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Protecting and Preserving Loudoun's Blue Ridge Corridor: A Policy Analysis

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Acknowledgements

Life itself depends on your filling and being filled with lives that are not your own.

— Adam Miller

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Disclaimer

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Honor pledge

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

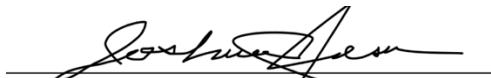
A handwritten signature in black ink, appearing to read "Adam Miller". It is written in a cursive style with a horizontal line underneath it.

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Key acronyms

MOD: mountainside overlay district

FBRM: Friends of the Blue Ridge Mountains

TDR: transfer of development rights program

PDR: purchase of development rights program

WMA: wildlife management area

NPS: National Park Service

Executive summary

Loudoun County, Virginia's Blue Ridge corridor is under threat. With only around 15 percent of its acreage currently protected by parkland or easement, Loudoun's Blue Ridge is vulnerable to development pressures that will prevent future generations from enjoying the region's rich natural, cultural, and historical resources. Often proposed development is inappropriate for a mountainous area—failing to preserve natural ridgeline features, retain continuous closed-canopy forest cover, minimize impervious surfaces, protect wildlife corridors, safeguard dark skies, or tactfully buffer the Appalachian National Scenic Trail (Piedmont Environmental Council, 2022). A failure to insulate the Blue Ridge from these development pressures—through greater use of conservation easements, zoning reform, or a more robust program of public land acquisition—would also significantly harm local air and water quality (Malone, 2022; Richardson et al., 2014, p. 5; USDA, n.d.).

Based on a review of the relevant scholarly literature and consideration of the policy context in Loudoun, I analyze three policy alternatives that the Loudoun government may employ to achieve the goal of insulating its ecologically sensitive and valuable mountain lands from unwise development:

- 1. Creating a transfer of development rights program:** Create a marketplace for tradeable development rights that landowners in the Blue Ridge corridor could sell to developers for use in eastern Loudoun; their own properties would then be placed under easement.
- 2. Zoning reform in Loudoun's mountainside overlay district (MOD):** Overhaul and expand its definition of the overlay district to protect mountains from base to summit; update use restrictions for this district to prohibit commercial development (like resorts, breweries, and amphitheaters).

3. Land acquisition: Acquire a 125.1-acre parcel of land around the northern end of Short Hill abutting the National Park Service's tract there (which is a part of Harpers Ferry National Historical Park).

In order to assess the relative merits of these policy approaches to conserving Loudoun's Blue Ridge corridor, I consider how a) costly, (b) politically feasible, and (c) effective each option is. After weighing all three alternatives against these criteria, I suggest based on my analysis that implementing a package of zoning reforms for the MOD is the most promising option. This is principally because the zoning reform alternative is the most cost effective of the three options considered, with a dollars-per-additional acre preserved figure of only \$70.41, compared to \$24,637 per acre for implementing a transfer of development rights program and \$86,567 per acre for implementing the land acquisition alternative. Additionally, its overall effectiveness level of 50,000 acres compares favorably to the other options' effectiveness, which number only in the hundreds of acres; once the reformed land-use policies in Loudoun's MOD have been enacted, these new rules apply immediately to all mountainous land that falls within its borders. Importantly, the political feasibility of zoning reform is also high, especially given the ongoing rural zoning review—meaning the zoning ordinances in question are already being examined by the county—and the favorable political composition of the Board of Supervisors (a 7–2 Democratic majority).

Moving forward, Friends of the Blue Ridge Mountains should seek to influence the rural zoning review at strategic moments by making effective use of the public input process that the county's zoning ordinance committee has created. One key moment will be the public hearing dedicated to discussing the MOD regulations, scheduled for this September. By applying consistent pressure on the right county government actors, Friends will guide Loudoun towards implementing the slate of zoning reforms that it seeks. These reforms, in turn, will effectively insulate Loudoun's

Blue Ridge from development pressures and ensure that generations to come can benefit from all that these mountains provide.

Introduction

The poet Mary Oliver wrote that “to pay attention” is “our endless and proper work” (Oliver, 1994). In paying attention to the Blue Ridge Mountains which I love and grew up exploring as a native of Purcellville, Virginia, I came to realize that they were under threat. For instance, only about 15 percent of Blue Ridge corridor lands in northern Virginia are currently protected by state or national parks and conservation easements (Land Trust of Virginia, 2013).

What then can be done to further insulate northern Virginia’s Blue Ridge from development pressures so that the region’s rich natural, cultural, and historical resources remain intact for future generations of Americans to enjoy? This is the urgent question that drives my report. I begin the process of answering it with a formal statement of the policy problem, followed by a review of the literature. In this review, I catalogue what has been done in other localities to address similar conservation policy problems. I group the literature accordingly into three broad thematic buckets: land acquisition, conservation easements, and zoning and land-use regulation. I then analyze three policy alternatives that the Loudoun government may employ to achieve the goal of insulating its ecologically sensitive and valuable mountain lands from unwise development. Next, I detail the three criteria I use to assess the relative merits of these policy approaches to conserving Loudoun’s Blue Ridge corridor: cost, political feasibility, and effectiveness. After weighing each alternative against these criteria, I recommend that the county reform its land-use policies in the mountainside overlay district and offer suggestions on how these reforms might be successfully implemented.

Let us step back though for a moment to examine the literal, geographic context of this problem. The Blue Ridge Mountains are a segment of the larger Appalachian Mountains. Often referred to as the front range of the Appalachians, these mountains run southwest from southern Pennsylvania to Georgia for just over 600 miles (Britannica, 2024). The Blue Ridge in northern

Virginia—especially Loudoun (see figure 1)—faces a cascade of threats, from climate change and overuse of and overcrowding along its hiking trails (most prominently the Appalachian Trail), to development pressures and proposed transmission line projects that would cross Blue Ridge slopes. The development pressures appear to be the most urgent threat. Solving or helping solve this problem will create a strong policy foundation for addressing the other challenges the Blue Ridge is confronting in northern Virginia.

Loudoun County was long one of the fastest-growing counties in the commonwealth (Lombard, 2024). This is another critical piece of context and helps explain the development pressures the region has historically faced. Although its growth has slowed considerably post-pandemic, according to UVA’s Weldon Cooper Center, its population growth over the last two decades has created considerable development pressures on Blue Ridge landowners throughout the northern Virginia area (Lombard, 2024; Malone, 2022). The Blue Ridge Mountains are, after all, where Loudoun’s residents, as well as many others in the region, often go to recreate. Plans for new mountaintop breweries or expanded cell towers and communication facilities (such as AT&T’s proposal in 2016 to dramatically expand its Short Hill complex by adding an apparent data center) have threatened to mar the continuity of these mountains’ signature, pristine forested ridgelines (Greene, 2021).

Another reason for focusing my efforts on Loudoun County is its political and cultural clout relative to that of neighboring counties like Clarke and Fauquier. With a population of nearly 421,000, compared to populations in Clarke and Fauquier counties of 14,783 and 72,972 respectively, Loudoun commands attention from state and federal officials in ways Clarke and

Figure 1: Map of Loudoun County



Fauquier may not (U.S. Census Bureau, 2021; Powell, 2024). Loudoun is a bellwether county,¹ for better or for worse; I am hopeful that in this case it can be for the better. If Loudoun embraces a conservation-forward policy approach, other, similarly situated towns, cities, and counties across the commonwealth will hopefully look to it as an example of what can be done to protect their mountains. (In that sense, then, this analysis may be thought of as a kind of case study.)

