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Federalism and Flexibility: Fifty Years of Community Development Block Grants
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PD&R

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Contents

Symposium

Federalism and Flexibility: Fifty Years of Community Development Block Grants

Guest Editors: Paul Joice, Jessie Handforth Kome, Tennille Parker, and Todd Richardson

Guest Editors' Introduction

The Community Development Block Grant at 50

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Introduction

No better account of the origin of the Community Development Block Grant (CDBG) exists than Charles Orlebeke and John Weicher's 2014 article, "How CDBG Came to Pass," which begins—

> The creation of the Community Development Block Grant (CDBG) in 1974 was a highly unusual public policy event. A sitting president proposed to terminate several established programs—including one that had been in existence for a quarter-century—in favor of a radically different and untried policy approach; his proposal was approved by a Congress of the opposite party which at the same time was in the process of impeaching him. How did that happen? (Orlebeke and Weicher, 2014)

Drawing heavily from Orlebeke and Weicher's and similar accounts of other scholars and policymakers (for example, Rich, 2014), the creation of CDBG was not only a watershed moment in community development policy, it was seen as part of a grand vision to transform the nature of federalism in the United States. In 1969, President Richard Nixon unveiled his plan for a "New Federalism" that would combine the spending power of the federal government with a decentralized approach to decisionmaking and program administration (Orlebeke and Weicher, 2014). President Nixon proposed a package of seven revenue sharing programs, including unrestricted "General Revenue Sharing" and six domain-specific "special revenue sharing programs"—including "Urban Community Development" and "Rural Community Development." The U.S. Congress approved the General Revenue Sharing proposal in 1972 with an initial funding level of $5 billion (more than $30 billion in 2024 dollars), but it was short-lived, suffering gradual

cuts until it was fully eliminated in the first year of President Ronald Reagan's administration (Orlebeke and Weicher, 2014). Of the special revenue sharing programs, only two would come to fruition: CDBG and a job training grant authorized in 1973 by the Comprehensive Employment and Training Act, which would be replaced in 1981 (Orlebeke and Weicher, 2014). CDBG would prove to be the only durable element of the Nixon Administration's grand vision for a New Federalism. Nixon himself would resign on August 9, 1974, less than a week before Congress completed negotiations on the law to establish CDBG.

The Housing and Community Development Act of 1974

On August 22, 1974, President Gerald Ford signed the Housing and Community Development (HCD) Act of 1974 into law. He used only one pen and handed it to the U.S. Department of Housing and Urban Development (HUD) Secretary James Lynn. President Ford then stepped up to the podium and said the following about CDBG:

> By replacing narrow programs such as urban renewal and model cities with a single block grant program for community development, this bill marks a complete and welcome reversal of the way that we solve the problems of urban America.
>
> In a very real sense, this bill will help to return power from the federal establishment to people in their own communities. Decisions will be made at the local level. Action will come at the local level. And responsibility will be placed squarely where it belongs—at the local level. (Betty Ford White House Papers, 1974)

At the time, President Ford remarked that he agreed with legislators who thought it the most important housing law since the Housing Act of 1934 and the most important community development law since the Housing Act of 1949.[1]

Time has proven that observation to be partly true. In addition to CDBG, the HCD Act of 1974 created the Section 8 programs—Project Based Rental Assistance and Tenant Based Rental Assistance, subjects of a previous *Cityscape* symposium—which have grown to represent the United States' most important resources for making rent affordable to extremely low-income households.

CDBG has had a different path during the past 50 years. It has proven to be very popular with the mayors and county executives who receive the funding. However, the base program has not evolved statutorily to reflect current needs and, due to inflation and static appropriation levels, has shrunk in importance, although new programs responding to the urgency of the moment that use its statutory structure (programs that share its DNA) have grown in importance.

This symposium looks at various aspects of the base CDBG program and some of the programs that share its DNA. To set the stage, this guest editor introduction reminds readers about how the program is used before summarizing the articles in the symposium.

[1] Gerald R. Ford Presidential Library. 1974. Betty Ford White House Papers "8/22/74 - Housing Act Signing." https://www.fordlibrarymuseum.gov/library/document/0018/4515646.pdf.

Unlike the most recent 43 years, the first 7 years following the HCD Act of 1974 had a few important changes for CDBG before it settled into the program known today. The two most important changes were—

1. Creating a dual formula structure—one that favored city age and decline and the other favoring places based on poverty and overcrowding, which occurred with a change to the statute in 1977, based on research by HUD analyst Harold Bunce.

2. Shifting administration of the "small cities" program from HUD to states in 1981. When CDBG was created in 1974 with the consolidation of eight programs, it initially set aside 90 percent of funds for entitlement cities that served as "central cities" of a metropolitan area (now "principal cities") or were greater than 50,000 in population. The remaining 10 percent of funds were administered by HUD to serve "small cities" that did not meet these criteria. HUD administered these funds through a competitive process that each of its field offices administered. The share of funds for the small cities program grew to 26 percent by fiscal year 1981.

The Reagan Administration sought to move decision making on small city funding from HUD to state governments. The 1981 Amendments to the HCD Act of 1974 created a formula for allocating funds to states and allowed states to take over administering the CDBG small city funds and legislated 30 percent of funds for the small cities program.

This major change to the CDBG statute in 1981 was the most recent.

CDBG—HUD's Swiss Army Knife

As noted previously, CDBG was born out of President Nixon's push for giving more local control over federal resources through revenue sharing. Pure revenue sharing simply transfers taxes collected from the federal government to local governments, with few requirements. Although CDBG is an extremely flexible funding source similar in principle to revenue sharing, it comes with some core requirements—national objectives. Every activity needs to meet one of the following national objectives.

- Low to Moderate Income Benefit. Benefiting low- and moderate-income persons (people with income less than 80 percent of Area Median Family Income).

- Addressing Blight. Preventing or eliminating slums or blight.

- Urgent Need. Addressing community development needs that have a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community for which other funding is not available.

Not less than 70 percent of the funds must provide low to moderate income benefit. The low to moderate income benefit requirement can be met in one of two ways—individual benefit, such as rehabilitation of homes for low-income persons, or area benefit in which the planned project, such as a street improvement, is in an area where more than 50.1 percent of individuals are low to moderate income.

Targeting a place based on a concentration of low- and moderate-income people is a particularly important feature of CDBG and facilitates targeting public improvements to lower-income communities.

In terms of which activities CDBG allows, it is often easier to talk about what CDBG cannot be used for than what it can be used for. Even the things for which it cannot be used, Congress often lets the HUD Secretary waive those "cannot" items when a crisis demands it for special programs.

For the core CDBG program, these uses are generally *not* allowed:

- Acquisition, construction, or reconstruction of buildings for the general conduct of government.
- Political activities.
- Certain income payments.
- New housing construction (with some exceptions).

Of the many, many allowed activities, grantees are most likely to use CDBG for public improvements or housing. However, the pattern of expenditure is very different for entitlement grantees than for state administered funds.

Exhibit 1 shows that state administered funds, in particular, are largely expended on public improvements (65 percent) such as water, sewer, street, and sidewalks. Entitlement grantees slightly favored housing activities in fiscal year 2023 (32 percent)—primarily rehabilitation—over public improvements (27 percent). Entitlement grantees also used roughly 14 percent of the funds for public service costs such as programs that serve youth, elderly, or homeless and roughly 8 percent for acquisition activities. Both for entitlement grantees and state administered funds, 3 to 5 percent is used for economic development that usually involves financial assistance to for-profit businesses or microenterprises.

Exhibit 1

Base Community Development Block Grant Fiscal Year 2023 Disbursements (1 of 2)

Activities	All*	Entitlements	State Administered
Public Improvements (primarily water, sewer, street, and sidewalk improvements but also various neighborhood, park, and recreational facilities)	36.0%	26.5%	64.9%
Housing (primarily rehabilitation of single-family and multifamily housing but also code enforcement)	27.6%	31.7%	15.5%
Public Services (primarily for youth, seniors, and homeless services and employment training but also a wide variety of other uses)	11.0%	13.8%	2.2%
Economic Development (primarily financial assistance for for-profit businesses, support for micro enterprises, rehabilitation of commercial properties, and technical assistance)	3.9%	3.4%	5.6%
Acquisition Activities (primarily acquisition but also demolition and associated activities)	6.4%	7.8%	2.1%

Exhibit 1

Base Community Development Block Grant Fiscal Year 2023 Disbursements (2 of 2)

Activities	All*	Entitlements	State Administered
Other	0.3%	0.2%	0.5%
Repayments of Section 108 Loans	1.7%	2.2%	0.2%
Administrative and Planning	13.1%	14.4%	9.0%
Total Disbursements Fiscal Year 2023	100.0%	100.0%	100.0%
Amount Disbursed Fiscal Year 2023	$3,787,857,544	$2,850,768,456	$925,508,173

**All includes $5.9 million for HUD-administered funds disbursed for Hawaii nonentitlement areas and $5.7 million disbursed for insular areas in addition to entitlement and state administered funds.*

Source: HUD. July 13, 2024. "CDBG Activity Expenditure Reports." https://www.hudexchange.info/programs/cdbg/cdbg-expenditure-reports/

The block grant feature of CDBG also can leverage private capital through the Section 108 Loan Guarantee program. Since 1974, 2,207 Section 108 loan commitments have been awarded for more than $10 billion (not inflation adjusted). CDBG serves as a backstop for Section 108 loans. The loans can be paid back with program revenue or a grantee's annual CDBG allocation. HUD estimates that, as of 2023, 36 percent of Section 108 debt service is paid with CDBG funds, which amounts to less than 2 percent of 2023 CDBG expenditures. HUD guarantees Section 108 loans, but there has not yet been a single Section 108 loan default that has resulted in repayment by HUD.

Citizen Participation and Planning

Although CDBG allows local governments a great deal of flexibility, it intends to create accountability to those local governments by requiring development of their plans through a citizen participation process. Local governments are accountable to HUD in terms of how they implement the programs. However, they are accountable to local citizens in choosing what they do with the funds.

Grantees prepare a consolidated plan every 5 years that explores community needs and lays out a 5-year strategy. Each year, grantees must also develop an annual action plan that says what they will do with that year's funding. Both the 5-year strategy and 1-year plan require citizen participation.

Base CDBG and Its Offspring

In 1975, the year after establishing CDBG, HUD distributed $2.47 billion ($14.9 billion in 2024 dollars) to 594 grantees for an average grant of $4.2 million ($25.1 million in 2024 dollars). For 50 years, CDBG funding has remained relatively constant (in nominal dollars) around $3.0 to $4.0 billion but has declined substantially when accounting for inflation. Meanwhile, the number of grantees has doubled. In fiscal year 2023, $3.3 billion was divided among 1,239 grantees for an average grant of $2.7 million. Accounting for these three joint phenomena—stagnant funding, 50 years of inflation, and a growing number of grantees—the average original CDBG grantee is now receiving one-tenth of what they received at the program's launch.

In its 50 years, the CDBG base program has provided $178 billion in funding, $385 billion when adjusting for inflation.

Although the CDBG base program has grown in grantees and shrunk in inflation adjusted funding, the CDBG rules have been used as the chassis for a number of other programs. In general, these other programs do relate back to the findings and purposes stated in Title I of the HCD Act, specifically "The primary objective of this title [...] is the development of viable urban communities, by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low and moderate income."[2]

In the past 2 decades, the programs generated from CDBG include the—

- CDBG-Disaster Recovery (CDBG-DR) program, which has allocated $135 billion adjusted for inflation since 1992 ($100 billion unadjusted for inflation).[3] The vision for CDBG-DR came from former HUD Secretary Henry Cisneros to support recovery after Hurricane Andrew in 1991 (Rudd, 2024). The first disaster for more than $1 billion that it covered was for the recovery from the terrorist attack on the World Trade Center. The first disaster for which it provided more than $10 billion was Hurricanes Katrina, Rita, and Wilma in 2005. Hurricane Sandy in 2012 led to a heavy focus on resiliency in addition to recovery, with former HUD Secretary Shaun Donovan leading the overall federal response. Recovery efforts from Hurricanes Maria, Harvey, and Irma in 2017 received more than $20 billion through CDBG-DR.

- Economic Development Initiative (EDI), better known as congressional set-asides. EDIs were a part of CDBG, roughly 5 to 10 percent of the size of the base program through fiscal year 2010. From fiscal years 2011 to 2021, no congressional set-asides were provided. Beginning in fiscal year 2022, congressional set-asides returned in a very big way. They were one-half as much as the formula program in fiscal year 2022, and in fiscal years 2023 and 2024, the congressional set-asides matched the size of the base program. Many of these projects are very similar to projects funded by the base CDBG but are not explicitly tied to the national objectives. The funding amounts and the local decisionmaking coming from members of Congress are also different. That is, the congressional process is replacing funding amounts built on a needs-based formula, and it also replaces local decisions on projects led by mayors and county executives.

- Neighborhood Stabilization Program (NSP), accounting for $10 billion inflation adjusted funds ($7 billion not adjusted) through separate appropriations in 2008, 2009, and 2010. After the spike in foreclosures beginning in 2007, Congress provided funding to assist local governments with addressing the vacant housing in neighborhoods with concentrations of foreclosures.

- Indian CDBG (ICDBG), which has been part of CDBG since the beginning. It accounts for $4.6 billion of inflation adjusted funds ($2.5 billion not adjusted) and is administered by HUD's Office of Native American Programs.

- CDBG American Recovery and Reinvestment Act (CDBG-ARRA) as supplemental funds to help communities recover from the foreclosure crisis and CDBG CARES Act (CDBG-CV) supplemental funds to help communities respond to the economic downturn from the

[2] U.S. Government Publishing Office. *Chapter 69—Community Development*. 42 USC 5301

[3] CDBG-DR also includes CDBG-MIT for disaster mitigation grants.

COVID-19 pandemic emergency. They account for $7.6 billion of inflation adjusted funds ($6 billion not adjusted).

- Recently funded programs include the Recovery Housing Program (RHP), Pathways to Removing Obstacles to Housing (PRO Housing), and Preservation and Reinvestment Initiative for Community Enhancement (PRICE).
- Other programs funded in the Community Development Fund in the past, but no longer, include the Sustainable Communities Initiative, the Rural Innovation Fund, a collection of grants for universities working with their communities, and Brownfield EDIs, among others.

During the COVID-19 emergency, in a throwback to true revenue sharing, the U.S. Department of the Treasury allocated $350 billion—nearly as much as 50 years of inflation adjusted CDBG—through its State and Local Fiscal Recovery Funds to states, local governments, Tribal governments, and territories. CDBG loomed large for these Treasury funds. The set-aside for cities used the CDBG formula for allocating the funds, and the county formula required that a county would get the larger of the allocation under the CDBG formula or per capita. The Treasury program rules that set activity limitations provided a safe harbor for any activities allowed under CDBG.

As several articles in this symposium discuss, opportunities exist for improving the allocation and administration of base CDBG funds. Those changes would have a bigger punch than the base funding because any improvements to the CDBG base program would also likely improve implementation for its offspring programs.

When factoring in these offspring programs, including the congressionally directed projects (but not the Treasury program), CDBG has averaged annual inflation adjusted funding of $11.6 billion in the past decade, which is comparable with the inflation adjusted $13.5 billion of its first decade. As exhibit 2 shows, the rise of CDBG-DR since Hurricane Katrina, and EDI funding in the past 3 years (congressionally directed), is most of the source of this funding growth.

Exhibit 2

Inflation Adjusted Annual Average Appropriations by Decade for Base CDBG and Its Offspring

	2024 Inflation Adjusted Annual Average Funding by Decade ($000)				
	Base CDBG Program	CDBG-DR	Economic Development Initiative	ICDBG, NSP, CDBG-ARRA, CDBG-CV	Total
1975–1984	$13,546,885	$0	$0	$102,217	$13,649,102
1985–1994	$8,060,281	$239,750	$0	$74,633	$8,374,663
1995–2004	$8,018,400	$799,079	$283,321	$118,898	$9,219,698
2005–2014	$5,081,541	$6,069,411	$189,421	$1,244,117	$12,584,491
2015–2024	$3,819,021	$6,379,180	$796,700	$688,496	$11,683,397
	2024 Inflation Adjusted Aggregated Funding 1975–2024 ($000)				
Total	**$385,261,275**	**$134,874,203**	**$12,694,426**	**$22,283,609**	**$555,113,513**

CDBG = Community Development Block Grant. CDBG-ARRA = CDBG American Recovery and Reinvestment Act. CDBG-CV = CDBG CARES Act. CDBG-DR = CDBG-Disaster Recovery. ICDBG = Indian Community Development Block Grant. NSP = Neighborhood Stabilization Program.

Source: HUD budget documents

The future of CDBG will likely be tied to making the base program work better, authorizing CDBG-DR, and finding a way to streamline speedy implementation of EDI projects. This symposium hopes to inform that future.

Symposium Articles

What is CDBG now, 50 years on? As the previous discussion emphasized, CDBG is flexible and now comprises a base program plus a collection of related programs. Measuring the effect of CDBG as a program is impossible given that it is really many different programs with many different local goals. Research is best performed by looking at a specific target area or specific activity.

The symposium articles represent a diverse set of studies looking at particular aspects of the core program or one of its related programs. The symposium begins with five articles focused on the core CDBG program. Vicki Watson, Maureen Milligan, Laura Salinas-Martinez, Tess Hembree, and Josh Shumaker share the perspectives of three leading community development nonprofits—Grow America (formerly the National Development Council), the National Community Development Association, and the Council of State Community Development Agencies—which have played key roles in the CDBG program throughout its history. Their article traces the history of CDBG and offers recommendations to improve the program for the coming decades.

The next two articles look at the effects of the CDBG program through a critical research lens. CDBG has long been a notoriously difficult program to evaluate. The very flexibility that makes CDBG such an attractive program for grantees makes it nearly impossible for researchers to characterize what kind of outputs or outcomes should be expected from the program as a whole. Building a community center, funding a job training program, rehabilitating homes for low-income homeowners, and providing business development loans—to name only a few eligible uses of CDBG funds—have vastly different goals and potential outcomes. Assessing whether CDBG activities are effective often requires a nuanced understanding of specific activities and high-quality, detailed data on those activities. Despite HUD's considerable effort, particularly during the past 20 years, data reported from CDBG grantees to HUD often lack the level of detail required to assess the program's effectiveness.

Brett Theodos, George Galster, and Amanda Hermans demonstrate one way of overcoming these challenges. They focus on home sale prices as the key outcome of interest, without any consideration of whether a particular activity was *intended* to increase property values under the theory (widely accepted among urban economists) that the general appeal of a place is capitalized into the property values in that place. If CDBG-funded activities improve a neighborhood in any way, the home prices in that neighborhood should increase relative to what would have happened without the CDBG-funded investment. The authors estimate "what would have happened" using an adjusted interrupted time-series approach that compares changes over time in areas that got CDBG investment relative to similar areas that did not. Across their three study sites, they find a statistically significant positive effect of CDBG investments, especially within 2,000 feet of the investment. The magnitude of the effect, and its persistence over space and time, varies across the three study sites, each of which used their CDBG funds in notably different ways. The cross-site variation exhibited in this article points to a need for additional research on different sites with different CDBG investment strategies.

George Zou also focuses on a single outcome measure—jobs—without concern for whether that outcome was intended by any particular CDBG activity. Indeed, Zou's analysis does not rely on CDBG activity data at all. He focuses on a sudden change in CDBG formula allocations that resulted when HUD began using annual American Community Survey data from the U.S. Census Bureau rather than data from the decennial Census. This data transition caused some grantees to experience a large change in funding, substantially beyond the year-to-year fluctuations that were common in preceding years. Zou exploits this plausibly exogenous variation in funding amounts to conclude that receiving additional CDBG funds causes a statistically significant increase in jobs within the CDBG grantee's jurisdiction. Notably, this analysis is not focused specifically on any particular type of CDBG activity; receiving additional CDBG funds appears to have positively affected local economies, regardless of how the grantees chose to use those funds. However, Zou did not observe a *decrease* in jobs among those grantees that received less CDBG funding. He speculates that those grantees may have managed to cut certain activities less likely to have an economic impact.

Zou's article calls attention to the role CDBG plays as de facto revenue sharing, but Greg Miller demonstrates that the CDBG formula does not effectively target the places most in need of revenue sharing. Miller's work is the latest in a long tradition of research that examines the CDBG formula and finds that it is poorly targeted to community development needs. Miller presents two formula alternatives—a "replacement" option and a more modest "repair" option. He acknowledges the political challenges of formula reform and recommends overcoming those challenges by phasing in a new formula paired with an increase in funding.

Keith Wiley and Manda LaPorte highlight one specific type of high-need community: Colonias, which are communities close to the United States-Mexico border that lack basic infrastructure such as water and sewer systems. Since 1990, the state-administered CDBG program has included a set-aside for colonias. Wiley and LaPorte use HUD administrative data to describe the types of activities funded under the colonias set-aside, as well as the location and reach of these activities. They also interview experts to explore ongoing challenges with deploying CDBG to support community development needs of colonias.

The remaining articles take a wider view—focusing not only on CDBG but also on the many other programs that have grown in recent years from the administrative infrastructure of CDBG. Heidi Frechette describes ICDBG and its reliance on the CDBG program model to address housing and community development needs in Tribal areas. Today, a mandatory 1-percent set-aside from CDBG appropriations funds ICDBG, and as a result, ICDBG is subject to the same stagnant funding challenge as the core CDBG program.

Paul Joice and Jennifer Carpenter trace the development of two CDBG spinoffs, starting with the CDBG-DR program and then focusing on NSP. Joice and Carpenter were among a team of HUD staff cobbled together on rotation from various other parts of HUD to support the initial NSP rollout. Their account considers some of the benefits and challenges of using the CDBG platform to address a crisis and explores how NSP highlights some policy tensions that go all the way back to CDBG's creation.

Next, Brian An, Rachel Drew, Andrew Jakabovics, Jenny Moody, Anthony Orlando, and Seva Rodnyansky explore a specific aspect of CDBG-DR—the extent to which it helps renters in the aftermath of a severe disaster. CDBG-DR is the federal government's primary mechanism for supporting long-term housing recovery after a disaster, but some have criticized the program for focusing on assisting property *owners*. In recent years, HUD has sought to address this concern by requiring that CDBG-DR grantees take steps toward rebuilding rental housing. An et al. examine the case of severe storms in Colorado in 2013, after which HUD provided CDBG-DR funding with rental housing requirements. They compare rental market outcomes for counties that received CDBG-DR with counties that experienced the storms but did not receive CDBG-DR. They find a statistically significant effect on rents—with rents growing 4.0 to 5.8 percent less in the places that received CDBG-DR. They also observe a higher volume of multifamily housing building permits in places that received CDBG-DR, suggesting that CDBG-DR may be helping to mitigate the rental housing supply shortages that often follow natural disasters.

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Practitioner Perspective on Community Development Block Grants Past and Future

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Abstract

This article describes the creation of the Community Development Block Grant (CDBG) program and its evolution over the years through the lens of three of the nation's leading nonprofit community development organizations. The authors describe their respective organizations' roles in the CDBG program and share their vision for its future.

Introduction

This article is the result of a collaboration between three of the nation's oldest nonprofit organizations focused on supporting community development nationwide: the National Community Development Association (NCDA), the Council of State Community Development Agencies (COSCDA), and Grow America.

Grow America[1] and NCDA[2] were both organized in 1969, soon after the federal government began committing significant federal resources to community development programs as a direct response to the activism of the Civil Rights movement. Both organizations were formed to serve the distinct needs of local jurisdictions that found themselves eligible to apply for millions of dollars in community development funding and, when successful, were also expected to comply with myriad federal regulations. Grow America fulfilled the role of a trusted advisor to local jurisdictions needing community development finance and small business lending expertise. At the same time, NCDA served as a representative and advocate for cities receiving funding via the Model Cities Program, one of the initial community development programs authorized and funded by Congress.

COSCDA[3] was established in 1975, 1 year after the CDBG authorization. COSCDA filled the unmet need for a national organization to represent the interests of state administrators of community development programs.

In honor of the 50th Anniversary of the Community Development Block Grant Program, this article shares the unique perspective of these three leading community development organizations, including each organization's role in designing and deploying the CDBG program. The article also highlights several examples of local community development initiatives that maximized the flexibilities provided in the CDBG program. The article concludes with a look at the CDBG program's future and proposes changes to enhance it for the next generation of community developers.

Design and Early Implementation of the Community Development Block Grant Program

Before the enactment of the Community Development Block Grant (CDBG) program in 1974, local and state governments relied on many federal categorical programs to address neighborhood conditions. These highly prescriptive programs were narrow in scope. Each program focused on funding one activity, such as planning or developing open space, water and sewer, or public

[1] Grow America was initially known as the National Council for Community Development and later began doing business as (DBA) the National Development Council (NDC). Grow America directs capital to support the development and preservation of affordable housing, the creation of jobs through training and small business lending, and the advancement of livable communities through investment in social infrastructure. Additional information about Grow America can be accessed at: https://growamerica.org/.

[2] NCDA was initially known as the Model Cities Directors' Association (MCDA). Soon after CDBG was authorized in 1974, MCDA changed its name to the National Model Cities and Community Directors' Association. In 1979, the organization's name was changed a final time to the National Community Development Association (NCDA). Today, the NCDA's membership is more than 500 and includes cities and counties. NCDA members administer HUD Office of Community Planning and Development (CPD) programs—CDBG, the HOME Investment Partnership Program (HOME), Homeless Assistance Grants, and the Housing Opportunities for Persons with AIDS (HOPWA) program. Additional information about NCDA can be accessed at: https://ncdaonline.org/.

[3] COSCDA is a national association representing state administrators of HUD-CPD programs. It facilitates coordination and collaboration among states across respective community development programs. Headquartered in Washington, D.C., COSCDA serves its member agencies through federal affairs work in Congress and the executive branch, training and technical assistance, and peer-to-peer engagement. Additional information about COSCDA can be accessed at: https://coscda.org/.

facilities. In addition, the programs provided funding on an exclusively competitive basis, which impeded long-term planning and bred funding uncertainty.

In the early 1970s, the National Community Development Association (NCDA) was a "young" organization. Still, it had already developed strong relationships with key leaders at the U.S. Department of Housing and Urban Development (HUD), including Floyd Hyde (former Mayor of Fresno, California, and Assistant Secretary for Model Cities and Government Relations at HUD) and Warren Butler (Special Assistant to HUD Secretary George Romney). NCDA and key partners, such as the U.S. Conference of Mayors, drew on these relationships at HUD to begin advocating for consolidating the multitude of categorical federal grants into one flexible program for local governments.

Within this same period, Grow America was leading the Nixon administration's $100 Million Minority Bank Deposit Program, a successful effort to persuade Fortune 500 companies to make deposits in minority-owned banks. During Grow America's visits to 21 states, staffers gained ground-level knowledge of the unique community development needs experienced by urban and rural communities nationwide.

Therefore, when Congress began holding hearings regarding the proposed CDBG program, Grow America's leaders were well-prepared to provide testimony. For example, during the hearings of the Senate Banking, Housing, and Urban Affairs Committee in 1973, executives from Grow America underscored the need for a flexible block grant approach that would allow local governments to address specific local challenges without the stringent constraints of categorical grants. This testimony was instrumental in shaping the legislative intent and structure of the CDBG program, including a more localized control of federal funds.

On August 22, 1974, President Gerald Ford signed into law the Housing and Community Development Act, which consolidated eight categorical federal programs (Model Cities, urban renewal, rehabilitation loans, historic preservation, open spaces, neighborhood facilities, water and sewer facilities, and public facility loans) into CDBG and ushered in a new era of community development in which cities and counties were given significant flexibility to undertake a wide range of community development activities.

The inception of CDBG greatly increased the efficiency of the federal grantmaking process. Consolidating the categorical programs into CDBG meant that entitlement communities no longer had to compete for funding for each program. CDBG provided communities with a single set of program rules and allowed them to make their own decisions about resource distribution at the state and local levels with minimal federal oversight. It also provided funding certainty for grantees, allowed communities to focus on long-term community development planning, and ushered in the birth of citizen participation. At the signing ceremony for the Housing and Community Development Act, President Ford said in his signing statement, "I think we can say without any reservation that the move from the narrow programs of the past in community development to programs that are very broad-gauged, a consolidation of programs such as Model Cities and urban development, will give a real impetus to local decisionmaking, local action, and local responsibility" (Office of the White House Press Secretary, 1974).

The Community Development Block Grant Program's Early Years: A Time of Learning and Adaptation

After the passage of the Housing and Community Development Act, NCDA, the Council of State Community Development Agencies (COSCDA), and Grow America continued to play a vital role in its implementation.

NCDA represented the CDBG grantees as an advocacy and membership organization and worked with HUD to ensure flexible development and implementation of the local Housing Assistance Plan and program activities. In the program's early years, CDBG grantees received large annual funding grants that allowed them to tackle major projects and improvements. For example, the City of New Bedford, Massachusetts, received $10 million in 1975 (compared with $2.5 million in 2024) and used the funds to tackle concentrated neighborhood revitalization. NCDA provided technical assistance and peer networking to grantees and advocated for expanding eligible program activities.

Grow America's early involvement in CDBG implementation ranged from technical assistance to local governments crafting their community development plans to training local officials on effective program administration. In addition, due to the financial structuring expertise of their staff, Grow America was involved in many of the initial projects funded through the Section 108 Loan Guarantee Program. Using the lessons it learned from working on early Section 108 projects, Grow America worked closely with HUD's Section 108 staff to identify program enhancements to the Section 108 program. The feedback from Grow America and other stakeholders contributed to adjustments and improvements in the program's design and processes to better meet the needs of communities using the Section 108 Loan Guarantee Program. This feedback led to improvements in the application structure and the option for grantees to apply for a pool of projects instead of a project-by-project application as long as grantees adopted comprehensive operating policies and procedures, including underwriting guidelines. Grow America also provided underwriting training to HUD staff and grantees and developed resources like the initial "roadmaps" for applying for a HUD Section 108 loan guarantee.

In the first 6 years of the CDBG program, HUD conducted an annual competition to fund small nonentitlement cities. This process proved to be unpopular in many rural communities. Therefore, in 1981, the Housing and Community Development Act was amended to create the state-administered CDBG program, designed to serve cities and towns under 50,000 in population and counties under 200,000 outside large metropolitan areas. In the early years of the state CDBG program, state grantees primarily awarded CDBG funding to public works and facilities projects in rural communities, including water and sewer, community facilities, and streetscapes.

The Community Development Block Grant Program's Lasting Legacy: The Flexibility to Respond to Crisis

In the decades since the creation of the CDBG program, Congress has recognized that the CDBG framework is uniquely suited to helping quickly deploy federal resources in response to local and national disasters. The CDBG Disaster Recovery Program (CDBG-DR) has received special appropriations for disaster recovery since 1993 (Rudd, 2024).

More recently, when the COVID-19 pandemic began to unfold in the spring of 2020, creating an economic crisis on top of a devastating health emergency, many communities turned to their existing CDBG programs as a framework to mobilize local recovery efforts, leverage local and other federal resources, and quickly expand programs and services to help address critical community needs, such as assistance to small businesses and emergency rental and utility assistance to impacted households.

In the early days of the COVID-19 pandemic, NCDA and COSCDA listened to their members. They recognized that the CDBG program needed more flexibility so cities could deploy their CDBG funds even more quickly to respond to the pandemic. They urged Congress to pass legislation to this effect. On March 27, 2020, Congress passed the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), which provided $5 billion in supplemental funding for the CDBG program to assist grantees in responding to the coronavirus pandemic. The CARES Act also included critical waivers for the CDBG program that added increased flexibility for grantees during the crisis. These funds played a vital role in helping grantees address the pandemic in their communities.

From April 2020 to June 2022, grantees used their CDBG-CARES Act (CDBG-CV) funds to:

- Support more than 73,400 businesses.
- Create and retain 37,300 full-time equivalent jobs.

Extend emergency grant payments/rental assistance for more than 800,000 households (HUD, 2022).

Once funding was appropriated to CDBG-CV, NCDA, COSCDA, and Grow America were actively involved in helping their members and clients assess their pandemic-recovery needs, design (or redesign) programs, and operationalize those programs during a time when most state and local government offices had limited ability to accept in-person visits. However, many low- and moderate-income (LMI) households lacked access to the resources needed to submit an online application for assistance, including access to a computer and high-speed internet. These three organizations brought their community development expertise so that clients could quickly learn of innovative programs deployed in communities nationwide that took full advantage of HUD's CDBG-CV waivers. In addition, Grow America helped design dozens of emergency rental and small business assistance programs with mobile-friendly applications that used video tutorials and infographics to help individuals navigate the application process. These organizations continue to use the lessons learned from the roll-out of CDBG-CV to advise their clients on program accessibility, strategic targeting of resources, and efficient program administration.

Program Outcomes

Through their advocacy and technical assistance work, NCDA, COSCDA, and Grow America have observed how CDBG offers a significant return on investment and encourages direct community engagement and local planning in public issues. Since 1974, CDBG has invested over $160 billion to create viable communities nationwide (Jaroscak, 2021). Most recently, from fiscal year (FY) 2005 to FY 2023, CDBG facilitated the creation and retention of 505,437 economic development-related jobs, contributed to infrastructure developments benefitting approximately 56 million persons,

assisted more than 176 million persons through public service activities, and met the housing needs of more than 1.9 million households (HUD, 2024).

Notably, CDBG is one of the few annual resources available to rural jurisdictions to address critical infrastructure and related needs. In FY 2023, states applied 65 percent of program funds ($600 million) to infrastructure projects. Housing came in second as a state investment, with 16 percent of funds dedicated overall.

Across the country, CDBG investments are regularly matched or exceeded by subsequent public and private investments. This funding is often from local governments, development finance agencies, nonprofit organizations, or other private investors. CDBG is often the first push needed to get the ball rolling for large-scale projects.

The flexible nature of CDBG leads to creativity, which leads to best practices. The following project best practices have positively impacted their local citizenry by addressing unique community needs.

Case Study One: Conroe, Texas

The CDBG Housing Relocation and Reconstruction Program is rewriting the narrative of citizens living in unsafe poverty conditions in Conroe, Texas, by providing safe, decent, sanitary, and affordable housing to one of the city's poorest neighborhoods. The program works to reconstruct dilapidated single-family homes owned by LMI clients into quality affordable housing. In addition, this program has the indirect benefit of increasing Conroe's affordable housing stock for future generations. It has had a measurable impact on the community. As of December 2023, the CDBG Housing Relocation and Reconstruction Program has used $1.2 million in CDBG funds to reconstruct 79 homes. In addition, the significant investment by CDBG has influenced the City of Conroe and other local developers to construct a local community center for the neighborhood and install new streets and street lighting.

Case Study Two: Quincy, Massachusetts

The City of Quincy, Massachusetts, used $765,000 in CDBG funding to construct a radiology suite within the Manet Community Health Center. The suite provides mammography and plain film x-ray imaging services, which have traditionally been unavailable for LMI populations. This project is transforming the community by providing early detection services and preventative care that had not been offered since the local hospital closed 10 years ago. After its construction in June 2023, the suite had already provided 277 mammograms and 515 x-rays within 4 months, indicating a huge demand for radiology services in Quincy. Fifty-seven percent of all mammography visits have been from the "extremely low" income level according to the federal poverty level. This project works to level the playing field for access to health care among traditionally underserved populations. The radiology suite regularly provides lifesaving services, making it an invaluable investment made possible by the CDBG program. The project's location also illustrates CDBG's long-lasting community impact. The Manet Community Health Center was created in 1978 using CDBG funding. The addition of a CDBG-funded radiology suite on the same ground 5 decades later is a testament to the generational benefits that can result from local investment.

Case Study 3: City of Allen, Texas, CDBG-CV Small Business Grant Program

The City of Allen, Texas, is a CDBG grantee with an annual allocation of approximately $435,000. In 2020, the City received $672,286 in CDBG-CV funds, which they chose to allocate between several programs, including the Small Business Grant Program. This program was designed to assist small businesses directly impacted by the COVID-19 pandemic with up to $25,000 for rent/mortgage, utilities, inventory, and payroll costs. The city allocated $250,000 of CDBG-CV funds to the Small Business Grant Program to assist 10 businesses.

As the CDBG-CV programs got underway, the city saw an overwhelming response to their Small Business Grant Program. The city received 56 applications within a 3-week period, indicating that the demand for the program far exceeded its initial budget. In 2021, the city was able to reallocate uncommitted CDBG-CV funds from other activities to the Small Business Program, increasing its program budget to $440,000. With these additional funds, the City of Allen was able to assist 19 small businesses with grants averaging $23,185.

Vision for the Future—Program Challenges Remain

Although the CDBG program allows communities to design and implement strategies tailored to meet local needs and priorities, it is severely underfunded. Statutory reforms are needed to increase program flexibility for grantees to expand the supply of affordable housing and fund vital community services. The following section discusses a list of program enhancements recommended by NCDA, COSCDA, and Grow America.

