et al., 2007; Parker, 2004). So long as the agreement maintains the land's conservation value, each easement can be written differently and be unique to the property. Public access is not necessarily granted and additional preservation efforts are typically not present, but both can be if the owner chooses to. A conservation easement exists on the property in perpetuity and is passed along when the current owner sells or gives away the land. The organization that holds the easement is responsible for stewarding the land forever, ensuring the terms of the easement are being followed.

Because conservation easements encumber the property they are placed on, the value of that land is usually reduced by some amount. This decrease in value can be claimed as a noncash charitable contribution which entitles the donor to tax deductions, and in some states an income tax credit. The fair market value of the donation is calculated as the difference in value between the encumbered and unencumbered property's value. This difference in values is calculated on the entirety of the property owned by the individual and not just the portion under easement. A completely accurate appraisal is very difficult, but is theoretically the net present value of the difference in future income streams. If the property has a high development value, the value of the conservation easement will be higher given the rights that it forfeits than if it had a low development value.

According to the National Conservation Easement Database, the amount of U.S. land under easements has increased from 13 million acres in 1992 to nearly 37 million acres in 2022 (Table 1). This growth far outpaces that of land set aside in national and state parks

and the number of acres owned outright by land conservancies. The growth of easements has been enabled by broad bipartisan support. On one side of the aisle, private land trusts and the decentralized decision making that allows landowners to make their own choices regarding conservation are viewed very favorably. On the other side, conservation easements are seen as an effective tool for conservation that complement traditional government-led approaches. Because of this broad support, in recent years, federal and state politicians have added or extended tax benefits to those who donate easements, thereby accelerating their growth (Parker and Thurman, 2018).

Table 1: Growth in Easements by Purpose in the United States (in acres)

	1992	2002	2012	2022
Environment	4,974,437	8,031,977	12,535,440	14,023,845
Farm and Ranch	668,804	1,329,768	2,842,201	3,497,350
Forest	778,237	1,192,901	2,664,699	2,898,657
Recreation	750,367	814,609	984,867	1,010,769
Other/Unknown	6,152,014	8,476,178	12,574,729	15,488,962
Total	13,323,859	19,845,432	31,601,936	36,933,465

This does not mean conservation easements are free of critics. Of particular interest here, easements are sometimes criticized for changing real estate and public finance dynamics in adverse ways, and can do so through a single individual's choices without regard for broader public welfare. Land that is protected through conservation restrictions or under ownership by public and nonprofit organizations is frequently taxed at lower rates than developed or unprotected land. Critics of new land protection worry that this may lead new conservation easements to erode local property tax bases and shift the tax burden to other landowners or lower the quality of public services in the area. Kalinin et al. (2023) for example, explain local opposition to President Biden's 30 by 30 executive order on these grounds, and they highlight media reports on how taking conservation land off tax rolls can increase burdens on homeowners which places the conservation on their expense.

The Value of Conservation

Undeveloped land which has limitations placed on its use and development through conservation has been shown to have a lower value than unencumbered land (List et al., 2006). With strictly fewer options available to landowners, conserved land is less desirable and therefore of lesser value. These results, however, require the conservation mechanism in place to have regulatory bite. In the case where that is not true, potential property buyers will not value conserved land any differently than unencumbered land (Mamun et al., 2024). The contract specified within the conservation easement requires oversight by the agency holding the easement to ensure compliance. While this poses a potential principal-agent problem, land trusts are nonprofit organizations with a perpetual obligation to enforce compliance, and therefore have little incentive to shirk this duty. Furthermore, land trusts can go through an accreditation process to better signal to donors that they are good stewards of the land they are in charge of. With this promise of oversight, conservation easements are likely to decrease the value of land they are placed on and maintain its conservation value in perpetuity.

While land encumbered by conservation restricts the rights afforded to its owner, it provides value to nearby landowners through natural beauty and the assurance that the open space conserved will remain in that state permanently. This assurance is incredibly important to landowners, as noted by Geoghegan (2002), who found that the positive effect of living near permanently conserved agricultural and forest land is far greater than its developable counterpart. This positive effect of nearby open space has been reiterated by studies from Anderson and West (2006) and Acharya and Lewis (2001), and the effect of permanent conservation has been shown to be higher and propagate farther than impermanent conservation (Fernandez et al., 2018; Chamblee et al., 2011; Irwin, 2002). Conserving farmland also increases nearby property values (Geoghegan et al., 2003) and has its own additional benefits by ensuring farmland is not destroyed, which is argued to ensure prolonged food availability. Farmland is a limited resource, which once destroyed, is unable to easily

be returned to its original use. These benefits are only marginally realized in local areas, however, nearby property owners can derive value in being assured over the land's future use.

Although conservation easements are a common tool for land trusts to use to help meet their conservation goals, many government programs exist to pay landowners to place their land in easement. Instead of simply allowing the easement to be donated, some programs compensate landowners directly for the loss in land value from a conservation easement. This helps government agencies achieve a variety of conservation goals, including conserving farmland, forestland, and riparian systems. By acres, the biggest government payment programs for permanent conservation easements include the Wetlands Reserve Program, Grasslands Reserve Program, Forest Legacy Program, Emergency Watershed Protection Program which together make up 7.3 percent of all conservation easements.