It is also important to note that the way Loudoun has historically chosen to respond to the development pressures it has faced since the 1990s have led to the current, precarious place in which the county's Blue Ridge region finds itself today. *Choice* is the operative word here. Some have presented exurban sprawl as merely the “latest iteration of the American Dream,” a natural, positive reaction to the realities of significant population growth (Brooks, 2004), but as Adler (2009) points out, although “most outer-ring suburbs are being developed into unwalkable sprawl . . . it doesn’t have to be that way,” continuing, “Loudoun County planners need only to look to another D.C. exurb [Gaithersburg] to see what’s possible when development happens differently.” There, exurban development centers around mass transit hubs—like the Gaithersburg Metro station—and features shopping integrated with housing, a hallmark of the environmentally friendly New Urbanism movement. Ewing, in Timperley (2022), also notes that there is “nothing inevitable about a highway-centric transportation system.” Our poorly designed system of public policies “favoring oil companies, road builders, and car manufacturers” can be undone through policy that instead puts people and the planet first, he says. Thus, Loudoun *does* have a choice. It can choose to manage and contain its sprawl—and thereby protect its sensitive Blue Ridge corridor—just as surely as it chose to enable that sprawl for many decades.

¹ For instance, Bidgood (2024), writing in the *New York Times* on the day after the election, described Loudoun County as “the very sort of well-heeled and highly educated suburb that Ms. Harris hoped would lift her to victory over former President Donald J. Trump” whose “early returns contained a flashing warning for Democrats: She just wasn’t winning by enough.” Loudoun was an electoral bellwether, in other words.

Problem statement

Too much land in Loudoun County's Blue Ridge corridor is vulnerable to development that will prevent future generations from enjoying the region's rich natural, cultural, and historical resources. Often this development is inappropriate for a mountainous area—failing to preserve natural ridgeline features, retain continuous closed-canopy forest cover, minimize impervious surfaces, protect wildlife corridors, safeguard dark skies, or tactfully buffer the Appalachian National Scenic Trail (Piedmont Environmental Council, 2022). A failure to insulate the Blue Ridge from these development pressures—through more a more robust (public) land acquisition program, greater use of conservation easements, or zoning reform—would also significantly harm local air and water quality. The forests of Loudoun's Blue Ridge play a critical role in regulating the county's water quality, capturing, absorbing, and then slowly releasing the water that flows down their slopes before it makes its way into the groundwater supply and the Potomac River; these forests also sequester carbon and scrub pollutants from the air (Malone, 2022; Richardson et al., 2014, p. 5; USDA, n.d.).

Ultimately, this policy problem—like so many others—is a matter of wisely weighing community goals and private rights (which are inevitably in tension) in the balance against each other. As Fulton (2004, p. 1) notes, “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.” This is a classic case of market failure. Landowners—who only consider the private marginal cost of their actions and develop to the point at which this cost equals their private marginal benefit, rather than to the point at which the social, or *society's* marginal cost equals their private benefit—impose negative externalities on surrounding communities through overdeveloping their land.

Client overview

One organization dedicated to addressing this problem is the Friends of the Blue Ridge Mountains (FBRM). Founded in 2006, FBRM is a non-profit organization headquartered in Purcellville, Virginia, dedicated to “preserv[ing], enhanc[ing], and celebrat[ing] the Blue Ridge Mountains as a valuable resource and treasured space for present and future generations” (Friends of the Blue Ridge Mountains, n.d.).

FBRM’s primary mandate is to advocate and care for the Blue Ridge. Although this mountain range stretches from southern Pennsylvania to northern Georgia, FBRM focuses on the northern Virginia area (which it defines as the region between the northern end of Shenandoah National Park and Harpers Ferry) and its core policy and issue areas are public land management, responsible land use, and land and water conservation in the Blue Ridge. FBRM works, in other words, to ensure that northern Virginia’s Blue Ridge is accessible to all, in perpetuity.

FBRM does both advocacy and implementation. That is, it advocates alongside groups like the Nature Conservancy and Piedmont Environmental Council to conserve more of the Blue Ridge’s lands and waters, while also helping to care for those spaces that are already in public hands. My problem, then, fits squarely within FBRM’s advocacy mission. Furthermore, the moment is ripe for action; Loudoun County is currently undertaking a rural zoning review. Over the next three years, the Board of Supervisors will examine all aspects of Loudoun’s rural zoning ordinances, including its policies surrounding the mountainside overlay district (Pampaloni, 2024). By overhauling and expanding its definition of and updating use restrictions for this district, Loudoun County’s elected leaders could go a long way towards insulating its vulnerable and ecologically and culturally valuable mountain lands from development. This report provides tools for helping FBRM effectively shape the rural zoning review process for the good of Loudoun’s Blue Ridge corridor and all of Loudoun’s citizens.

Literature review

Conservation easements

A conservation easement is a “voluntary legal agreement between a landowner and a government agency or land trust that permanently limits future development of the land to protect its conservation values” (Virginia Department of Forestry, n.d.). Easements’ permanence are a key feature in making them such effective vehicles for conservation. These agreements “possess a unique ability to protect land in perpetuity,” as a landowner’s choice to forfeit the right to develop their property binds all of its subsequent owners; the easement, in other words, is a deed that becomes a part of the chain of title (Brown et al., 2023, p. 2). Furthermore, Virginia law stipulates that easements are perpetual in duration unless the deed states otherwise; however, like any property interest, an easement may be taken—and thus extinguished—by eminent domain (Virginia Conservation Easement Act, 1988).

Landowners’ motivations for placing their property under conservation easement vary. While easements are traditionally donated—suggesting altruistic intentions—landowners may receive generous tax credits or deductions from their state government and the Internal Revenue Service for doing so. Most who donate are likely motivated by a mix of both financial and non-financial incentives. Among the most prominent non-financial motives are environmental motive-values—caring about your land because of its inherent ecological worth—and place-attachment—for instance, caring about the fate of your property because it has “been in the family for generations” (Farmer et al., 2015). Importantly, easements do not just have to be donated; development rights can also be purchased through a purchase of development rights program or traded in the form of development rights credits via a transfer of development rights program.

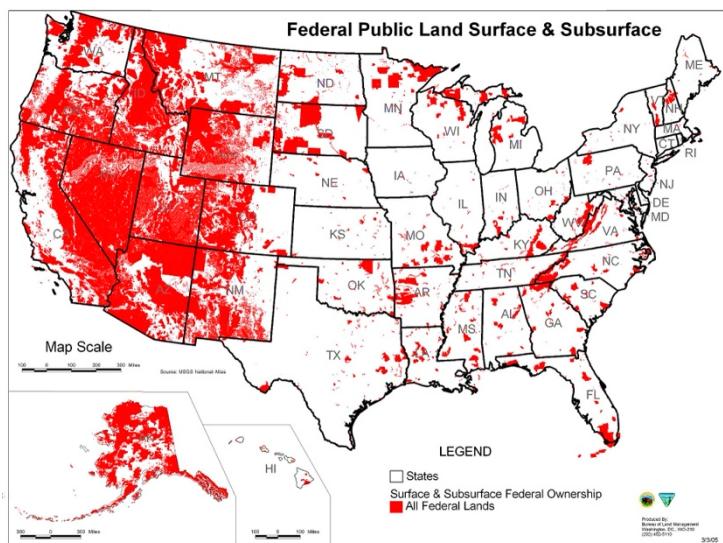
Beyond their legal permanence, do conservation easements “work”? On the one hand, it is obvious that any conservation easement whose terms are obeyed will work. That is, if land that is

not supposed to be developed, is in fact *not developed*, then that existing natural, open, or agricultural space will be preserved—a victory for conservation. This has been borne out in the research: lands under conservation easement have fewer buildings, fewer roads, and show increased evidence of wildlife activity than lands not under easement (Pocewicz et al., 2011). Conservation easements have also been shown to benefit wildlife biodiversity on private properties (Wallace et al., 2008). However, Brown et al. (2023) complicate this picture somewhat by noting that the generally negative clauses and restrictive language of conservation easements (i.e., simply telling landowners what they can't do with their land) means that oftentimes proactive measures to improve ecosystem health on preserved properties are neglected. Consequently, they propose a shift to more affirmative language in easements, so that the agreements contain both a mix of “dos” and “don’ts” (i.e., in simple terms “this land must not be developed” *and* “100 native trees and shrubs must be planted in the first two years after this agreement is finalized”).