Stagnant Funding

CDBG program funding has not kept up with the increase in grantees added to the program since 1975 and, more importantly, with inflation. The number of grantees receiving a direct CDBG allocation from HUD has increased from 594 grantees in 1975 to 1,245 today, representing a 52-percent increase. Moreover, the program has never been adjusted for inflation, although local program costs increase annually. The program's inaugural funding level of $2.47 billion in 1975 is the equivalent of about $14.5 billion in 2024.

Increased program funding is needed. In a 2019 CDBG Coalition survey of CDBG grantees, more than 92 percent of the 232 local government grantees who responded said they had reduced programs because of a lack of CDBG funding. Nearly 70 percent of these local governments eliminated programs because of insufficient CDBG funding.

Recommendation: Increase the CDBG program's funding level to align with inflationary costs and growth in entitlements.

Lack of Sufficient Flexibility to Use Funds for New Housing Construction

Stable, decent, affordable housing is critical to improving communities and local economies. CDBG can be used for new housing construction but only in extremely limited circumstances (e.g., if the new construction is carried out by a community-based development organization [CBDO] as part

of a comprehensive local neighborhood revitalization plan). This narrowly restricted use impedes communities from using CDBG to increase the local supply of affordable housing. Although HOME Investment Partnerships Program (HOME) funds can be used for new housing construction, *597 (48 percent) of the 1,245 CDBG grantees do not receive HOME funds*. For those communities that receive HOME dollars, the level of funding has remained flat.

Recommendation: Broaden the CDBG statute to allow new housing construction as an eligible program activity without restrictions.

Low Public Services Cap

The public services category within CDBG covers many important activities that support and benefit low-income communities. Grantees use CDBG funds for a wide range of public service activities such as job training, daycare assistance for low-income working families, food banks, youth services such as summer employment for young adults and afterschool programs for low-income youth, health services, services for seniors, and other vital community services. However, the current 15-percent cap on the use of public services in the CDBG program hamstrings the ability of grantees to do more.

Recommendation: Expand the public services cap to at least 20 percent to provide grantees with more flexibility and resources to address local community development needs and increase services to vulnerable populations.

Data on Local Programs are Hard to Access and Share

Every 3 to 5 years, state and local jurisdictions that receive CDGB funding spend hundreds of hours developing their HUD Consolidated Plans (ConPlan), and every year they spend additional time developing their Annual Action Plans and Consolidated Annual Performance and Evaluation Reports (CAPER). In many instances, these documents run hundreds of pages long and are posted as PDF documents on HUD grantees' websites. Although HUD has made great strides in easing the data collection burden for local jurisdictions through the introduction of the eCon Planning Suite and CPD maps, an opportunity exists to make grantees' ConPlan data and data insights more accessible to the general public and more useful for community development professionals.

Recommendation: HUD should consider creating a ConPlan dashboard with a simple user interface with which users can search for specific elements contained in grantees' approved ConPlans, Annual Action Plans, and CAPERs. By allowing users to easily compare data, strategies, investments, and performance across jurisdictions and time periods, HUD could foster more collaboration in the community development field.

States Cannot Award Grant Funding to Consortiums of Units of General Local Government

CDBG regulations related to the State CDBG program require state grantees to distribute funding to Units of General Local Government (UGLG), which are defined as "any city, county, town, township, parish, village, or other general purpose political subdivision of a state, Guam,

the Northern Mariana Islands, the Virgin Islands, and American Samoa or a general purpose subdivision thereof." This regulation constrains the ability of states to invest in projects that provide widespread benefits beyond the boundaries of jurisdictions individually, such as public infrastructure or public facilities that serve the residents of multiple UGLGs.

Recommendation: CDBG regulations should be modified to align with the HOME program and allow CDBG Consortiums so that geographically contiguous UGLGs can receive state CDBG grants to complete projects that benefit multiple UGLGs.

Existing Capacity Building and Training Programs are Underfunded

An increasing number of community development professionals are leaving the field for various reasons, including retirement and seeking higher-paying jobs in the for-profit sector. As a result, entitlement communities throughout the United States are losing years of institutional knowledge and community development experience within their program staff and the staff of their subrecipients. Professionals new to the community development space are eager to consume the necessary learning to effectively implement important programs that are catalysts for positive change in low-income communities.

Recommendation: HUD should increase the amount of funding for the following programs so that more community development professionals can obtain necessary training and receive technical assistance:

- **Community Compass Initiative—**The Community Compass Initiative employs an innovative, outcome-focused approach to foster collaboration among HUD, grantees, and the organizations providing technical assistance and capacity building on behalf of HUD to help grantees navigate complex housing and community development issues.
- **Distressed Cities and Persistent Poverty Technical Assistance Program—**HUD provides technical assistance directly to entities serving smaller communities with populations under 50,000. The Distressed Cities and Persistent Poverty Technical Assistance (DCTA) program is designed to build the capacity of local governments experiencing economic distress and assist local governments and their nonprofit partners in alleviating persistent poverty in specific census tracts. Central to the technical assistance offered through this initiative are effective financial management practices, governance and management, leadership development, data and research, building partnerships, community engagement, and strategic planning.
- **Thriving Communities Technical Assistance Program—**The Thriving Communities Technical Assistance (TCTA) program assists local governments by ensuring housing needs are considered part of their larger infrastructure investment plans while supporting equitable development in disadvantaged communities.

Rural Communities Need Targeted Funding for Capacity Building and Training

Due to limited budgets and difficulty recruiting experienced community development professionals, rural communities have less capacity to engage in planning, managing, and

overseeing grants, loans, and related capital. For example, under the State CDBG Program, states consult with their nonentitlement, primarily rural communities, while developing their ConPlan. However, the data and input that states receive from their rural communities may be limited, out-of-date, or incomplete due to the limited planning and data analytics capacity of many rural communities. Therefore, the needs of some rural communities may not be accurately reflected in a state's ConPlan. Moreover, rural communities often lack the capacity to design projects that could be funded by the State CDBG Program.

Recommendation: HUD should increase staffing and technical assistance support through an expanded state administrative cap and targeted rural technical assistance programs.

Reflecting on the 50-year legacy of the Community Development Block Grant (CDBG) Program, it is evident that it has been instrumental in transforming communities across the United States. Born out of a pivotal era of civil rights activism and legislative change, CDBG has evolved from a novel consolidation of federal resources into a cornerstone of community development efforts. Through its flexibility and adaptability, CDBG has empowered local governments to address diverse needs, from public infrastructure improvements to essential social services. It has fostered meaningful, long-term investments in communities nationwide. The CDBG framework of program flexibility, local control and decisionmaking, community input and citizen participation, and local planning has left a lasting impression on federal policy and lawmaking by being used as the model for new legislation and programs—Neighborhood Stabilization program, CDBG-DR, CDBG-CV, American Recovery and Reinvestment Act, McKinney Vento Act, the Homeless Emergency Assistance and Rapid Transition to Housing (HEARTH) Act, Empowerment Zones, and Enterprise Communities—to name a few.

The collaborative efforts of NCDA, COSCDA, and Grow America have been central to the program's success, demonstrating a shared commitment to enhancing the lives of low- and moderate-income populations through strategic planning, advocacy, and technical assistance. From the early days of CDBG's implementation to these organizations' roles in responding to the recent challenges, such as the COVID-19 pandemic, their contributions have shaped the program's development and refined its impact on communities.

This analysis has also revealed areas where CDBG can be strengthened to better meet the needs of future generations. The proposed reforms address critical aspects of the program, including increasing funding, expanding eligible activities, and enhancing capacity building for community development professionals. To ensure greater impact and program success in the next 50 years, Congress must substantially increase program funding and address statutory impediments to housing development and public service expansion.

By advocating for these changes, the authors aim to ensure that CDBG remains a vital tool for community revitalization and continues to foster innovative solutions for the challenges ahead.

It is crucial to honor the lessons learned from the CDBG program's past successes and challenges. The vision for CDBG's future must build on this rich history, embracing both the proven strategies of the past and the new opportunities for growth and improvement. NCDA, COSCDA, and Grow

America can help ensure that CDBG remains a dynamic and effective resource for communities seeking to create lasting, positive change by reinforcing their commitment to community development and advancing these proposed reforms.

CDBG's 50-year history is a testament to the power of federal-local partnerships in advancing community development goals. While celebrating this milestone, the authors also look ahead with optimism and resolve to refine and strengthen the program for the future, continuing the legacy of innovation, resilience, and impact that has defined CDBG from its inception.

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Neighborhood Home Price Impacts of Community Development Block Grant Spending: Longitudinal Evidence From Three Jurisdictions

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Abstract

For a half-century, the Community Development Block Grant (CDBG) program has been one of the largest federal programs supporting local economic and community development, although few rigorous evaluations of its impacts have been conducted. This study measures CDBG's local housing market effects using annual data collected over roughly the past 20 years in Jersey City, Los Angeles County, and Washington, D.C., which are analyzed with the adjusted interrupted time series quasi-experimental impact evaluation model. Considerable, non-random selection determines which places receive CDBG-funded investments. Nevertheless, this study finds plausibly causal evidence that these investments produced substantial, persistent changes in the housing price trajectories in low-income neighborhoods. Home prices within 2,000 feet of these investments in Los Angeles County, Jersey City, and Washington, D.C., rose, on average, 5, 16, and 19 percent more than the counterfactual, respectively, although those impacts generally eroded slowly over time. At all sites, effects were measurable up to 2,000 feet in distance but differed in the degree to which they decayed across space. Cross-site differences emerged with respect to when the effects commenced after the CDBG expenditure and how long the effects persisted. Those differences likely reflect cross-site variations in the composition, intensity, and context of CDBG expenditures.

Introduction

Since its passage in 1974, the Community Development Block Grant (CDBG) program has provided billions of dollars in capital investment to local communities through their state and local governments. When it passed, the program replaced several categorical grant programs administered by HUD that sought to improve urban neighborhoods and housing (Rohe and Galster, 2014). Despite a significant decline in real-dollar investment since its peak in the 1970s, the program remains one of the largest federal programs supporting economic and community development (Theodos, Stacy, and Ho, 2017). Over the course of its half-century existence, the program has funded hundreds of thousands of neighborhood enhancements in the form of new community facilities, housing construction and repair, infrastructure improvements, demolition of derelict properties, and business development.

But has the CDBG program improved economic outcomes in low- to moderate-income (LMI) communities? Unfortunately, quasi-experimental statistical analyses of its impacts on neighborhoods have been few, typically considered only a single jurisdiction, and are dated. This limited literature leaves many key aspects of CDBG's area-wide effects unknown or uncertain; those gaps inform the research questions addressed in this paper:

1. Is plausibly causal evidence available that CDBG spending has changed the home price trajectories of LMI neighborhoods?

2. If so, how far, spatially, do those impacts extend?

3. If so, what is the time lag between CDBG spending and this local housing market response, and how long does that response persist?

The research reported here addresses those questions using data collected over roughly the past 20 years in three urban jurisdictions: Jersey City, New Jersey; Los Angeles County, California; and Washington, D.C. (hereafter, DC). The authors selected these jurisdictions because they have high-quality, longitudinal information about their CDBG expenditures and were willing to cooperate in this research. The outcome measure employed is sales transaction prices of individual single-family homes and condominiums. Statistically, the authors model the relationship between individual home sales prices and proximate CDBG-funded investments during previous years at various distances from the sale. Home prices are not only of intrinsic interest, but they also represent an appealing summary indicator because they have long been shown to capitalize many crucial aspects of neighborhood quality of life (Grieson and White, 1989; Palmquist, 1992).

In estimating parameters of those relationships, the authors employ the adjusted interrupted time series (AITS) econometric model, a well-established, quasi-experimental specification for measuring property value impacts of various local investments or land uses. This model assesses impact by comparing levels and trends of home prices before any proximate CDBG-funded investments to those levels and trends after such spending, while controlling for the coinciding price trajectories of other lower-income neighborhoods that do not get such investments during the period. This AITS specification reduces the bias arising from the non-random selection of

neighborhoods where CDBG funds are spent. As such, the estimated parameters can be thought of as plausibly causal impact estimates.

The authors find that average home prices within 2,000 feet of CDBG-funded investments in all three study sites rose significantly more than the counterfactual, although those impacts decayed slowly over time. The counterfactual group included sales located between 3,000 and 6,000 feet of a CDBG project and in tracts where the median income was at or below 80 percent of the Area Median Income in 2019. Differences emerged across sites in how long those impacts endured, when they commenced after the CDBG expenditure, and the degree to which the impacts extended across space.

Previous Literature and This Contribution

Despite the program's longevity, size, and importance, limited research exists into the outcomes of CDBG spending. Some studies document how the grants have been spent on specific types of activities (e.g., Rosenfeld et al., 1995; Walker, Abravanel et al., 2002). Others interview local officials to provide qualitative evidence about CDBG's importance for accomplishing community development objectives (Prunella et al., 2012; Prunella, Theodos, and Thackeray, 2014; Walker, Hayes et al., 2002). Yet little quantitative, methodologically rigorous, and recent evidence exists about whether CDBG spending has substantial, measurable impacts on the disadvantaged neighborhoods in which it occurs.

The U.S. Department of Housing and Urban Development (HUD) has commissioned and published two quantitative evaluations of CDBG, which are now dated: Bleakly et al. (1982) and Walker, Hayes et al. (2002). Bleakly et al. analyzed CDBG spending from 1979 to 1981 in 30 Neighborhood Strategy Areas (NSAs) in 20 cities. They observed positive correlations between higher-than-average spending levels on a block and a composite NSA condition index including the percentages of blocks with well-maintained streets, little litter, and landscaping and structures in very good condition. An Urban Institute study (Walker, Hayes et al., 2002; later published as Galster, Walker et al., 2004) examined three summary indicators and found measured multiple dimensions of market activity in census tracts across 17 cities: the median amount of the home purchase loans originated, the home purchase mortgage approval rate, and the number of businesses. They found that cumulative CDBG spending per low-income resident from 1994 to 1996 was positively correlated with 1994-to-1999 changes in those indicators (especially the first, which was highly correlated with home prices) only when tracts received an above-median amount of CDBG investment ($86,737 or more in current dollars). Pooley (2014) compared CDBG spending and changes in mean census tract values of owner-occupied homes in Philadelphia from 1990 to 2009. She found that the percentage growth in mean values was significantly greater than in control tracts only in those tracts receiving at least $964,800 (current dollars) of CDBG spending over 5 years during the 1995-to-2007 period. Overton and Stokan (2023) analyzed the relationship between assessed values of single-family residential properties in Dallas County and the amounts of CDBG spending of various types from 2004 to 2017, using a hedonic regression model with census block group and time fixed effects, 3-year moving average changes in lagged local assessed values, and controls for dwelling and census tract characteristics. They found that more CDBG spending on a parcel for place-based

investments—such as housing improvements, demolition, parks and recreation facilities, or water and sewer improvements—were associated contemporaneously, 1 year later, and 2 years later with higher assessed values of single-family residential parcels within 2,000 feet.[1]

Galster, Tatian, and Accordino (2006) is the only study to have used a quasi-experimental design (AITS) to measure CDBG impacts. The authors focused on changes in individual single-family home prices from 1998 to 2004 in the seven Neighborhoods in Bloom (NiB) revitalization target areas in Richmond, Virginia, resulting from a comprehensive set of services and place-based investments jointly funded by HUD's CDBG, HOME, and HOPE VI programs; the Local Initiatives Support Center (LISC); and city general funds. The authors found that during the course of the initiative, the annual growth of home values in the target areas was almost 11 percent greater after controlling for coincident trajectories in lower-income control areas. That positive impact was most strongly observed for blocks exhibiting an above-average concentration of CDBG spending.

Although path-breaking in its efforts to identify plausibly causal impact estimates, the Galster, Tatian, and Accordino (2006) study leaves many questions unanswered. First, given that the NiB initiative involved an unusually well-targeted, long-sustained, wide-ranging amalgam of hard and soft investments and complementary programmatic initiatives that were funded by many city, nonprofit, and federal sources beyond CDBG,[2] how general the findings are for more generic CDBG expenditure patterns exhibited across several jurisdictions is unclear. Second, their study did not investigate the temporal pattern of local housing market responses to the investments or the scale of their spatial externalities. The authors of this article add to those studies with a research design that controls for the likely non-random selection of CDBG spending in neighborhoods based on their preexisting conditions and trajectories. This article builds on their AITS model and employs an updated, long panel of observations in three jurisdictions to address those gaps.

Analytical Approach

Overview

The foremost of several empirical challenges (see Theodos and Firschein, 2015) in obtaining an unbiased estimate of the impacts of place-based investments by public or private entities is that the locations chosen for those investments are typically not representative of all potential places where they might have been made. Some might be selected, for example, because of the expectation that properties there will soon start rapidly inflating in value because the jurisdiction may want to put its resources into places where it perceives the market will respond to those investments. In another case, a place might not yet be on the cusp of revitalizing, but some added public investment might be sufficient to encourage market response. Conversely, jurisdictions might choose the neediest, hardest-to-redevelop places for attention on equity grounds.

[1] Overton and Stokan (2023) employ block-group fixed effects and a 3-year-lagged moving average of land values as controls. Unfortunately, both of those values are endogenous with previous, spatially clustered CDBG expenditures, as is likely given the findings in Figure 3 that display the geographic and temporal patterns of these expenditures. As such, their CDBG impact estimates are likely biased downward.

[2] All the city's CDBG funds for 5 years were targeted to a single area. For more comprehensive descriptions of the NiB Program, see Accordino, Galster, and Tatian (2005) and Rossi-Hansberg, Sarte, and Owens (2010).

Regardless, neighborhoods observed with place-based investments are unlikely to perform in many dimensions in the same way as others, even those that are similar in many observable characteristics. Given those expected idiosyncrasies of targeted neighborhoods, program impact evaluators find it difficult to identify valid counterfactuals against which to compare their performance after intervention. That is, accurately measuring the degree to which changes in targeted neighborhoods post-investment are due to the intervention or would have occurred in any event is problematic.

This article employs the adjusted interrupted time series (AITS) model to meet the challenge of non-random selection of neighborhood investments. AITS represents an amalgam of the well-known interrupted time series (ITS) and difference-in-differences (DiD) approaches to quasi-experimental impact assessment.[3] From ITS, AITS employs the intuition that the impact of a place-based investment ("treatment") will manifest itself as a post-treatment change in the pre-treatment trend or level—or both—of the outcome indicator in question. But the internal validity of ITS is threatened if (1) the sample of treated neighborhoods is not randomly chosen or (2) both treated and non-treated neighborhoods are influenced by some exogenous force coincident with the post-treatment period. The ITS estimator thus requires "adjustment" to address both possibilities, as is at the core of the DiD approach. The standard DiD estimator is the difference between pre-treatment and post-treatment differences between treated and control neighborhoods in the mean *level* of the outcome indicator. Its internal validity is threatened by pre-intervention *trends* in the outcome indicator that differ between control and treatment areas. Instead of assuming those trends are parallel, as in DiD, AITS controls for them explicitly. Thus, its estimate of impact is the difference between pre-treatment and post-treatment differences between treated and control neighborhoods in both the mean *level* and *trends* of the outcome indicator.[4]

AITS Model for Addressing the Research Questions

In this study, the core AITS model of the impacts of CDBG-funded investments on nearby home prices is expressed symbolically:

$$[1]\ P_{it} = c + \alpha_{1d}\, T_{id} + \alpha_2\, TR_t + \alpha_{3d}\,(T_{id} * TR_t) + \delta_{1d}\, PostT_{id} + \delta_{2d}\,(PostT_{id} * TR_t)$$
$$+ [\lambda_s][STRUCT_s] + [\eta_k][JURIS_k] + [\psi_t][CYCLE_t] + \beta SPACET_{it} + [\varphi_L](\mathrm{LAT/LON}_i) + \epsilon_{it}$$

where—

P is the natural logarithm of the sales price of a single-family home or condominium;

i represents the individual home sale;

t represents the year;

[3] For a comparison of the internal validity of the AITS and other quasi-experimental approaches, see Galster, Temkin, et al. (2004).

[4] AITS has already been successfully employed in community development evaluation research appearing in many peer-reviewed articles (e.g., Galster, Tatian, and Accordino, 2006; Galster, Temkin et al., 2004; Nygaard, Galster, and Glackin, 2022; Woo, Joh, and van Zandt, 2016). An independent assessment of the method concluded that "the AITS method can produce compelling evidence on the effects of place-based intervention" (Deng and Freeman, 2011: 310). Colwell, Dehring, and Lash (2000) and Ellen and Voicu (2006) employ models that are intuitively similar to, but operationally somewhat different from, AITS.

c is a constant;

T_{id} is a dummy variable denoting whether the sale i is in the "treatment group," i.e., will receive or has received CDBG investment anytime within distance d (2,000 feet in the core model) during the analysis period;

TR_t is an annual trend variable taking the value one in the first year of the analysis period, two in the second year, and so forth;

$PostT_{id}$ is a dummy variable denoting whether sale i has been "treated", i.e., *has* received CDBG investment within distance d at any time (within the analysis period) prior to the time of sale i;

$[STRUCT_s]$ is a set of s structural characteristics for the dwelling sold;

$[JURIS_k]$ is a set of dummy variables denoting the political jurisdiction (city or county) where the sale occurred;

$[CYCLE_t]$ is a set of dummy variables denoting the expansionary or contractionary stage of the regional housing market cycle during year t;

$SPACET_{it}$ is a spatial lag in the dependent variable (a control for spatial autocorrelation);

LAT/LON_i is the latitude and longitude of the ith sale (a control for spatial heterogeneity of the time-invariant characteristics of the local geography);[5] and

ϵ_{it} is a random error term with the usual assumed statistical properties.

The interpretation of the key impact parameters of (1) follows. Coefficients α_{1d} and α_{3d} measure the degree to which the areas where sales have or will be treated by nearby CDBG-funded investments systematically differ from control areas in their level and/or trend in prices, respectively; they represent the controls for non-random targeting of CDBG. Coefficients δ_{1d} and δ_{2d} measure average treatment effects of nearby CDBG-funded investments on the level or trend in prices, respectively, and represent the answers to the first research question.

For the second research question, about the extent of spatial externalities, T_{id} in (1) is replaced with a set of dummy variables denoting whether CDBG-funded investment was ever within 0 to 250 feet; 251 to 500 feet; 501 to 1,000 feet; or 1,001 to 2,000 feet. Given that little variation in impacts emerged over those ranges, the authors employ for subsequent analysis the simpler specification of a single, 2,000-foot-radius impact area.[6]

The third research question, about the temporal pattern of impacts, is addressed by replacing T_{id} in (1) with time dummy variables denoting the most recent year that any CDBG-funded investment occurred within 2,000 feet: 1 year ago, 2 years ago, and so forth. That specification tests how long impacts take to appear and then (potentially) decay over time after the last investment has been made in the vicinity by the time of sale.

[5] See Can and Megbolugbe (1997).

[6] This approach is comparable to the one in Overton and Stokan (2023).

Data

CDBG Data

The authors gathered annual information about the amounts, types, and locations of CDBG expenditures directly from three local jurisdictions that agreed to collaborate on this research. The Jersey City Division of Community Development supplied that information for 1994 through 2019; the Los Angeles County Development Authority for 2009 through 2021; and the DC Department of Housing and Community Development for 2000 through 2020.[7] Although the sites reflect diversity of region and size, the authors make no claims about the representativeness of the three study sites; descriptive statistics for the demographic, economic, and housing characteristics of those places are provided in appendix exhibit A1.

Because this study focuses on the spatial impact of CDBG-funded investments, the analysis excludes CDBG-funded activities related to the provision of social services, funding of administrative personnel, planning, administration, Section 108 repayments, and other non-place-specific activities. See appendix exhibit A2 for a list of HUD matrix codes for place-based project types included in this study; the authors geocoded those CDBG-funded, place-based investments.

Descriptive statistics for the CDBG (inflation-adjusted) expenditure patterns during the analysis periods of this study are presented in exhibit 1. They show large cross-site variation in total CDBG funding, how those funds were distributed across different parcels, and their spatial concentration. DC received the largest annual average grant during the period ($17.9 million per year), followed by Los Angeles County ($9.9 million) and Jersey City ($5.7 million). DC also devoted by far the largest median amount of CDBG invested in a parcel ($563,730); by contrast, the figures were $74,351 for Jersey City and only $8,725 for Los Angeles County. The spatial concentrations of CDBG-funded investments were extremely different across the sites: annual spending per square mile of the jurisdiction varied from a high of $387,026 in Jersey City to a low of $2,450 in Los Angeles County. Jersey City focused most investments on its Martin Luther King Drive Redevelopment Plan, a 26-block-long (about 1.5 miles) project focused on the comprehensive revitalization of the main retail corridor of the city.

[7] Within Los Angeles County are many other CDBG entitlement jurisdictions whose investments are not considered here, including Compton, Glendale, Inglewood, Long Beach, Los Angeles City, Monterey Park, Palmdale, Pasadena, Pomona, Redondo Beach, and Santa Monica. See https://www.hudexchange.info/grantees/allocations-awards. Many of the CDBG investments analyzed were located in those jurisdictions within Los Angeles County, however. The practical implication of this spatial overlap is that some areas specified in this study as "control" because they had no Los Angeles County-funded CDBG nearby may, in fact, have been the site of investments funded by the smaller jurisdiction's CDBG allocation. To the extent that the control areas were contaminated in that way, the impact estimates will be biased downward.

Exhibit 1

Descriptive Statistics of CDBG Place-Based Investment Expenditures During the Analysis Period, by Site

	Jersey City, NJ	Los Angeles County, CA	Washington, D.C.
CDBG funding years analyzed	1994-2018	2009-2018	2000-2020
Total CDBG-funded projects*	443	436	307
Total CDBG funding*	$142,618,921	$99,422,948	$376,571,809
CDBG funding* per year	$5,704,757	$9,942,295	$17,931,991
CDBG funding* per year per sq. mi.	$387,026	$2,450	$293,726
N of parcel x year observations^	1,919	11,531	668
Average CDBG amount per project	$321,939	$230,746	$1,226,618
Median CDBG amount per project	$76,648	$140,473	$197,587
Average amount per parcel x year	$74,351	$8,725	$563,730
Median amount per parcel x year	$5,140	$1,605	$33,999
Projects by Category:			
Business development	24	26	46
CDBG funding	$51,453,695	$6,897,976	$22,617,855
Share of all CDBG funding	36.1%	6.9%	6.0%
Public facilities	129	32	26
CDBG funding	$35,563,404	$20,667,458	$63,543,390
Share of all CDBG funding	24.9%	20.8%	16.9%
Acquisition	40	4	111
CDBG funding	$21,784,160	$3,128,281	$227,430,730
Share of all CDBG funding	15.3%	3.1%	60.4%
Residential development	203	317	116
CDBG funding	$13,849,880	$52,546,292	$46,554,707
Share of all CDBG funding	9.7%	52.9%	12.4%
Infrastructure	27	55	6
CDBG funding	$11,319,229	$16,182,941	$12,627,842
Share of all CDBG funding	7.9%	16.3%	3.4%
Demolition	20	2	2
CDBG funding	$8,648,553	$1,182,225	$3,797,285
Share of all CDBG funding	6.1%	1.2%	1.0%

** Projects that could be accurately geocoded during analysis period shown.*

^ Observations of Community Development Block Grant (CDBG)-funded investment parcels joined to home sales data for adjusted interrupted time series modeling.

Note: All dollar figures are adjusted to constant 2019 dollars.

Source: Author's analysis of CDBG investment data from Jersey City, Los Angeles County, and Washington, D.C.

Cross-site variations are also apparent in the types of neighborhoods targeted, the types of investments supported, and how investment types were combined in the same project. The 2000 median values of owner-occupied homes within CDBG treatment areas were $127,200 in Jersey City, $137,200 in DC, and $190,800 in Los Angeles County (all expressed in 2000 dollars). The median poverty rates within treatment areas were 10 percent in Los Angeles County, 16 percent

in Jersey City, and 20 percent in DC. Within treatment areas, the median percentage non-White population share ranged from 69 percent in Los Angeles County to 95 percent in DC.

How the jurisdictions invested their CDBG funds was also different. DC allocated more than 60 percent of its CDBG funding over the period to property acquisition; Los Angeles County allocated more than 50 percent to residential development (typically, small-scaled home rehabilitation); and Jersey City allocated more than 30 percent to business development and about 25 percent to public facilities. Finally, the jurisdictions bundled various types of investments in distinctive ways within the same target area. Almost 25 percent of the treated home sales were treated with at least five different investment types in Jersey City, whereas only 3 percent of sales in DC and no sales in Los Angeles County were so treated. At the other end of the spectrum, 35 and 95 percent of the treated home sales were treated with only one type of investment in DC and Los Angeles County, respectively, whereas just 16 percent were so treated in Jersey City. The combinations of treatments that were associated most often with bundling also varied across sites. In Jersey City, treated homes were frequently exposed to combined housing/public facilities and acquisition/business development investments; demolition often occurred with acquisition and infrastructure. In DC, acquisition/public facilities (sometimes also with housing) and acquisition/infrastructure/public facilities/business development were oft-observed combinations of treatments. In Los Angeles County, the only noticeable (but rare) pairing was acquisition and business development; the vast majority of investments were solely single-family rehabilitation (see Theodos, Galster, and Hermans, 2024 for additional information).

In sum, the three study sites reflect wide variations in multiple dimensions of how they have employed their CDBG dollars. Unfortunately, that multidimensional variability challenges the ability to interpret cross-site variations. Put differently, the nature of the CDBG "treatment" is different—it is applied with different intensities and in different contexts across the three study sites—so findings are challenging to parse.

Home Sales and Structural Characteristics Data

The authors secured information on single-family (detached, townhouse, cooperative, and condominium) property values from the Zillow transaction and assessment dataset (Z-TRAX). Z-TRAX provides records of individual properties' sales prices, addresses, and limited structural characteristics.[8] Data were available from 2000 to 2019 (2022 in the case of DC). Those home data were employed for the three study jurisdictions and the adjacent counties (cities, in the case of Jersey City) to provide a more expansive set of observations for use as control area sales, as explained below.

The home sales and CDBG information were merged using both time and spatial criteria. For each sale in the jurisdiction (and its associated control areas in adjacent jurisdictions) beginning in 2001 (2010 in the case of Los Angeles County due to its more limited CDBG data), the authors coded the annual amount and types of CDBG expenditures that had occurred (if any) within several, mutually exclusive concentric distance rings centered on the sale, beginning the year before the

[8] Zillow shared Z-TRAX with the Urban Institute through a research partnership.

sale and continuing to the earliest year for which CDBG data were available for that jurisdiction.[9] Those bespoke distance rings were 0 to 250 feet; 251 to 500 feet; 501 to 1,000 feet; 1,001 to 2,000 feet; 2,001 to 3,000 feet; and 3,001 to 6,000 feet.[10]

Variable Specifications

As is conventional in hedonic price models, the dependent variable is the natural logarithm of the home sales price. The CDBG impact variables of primary interest are as specified in equation 1. As controls for property characteristics, dummy variables are employed denoting size (number of bedrooms in Los Angeles County; bathrooms in DC); structure type (single-family detached; townhouse; condominium in multifamily structure; co-op in multifamily structure), year built, and political jurisdiction. Business cycle fixed effects control for cyclical macroeconomic conditions affecting the metropolitan area-wide property market, distinguished by three periods: 2001 through 2007, 2008 through 2013, and 2014 and after.[11] The authors employ the spatial lag of housing prices[12] to control for spatial autocorrelation and the latitude and longitude of the property control for spatial heterogeneity (Can and Megbolugbe, 1997). The latter can be viewed as controls for unmeasured attributes of the local natural and built environment. Descriptive statistics for all those variables are in appendix exhibit A3.

Designation of Treatment and Control Groups

The authors assigned sales observations that had received in the past or would receive in the future any CDBG-funded investments within 2,000 feet of the treatment group. The control group was assigned observations if they (1) were within 3,001 and 6,000 feet of a treatment group sale; (2) were located in an LMI census tract; and (3) did not qualify for the treatment group. The intuition behind the control group selection criteria was that the authors sought sales from places that were eligible for CDBG-funded investments, were relatively near those that did, and did not receive any. The 2,000-foot limit for defining the treatment group was based on preliminary analyses and a

[9] The authors recognize that the analysis period has observations that are left-censored (i.e., missing older data) for CDBG and right-censored (i.e., missing newer, future data) on home sales. Although that censoring likely erodes the statistical power of efforts to identify temporal patterns of responses to CDBG-funded investments, the authors do not believe it to bias. The left-censoring may overstate the impacts of CDBG at the beginning of the panel because other CDBG spending may previously have occurred in those locations. On the other hand, it may understate the impact if the previous spending occurred in places assigned to the control group. Nevertheless, this study has much longer panels of CDBG spending in all of the study sites than the only previous quasi-experimental impact evaluation of CDBG, which was 5 years (Galster, Tatian, and Accordino, 2006).

[10] This specification of bespoke distance rings to measure the extent of externalities is conventional (Baum-Snow and Marion, 2009; Ding and Knaap, 2003; Galster, Tatian, and Smith, 1999; Koschinsky, 2009; Nygaard, Galster, and Glackin, 2022; Overton and Stokan, 2023; Santiago, Galster, and Tatian, 2001; Schwartz et al., 2006). For a critique of this approach, see Diamond and McQuade, 2019.

[11] All three of the study sites exhibited similar metropolitan home price trajectories during the designated periods: expansion—2000 through 2007; contraction—2008 through 2013; expansion thereafter. See https://realestatedecoded.com/case-shiller/.

[12] The authors operationalize this value as the weighted average of sales prices in the same census tract and all adjacent tracts in the previous year.

large body of previous research on place-based investment externalities.[13] To ensure that the control group sales were free from potential contamination, however, the authors mandated an additional 1,000 feet of separation from any CDBG spending. The sample selection processes resulted in the following numbers of home sales observations (treatment group sales shown parenthetically), with full information that meets the selection criteria: Jersey City = 46,872 (45,676); Los Angeles County = 166,036 (136,923); DC = 106,554 (92,354).

In all three study sites, substantial numbers of sales in control areas are in LMI census tracts in adjacent political jurisdictions, which raises the specter of potential unobserved contamination of control areas, whereby, unbeknownst to the authors, the adjacent jurisdictions may have spent CDBG or other funds to revitalize those areas. To the degree that such contamination was present, it would bias downward the impact estimates. Another potential problem arises in Jersey City because its small geographic scale renders few observations of home sales in LMI areas beyond 3,000 feet of treatment areas. As a result, sales in control areas are notably clustered outside the Jersey City jurisdiction, especially in Union City. However, because all those adjacent New Jersey communities can be considered reasonably close-substitute housing markets, the authors anticipate no major bias arising from that circumstance.

Results

Before discussing spatial variation and temporal patterns of CDBG impacts, this paper first presents the core model's CDBG impact. Impacts are evident in all three study sites, though the extent of those impacts vary.

Core Model of CDBG Impacts

The authors estimated the parameters for equation 1 in each of the study sites using ordinary least squares (exhibit 2). Overall, the model performance was acceptable, given the paucity of dwelling characteristics available as covariates. The authors focus on the variables unique to the AITS specification. As predicted, the places where jurisdictions directed CDBG-funded investments were distinctly different in their housing price trajectories from other LMI neighborhoods in the vicinity (see the coefficients for the "CDBG treatment group" in exhibit 2). In Jersey City and DC, the price level in the treatment group was 12 percent and 6 percent lower, respectively, than in the control group.[14] Turning next to trends (see the coefficients for the "CDBG Treatment Group Trend" in exhibit 2), however, the comparative price trends pre-treatment were significantly higher—by 3 percentage points in Jersey City and 2 percentage points in DC. Those sets of findings suggest

[13] Baum-Snow and Marion (2009) observed LIHTC impacts within a single ring of 3,274 feet (1 km). Rossi-Hansberg, Sarte, and Owens (2010) and Diamond and McQuade (2019) observed small effects of place-based developments beyond 2,000 feet, but the vast majority of studies do not (Baird et al., 2020; Colwell, Dehring, and Lash, 2000; Ding and Knaap, 2003; Ding, Simons, and Baku, 2000; Ellen et al., 2001; Ellen and Voicu, 2006; Koschinsky, 2009; Leonard, Jha, and Zhang, 2017; Nygaard, Galster, and Glackin, 2022; Overton and Stokan, 2023; Santiago, Galster, and Tatian, 2001; Schwartz et al., 2006; Simons, Quercia, and Maric, 1998; Wilson and Bin Kashem, 2017). See the review in Thomson (2008).

[14] In a semi-log model such as this study, one cannot interpret coefficients of dummy variables (C) as percentage differences in prices unless one transforms them using the standard formula: 100 [exp(C) – 1] (Halvorsen and Palmquist, 1980). This means that the transformed results discussed in the text will appear slightly different than the non-transformed results for dummy variables shown in the tables.

that in those two jurisdictions, CDBG spending was directed primarily to neighborhoods that were most disinvested but were apparently rebounding. Los Angeles County reflects the opposite pattern: target areas exhibited 19-percent-higher price levels but with slower-growing trends relative to other LMI areas. Results in all three sites also confirm the importance of employing the AITS estimator for impact evaluation because the parallel price trends pre-treatment assumption required for DiD internal validity (Wooldridge, 2002) is violated.