Given that many options exist for both government and privately led conservation efforts, privately donated conservation easements are often criticized for being non additional. With limited funds, agents should spend money where it will have the biggest impact — in locations with high conservation value that is also at risk of being lost, usually from development. Many are concerned that some privately donated easements happen for the tax incentives, and without proper screening or appraisal, could result in low-quality land being donated that may not have any threat of being lost to development. Past studies on this matter have shown small but significant evidence of additionality. Grassland easements in the Northern Great Plains have been shown to be additional at rate of 0.28% per year (Claasen et al., 2017). For farmland easements in New England, this rate is 0.0067% per year (Malakoff and Nolte, 2023), and for forestland in Massachusetts, easements prevent forest loss at a rate of 0.04% per year and development at around 0.03% per year and are mainly driven by urban development pressure and income differences (Nolte et al., 2019).

This paper builds on previous analyses regarding valuing permanent conservation, specifically work done by Chamblee et al. (2011) and Geoghegan (2002) on conservation ease-

ments. I add to the literature by conducting a nationwide study on the effect of conservation easements and using this to understand their additionality. I also examine the heterogeneity of this effect, breaking it down by type and location, and study how conservation easements affect development within counties. This methodology will not only aim to characterize the amenity valuation that has been looked at in the past but on a larger and broader scale, but will also consider knock-on effects in the form of changes in development, which inform the extent to which conservation easements play a role in affordable housing.

Data

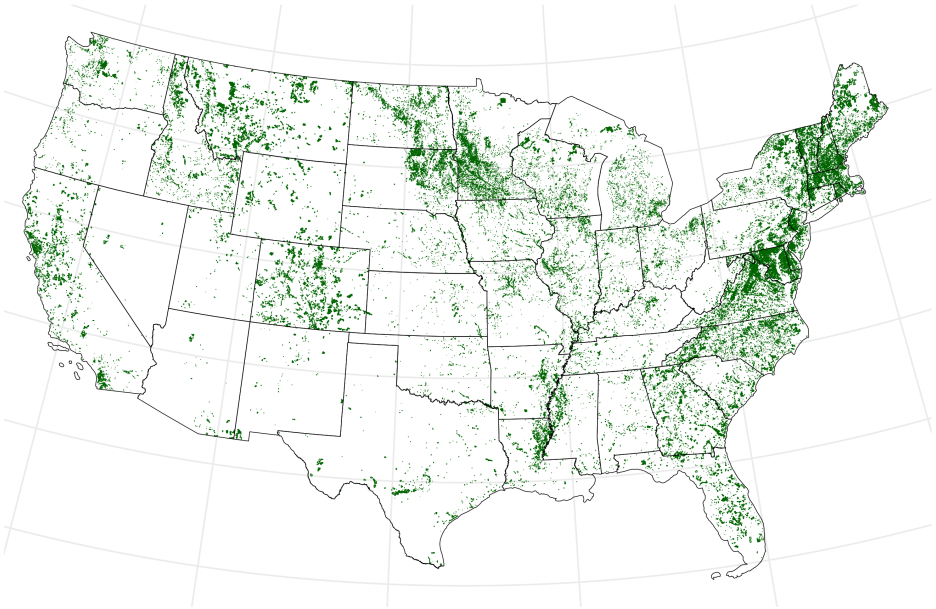
Conservation Easements

For data on conservation easements, I have access to the National Conservation Easement Database (NCED) which represents a collaborative effort between land trusts, landowners, and government agencies. The NCED is the most comprehensive nationwide dataset available on conservation easements. It indicates an easement's geographic coordinates along with a polygon usable in geospatial software, holder (name of land trust or public agency), current use of land, year established, and other informative descriptors. While reporting data on easements is not required, the NCED is created through collaboration with public and private land trusts so that it may be as complete as possible and includes easements as far back as 1876 up to 2022. A summary of conservation easements by type is shown in Table 2 and a nationwide map of all conservation easements in 2022 is shown in Figure 1.

Table 2: Summary of Conservation Easements in the United States

Purpose	N	Total Acres	Mean Acres	Std. Dev. Acres	Min. Acres	Med. Acres	Max. Acres
Environment	87,354	14,024,216	161	2,217	0.00	17	313,392
Farm	29,689	3,497,885	118	492	0.00	58	32,947
Forest	17,824	2,898,878	163	4,085	0.00	21	357,935
Recreation	6,013	1,010,845	168	1,954	0.00	5	81,011
Other	66,216	15,501,640	234	1,527	0.00	22	130,489
All	207,096	36,933,464	178	2,098	0.00	23	357,935

Figure 1: Conservation Easements in 2022



The largest single program for easement acquisition is the Wetlands Reserve Program (WRP), which makes up over 8 percent of total easement acreage. Other large federally operated programs that purchase easements include the Grasslands Reserve Program (GRP), Forest Legacy Program, Emergency Watershed Protection Program (EWPP), and Farm and Ranch Lands Protection Program (FRPP). While federal programs that buy easements make up a significant fraction of the overall acreage of conservation easements, land trusts play a large role in stewarding conservation easements acquired through either donation or direct purchase from private landowners. A full breakdown of easements by the combination of holder and owner is shown in Table 3.