It should be noted too—as a final piece of context—that conservation easements, as instruments for private land conservation, are a particularly useful tool in Virginia, where—similar to other eastern states—a significant portion of land is privately held (Brown et al., 2023). Additionally, in his 2021 executive order on tackling the climate crisis, President Biden committed the United States to the 30x30 pledge, a worldwide initiative for governments to protect thirty percent of Earth’s land and ocean area by 2030 (Executive Office of the President, 2021). Given the prevalence of private land ownership in the United States, especially in the east (see figure 2), it is unlikely that

this goal will be met without significant buy-in from private landowners who are willing to put their land under easement.

Figure 2: Federal Landownership



various use districts. The court located this right in governments' broad police power to protect the "health, safety, welfare, and morals of the public" (Blackwell, 1988, p. 615). Euclidean zoning (as it is known based on this landmark Supreme Court case), however, proved ineffective for conservation purposes, as its focuses are protecting social and economic values (e.g., it is about keeping things like factories and industrial parks away from residential neighborhoods) rather than safeguarding natural resources.

Overlay zoning (e.g., the mountainside overlay district that protects Loudoun's mountainous areas), which allows for specific tailoring to protect certain environmentally sensitive areas, is a flexible enough regime to accommodate the irregular boundaries of these ecologically important zones (Blackwell, 1988). Interestingly, even as the tool of overlay zoning has enabled cities and their planning staffs across the country to better integrate conservation goals with general land-use regulations, there are still areas of disconnect. For instance, although conservation easements (which are an important tool, as previously described) are perpetual and have significant impacts on the land

Zoning and land-use regulation

Zoning and land-use regulation have not always been thought of as tools for environmental conservation. In the United States, the (formal) advent of zoning dates to 1926, when the U.S. Supreme Court, in *Euclid v. Ambler Realty*, upheld localities' right to regulate land by dividing it into

use in a community, they have—with few exceptions—not been incorporated meaningfully into local land-use planning (Richardson & Bernard, 2011).

Land acquisition

Land acquisition is a more straightforward method of conservation, at least in principle. By land acquisition, I mean specifically efforts by local, state, federal and tribal governments to purchase lands outright for the purpose of conservation. Non-profits such as the Nature Conservancy or Wilderness Foundation also purchase lands for conservation (Gerber & Rissman, 2012). Oftentimes, these purchased lands are turned into national parks, preserves, or forests and opened to the public. Public access is indeed a key distinguishing feature of this conservation alternative, as easements don't require landowners to provide public access to their land (Virginia Department of Forestry, n.d.).

Czech (2002) states that land acquisition is “one of the keys” to biodiversity conservation (p. 1488). Although this may seem obvious, the practice of actually acquiring lands is anything but obvious or simple. Both non-profits and government agencies seeking to purchase lands have limited resources—and often tight budgets and few staff—and so must make decisions about what sorts of land to prioritize for purchase, or even whether to try and acquire land at all. Gerber & Rissman (2012) note that non-profit organizations like the Nature Conservancy are constantly torn between taking a *land-acquisition approach* versus a *land-use planning and zoning* approach to ecological and cultural resource conservation. That is, leaders of the Nature Conservancy and other similar groups are always asking themselves, in essence, this question: “Is the political fight to advocate for stricter zoning regulations in [a given ecologically sensitive area or property] worth it, or should we simply buy the property outright to prevent the uses we don’t want to see?” In the public sector, prioritization looks more like deciding how to allocate finite taxpayer resources, as purchasing new lands becomes more and more expensive (Santos et al., 2014). Czech (2002) outlines a tripartite

strategy for prioritization that governments might take: (1) relatively inexpensive, ecologically intact land should be prioritized for acquisition, (2) fee-title acquisition (i.e., outright purchase) should be preferred to conservation easement, and (3) low-lying coastal lands should receive lower priority.

Identifying alternatives

My policy alternatives fall into three categories, in accordance with the literature I surveyed: conservation easements, zoning reform, and land acquisition. As detailed above, each tool for preserving ecologically sensitive lands is well-attested in both the literature and in practice.

Ideally, these tools will be deployed in Loudoun as a kind of environmental policy cocktail. While a zoning-reform approach to protecting sensitive Blue Ridge lands in Loudoun may ultimately prove the easiest and most effective to implement—more on this below—strategic land purchases and a transfer of development rights (TDR) program should also be a part of any long-term solution. Such policies could be effectively integrated within the framework of a specially designated corridor (for example, a “Blue Ridge National Heritage Area,” something analogous to the Journey Through Hallowed Ground National Heritage Area) that spans the entire northern Virginia area, from the northern end of Shenandoah National Park to Harpers Ferry. While obtaining this kind of federal designation would be a lengthy and difficult process, requiring an act of Congress, it would likely catalyze the adoption of wise land-use and conservation policies throughout the wider region’s Blue Ridge corridor, and not just in Loudoun. Conserving the Blue Ridge is, in the end, a fundamentally cross-jurisdictional problem and so cannot be effectively addressed, ultimately, without a comprehensive regional conservation strategy.

Creating a transfer of development rights (TDR) program

What would an easement-based policy for protecting sensitive Blue Ridge lands look like in Loudoun County? I propose the creation of a transfer of development rights (TDR) marketplace. This voluntary, market-based approach would allow property owners who live in the designated

sending area—Loudoun’s Blue Ridge corridor—to forfeit their development rights in exchange for tradeable development rights or credits, which property owners could then sell to developers. The developers in turn could use these credits to build in designated “receiving areas” more densely than they otherwise would be able to (Cheshire, 2007; WeConservePA, n.d.). I suggest designating corridors of land in eastern Loudoun that already feature high-density development (e.g., Ashburn, Leesburg, or Sterling) as receiving areas. At the very least, any land so designated should fall east of the county’s urban growth boundary (Route 15).

Whereas under the traditional conservation easement scheme, property owners (for personal, altruistic reasons or to obtain some tax benefit) *donate* their development rights, under a TDR scheme, the motivations are more directly financial. Loudoun County had a purchase of development rights (PDR) program—a distinct but related concept that involves compensating landowners for the value of their extinguished development rights, which are then permanently extinguished and cannot be traded—from 2000 until 2004, but it is no longer active (Loudoun County, n.d.). In the more than twenty years since, various unsuccessful attempts have been made to resurrect the county’s PDR efforts.