Exhibit 2

Estimated Parameters of AITS Model of Home Price Impacts of CDBG-Funded Investments, by Study Site (1 of 2)

VARIABLES	Jersey City, NJ	Los Angeles County, CA	Washington, D.C.
CDBG Treatment^ Group	– 0.133***	0.177***	– 0.0581***
	(0.0472)	(0.00607)	(0.0122)
Time Trend	0.0500***	0.0495***	0.0273***
	(0.00352)	(0.00101)	(0.00105)
CDBG Treatment^ Group Time Trend	0.0338***	– 0.0136***	0.0191***
	(0.00715)	(0.00125)	(0.00145)
CDBG Treated^ Group (i.e., after treatment)	0.149***	0.0453***	0.176***
	(0.0292)	(0.00495)	(0.00855)
CDBG Treated^ Group Time Trend (after treatment)	– 0.0422***	– 0.0155***	– 0.0329***
	(0.00645)	(0.00108)	(0.00131)
Contraction Period 2008–13	– 0.336***	N/A	– 0.0524***
	(0.0137)		(0.00636)
Expansion Period 2014+	– 0.514***	0.0481***	– 0.0196*
	(0.0212)	(0.00383)	(0.0107)
Single Family (vs. 2–4 unit)	0.142***	0.158***	– 0.220
	(0.0397)	(0.00423)	(0.137)
Condominium (vs. 2–4 unit)	– 0.108***	– 0.148***	– 0.413***
	(0.0390)	(0.00585)	(0.137)
Cooperative (vs. 2–4 unit)	0.624	– 0.578***	N/A
	(0.432)	(0.0953)	
Number of Bathrooms	N/A	N/A	0.201***
			(0.00193)
Number of Bedrooms	N/A	0.0961***	N/A
		(0.000994)	
Jersey City (vs. Secaucus/Weehawken)	0.381***		
	(0.0852)		
Hoboken (vs. Secaucus/Weehawken)	0.432***		
	(0.0856)		
Bayonne (vs. Secaucus/Weehawken)	0.460***		
	(0.0945)		
Union City (vs. Secaucus/Weehawken)	0.128		
	(0.0866)		

Exhibit 2

Estimated Parameters of AITS Model of Home Price Impacts of CDBG-Funded Investments, by Study Site (2 of 2)

VARIABLES	Jersey City, NJ	Los Angeles County, CA	Washington, D.C.
North Bergen (vs. Secaucus/Weehawken)	0.248***		
	(0.0958)		
Los Angeles County (vs. Ventura County)		– 0.451***	
		(0.0223)	
Orange County (vs. Ventura County)		– 0.454***	
		(0.0285)	
San Bernardino County (vs. Ventura County)		– 0.628***	
		(0.0483)	
District of Columbia (vs. Prince George's County)			0.503***
			(0.00778)
Montgomery County (vs. Prince George's County)			0.426***
			(0.0141)
Spatial Lag of Home Prices	2.29e-06***	1.53e-06***	1.64e-06***
	(3.09e-08)	(3.86e-09)	(1.50e-08)
Latitude	– 1.691***	– 0.602***	0.336***
	(0.275)	(0.00569)	(0.0574)
Longitude	3.517***	0.0672***	– 3.114***
	(0.293)	(0.00574)	(0.0674)
Constant	340.5***	40.29***	– 241.6***
	(30.44)	(0.718)	(5.040)
Year Built Fixed Effects	YES	YES	YES
Observations	46,872	166,036	106,554
R-Squared	0.354	0.649	0.621
Period of Sales Analyzed	2000–2019	2010–2019	2001–2022 Q1

**** p<0.01. ** p<0.05. * p<0.1.*

AITS = adjusted interrupted time series. CDBG = Community Development Block Grant. N/A = not applicable. Q1 = first quarter.

Note: Standard errors in parentheses.

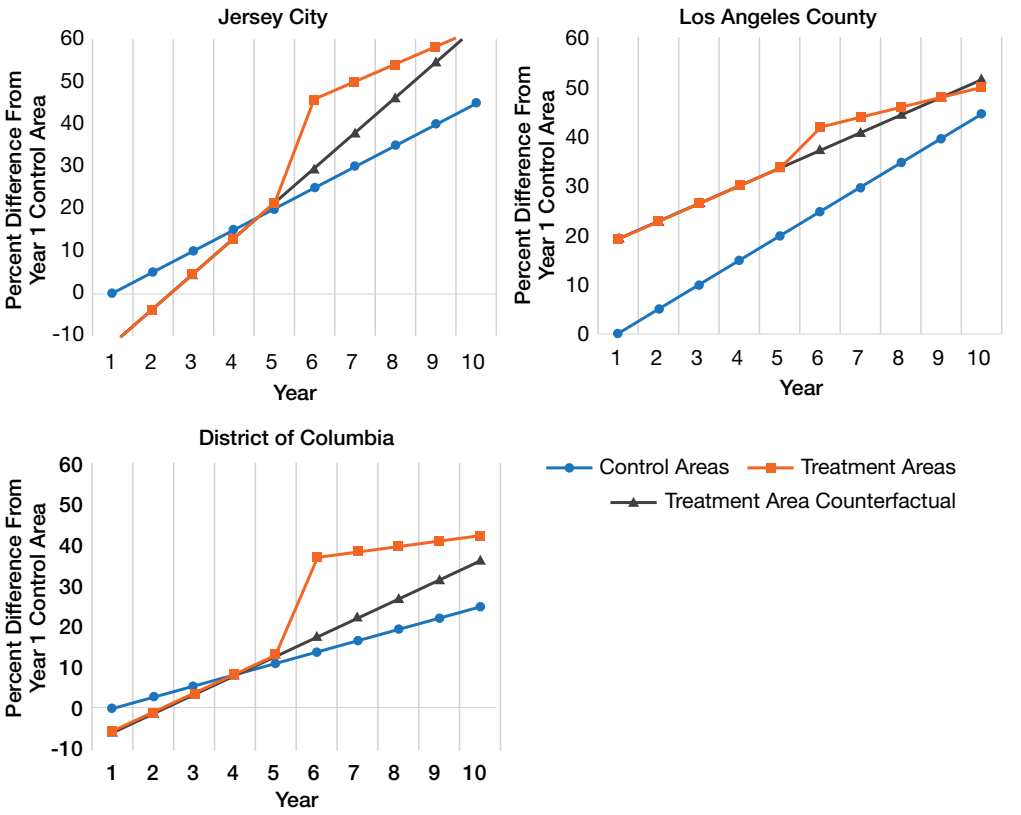
Source: Authors' analysis of CDBG and Z-TRAX data in Jersey City, Los Angeles County, and Washington, D.C.

Looking next at impacts (see the coefficients for the "CDBG treated group" and its time trend in exhibit 2), the clear result across all three jurisdictions was that CDBG-funded investments were associated with a significantly (statistically and substantively) higher level of housing prices within 2,000 feet but a lower subsequent rate of increase (which can be interpreted as temporal erosion in the initial impact) compared with the counterfactual. The initial price level impacts were 16 percent in Jersey City, 5 percent in Los Angeles County, and 19 percent in DC. The reduction in price trend effects was minus 4, minus 2, and minus 3 percentage points in annual growth for Jersey City, Los Angeles County, and DC, respectively. How those two sorts of impacts interact can be most easily portrayed graphically. Exhibit 3 shows (in the line with squares) the predicted home price trajectory for a typical treatment area associated with a typical CDBG-funded investment in (arbitrarily chosen) year 5 during the analysis period in the particular jurisdiction. The

counterfactual is the projected pre-treatment home price trend, shown in the line with triangles. The trend for low- to moderate-income control area prices is also portrayed (in the line with diamonds) for comparison. Exhibit 3 shows, first, that the initial positive impacts fade over time; the authors probe this temporal pattern in depth below. It shows, second, that typical impacts are comparatively small and short-lived in Los Angeles County, which is unsurprising given the weak intensity of treatment that the aforementioned small amounts of widely scattered CDBG funds represented there.

Exhibit 3

Graphic Representation of Home Price Trajectories Associated with CDBG-Funded Investment



CDBG = Community Development Block Grant.
Source: Authors' calculations based on parameters in exhibit 2

Although the impacts measured for DC and Jersey City are substantial, they are not out of line with those estimated by Galster, Tatian, and Accordino (2006) for Richmond's aforementioned NiB initiative, using a similar econometric approach. After inflating the dollar amounts invested in this program to be equivalent to the 2019 dollars used here, the NiB invested, on average, about $100,000 per block in the target areas over the course of 5 years, with funding sourced by CDBG (35 percent), other federal programs (42 percent), and the Local Initiatives Support Center (22 percent). At the end of the program, home prices in target areas were almost 55 percent higher

than they were a year before the program started, controlling for coincident trends in other LMI neighborhoods and other non-NiB neighborhoods in Richmond. Unfortunately, those researchers did not investigate how the short-term impacts may have eroded over time.

Model of Spatial Variation of CDBG Impacts

The authors of this study explored whether spatial heterogeneity was present in the apparent impacts shown in exhibits 2 and 3 by reestimating equation 1 with the more fine-grained distance rings specified above. The results are in exhibit 4, with parameters for controls omitted for brevity. Exhibit 4 shows, first, that the apparent non-random selection of treatment neighborhoods persists across smaller scales. That is, both the direction and magnitudes of both pre-investment price levels and trends in the treatment group are quite homogenous over a range of 2,000 feet in all three study sites. That finding indicates that the jurisdictions did not seem to be "micro-targeting" specific neighborhood contexts.

Exhibit 4

Estimated Parameters of Core AITS Model of Home Price Impacts of CDBG-Funded Investments, by Study Site, Alternative Impact Distances (1 of 2)

	Jersey City, NJ	Los Angeles County, CA	Washington, D.C.
Treatment Group Within 250'	– 0.236***	– 0.0378***	– 0.195***
	(0.0233)	(0.0101)	(0.0200)
Treatment Group Within 251–500'	– 0.280***	– 0.0542***	– 0.102***
	(0.0188)	(0.00762)	(0.0121)
Treatment Group Within 501–1,000'	– 0.283***	– 0.000137	– 0.133***
	(0.0206)	(0.00584)	(0.00955)
Treatment Group Within 1,001–2,000'	– 0.137***	0.136***	– 0.145***
	(0.0407)	(0.00581)	(0.0104)
Time Trend	0.0413***	0.0434***	0.0215***
	(0.00309)	(0.000936)	(0.000976)
Treatment Group Time Trend Within 250'	0.0171***	0.00598**	0.0177***
	(0.00374)	(0.00247)	(0.00303)
Treatment Group Time Trend Within 251–500'	0.0218***	0.00468**	0.0108***
	(0.00295)	(0.00183)	(0.00168)
Treatment Group Time Trend Within 501–1,000'	0.0242***	-0.000176	0.0124***
	(0.00311)	(0.00137)	(0.00142)
Treatment Group Time Trend Within 1,001–2,000'	0.00964*	– 0.0114***	0.0244***
	(0.00556)	(0.00123)	(0.00137)
Treated Within 250'	0.131***	0.0236	0.160***
	(0.0283)	(0.0168)	(0.0283)
Treated Within 251–500'	0.230***	0.0319***	0.160***
	(0.0216)	(0.0119)	(0.0175)
Treated Within 501–1,000'	0.0628***	0.00345	0.122***
	(0.0190)	(0.00793)	(0.0124)

Exhibit 4

Estimated Parameters of Core AITS Model of Home Price Impacts of CDBG-Funded Investments, by Study Site, Alternative Impact Distances (2 of 2)

	Jersey City, NJ	Los Angeles County, CA	Washington, D.C.
Treated Within 1,001–2,000'	0.0918***	0.0454***	0.179***
	(0.0252)	(0.00563)	(0.00934)
Treated Group Time Trend Within 250'	– 0.0132***	– 0.00723**	– 0.0187***
	(0.00396)	(0.00311)	(0.00331)
Treated Group Time Trend Within 251–500'	– 0.0252***	– 0.00386*	– 0.0164***
	(0.00307)	(0.00225)	(0.00188)
Treated Group Time Trend Within 501–1,000'	– 0.0159***	– 0.00176	– 0.0146***
	(0.00307)	(0.00158)	(0.00153)
Treated Group Time Trend Within 1,001–2,000'	– 0.0215***	– 0.0124***	– 0.0308***
	(0.00488)	(0.00117)	(0.00134)
Observations	46,872	166,036	106,554
R-Squared	0.370	0.648	0.623

*** p<0.01. ** p<0.05. * p<0.1.

AITS = adjusted interrupted time series. CDBG = Community Development Block Grant.

Notes: Standard errors in parentheses. Models include controls, as in exhibit 2.

Source: Authors' analysis of CDBG and Z-TRAX data in Jersey City, Los Angeles County, and Washington, D.C.

Of more core interest, exhibit 4 shows that the apparent impacts from CDBG-funded investments (1) are measurable up to a distance of 1,000 to 2,000 feet and (except in Los Angeles County) within all closer distance rings; (2) generally decay with distance (except in Los Angeles County); and (3) do not persist as long past 1,000 feet. The authors hypothesized that the greatest initial impacts would occur closest to the investment, given prior research (Colwell, Dehring, and Lash, 2000; Diamond and McQuade, 2019; Nygaard, Galster, and Glackin, 2022; and Rossi-Hansberg, Sarte, and Owens, 2010).[15] In this study, that conventional pattern was exhibited in DC, where price levels were boosted by 15 to 21 percent within 500 feet but only by 7 to 9 percent from 501 to 2,000 feet. In Jersey City, the impacts were 14 to 26 percent within 500 feet but only 6 to 10 percent from 501 to 2,000 feet. In Los Angeles County, however, distance decay was not apparent within 2,000 feet.

Although the consistently negative post-treatment trend variable coefficients indicate that at all distances, the initial impacts fade over time, the largest amount of such temporal erosion occurred at the farthest distance (except for Jersey City). This new and intriguing finding seems plausible inasmuch as the long-standing physical changes in the neighborhood environment directly funded by CDBG (new construction or rehabilitation of housing and community facilities, infrastructure improvements, etc.) are less visible beyond the immediate environs.

[15] However, Theodos et al. (2021) did not find distance decay effects for the New Markets Tax Credit program.

Model of Temporal Pattern of CDBG Impacts

Results for the variation on equation 1 employing dummy variables denoting the most recent year that any CDBG-funded investment occurred within 2,000 feet are in exhibit 5. On overview, two points stand out. First, the linear post-treatment trend estimated in the basic AITS model (exhibit 2) oversimplifies the temporal pattern of impacts. Second, the temporal patterns of home price level impacts were very different across sites.

Exhibit 5

Estimated Parameters of AITS Model of Home Price Impacts of CDBG-Funded Investments, by Site and Timing of Most Recent Investment

	Jersey City, NJ	Los Angeles County, CA	Washington, D.C.
CDBG Treatment^ Group	– 0.124***	0.177***	– 0.0557***
	(0.0443)	(0.00607)	(0.0122)
Time Trend	0.0526***	0.0493***	0.0283***
	(0.00350)	(0.00101)	(0.00107)
CDBG Treatment^ Group Time Trend	0.0191***	– 0.0136***	0.0192***
	(0.00655)	(0.00125)	(0.00145)
CDBG Treated^ Group Time Trend	– 0.0271***	– 0.0181***	– 0.0312***
	(0.00575)	(0.00109)	(0.00133)
Last Treated^ 9+ Years Ago	0.200***	0.0692***	0.118***
	(0.0262)	(0.0227)	(0.0117)
Last Treated^ 8 Years Ago	0.0872***	0.136***	0.146***
	(0.0287)	(0.0147)	(0.0127)
Last Treated^ 7 Years Ago	0.185***	0.121***	0.141***
	(0.0287)	(0.0114)	(0.0123)
Last Treated^ 6 Years Ago	0.132***	0.0949***	0.122***
	(0.0277)	(0.00953)	(0.0116)
Last Treated^ 5 Years Ago	0.173***	0.0767***	0.129***
	(0.0274)	(0.00804)	(0.0111)
Last Treated^ 4 Years Ago	0.0920***	0.0763***	0.179***
	(0.0270)	(0.00708)	(0.0107)
Last Treated^ 3 Years Ago	0.0251	0.0787***	0.181***
	(0.0263)	(0.00631)	(0.00995)
Last Treated^ 2 Years Ago	0.0424*	0.0754***	0.177***
	(0.0257)	(0.00566)	(0.00971)
Last Treated^ 1 Year Ago	– 0.00588	0.0427***	0.157***
	(0.0253)	(0.00501)	(0.00889)
Observations	46,872	166,036	106,554
R-Squared	0.360	0.649	0.621

**** p<0.01. ** p<0.05. * p<0.1.*

^ within 2,000 feet.

AITS = adjusted interrupted time series. CDBG = Community Development Block Grant.

Notes: Standard errors in parentheses. Models include controls, as in exhibit 2.

Source: Authors' analysis of CDBG and Z-TRAX data in Jersey City, Los Angeles County, and Washington, D.C.

In Jersey City, the expenditure of CDBG funds did not have an impact (9 percent) for 3 years, rising to 10 percent after 4 years and 18 percent after 5 years. Those impacts persisted (with some year-to-year variation) at roughly the same magnitude (if not larger, i.e., 22 percent) after 9 years, if not longer. By contrast, in DC, the impacts arose at almost full magnitude the year after the CDBG expenditure (i.e., 17 percent, rising to 20 percent) but began tapering off after 4 years while still remaining significant after 9 years (13 percent). The temporal patterns were different in Los Angeles County yet again. Impacts registered after 1 year (4 percent), remained roughly constant (7 to 8 percent) for the next 4 years, rose from 10 to 14 percent over the next 3 years, and finally diminished thereafter (to 7 percent). The authors attribute those differences in temporal patterns to systematically different types and intensities of investments funded by CDBG and to different neighborhood and market contexts.

The results in this study mirror the similarly disparate findings of previous studies of the temporal pattern of place-based investment impacts. Ellen and Voicu (2006) find that the positive price spillovers in New York City from publicly funded, rehabilitated subsidized multifamily units did not decline over time, whereas those generated by private, unsubsidized infill construction did decline. Koster and van Ommeren (2019) found that the home price increases in distressed Dutch neighborhoods (0.9 square mile in size) resulting from the rehabilitation of large public housing estates emerged within 2.5 years of project completion and grew steadily up to 7.5 years after the investment (the end of their analysis window). Diamond and McQuade (2019) found considerable differences in temporal patterns depending on neighborhood context. The positive price impacts of LIHTC developments in the lowest-income-quartile of U.S. neighborhoods began immediately after funding for the project was announced and rose steadily for the next 10 years. By contrast, negative impacts after project announcement continued to accumulate slowly over 10 years in third-income-quartile neighborhoods, whereas they registered immediately in the highest-quartile neighborhoods. Overton and Stokan (2023) found for most categories of place-based CDBG expenditures in Dallas County that impacts were higher after a 1-year lag than they were when measured either contemporaneously or with a 2-year lag; longer lags were not investigated.

Discussion and Conclusion

The CDBG program is one of the largest community/economic development tools available to states and local governments. More than 5 decades old, it is also one of the longest standing. Its ability to fund a variety of projects and its structure of giving control over many decisions to states and local governments pose challenges for understanding the impacts. For example, Jersey City spent a plurality of its CDBG funds on business development but also combined that investment with sustained redevelopment of a main retail corridor. Los Angeles County's CDBG-funded investments emphasized small-scale residential development projects scattered across the jurisdiction. And DC invested the most CDBG funds per project, particularly for property acquisition but often combined with other investment types.

The authors observed that in all three study sites, the places where CDBG-funded investments were targeted did not represent a random sample of the jurisdiction's LMI neighborhoods. Whether by accident, policymakers' strategic designs, or particular neighborhood groups' effective advocacy, in Jersey City and DC, those selections built on preexisting positive trends in the neighborhood

property market. The authors also observed impacts of a substantial boost in home prices within 2,000 feet of CDBG-funded investments. By contrast, in Los Angeles County, CDBG-funded investments were targeted to less-disadvantaged places, but their trends were underperforming those in other LMI neighborhoods. That targeting (coupled with a much less intense treatment) yielded weaker and short-lived changes in local market trajectories in Los Angeles County. If those results may be generalized, they imply that local planners will likely gain more traction from their CDBG-funded investments if they build on existing momentum in localized property markets with a substantial concentration of resources. That statement echoes a long-standing conclusion about targeting in the CDBG and place-based program evaluation literature (Bleakly et al., 1982; Galster, 2019: ch. 11; Galster, Walker et al., 2004; Pooley, 2014; Rohe and Galster, 2014; Theodos, 2022a,b,c; Thomson, 2008).

Although the authors observed positive externalities as far as 1,000 to 2,000 feet from CDBG-funded investments, the distance decay patterns were different across sites. Previous research indicates that impact spatial decay patterns likely depend on the type of place-based investment generating the property value externalities; see Baird et al. (2020); Baum-Snow and Marion (2009); Colwell, Dehring, and Lash (2000); Ding, Simons, and Baku (2000); Diamond and McQuade (2019); Nygaard, Galster, and Glackin (2022); Overton and Stokan (2023); Rossi-Hansberg, Sarte, and Owens (2010); Santiago, Galster, and Tatian (2001); Schwartz et al. (2006); Simons, Quercia, and Maric (1998); Theodos et al. (2021). The authors therefore suspect that much of the cross-site heterogeneity in the spatial patterns of price impacts observed can be traced to their different compositions of the CDBG-funded investments and perhaps their intensity, concentration, and neighborhoods targeted, suggesting an important topic for future research.

The authors also observed heterogeneity in the timing of impacts across sites, which may be explained by variable completion periods for different place-based investments. Moreover, in the period before completion, the area may undergo temporary disruptions, depending on the investment—for example, the exterior rehabilitation of several single-family homes, a major sewer replacement, or the construction of a new community center. Finally, timing of observed impacts may be complicated by anticipation effects. If the planned investment is highly visible, large scale, and well publicized in advance, the property market may well register price gains before construction begins, as speculators perceive future arbitrage opportunities (as observed by Baum-Snow and Marion, 2009; Colwell, Dehring, and Lash, 2000). Nevertheless, the findings from this study indicate that local policymakers should not expect long lags between when they spend their CDBG funds and resulting property market impacts.

The authors employed quasi-experimental econometric methods to investigate whether CDBG-funded investments can change the home price trajectories of LMI neighborhoods. This research study, although a meaningful contribution to the understanding of the program, should not be the final word. Spatial spillovers from certain types of CDBG-funded investments may be greatest within line-of-sight, so future studies might explore impacts using block-face geographies. Even longer panels of CDBG spending and home price data will be required to probe further the provocative finding that impacts decay over time. This study examined outcomes for only three entitlement communities, and, given their idiosyncratic CDBG spending patterns, how well those outcomes can be generalized to other jurisdictions is unclear. Only one outcome is examined in

this study, and although a parsimonious measure of community impacts, other measures are also worthy of investigation.

From this analysis of longitudinal data from the past 2 decades in Jersey City, Los Angeles County, and DC, the authors conclude that CDBG-funded, place-based investments (especially in Jersey City and DC, where they were applied more intensely) plausibly caused substantial and long-lived boosts to the local home sales market, indicating that their positive externalities were being capitalized within a range of 2,000 feet. A notable observation is that statistically significant impacts occurred in all three study sites, in light of the large variation in the amounts, types, and bundling of CDBG-funded investments that these jurisdictions exhibited. Given that evidence of the CDBG program's widespread efficacy, Congress would do well to reevaluate the wisdom of allowing the budget for this program to continually decline in inflation-adjusted terms.

Appendix

Exhibit A1

Characteristics of the Study Sites

	Jersey City, NJ			Los Angeles County, CA			Washington, D.C.		
	Non-White (%)	Poverty (%)	Price ($2,000)	Non-White (%)	Poverty (%)	Price ($2,000)	Non-White (%)	Poverty (%)	Price ($2,000)
Mean	68.7%	16.4%	$173,889	66.8%	13.4%	$228,687	82.6%	20.9%	$178,447
Minimum	22.1%	0.0%	$0	8.6%	0.0%	$0	10.0%	1.2%	$0
1st Quartile	60.4%	9.7%	$113,900	48.5%	6.3%	$157,700	74.0%	13.1%	$108,800
Median	72.7%	16.0%	$127,200	68.9%	10.1%	$190,800	94.8%	19.6%	$137,200
3rd Quartile	81.7%	21.1%	$157,400	90.1%	18.3%	$269,300	98.5%	27.3%	$183,400
Maximum	99.5%	49.3%	$625,000	99.8%	67.1%	$1,000,001	100.0%	63.4%	$1,000,001
N Treated Sales	45,676	45,676	45,676	136,923	136,923	136,923	92,354	92,354	92,354

Non-White = those who are not Non-Hispanic White. Price = median value of specified owner-occupied dwellings ($0 = insufficient N to estimate).
Note: Poverty based on all persons for whom poverty status is determined.
Source: 2000 U.S. Decennial Census

Exhibit A2

HUD Matrix Codes in This Study, Grouped by Spending Category (1 of 2)

Acquisition projects include HUD Codes 1 (Acquisition of Real Property); 14G (Rehab: Acquisition)

Business development projects include HUD Codes 14E (Rehab: Publicly or Privately Owned Commercial/Industrial); 17A (Commercial/Industrial: Acquisition/Disposition); 17C (Commercial/Industrial: Building Acquisition, Construction, Rehabilitation); 17D (Commercial/Industrial: Other Improvements)

Demolition projects include HUD Codes 04 (Clearance and Demolition); 07 (Urban Renewal Completion)

Infrastructure projects include HUD Codes 03H (Solid Waste Disposal Improvements); 03I (Flood Drainage Improvements); 03J (Water/Sewer Improvements); 03K (Street Improvements); 03L (Sidewalks); 04A (Cleanup of Contaminated Sites); 05V (Neighborhood Cleanups); 11 (Privately Owned Utilities); 17B (Commercial/Industrial: Infrastructure Development)

Exhibit A2

HUD Matrix Codes in This Study, Grouped by Spending Category (2 of 2)

Public facility projects include HUD Codes 03A (Senior Centers); 03B (Handicapped Centers); 03C (Homeless Facilities [not operating costs]); 03D (Youth Centers); 03E (Neighborhood Facilities); 03F (Parks, Recreational Facilities); 03G (Parking Facilities); 03M (Child Care Centers); 03N (Tree Planting); 03O (Fire Stations/ Equipment); 03P (Health Facilities); 03Q (Facilities for Abused and Neglected Children); 03S (Facilities for AIDS Patients [not operating costs]); 16B (Non-Residential Historic Preservation); and 23 (Tornado Shelters Serving Private Mobile Home Parks)

Residential development projects include HUD Codes 12 (Construction of Housing); 13 (Direct Homeownership Assistance); 14A (Rehab: Single-Unit Residential); 14B (Rehab: Multi-Unit Residential); 14C (Rehab: Public Housing Modernization); 14D (Rehab: Other Publicly Owned Residential Buildings); 14H (Rehab: Administration); 16A (Residential Historic Preservation)

108 loan projects included HUD Codes 19F (Planned Repayments of Section 108 Loans) and 19G (Unplanned Repayments of Section 108 Loans). 108 loan projects were recategorized into whichever of the previous six categories best fit the funded activity for the purpose of analysis.

Exhibit A3

Descriptive Statistics of Variables in AITS Model, by Site (1 of 3)

Jersey City, NJ					
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Ln (home sales price)	46,872	12.49992	0.754267	9.21034	15.42495
CDBG Treatment group^	46,872	0.974484	0.157689	0	1
Time Trend	46,872	9.269052	5.599561	1	19
CDBG Treatment^ Group Time Trend	46,872	9.023788	5.711419	0	19
CDBG Treated^ Group	46,872	0.932284	0.251261	0	1
CDBG Treated^ Group Time Trend	46,872	8.859575	5.892199	0	19
Contraction Period 2008–2013	46,872	0.176438	0.381196	0	1
Expansion Period 2014+	46,872	0.317439	0.465485	0	1
Single-Family Unit	46,872	0.473332	0.499294	0	1
Condominium	46,872	0.520823	0.499572	0	1
Cooperative	46,872	4.27E-05	0.006532	0	1
Duplex or Quad	46,872	0.005803	0.075957	0	1
Jersey City	46,872	0.805044	0.396171	0	1
Hoboken	46,872	0.116658	0.321016	0	1
Bayonne	46,872	0.006934	0.082981	0	1
Secaucus	46,872	0	0	0	0
Union City	46,872	0.060932	0.239208	0	1
North Bergen	46,872	0.009302	0.095998	0	1
Weehawken	46,872	0.001131	0.033608	0	1
Spatial Lag	46,872	339896.9	163464	70830.4	967118
Latitude	46,872	40.72681	0.019118	40.67615	40.77395
Longitude	46,872	– 74.0608	0.021218	– 74.1075	– 74.0239
Year Built	46,872	1950.147	40.48773	1714	2021

AITS = adjusted interrupted time series. CDBG = Community Development Block Grant. Max = maximum. Min = minimum. Obs = observations. Std. Dev. = standard deviation.

Note: ^ within 2,000 feet.

Source: Authors' analysis of CDBG and Z-TRAX data in Jersey City, Los Angeles County, and Washington, D.C.

Exhibit A3

Descriptive Statistics of Variables in AITS Model, by Site (2 of 3)

Los Angeles County, CA					
Variable	**Obs**	**Mean**	**Std. dev.**	**Min**	**Max**
Ln (home sales price)	166,036	12.90941	0.659977	9.21034	15.42495
CDBG Treatment Group^	166,036	0.824659	0.38026	0	1
Time Trend	166,036	5.317666	2.802759	1	10
CDBG Treatment^ Group Time Trend	166,036	4.410429	3.25244	0	10
CDBG Treated^ Group	166,036	0.579055	0.493712	0	1
CDBG Treated^ Group Time Trend	166,036	3.635802	3.650298	0	10
Contraction Period 2008–2013	166,036	0.422932	0.494026	0	1
Expansion Period 2014+	166,036	0.577068	0.494026	0	1
Single-Family Unit	166,036	0.711412	0.453107	0	1
Condominium	166,036	0.203022	0.40225	0	1
Cooperative	166,036	0.000102	0.010118	0	1
Duplex or Quad	166,036	0.085463	0.279571	0	1
Number of Bedrooms	166,036	3.208828	1.300619	0	32
Los Angeles County	166,036	0.994459	0.074231	0	1
Orange County	166,036	0.003005	0.054739	0	1
San Bernardino County	166,036	0.000512	0.02262	0	1
Ventura County	166,036	0.002024	0.04494	0	1
Spatial Lag	166,036	504962.1	293549.8	66661.18	1999775
Latitude	166,036	34.05701	0.18665	33.74588	34.80317
Longitude	166,036	– 118.135	0.191621	– 118.833	– 117.699
Year Built	166,036	1961.855	26.51551	1821	2021

CDBG = Community Development Block Grant. Max = maximum. Min = minimum. Obs = observations. Std. Dev. = standard deviation.

Note: ^ within 2,000 feet.

Source: Authors' analysis of CDBG and Z-TRAX data in Jersey City, Los Angeles County, and Washington, D.C.

Washington, D.C.					
Variable	**Obs**	**Mean**	**Std. dev.**	**Min**	**Max**
Ln (home sales price)	106,554	12.69391	0.771108	9.21034	15.42295
CDBG Treatment Group^	106,554	0.866734	0.339863	0	1
Time Trend	106,554	11.389	6.243762	1	22
CDBG Treatment^ Group Time Trend	106,554	10.07577	7.046699	0	22
CDBG Treated^ Group	106,554	0.681223	0.466005	0	1
CDBG Treated^ Group Time Trend	106,554	9.21941	7.789721	0	22
Contraction Period 2008–2013	106,554	0.212259	0.408909	0	1
Expansion Period 2014+	106,554	0.434296	0.495667	0	1
Single-Family Unit	106,554	0.604576	0.488944	0	1
Condominium	106,554	0.395311	0.48892	0	1
Cooperative	106,554	0.000113	0.010612	0	1
Number of Bathrooms	106,554	1.951184	0.881727	0.5	10.5
District of Columbia	106,554	0.873285	0.332655	0	1

Exhibit A3

Descriptive Statistics of Variables in AITS Model, by Site (3 of 3)

Washington, D.C.					
Variable	**Obs**	**Mean**	**Std. dev.**	**Min**	**Max**
Montgomery County	106,554	0.015438	0.123288	0	1
Prince George's County	106,554	0.111277	0.314476	0	1
Spatial Lag	106,554	407134.9	192781.4	56973.22	1602267
Latitude	106,554	38.9096	0.033035	38.80901	38.99792
Longitude	106,554	– 76.9982	0.03689	– 77.0638	– 76.8894
Year Built	106,554	1945.097	37.00281	1780	2020

CDBG = Community Development Block Grant. Max = maximum. Min = minimum. Obs = observations. Std. Dev. = standard deviation.
Note: ^ within 2,000 feet.
Source: Authors' analysis of CDBG and Z-TRAX data in Jersey City, Los Angeles County, and Washington, D.C.

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Examining the Local Economic Impacts of the Community Development Block Grant

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RAND

Abstract

This article provides preliminary evidence on the job impacts of the Community Development Block Grant (CDBG) program. The author uses a difference-in-differences (DiD) study design to leverage a one-time shock to the formula allocation process, which permanently reshuffled grant generosity, creating quasi-experimental variation. Job counts increased greatly in localities that received a large positive boost to their allocations but were unchanged in localities where allocations fell. For localities that benefited from the shock, cost-per-job estimates of the CDBG appear promising.

Introduction

The growing geographic concentration of poverty across the country has had widespread impacts on social and economic well-being. In response, governments at every level have increasingly relied on spatially targeted investments—or "place-based policies"—to revitalize local areas in decline. federal efforts such as the Opportunity Zones program and a recent $80 billion surge in place-based industrial initiatives (Muro et al., 2023) aim to attract economic investment to struggling regions. Local governments spend $60 billion annually on job creation efforts, with three-quarters of this investment spent on lucrative (often desperate) firm incentives to attract new employers to ailing places (Bartik, 2020).

Despite the growing stakes and urgent need for economic revitalization, policies such as the Community Development Block Grant (CDBG) program have seemingly faded into the background despite being a cornerstone of federal investment in low-income communities for the past 50 years. With more than $200 billion spent across the program's lifespan, the CDBG continues to provide local governments with a flexible funding mechanism to support a broad range of community development activities aimed at revitalizing neighborhoods, promoting economic development,

and improving local living conditions. One potential reason for the CDBG's low salience is that few efforts have been made to rigorously evaluate its causal impacts. Despite the CDBG's historical bipartisan popularity, the lack of data-driven evidence likely hampers support for the program today.

This article presents preliminary causal evidence on the CDBG's economic impacts by examining its effects on local job counts through a natural experiment that introduced a permanent, one-time shock to the CDBG formula allocation process. The author uses a difference-in-differences (DiD) study design to quantify how the trajectory of jobs in local areas changed in response to this shock. This approach suggests that the CDBG increased job counts by an average of 7.2 percent among benefactors of the one-time shock over the subsequent 8 years at an estimated cost-per-job of $21,667. In a working companion article, the author finds similar results when applying more rigorous methods. A wider range of job outcomes are also explored, along with CDBG's impacts on local public finance and how different kinds of CDBG investments vary in job creation effectiveness (Zuo, 2024).

The CDBG offers important insights into effective federal support for declining areas. First, different places have different needs; investments of one kind might be effective in certain places but have limited impacts in other places. The flexibility of the CDBG enables federal dollars to be tailored to local use without pigeonholing funds to specific purposes for which certain places may have little need. Second, the decisionmaking process behind which place-based policies to fund and where to target them is staggeringly open-ended. Although some place-based investments have successfully led to sustained prosperity, many others—at great cost—have done little to generate lasting economic growth. Given this finding, researchers have struggled to provide guidance on what place-based investments local governments ought to pursue. The CDBG funds a broad range of investment activities—many of which are not strictly focused on economic development. Grantees have the discretion to choose from a wide spectrum of eligible activities, including activities related to housing, public services, public facilities, and more. The program's national coverage and broad uses provide strong potential for future research on effective place-based policymaking.

This article fills several important gaps in the existing literature on the CDBG. The author proposes a source of quasi-experimental variation in block grant generosity to causally estimate the CDBG program's impact and focuses explicitly on jobs as a measure of local economic vitality. Other existing studies propose using home values as a key outcome of interest—arguing that home values capitalize on the general appeal of an area and would thus change in response to effective CDBG investments (Galster et al., 2004; Pooley, 2014).