Table 3: Easement Acres by Holder and Owner, 2022

	Private Owner	Government Owner	Unknown Owner	Total
Private Holder	9,910,305	819,894	2,346,335	13,076,534
Government Holder	11,497,642	5,772,198	5,955,894	23,225,734
Unknown Holder	118,197	33,692	479,308	631,197
Total	21,526,144	6,625,784	8,781,537	36,933,465

Property Data

Data on easements is then be paired with land and housing values. I have access to Multiple Listing Service (MLS) property sales data and property appraisal data from the vendor Core Logic, to which we have full access through a University of Wisconsin site license. This database contains information on millions of property sales nationwide between 1992 and 2022 as well as vacant land and farms (prices, locations, land and house characteristics) across multiple decades, along with historical annual data on characteristics of the near universe of residential home parcels in the country. Using this dataset alongside the NCED data, I construct a panel of data of sales of developed, residential properties in 44 states [2] within the United States from 1992 to 2022 and if the sale occurred within a set distance of an established conservation easement. Residential properties are considered to be single family residences, apartments, condos, mobile homes, multi family residences, or townhouses.

Properties are considered to be treated if the nearest conservation easement is within 2,000 meters at the time of the sale. This distance was chosen as it is in line with other treatment distances used in open space amenity capitalization studies (Geoghegan et al., 2003; Acharya and Lewis, 2001). I further break this treatment category down into 0 to 500 meters, 500 to 1,000 meters, and 1,000 to 2,000 meters to examine the effect of treatment distance. In this case, a property would be "treated" in the 500 to 1,000 meter group if the nearest easement was between 500 and 1000 meters. A property is considered to be untreated if the nearest conservation easement is over 2,000 meters at the time of the sale. Properties near conservation easements with no establishment date are dropped, which total 7.8 percent of observations. A summary of observations, prices, number of easements, and fraction of observations in metro counties broken down by treatment group is shown in Table 4.

[2] Alaska, North Dakota, New Mexico, Utah, and Wyoming were omitted due to insufficient parcel sale information. Hawaii was omitted due to the lack of conservation easements across the state.

Table 4: Summary of Treatment Groups

	0m-500m	500m-1,000m	1,000m-2,000m	Over 2,000m
Sales (N)	1,009,220	1,311,522	2,774,862	29,691,150
Properties	489,064	652,785	1,374,058	12,062,170
Mean Sales per Property	2.1	2.0	2.0	2.5
Mean Price	$536,869	$479,450	$449,604	$372,380
Median Price	$407,156	$362,690	$339,875	$269,005
Mean Easements within 500m	1.59	-	-	-
Mean Easements 500m-1,000m	1.31	1.49	-	-
Mean Easements 1,000m-2,000m	3.47	2.20	1.9	-
Mean Acres within 5,000m	745	548	413	46
Share in Metro	0.95	0.94	0.93	0.93