However, simply creating a TDR marketplace would likely be insufficient. Loudoun would also need to ensure that its development-rights trading program exists within a broader regulatory context incentivizing landowners in the Blue Ridge corridor to enter the marketplace. Fulton (2004) notes, based on his broad-spectrum examination of TDR programs across the country, that a critical component of successful development-rights marketplaces is their placement within the framework of a larger, comprehensive land-use plan containing specific goals for urban development and land conservation. Although Loudoun updated its comprehensive plan in 2019 and its zoning ordinance in 2023, there is still room for ensuring the right setting for a TDR marketplace. As a part of its

ongoing rural zoning review, Loudoun's Board of Supervisors could seek to downzone² both sending *and* receiving areas. This ensures that landowners in the receiving areas will be incentivized to forfeit their development rights in exchange for development credits because they will receive many more credits per acre than they have in allowable lots per acre under the existing zoning (e.g., let's say they can build one house per twenty-five acres while they receive one development credit per every two acres). Furthermore, developers know that they will actually need to buy these credits in order to build as densely as they would like, since the possibility of upzoning will have been eliminated (Fulton, 2004; WeConservePA, n.d.).³

Zoning reform (MOD)

This policy problem can also be addressed through zoning reform. The Loudoun County Board of Supervisors is just embarking on a rural zoning policy review, as previously noted. Over the next three years, the board will examine all aspects of Loudoun's rural zoning ordinances, including its policies surrounding the mountainside overlay district or MOD (Pampaloni, 2024). (The term "mountainside overlay district" simply refers—in more technical parlance—to those mountainous portions of Loudoun County where special zoning rules apply.) By overhauling and expanding its definition of the MOD to protect mountains from base to summit and updating use restrictions for this district in order to prohibit commercial development (like resorts, breweries, and amphitheaters), Loudoun County's elected leaders would go a long way towards insulating its ecologically and culturally valuable yet vulnerable mountain corridors from unwise development as defined above.

² *Downzoning* refers to the process of rezoning an area to reduce the permitted density of housing and other development. *Upzoning* is simply the reverse.

³ As Fulton (2004) observes, “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.” However if upzoning is always a possibility, then developers in Loudoun won’t be convinced that there is a limited supply of this right and so will not see a reason to participate in the TDR marketplace, causing the market will fail.

Land acquisition

Land acquisition is the final alternative I propose, which would involve opening new swaths of mountain lands⁴ to public access.⁵ Conservation done this way, and properly managed, can become a win for multiple constituencies—the climate, Loudoun’s air and water quality, its citizens, and any others who go there to recreate. I specifically recommend that Loudoun County partner with the state government⁶ to acquire a 125.1-acre parcel of land around the northern end of Short Hill abutting the National Park Service (NPS)—owned tract there (which is a part of Harpers Ferry National Historical Park). The parcel I suggest for purchase is sandwiched between the NPS tract and four other parcels already under conservation easement. Those properties in turn abut Harpers Ferry Road, and so by purchasing the 125.1-acre parcel, the government would be building a “bridge” likely enabling public access from that road to the NPS tract.

The state could designate its parcel a wildlife management area (WMA) or, alternatively, donate the land to the federal government with the stipulation that it be annexed by Harpers Ferry National Historical Park. Currently, there is no public access to the NPS parcel on Short Hill—it is effectively an island within a sea of privately owned land—and by concentrating on acquiring land around it in order to enable public access, Loudoun and the commonwealth would both productively focus its own land-acquisition efforts *and* catalyze further land acquisition by others.

⁴ I’ve had this (perhaps rather curious) item on the long-term to-do list I keep on my phone since 2019: “Plan a Short Hill hiking trail.” So the idea of opening Short Hill to public access has been on my mind a long time and is in fact what inspired me to pursue this APP in the first place.

⁵ As noted in the literature review, public access is a key distinguishing feature of this alternative, as conservation easements don’t require landowners to provide public access to their land.

⁶ Non-profits could also be involved in the purchasing process too. The efforts of one such non-profit, the Conservation Fund, have been instrumental in convincing the commonwealth to acquire Oak Hill, James Monroe’s estate in southern Loudoun, and convert it into a state park (although the acquisition process is ongoing and subject to General Assembly approval).

Evaluative criteria

FBRM's goal in this case is to insulate as much additional Blue Ridge land in Loudoun as possible from unwise development. More precisely, FBRM seeks to preserve as much of the Blue Ridge's existing continuous closed-canopy forest cover as possible (effectiveness), at the lowest possible cost and in a politically feasible manner. I have established the following criteria to evaluate the degree to which each of my alternatives enables Loudoun and FBRM to achieve these goals.

Cost

Direct cost is the most straightforward of my criteria to both conceptualize and operationalize. Across the three alternatives, I measure accounting costs in U.S. dollars, as discounted over a time horizon of 10 years. I also consider the opportunity costs of foregone development for the zoning reform and land-acquisition alternatives.

Political feasibility

Measuring political feasibility, while a more qualitative endeavor, is nonetheless critical. I assess political feasibility in two ways. I first rate the likelihood (on a “high, medium, low” scale) that Loudoun County’s Board of Supervisors—as presently constituted—would pass the requisite legislation to create a TDR program, fund land acquisition efforts on Short Hill, or approve new zoning regulations for the Blue Ridge corridor. I base my rating upon a study of the board’s recent voting history on environmental issues.

I further assess political feasibility by using James Q. Wilson’s typology of political competition (Weimer & Vining, 2017). His framework, often visualized in a 4x4 grid (see figure 3 below), posits four different kinds of “politics” that may exist for a given policy change—interest group, entrepreneurial, majoritarian, and client—based upon a combination of the policy’s distribution of costs and benefits (which can be either widely distributed or concentrated). I assign each of my policy alternatives to a quadrant within that square. This assignment, in turn, feeds into

my assessment of the likelihood that voters and their representatives, as rational actors, will support the given policy alternative.

Figure 3: Wilsonian Typology of Political Competition

	Distributed costs	Concentrated costs
Distributed benefits	Majoritarian politics	Entrepreneurial politics
Concentrated benefits	Client politics	Interest-group politics

Effectiveness

I measure effectiveness in terms of additional acres of Blue Ridge corridor lands preserved over the 10-year study period. “Preserved,” given my slate of alternatives, does not just mean new lands purchased or new easements secured. In the case of the zoning alternative, “preserved” refers to lands protected by new, more stringent zoning regulations. But what of the durability of these various conservation vehicles? Administrations come and go, as do their policy priorities. Zoning ordinances too are subject to consistent revision. And land purchased by a public agency and set aside for conservation can be repurposed to less productive ends. For instance, during his first term, Mr. Trump made repeated attempts to roll back protections for Bears Ears National Monument in southern Utah. Now that he has returned to the Oval Office, many observers worry that public lands are again under threat. Only conservation easements are a truly permanent vehicle. This temporal aspect of effectiveness is thus harder to quantify, which is why (as I noted under the cost section) I have limited my analysis to a period of 10 years.

One additional effectiveness consideration involves the quality of the land preserved. As outlined above, FBRM’s goal is to preserve continuous closed-canopy forest cover in Loudoun’s Blue Ridge. Consequently, not just *any* land that happens to be preserved should be added to a given alternative’s effectiveness ledger. However, for the purposes of this analysis, I assume that all acres

preserved fall into the continuous-closed-canopy-forest category. This is a reasonable assumption to make given that Loudoun would not include degraded, non-ecologically valuable lands in the designated receiving areas under the TDR scheme, nor would the county seek to acquire such lands. Finally, this is a valid assumption in the context of the zoning reform alternative as well because the mountainside overlay district is specifically designed to encompass steep mountain slopes with precisely the kind of forest cover that FBRM seeks to protect.

Cost effectiveness

I take the total cost of each alternative and divide it by

$$\text{Cost-Effectiveness Ratio} = \frac{\text{Total Cost}}{\text{Units of Effectiveness}}$$

total units of effectiveness to generate a cost-effectiveness

ratio in US dollars per additional acre preserved.

Evaluating alternatives

Creating a transfer of development rights (TDR) program

Cost: I cost this alternative by estimating the price of employing five county employees at an average salary over a 10-year period. Direct costs would be minimal but the county would have to staff the program and there would be start-up costs as well in launching this market and facilitating it.

However, I assume that the bulk of the costs arise from staffing the program and further assume that a team of five would be needed to manage this TDR marketplace, at a present-value cost of \$3,520,679.28.⁷ See my appendix for calculation details.