Methods

To estimate the CDBG's impact on local job counts, the author uses a DiD approach, leveraging a one-time change in the data sources used to calculate annual CDBG allocations. This shock caused annual CDBG allocations to suddenly change for many grantees—and never revert. In 2012, the data inputs used to calculate CDBG allocations changed from the 2000 decennial census data to the 2005–2009 American Community Survey (ACS) (Joice, 2012). Before 2012, each grantee's percentage claim of the total CDBG budget remained relatively stable. The transition to the ACS in

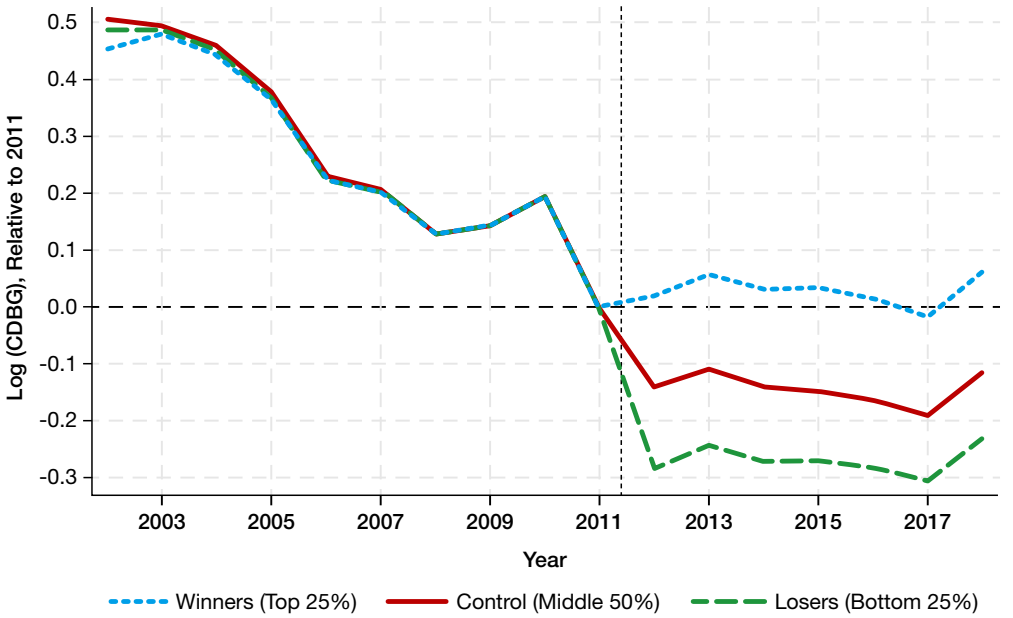
2012 led to a widespread "reshuffling" of grantee CDBG allocations, generating quasi-experimental variation in grant generosity and creating a natural experiment for evaluating the program's impact.

Grantees are categorized into three groups based on this reshuffling: *winners*, representing the top 25 percent of grantees, receiving the largest positive changes; *losers*, who represent the bottom 25 percent, experiencing the largest negative changes; and *control* grantees, representing the middle 50 percent, whose allocations remained relatively stable.

Exhibit 1 illustrates how the funding trajectories of these three groups evolved. Each line represents the natural logarithm of each group's average CDBG allocation, and for visual comparison, each line represents the average allocation size *relative to 2011*. Before the data shock in 2012, all three groups exhibited nearly identical trajectories in their CDBG funding allocations. After the data shock, the three groups diverge substantially in terms of their future funding trajectories.

Exhibit 1

CDBG Funding Trajectories Before and After 2012 Data Shock



Notes: This exhibit presents the trajectory of average CDBG allocations for winners, losers, and control grantees based on the percent change in allocation size before and after the 2012 data shock. Allocation trajectories over time are centered to show how grant allocations compare with their baseline values in 2011.
Source: U.S. Department of Housing and Urban Development Open Data

Exhibit 2 provides summary statistics comparing these three groups of grantees. The socioeconomic characteristics appear similar, but differences appear in terms of racial composition (63 percent White for winners, 54 percent for losers, 61 percent for control), property values (in thousands of dollars, 205 for winners, 305 for losers, 239 for control), and population/jobs (in thousands of people, 235 for winners, 204 for losers, 254 for control).

Exhibit 2

CDBG Grantee Summary Statistics

	Winners		Losers		Control	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Socioeconomic Characteristics						
EPOP Ratio	0.462	0.058	0.460	0.048	0.460	0.050
	61,395	16,910	64,418	22,487	60,523	20,402
HH Income	5	0	8	7	3	2
% In Poverty	0.164	0.081	0.152	0.075	0.169	0.079
% College Educated	0.287	0.116	0.291	0.143	0.280	0.124
% HS Grad or Less	0.405	0.116	0.428	0.130	0.426	0.120
% In Professional Occupation	0.343	0.083	0.349	0.111	0.341	0.094
Demographic Characteristics						
% White	0.631	0.215	0.540	0.256	0.609	0.226
% Married	0.492	0.078	0.460	0.072	0.456	0.082
% Single Mother	0.579	0.046	0.583	0.043	0.583	0.039
% Working Age	0.143	0.059	0.145	0.054	0.158	0.066
Neighborhood Characteristics						
Median Rent	878	234	1,033	363	906	330
Median Home Value	205,151	102,069	305,373	191,487	239,363	154,603
% Vacant Housing	0.085	0.041	0.079	0.043	0.088	0.039
Population and Jobs						
Population	234,903	240,597	203,970	382,535	254,335	603,798
	03	97	70	35	35	98
	33,217	49,134	26,670	67,351	41,599	146,236
All Jobs	7	4	0	1	9	36
Grantees	223		223		444	

CDBG = Community Development Block Grant. EPOP = employment-to-population ratio. HH = household. HS = high school. SD = standard deviation.

Note: This exhibit summarizes CDBG grantee characteristics across winning, losing, and control grantees—as defined based on the change in grantee allocation due to the CDBG shock.

Sources: U.S. Department of Housing and Urban Development; U.S. Census

Despite these differences, the study's empirical strategy relies on the three groups exhibiting similar *trends* in job counts—not static differences in *levels*. More specifically, DiD is used to compare outcomes for winners (or losers) against counterfactual control grantees. The sample is restricted to only winners (or losers) and control grantees, and the following regression equation is used for estimation:

$$Y_{it} = \alpha + \beta\,(\text{Winner}_i \times \text{Post}_t) + \phi_i + \theta_t + \epsilon_{it}$$

where Y_{it} denotes the outcome variable (e.g., job counts) for grantee i in year t, $Winner_i$ is a binary indicator for grantees in the group of winners (or, $Loser_i$ when comparing losers with control grantees), $Post_t$ is a binary indicator for the posttreatment period, and ϕ_i and θ_t are grantee and time fixed effects, respectively. Standard errors are clustered at the grantee level to account for potential serial correlation within grantees over time. Additional control variables were not included due to frequency and geographic irregularity of the data. To date, no publicly available data source compiles annual covariates at the grantee level (e.g., a mix of cities and urban counties) from

2002 through 2019. Other grantee characteristics that do not change over time are controlled for through the grantee fixed effect ϕ_i.

The DiD coefficient of interest, β, measures the causal impact of the CDBG shock on winners relative to the control group. A similar regression, including losers and control grantees, would estimate the causal impact of "losing" from the CDBG shock. As exhibit 1 indicates, winners and losers experienced a permanent 15- to 20-percent shock to their allocations in opposite directions.

The validity of the DiD approach hinges on the assumption that in the absence of treatment, the treatment group (either winners or losers) and the control group would have followed parallel paths over time. This assumption is inherently unverifiable because one cannot observe how treated grantees would have responded if the data shock had not occurred. The "Results" section below explains two simple checks that provide evidence in support of this assumption.

A major concern with this approach is that the data shock might reflect endogenous changes in local labor market conditions between 2000 and 2009. For instance, winners might be disproportionately composed of grantees experiencing declining labor markets, leading to an increase in poverty counts between the 2000 census and the 2005–2009 ACS. Thus, the division of grantees into three groups could potentially incorporate the actual changes that occurred between 2000 and 2009, complicating the argument that the "treatment" was entirely exogenous.

Several factors mitigate these concerns. First, the data update includes outdated information. The shock occurred in 2012, but the update reflects changes in poverty, overcrowding, and pre-1940 housing from 2000 to 2005–2009 and population changes from 2009 to 2010. Second, much of the variation from the update likely stems from measurement changes rather than actual labor conditions. Serrato and Wingender (2016) argue that the shift from the 2009 population estimate to the 2010 full count was largely due to measurement error. In the CDBG data shock, housing units built before 1940 increased by 8 percent, which should be impossible and points to measurement differences between the census and ACS being the driving factor. Overcrowded housing counts fell by 46 percent despite population growth outpacing housing starts, especially during the Great Recession, when housing construction rates halved (USAFacts, 2021).

Joice (2012) outlines key measurement differences between the decennial census and ACS. The census occurs every 10 years on April 1, whereas the ACS averages data collected continuously over 5 years, capturing seasonal differences the census misses. The ACS also changed the census' "residence rule," affecting areas with many seasonal residents. The smaller ACS sample has more sampling error than the larger census long-form sample. Lastly, the census used mostly mail-in responses, whereas the ACS relied more on phone and in-person interviews, reducing respondent confusion about room counts and building age (Woodward, Wilson, and Chesnut, 2007).

Two simple empirical checks assessed this potential threat. First, after 2012, CDBG inputs were updated annually with each ACS iteration. Changes in CDBG inputs from 2012 to 2019, which reflect how local conditions changed and did *not* involve measurement changes, do not produce any notable reshuffling in exhibit 1. A lack of movement suggests that the data shock did not primarily reflect endogenous labor market changes. Second, the author directly observed how pre-2012 job

trajectories differed across the three groups. Exhibits 2 and 3, which are described in further detail below, indicate that the three groups were on highly similar job trajectories before 2012, mitigating potential concerns that the results in this study were driven by the composition of the different groups. Although the DiD estimate provides estimates for how the CDBG affected jobs, determining cost effectiveness further necessitates an examination of how much public spending was required to achieve those effects. A naïve approach would be to approximate the amount of CDBG funding associated with the 2012 data shock. However, this estimate would not reflect the total change in local public spending that occurred due to the shock. The CDBG—like other block grants—is commonly used as "seed money" to attract other sources of funding (Theodos, Stacey, and Ho, 2017); thus, a sudden increase in CDBG funding could potentially generate additional spending multipliers that must be explained. To estimate these potential multipliers, the author conducts the same DiD analysis using local public spending on housing and community development as an outcome variable. Using this estimate, the author approximates the total public spending that was induced by the 2012 data shock to use as the denominator in cost-per-job calculations.

Data

Job Counts: To calculate the number of jobs associated with each grantee, the author uses data from the Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES), a public dataset administered by the LEHD program at the U.S. Census Bureau. The LODES data provide worker counts at the census block level, although these counts are typically infused with a small amount of noise to protect anonymity. All census block counts were aggregated to the geographic boundaries of their respective grantees. For most states, data extend from 2002 through 2019.

CDBG Allocations: To identify winners, losers, and control grantees, publicly available data on grantee-specific allocations since 1975 were used. Using the Consumer Price Index, nominal allocations were adjusted to real dollars. Only the grantees who were continuously eligible for the CDBG from 2002 to 2019 were included, encompassing roughly 80 percent of all grantees in the data. Jurisdictions qualify for CDBG inclusion by crossing a population threshold; therefore, the 20 percent of excluded grantees are small counties and cities that crossed the population threshold (50,000 for cities; 250,000 for counties) at some point during this timeframe.

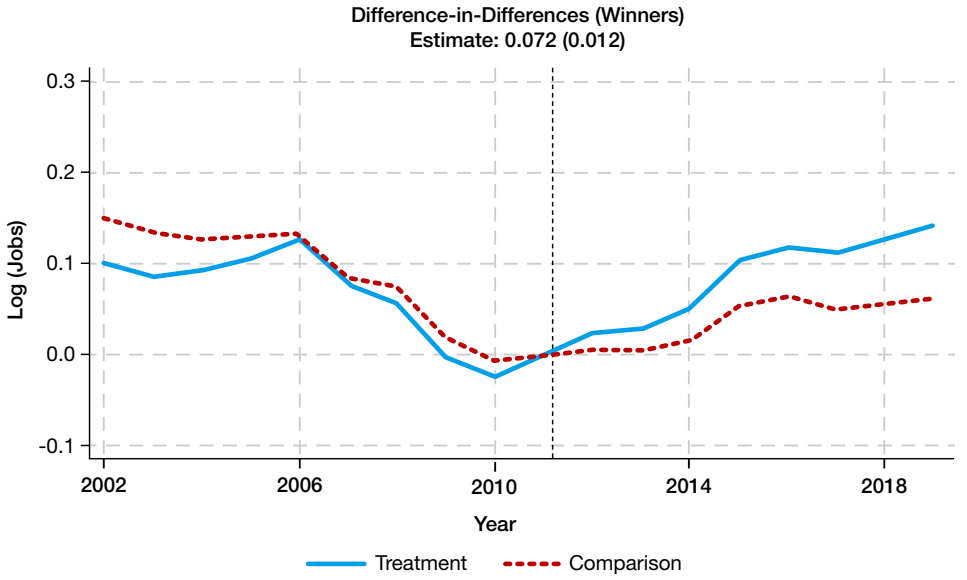
City/county-level public spending data: Local public spending was analyzed using Annual Survey of Local Government Finances data, which are detailed annual data on state and local public finances. Because these data come from surveys of local government administrators, their accuracy is less reliable than administrative data. The survey includes detailed revenue and expenditure categories for each government unit. The author focuses on "Community Development and Housing" spending, which aligns with CDBG uses. Given the complexity of cleaning and standardizing these data, a cleaned version available via Pierson, Hand, and Thompson (2023) was accessed. One noteworthy issue with these data is that some grantees report missing or zero spending on housing and community development—an impossibility if the jurisdiction is a CDBG grantee. This finding suggests that some survey respondents may be either misreporting or miscategorizing the spending. Given this realization, only grantees with five or fewer missing values throughout the study period were kept; the missing values were linearly interpolated when possible.

Results

Exhibit 3 shows the trajectory of job counts (in natural logarithm form) between winning and control grantees relative to 2011 values. Before the data shock, the two groups trended similarly, especially between 2006 and 2011. Shortly after the data shock, the two groups diverge gradually over time. The widening jobs gap is consistent with the accumulating funding gap caused by the data shock. The difference-in-differences estimate indicates that winning grantees experienced a large and significant 7.2-percentage-point increase in job counts relative to comparison grantees.[1] This estimate is significant at the 1-percent level.

Exhibit 3

The Impact of the CDBG Shock on Jobs (winners vs. control)



CDBG = Community Development Block Grant.

Notes: This exhibit presents difference-in-differences (DiD) estimates depicting the impact of the CDBG data shock on job counts, restricting the sample of grantees to winners and control grantees. The DiD estimate and standard error are presented in the graph subtitle. The y-axis denotes job counts relative to baseline levels in 2011. N=12,006, based on 18 years of data and 667 grantees (223 winners and 444 controls).

Sources: U.S. Census Longitudinal Employer-Household Dynamics; U.S. Department of Housing and Urban Development Open Data

As an additional test for the robustness of the DiD approach, a "placebo-in-time" test was conducted. This test introduces a "fake" event before the actual event to probe whether the baseline estimates in this study can be reproduced in a smaller placebo study—providing evidence as to whether the baseline estimates can be attributed specifically to the data shock. Data from 2002 to 2011 were used, and placebo treatment dates in 2007–09 and 2010 were assigned. In exhibit 4, the baseline estimates are presented in the leftmost column. No evidence that any of the placebo studies yield large or significant effects was found, supporting a causal interpretation of the baseline findings in this study.

[1] This estimate represents the average effect over 8 years after the data shock.

Exhibit 4

Placebo-in-Time Estimates

	(1)	(2)	(3)	(4)	(5)
DiD Estimate	0.072**	0.020	0.014	0.014	0.017
	(0.012)	(0.011)	(0.010)	(0.010)	(0.010)
Specification	Standard	Placebo	Placebo	Placebo	Placebo
Timeframe	2002–2019	2002–2011	2002–2011	2002–2011	2002–2011
Event Year	2012	2007	2008	2009	2010
N	12,006	6,670	6,670	6,670	6,670

DiD = difference-in-differences.

**p < 0.05. **p < 0.01.*

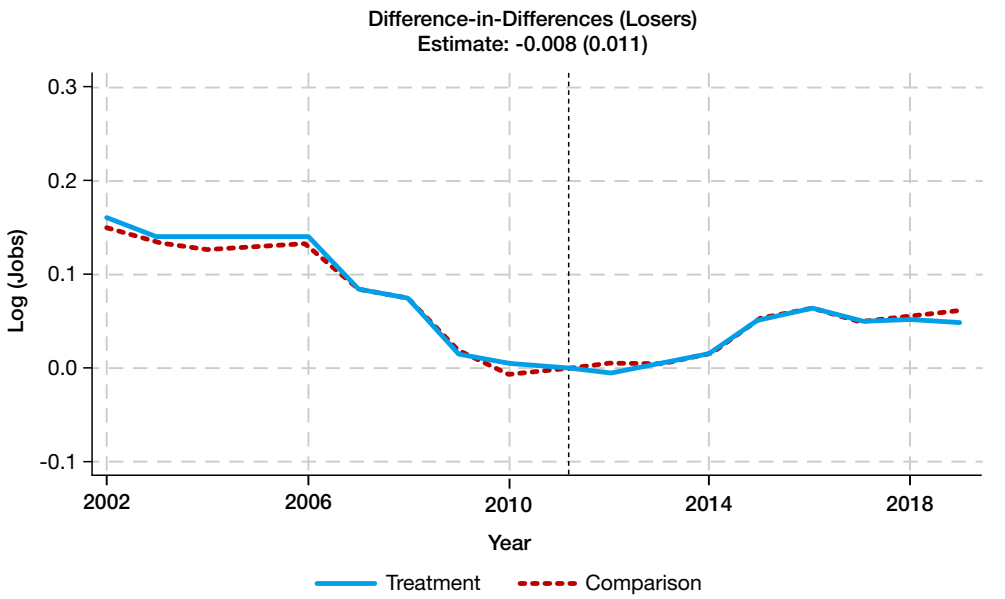
Notes: This table presents results from a placebo-in-time robustness check. Column (1) presents the baseline difference-in-differences estimate. Columns (2) through (5) present placebo estimates using only pretreatment data ranging from 2002 to 2011. Each placebo estimate is obtained by assigning the placebo treatment date noted in the bottom panel.

Sources: U.S. Census Longitudinal Employer-Household Dynamics; U.S. Department of Housing and Urban Development Open Data

Exhibit 5 shows that losing grantees experienced virtually no impact on job counts, with an insignificant difference-in-differences estimate of -0.8 percentage point. This result suggests that the funding shock potentially led to asymmetric outcomes between winners and losers. This finding potentially suggests that grantees who lost funding due to the data shock were largely able to reallocate spending away from low-impact activities to mitigate the economic impacts of the negative shock.

Exhibit 5

The Impact of the CDBG Shock on Jobs (losers vs. control)



CDBG = Community Development Block Grant.

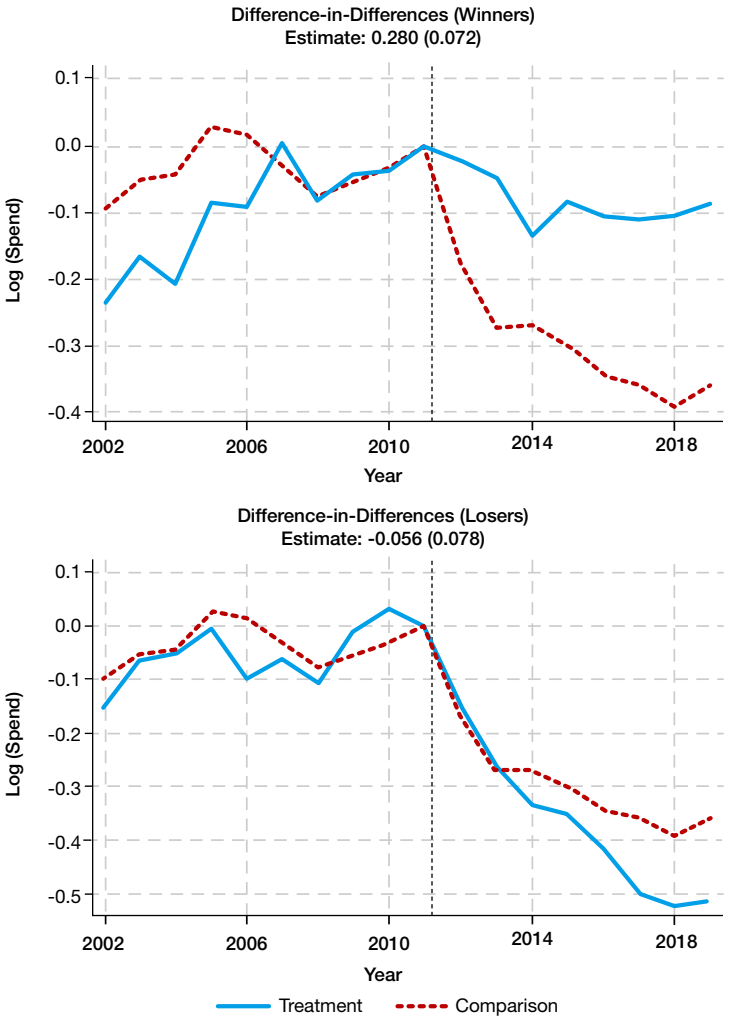
Notes: This exhibit presents difference-in-differences (DiD) estimates depicting the impact of the CDBG data shock on job counts, restricting the sample of grantees to losers and control grantees. The DiD estimate and standard error are presented in the graph subtitle. The y-axis denotes job counts relative to baseline levels in 2011. N=12,006, based on 18 years of data and 667 grantees (223 losers and 444 controls).

Sources: U.S. Census Longitudinal Employer-Household Dynamics; U.S. Department of Housing and Urban Development Open Data

How much extra public spending did the CDBG shock generate? Exhibit 6 illustrates the DiD estimate using local public spending on housing and community development from the Annual Survey of Local Government Finances as the outcome of interest. Despite data quality caveats, evidence suggests that winners increased their total local spending on housing and community development by 28 percent over the course of the post-period relative to control grantees. Before 2007, job counts between the two groups appear on different trajectories. After 2007, the two groups begin to move in lockstep, a promising development in support of the parallel trends' assumption.

Exhibit 6

Impacts on Local Public Spending on Housing and Community Development



CDBG = Community Development Block Grant.

Notes: This exhibit presents difference-in-differences (DiD) estimates depicting the impact of the CDBG data shock on total local public spending on housing and community development, as measured by the Annual Survey of Government Finances. DiD estimates and standard errors are presented in each panel's subtitle. The y-axis denotes total spending relative to baseline levels in 2011.

Sources: U.S. Census Longitudinal Employer-Household Dynamics; U.S. Department of Housing and Urban Development Open Data

The same exhibit indicates that losers experienced a small decline (though statistically insignificant) in local public spending. Both of these public spending results stand consistent with the asymmetric job results presented in exhibits 3 and 5. This result also hints that despite the negative funding shock, losing grantees ultimately spend similar amounts to control grantees on housing and community development, potentially through reducing spending on activities other than community development (such as administration and staffing costs).

To calculate cost-per-job, the median number of jobs among CDBG grantees before the CDBG shock (11,853) was determined then multiplied by the average percentage difference in jobs between winning and control grantees at the end of the sample period (an 8.1-percent gap) to determine the total net jobs created for the typical grantee after 8 years (960). To calculate the denominator, the median pretreatment public spending on community and housing development ($6.6 million in 2011 dollars; $9.2 million in 2024 dollars) is multiplied by the DiD estimate (28 percent) to obtain $2.6 million in induced public spending from the CDBG shock. Over 8 years, the accumulated difference in public spending amounts to 20.8 million real dollars. Therefore, the CDBG shock led to a cost-per-job estimate of approximately $21,667 per job for winners.

Discussion

How do the CDBG's job impacts compare with those of other programs? Bartik (2020) summarizes cost-per-job calculations for a variety of place-based policies, including firm incentive policies ($196,000 per job created), customized job training ($15,000), the Tennessee Valley Authority ($77,000), cleanup of contaminated industrial sites ($13,000), and customized services to businesses ($34,000). Whereas the CDBG does not rank at the very top of this list, its effectiveness is notable given that it is not explicitly a jobs program. Although some funds are used directly for economic development, the program frequently supports housing, infrastructure, public improvements, and public services. These flexible uses could potentially synergize with other existing economic development efforts by supporting population and business growth. The CDBG appears vastly more effective than firm incentives to attract employers to local areas—incentives that outpace CDBG spending by fifteenfold each year.

The CDBG stands out among federal programs due to its flexible and decentralized approach, allowing local governments to tailor their investments on the basis of specific community needs. Over its lifetime, the CDBG has allocated more than $200 billion to support place-based investments in low-income neighborhoods across the United States. The program's structure combines the scale and reach of federal funding with the adaptability of local decisionmaking, embodying the ideal principles of fiscal federalism. This flexibility has enabled municipalities to effectively address diverse local challenges, from housing and infrastructure improvements to public services and economic development projects. By contrast, other federal programs have been criticized for funneling federal dollars into one-size-fits-all programs with mixed benefits across widely different municipalities (Austin, Glaeser, and Summers, 2018).

The CDBG also appears to have high potential for generating public spending multipliers. Funds from the block grant frequently attract other sources of public and private funding (Theodos, Stacy, and Ho, 2017). The findings of this study align with a previous evaluation of the federal

Empowerment Zone program in the 1990s, which found that each dollar from a federal block grant generated an additional $7 of external funding (Busso, Gregory, and Kline, 2013). Further enhancing its potential for generating spending multipliers is the Section 108 Loan Guarantee program, which allows grantees to leverage their annual CDBG allocations to secure below-market-rate federal loans up to five times the size of the original allocation (Prunella, Theodos, and Thackeray, 2014). The CDBG therefore provides a source of liquidity and leverage, further allowing winners to "crowd in" large amounts of additional spending from a positive funding shock.

In a working companion article (Zuo, 2024), similar cost-per-job estimates are found using more state-of-the-art causal methods ($25,042 per job). The author also further contextualizes the magnitude of these findings and explores mechanisms behind the asymmetric effects for winners and losers. In one analysis, itemized CDBG spending data were used to assess how specific categories of CDBG expenditures responded to the shock. The article shows that for winners, CDBG expenditures increased across a wide variety of potentially high-impact spending categories. For losers, spending remained unaffected across most of these categories except for a notable decline in spending on public services—which are intended to encompass a wide variety of health and social programs but appear primarily used to fund miscellaneous activities labeled as "other public services." Together, these facts suggest that losers were potentially able to absorb the negative funding shock by reducing spending on marginal public services, providing a potential explanation for the CDBG's asymmetric job impacts.

Conclusion

This article sheds light on how block grants can be used to bridge the scale of federal programs with the diverse, individual needs of localities across the nation. The author finds that in jurisdictions that received a positive shock to their CDBG allocations, new jobs were created at a moderately low cost of $21,667 per job. Jobs were surprisingly unaffected in jurisdictions that experienced negative shocks to their allocations; the author finds evidence suggesting that affected jurisdictions were able to trim spending on marginal public services to offset this decrease in grant generosity. Because jurisdictions possess deep knowledge of their local labor markets, and because they face strong incentives to enhance economic opportunities and local living quality, a fiscal federalism-based approach to place-based policymaking appears to generate outsized job impacts. In addition to its flexibility, the CDBG provides local governments with powerful tools for coordinating other funding sources, unlocking investments that might otherwise have been difficult to achieve.

These findings relate to one important aspect of CDBG—its role as a form of de facto revenue sharing. Regardless of how they used the funds, grantees experienced an increase in jobs when they received a positive shock to their CDBG grant amount, indicating a general positive effect of federal spending in distressed communities. More work is needed, though, to better understand the relative effectiveness of different place-based investments supported by CDBG. One could assess impacts in specific neighborhoods that have received substantial CDBG investments and perhaps even determine the relative effectiveness of different types of CDBG-funded activities. This topic remains an important area for further research.

Authors

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Refreshing the Community Development Block Grant Program Formula: A Modern Allocation to Community Need

Greg Miller
Aidy

Abstract

This article builds on the critique presented by Miller and Richardson (2023) of the Community Development Block Grant (CDBG) program formula, which has remained unchanged since 1977 despite its reliance on outdated metrics, such as pre-1940 housing and growth lag. The formula's inefficiency in targeting communities needing development funds has been well documented, yet political hurdles and zero-sum funding allocation have stalled modernization efforts. In addressing such criticisms, this article explores alternative formulas, proposing a "replacement formula" that emphasizes poverty and dated infrastructure with adjustments for fiscal capacity alongside a more conservative "repair formula" that modifies the existing dual formula structure to address its most critical flaws. This article also proposes a phased implementation of a new formula that may resolve the political challenges of reform, offering a path toward a more equitable and effective distribution of CDBG funds.

Introduction

The Community Development Block Grant (CDBG) program has been a cornerstone of urban revitalization and support for low- and moderate-income communities for the past 50 years. For all but the first 3 years of CDBG, the funds have been distributed according to the same formula. That formula relies on outdated variables, including pre-1940 housing and growth lag since 1960. Since the formula's inception in 1977, several authors have conducted in-depth examinations of the inconsistencies of the CDBG formula in targeting communities with the most community development need. Most recently, Miller and Richardson (2023) published a congressionally mandated report that expanded the decades of criticisms into a modern context, showing that the formula continues to decline in its ability to target need.

Funding formulas are a zero-sum game: giving one jurisdiction more money means less is available to give to another. Despite decades of criticism, the politics of a zero-sum game have prevented the formula from modernizing. This article is an extension of the report by Miller and Richardson (2023) to explore alternative formulas that could modernize the current formula. The author of this article, Greg Miller, did this analysis while working for the U.S. Department of Housing and Urban Development (HUD), but the views in this article are not reflective of the views of HUD. This article will presume some knowledge of the initial report, including how the current CDBG formula works. Reading the initial report is highly recommended before reading this article.

Flaws in the Current Formula

The current formula creates funding discrepancies that can, at times, be extreme:

> A couple of examples illustrate the problem with the current formula. Although San Sebastian Municipio, Puerto Rico, receives $32 per impoverished person, with a 50-percent poverty rate and median household income of $15,995, Haverford, Pennsylvania, receives $461 per impoverished person, with a 3-percent poverty rate and median household income of $114,554. Pre-1940 housing and growth lag drives Haverford's high allocation, yet Haverford does not have high community needs. Similarly, Arlington, Massachusetts, receives $448 per impoverished person, with a poverty rate of 5 percent and a median household income of $125,000. Meanwhile, Hattiesburg, Mississippi, receives $37 per impoverished person, with a poverty rate of 28 percent and a median household income of $36,000. Pre-1940 housing drives Arlington's allocation, with a lower allocation coming from growth lag.
>
> —Miller and Richardson (2023)

Miller and Richardson also outlined eight primary issues with the CDBG formula.

1. College Town Overallocation (the poverty factor includes college students, equating to college towns being overallocated).
2. Formula A Inequity (the population factor evens the distribution of funds between high-need and low-need formula A grantees).
3. Formula B Inequity (grantees may receive very different allocations due to the pre-1940 housing variable).
4. Formula B Overallocation (grantees disproportionately overrepresent the share of need among formula B factors, receiving more allocation than their needs should imply).
5. Nonentitlement Underallocation (although funds are split such that nonentitlement areas receive 30 percent of the allocation, nonentitlement areas represent greater than 30 percent of the share of most formula variables, which results in less funding going to nonentitlement areas than their needs imply).

6. Systematic Reweighting of Factors (the formula reassigns weights of the factors in two ways. First, the formula uses metropolitan area denominators for the calculation of the distributions, and second, the nature of the dual formula results in factors being either more or less favored than their weights imply).

7. Timeframe Lag (the pre-1940 housing factor and the growth lag factor, which measures lag since 1960, will not capture communities that are either relatively new and have high need or have recently increased in need).

8. Underweighting Poverty (the current formula, in aggregate, results in just greater than 30 percent of funds distributed according to poverty, which results in great discrepancies in allocations per impoverished person).

CDBG is intended to benefit primarily low- and moderate-income families, and allocating funds to jurisdictions proportional to community development need is important to achieve that objective. Poverty is the variable most correlated with community need indexes. CDBG may not be considered a poverty-alleviating program, but poverty is so interwoven with community need that it should drive most of the allocation of funds.

Meanwhile, the inclusion of growth lag is problematic and creates a large number of grantees. Although the other variables in the CDBG formula are scaled relative to all other jurisdictions, growth lag consists only of jurisdictions experiencing growth lag—a shortfall in population that an entitlement area has experienced as defined by its actual population growth since 1960 compared with the average population growth of all metropolitan cities since 1960. More than 60 percent of all jurisdictions record a zero on the growth lag variable. Therefore, jurisdictions that record a value for growth lag, even a low value, account for relatively high total growth lag.

The idea behind a growth lag is to capture areas in economic decline, yet growth lag captures just as many, if not more, high-income, low-need communities. For instance, Haverford, Pennsylvania, and Arlington, Massachusetts—mentioned earlier—are wealthy suburbs that have growth lag because they choose not to expand. When the growth lag factor captures high-need communities, it results in overallocation. As a result, Detroit—for example—receives 64 percent of its allocation under the growth lag factor; therefore, any formula without growth lag calculations results in significant decreases for Detroit, even if the formula calculates funds for Detroit at the highest per capita levels (foreshadowing the formula alternatives presented here).

Need exists only to the extent that people have that need. Growth lag reflects the opposite. As with Detroit, the fewer people the city has, the more money it gets. Moreover, community development need exists to the extent that people are in need and the community lacks the capital and infrastructure to meet that need. The inclusion of growth lag in the current formula is an attempt to identify the latter (the communities with less economic activity), resulting in lagging infrastructure.

Formulas with the pre-1940 housing variable built in also over-target wealthy suburbs because wealthy communities preserve old housing for aesthetic purposes, whereas lower-income communities are more likely to bulldoze such properties or leave them vacant. San Francisco receives a large majority of its allocation because of the pre-1940 housing (as well as from growth

lag) factor, and although San Francisco certainly had people in need, it has a median family income of more than $167,861.[1] San Francisco is an urban core that has operated in many ways like a wealthy suburb.

Detroit's and San Francisco's allocations are emblematic of the reason the CDBG formula has not changed. Both jurisdictions have needs, but because the current formula's anomalies disproportionately assign large allocations to each city, similarly needy places do not receive their fair share of funds. For the low-income jurisdictions with low allocations, under an updated formula, Detroit and San Francisco would receive reduced funding. Hattiesburg, Mississippi; Puerto Rico; and Memphis, Tennessee, are among the low-income jurisdictions that would benefit from increased allocations.

The author of this article does not argue that CDBG is a legacy program that should protect jurisdictions from relative decreases in funding. Instead, the author asserts that CDBG is a chassis that should be modernized as programs get built on top of it, with a vision of a larger role of CDBG in the future. If this assertion is true, then modernizing the formula should be part of that vision. The transition to a more modernized formula does not have to be sudden; a new formula can be phased in when more funding is allocated.

Formula Alternatives

Miller and Richardson (2023) illustrated that the current formula results in wide variability in funding according to community development need, and they outlined numerous issues with the current formula that result in the imperfect targeting of jurisdictions in need. The initial report criticized the formula with and without the community needs index, and both avenues of criticism corroborated each other. The evidence presented in the report led to a series of considerations for a future formula to allocate CDBG funds. Those considerations were to create a single formula, place a larger weight on poverty, target aging housing in poor and declining communities, and remove the growth lag and population variables.

The development of a new formula followed three guiding principles. First, the new formula should target funds according to community development need. This criterion should be dually focused on vertical equity so that high-need grantees would receive allocations proportional to their need and horizontal equity so that similarly needy grantees receive similar allocations. Second, the formula should be simple. The complexity of the current formula introduced a host of unanticipated flaws in targeting need. A simplified formula will make allocations more transparent and create a greater sense of fairness. Finally, the formula should be durable over time so that it can be consistently updated (as with the current formula).

Miller and Richardson (2023) constructed a community needs index to assign a community needs score to every CDBG jurisdiction; the index is referenced in this article to explain the impacts of using a new formula. The community needs index is a tool to assess the targeting of formulas; however, it should not be used to construct a new formula. The index is formed from factor analysis, which relies on subjective interpretation and weighting factors while not capturing all

[1] U.S. Census Bureau American Community 1-Year Estimates for 2022: https://www.census.gov/programs-surveys/saipe.html.

the variances explained in the data. Therefore, the community needs index should not be treated as the gold standard. Instead, a new formula should stem from a solid theoretical grounding and be tested against the community needs index. This approach contrasts with performing a regression analysis to find the few variables that make the "best possible" formula according to the community needs index.

With these goals in mind, the author proposes a new formula, one that starts from scratch without remnants of the current formula. This formula is referred to as the "replacement" formula, and it results in large decreases in funding for currently overtargeted jurisdictions according to the community needs index.