Empirical Strategy

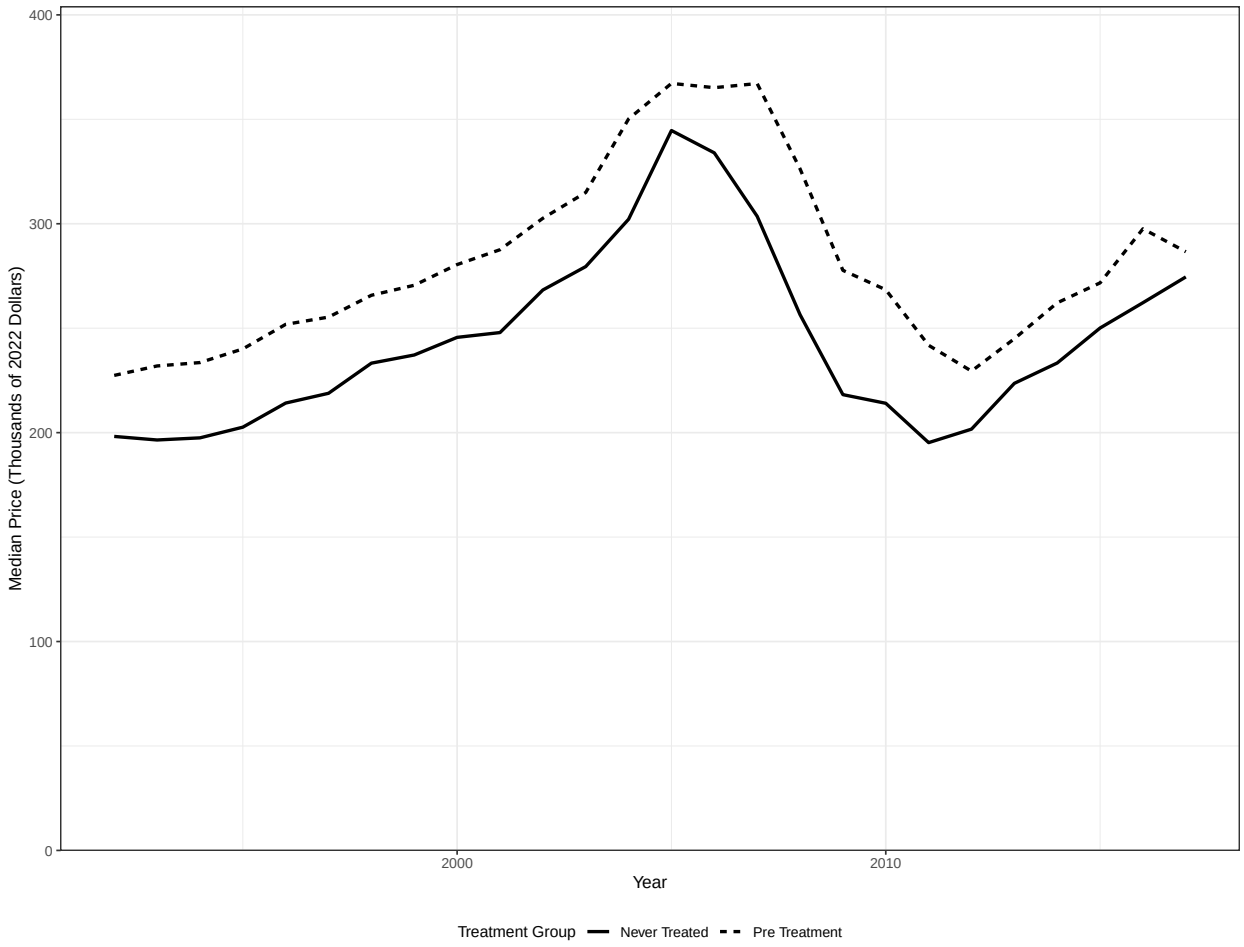
The theory for this analysis stems from a traditional hedonic pricing model. This type of model highlights how property prices embed house and land characteristics like square footage, number of bedrooms, acreage as well as neighborhood characteristics like school or public utility quality. Other contributing factors are likely to include environmental conditions — permanent conservation in this context. Hedonic price analysis can be used to isolate the influence of conservation easements by accounting for all other factors that contribute to a property's sale price. This theory and methodology is well developed in environmental economics.

Estimating the effect of easements on nearby properties requires considering many competing effects. To achieve this, I conduct a property market analysis that builds from the notion that prices are a function of property attributes. With the data I have in hand, I am able to fully account for housing characteristics through property level fixed effects. I account for annual neighborhood characteristics through county-by-year fixed effects. My model is similar to a typical difference-in-differences model with staggered treatment. Treatment is defined as being within a set distance of an easement in years following the easement's establishment. The first difference in this model is the difference in price between treated

properties before and after treatment and the second difference is the difference in price between control properties before and after treatment. County-by-year fixed effects account for any county level differences over time.

This model makes several identifying assumptions. The first is parallel trends between never treated and pre-treatment groups. I show prices for both groups moving together (Figure 2 and minor discrepancies between groups are accounted for using strong fixed effects. The next set of assumptions is constant and permanent treatment effect and independence of treatment timing. While there are well documented ways to account for these, most notably Callaway and Sant'Anna (2021), Sun and Abraham (2021), and de Chaisemartin and D'Haultfœuille (2020). However, estimating treatment effects using these methods is not possible due to computational limitations given the unusually large and complex dataset utilized in this study. Instead, I argue that given the nature of conservation easements, timing of treatment and length of treatment are irrelevant for their effect. A conservation easement is a perpetual agreement that permanently restricts development. Therefore, timing should not affect treatment and this effect should be constant and permanent. Lastly, this model assumes constant residential composition. As discussed by Kuminoff and Pope (2014), this is necessary for models that rely on panel variation, as a change in residential composition changes the price function which can bias the estimated treatment effect.

Figure 2: Median Price of Pre Treatment and Never Treated Sales (1992-2017)



To estimate the effect of easements on nearby property prices, I use the following primary specification:

$$ln(P_{ijt}) = \sum_{k=1}^{3} \beta_k D_{k,ijt} + \delta_i + \lambda_{jt} + \upsilon_t + \varepsilon_{ijt} \tag{1}$$

which predicts the price P_{ijt} of property i in county j during year t where $D_{k,ijt}$=1 if a property sale occurred with the nearest conservation easement located within one of three set distance-based concentric donuts around an easement and 0 otherwise ($D_{1,ijt} = 1$ if the property sale was within 500 meters of an easement, $D_{2,ijt} = 1$ if it was between 500 and 1,000 meters, and $D_{3,ijt} = 1$ for between 1,000 and 2,000 meters). Fixed effects for

property, county-by-year, and quarter of year are given by δ_i, λ_{jt}, and υ_t respectively. These fixed effects account for the variance in housing characteristics as well as time dependent neighborhood characteristics that may affect housing prices and seasonality of the housing market. The estimated β_1 through β_3 are strictly the amenity effect, predicting the impact on price of a property sale being within up to 2,000 meters of a conservation easement and how this estimated effect changes with distance.