Political feasibility I: (medium) Given Democrats' 7–2 control of the Loudoun County Board of Supervisors, establishing a TDR program is not out of the question. Furthermore, the board chair,

⁷ This assumption about the five-person teams stems from a conversation I had with Larry Malone, executive director of Friends of the Blue Ridge Mountains, who estimated that this would be a reasonable number to use for the size of a start-up zoning enforcement unit within the county's Department of Planning and Zoning (L. Malone, personal conversation, February 28, 2025). I am also using a social discount rate of 2% in my estimates, per guidance issued by the Biden administration's Office of Management and Budget (2023).

Phyllis Randall (D), has been trying for years to restart the county's long-dormant PDR program. However a majority of her colleagues recently voted to reject a proposal to do just this, which gives some indication of the headwinds this policy alternative would face, even given the nominally environmentally friendly makeup of the board (Pampaloni, 2024). Because the board's legislative history undercuts somewhat my assumptions about its support of environmental causes, I have given this alternative a rating of "medium."

Political feasibility II: Under Wilson's framework, this proposal involves an entrepreneurial politics (concentrated costs, distributed benefits), as developers will pay for the development credits while the broader public, both in Loudoun and throughout the state, will reap the rewards of a cleaner, greener Loudoun. We can expect, then, a fairly robust level of political support from local citizens for this proposal given this cost/benefit structure, assuming that citizens are rational actors. And if we further assume that the Board of Supervisors is at least somewhat responsive to political activity, this alternative's entrepreneurial politics bolsters its political feasibility.

Effectiveness: This number is a bit more difficult to ascertain. Landowners in Loudoun County entered into 16 permanent conservation easements totaling 2,286 acres in 2023 (*Times-Mirror* staff, 2024), so any effectiveness metric would have to look beyond this baseline (i.e., capturing only easements entered into through the TDR process, above and beyond the sort of acreage the *Times-Mirror* reported on). For purposes of my estimates here—and given that in 2023 each landowner put an average of 142.9 acres under easement—I assume that one⁸ additional landowner (beyond the 16-per-year figure from 2023) would put their land in easement under the TDR program annually. This

⁸ The assumptions underlying this figure are that 1) most landowners considering putting property into conservation easement have at least some non-financial motivation for doing so, whether environmental motive-values or place-attachment, and are thus willing to accept compensation in the form of tax credits or a reduced tax burden and 2) that the "marginal" landowner considering an easement lacks these extra-financial motivations and that a higher level of compensation is required in order to sufficiently incentivize them to place their land under easement.

would result in an effectiveness of 142.9 acres/year and an overall effectiveness of 1,429 acres over 10 years.

CEA: \$24,637 per additional acre preserved

Zoning reform (MOD)

Cost: Costing this alternative requires determining the amount of additional funds Loudoun's Department of Planning and Zoning would need annually to effectively manage a more stringent set of MOD regulations. The direct costs of this alternative are negligible relative to the size of the total cost, as imposing new zoning regulations wouldn't cost the county anything. However, enforcement matters; zoning reform wouldn't be effective without a zoning enforcement group to enforce the new regulations, and so relevant costs could also include hiring zoning enforcement officers. The median salary in 2023 for a Loudoun County government employee was \$78,389 (GovSalaries, n.d.). Assuming that the county hires five zoning enforcement officers at this rate beginning next year for 10 years, then total discounted costs amount to \$3,520,679.28. Additionally, there is a non-trivial opportunity cost to zoning reform. Assuming that the purchase price of acquired land reflects the opportunity cost (Naidoo et al., 2006), we can use the price-per-acre figure from the third alternative (\$86,567) to obtain a general sense of the value of foregone development per acre under the new zoning regime. I have not included this number in the cost portion of the outcomes matrix below (in particular because it is difficult to estimate how much in lost tax revenue per acre this forgone development would result in for the county), but it is nonetheless important to remember that zoning reform would come at a cost, even if not directly.

Political feasibility I: (high) I rate this alternative as highly politically feasible because the county is already undertaking a rural zoning review, re-examining the very ordinances that FBRM seeks to reform (Pampaloni, 2024). There is thus a window of opportunity of which FBRM should take advantage. Furthermore, Democrats' 7–2 majority on the Board of Supervisors will last at least

through December 31, 2027. Given that Democrats are traditionally the greener of the two major parties, their supermajority on the board makes this existing window of opportunity more promising still. Nonetheless, Loudoun's Board of Supervisor has historically proven quite friendly to data center development in Loudoun's east, attenuating the strength of its environmental record somewhat.⁹

Political feasibility II: Again employing the Wilsonian framework, this proposal also involves an entrepreneurial politics, with concentrated costs, distributed benefits. Only those Loudouners with land on the ridgeline will pay a cost, while the broader public will reap the rewards of a greener Loudoun. This political reality improves zoning reform's political feasibility, for the same reasons it would bolster the TDR alternative's political feasibility.

Effectiveness: Significant, up to 50,000 acres, in that wide swaths of Loudoun (its entire Blue Ridge corridor in essence) would be newly protected. According to a Loudoun County government webpage, steep slopes and moderately steep slopes—which I use as a proxy for the total area of Loudoun's Blue Ridge corridor—occupy an area of approximately 50,000 acres in the county (n.d.). (Moderately steep slopes are areas with a 15% to 25% grade. Very steep slopes refer to more environmentally critical slopes of greater than 25%).

CEA: \$0 per additional acre preserved or \$70.41 per additional acre preserved (with costs of zoning enforcement officers included)

Land acquisition

Cost: I cost this option by estimating the market value of relevant parcels of land on Short Hill via comparison with the price Loudoun paid for parkland along Evergreen Mill Road in 2023. It would

⁹ However, just last month, the board eliminated data centers as a by-right use within the county, which means constructing new data centers will be a much more difficult, legislatively involved process moving forward (Pampaloni, 2025).

cost \$10,829,552¹⁰ to acquire a 125.1-acre parcel adjoining the NPS's Short Hill tract, which would connect that publicly-owned piece of land to Harpers Ferry Road, enabling public access to it. (*Note:* I am assuming that this land purchase would occur at the outset of the 10-year period, so no discounting of costs is needed. See appendix for a map containing more details.) And once again stipulating that, in general, the purchase price of acquired land reflects the opportunity cost—or value of foregone development—we can assume a non-trivial opportunity cost to this alternative as well.

Political feasibility I: (low) Money is a significant concern when it comes to political feasibility. As land is relatively expensive and public resources are limited, the choice to allocate taxpayer dollars for land acquisition can generate significant political controversy and popular pushback. As one conservation collective put it frankly in a policy guidance document, “there is simply not enough local, state, and federal conservation funding to protect all the land that needs protecting—and the relatively little funding that does exist is often in jeopardy.” Despite these inherent political headwinds—which underlie my rating of “low”—there are at least two reasons that the land acquisition option remains at least a *possibility*. The first is that Loudoun has been working to develop a countywide linear parks and trails system since 2021, and so any land acquired on Short Hill (and converted into a state wildlife management area) could be integrated into that system (Pampaloni, 2024). This, then, may create an added incentive for Loudoun to consider acquiring land there. Secondly, Virginia opened its first state park in Loudoun (Sweet Run) in 2024 along the adjacent Blue Ridge Mountain. Thus the state has already demonstrated concrete interest in land acquisition in Loudoun, even as Virginia’s governor Glenn Youngkin, a Trump-aligned Republican, has not made environmental advocacy a priority.

¹⁰ This figure is based on the county’s 2023 purchase of 335 acres along Evergreen Mills Road, for which it paid \$29 million dollars.