Richardson's (2005) goal of minimizing the redistribution of funds so that no jurisdictions lose large amounts of funding was not considered when devising the most optimal formula. Given that CDBG issues funds annually, short-term considerations of jurisdictions that lose money should not change the formula that may be correct on premise. The leaders of many jurisdictions, upon the use of a replacement formula, may be disappointed to receive lower allocations; hence, this article offers a "repair" formula that maintains the dual-formula structure of the current method while correcting some of the problems previously noted.

The formulas for the repair and replacement options are templates based on the findings by Miller and Richardson. No perfect solution exists, but the formulas provided in this article can provide a glimpse into how policymakers should create a modern formula.

This article strongly recommends the replacement formula more than the repair formula. To prevent an acute change in allocation for jurisdictions that will be issued a decrease in funding under a new formula, legislators can use a phased approach to implementation. A replacement formula could be weighted with the current formula for 5 years. For the first year, the current formula could be weighted 80 percent; the next year, 60 percent; then, during the next 3 years, the weight would decrease by 20 percent until the replacement formula is fully adopted. This gradual implementation would prevent the occurrence of a "cliff effect," the sudden significant decrease in funding from one year to the next. For each jurisdiction, the online appendix (https://github.com/gregmiller00/cdbg) lists the fiscal year 2022 allocation under the current formula and the replacement and repair alternatives, as well as the first-year allocation under a 5-year phase-in. The appendix also shows the difference in funding between the proposed formulas and the current formula.

Alternatively, the occurrence of changes by a replacement formula can trigger mechanisms that cause it to become effective only when funding levels increase. A trigger mechanism could ensure that jurisdictions do not see significant decreases in funding, reducing the impact of a formula change. If Congress increases funding allocation for the CDBG program, refusing to change the formula would be a missed opportunity.

A One-Formula Alternative (Replacement Formula)

With the insight established in the initial report on targeting community need, this article proposes a replacement formula based on poverty and pre-1980 housing (vacant or occupied by a

household in poverty) factors, with a fiscal capacity adjustment factor based on the mean income of a place compared with its metropolitan area. The formula would apply to all jurisdictions in the following manner:

$$\left[\frac{POV_i}{SUM(POV)} * 0.7 + \frac{DATED_i}{SUM(DATED)} * 0.3\right] * f(inc_{ratio}) * total_{alloc}$$

Where—

- *(i)* is the value for the jurisdiction.
- *SUM()* is the nationwide sum of the variable.
- *POV* is the number of impoverished people, excluding those enrolled in college.
- *DATED* is the number of houses built 40 or more years ago or before the recent decennial census that are either vacant or occupied by households in poverty. At the time of this article, that category correlates to pre-1980 housing. Here, "vacant" excludes categories of vacancy, such as seasonal use and usual residence elsewhere, which may be secondary homes for well-off households. For the census-provided data, vacant means including the following three categories: For Rent, For Sale Only, and Other Vacant.
- *f()* is a fiscal capacity adjustment factor formula with a minimum at 0.9 and a maximum at 1.1: $\frac{0.2}{1 + e^{-10 * (x-1)}} + 0.9$
- inc_{ratio} is the ratio of a place's mean income ratio to the metropolitan area. Nonentitlement areas are set to 1.

This formula places a strong weight on poverty, the same as Congress' emphasis on serving 70 percent of low- to moderate-income households. Poverty is the most obvious indicator of community need and displays the highest levels of correlation with all other variables of community need. Poverty targets both the number of people and households in need and areas with low fiscal capacity to assist those people.

Poverty alone cannot identify areas struggling with a confluence of poverty and dated infrastructure, representing areas of particular need. Therefore, dated housing is added with a 30-percent weight. This variable is restricted to an area's vacant pre-1980 housing and pre-1980 housing occupied by households in poverty. Vacant pre-1980 housing indicates potentially rundown areas that likely lack the private investment needed to revitalize aging infrastructure and indicates low demand to occupy those housing units.

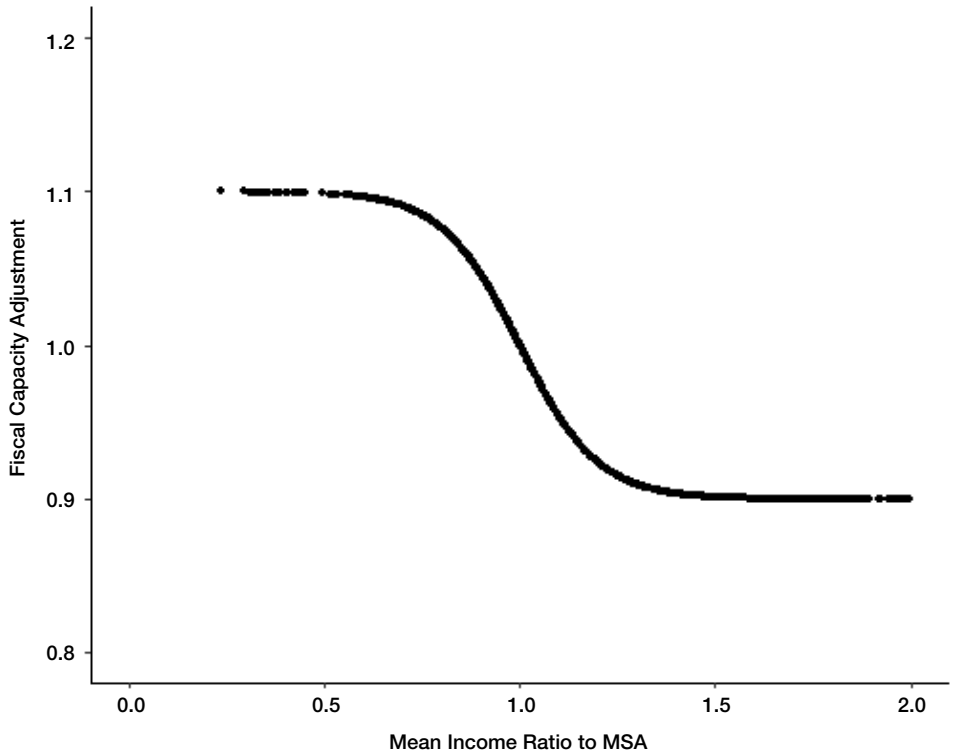
The dated housing variable already captures the intent behind the growth lag factor—perhaps better than growth lag. The intent behind the growth lag factor is to target places that are losing business and economic activity. In these areas, new construction is expected to be low, so the communities will rely more on dated infrastructure. In addition, with a loss in population, the area will likely have increased vacant and dated housing, representing abandoned buildings that

are likely not inhabitable. The pre-1980 housing factor has a correlation of 0.57 with 30-year population change, which indicates a good degree of correlation between the two variables.

The fiscal capacity adjustment rounds out the development of a replacement formula. In trading complexity for simplicity, this adjustment ensures that the formula appropriately targets the neediest jurisdictions in each metropolitan area that have the least capacity to meet their needs, as caused by a lower tax base than neighboring jurisdictions. By calculating a ratio, the adjustment helps capture regional price differences because a jurisdiction with low mean income ratios faces higher costs (as implied by higher median income in their area) and will be particularly needy for their area. Exhibit 1 shows the shape of the function applied to the median income ratios, which ensures that the adjustment is not too strong. Due to the fiscal capacity adjustment, the formula must be pro rata reduced or increased after running the allocation.

Exhibit 1

Fiscal Capacity Adjustment



MSA = metropolitan statistical area.

Source: Office of Policy Development and Research calculations of American Community Survey data

The initial report suggested that growth lag and overcrowding could remain if legislators deem it necessary, but this article ultimately suggests removing both. Growth lag is excluded because the dated housing factor captures the intent behind a growth lag factor better than growth lag. First, because many jurisdictions record a growth lag of zero, even if a jurisdiction has a small amount of

growth lag, it will receive a relatively large allocation from the factor due to a small denominator. Second, growth lag also captures suburban areas with growth lag due to policies intended to reduce population growth and development.

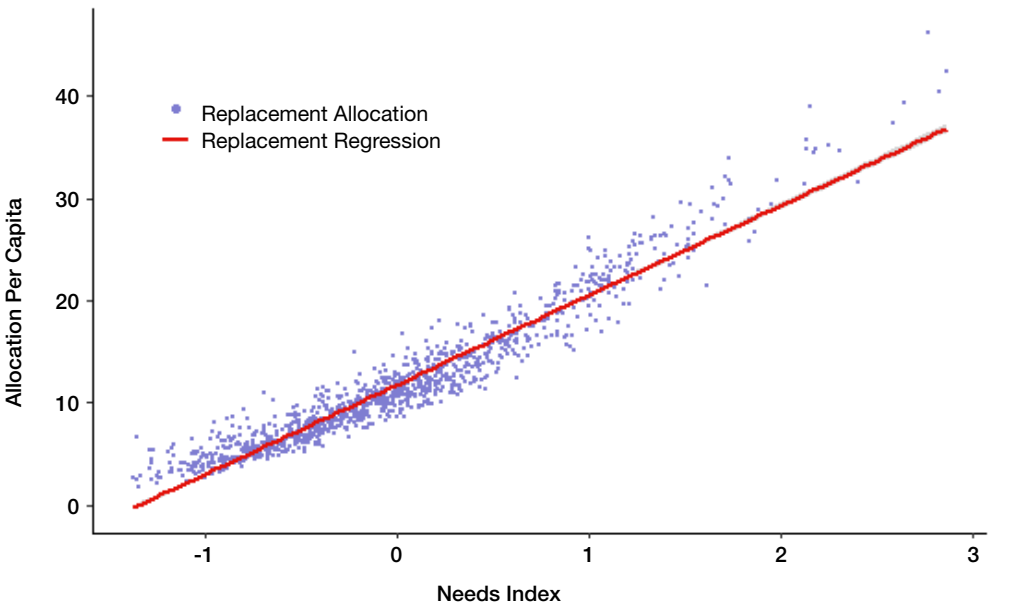
Overcrowding is also excluded from the analysis. The factor was initially included to target the slums of the 1970s, which explains its 25-percent weight in formula A. Although 8.2 percent of houses were overcrowded in 1970, 3.4 percent were overcrowded in 2020, making it an issue unique to a smaller number of communities. At the same time, areas with overcrowding—high-demand and high-cost areas—likely have a higher fiscal capacity to meet those needs due to larger tax bases. Overcrowding also occurs in impoverished places surrounding high-cost communities, where large immigrant populations reside. The fiscal capacity adjustment will ensure targeting these places, from which workers commute into metropolitan cores for work, because the place will have a much lower mean income than the high-cost metropolitan areas. Therefore, overcrowding is not included in this formula.

Targeting to Need

The replacement formula performs well on the community needs index. Exhibits 2 and 3 show the formula's performance using the nominal per capita needs and needs index ranking. The proposed formula displays a good degree of vertical and horizontal equity. The solid line in these figures is not the model allocation. Instead, the exhibits show the regression of the proposed formula against the needs index to illustrate the general trend of the proposed formula.

Exhibit 2

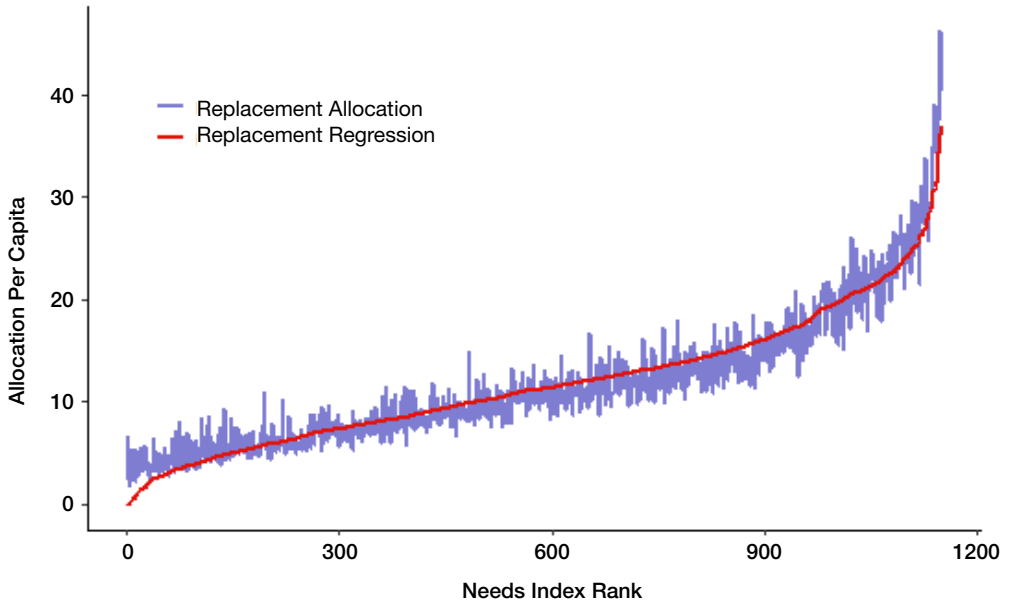
Replacement Formula Performance on the Needs Index



Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation and the needs index

Exhibit 3

Replacement Formula Performance on Needs Index Rank



Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation and the needs index

The regression—represented by the solid line in exhibits 2 and 3—demonstrates the replacement formula's improvements on horizontal and vertical equity. Exhibit 4 shows the regression results, unweighted and weighted. Horizontal equity is represented by less variation in allocation from similarly-needed jurisdictions (R-squared value) while vertical equity is represented by more funding for high-need jurisdictions (slope). The formula displays much better horizontal equity than the current formula, with R-squared values of 0.94 unweighted and 0.93 weighted. The proposed formula also displays vertical equity, with slopes of 8.85 and 8.47, respectively. As the initial report mentioned, vertical equity would be 8.27 or less, assuming the community needs index is correct, because that slope assumes that the least needy community has zero need. However, the community needs index likely understates the needs of very high-need communities. Factor 3, which targets areas of income inequality and high college education rates, results in places with widespread need across the entire community receiving low scores on factor 3. A slightly higher vertical slope may be justified in the creation of a new formula.

Exhibit 4

Regression of the Replacement Formula on the Needs Index

	Unweighted	Weighted
Coefficient	8.85097	8.47296
R-squared	0.94050	0.92670

Source: Office of Policy Development and Research calculation of the Community Development Block Grant alternative formula allocation and the needs index

Winners and Losers

A new formula will always shift funds, and assuming no increase in CDBG funding, formulas become a zero-sum game, with winners and losers—jurisdictions that gain funds and those that lose funds, respectively. This proposed replacement formula is the same. In fact, with the analysis in Miller and Richardson (2023) indicating that some jurisdictions receive either significant underallocation or overallocation, quite a few big winners and big losers exist. Exhibit 5 breaks down the count and percentage of winners and losers based on bracket categories. With no change to the amount appropriated, 24 percent of jurisdictions gain more than 30 percent of their current funding, and 22 percent lose more than 30 percent of their funding. Slightly less than one-fifth of CDBG places stay within 10 percent of their current allocation.

Exhibit 5

Winners and Losers of the One Formula Proposal

Winners and Losers	Count	Percent (%)
Gained 30% or more	304	24
Gained 10–20%	173	13
Gained 5–10%	55	4
Gained 0–5%	52	4
Lost 0–5%	67	5
Lost 5–10%	71	6
Lost 10–30%	282	22
Lost 30% or more	284	22

Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation

To see how the replacement formula shifts funds by level of need, exhibit 6 shows the shift in funding by decile of need from the current formula to this alternative formula. The first three deciles lose funds, with the least needy jurisdictions dropping 33 percent. The fourth through ninth deciles all gain allocations under this formula.

Exhibit 6

Allocation Per Capita Difference Between Replacement and Current Allocation by Decile of Need

Decile of Community Development Need	Current Formula ($)	Replacement Formula ($)	Percent (%) Difference
Low	6.57	4.41	– 33
2	6.95	5.85	– 16
3	7.51	7.20	– 4
4	8.33	8.50	2
5	8.87	9.97	12
6	11.14	11.33	2
7	11.45	12.82	12
8	13.01	14.55	12
9	17.52	18.52	6
High	28.66	26.40	– 8

Source: Office of Policy Development and Research calculation of the Community Development Block Grant alternative formula allocation and the needs index

The neediest jurisdictions are a sensitive topic when it comes to the analysis of the current formula. Due to the strength of the growth lag and pre-1940 housing variables, these jurisdictions are already strongly funded. The model allocation in the initial report, reflecting the allocation difference between the model and current allocation by decile of need, suggests a 14-percent drop for the top decile of needy jurisdictions. In a more modernized allocation, the top decile of need drops 8 percent. Certain extreme examples of high-need jurisdictions receive a decreased allocation under the proposed formula. These examples include a 30-percent decrease for Detroit, Michigan; a 29-percent decrease for Saginaw, Michigan; and a 40-percent decrease for Youngstown, Ohio.

As need increases, so does the variance in allocations under the current formula. Among high-need jurisdictions, similarly needy jurisdictions receive significantly different allocations. To minimize the differences, certain high-need jurisdictions will have to decrease their allocations to increase the allocation of other high-need places. The decrease in funding helps cure the horizontal equity issues among high-need jurisdictions. Some extreme examples include an 84-percent increase for Warren, Michigan; a 55-percent increase for Monroe, Michigan; and a 105-percent increase for Albany, Georgia.

The biggest gainers are, unsurprisingly, jurisdictions in Puerto Rico that have high levels of poverty and are mostly awarded under formula A. Moss Point, Mississippi, is the largest gainer under the proposed formula, receiving 286 percent of its current allocation, and Puerto Rico jurisdictions make up the next four top gainers. Exhibit 7 restricts to populations greater than 200,000 and shows the five largest gainers under the proposed formula. Memphis, Tennessee, nearly doubles its current allocation under the proposed formula.

Exhibit 7

Select Large Gainers (by percent) From the Proposed Formula Among Cities (> 200,000 population, per capita amounts rounded to the nearest dollar)

	Fiscal Year 2022 Per-Capita Allocation ($)	Replacement Formula Per Capita ($)	Difference Per Capita ($)	Change (%)
Memphis, TN	10	19	+ 9	98
Shreveport, LA	10	20	+ 9	94
St. Petersburg, FL	7	13	+ 6	81
Montgomery, AL	8	15	+ 7	75
Wichita, KS	7	13	+ 6	75

Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation

Haverford, Pennsylvania, and Arlington, Massachusetts, are among the top five locations with the largest decreases using the proposed formula—which follows from the initial report—because the cities contain high allocations per person in poverty. Meanwhile, Newton, Massachusetts, has the largest decrease in allocation, receiving only 16 percent of its current allocation. Newton is awarded under formula B, largely due to the pre-1940 housing and growth lag factors, because it is a relatively wealthy suburb with historic buildings. Newton has a median household income of $164,607, whereas the national median household income is $70,784. The others among the

biggest losers are all formula B grantees that are relatively wealthy communities. Exhibit 8 shows the largest decreases in allocations for jurisdictions with populations greater than 200,000.

Exhibit 8

Biggest Decreases (by percent) From the Proposed Formula Among Cities (> 200,000 population, per capita amounts rounded to the nearest dollar)

Name	Fiscal Year 2022 Per Capita Allocation ($)	Replacement Formula Per Capita ($)	Difference Per Capita ($)	Percent of Original (%)
San Francisco, CA	21	6	15	29
Pittsburgh, PA	45	16	29	36
St. Louis, MO	59	24	35	40
Fremont, CA	7	3	4	45
Minneapolis, MN	26	13	13	49

Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation

Nonentitlements

This formula does not split funds allocated for entitlement and nonentitlement areas into different preset buckets. By allocating entitlement and nonentitlement areas through the same formula, nonentitlement areas receive 36 percent of the total allocation—almost exactly the share of need that nonentitlement areas contain according to the community needs index. Therefore, nonentitlement areas, on average, gain allocation under the proposed formula.

No Losers Provision

The current formula has resulted in certain jurisdictions winning for decades because they receive significantly greater allocations than their needs imply; because formulas are a zero-sum game, other jurisdictions with needs have been losing. Nevertheless, reducing jurisdiction allocations is a politically fraught situation. This sentiment was the genesis of the dual formula, which, in keeping formula A, could be marketed as a process resulting in "no losers"—although keen observers and mathematicians know that reallocating funds always results in winners and losers.

The only way to ensure no losers and improve the formula is to increase funding. Unfortunately, because some wealthy slow-growth communities perform so well under the current formula, a significant funding increase would be needed to offset their decrease. Under the proposed replacement formula, Congress would need to increase the Community Development Block Grant program allocation by more than six times its current amount to ensure no losers.

Miller and Richardson (2023) showed that the level of CDBG funding has remained relatively stagnant since the program's inception. Increasing CDBG funding to $7.1 billion—one-half of the amount CDBG would have been if it had tracked with inflation—would result in significantly fewer losers, and the losers would almost all be wealthy communities. Only 46 jurisdictions, or 3.75 percent, would lose funding, with 12 still losing more than 30 percent. If CDBG funding were to increase to the 1978 inflation equivalent of $14.2 billion, there would only be four jurisdictions

that lose between 10–30 percent. If CDBG funding were to increase to $21.2 billion—the amount of funding tracked with inflation and population growth—then no jurisdiction would receive a decreased allocation.

Repair Formula

The current formula has remained unchanged despite 40 years of researchers recommending changes largely because, as previously discussed, formula change always implies losers. Because of significant decreases in funding (also preventing change), this article proposes a replacement formula that offers a "repair" option to make the formula more efficient in targeting community development need while being path-dependent from the current formula.

The repair formula would keep the current formula's dual format, with two formulas resembling the current equation:

Formula A: $\left[0.75 * \frac{Pov_a}{Pov_{nat}} + 0.25 * \frac{Ocrowd_a}{Ocrowd_{nat}}\right] * total\_alloc$

Formula B: $\left[0.4 * \frac{Pov_a}{Pov_{nat}} + 0.1 * \left[\frac{Grlag_a}{g(Grlag)_{nat}}\right] * g(medinc_{ratio}) + 0.5\frac{Dated_a}{Dated_{nat}}\right] * total\_alloc$

In formula A, population is removed as a factor, shifting the weight from population to poverty. Poverty in this formula removes full-time college students.

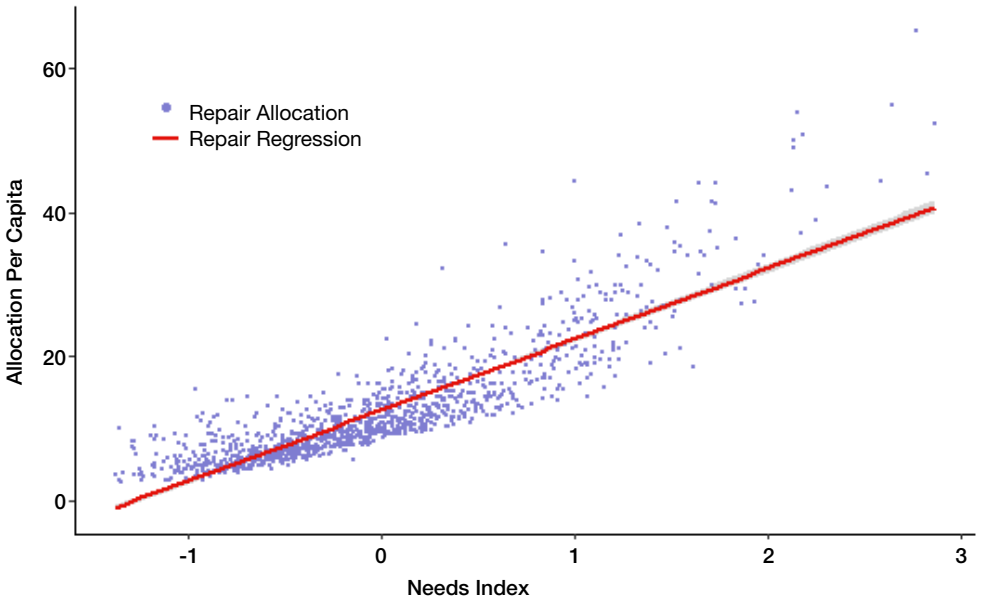
Formula B addresses changes associated with growth lag. The weight on growth lag is reduced by 10 percent and shifted to poverty (excluding college students). Next, growth lag is multiplied by a function that takes the ratio of an area's median income to the national median income. If an area has less than the national median income, its growth lag factor is 1 (or 100 percent). For areas with higher median income than the national average, growth lag is exponentially decreased such that an area with a 125-percent median income has a 49-percent reduction in its growth lag. The denominator is the sum of growth lag nationally after adjustments for median income ratios. This function removes the effect of the growth lag factor on wealthy suburbs.

As with the replacement formula, dated housing refers to the number of houses built 40 or more years before the recent decennial census that are either vacant or occupied by households in poverty. At the time of this article, that category correlates to pre-1980 housing. Nonentitlements and entitlements will draw from the same bucket of funding. For growth lag, nonentitlement areas will be assigned a zero.

Exhibits 9 and 10 show the repair formula's performance using the nominal per capita needs and community needs index ranking. As shown, the replacement formula displays a good degree of vertical equity but only modest horizontal equity. The regression line in these exhibits is not the model allocation; it is the regression of the repair formula against the needs index.

Exhibit 9

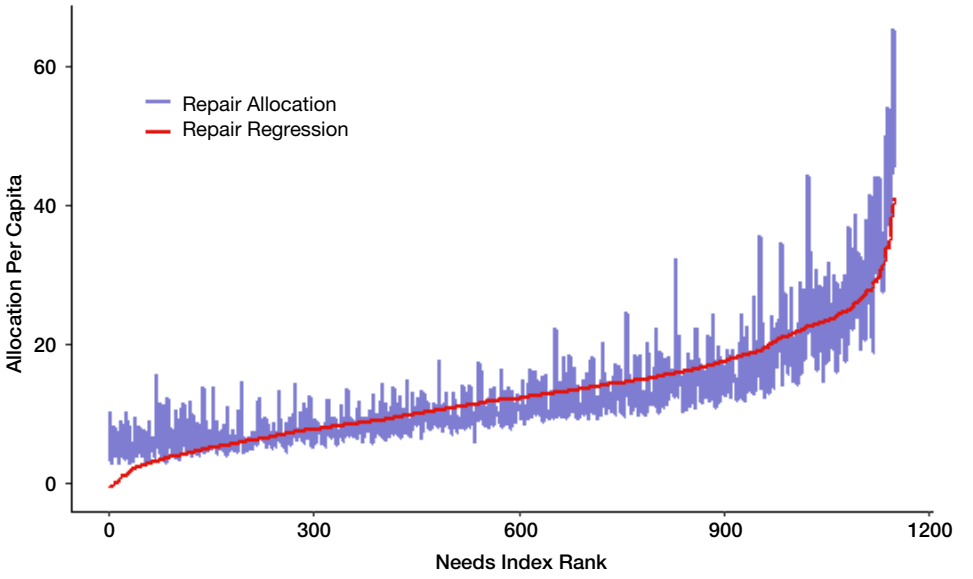
Repair Formula Performance on the Needs Index



Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation and the community needs index

Exhibit 10

Repair Formula Performance on Needs Index Rank



Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation and the needs index

The repair formula displays greater vertical allocation and lower horizontal equity than the replacement formula. Exhibit 11 shows the unweighted and weighted regressions. The formula displays much better horizontal equity than the current formula, with the R-squared values of 0.7777 unweighted and 0.6906 weighted. The repair formula also displays vertical equity, with slopes of 9.76 and 8.92, respectively. As the initial report found, vertical equity would be 8.24 or less if the community needs index is correct because that is the slope assuming that the least needy community has zero need.

Exhibit 11

Regression of the Repair Formula on the Needs Index

	Unweighted	Weighted
Coefficient	9.7560	8.92479
R-squared	0.7777	0.6906

Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation and the community needs index

Compared with the current formula, the repair formula has greater vertical allocation, outpacing the model allocation, which is likely because the growth lag adjustment results in a very small denominator, such that high-need places with growth lag receive significant allocations. Although high-need jurisdictions perform well, this formula ensures that low-need communities do not receive high amounts of funding. This formula does a better job of ensuring horizontal equity. The retention element of the dual formula partly causes the remaining horizontal equity issues because jurisdictions indicating similar need are allocated under different formulas, with formula B still outperforming formula A.

Exhibit 12 shows the winners and losers by categorical brackets of how much they gained or lost. The repair formula results in significantly fewer big losers than the one-formula proposal, with only 8 percent losing more than 30 percent of their original allocation, compared with 22 percent for the replacement formula.

Exhibit 12

Winners and Losers of the Repair Formula Proposal

Winners and Losers	Count	Percent (%)
Gained 30% or more	195	16
Gained 10–20%	419	34
Gained 5–10%	99	8
Gained 0–5%	69	6
Lost 0–5%	74	6
Lost 5–10%	69	6
Lost 10–30%	205	17
Lost 30% or more	98	8

Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation and the community needs index

Exhibit 13 breaks down the effect of the repair formula by decile. The lowest-need jurisdictions lose 13 percent of their current allocation, and jurisdictions in the second lowest-need decile

lose, on average, 6 percent. All other need categories gain in allocation, including the neediest, according to this formula.

Exhibit 13

Per Capita Allocation Difference Between Repair and Current Formula by Decile of Need

Decile of Community Development Need	Current Formula ($)	Repair Formula ($)	Percent (%) Difference
Low	6.57	5.71	– 13
2	6.95	6.51	– 6
3	7.51	7.56	1
4	8.33	8.88	7
5	8.87	9.84	11
6	11.14	11.81	6
7	11.45	13.15	15
8	13.01	15.14	16
9	17.52	19.61	12
High	28.66	30.60	7

Source: Office of Policy Development and Research calculation of the Community Development Block Grant formula allocation and the community needs index

Nonentitlements receive just under 29 percent of the total allocation with the repair formula, which is less than the needs that nonentitlements imply and less than the current 30 percent they are allocated. Because nonentitlement areas cannot have growth lag, they are slightly disadvantaged under any formula that attempts to allocate to both areas and includes growth lag. Any politically feasible alternative that attempts to limit big losers would likely have to retain the growth lag factor because it contributes to significant funding levels for a noticeable percentage of jurisdictions. Therefore, policymakers, if adopting a version of a repair formula, should consider retaining the separate buckets of funding for nonentitlement and entitlement areas.

Conclusion

A modern CDBG program requires a modern formula. Despite 4 decades of criticism of the current formula (including from the formula's original author), the CDBG formula remains unchanged. At the same time, CDBG funding levels have also remained steady since the program's inception—and formulas are a zero-sum game when funding is held constant. Nonetheless, policymakers should consider any increase in funding without a formula change a missed opportunity, one that will continue to result in inequitable funding annually.

Miller and Richardson (2023) suggested that Congress could give HUD the same flexibility as it has under its HOME Investment Partnerships Program. Rather than defining the CDBG formula legislatively, Congress could give HUD the needed flexibility to define the formula. Congress may choose to coordinate formula changes based on a collaborative approach between HUD and participating jurisdictions with negotiated rulemaking. This approach was used for the Public Housing Operating Fund and the Indian Housing Block Grant formulas.

This article builds on the insights of Miller and Richardson (2023) and proposes alternative formulas for a modern allocation. The first alternative—the replacement formula—proposes a new formula targeting the statutory objectives of the program. The replacement formula weights poverty at 70 percent and pre-1980 housing (either vacant or occupied by a household in poverty) at 30 percent. The formula then multiplies by a fiscal capacity adjustment to enhance targeting to communities with the least capacity to meet their needs. This formula, tested against the needs index, performs very well in capturing need. The second alternative—the repair formula—fixes obvious problems in the current formula but does not cause as many jurisdictions to have significant decreases in funding. Using either alternative would be more effective than the current, less modernized formula.

Acknowledgments

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Author

Greg Miller was a program analyst in policy development and research for the U.S. Department of Housing and Urban Development.

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Community Development Block Grants in Colonia Communities: Infrastructure, Housing, and Resources for Forgotten America

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Abstract

The U.S.-Mexico border region is often in the news for immigration and border security concerns; however, the issues of substandard housing and living conditions in many of these communities—commonly referred to as "colonias"—are overlooked by the public. Over 2,000 known colonias are in the border region, and these communities are home to over half a million people (Federal Reserve Bank of Dallas, 2015). On the ground, stakeholders have sought assistance in addressing the most common housing and infrastructure needs of families within colonias, both recognized and informal. The federal government began responding to these calls in the early 1990s.

Beginning in 1991, HUD's Community Development Block Grant (CDBG) nonentitlement program included a set-aside requirement that a percentage of funds be used for colonias. This set-aside was meant to ensure that CDBG resources are used to address the substandard living conditions that exist in these unregulated developments (colonia) found near the U.S.-Mexico border in all four border states (Arizona, California, New Mexico, and Texas). Despite having been in operation for over 32 years and requiring millions of dollars to be used to improve colonias, limited academic study has been conducted on colonias and the federal resources that flow to these communities.

This article seeks to improve understanding of the program through analyzing administrative data on the CDBG nonentitlement program and perspectives from experts and practitioners who work directly in colonia communities and the CDBG program. The analysis describes CDBG funds awarded during the 2014 to 2023 period in all four U.S.-Mexico border states and was augmented by interviews detailing CDBG's role and impact to meet these distinct communities' needs. The authors highlight that although nonentitlement colonia set-aside funds, in aggregate, most often support infrastructure and water/sewer treatment activities, uses vary across states. The authors further emphasize that these set-aside projects, along with other nonentitlement efforts, were closely related to the Federal Housing Finance Agency's designated colonia investment areas. Experts and practitioners viewed the set-aside funds as an important resource for colonias that could be strengthened by altering the program's definition by expanding its coverage and by increasing efforts to build up local capacity to both access and effectively use resources.

Colonias Have a Long History in the United States, but Many Gaps in Information Still Exist

In the United States, the term *colonias* has been applied generally to unincorporated communities located in California, Arizona, New Mexico, and Texas along the U.S.-Mexico border that are characterized by high poverty rates and substandard living conditions. In practical terms, colonias are largely defined by what they often lack, such as potable drinking water, water and wastewater systems, paved streets, and conventional mortgage financing. Studies have estimated that over 2,000 colonias are in the border region (Wiley, George, and Lipshutz, 2021), with most (90 percent) located in Texas. The issue of colonias and substandard living conditions impacts hundreds of thousands of people along the U.S. Mexico border (Federal Reserve Bank of Dallas, 2015).

Colonias are the result of several dynamics, but their creation and evolution are largely a factor of housing affordability (Durst and Cangelosi, 2021). Driven at least in part by low wages and incomes, many residents of the region were unable to afford conventionally built homes that use high-quality building techniques and materials. An alternative way to homeownership developed. Families purchased unimproved lots, which often lacked access to basic infrastructure (water, sewer, paved streets, etc.), and, over time, built their homes themselves in a piecemeal approach. These developments became known as colonias.

Lax land use regulations in turn made such development possible. For much of the 20th century, county governments lacked the power to regulate the subdivisions of land that lie outside the jurisdiction of city governments. Without these controls in place, landowners would be able to subdivide and sell their property through a range of methods without the necessary infrastructure (Parcher and Humberson, 2007). By 1995, Texas enacted several laws, including the Model Subdivision Rules, that prohibited the development of subdivisions without proper infrastructure and services, such as plumbing (Federal Reserve Bank of Dallas, 1996; Olmedo and Ward, 2016). Poor housing quality and conditions persist, even though access to basic infrastructure has improved (Olmedo and Ward, 2016).

Another factor in colonia formation was access to financing, which, particularly in Texas, came in the form of a contract for deed arrangement in which a buyer makes payments directly to the developer while the land title remains with the developer until the amount is paid in full. These arrangements often involved high interest rates, and many are not recorded with the county clerk (Federal Reserve Bank of Dallas, 2015). In this largely informal arrangement, just one missed payment could result in the developer foreclosing on a property and the buyer losing their entire investment (Parcher and Humberson, 2007).

Colonias Are Not Monolithic

Despite being categorized together, colonias vary extensively within the region, from small clusters of homes located near agricultural employment opportunities to established communities whose residents commute to nearby urban centers (Núñez-Mchiri, 2009). Colonias have varied histories. Some emerged in the past 50 years, but others have been in existence since the 19th century. Various factors led to colonia development within each border state. The large number and increased

visibility of colonias in Texas, however, tends to guide common perceptions and even government policy based on the situations of colonias located there (Mukhija and Monkkonen, 2006).

A variety of settlements have been designated colonias by local, state, and federal governments, with those communities in Arizona, California, and New Mexico varying considerably and including Native American lands, old mining towns, and retirement communities. Colonias in Arizona, California, and New Mexico are generally older than those found in Texas (Mukhija and Monkkonen, 2006). Many New Mexico colonias, for example, have been in existence since the mid-1800s, and all California colonias were developed before 1929, when subdivision laws went into effect in that state (Núñez-Mchiri, 2009). In Arizona, "wildcat" subdivisions emerged in the 1950s and differ in several ways from patterns for Texas' colonias. Things also continue to evolve, though, as can be seen with New Mexico's historic settlements that are experiencing new fringe growth in the form of illegal subdivisions similar to those created in Texas under contract for deed arrangements (Donelson and Holguin, 2001).