Results

The amenity effect described in the previous sections is estimated using Equation 1, and the estimated coefficients of the model are shown in column 1 of Table 5. Standard errors are clustered at the property level to account within property correlation in unobservables. There is significant evidence of an amenity effect for for properties sold within 2,000 meters of a conservation easement. This amenity is smallest for properties within 500 meters at a 0.35 percent increase. The effect then increases for properties from 500 to 1,000 meters at a 1.32 percent increase in price and falls slightly for properties 1,000 to 2,000 meters at a 1.27 percent increase.

When also accounting for the number of easements within these distances from sold properties, the estimated effect of more conservation easements within 500 meters of a sold property is negative. This is shown in column 2 of Table 5. Although there is a positive effect from treatment, additional conservation easements this close to a property decrease its sale price. In fact, a property sold within 500 meters of two conservation easements would see a decrease in its sale price on average. However, accounting for the number of easements over 500 meters away does not significantly affect the estimated treatment effect. These results suggest that while living near a conservation easement is valued positively, homeowners are willing to pay to avoid living very close to too many easements and that the optimal distance for a conservation easement is likely between 500 and 1,000 meters from a

residential property.

Columns 3 and 4 of Table 5 include total acres of land in easement within 5,000 meters of a sold property, which account for local effects from more easements including a continuous amenity effect or a price effect from restrictions on housing supply. In both models, an increase in nearby easement acres does not significantly affect housing prices. This either means the cancellation of competing effects or the sum of multiple null effects. Since a restriction on housing supply has a nonnegative impact on prices, more nearby land in easement is either a disamenity or has no effect on price. More land in easement is a result of more easements, which are shown to have no effect on price beyond 500 meters of a property. Furthermore, when accounting for easements at this distance, the estimated effect of total acres remains unaffected, suggesting that there is neither an amenity nor a disamenity effect from additional land in easement. Therefore, it is most likely that the amenity effect is unchanged with more nearby land in easement and that easements do not affect supply significantly enough to impact housing prices in nearby areas.

Table 5: Main Results

Dependent Variable:	ln(Price)		
Model:	(1)	(2)	(3)
Nearest Easement			
Within 500m	0.0035*	0.0116***	0.0115***
	(0.0019)	(0.0024)	(0.0024)
500m to 1,000m	0.0132***	0.0118***	0.0117***
	(0.0014)	(0.0016)	(0.0016)
1,000m to 2,000m	0.0127***	0.0125***	0.0123***
	(0.0010)	(0.0010)	(0.0011)
Number of Easements			
Within 500m		-0.0070***	-0.0070***
		(0.0012)	(0.0012)
500m to 1,000m		0.0011	0.0011
		(0.0007)	(0.0007)
1,000m to 2,000m		0.0001	0.0001
		(0.0002)	(0.0002)
$sinh^{-1}$(Acres in Easement within 5,000m)			0.0001
			(0.0002)
Fixed-effects			
Property	x	x	x
County × Year	x	x	x
Quarter	x	x	x
Observations	34,817,208	34,817,208	34,817,208
R^2	0.80584	0.80584	0.80584

*Clustered (by property) standard errors in parentheses. Codes for significance: ***: 0.01, **: 0.05, *: 0.1*

Heterogeneity Analysis

The effect of conservation easements on nearby property values is dependent on both the attributes of the easement itself as well as the properties it affects. Given the wide range of heterogeneity across conservation easements, including their location, purpose, holder, and public access, I break down treatment within 2,000 meters by purpose, holder, and public access to better understand which aspects of easements are important to homebuyers. I

also examine the treatment effect in subsets of the data by metropolitan level of the county. Since there are high levels of correlation between various characteristics of easements, such easements that are open access and for recreation, estimating the effect of each easement characteristic allows for the deconstruction of the amenity effect to inform where it is coming from.

The results for metropolitan compared with non-metropolitan counties are shown in Table 6. Metropolitan counties are the source of the majority of the treatment effect. The results look very similar to the baseline specification, which is understandable given that over 95 percent of the sales in the dataset occurred in metropolitan counties. However, the results in non-metropolitan counties suggest that there is little if any amenity effect from living near conservation easements in these counties. One unique result though is that more land in easement within 5,000 meters *does* affect property prices in non-metropolitan counties. It is likely that a single easement is not additional in these areas leading to a null effect on price. However, homeowners in these counties may derive utility from living in areas that have a lower chance of being developed given the restrictions by conservation easements.

Table 7 shows the effects from various easement characteristics. Considering each set of characteristics separately (columns 1-3), the most positively valued characteristics are easements for recreation purposes (5.1 percent increase in price) and held by the government (2.2 percent increase in price). The effect of open versus closed access is not particularly distinguishable (1.8 percent increase in price for open access versus 1.6 percent increase for closed). Considering the effects of purpose, holder, and access type in the same model (column 4), I find positive impacts on price from easements for conserving environmental systems (0.9 percent) and recreation opportunities (4.2 percent) and negative effects for those conserving farm or ranch land (-1.3 percent) and forests (-1.6 percent). Easements held by government agencies increased nearby sale prices by 1.6 percent. In this model, the coefficient for privately held easements was unable to be estimated due to collinearities with

other characteristics and fixed effects. Access type was the least important, with open access easements causing a slight decrease in sale prices (-0.7 percent) and closed access easements increasing prices by 0.3 percent only at the 10 percent significant level.