Political feasibility II: Under the Wilsonian framework, land acquisition implicates a majoritarian politics, with both distributed costs and benefits. The taxpayers would ultimately pay for the land purchase, while also being the beneficiaries of the new or expanded parkland created as a result. Majoritarian politics are “conducted” through broad public debate; choosing to spend a significant sum of money on buying land on Short Hill means of course that the county would have fewer funds to spend on other discretionary budget priorities. It is difficult to predict how such a debate would unfold in Loudoun today; however if last summer’s successful grassroots effort to force a regional power regulator to reroute a planned transmission line away from western Loudoun is any indication, significant popular support for environmental causes can be successfully marshalled in the county (Pampaloni, 2024). I thus assume that this policy option’s majoritarian politics bolsters its political feasibility.

Effectiveness: 121.1 acres; this does not include figures for other land purchases that could be catalyzed by the county government’s initial acquisition of land on Short Hill

CEA: \$86,567 per additional acre preserved

Outcomes matrix

	Creating a TDR program	Zoning reform	Land acquisition
Cost (dollars)	\$3,520,679.28	\$0 or \$3,520,679.28	\$10,829,552
Political feasibility I (likelihood of successful adoption by Board of Supervisors)	medium	high	low
Political feasibility II (Wilsonian politics)	entrepreneurial—increases likelihood of public support	entrepreneurial—increases likelihood of public support	majoritarian—increases likelihood of public support
Effectiveness (additional acres preserved)	142.9 acres	50,000 acres	125.1 acres
CEA (dollars/additional acre preserved)	\$24,637/acre	\$0/acre or \$70.41/acre	\$86,567/acre

Recommendation

Given the zoning reform (MOD) alternative's minimal cost, high level of political feasibility, and high effectiveness relative to the other policy options laid out above, I am recommending that Friends of the Blue Ridge Mountains advocate for implementation of this alternative. The cost-effectiveness figure sums its advantages up. With a dollars-per-additional acre preserved figure of only \$70.41, the zoning reform alternative is by far the most cost effective of the three options laid out above. The cost-effectiveness of zoning reform stems of course from its global reach. Once land-use policies in Loudoun's mountainside overlay district have been reformed, the new rules apply immediately to all mountainous land that falls within its borders. Although zoning reform costs the county as much as creating a TDR marketplace would—when the cost of creating a zoning-reform unit within the Department of Planning and Zoning are included—its effectiveness is much higher.

It is important to realize, however, that this approach is not a silver bullet. There are always tradeoffs. As we have seen, zoning reform lacks the permanence of the TDR, easement-based option and also doesn't address issues with lack of sufficient public access to Loudoun's Blue Ridge corridor that the acquisition alternative does. Furthermore, because of its sweeping nature, zoning reform in the MOD has the potential to anger a vocal constituency of landowners who will protest the uncompensated "taking" of property through a limitation of their development rights. Ideally, then, these tools will be deployed as a sort of "environmental policy cocktail," as described earlier—with zoning reform the principal but not sole tool in Loudoun's pocket for land conservation.

Implementation

Successful implementation of my zoning reform recommendation in Loudoun County will hinge upon a robust understanding of and engagement with county government and community stakeholders, as well as consistent evaluation by county officials of the zoning reform's efficacy throughout Loudoun's entire Blue Ridge corridor area. In what follows, I detail who the principal stakeholders are in this space, what a successful messaging and engagement strategy might look like, and how evaluation can be done effectively.

Stakeholders

One of the key public-sector stakeholders when it comes to protecting Loudoun's Blue Ridge is the Board of Supervisors. Led by Chairwoman Phyllis Randall (D), the board's 7–2 Democratic majority has the power to pass all zoning ordinance amendments (this kind of amendment is the vehicle that would ultimately be used to implement changes in the mountainside overlay district regulations) that come before the board, over any Republican objections. Before a zoning ordinance amendment reaches the supervisors' desks, however, it must first be vetted by county planning staff. These staff, who are nonpartisan, estimate cost and as well as other, non-fiscal impacts of zoning changes on behalf of the board.

In addition to these public-sector actors, landowners with holdings in the affected areas will also need to be engaged as crucial stakeholders. Some will undoubtedly protest that zoning reform in the mountainside overlay district represents an odious and even unconstitutional government incursion into their rights as property owners (an uncompensated “taking” of property, via limitation of their development rights). However, other landowners may be more amenable to the idea of updating the MOD regulations if the reasons for the reforms are properly messaged (see next section for details here). A group of stakeholders that will be key in successfully messaging any proposed reforms—especially to landowners who are unsure about these changes—is the network of Loudoun-based nonprofit environmental advocacy groups like Friends of the Blue Ridge Mountains (there are countless others, and many, including FBRM, are members of the Blue Ridge Conservation Alliance, an umbrella coalition).

Messages

Perhaps one of the most compelling reasons that we should care about Blue Ridge conservation efforts is this: scientists now agree that land conservation is an imperative, a *must* not a *maybe if we have the time or money*. As the Nature Conservancy has written (n.d.), scientists have determined that “we must protect at least 30% of lands, fresh waters, and oceans by 2030 to have any chance of stemming the dual crises of biodiversity loss and climate change facing our planet.” By connecting Loudoun with this broader 30x30 movement and framing issues of land conservation as intimately related to addressing climate change, organizations within the Blue Ridge Conservation Alliance could effectively communicate to landowner-stakeholders in Loudoun the *why* of the proposed zoning reforms.

An effective messaging strategy—clearly articulating the why—might look like going door-to-door with literature, running an ad campaign in the local newspapers, and holding town halls throughout the western Loudoun area. The campaign’s target audience would be citizens of western

Loudoun—the constituency most affected by the changes. If FBRM can mobilize these residents in support of the changes, then the Board of Supervisors would likely be less hesitant to enact zoning reform, knowing that there wouldn't be a serious backlash in its wake. FBRM should focus its mobilization efforts on turning out Loudoun residents to the public hearing currently scheduled for this September that will be dedicated to discussing the MOD regulations.

Of course, this approach will not convince everyone. Climate skepticism abounds and so some landowners may not be swayed by climate-centric arguments. This is where outreach focusing on preserving Loudon's rural history and character, its appeal as a viticultural destination, and its potential as a hub for recreation—especially connected to the Appalachian Trail and Sweet Run State Park—may prove more efficacious. Such non-climate-based outreach could involve setting up informational tables at wineries with literature highlighting that the mountain views winery customers love are threatened or working with Sweet Run State Park to educate park visitors about threats to the mountains they've come to explore. Across the board, savvy tailoring of the core conservation message for different audiences will be key.

Evaluation

Imagining a world in which these zoning reforms have been implemented, what might evaluation look like? How will the Board of Supervisors know that landowners are obeying the new rules it has established for the county's mountainside overlay district? Much of this impact evaluation work will hinge on the capacity of personnel in the Planning and Zoning Department (especially the unit tasked with zoning enforcement) to execute. The Board of Supervisors should make it a point to hear at least quarterly updates from the zoning enforcement team on what they are seeing in the field, especially in the Blue Ridge corridor (number of zoning violation complaints received in the last three months, actions being taken to remediate violations and level civil fines on the violators, and so forth). In addition, Friends of the Blue Ridge Mountains could work with its partners in the

Blue Ridge Conservation Alliance to conduct its own informal surveys of landowners on the Blue Ridge to ascertain the extent of landowners' compliance with the new regulations.