CDBG Reaches Colonia Communities

Beginning in 1990 with the passage of the Cranston-Gonzalez National Affordable Housing Act ("1990 Cranston-Gonzalez Act"), HUD requires the four U.S.-Mexico border states to make available a percentage of their nonentitlement CDBG funds in colonias. This policy is known as the "colonia set-aside," and the current requirement is that Arizona, New Mexico, and Texas can spend up to 10 percent and that California can spend up to 5 percent of their nonentitlement funds on colonias.[1]

Colonia Definitions: Old and New

The 1990 Cranston-Gonzalez Act sets out the parameters for what communities can be considered colonias under CDBG. A key component is that a colonia must be in the border region, which the Act defines as land within 150 miles of the U.S.-Mexico border and outside of metropolitan areas with populations of one million residents or more.[2] The entire border region is vast, covering over 254,000 square miles and home to over 33 million people,[3] and much of that region is served by the nonentitlement CDBG program (exhibit 1).

As defined by the 1990 Cranston-Gonzalez Act, colonias are communities within the border region that lack basic infrastructure (water, sewer systems) and quality housing communities that were in

[1] As of June 6, 2024, see the following report for information on set-aside threshold: https://www.hud.gov/sites/documents/12-08CPDN.PDF.

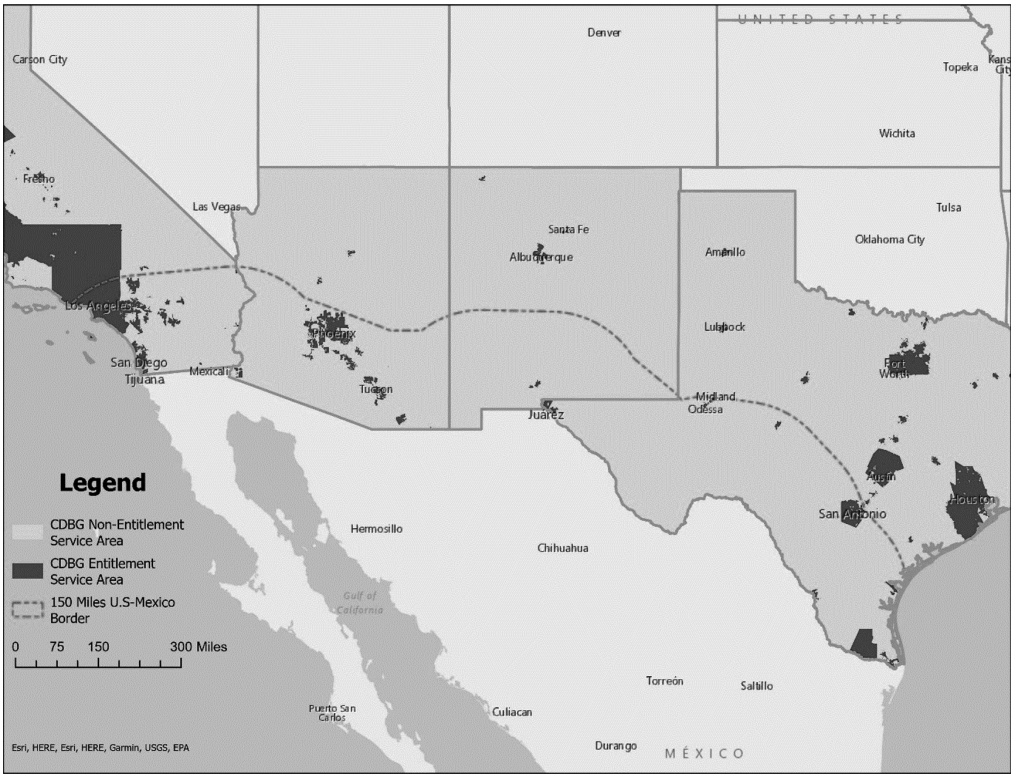
[2] The Cranston-Gonzalez National Affordable Housing Act of 1990 defined colonias and established the CDBG colonia set-aside. As of 2020, the U.S.-Mexico border region contained at least parts of five metropolitan statistical areas with more than 1 million people: San Antonio-New Braunfels, Texas; Tucson, Arizona; Phoenix-Mesa-Chandler, Arizona; San Diego, California; and Riverside-San Bernardino-Ontario, California.

[3] See the following link to view the Fannie Mae/Housing Assistance Council report, entitled *Colonias Investment Areas: Working Toward a Better Understanding of Colonia Communities for Mortgage Access and Finance*, November 2020, for information: https://www.fanniemae.com/media/37566/display.

existence before 1990.[4] The "before 1990" stipulation means CDBG activities occurring in newly formed colonia or colonia-type communities would not be considered part of the colonia set-aside.

Exhibit 1

U.S.-Mexico Border Region and Community Development Block Grant (CDBG) Grantee Service Areas



Note: The Cranston-Gonzalez National Affordable Housing Act defines the U.S.-Mexico border region as excluding metropolitan statistical areas with populations over 1 million.

Sources: Housing Assistance Council-generated map. The following HUD website (as of June 1, 2024) provided CDBG grantee boundaries information: https://hudgis-hud.opendata.arcgis.com/datasets/HUD::community-development-block-grant-grantee-areas/about

The border region, for HUD CDBG program purposes, can be divided into service areas for its 133 entitlement (urban/suburban areas) and 4 state nonentitlement grantees (which include most of the border region's land area).[5] The CDBG colonia set-aside requirement only applies to the four state nonentitlement grantees and qualifying communities that meet HUD's colonia definition within 150 miles of the border in their service areas.

[4] As of June 1, 2024, see the following URL with the 1990 Cranston-Gonzales Act that contains the colonia definition language: https://files.hudexchange.info/resources/documents/Section-916-of-the-National-Affordable-Housing-Act-of-1990-As-Amended.pdf.

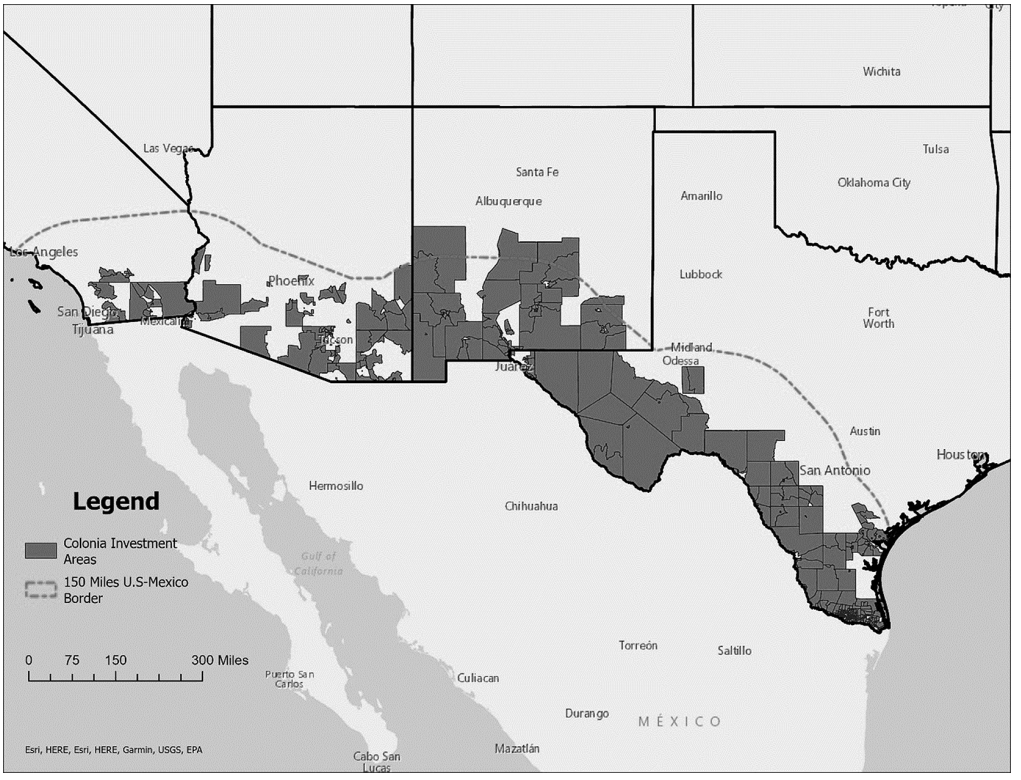
[5] These numbers refer to HUD CDBG grantees that have at least some land areas that fall within the 150-mile border region delineation. https://hudgis-hud.opendata.arcgis.com/datasets/HUD::community-development-block-grant-grantee-areas/about.

Colonia Investment Areas: A New Rubric to View Colonias

Although it is nearly impossible to identify the location of every colonia community, if for no other reason than what constitutes a colonia varies by the definition used, the Federal Housing Finance Agency's (FHFA's) designated Colonia Census Tracts represent census tracts with government-recognized (federal, state, and local) colonia communities. For this analysis, the FHFA's Colonia Census Tracts are referred to as *colonia investment areas*, which was the name of the original concept and definition adopted by FHFA (Housing Assistance Council, 2020). These 577 colonia investment areas, with more than 1 in each of the four-border-states region, provide a colonia baseline of located communities (exhibit 2). Linking the colonia investment area data to HUD's Integrated Disbursement and Information Systems (IDIS) awards information highlights the degree to which CDBG efforts are reaching colonia communities.

Exhibit 2

Colonia Investment Areas



Source: Housing Assistance Council-generated map using data from the Federal Housing Finance Agency identifying colonia investment areas. See the following URL for data: https://www.fhfa.gov/data/duty-to-serve/eligibility-data

UGLGs Operate Nonentitlement Projects

CDBG nonentitlement grantees do not operate projects themselves. Instead, they largely use a competitive process, determined by each state, to select applications from smaller units of general

local government (UGLGs) to engage in qualifying community development projects and activities.[6] The UGLGs then play an important part in the process.

Using HUD's UGLG data, the border region is home to approximately 600 UGLGs, of which 337 are primarily located within nonentitlement service areas.[7] CDBG nonentitlement funds granted to one of the 337 UGLGs for undertaking a project or activity that impacts a HUD-recognized colonia can count toward their colonia set-aside.

Methodology

Through this research, the authors took a mixed-methods approach to describe HUD's CDBG colonia set-aside funding and explored how it might be more effectively accessed. First, the authors performed a descriptive analysis of CDBG nonentitlement activities using HUD's IDIS administrative data. The IDIS data present CDGB activity (nonentitlement and entitlement) occurring during the calendar years 2014 to 2023 for the four U.S.-Mexico border states. The data include information on the amount of CDBG funds awarded, the location of the activity, the local government unit involved, and the type of activity undertaken. This analysis helped provide a time series picture of CDBG set-aside activities in colonia communities.

To help contextualize and provide additional insights into the data analysis, the Housing Assistance Council conducted interviews with key stakeholders and organizations that work directly in and with colonia communities to present their experiences and perspectives on HUD's CDBG program in these areas. The interviews were open-ended, and stakeholder insight guided the discussion. This element of the research focused on challenges, strengths, and recommendations for improving CDBG set-aside access and effectiveness.

Unit(s) of Analysis

This study's IDIS data analysis uses funds awarded to describe nonentitlement programs rather than the number of tasks completed (e.g., number of houses repaired or number recipients of healthcare services). The authors chose this approach primarily because HUD's IDIS data are not configured or recorded with enough consistency to reliably analyze individual tasks or items. The data, for example, may include a record for each individual home repaired, but one record often represents many homes being repaired. In addition, the way in which IDIS data are structured makes it difficult to compare tasks completed due to variation in categories (e.g., drug treatments, microenterprise loans, and water treatment facilities). This review avoided such complexities by focusing on funded awards, not tasks completed.

[6] As of June 6, 2024, see the following HUD website for a definition and map of UGLGs: https://hudgis-hud.opendata.arcgis.com/datasets/HUD::unit-of-general-local-government-uglg/about.

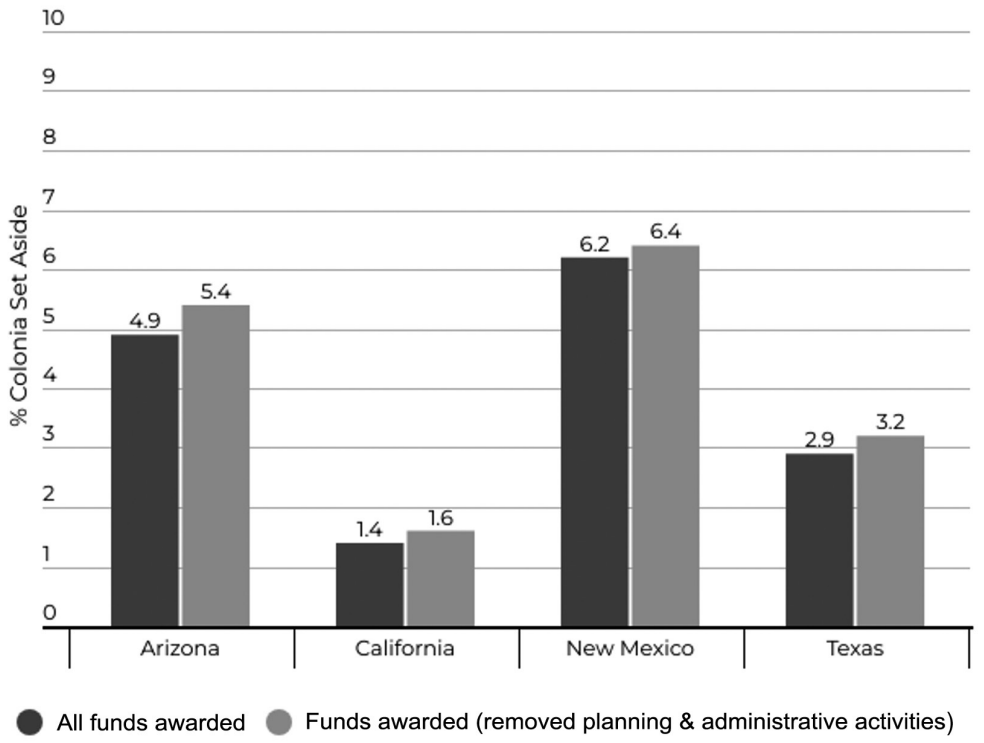
[7] The analysis first identified UGLGs that are at least in part within the 150-mile U.S.-Mexico border region. Next, from those border region UGLGs, the authors selected UGLGs with a center point within a nonentitlement grantee's boundary. The UGLG boundary data are from the following HUD website: https://hudgis-hud.opendata.arcgis.com/datasets/97c733d6b4504d6ebbb111b7061ab393/explore. The CDBG grantee boundary data come from the following HUD website: https://hudgis-hud.opendata.arcgis.com/datasets/HUD::community-development-block-grant-grantee-areas/about.

Data Questions and Limitations

IDIS data are important and useful, but they come with significant limitations. The most important challenges for this study are the data coverage and the completeness of records. To review the data, the authors compared the CDBG set-aside thresholds and other HUD-reported allocation information. Exhibit 3 presents the percentage of funds awarded in the IDIS subset that are identified as colonia set-asides for the four border states. In no case did the percentages reach the set-aside maximum of 10 percent for Arizona, New Mexico, and Texas or the 5-percent maximum for California. It is understandable that the percentages would not necessarily match, but they should be closer if there were no grantee data reporting errors.

Exhibit 3

Percent of IDIS-Reported CDBG Awarded Funds Classified as Colonia , 2014 through 2023



CDBG = Community Development Block Grant. IDIS = Integrated Disbursement and Information Systems.
Source: Housing Assistance Council tabulation of a subset of HUD's IDIS data covering the calendar years 2014 through 2023

An additional comparison was made between aggregated IDIS colonia set-aside total funds awarded for each state and estimates of what these totals should be based on HUD-reported state allocations using the colonia set-aside thresholds. The IDIS totals were lower than the estimates for each of the four states; however, these IDIS totals did represent a sizable proportion of the estimated allocations (exhibit 4).

Exhibit 4

IDIS Funded Awards as Percent of Estimated Allocations, FY 2015–23

State Entitlement Programs	IDIS-Funded Awards as Percent of Estimated Allocations (FY 2015–23)*	
	Colonia Set-Aside Allocations (%)	Colonia Set-Aside Allocations Administrative Expenses Removed (%)
Arizona	74.9	83.2
California	62.3	69.2
New Mexico	43.0	47.8
Texas	38.1	42.4
Total	46.0	51.1

**For administrative expenses restriction, the authors removed 10 percent of the initial allocation and then applied the set-aside threshold.*

IDIS = Integrated Disbursement and Information Systems.

Notes: For administrative expenses removed, first take out 10 percent for administrative expenses. Then, arrive at estimate by multiplying allocation totals by percent of set-aside (10 percent for Arizona, New Mexico, and Texas; 5 percent for California).

Source: Housing Assistance Council tabulation of HUD IDIS data and HUD Community Development Block Grant https://www.hud.gov/program_offices/comm_planning/budget

These differences likely reflect the fact that IDIS awards data may not be complete or may possibly suffer from data reporting challenges.[8] Although all activities and expenditures are reported in IDIS, the system has less reliable indicators for activities under the colonia set-aside. However, the data do represent a large portion of CDBG colonia set-aside activities and serve as a reasonable snapshot into the program's operations over the last 10-year period.

Analysis of the CDBG Colonia Set-Aside Program

State Level

IDIS data contained 130 unique nonentitlement CDBG colonia set-aside activities,[9] totaling $46,078,404 in funds awarded during the calendar years 2014 to 2023. Texas was awarded the largest amount of colonia set-aside funds, which is directly related to its larger annual CDBG nonentitlement allocation. For example, the 2023 nonentitlement allocations were by state and included Arizona ($9.9 million), California ($31 million), New Mexico ($11 million), and Texas ($68 million).[10] This distribution aligns with the general composition where two-thirds of HUD-identified colonias are located in Texas (Wiley, George, and Lipshutz, 2021; exhibit 5).[11]

[8] It may be that data input is incomplete or there is a misunderstanding on how it is to be done. This may result in information being omitted or duplicate reporting of an activity.

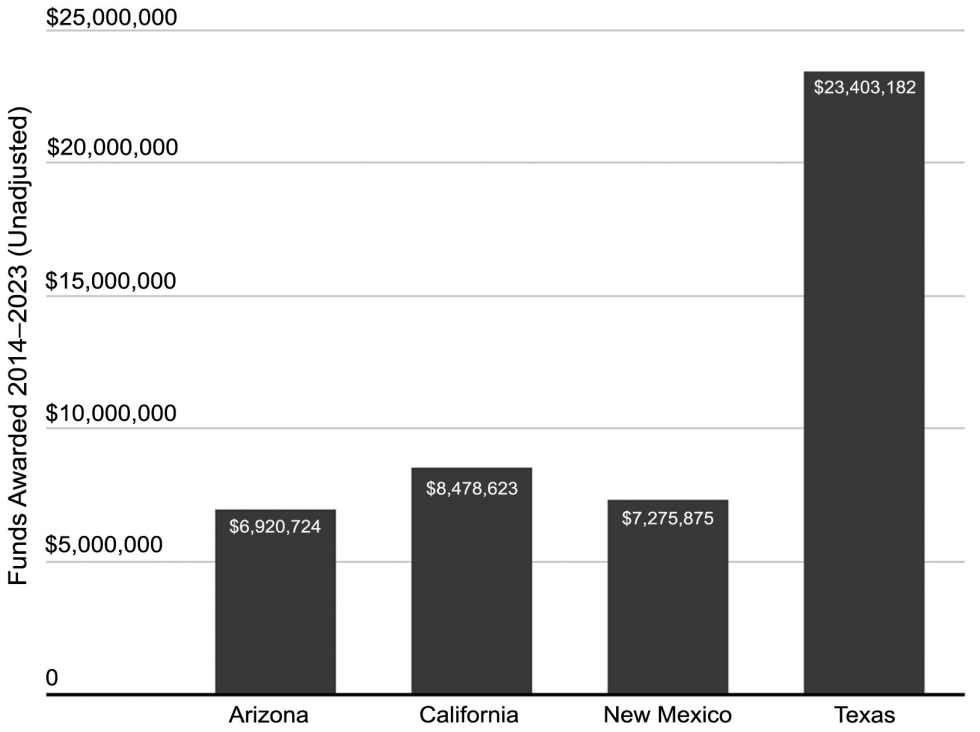
[9] In total, there were 118,813 records for both entitlement and nonentitlement CDBG grantees during the 2014 to 2023 calendar year period. Only 152 of these records were specifically identified as having involved colonia set-aside activities. This number declined to 130 when the authors removed duplicate records (unique identifiers created out of grantee name, IDIS activity number, and year reported. What appears to have occurred is the data for the entire activity were entered into the system each time something of note was completed. For example, each time a home was rehabilitated the record would say $500,000, but this amount reflects all five records filled in, not the amount for each occurrence.

[10] Using the 2023 nonentitlement allocations as an example, applying the colonia set-aside percentages of 10 percent for Arizona, New Mexico, and Texas and 5 percent for California would result in an order of funds allocated like what is shown in exhibit 3: Texas with the most awards, followed by California, New Mexico, and Arizona. The actual number of funds and percentages in the data are not perfect matches with the allocation numbers, although that is likely due to how the data are reported and other issues.

[11] The IDIS individual colonia set-aside records by state: 11 for Arizona and New Mexico, 9 for California, and 99 for Texas.

Exhibit 5

IDIS CDBG Colonia Set-Aside Funds Awarded, 2014–23



CDBG = Community Development Block Grant. IDIS = Integrated Disbursement and Information Systems.
Source: Housing Assistance Council tabulation of a subset of HUD's IDIS data covering the calendar years 2014 through 2023

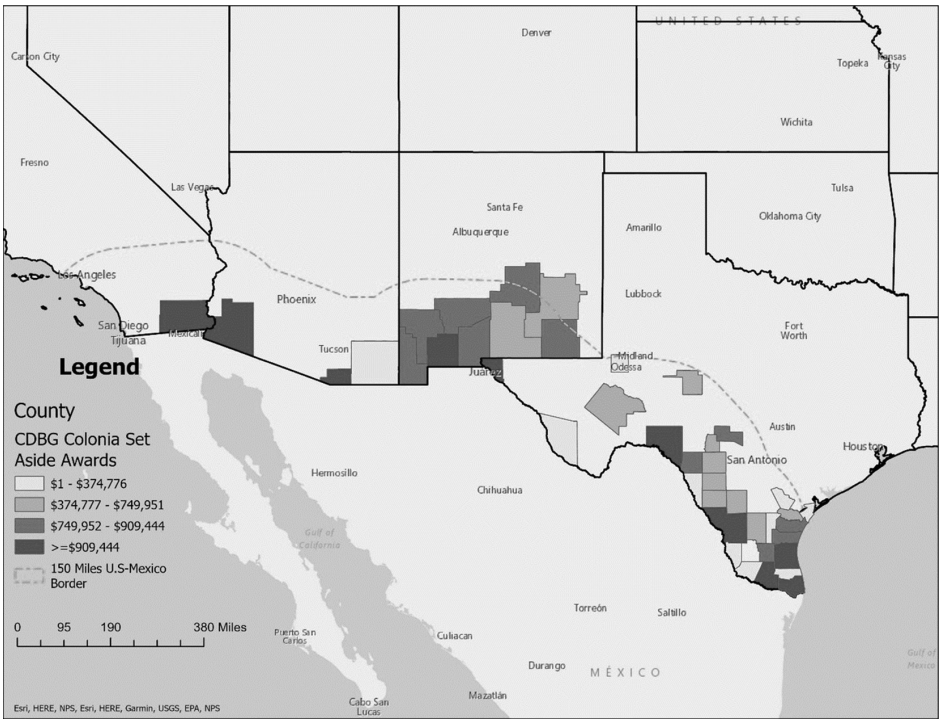
County Level

The state nonentitlement programs awarded colonia set-aside funds for use in 42 different counties,[12] of which more than one-half (29) were in Texas (exhibit 6). During the analysis period, six counties each received more than $2 million in designated set-aside funds, with Imperial County in California receiving the largest amount ($8,478,623). Imperial County is the only county in California with HUD-recognized colonias, which explains its elevated awards total. The 10 counties with the most funded awards account for nearly two-thirds of the reported colonia set-aside funds.

[12] One record had the incorrect county Federal Information Processing Standard (FIPS) code (Sacramento County, California, when it should have been Imperial County, California), and another listed a county beyond the 150-mile border region threshold. The authors removed the former case and corrected the state-county FIPS code for the latter California case.

Exhibit 6

Counties Receiving CDBG Colonia Set-Aside Funds, 2014–23



CDBG = Community Development Block Grant.

Source: Housing Assistance Council-generated map. Calculation of HUD-provided CDBG colonia set-aside funds data

Although nonentitlement funds are mainly used in nonentitlement service areas, HUD regulations allow[13] and the IDIS data show an overlap between Texas nonentitlement colonia set-aside activities and Hidalgo County (an entitlement grantee) (exhibit 7). Hidalgo County, Texas, has more colonias than any other county in the region (over 900 identified colonias), and it is home to 40 percent of all colonias in Texas, so CDBG activities in that county are likely to impact a colonia (Fannie Mae and Housing Assistance Council, 2020).

Exhibit 7

Top Ten Counties CDBG Colonia Set-Aside Funds Awarded, 2014–23 (1 of 2)

County Name	Funded Amount ($)
Imperial County, California	8,478,623
Santa Cruz County, Arizona	3,857,267
Yuma County, Arizona	2,779,868
Cameron County, Texas	2,651,206
Val Verde County, Texas	2,544,436
Webb County, Texas	2,199,316

[13] See HUD's Community Planning and Development (CPD) Notice 12-008 (page 4), which explains how nonentitlement funds may be used in entitlement areas and Tribal areas.

Exhibit 7

Top Ten Counties CDBG Colonia Set-Aside Funds Awarded, 2014–23 (2 of 2)

County Name	Funded Amount ($)
El Paso County, Texas	1,704,490
Hidalgo County, Texas	1,508,808
Kenedy County, Texas	1,329,721
Luna County, New Mexico	1,250,000

CDBG = Community Development Block Grant.

Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering the calendar years 2014 through 2023

Unit of General Local Government (UGLG) Level

Although CDGB funds can be organized by the county where they are used, another way to explore the data is by the UGLG (sub-state unit of government such as county, city, town, parish, or borough) that undertakes the project. That is, just because a project occurs in a specific county does not universally mean that the county government operated it.

Of the more than 330 HUD-listed UGLGs[14] in the four U.S.-Mexico CDBG nonentitlement service areas, 51 were awarded colonia set-aside funds during the 2014–23 period. The population size of the grantees ranges from fewer than 1,000 in UGLGs like the village of Hope, New Mexico, to over 100,000 in places like Imperial County, California. Most UGLGs receiving nonentitlement colonia set-aside funds are counties (68 percent, or 33 of 51), and these county governments received 78 percent of all set-aside funds (exhibit 8).

Exhibit 8

UGLGs in CDBG Nonentitlement Colonia Set-Asides, 2014–23

State	Number Non-County UGLGs	Number County UGLG	Percent UGLGs County (%)	Total UGLGs
Arizona	4	2	33.3	6
New Mexico	11	0	0	11
Texas	1	31	96.9	32
California	0	2	100	2
Totals	16	35	68.6	51

CDBG = Community Development Block Grant. UGLG = unit of general local government.

Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering the calendar years 2014 through 2023

The rationale for nonentitlement programs awarding most colonia set-aside funds to county governments is that most nonentitlement areas are rural and sparsely populated jurisdictions where only county governments have the capacity to both develop a workable proposal/plan and implement/undertake it. Nevertheless, some variation exists in UGLGs across the four states, with all of California's colonia set-aside awards involving Imperial County government, whereas none of New Mexico's activities involved a county UGLG. The way colonias are defined is an important

[14] UGLG data were downloaded from the following HUD website, which provided them in ArcGIS format for mapping (https://hudgis-hud.opendata.arcgis.com/datasets/97c733d6b4504d6ebbb111b7061ab393/explore). These data do not contain all general local units of governments (such as school districts). They more accurately represent larger UGLGs that access HUD funds, such as CDBG.

factor in who administers assistance projects. For example, New Mexico colonias are primarily defined as entire towns. Conversely, in Texas, a colonia is usually defined at the neighborhood or subdivision level. Another factor is which level of local government has the responsibility and expertise to perform the job, which can vary by state and task (wastewater, housing, etc.).

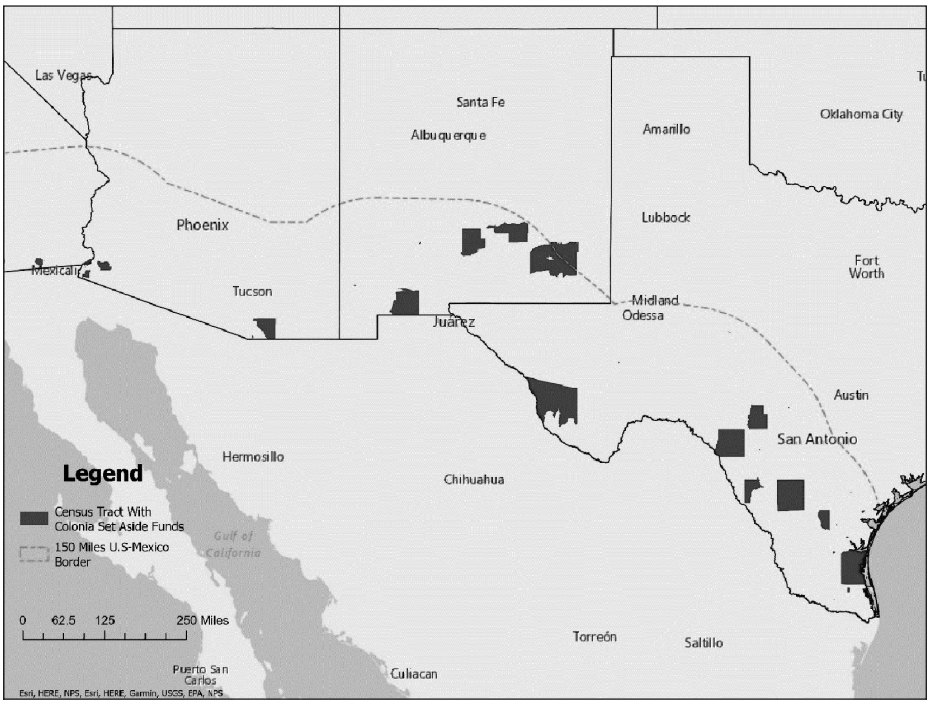
Census Tract Level

This research was able to identify 50 separate census tracts which the IDIS data listed as the locations for colonia set-aside projects.[15] Most of these census tracts were in Texas (30 of 50), which is reflective of that state having the most colonias. Exhibit 9 shows the location of these census tracts.[16]

Exploring CDBG set-aside activity at a smaller geography allows for additional analysis and makes it easier to relate this information to other data, such as the colonia investment areas. However, reducing or estimating a project's service area (area of impact) to a single census tract is difficult. For example, a water treatment project could serve a large area, certainly more than one census tract.

Exhibit 9

Census Tracts With CDBG Colonia Set-Aside Activities, 2014–23



CDBG = Community Development Block Grant.
Source: Housing Assistance Council-generated map using HUD Integrated Disbursement and Information Systems data to identify census tracts with colonia set-aside funds

[15] Of the initial 52 census tracts, the authors dropped 1 because it was erroneously listed as being in Sacramento, California, and another because it was beyond the 150-mile HUD colonia definition threshold (Falls County, Texas).

[16] Census tract data in IDIS can be incomplete. Grantees report an activity address, and if that reported address is a valid USPS address, it will be georeferenced to tracts. Many addresses in rural areas will not validate by the USPS, and no tract data would be available.

Reaching Known Colonia Communities

The analysis used proximity to relate the CDBG colonia set-aside census tracts to FHFA colonia investment areas (exhibit 10). For Arizona, California, and New Mexico, every census tract associated with a colonia set-aside activity was either in or shared a border with a colonia investment area. Texas stands out as having about 30 percent of activities in areas that are further away from colonia investment areas, but most of them are still relatively close, within 5 miles or less of the 150-mile threshold. Given the lack of precision, often due to an inability to denote one census tract service area (as in the case of an infrastructure project that reaches a large area), the 5-mile-or-less threshold seems most reflective of the units of geography of service area coverage.[17]

Exhibit 10

Census Tracts Reported Location of CDBG Colonia Set-Aside Activity and Proximity to Colonia Investment Areas, 2014–23

Nonentitlement Program	In Colonia Investment Area (%)	Bordering Colonia Investment Area (%)	<=5 Miles Colonia Investment Area (%)	>5 Miles Colonia Investment Area (%)
Arizona	77.8	22.2	0	0
California	66.7	33.3	0	0
New Mexico	75	25	0	0
Texas	50	20	20	10
Totals	60	22	12	6

CDBG = Community Development Block Grant.

Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering the calendar years 2014 through 2023

Looking at the relationship the other way, of the 577 colonia investment areas, 359 had their center point in a nonentitlement service area. Of these nonentitlement colonia investment areas, 195 are within 10 miles of a census tract where a colonia set-aside project was listed as occurring, and 127 are within 5 miles. These numbers do not include the activities impacting Hidalgo County, where colonias and colonia investment areas are relatively common.

Activities in CDBG Colonia Set-Aside Awards, 2014–23

A hallmark of the CDBG program is its flexibility and how inclusive it is when it comes to the types of activities that can be supported. The IDIS database contained over 90 different types of activities that nonentitlement grantees conducted in their CDBG awards. The activities included outlays for water/sewer improvements, tree planting, and microenterprise assistance as examples. To simplify the data and make it easier to understand, this study organized these activities into 10 general categories shown in exhibit 11.

[17] It is unclear how the other 7 percent of Texas colonia set-aside census tracts fall outside of the 5-mile threshold, and these are areas currently not identified as a colonia by either the colonia investment area work or the Texas Office of Attorney General's website. (https://www.texasattorneygeneral.gov/divisions/colonias-database)

Exhibit 11

CDBG Nonentitlement Grantee Awarded Activities (2014–23) by Category

Category	Examples of Activities Included
Health Care and Disability Services/Facilities	Mental Health Services, Operating Costs of Homeless/AIDS Patients Programs, Health Facilities
Child/Youth Services/Facilities	Childcare Centers, Youth Services, Abused and Neglected Children Facilities
Public Safety	Crime Awareness, Substance Abuse Services, Service for Victims of Domestic Violence
Community Investment/ Infrastructure	Parking Facilities, Neighborhood Facilities, Transportation Services
Housing	Direct Homeownership Assistance, Homebuyer Counseling, Public Housing Modernization
Senior Services	Senior Centers, Senior Services
Water/Sewer Treatment Facilities	Water/Sewer Improvements, Solid Waste Disposal Improvements
Direct Economic Assistance	Microenterprise Assistance, Employment Training, Economic Development Technical Assistance
Administrative Expenses	State Administration, State CDBG Technical Assistance to Grantees, General Program Administration
Miscellaneous	Subsistence Payment, Legal Services, Interim Assistance

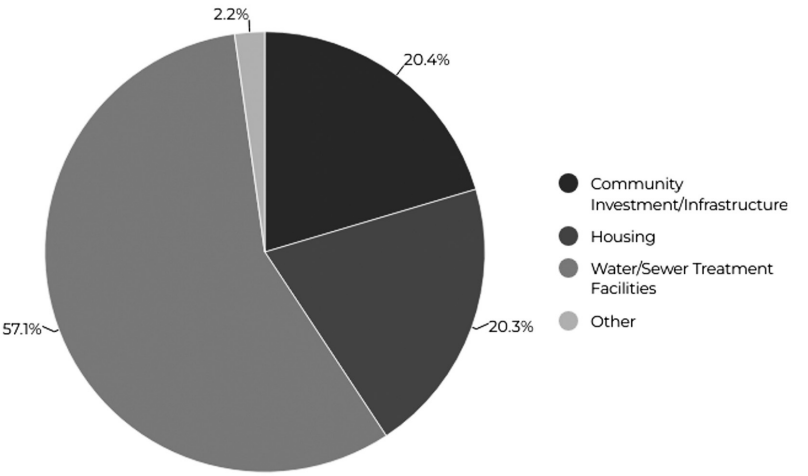
CDBG = Community Development Block Grant.

Source: Housing Assistance Council categories of CDBG covering the calendar years 2014 through 2023

IDIS-reported CDBG activity funded by colonia set-aside status for all four states' nonentitlement programs can be found in exhibit 12. As expected, the data indicated that a majority of nonentitlement colonia set-aside funds were awarded for use on water/sewer treatment facilities. Community investment/infrastructure and housing were the other two areas with significant awards, and this fits with the literature's documentation of limited infrastructure (electric, roads, street lights, etc.) and poor-quality housing present in many colonias (Ward and Peters, 2007).