Table 6: Metro vs Nonmetro Counties

Dependent Variable:	ln(Price)	
	Metropolitan	Non-metropolitan
Model:	(1)	(2)
Nearest Easement		
Within 500m	0.0117***	-0.0033
	(0.0025)	(0.0082)
500m to 1,000m	0.0120***	0.0036
	(0.0017)	(0.0048)
1,000m to 2,000m	0.0126***	0.0053*
	(0.0011)	(0.0032)
Number of Easements		
Within 500m	-0.0072***	0.0050
	(0.0012)	(0.0056)
500m to 1,000m	0.0011	0.0036
	(0.0007)	(0.0028)
1,000m to 2,000m	0.0001	0.0023*
	(0.0003)	(0.0014)
$sinh^{-1}$(Acres in Easement within 5,000m)	7.95×10^{-5}	0.0013***
	(0.0002)	(0.0004)
Fixed-effects		
Property	x	x
County × Year	x	x
Quarter	x	x
Observations	33,293,620	1,523,588
R^2	0.80174	0.91612

*Clustered (by property) standard-errors in parentheses. Codes for significance are given by: ***: 0.01, **: 0.05, *: 0.1. Metropolitan counties are defined as counties with urban areas of 50,000 people or more. 39% of counties are classified as metropolitan. This analysis uses the 2023 classification of counties.*

Table 7: Treatment Effect by Easement Purpose, Holder, and Access Type

Dependent Variable:	ln(Price)			
Model:	(1)	(2)	(3)	(4)
Purpose				
-Environment	0.0194***			0.0085***
	(0.0015)			(0.0017)
-Farm or Ranch	0.0004			-0.0134***
	(0.0024)			(0.0029)
-Forest	-0.0062***			-0.0163***
	(0.0015)			(0.0019)
-Recreation	0.0510***			0.0424***
	(0.0018)			(0.0026)
Holder Type				
-Government		0.0217***		0.0160***
		(0.0012)		(0.0016)
-Private		0.0040***		-
		(0.0012)		(-)
Access				
-Open			0.0182***	-0.0074***
			(0.0013)	(0.0018)
-Closed			0.0157***	0.0029*
			(0.0013)	(0.0017)
Fixed-effects				
Property	x	x	x	x
County × Year	x	x	x	x
Quarter of Year	x	x	x	x
Observations	34,817,208	34,817,208	34,817,208	34,817,208
R^2	0.80584	0.80584	0.80584	0.80584

*Clustered (by property) standard-errors in parentheses. Codes for significance are given by: ***: 0.01, **: 0.05, *: 0.1. Coefficients are unable to be estimated for privately held easements in columns 4 and 5 due to them be perfectly collinear with other covariates and fixed effects. Estimated coefficients for easements with a purpose of "other/unknown" and public access of "unknown" are omitted from the table.*

Easements and Development

With the large increase in the cost of housing in recent years, an obvious solution is to increase supply in an effort to improve affordability. However, zoning and other land use restrictions may affect the ability of governments to effectively combat this problem by limiting where additional housing can be built. While conservation easements have yet to be specifically targeted, increased incentives encourage more and more donations of land that will permanently be unable to be developed. Furthermore, if conservation easements are strategically enacted to prevent development, it is even more likely that they will have a binding effect on developable land and therefore housing supply.

To examine this in more detail, I construct a county level panel using data from the NCED and from the National Land Cover Database (NLCD). The NLCD is an annual survey by the United States Geological Survey (USGS) from the United States Department of the Interior which provides codes for land use at a 30 by 30 meter resolution. I use these two datasets to determine the fraction of land in each county that is developed and under easement. These values are partnered with U.S. Census data for county level controls, including population and income.

Table 8: County Level Easement Coverage and Development (1985-2022)

Variable	N	Mean	Std. Dev.	Min	Median	Max
Developed	100,443	8,930	10,371	122	4,126	96,657
New Development	100,443	60	99	-507	14	2,470
Total in Easement	100,443	1,408	3,796	0	0	64,472
5 Year Change in Easements	100,443	181	668	0	0	22,567
Income	100,443	$31,108	$14,079	$4,916	$38,517	$418,669
Population	100,443	94,244	308,131	44	63,548	10,124,628

Development and easement coverage is measured in acres per 100,000 acres of a county. Data from the National Conservation Easement Database (NCED) and the National Land Cover Database (NLCD). Income is per capita and given in 2022 dollars.

The variable of interest in this part of the analysis is the annual change in developed

land. This value is the new development in a specific county and is affected and potentially limited by land use restrictions which may include conservation easements. I examine the effect that two different measures of conservation easement coverage has on development — the amount of land under easement in a county and the five year change in easement coverage. Theses two measures provide a better understanding over what is affecting new development: total easements, new easements, both, or neither. While total easements can limit overall development opportunities, new easements might specifically be at fault for limiting development if they are being placed strategically to combat a loss in open space to development.