Conclusion

This report has sought to address the challenges facing Loudoun's vital Blue Ridge corridor. Based upon a review of the relevant scholarly literature and consideration of the policy context in Loudoun, I analyzed three policy alternatives that Loudoun County might employ to achieve the goal of insulating its ecologically sensitive and valuable mountain lands from development pressures: Creating a transfer of development rights program, zoning reform in Loudoun's mountainside overlay district, and land acquisition. Given the zoning reform (MOD) alternative's minimal cost, high level of political feasibility, and high effectiveness relative to the other policy options laid out above, I recommended that Friends of the Blue Ridge Mountains advocate at the county-government level for implementation of this alternative.

However in closing, I wish to emphasize again the regional nature of this problem. Even if Loudoun does adopt more stringent MOD zoning policies, this regime of special protections for its Blue Ridge corridor will be most effective once integrated within the framework of a specially designated corridor (such as a Blue Ridge National Heritage Area, as mentioned earlier) that spans all of northern Virginia, from the northern end of Shenandoah National Park to Harpers Ferry. Obtaining this kind of federal designation would be a lengthy and difficult process, requiring an act of Congress. One of the limitations of the present study is its narrow geographic focus, and much work remains to be done in both assessing what exactly it would take to obtain this designation for northern Virginia's Blue Ridge *and* the extent to which a Blue Ridge National Heritage Area would catalyze the adoption of wise land-use and conservation policies throughout the wider region's Blue Ridge corridor. Regardless of what these specifics prove to be, it is nonetheless true

that conserving the Blue Ridge is a fundamentally cross-jurisdictional issue and so cannot be effectively addressed without a comprehensive regional conservation strategy.

But amidst an uncertain federal policy landscape and a gubernatorial election year in Virginia, the work of preserving the Blue Ridge in northern Virginia—if it is to be done at all—will have to be taken up by local governments. Loudoun, then, has a meaningful window of opportunity to lead out in Blue Ridge conservation efforts. And if it does its work well, the county may ultimately inspire officials in both Richmond and Washington to extend enhanced protections to the Blue Ridge range, even beyond northern Virginia.

Reference list

Adler, B. (2009, April 13). *A tale of two exurbs*. The American Prospect.

<https://prospect.org/api/content/1fabf960-390d-50b7-b069-fc3b2be172a0/>

Bidgood, J. (2024, November 6). Anticipating a close race, the nation watched momentum shift toward Trump. *The New York Times*.

<https://www.nytimes.com/2024/11/06/us/elections/election-night-scene.html>

Blackwell, R. J. (1988). Overlay zoning, performance standards, and environmental protection after Nollan Comment. *Boston College Environmental Affairs Law Review*, 16(3), 615–660.

Brooks, D. (2004, April 4). Our Sprawling, Supersize Utopia. *The New York Times*.

<https://www.nytimes.com/2004/04/04/magazine/our-sprawling-supersize-utopia.html>

Brown, S. A., Rotman, R. M., Powell, M. A., & Wilhelm Stanis, S. A. (2023). Conservation easements: A tool for preserving wildlife habitat on private lands. *Wildlife Society Bulletin*, 47(2), e1415. <https://doi.org/10.1002/wsb.1415>

Cheshire, K. (2007). *Market-Based Planning Tools: An Overview of TDRs and PDRs*.

https://ncsegrant.ncsu.edu/ncsegrant_docs/coastallaw/pubs/cheshire.pdf

Czech, B. (2002). A Transdisciplinary Approach to Conservation Land Acquisition. *Conservation Biology*, 16(6), 1488–1497. <https://doi.org/10.1046/j.1523-1739.2002.01046.x>

Executive Office of the President. (2021). Executive Order No. 14,008, “Tackling the Climate Crisis at Home and Abroad.” 86 Fed. Reg. 7619. Issued January 27, 2021.

Farmer, J. R., Meretsky, V., Knapp, D., Chancellor, C., & Fischer, B. C. (2015). Why agree to a conservation easement? Understanding the decision of conservation easement granting. *Landscape and Urban Planning*, 138, 11–19. <https://doi.org/10.1016/j.landurbplan.2015.01.005>

Friends of the Blue Ridge Mountains. (n.d.). *Our mission*. Retrieved March 31, 2025, from

<https://friendsofblueridge.org/>

Fulton, W. (2004). *TDRs and Other Market-Based Land Mechanisms: How They Work and Their Role in Shaping Metropolitan Growth*. The Brookings Institution Center on Urban and Metropolitan Policy.

Gerber, J.-D., & Rissman, A. R. (2012). Land-Conservation Strategies: The Dynamic Relationship between Acquisition and Land-Use Planning. *Environment and Planning A: Economy and Space*, 44(8), 1836–1855. <https://doi.org/10.1068/a44395>

GovSalaries. (n.d.). *Loudoun County salaries—Virginia*. Retrieved March 7, 2025, from <https://govsalaries.com/salaries/VA/loudoun-county>

Greene, R. (2021, June 25). *Lingering Local Distrust Fells AT&T's Short Hill Cell Tower Plans*. LoudounNow.Com. https://www.loudounnow.com/archives/lingering-local-distrust-fells-at-t-s-short-hill-cell-tower-plans/article_b668c398-16d6-5513-b464-6162dd583109.html

Land Trust of Virginia (2013). *Blue Ridge Conservation Initiative* (report with supporting maps and documents).

Lombard, H. (2024, January 29). *Amid slow population growth, Virginia's demographic landscape is being transformed*. Weldon Cooper Center. <https://www.coopercenter.org/research/amid-slow-population-growth-virginias-demographic-landscape-being-transformed>

Loudoun County government. (n.d.). *Existing conservation easements*. Retrieved February 28, 2025, from <https://www.loudoun.gov/2817/Existing-Conservation-Easements>

Loudoun County government. (n.d.). *Mountainsides and steep slopes*. Retrieved March 5, 2025, from <https://www.loudoun.gov/1378/Steep-Slopes-Mountainsides>

Malone, L. (2022, November 10). The Blue Ridge Mountains: A friend at risk. *Loudoun Now*. https://www.loudounnow.com/opinion/the-blue-ridge-mountains-a-friend-at-risk/article_f247ec14-6273-11ed-9363-8f9259830201.html

Naidoo, R., Balmford, A., Ferraro, P., Polasky, S., Ricketts, T., & Rouget, M. (2006). Integrating economic costs into conservation planning. *Trends in Ecology & Evolution*, 21(12), 681–687.
<https://doi.org/10.1016/j.tree.2006.10.003>

Nature Conservancy (n.d.). *Why we're committing to 30x30: Protect 30% of land and water by 2030.*

Retrieved December 2, 2024, from <https://www.nature.org/en-us/what-we-do/our-priorities/protect-water-and-land/land-and-water-stories/committing-to-30x30/>

Office of Management and Budget. (2023). *Circular A-4*. <https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/11/CircularA-4.pdf>

Oliver, M. (1994). *Yes! no!* <https://www.poetry-chaikhana.com/blog/2019/11/08/mary-oliver-yes-no-2/>

Pampaloni, H. (2024, July 9). PJM considers alternate route for western Loudoun power line. *Loudoun Now*. https://www.loudounnow.com/news/pjm-considers-alternate-route-for-western-loudoun-power-line/article_3faf7494-3e2e-11ef-a865-bb979c92b9ce.html

Pampaloni, H. (2024, September 19). Supervisors approve plan for rural zoning review. *Loudoun Now*. https://www.loudounnow.com/news/supervisors-approve-plan-for-rural-zoning-review/article_f959d4fc-7696-11ef-9848-27282f26b69c.html

Pampaloni, H. (2024, October 11). Parks and Rec unveils name, branding for linear parks and trails system. *Loudoun Now*. https://www.loudounnow.com/news/parks-and-rec-unveils-name-branding-for-linear-parks-and-trails-system/article_58f2cca4-87fc-11ef-8c3d-1bcc5f159962.html