Exhibit 12

Colonia Set-Aside Nonentitlement Awards, 2014–23



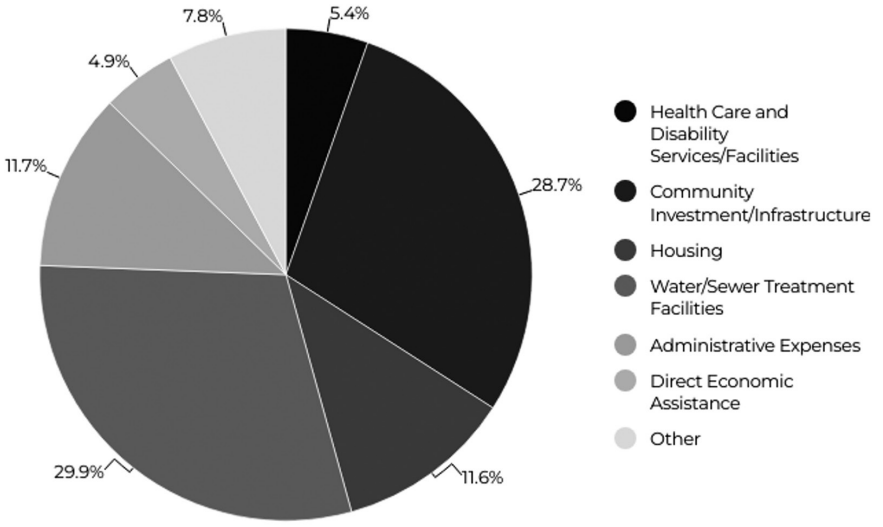
Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering calendar years 2014 through 2023

Economic and Healthcare-Related Activities are More Common Than Other Nonentitlement Activities

Exhibit 13 indicates that all other nonentitlement activities involved less funding, proportionately, for water/sewer treatment and housing and more funding for other activities, particularly direct economic assistance and healthcare and disability services. These outlays likely reflect differences in community need, with colonias needing more basic infrastructure and housing investments and other areas already having sufficient infrastructure in need of activities that address efforts such as economic growth and public health. These differences highlight a unique structure of the CDBG program that allows flexibility in how grantees may use funds to address community needs.

Exhibit 13

Non-Colonia Set-Aside Nonentitlement Awards, 2014–23



Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering calendar years 2014 through 2023

Change in Activities

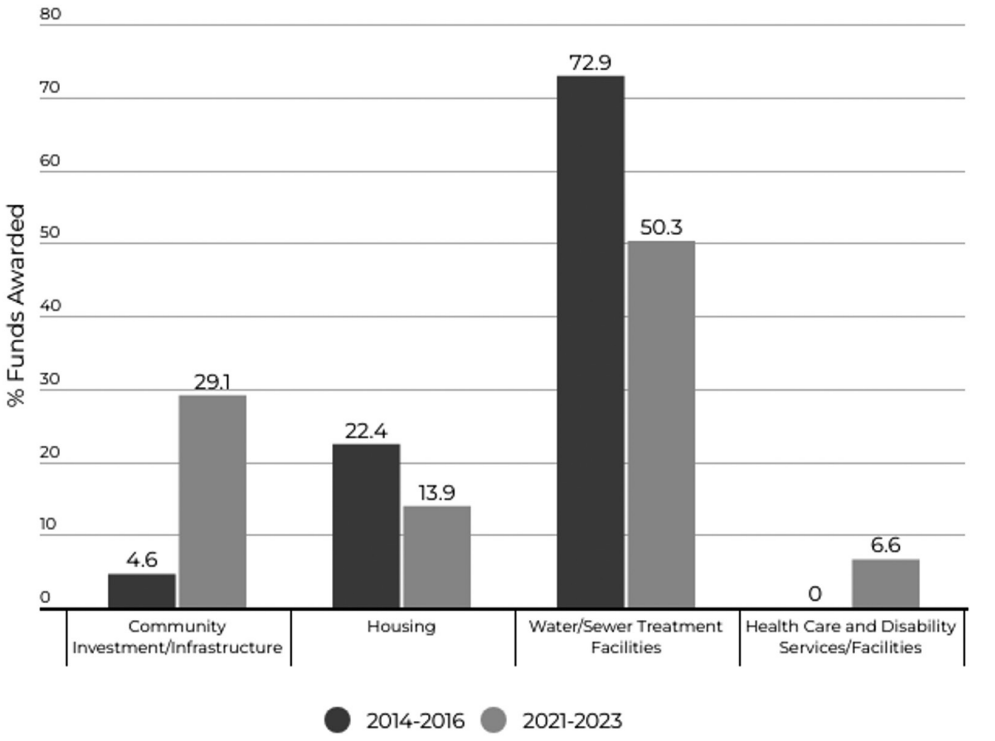
Colonia program priorities can change and evolve over time, mirroring changes in community needs and dynamics. As basic infrastructure deficiencies are addressed, more funds may focus on such things as economic development and health care. To assess changes in activities, this research compared awards from the first 3 years (2014–16) and the last 3 years (2021–23) of the study period.

A majority of colonia set-aside funds went to water and sewer treatment facilities projects in both the 2014-to-2016 period and the 2021-to-2023 period (exhibit 14). Water and wastewater activities, however, did decline between the two time periods (73 percent to 50 percent), with the share going to community investments and infrastructure increasing (5 percent to 29 percent). It is unclear why water and sewer treatment declined, but it may reflect some change in focus that

could relate to the success of earlier efforts to address water and sewer treatment infrastructure needs or other policy efforts like annexation.[18]

Exhibit 14

Colonia Set-Aside Activities, 2014–16 and 2021–23



Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering calendar years 2014 through 2023

Some variation was present in the type of set-aside activities undertaken among the four border states (exhibit 15). Although most state colonia set-aside awards involve either water and sewer treatment facilities or community investment and infrastructure, Arizona and Texas stand out for a relatively sizable proportion of funds going to housing activities, whereas New Mexico has a larger share of funds going to healthcare and disability services and facilities activities. To put this into perspective, the Texas and Arizona share of awards going to housing are three times as large as the housing share of expenditures for all non-colonia set-aside awards.

These differences across states relate to differences in need. The focus on housing efforts in Texas clearly fits with the prevalence of substandard housing in colonias. Similarly, California colonias are often older communities (Mukhija and Monkkonen, 2007) with aging infrastructure, which may

[18] Due to the limited number of activities involved, one should look at these data with caution. The addition or decline of just a few activities can alter such results but may not be reflective of broader change. For example, there was an increase in the 2021–23 period in health care etc. awards, which one might think is reflective of the global pandemic, but the increased healthcare-related activity is driven by one state, New Mexico.

explain why two-thirds of awards are in the community investment/infrastructure rather than the water/sewer treatment category as in the other three states.

Exhibit 15

Percentage of State Colonia Set-Aside Awards by Activity Type, 2014–23

Activity	Arizona (%)	California (%)	New Mexico (%)	Texas (%)
Water/Sewer Treatment Facilities	53.5	36.6	51.9	67.1
Community Investment/Infrastructure	13.6	63	30.9	3.6
Housing	32.9	0	6.9	28.2
Health Care and Disability Services/Facilities	0	0	10.3	0
Other	0	0.4	0	1.1
Total	100	100	100	100

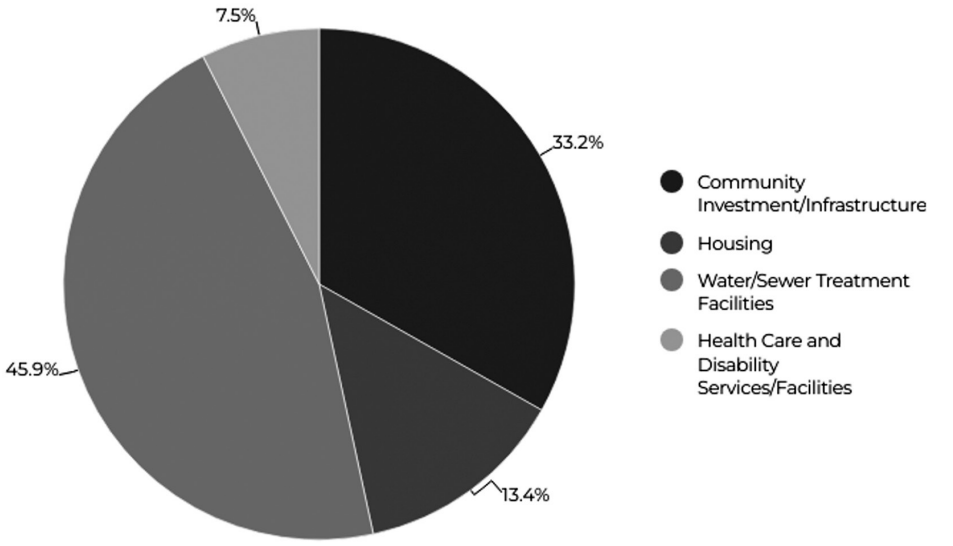
Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering calendar years 2014 through 2023

Regarding UGLG-related activity, the analysis suggests two areas of difference. First, a larger share of non-county UGLG activity involved water and sewer treatment facilities compared to county government activities (exhibit 16). Second, a larger share of county UGLG activity involved housing activities compared to non-county UGLGs (exhibit 17). Differences such as these might, at least in part, be reflective of the government units that are directly engaged in these types of projects. For example, a smaller local government may be more involved in water and sewer treatment or infrastructure projects because they are more likely to directly work with local utilities/service providers.

Variability in government responsibility likely shapes differences in which a municipality undertakes an activity. For example, in many states, county governments operate school districts, but in other areas, cities, towns, or townships take on these responsibilities. The entity operating a primary education program would then depend on the government responsible for overseeing that service. Independent of this, caution should be exercised when assessing CDBG colonia set-aside activities by UGLGs because the number of cases involved is small, particularly because county governments undertake most activities. One or two projects can skew results, so closer scrutiny needs to apply.

Exhibit 16

Non-County UGLG Colonia Set-Aside Activity

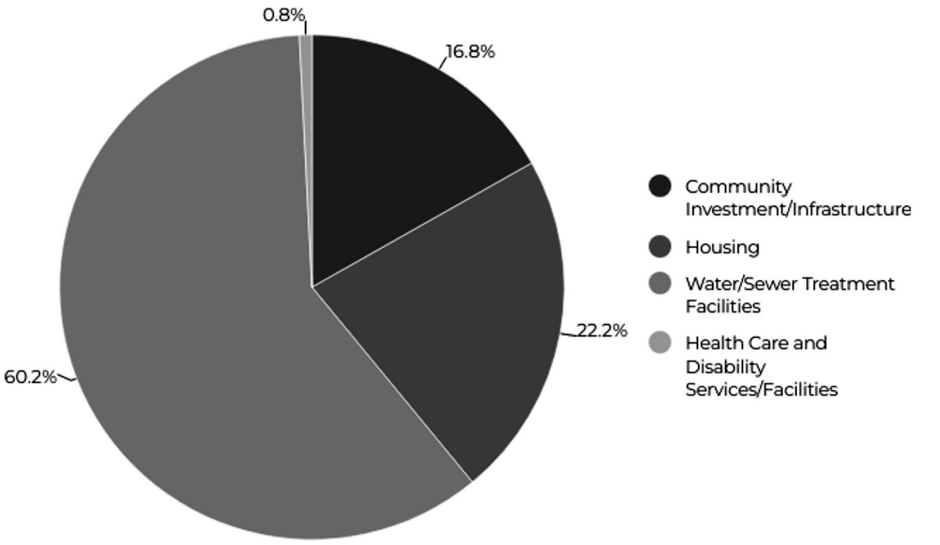


UGLG = unit of general local government.

Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering calendar years 2014 through 2023

Exhibit 17

County UGLG Colonia Set-Aside Activity



UGLG = unit of general local government.

Source: Housing Assistance Council tabulation of a subset of HUD's Integrated Disbursement and Information Systems data covering calendar years 2014 through 2023

CDBG Involvement in Colonias Goes Beyond the Set-Aside

Although the CDBG colonia set-aside ensures that a specific amount of funds and attention will be focused on colonias, other CDBG projects in these four U.S.-Mexico border states can and certainly do reach residents of colonias. To evaluate these activities, this research linked the IDIS entitlement and nonentitlement activities data to colonia investment areas using the census tract information provided for the activity. Non colonia set-aside activities that fit within one of the following CDBG categories are considered as likely (to some degree) impacting a colonia:

- Nonentitlement activity identified by HUD as including in its service area-recognized colonia (though not a set-aside).
- Nonentitlement activity involves a colonia investment area.
- Entitlement activity involves a colonia investment area (Hidalgo County, Texas, is an entitlement grant, and almost all of the county's census tracts contain at least part of a colonia).

For the 2014-through-2023 period, IDIS CDBG data were used to highlight the number of activities and funds awarded in areas identified as having a colonia —either by HUD or the FHFA colonia investment area classification. The data suggest that although CDBG funds are awarded to areas with colonias, they are not typically a part of the colonia set-aside, but rather they are the standard entitlement or nonentitlement programs. Twice the amount of CDBG nonentitlement activities outside of the colonia set-aside program are reaching colonias than within the designated colonia set-aside program (exhibit 18).

Exhibit 18

CDBG Activity in U.S.-Mexico Border States by Colonia

CDBG Program Description	Number of Unique Activities	Awards ($)
Total (Entitlement & Nonentitlement)	60,986	8,686,845,774
Nonentitlement	8,332	1,665,732,353
Colonia Set-Aside	130	46,078,404
Not Colonia Set-Aside	8,202	1,619,653,949
HUD-Defined Colonia	46	12,234,067
Colonia Investment Area	429	114,611,530
All Other	7,727	1,492,808,352
Entitlement	52,654	7,021,113,421
Colonia Investment Area	1,826	110,396,554
All Other	50,828	6,910,716,867

CDBG = Community Development Block Grant.

Source: Housing Assistance Council tabulations of HUD Integrated Disbursement and Information Systems 2014–23 data provided by HUD

One caveat is that the analysis uses a single census tract to capture the location/impact of a project, and, as noted earlier, this information is always less than complete. Although receiving CDBG colonia set-aside designation refers to a direct relationship between the activity and colonia residents, no such relationship necessarily exists between the other designations. The grantee may have intended to report these activities as part of the colonia set-aside but failed to properly flag the

activity in IDIS. This omission likely explains the differences in colonia set-aside counts/awards, but it is also reasonable to assume that more activities and resources do reach colonia residents than the colonia set-aside award totals reflect alone.

Beyond the Data: Expert and Practitioner Perspectives on CDBG's Effectiveness in Colonias

This study's administrative data analysis, while important, does not fully capture the nuances of the program or areas for improvement. To help contextualize and add depth to the descriptive CDBG colonia activity analysis, this research sought perspectives informed by experience from experts and practitioners either directly or indirectly involved with colonias and CDBG colonia set-aside operations. The goal of these interviews was to better understand how the program operates in the real world and what or how these operations might be improved upon.

This element of the analyses specifically involved six interviews with colonia experts working directly with these communities and those who have experience using HUD's CDBG set-aside. The interviews were primarily open-ended (the interviewee's comments steered discussion). Although the responses to questions varied, they provided valuable information that helped put the IDIS data analysis into perspective. The authors summarize the responses below, organizing them around the guiding questions and focusing on where the responses either relate to the data analysis and/or shed light on specific program attributes and operations.

While talking with experts in the field and working directly with colonias, it is important to reiterate that no two colonias are the same—especially state-to-state. What may be applicable to one colonia may not ring true for another. Recognizing the extreme shifts in trends among colonias is necessary when trying to address their challenges and opportunities.

Changes, Challenges, and Opportunities in Colonias

Colonia communities have been around for several decades. In some areas, colonias that are more established face different challenges than the "new colonias," such as HUD's CDBG set-aside, which do not have the same access to funding as traditional colonias. For example, older colonias in certain parts of Texas do not have the same infrastructure challenges as they once had. Recently, organizations that serve these communities have noticed an increase in housing quality needs as opposed to plumbing and drainage concerns.

However, when looking at colonias in New Mexico, for example, many are still dealing with severe infrastructure concerns. Respondents noted that the attention colonias received in these areas has slowly disappeared, placing them in the shadows once again. Unfortunately, as state procedures around CDBG set-aside change, so does the ability for the most in-need communities to access these funds.

Major opportunities highlighted by all interviewees were an increase in capacity for services, an even greater flexibility in available funding, and an overall revitalized reinvestment in CDBG. Due to the complexity of applying for the nonentitlement set-aside funds and the fact that each state has a different system, accessible trainings around accessing the funds are needed. In some colonias,

one-on-one technical assistance would increase the likelihood of these communities accessing the CDBG funds.

In addition, flexibility in how and where the funds go from state to state would benefit CDBG programming. Texas has a requirement to provide a tool bank for colonia communities to access power tools and other resources. Organizations working directly with colonias, however, have seen little use of these services and have noted that these funds would be better spent on other projects within these communities. On the other hand, in New Mexico, an increased flexibility in the 150-mile rule would help reach more communities. In fact, experts have noticed that in New Mexico colonias receiving CDBG have slowly shrunk to 100 miles from the border, further limiting some communities' access to the set-aside program.

Finally, a revitalization of CDBG colonia set-aside would help bring awareness back to the program and the communities that could benefit from its resources, especially colonias. Experts have mentioned that although CDBG has provided amazing programming for colonias, more awareness could be brought back to colonias.

Capacity is Key

HUD's CDBG set-aside is one of the earliest federal policies targeting assistance to colonias and is one of the longest duration continuous efforts. However, with the longevity of this program, capacity issues have been revealed. In Texas, HUD CDBG set-aside funding first goes to the Texas Department of Agriculture before going to the Texas Department of Housing and Community Affairs. From there, the funds are distributed to awardees. Reporting then travels back to the Texas Department of Agriculture through the Department of Housing and Community Affairs. Some practitioners assert that this procedural maze has put a capacity strain on local governments and organizations using these funds.

Moreover, experts have noted that colonias located in unincorporated areas are finding it difficult to compete with communities in incorporated towns or closer to higher density areas. However, in both unincorporated and incorporated colonias, capacity continues to be a huge concern.

At the HUD level, CDBG set-aside funding allocates each state to use $100,000 plus a 3-percent match on administrative costs. However, at the state level, each state awarding CDBG funds can determine the administrative budget allocated to UGLGs (with a 20-percent cap for administration and planning). The state-calculated allocation often does not cover the administrative process for these organizations, causing them to lose money when providing services. Due to the complex process of applying, pre-award costs can be an additional burden. Although technical assistance and planning resources are available, applicants may be unaware of those resources.

Once funds are awarded, the capacity to manage construction and infrastructure projects is a concern. These activities often rely on contractors, leaving UGLGs in charge of contract management, which they may have limited capacity and experience executing.

Furthermore, more and more frequently as colonia areas are becoming incorporated communities, colonias located in unincorporated areas are falling further behind. With less capacity, unincorporated communities are struggling to apply for CDBG entitlement and nonentitlement programming.

Definitions and Geography Matter

In the border states, only colonias identified before 1990 are qualified to receive funding from the HUD CDBG set-aside. CDBG funds are available to communities or "new colonias" that fall outside the 1990 rule; however, these CDBG funds are not a part of the specific colonias set-aside fund. Regardless of the set-aside, organizations that work with colonias rely heavily on CDBG funds.

Some interviewees recommended the expansion of the definition of colonias to include communities outside of the 1990 qualification to reach "new colonias." They argued that these communities often look identical to colonias but do not have access to the same funding opportunities. On the other hand, others worried that expanding the definition would stretch the funding, giving fewer dollars to communities that have grown to rely on the set-aside.

Discussion and Recommendations to Improve CDBG for Colonias

The data analysis and feedback from experts in the border colonial region reinforce the idea that HUD's CDBG program significantly impacts colonias and serves as an important resource for the communities and groups involved in community development/housing affordability in this region of the United States. However, the program could still benefit from some improvements. Below are recommendations for improving CDBG set-aside programming.

Ensure that colonias experiencing the greatest needs have access to CDBG set-aside funding. A recurring theme when interviewing colonia experts was that access to HUD's CDBG set-aside funds was not equal from colonia to colonia or state to state. Capacity, especially for colonias in unincorporated areas, is a massive barrier to colonias in desperate need of resources. During several conversations, some experts expressed concern that CDBG funds may be going to new developments near colonia developments but that the funds weren't being used to improve infrastructure or housing within the existing colonia.

In order to better identify colonias with greater needs and barriers, capacity building needs to be strengthened through increased community and civic engagement programming from technical assistance providers at every level. On-the-ground programming is the best way to ensure that CDBG programming is reaching colonias with the greatest needs in each region and in each state.

Increasing awareness and understanding about where CDBG funding is going can help ensure that states are awarding funds to colonias with the greatest needs. One possible consideration may be to use information from a relatively recent EPA/USDA assessment of communities along the U.S.-Mexico Border that classifies colonias based on level and type of need (Rural Community Assistance Partnership, 2015).

Consider adopting the definition of colonias investment areas to increase access to border communities and grow CDBG set-aside reach. A common concern raised during the conversation

with experts was the definition of colonias. Despite efforts to restrict the formation of new colonias, these communities exist. In both unincorporated and incorporated areas, no two colonias are the same. Labeling one community a colonia but not another one because of the year it was developed, where it is located along the border, or whether or not it has water access further limits these communities' access to resources, including HUD's CDBG nonentitlement set-aside. Adopting a modern definition can help pave the way for other federal programming that also uses restrictive or outmoded colonia definitions.

The incorporation of a colonia definition that is reflective of today's market, economic, and housing dynamics would also be more reflective of the CDBG programs' impact on colonias. Any expansion of the colonia definition must contain protections on its use to ensure that activities receiving the colonia set-aside classification truly aid them.

Increase set-aside funds to allow for greater impact within colonias. CDBG set-aside funds are a drop in the bucket for colonias. Along with modernizing the definition of colonias, increasing the CDBG funding is necessary to ensure that communities that need these resources the most have access. Increased funding would also reduce the costly and prohibitive competition for funds. If HUD truly wants to address the infrastructure and housing needs of these communities, major investments need to be made, and those investments need to be flexible.

Give colonias communities and residents the attention they deserve. It is no surprise that the topic of colonias is a polarizing issue. Often tied to conversations around immigration, many border state officials try to avoid addressing colonias. Unfortunately, this avoidance is a concern for experts on the ground. In the early days of CDBG's set-aside, colonias received notable and needed attention. In recent years, however, this attention has waned, causing colonias to fall back into the shadows. Bringing colonias back into the conversation, especially by local and state officials, can help elevate programming available to them.

Colonias vary by state, so flexibility is needed. States address the needs of colonias differently. Texas has set forth laws, such as the Model Subdivision Rule of 1995, to discourage the formation of new colonias. With the highest number of colonias, Texas has established programming that stakeholders have learned to navigate. Other states have not paid as much attention to their colonia communities. With the CDBG nonentitlement set-aside going directly to the state before being awarded to colonias and the organizations, administrative procedures can change from year to year, forcing some colonias to relearn protocols over and over again. Improving the bureaucratic process of CDBG funding can help with capacity issues on the ground.

Enhancing access to CDBG data would increase program visibility and impact. Although this report had access to the 2014 to 2023 CDBG data, increasing the visibility of this information can help inform communities, especially colonias, on the impact of the CDBG set-aside. Increased access to data and information can help inform strategies and solutions, allowing states to provide better advice for future programming to the communities that have been awarded funding. For instance, in New Mexico, set-aside funding was not used for public safety activities from 2014 to 2023. Future improved data collection and organization, along with enhanced capabilities of

linking data resources, could help users better identify and understand data reporting issues and help to develop a clearer picture of the CDBG program.

What's Next for CDBG and Colonia Communities?

Ultimately, the consistency and longevity of programming like HUD's CDBG nonentitlement colonia set-aside has helped colonias become more established communities, improving the quality of life for residents. This report seeks to highlight the tremendous efforts of HUD and its CDBG program while raising concerns and offering recommendations for improvements. Colonias and the individuals living in these communities deserve more, and this article is merely a stepping stone to more research that needs to be done.

Acknowledgments

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The Indian Community Development Block Grant at 50

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The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. Government.

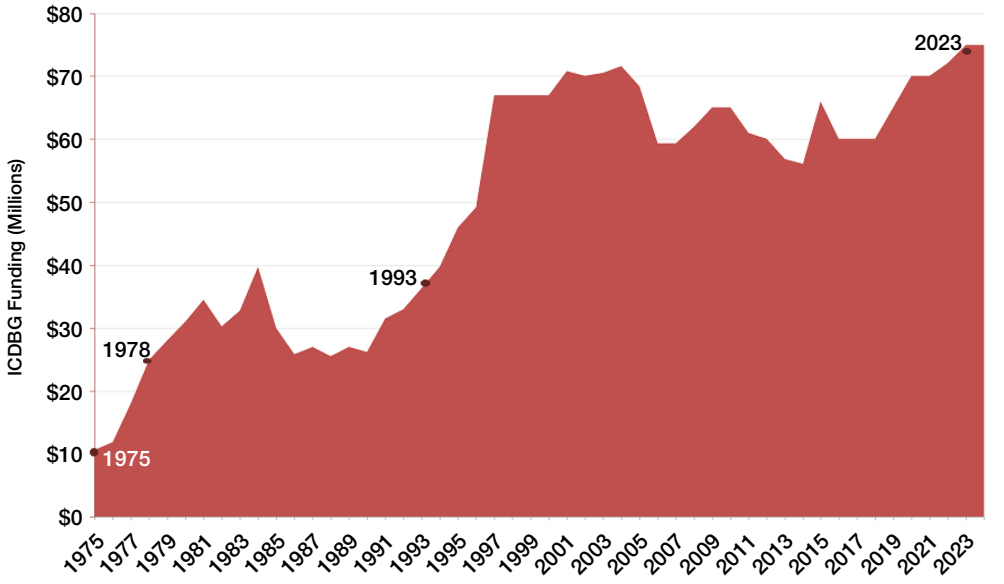
Introduction

Throughout the nation, Tribes are using resources to foster, construct, and support their communities within their lands and beyond. The work is challenging, rewarding, and impressive. At the heart of much of this effort lies the Indian Community Development Block Grant (ICDBG) program. The program is brought to life by the Tribes and Tribal housing practitioners, and their work is invaluable.

Enacted by Congress as part of the Housing and Community Development Act of 1974 (U.S. Congress, 1974), the Community Development Block Grant (CDBG) unlocked a powerful new resource for states, local governments, and Tribal communities. For the past 50 years, the program has provided critical funding to address infrastructure, economic development, housing, disaster recovery, and other community needs. CDBG also set the stage for a future companion program known as ICDBG, which was launched in 1978. Since that time, the ICDBG program has provided more than $2.4 billion in federal funding to assist hundreds of Tribal communities across Indian Country (exhibit 1). With these funds, Tribes have bolstered their economies, responded to disasters, strengthened cultural traditions, and addressed critical housing and infrastructure needs.

Exhibit 1

Nominal Yearly ICDBG Funding Amounts



Key Years in the ICDBG Timeline

1975: First CDBG awarded to 40 Indian tribes.
1978: ICDBG established. Prior to 1978, Tribes were included as units of local government under CDBG.
1979: On December 15, 1978 HUD issues a final rule to establish the first ICDBG program.

1993: The administration of the ICDBG program was moved from HUD's Office of Community Planning and Development to the newly established Office of Native American Programs.

2023: HUD publishes a Dear Tribal Leader letter to initiate the rulemaking process on the ICDBG program regulations.

CDBG = Community Development Block Grant. ICDBG = Indian Community Development Block Grant.
Note: Key years are identified on the chart, and more information is provided in the timeline.
Sources: Data compiled from HUD's annual CDBG reports to Congress (before 1996) and ICDBG Federal Register notices (1996 to present)

This article discusses the history, impact, and future of the ICDBG program, which is designed to provide critical community development resources to Tribal communities grounded in the fundamental principles of Tribal sovereignty and self-determination.

Building the Foundation for ICDBG

To better understand the ICDBG program as it exists today, it is important to acknowledge how the U.S. Department of Housing and Urban Development (HUD) served Tribes before the creation of the CDBG program.

Over the past 60 years, Tribal housing programs in Indian Country have undergone a monumental shift (HUD, 1988; Richardson, 2023). In 1962, just 12 years before the CDBG program came about, HUD took its first step toward providing housing resources to Tribes in furtherance of the federal government's trust and treaty obligations. Although the U.S. Housing Act of 1937 established the Low Rent Public Housing Program to assist several states in remedying the unsafe

and unsanitary housing conditions facing low- to moderate-income persons, it did not provide immediate support for American Indians and Alaska Natives. The 1937 Act provided authority to "vest in local public housing agencies the maximum amount of responsibility in the administration of their programs" and authorized the Secretary of HUD to make loans and annual contributions to public housing agencies to assist in the development and acquisition of low-rent housing projects and in maintaining the low-rent character of such projects (U.S. Congress, 1937). Although the 1937 Act provided the statutory basis for housing programs in Tribal communities, HUD did not administer dedicated Tribal housing programs until 1962. At this time, HUD administratively determined that Indian Tribes had the legal authority to establish, pursuant to Tribal law, Indian housing authorities that could develop and operate low-rent housing projects in areas subject to Tribal jurisdiction (Williams and Leatherman, 1975). This clarification helped lay the foundation for future federal Tribal housing and community development programs such as ICDBG.

Between 1962 and 1974, Congress continued to clarify and expand HUD's authority and responsibility for assistance to low-income families in Tribal communities. During these years, Tribes became eligible for the Mutual Help, Low Rent, and Turnkey III affordable housing programs and a variety of categorical programs such as Neighborhood Facilities Grants, Water and Sewer Grants, Model Cities, Historic Preservation, Open Space, and Code Enforcement. Although Tribes received funding under these various programs, funding was sporadic, and the total amount of funds approved for Tribes represented a small, disproportionate amount compared with the total funding available.

With the passage of the Housing and Community Development Act of 1974, Congress consolidated HUD's various community development programs, folding them into one flexible grant now known as CDBG (Orlebeke and Weicher, 2014). The new program allocated annual CDBG funding to large cities; urban counties, known as entitlement communities; and states, which are responsible for distributing state CDBG funds to smaller communities, known as nonentitlement communities, at their discretion. With this program, Tribes could access CDBG funding by initially qualifying as a "unit of general local government."

The Making of ICDBG

During the first few years of the CDBG program, a pivotal development occurred with the establishment of HUD's first office aimed at serving American Indian and Alaska Native communities. The creation of the Office of Indian Programs (OIP) in 1976 laid the foundation for what would later evolve into the Office of Native American Programs (ONAP), marking a significant milestone because OIP provided Tribes with direct support from HUD staff tailored to the specific needs of Indian Country (HUD, 1988).

During 1975 and 1976, the number of Tribes receiving assistance to address their community development needs increased significantly. However, the implementation of the new CDBG program revealed shortcomings that prompted reflection among many Tribes and OIP staff. Although the CDBG program offered flexibility and local autonomy, a pressing need existed for a more responsive approach that accounted for the unique legal, cultural, and economic circumstances of Native American communities. HUD owes a trust responsibility to Tribal nations

and needed the authority to administer Tribal programs in a manner that recognizes Tribal self-determination and self-governance.

Astrid Trauth, who served as the Director of Planning and Development in HUD's regional office in San Francisco, led an effort to gain deeper insight and identify potential solutions. Ms. Trauth worked closely with Tribal leaders and convened meetings in late 1976 and early 1977. HUD's efforts were reflective of the federal policy of self-governance and self-determination, as acknowledged in the passage of the Indian Self-Determination and Education Assistance Act of 1975. Another HUD staffer, Bob Barth, later recounted that the "primary consideration of Tribal representatives and HUD in the design of the CDBG program ... was the development of viable Indian communities within the context of Tribal Self-Determination" (Barth, 1980). Through this close consultation with Tribes in 1977, a legislative strategy was conceived to establish a new "special funding mechanism," which later resulted in the development of a new CDBG set-aside for Indian Tribes and Alaska Natives, now referred to as ICDBG (Trauth, 1980).

This experience underscored the necessity of designing a program that could provide a consistent and reliable level of funding for CDBG grants awarded to Tribes. This program would enable Tribes to effectively plan and implement long-term development initiatives tailored to their specific needs. A collective call for reforms emerged aimed at ensuring a baseline level of funding each year while preserving the flexibility and autonomy inherent in the CDBG program.

As a result of these efforts, commencing with the 1977 amendments to the Housing and Community Development Act of 1974, Congress has made various revisions over the years regarding how it funds Tribal programs. By 1989, Congress removed Tribes from the discretionary fund and created a dedicated source of ICDBG funding in the form of an annual mandatory 1-percent set-aside from the larger CDBG pot reserved for Tribes (U.S. Congress, 1989). Tribal applicants would compete for this funding, which would be administered by ONAP separately from the CDBG program.

In addition to establishing a special funding mechanism, the changes allowed the Secretary of HUD to waive the labor standards requirements of CDBG (principally Davis-Bacon Act requirements) for ICDBG projects in recognition of Tribal labor laws that govern Tribal lands. The changes also mandated nondiscrimination requirements that were appropriately tailored to Tribes. Because funding to Tribes would subsequently be provided separately from funding provided to states and units of local government, Indian Preference requirements also applied to ICDBG grants. Consistent with what was then a new federal policy, first codified in Section 7(b) of the Indian Self-Determination and Education Assistance Act, Tribes were required to give a preference to Indians, Indian organizations, and Indian-owned economic enterprises when providing training opportunities, employment, and contracts funded under ICDBG. Thus, the ICDBG program as it exists today was born.

ICDBG Today

Like its predecessor (CDBG), the ICDBG program provides direct grants to support the development of viable communities, including decent housing, a suitable living environment, and

economic opportunities, primarily for low- and moderate-income persons. Eligible applicants include Tribes and Tribal organizations designated by Indian Tribes to apply for an ICDBG grant on their behalf. Tribes and Tribal organizations apply for funding for specific projects under a Notice of Funding Opportunity (NOFO) process. Under the ICDBG NOFO, HUD assesses applications on the basis of the following rating factors: capacity, need/extent of the problem, soundness of approach, leveraging of resources, and comprehensiveness and coordination.

ICDBG Single Purpose grants are competed for and awarded on a regional basis. Funds appropriated by Congress annually are first allocated to six area ONAP regions, each receiving an initial base amount of $1 million, with the remaining ICDBG program funds awarded on the basis of a formula. That formula allocates funding by factoring in the total eligible Indian population, the total extent of poverty, and the share of the total extent of overcrowded housing. Each area ONAP reviews and scores applications submitted by Tribes and Tribal organizations in its service area. In most years, the program is highly oversubscribed and very competitive. As a result, many strong Tribal projects go unfunded due to limited appropriations.

The ICDBG program has evolved significantly over the years to better meet the needs of Indian Tribes and Alaska Native villages. Today, the ICDBG program provides countless opportunities for Tribal communities to provide a wide range of critical projects and services to their Tribal members. Here are some examples:

Expansion of Eligibility and Funding: Initially, ICDBG primarily focused on housing and community infrastructure projects. Over time, more Tribes have used the program to carry out a wider range of community development projects, such as economic development, healthcare facilities, community centers, and educational facilities.

Integration with Other Programs: The program has been integrated with other federal initiatives and funding sources to leverage resources and maximize impact. This integration includes coordination with housing programs, healthcare initiatives, and educational grants.

Focus on Sustainability and Resilience: In recent years, ICDBG-funded projects have had a stronger emphasis on sustainability and resilience. These initiatives include projects that promote energy efficiency, environmental conservation, and disaster resilience.

Streamlined Application and Reporting Processes: HUD has taken steps to streamline the application, approval, and reporting processes associated with ICDBG funding, making it easier for Tribes to access and manage funds effectively.

ICDBG for Disaster Recovery

ICDBG has also been a critical program for disaster recovery in Tribal communities. Although relatively small, ICDBG Imminent Threat grants are HUD's primary source of funding for Tribes that are affected by disasters or other emergencies. The ceiling for Imminent Threat grants is $450,000 for disasters that are not presidentially declared and $900,000 for presidentially declared disasters. Immediately following a disaster, HUD works closely with each affected Tribe

and other agencies, such as the Federal Emergency Management Agency, to assess damage and loss to Tribal communities. HUD then awards these grants to help Tribes with their recovery efforts and to supplement nonduplicative funding provided by other agencies. Imminent Threat grants provide critical and immediate funding to provide rental assistance to displaced families, rehabilitate damaged homes of low- and moderate-income families, remove debris, repair damaged infrastructure, and more. Historically, Congress has appropriated $5 million for Imminent Threat grants annually.

ICDBG for COVID Relief

In the early days of the COVID-19 pandemic, Congress worked closely with HUD and Tribal housing stakeholders to identify ways to provide immediate relief for Tribal communities. Given Tribes' familiarity with the ICDBG program and its community focus, the ICDBG program became a clear choice to deliver pandemic relief funding. In 2020, Congress provided $100 million in emergency ICDBG funding to help Tribes prevent, prepare for, and respond to the pandemic under the Coronavirus Aid, Relief, and Economic Security (CARES) Act. Congress later provided an additional $280 million in emergency ICDBG funding under the American Rescue Plan Act of 2021. Congress directed HUD to distribute this emergency funding to Tribes on a noncompetitive basis. HUD awarded all funding in the form of ICDBG Imminent Threat grants and used special authority granted by Congress to waive statutes and regulations and set alternative requirements to facilitate and expedite the use of these important dollars during a critical time.