The reduced form equation to be estimated is

$$\Delta D_{jt} = \beta_1 E_{jt} + \beta_2 \Delta_5 E_{jt} + \theta X_{jt} + \varepsilon_{jt} \tag{2}$$

where ΔD_{jt} is the change in development of county j between year $t-1$ and t. The coverage of conservation easements is given by E_{jt} and the five year change in easement coverage is given by $\Delta_5 E_{jt}$. Easement coverage and development are measured in acres per 100,000 acres. Due to the large number counties with no easement coverage, I do not utilize a log or inverse hyperbolic sine transformation. Therefore, β_1 can be interpreted as the change in acres of annual development given a one acre increase in easement coverage per 100,000 acres of a county. Similarly, β_2 is the change in acres of annual development given a one acre increase in easement coverage in the last 5 years per 100,000 acres of a county. Controls are included in X_{jt}, and standard errors are clustered at the county level.

The results of the estimated Equation 2 are shown in Table 9. In the preferred specification which includes controls for demographic characteristics (Column 3), there is a small but significant effect of total easement coverage. An increase in easement coverage by 1 acre is estimated to decrease new development by 0.0012 acres. This suggests that

the average easement donation (28 acres per 100,000) decreases development by 1.7 acres over 50 years. This effect is greater in more developed counties, as shown in Column 4 which breaks down treatment by quartiles of county level development. An easement in the highest quartile of developed counties decreases new development over 5 times as much as an easement in the lowest quartile of counties.

Table 9: Development Results

Dependent Variable:	ΔDevelopment			
Model:	(1)	(2)	(3)	(4)
Variables				
Easement Coverage	-0.0009***	-0.0009***	-0.0012***	
	(0.0003)	(0.0003)	(0.0003)	
Easement Coverage × Q1 Development				-0.0005***
				(0.0002)
Easement Coverage × Q2 Development				-0.0012***
				(0.0004)
Easement Coverage × Q3 Development				-0.0014***
				(0.0005)
Easement Coverage × Q4 Development				-0.0026***
				(0.0008)
ΔEasement Coverage (since $t-5$)		0.0001	0.0004	0.0002
		(0.0005)	(0.0004)	(0.0004)
Development (1 year lag)			-0.0130***	-0.0128***
			(0.0020)	(0.0021)
Population (1 year lag)			2.24×10^{-5}	2.19×10^{-5}
			(3.2×10^{-5})	(3.17×10^{-5})
Income (1 year lag)			0.0009***	0.0009***
			(0.0002)	(0.0002)
Fixed-effects				
County	x	x	x	x
Year	x	x	x	x
Observations	100,443	100,443	100,443	100,443
R^2	0.77003	0.77003	0.78250	0.78265

*Clustered (by county) standard-errors in parentheses. Codes for significance are given by: ***: 0.01, **: 0.05, *: 0.1. The dependent variable is the annual change in development. Both development and easement coverage are measured in acres per 100,000 acres of a county.*

Discussion

Land conservation has long been a priority for both government agencies and private actors for a long time. Conserved land provides a multitude of ecological benefits but also has been shown to be positively capitalized into nearby properties due to its amenity value. However, with growing concerns over housing affordability, land use restrictions imposed by permanent conservation have the potential to affect the supply and therefore the price of housing for homebuyers. This project examines the market for conservation easements and how their establishment affects nearby residential property prices and local development. I estimate the price effect from conservation easements using nationwide data on conservation easements alongside nationwide parcel data on repeated residential sales and land use.

On average, conservation easements increase the sale prices of nearby residential properties. This effect is mainly driven by the binary treatment of properties and is only affected by quantity or acreage of nearby easements for properties within 500 meters. These results are mainly driven by sales in metropolitan counties with the effects in non-metropolitan counties being either smaller or less significant. Easements for recreation purposes and those held by government agencies are particularly valued. Given the number of treated properties and distances to easements, value added by conservation easements amounts to 12.5 billion dollars from 1992 to 2022 or 427 million dollars per year in higher property sale values.

With regards to development, I find that easement coverage decreases new development at a rate of 0.0012 acres per 1 acre of land in easement. This result suggests that the average easement decreases new development by 0.03 acres per year or about 1.7 acres over 50 years. While the annual effect is seemingly very low, the perpetual nature of conservation easements ensures that this effect compounds into a larger effect over time. I also find that this effect is 5 times larger in the most developed quartile of counties counties than it is in the least developed quartile. It is likely that this average impact on development is a lower bound estimate and will increase in magnitude of preventing new development over time as counties become more developed. However, the decrease in development does not

seem to translate to affecting house prices. More land in easement within 5,000 meters of a property does not significantly affect its sale price, except for the small share of sales in non-metropolitan counties.

The main result of this study, that homebuyers are willing to pay more to live near permanently conserved land, is not all that surprising, as it is in line with previous studies. However, there are some important implications given the context of the study. First, conservation easements provide immediate value to nearby properties. In most cases, however, the use of the land is unchanged. Therefore, there is a positive valuation placed purely on the development restriction enacted by the conservation easement. This is shown most conclusively by the 0.4 percent increase in sale prices for parcels near closed access easements — land that has no change in use or amenity value besides the use restriction placed on it. This result specifically suggests that many conservation easements are additional within some time horizon important to homebuyers. Otherwise, willingness to pay to live near land in a conservation easement compared to the same land without a conservation easement would be zero.