Pampaloni, H. (2024, October 17). Divided county board rejects PDR program restart. *Loudoun Now*. https://www.loudounnow.com/news/divided-county-board-rejects-pdr-program-restart/article_bdc36250-8ca3-11ef-b6f7-bf9b3693ee25.html

Pampaloni, H. (2025, March 19). By-Right data centers eliminated in Loudoun, existing applications grandfathered. *Loudoun Now*. https://www.loudounnow.com/news/by-right-data-centers-eliminated-in-loudoun-existing-applications-grandfathered/article_130515be-0478-11f0-ab4f-7771b6b47f71.html

Piedmont Environment Council. (2022, November 30) *The mountains are calling (you to action!)*. Retrieved January 30, 2025, from <https://www.pecva.org/region/loudoun/the-mountains-are-calling-you-to-action/>

Pocewicz, A., Kiesecker, J. M., Jones, G. P., Copeland, H. E., Daline, J., & Mealor, B. A. (2011). Effectiveness of conservation easements for reducing development and maintaining biodiversity in sagebrush ecosystems. *Biological Conservation*, 144(1), 567–574. <https://doi.org/10.1016/j.biocon.2010.10.012>

Powell, M. (2024, April 18). Clarke County supervisors ask Loudoun counterparts for help lobbying state for Rt. 7 improvements. *Loudoun Times-Mirror*. https://www.loudountimes.com/0local-or-not/1local/clarke-county-supervisors-ask-loudoun-counterparts-for-help-lobbying-state-for-rt-7-improvements/article_50a915f2-fda6-11ee-bb7c-1b0c8d79b3a1.html

Richardson, J. J., & Bernard, A. C. (2011). Zoning for conservation easements. *Law and Contemporary Problems*, 74(4), 83–108.

Richardson, L., Huber, C., Zhu, Z., & Koontz, L. (2014). *Terrestrial carbon sequestration in national parks: Values for the conterminous United States*. National Park Service. <https://irma.nps.gov/DataStore/DownloadFile/522689>

Santos, M. J., Watt, T., & Pincetl, S. (2014). The push and pull of land use policy: Reconstructing 150 years of development and conservation land acquisition. *PLOS ONE*, 9(7), e103489. <https://doi.org/10.1371/journal.pone.0103489>

Staff. (2024, March 13). New conservation easements total 2,300 acres. *Loudoun Times-Mirror*.

https://www.loudountimes.com/0local-or-not/1local/new-conservation-easements-total-2-300-acres/article_91c00724-e174-11ee-9432-cb1c95105fe0.html

The editors of Encyclopedia Britannica. (2024). Blue Ridge Mountains. In *Britannica*.

<https://www.britannica.com/place/Blue-Ridge-mountains>

Timperley, J. (2022, April 28). *Urban sprawl defines unsustainable cities, but it can be undone*. Popular Science. <https://www.popsci.com/environment/urban-sprawl-cities-sustainable/>

U.S. Census Bureau. (2021, August 25). *Virginia Adds More Than 600,000 People Since 2010*. Census.gov. <https://www.census.gov/library/stories/state-by-state/virginia.html>

USDA Climate Hub. (n.d.). *Maintain and enhance infiltration and water storage capacity of forest soils*. Retrieved March 31, 2025, from <https://www.climatehubs.usda.gov/approach/maintain-and-enhance-infiltration-and-water-storage-capacity-forest-soils>

Virginia Conservation Easement Act, Title 10.1 § 10.1-1009 *et seq.* (1988).

Virginia Department of Forestry. (n.d.). *Conservation easements*. Retrieved November 15, 2024, from <https://dof.virginia.gov/forest-management-health/forestland-conservation/conservation-easements/>

Wallace, G. N., Theobald, D. M., Ernst, T., & King, K. (2008). Assessing the ecological and social benefits of private land conservation in Colorado. *Conservation Biology*, 22(2), 284–296.

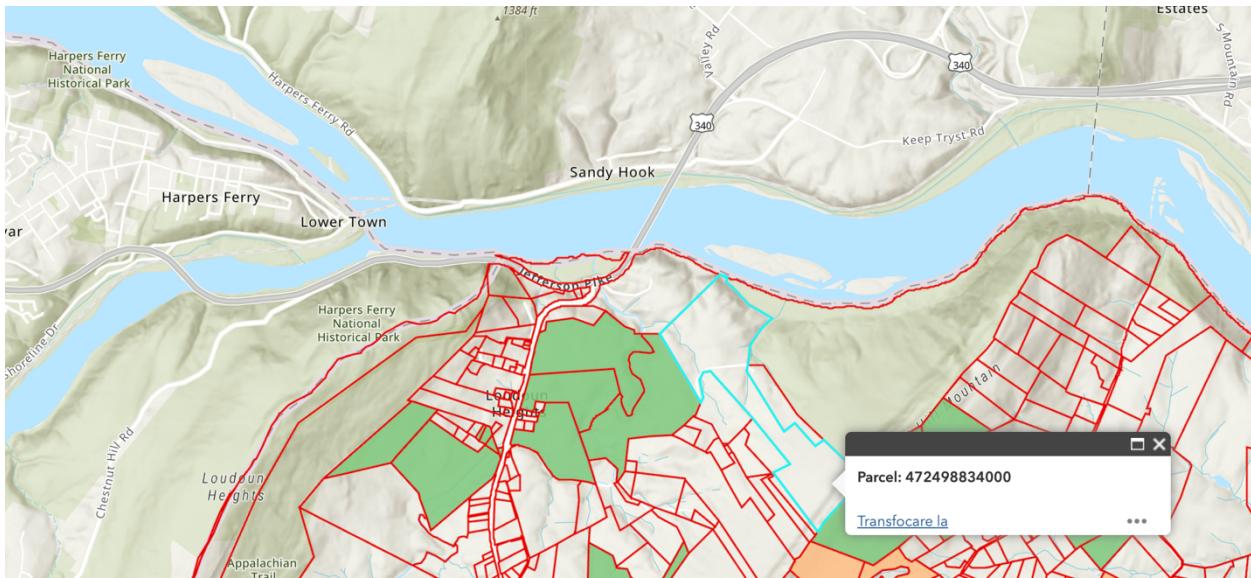
<https://doi.org/10.1111/j.1523-1739.2008.00895.x>

WeConservePA. (n.d.). *Transfer of development rights*. Retrieved February 19, 2025, from <https://library.weconservepa.org/guides/12-transfer-of-development-rights>

Weimer, D., & R. Vining, A. (2017). *Policy analysis: Concepts and practice* (6th ed.). Routledge. <https://doi.org/10.4324/9781315442129>

Maps and costing appendix

- Map of Short Hill with parcel to be acquired outlined in light blue. Areas shaded dark green are under conservation easement. The light green portions of the map represent federal or state parkland. Red lines demarcate parcel boundaries.



Screenshot from Loudoun County's GIS database. Data current as of December 2024.

- Calculations for cost of employing five zoning enforcement officers or five staff members to run the TDR program:

Cost of employing five zoning/planning staff in year zero	Discounted costs	Year
\$391,945.00 (or \$78,389 x 5)	\$321,531.41	10
	\$327,962.04	9
	\$334,521.28	8
	\$341,211.71	7
	\$348,035.94	6
	\$354,996.66	5
	\$362,096.60	4
	\$369,338.53	3
	\$376,725.30	2
	\$384,259.80	1
Discount rate = 2%	\$3,520,679.28	total

$$\frac{391,945}{1.02^{\text{year}}} = \text{present value cost}$$



Question, comments, or feedback? The author of this report would love to hear from you and may be reached at jsx7na@virginia.edu.



FRANK BATTEEN SCHOOL
of LEADERSHIP and PUBLIC POLICY