Another interesting result is the value placed on easements held by the government especially when compared to those held by a private organization like a land trust. One possible explanation for this is the stronger promise of stewardship. Although easements exist in perpetuity, they only provide value if the holder of the easement is properly ensuring compliance from the landowner. Land trusts steward the majority of privately held easements, but their future existence is not guaranteed as it is dependent on donations. Without the proper operating budget, they may be unable to properly steward the land or even cease to exist. While programs are in place for other land trusts to pick up and steward these easements instead, there is no guarantee it will happen. Another possible reason for this is that easements held by the government may be more visible or better advertised. If property owners are unaware of the existence of a conservation easement, it is unlikely that it will be capitalized into the price. Without public recognition, it can be difficult for land trusts to

inform the public of their projects.

The results from this study reveal some of the ways through which conservation easements affect housing prices and what that may mean for property owners in the area. On one hand, the price increase of residential properties suggest a high amenity value of living near conservation easements which contributes to arguments for more conservation. Furthermore, more land under easement does not have a significant effect on price suggesting that housing supply is not measurably decreased. Conservation easements are shown to be additional in preventing new development. However, the effect is not large enough to affect prices, likely due to the type or location of development that is being prevented. Additional research is required to address in more detail the mechanisms behind these findings.

References

Acharya, G. and L. Lewis (2001). Valuing open space and land-use patterns in urban watersheds. *Journal of Real Estate Finance and Economics 22*, 221–237.

Anderson, S. T. and S. E. West (2006, 11). Open space, residential property values, and spatial context. *Regional Science and Urban Economics 36*, 773–789.

Callaway, B. and P. H. Sant'Anna (2021, 12). Difference-in-differences with multiple time periods. *Journal of Econometrics 225*, 200–230.

Chamblee, J. F., P. F. Colwell, C. A. Dehring, and C. A. Depken (2011). The effect of conservation activity on surrounding land prices. *Land Economics 87*, 453–472.

Claasen, R., J. Savage, C. Loesch, V. Breneman, R. Williams, B. Mulvaney, and T. Fairbanks (2017). Additionality in grassland easements to provide migratory bird habitat in the northern plains. *Journal of Agricultural and Resource Economics 42*, 291–309.

de Chaisemartin, C. and X. D'Haultfœuille (2020, 9). Two-way fixed effects estimators with heterogeneous treatment effects. *American Economic Review 110*, 2964–2996.

Fernandez, L., M. Mukherjee, and T. Scott (2018, 4). The effect of conservation policy and varied open space on residential property values: A dynamic hedonic analysis. *Land Use Policy 73*, 480–487.

Geoghegan, J. (2002). The value of open spaces in residential land use. *Land Use Policy 19*, 91–98.

Geoghegan, J., L. Lynch, and S. Bucholtz (2003, 4). Capitalization of open spaces into housing values and the residential property tax revenue impacts of agricultural easement programs. *Agricultural and Resource Economics Review 32*, 33–45.

Irwin, E. G. (2002). The effects of open space on residential property values. *Land Economics 78*, 465–480.

Kalinin, A. V., K. R. Sims, S. R. Meyer, and J. R. Thompson (2023, 5). Does land conservation raise property taxes? evidence from new england cities and towns. *Journal of Environmental Economics and Management 119*.

Kuminoff, N. V. and J. C. Pope (2014). Do "capitalization effects" for public goods reveal the public's willingness to pay? *INTERNATIONAL ECONOMIC REVIEW 55*.

List, J. A., M. Margolis, and D. E. Osgood (2006, December). Is the endangered species act endangering species? Working Paper 12777, National Bureau of Economic Research.

Malakoff, K. L. and C. Nolte (2023, 9). Estimating the parcel-level impacts of agricultural conservation easements on farmland loss using satellite data in new england. *Land Use Policy 132*.

Mamun, S., E. Nelson, and C. Nolte (2024). Estimating the impact of critical-habitat designation on the values of developed and undeveloped parcels. *Land Economics 100*, 148–175.

Nolte, C., S. R. Meyer, K. R. E. Sims, and J. R. Thompson (2019, 11). Voluntary, permanent land protection reduces forest loss and development in a rural-urban landscape.

Parker, D. P. (2004). Land trusts and the choice to conserve land with full ownership or conservation easements. *Natural Resources Journal 44*, 483–518.

Parker, D. P. and W. N. Thurman (2018, 4). Tax incentives and the price of conservation. *Journal of the Association of Environmental and Resource Economists 5*, 331–369.

Parker, D. P. and W. N. Thurman (2019). annurev-resource-100518-094121. *Annual Review of Resource Economics 11*, 337–354.

Rissman, A. R., L. Lozier, T. Comendant, P. Kareiva, J. M. Kiesecker, M. R. Shaw, and A. M. Merenlender (2007, 6). Conservation easements: Biodiversity protection and private use. *Conservation Biology 21*, 709–718.

Sun, L. and S. Abraham (2021, 12). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics 225*, 175–199.