Tribes have shared that these supplemental funds were a vital lifeline for facing an unprecedented public health challenge. Tribes used COVID-19 ICDBG funding for these and other purposes:

- Construct food pantries and food banks.
- Acquire new housing to alleviate severe overcrowding.
- Bring clean water to Tribal communities.
- Purchase ambulances and operative medical units.
- Provide emergency rental and mortgage assistance to struggling families.
- Purchase and convert motels to housing for people experiencing homelessness.
- Renovate community centers to distribute emergency food and supplies.
- Acquire facilities and convert them into daycare centers for children or coordination centers for essential workers.

The structure of ICDBG funding played a pivotal role in addressing COVID-19 by offering flexibility, local control, and efficient deployment of resources to meet the diverse needs of communities during a rapidly evolving public health emergency. This expedited response was crucial in providing timely support to communities.

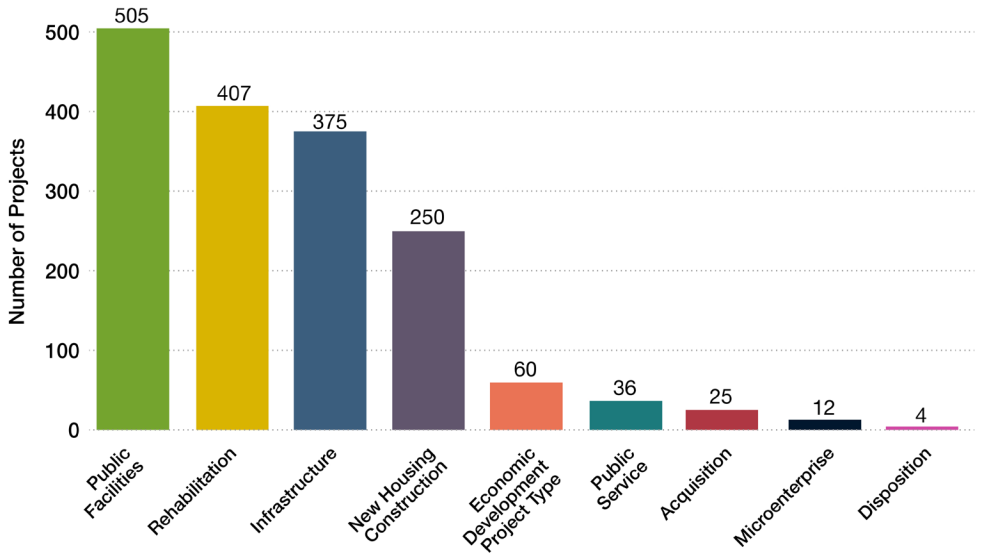
This experience demonstrates that not only has ICDBG been a reliable and important resource for Tribes over the past 50 years, but it has also served as a key tool to address emergencies using an existing programmatic framework that allowed HUD to quickly deploy funding to Indian Country. Tribes are uniquely positioned to serve the needs of their members, especially in times of crisis and disaster. Provided with adequate funding, Tribes have made a significant impact under the ICDBG program model, highlighting innovation and effective leadership in Indian Country.

ICDBG in Action in Tribal Communities

Like the CDBG program, a key feature of the ICDBG program is the broad menu of eligible activities that Tribes can carry out. Exhibit 2 highlights the diversity of project types and funding priorities over 20 years.

Exhibit 2

ICDBG Projects by Type, 2004–23



ICDBG = Indian Community Development Block Grant.

Source: Data submitted by ICDBG grantees via the Annual Status and Evaluation Report and compiled by the author using the Office of Native American Programs Performance Tracking Database

The ICDBG program has adapted to the changing needs and priorities of Indian Tribes and Alaska Native communities. Through the ICDBG program, Tribes have provided critical support for community development, sustainable construction practices, investing in infrastructure improvement, driving economic growth, combating climate change, preserving important cultural sites, and much more.

Exhibits 3, 4, and 5 illustrate how the ICDBG program has made an impact in Indian Country with investments in health and wellness.

Exhibit 3

Hospital Annex

Notes: The hospital annex is for the San Carlos Apache Tribe, and it is in Peridot, Arizona. The facility provides health care for 3,500 patients annually.
Photo credit: San Carlos Apache Tribe

Exhibit 4

Child Development Center

Notes: The Child Development Center in Chickasaw.
Photo credit: Chickasaw Nation

Exhibit 5 illustrates how the ICDBG program has made an impact in Indian Country with investments in critical infrastructure.

Exhibit 5

Water Infrastructure

Notes: This project benefits the Native Village of Nanwalek with the replacement of water mains, installation of new service lines to homes, and heating elements to make clean water available throughout the year.
Photo credit: Native Village of Nanwalek

Success Stories…in Their Own Words

Jacqueline Pata, Central Council of the Tlingit and Haida Indian Tribes of Alaska

The ICDBG-CARES funding was a game changer for Tribes. The funds significantly helped Tribal communities by alleviating financial stresses and expanding project opportunities. Communities established food pantries, which were crucial during the pandemic and continue today. In addition, Tribes used grants for vital HVAC upgrades to improve air quality, recognizing new health needs. Innovatively, some Tribes embarked on residential construction, enabled by relaxed funding rules, fostering sustainable housing and job creation. Infrastructure projects, such as land development, were also funded and are crucial for future community growth. Overall, these funds sparked a transformative shift, promoting long-term planning, leveraging additional grants, and empowering Tribes to meet evolving community needs effectively.

Cindy Logsdon, CEO/Director, Citizen Potawatomi Community Development Corporation

In 2002, with the support of the ICDBG program, the Citizen Potawatomi Nation (CPN) established the Citizen Potawatomi Community Development Corporation (CPCDC) in Shawnee, Oklahoma. CPCDC was incorporated in 2003 and received its Native Community Development Finance Institution (CDFI) certification in 2004. For 20 years, we have helped CPN members and employees navigate a wide variety of financial decisions by offering financial education, consumer and commercial loans, and supported the establishment of new businesses to become more competitive and profitable. During this time, we have utilized the ICDBG program five times to administer microenterprise development programs. The ICDBG program has significantly increased economic development opportunities for CPN and continues to make a difference today.

Neil Whitegull, Ho-Chunk Nation, Area Administrator, Eastern Woodlands Office of Native American Programs

Neil remembers the Dells Dam Community Center ICDBG project, which was initially conceived as a safety facility, its purpose transcended mere functionality. Utilizing solar panels and geothermal heating, the center became a great example of sustainable design. When winter came, there were doubts about its capabilities, but the true testimony was the $95 electric bill—a feat unheard of in Wisconsin during the winter. Beyond the innovative features, the center embodies cultural pride, with doors facing west in reverence to Tribal leaders. Today it is a gathering place, and over the years, our community centers have become woven into the fabric of Tribal life. They host meals, community celebrations, and educational workshops. It's a place to gather, connect, and remember.

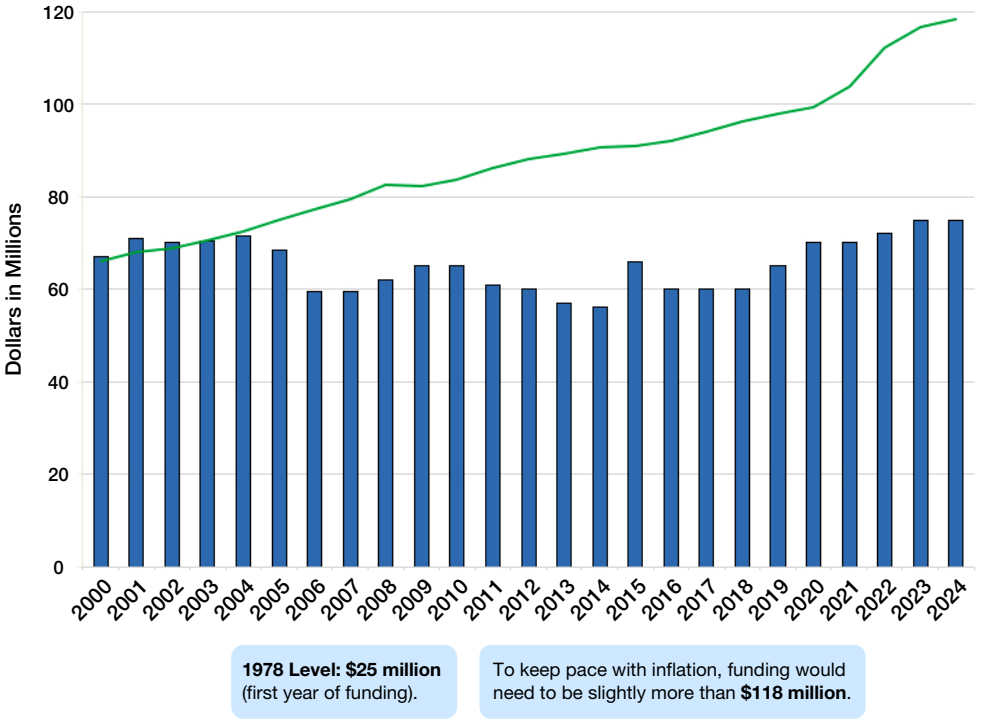
Program Challenges

Over the years, a variety of challenges have impacted the overall effectiveness of the ICDBG program. For example, as noted by HUD's 2017 *Housing Needs of American Indians and Alaska Natives in Tribal Areas* report (Pindus et al., 2017), the effect of inflation on construction costs and the persistent lack of basic infrastructure in many Tribal communities remain a key challenge. Also, as shown in exhibit 6, funding for the ICDBG has not kept pace with inflation over the history of the program. The combination of increased construction costs along with stagnant funding has resulted in fewer awards to Tribes while necessitating an increase in the award ceiling to account for rising costs.

Diminished investments in the Indian Housing Block Grant (IHBG) since its inception have had unintended impacts on the ICDBG project applications over the years as Tribes and Tribally designated housing entities struggle to maintain aging housing stock with flatlined funding. As a result, more and more ICDBG applications are for housing rehabilitation and new construction rather than public facilities or infrastructure projects. This shift has pulled funding away from Tribes' ability to address critical infrastructure and public facility needs. However, this trend comes amid a historic increase in IHBG formula funding and the establishment of the IHBG Competitive program in 2018, which prioritizes grants for new housing construction. HUD ONAP will be tracking whether this increased funding will lead to a shift in Tribes' use of ICDBG grants, potentially directing more ICDBG resources back toward infrastructure needs rather than housing rehabilitation and development.

Exhibit 6

ICDBG Effect of Inflation, 2000–24



ICDBG = Indian Community Development Block Grant.

Sources: Data compiled by authors from HUD's annual Community Development Block Grant reports to Congress (before 1996) and ICDBG Federal Register *notices (1996 to present); inflation data compiled from the Department of Labor's Consumer Price Index*

Conclusion: Looking to the Future

The ICDBG program has, without a doubt, made a lasting impact on Indian Tribes and Alaska Native communities over the past 50 years. Tribal museums, daycare centers, health and wellness facilities, and investments in infrastructure and public safety buildings stand as testaments to the critical importance of this funding. For many Tribal planners, the ICDBG program serves as an important tool to leverage additional funding resources that spearhead many of their community projects and economic development initiatives. Even in the most rural of areas, the impact of ICDBG can be seen—whether it is a travel plaza enticing travelers to stop in for a quick bite or a Tribal museum highlighting the rich culture and history of a Tribe—ICDBG has and continues to play an important role in key community development initiatives.

The ICDBG program will continue to be a vital resource for Tribes because data show a continued need for community development and infrastructure in Indian Country. To strengthen the program, HUD is updating the ICDBG regulations, which have not been revised in nearly 2 decades. Many of these regulations were modeled after CDBG and are not reflective of—nor were they intended

for—a sovereign government. In recognition of the government-to-government relationship, HUD is consulting with Tribes on what changes should be made to further improve the program and ensure that the updated regulations honor and respect Tribal sovereignty and self-determination.

Astrid Trauth and the countless Tribal housing leaders may not have realized it at the time, but their work and advocacy ensured that the ICDBG program was born out of consultation with Tribes. With this strong legacy of dedication and respect, HUD remains committed to respecting Tribal sovereignty and self-determination, working alongside Tribes to strengthen and build upon the success of this program for future generations.

Given the clear success of the program over the first 50 years, HUD looks forward to what Tribes will achieve in the years to come.

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Addressing a National Crisis via CDBG: The Case of the Neighborhood Stabilization Program

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Abstract

The Neighborhood Stabilization Program (NSP) was established in 2008 to address the fallout of the foreclosure crisis and ensuing Great Recession. Like a number of other special appropriations in recent decades, NSP was designed to rely on the administrative chassis of the Community Development Block Grant (CDBG) program. This article discusses the origin and implementation of NSP and explores lessons about why and how policymakers use the CDBG platform to address specific needs.

Introduction

A terrorist attack, a catastrophic natural disaster, a foreclosure crisis, a global pandemic, and a persistent affordable housing crisis are seemingly disconnected phenomena that have two notable commonalities. They are urgent crises that compel government action, and the response from the federal government has relied on the administrative chassis of the Community Development Block Grant (CDBG) program.

Why CDBG? Why is this one federal program called on repeatedly to address catastrophes and crises? This article focuses on one prominent CDBG offshoot—the Neighborhood Stabilization Program (NSP)—which represented a significant milestone in the use of CDBG for specific community development needs. The article explores the origin of NSP, its implementation, and

lessons learned. The authors draw on their experiences supporting the implementation and evaluation of NSP and other CDBG special appropriations to distill key lessons about why and how policymakers use CDBG to address specific needs.

Early CDBG Supplemental Appropriations (CDBG-DR)

In the early 1990s, after a series of natural disasters, the U.S. General Accountability Office (GAO) issued a report detailing gaps in the nation's disaster recovery framework (GAO, 1991). Notably, it highlighted that the severity of the specific disasters it reviewed created clear needs for improvement and specifically identified a gap in assistance for long-term housing solutions after a disaster—noting that the Federal Emergency Management Agency did not have a well-defined role in addressing the long-term housing needs of disaster-affected communities. Based on this gap, GAO recommended that the U.S. Congress consider amending legislation to provide appropriations to the U.S. Department of Housing and Urban Development (HUD) specifically for disaster assistance.

In 1993, Congress appropriated the first set of funding that would become CDBG Disaster Recovery (CDBG-DR) grants to address the impacts of Hurricanes Andrew and Iniki and Typhoon Omar. With this first set of appropriations, Congress would set in motion a funding source for states and local governments that would continue for the next 30 years, allowing communities to invest in long-term disaster recovery with a focus on meeting the needs of low- and moderate-income households. Generally, CDBG-DR has been used as a vehicle for long-term disaster recovery for 30 years because of the flexibility of the CDBG framework. These funds allow communities to make their own funding decisions based on local needs on the ground. To determine what programs and projects to fund, grantees use a robust community engagement process to make sure they are "getting it right" for disaster survivors, which might mean pairing housing recovery with economic revitalization, infrastructure improvements, mitigation, and needed public services.

Natural disasters can uproot people's lives for years, and housing might not be the only pressing need for a low-income household trying to recover from a devastating event. In 2011, a massive EF5 tornado in Joplin, Missouri, killed 161 people, injured more than 1,150, and left 3,000 students homeless while destroying nearly one-half of the district's classroom space (Morris, 2011). The scale and severity of the tornado also left disaster survivors with trauma or posttraumatic stress disorder, which can be more prevalent for those with lower incomes (Houston et al., 2015). Based on a vigorous community engagement model, Joplin's CDBG-DR program not only funded the costs to repair homes damaged in the event, but it also invested in homeownership assistance (giving downpayment assistance to households that wanted to buy homes in Joplin to bring people back to the city), mental health services to address the trauma-related effects of the disaster, and job training to fill gaps in the city's workforce. Most of these types of programs can be funded with CDBG, but CDBG-DR is able to go a step further with the flexibility Congress allows, giving HUD the authority to issue waivers and alternative requirements to make the programs even more flexible and adapt to unique disaster recovery needs.

Since those initial appropriations in 1993, Congress has appropriated nearly $100 billion in funding for CDBG-DR grants and its partner programs, such as CDBG Mitigation (CDBG-MIT)

and National Disaster Resilience (CDBG-NDR). Although the 1993 appropriations were relatively modest at $85 million, the amount would progressively get higher, with each appropriation eventually moving into the billions when Congress appropriated funds to assist in the September 11, 2001, terrorist attack recovery efforts in New York City. Those appropriations would top out at $3.4 billion and eventually help pay for the National September 11 Memorial & Museum and the Perelman Performing Arts Center, which have proven to illustrate the resilience of Lower Manhattan. These appropriations were also one of the few times that CDBG-DR would be adapted to address a crisis much different than natural disasters. Using these funds to recover from a catastrophic terrorist attack again exemplifies the flexible nature of these grant funds and how they can be used to meet a number of unique needs while keeping their focus on the long-term recovery of low- and moderate-income families.

Appropriations for CDBG-DR continued trending upward after the devastating impacts of Hurricane Katrina. In 2006, Congress appropriated more than $16 billion for the disaster impacts of Hurricanes Katrina, Rita, and Wilma. In 2013, Congress appropriated another $16 billion for Hurricane Sandy recovery, then broke records in 2017 by appropriating $28 billion for CDBG-DR grants addressing the disaster impacts of Hurricanes Harvey and Maria. With only a few exceptions, Congress has appropriated funds for CDBG-DR for disasters occurring nearly every year from 1993 to 2023. As disasters intensify and their severity increases, Congress likely will continue to appropriate money for CDBG-DR.

Creating the Neighborhood Stabilization Program

As the previous section discussed, CDBG-DR has been used with growing frequency to support recovery efforts following *geographically constrained crises*. In 2008, Congress established NSP, which used the CDBG framework to address a *nationwide crisis*. In 2006, home prices began a rapid decline. Soon after, mortgage delinquencies and foreclosure starts increased to record levels (HUD, 2010). The effects cascaded through the housing finance industry. Subprime lenders went bankrupt. Uncertainty about the valuations of mortgage-backed securities and other financial derivatives led to the bankruptcies and forced sales of major financial institutions. At the local level there were concerns that foreclosures would create negative externalities—that foreclosed and vacant homes could adversely affect their surrounding areas, potentially creating a negative feedback loop (Joice, 2011). Research suggested that foreclosures might increase crime, increase subsequent foreclosures, and decrease home values (Immergluck and Smith, 2006a, 2006b; Schuetz, Been, and Ellen, 2008).

Congress initially responded to this crisis by passing the Housing and Economic Recovery Act of 2008 (HERA), which included $3.92 billion for "emergency assistance for the redevelopment of abandoned and foreclosed homes." Congress would later appropriate an additional $2 billion in 2009 and $1 billion in 2010 toward the same purpose. HUD administered all three of these funding rounds as NSP, referred to as NSP1, NSP2, and NSP3, respectively. This article uses "NSP" to refer to programmatic aspects common to all three rounds of funding.

Congress directed that NSP funds be governed under the rules of the CDBG program unless otherwise indicated. Using the CDBG "chassis" for NSP was logical, given that the kind of activities

needed to address the foreclosure crisis were, in many cases, already eligible uses of CDBG funds. For example, CDBG has often been used for activities such as homeownership assistance, acquisition, rehabilitation, and demolition.

Another key benefit of using CDBG as the model for NSP is the flexibility that is a defining feature of CDBG. The *block grant* approach prioritizes the devolution of program administration choices from the federal to the state and local levels. CDBG regulations give states maximum feasible deference to make most decisions, and local governments can choose to fund the eligible activities they think will have the greatest effect on their local needs.[1] This flexibility is notable in relation to NSP because the foreclosure crisis played out in significantly different ways across the country. The so-called "sand states" were booming prior to 2006, with high population growth and rising home prices, which led to some overbuilding. They were hit hard by foreclosures because of a high incidence of subprime lending and a steep decline in home prices after 2006. At the other extreme were the cities and regions that had experienced slow population growth (or population loss) and persistent economic challenges for years leading up to 2006; for these areas, the foreclosure crisis exacerbated preexisting trends of vacant, abandoned, and deteriorating housing (HUD, 2010; Joice, 2011). These varied contexts called for a variety of interventions. In some places, light-touch programs like homeownership assistance might have been sufficient to get new buyers into foreclosed homes, prevent long-term vacancies, and stabilize the local market. Other homes required rehabilitation to attract new occupants and improve neighborhoods. In the most distressed areas, with a significant glut of vacant and deteriorating homes, demolition and clearance may have been the only options to prevent further decline. In other situations, the best approach may have been to focus on property acquisition and land banking to facilitate future redevelopment. By following the CDBG model, Congress and HUD made clear that NSP would empower state and local grantees to make the choices they deemed the best fit for their specific needs.

Perhaps the most important benefit of using the CDBG chassis for NSP was the extensive administrative infrastructure that could be leveraged. More than 1,200 state and local governments were already receiving CDBG funds each year. Those grantees had staff on hand with expertise in CDBG. Each grantee had a Consolidated Plan that included a strategic assessment of housing needs, and grantees had well-established processes for soliciting citizen participation, complying with fair housing laws, reporting accomplishments to HUD, and more. HUD also had dedicated CDBG staff in the Office of Community Planning and Development (CPD), resources to guide grantee choices, and information systems to manage funds and track activities. The Disaster Recovery Grants Reporting system that HUD established for CDBG-DR grants was used to disburse NSP funds and collect data on NSP-funded activities.

HERA established an aggressive implementation timeline for NSP1. HUD was required to establish a funding formula within 60 days and to distribute the funds to grantees within 30 days thereafter. Grantees would then have 18 months to obligate funds. Building NSP on the chassis of CDBG helped to expedite the program's rollout to meet these goals, but HUD had to navigate early on several statutory requirements and policy decisions unique to NSP.

[1] Community Development Block Grants, 24 CFR, Part 570.

One such challenge was how to allocate the funds. HERA required that NSP1 funds be distributed to states and local governments with the greatest need, based on number and percentage of home foreclosures, homes financed by subprime mortgage loans, and homes in default or delinquency. Todd Richardson, a senior career employee in HUD's Office of Policy Development and Research with extensive experience related to CDBG and CDBG-DR formula allocations, had testified before a congressional committee on May 22, 2008, on the approach HUD would take if Congress appropriated funds for NSP. The development of that testimony did two things: (1) It jumpstarted HUD's thinking about which data it might use for a formula, and (2) it telegraphed to Congress HUD's likely approach so that when funds were appropriated on July 30, 2008, HUD was ready with a formula (Richardson, 2008). The CDBG formula relies on data from the U.S. Census Bureau that are highly standardized and available for the entire country on a regular basis. However, Census Bureau data typically do not provide the kind of information required for special appropriations such as NSP or CDBG-DR. Before HERA was passed, HUD had already been monitoring data related to foreclosures, subprime mortgages, and mortgage delinquencies. These data sources had various limitations; none covered the entire United States with a level of granularity that would be necessary to allocate funds fairly to local governments. HUD determined that the best source of data on the factors established in HERA was the Mortgage Bankers Association National Delinquency Survey (MBA-NDS), which did not produce data below the state level. Therefore, HUD established a two-step formula allocation process. First, funds were allocated to states, primarily using MBA-NDS data, with a minimum state allocation of $19.6 million as required by HERA. HUD then developed a model of foreclosure risk based on publicly available, finely grained data sources—specifically, home price data from the Office of Federal Housing Enterprise Oversight (which the Federal Housing Finance Agency later subsumed), Home Mortgage Disclosure Act data on high-cost loans, and unemployment data from the U.S. Department of Labor. These data explained 75 percent of state-level variance in foreclosure rates. Estimated foreclosure risk and a measure of abandonment risk based on U.S. Postal Service vacancy data were used to subdivide state-level allocations for local governments within each state. HUD imposed a minimum grant size of $2 million. Any amounts below that threshold were rolled up into the state government grant. The minimum grant amount reflected HUD's thinking about the administrative costs of administering NSP. Although NSP leveraged the CDBG chassis, it was different enough from CDBG that there would be costs to learning the program and administering NSP activities. HUD believed that setting a minimum grant amount would best ensure that NSP would be administered effectively (HUD, 2008).

Another substantial challenge was how to adapt the CDBG regulations to the unique challenges NSP funds were meant to address. NSP followed the CDBG model in many ways, but it was not simply incremental CDBG funds that could be used interchangeably with regular annual CDBG allocations. One of the key early tasks for HUD was publishing a *Federal Register* notice to govern NSP1. This 20-page notice, published on October 6, 2008, served several essential purposes. It explained the funding formula and announced allocation results. It presented the process grantees would follow to receive funds, including provisions meant to expedite grant awards relative to the standard CDBG process.[2] The notice also operationalized several requirements of HERA that were either different from, or simply not addressed by, standard CDBG rules and guidance. CDBG

[2] For example, HUD reduced the amount of time that the NSP plan had to be posted for public comment.

includes requirements to ensure that the program benefits low- and moderate-income families and individuals, which is defined as those with income up to 80 percent of the HUD Area Median Income (AMI). HERA created a new threshold for NSP of 120 percent of AMI. The notice defined several terms that were essential for NSP but not used in the regular CDBG program, including *abandoned, foreclosed*, and *land bank*. The notice also provided a crosswalk of the NSP eligible activities identified in HERA and regular CDBG eligible activities.

Staffing the rollout of NSP1 was an extraordinary challenge—both for HUD and grantees. Although existing staff had expertise in CDBG and related areas, they did not have adequate bandwidth. For grantees, it was the bandwidth to plan, design, and implement new activities, and for HUD CPD, it was the bandwidth to review and approve NSP1 action plans, create guidance, and monitor compliance. Grantees could use a portion of their NSP1 grant for administration, but HERA did not include any additional funding for HUD staffing, systems, or technical assistance. Initially, HUD relied heavily on staff detailed from other offices (including this article's authors) to handle the time-sensitive task of reviewing and approving NSP1 plans. The American Recovery and Reinvestment Act of 2009 (ARRA), which appropriated an additional $2 billion for NSP2, authorized HUD to use up to $200 million for capacity building and support. These administrative funds significantly increased the capacity of HUD to administer NSP and also enabled a technical assistance effort that was, in the words of one grantee, "excellent and more expansive than any other assistance provided before by HUD" (Spader et al., 2015). However, limited capacity at the start of NSP1 likely slowed progress. Although 99 percent of NSP1 grantees met the requirement to obligate their full grant within 18 months of award as of June 2010, roughly 3 months before the 18-month deadline, only one-third of NSP1 grantees had obligated more than 80 percent of their funds (GAO, 2010).

Beyond the provision of funds for HUD staffing and technical assistance, NSP2 differed from NSP1 in one notable way: it was a competitive program rather than a formula-based grant. This speaks to an inherent tension of NSP. Using the CDBG chassis was obviously meant to provide grantees with broad flexibility about how to use the funds to best meet their local needs. NSP1 prioritized speed, simplicity, and grantee discretion. Yet the crisis that NSP was meant to address was fairly focused on a specific set of issues related to foreclosure and abandonment of housing. With ARRA and NSP2, Congress enabled HUD to play a more active role in assessing which applicants had adequate capacity and proposed strategies thought to be more effective, such as concentrating investment. One substantial departure from the CDBG model is that HUD allowed NSP2 applications from a wider set of entities, including nonprofits that had never before received a direct CDBG award from HUD. HUD also developed census tract-level estimates of foreclosure and abandonment risk, deployed an innovative, web-based mapping tool that applicants used to identify the areas they would target for NSP2 investment, and required that applicants focus on areas with the greatest need (HUD, n.d.).

In 2010, Congress appropriated an additional $1 billion for NSP, the third and final round of funding, which was awarded under a formula allocation process (NSP3). Given the origin of CDBG—a flexible formula grant program replacing several use-specific competitive grant programs—it is interesting that the three rounds of NSP funding vacillated from formula allocation

to competitive award and back to formula allocation. Competitive grants offer an obvious appeal to federal policymakers—the opportunity to influence the types of activities, locations, and entities that are funded. Wielding this power effectively could result in a more effective use of federal funds, but with great power comes great responsibility. It is difficult for the federal government to accurately assess the capacity of local organizations or the merit of their proposed activities. A central element of the original case for CDBG was the desire to decentralize power and authority under the belief that local leaders were better positioned to decide on appropriate activities and be held accountable for those decisions (Orlebeke and Weicher, 2014; Rich, 2014). Another argument made in the 1970s in favor of the CDBG approach was that block grants allocated by formula would be deployed faster than competitive grants. The design of NSP1, NSP2, and NSP3 reflects the same tensions that existed 50 years ago. NSP1 was awarded fast, NSP2 enabled a more active federal role, and NSP3 reverted to the simple and fast formula approach.

Lessons Learned

Through June 2013, NSP funds addressed 69,443 units (56,175 for NSP1, 10,621 for NSP2, and 2,647 for NSP3).[3] This works out to approximately $100,000 of federal investment per unit, although notably, NSP grantees generated more than $2 billion in program income.[4] NSP1 was used relatively more for demolition and clearance (41 percent of units compared with 27 percent of units addressed by NSP2 and 31 percent of units addressed by NSP3), and NSP2 was used relatively more for rehabilitation and new construction (52 percent of units compared with 33 percent of units addressed by NSP1 and 42 percent of units addressed by NSP3).

Was NSP effective? Some analyses focused on specific locations have found that NSP positively affected home prices within one-tenth of a mile (Bak and Hewings, 2017; Leonard, Jha, and Zhang, 2017). However, an independent HUD-funded evaluation by Spader et al. (2015) examining a large sample of NSP2 grantees found mostly null effects. Despite efforts by HUD to encourage NSP2 grantees to target investments, the evaluation found that NSP2 activities were generally not highly spatially concentrated. The average NSP2 census tract studied contained seven properties "treated" by NSP and $1.2 million in expenditures. The evaluation used a census tract-level difference-in-differences analysis to compare outcomes for NSP2-treated tracts with similar tracts that did not receive NSP2 investment. Across the full sample, the evaluation found that NSP2 had no effect on home prices. Other analyses, focusing on certain market types and other outcomes—including sales volume, distressed properties, vacancy, and investor purchases—showed no consistent positive effects of NSP2. The evaluation also examined NSP2's impact on home prices using hedonic analysis of property-level data. The researchers tested many different models with different ways of measuring foreclosure activity and NSP2 activity and could not find any consistent positive effect of NSP2. They concluded that omitted variables and selection bias were significant challenges—that is, unmeasurable characteristics of the neighborhoods and properties that received NSP2 investment swamped the size of the NSP2 investment.

[3] Based on authors' analysis of NSP Production Reports at https://www.hudexchange.info/programs/nsp/nsp-production-reports/.

[4] Based on authors' analysis of NSP Financial Reports as of May 1, 2024, at https://www.hudexchange.info/resource/622/nsp-monthly-financial-update-report/.

Spader et al. (2015) recognized that NSP can be viewed through multiple lenses—as a neighborhood stabilization program, as a stimulus program, and as a longer-term revitalization program. Perhaps NSP was not successful as a *neighborhood stabilization program*, using traditional program evaluation methods focused on neighborhood spillover effects. However, it might be viewed more favorably as a stimulus program or a long-term revitalization program. Starting with the latter, grantees that used NSP to acquire, rehabilitate, and preserve affordable housing have produced a valuable "output" even if it does not result in positive neighborhood-level outcomes. It is also important to note that many grantees targeted areas with longstanding distress, and a substantial amount of NSP-funded activity consisted of demolition and clearance. Such investments may be necessary and useful even if they do not "turn around" a neighborhood and lead to measurable improvements such as increased home prices. One of this article's authors observed this dynamic firsthand working in Flint, Michigan, a city that lost one-half of its population during the preceding 50 years and used NSP (and other federal funds) extensively to demolish abandoned buildings and for other innovative strategies, such as land banking—a practice that was somewhat rare prior to 2008 but became more widely adopted with the implementation of NSP.

It is also important to think of NSP as a stimulus program. After all, the laws that funded NSP were largely focused on economic stimulus. The tight expenditure deadlines that Congress required for NSP and using CDBG regulations to expedite implementation suggest that NSP was also meant to be countercyclical stimulus spending. NSP grantees reported that the funding helped them retain or hire staff and provide work to the stagnant private construction sector (Spader et al., 2015). One phenomenon some NSP grantees reported was the challenge of competing with private actors, such as investors and real estate developers. The fact that those private actors had returned to the marketplace suggests that, at least in some locations, the broad suite of federal stimulus spending had achieved its objectives. It may not be possible to disentangle the effect of NSP from other federal programs and policies. However, the fact that NSP funds were spent rapidly on eligible uses, without widespread fraud, could be deemed a success even in the absence of positive neighborhood-level outcomes. Put differently, if Congress wishes to spend money to stimulate the economy, with a focus on housing and community development, NSP proved that the CDBG chassis is a capable platform for doing so.

When using CDBG to address an urgent crisis, policymakers must weigh the extent to which the program is meant to (1) provide short-term economic stimulus or (2) address a specific issue with carefully tailored investments. Superficially, NSP prioritized both—spending funds rapidly and focusing on specific needs related to foreclosure and abandonment. However, these requirements often conflicted. Some grantees reported changing strategies, perhaps sacrificing effectiveness, to meet spending deadlines. Conversely, some requirements and programmatic decisions by grantees slowed program launch—such as the need to design new foreclosure-specific activities and the desire to target investments geographically. Perhaps a program that was more like "vanilla" CDBG would have been spent faster than NSP (but sacrificed program effectiveness). Conversely, perhaps a version of NSP without such an aggressive spending timeline would have been more effective at neighborhood stabilization but less effective as economic stimulus.

Conclusion

NSP represented a significant step in the history of CDBG. Although CDBG had become increasingly used during the 1990s and 2000s as a tool for disaster recovery, NSP was novel in that it used the CDBG administrative infrastructure to address a crisis that was somewhat narrowly focused (on foreclosure and abandonment) but broad in geographic extent (the entire country). Since NSP, Congress has continued to use CDBG to address crises beyond natural disasters. The Coronavirus Aid, Relief, and Economic Security, or CARES, Act provided $5 billion in supplemental CDBG funds known as CDBG-CV, which were distributed by formula to all CDBG grantees. The Support for Patients and Communities Act created the Recovery Housing Program, which relies on CDBG regulations, similar to NSP, to support transitional housing for individuals in recovery from substance-use disorders. The Pathways to Removing Obstacles to Housing (PRO Housing) program recently awarded $85 million in competitive grants, based on the CDBG model, meant to support communities actively taking steps to remove barriers to affordable housing, such as by reforming zoning and land use policies.

The varied design features of these programs—including whether to award funds competitively or by formula and whether to focus on specific activities or defer to grantees—hearken back to the debates that surrounded the creation of CDBG. Is it best for the federal government to support community development needs via a large, flexible block grant or an array of more targeted programs? The proliferation of CDBG-derived programs suggests movement toward the latter approach, especially when viewed alongside the substantial decline in inflation-adjusted appropriations for the core CDBG program. Still, these programs owe their existence to the versatility and stability of the underlying CDBG chassis. If federal policymakers expect to continue using CDBG as a tool to address a broad array of crises, it would be wise to ensure adequate investment in the federal, state, and local administrative infrastructure of the core CDBG program.

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Community Development Block Grants Disaster Recovery, Rental Requirements, and Rental Market Impacts

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Abstract

Community development in the wake of natural disasters is a challenging undertaking. For the past 2 decades, the distribution and implementation of Community Development Block Grant Disaster Recovery (CDBG-DR) grants have varied widely, creating useful experimentation to explore the effects of different community development strategies. This article presents an original, hand-collected dataset documenting the requirements in CDBG-DR grants that could shape rental recovery outcomes. Case-study counties were selected from this dataset to track rental market outcomes before and after the natural disasters. The authors found that multifamily rents grew more slowly, and multifamily permits increased more in ZIP Codes that received CDBG-DR funding than in comparable disaster-impacted ZIP Codes that did not receive CDBG-DR funding. These findings suggest that the program's rental requirements are likely associated with improved outcomes for renters, who are uniquely vulnerable to disasters and deserve further attention from researchers and policymakers looking to mitigate the negative effects.

Natural Disasters and CDBG-DR

In the wake of natural disasters, communities face immense challenges in rebuilding their lives, homes, and neighborhoods. The availability and affordability of rental housing for displaced individuals and families are among the most pressing issues. In the United States, Community Development Block Grant Disaster Recovery (CDBG-DR) funding plays a crucial role in providing financial assistance to states and localities major disasters affect, especially for housing recovery (Boyd and Gonzales, 2011; Theodos, Stacy, and Ho, 2017). However, a significant gap exists in understanding how different rental housing requirements in CDBG-DR have interacted with rental market conditions over time.

CDBG-DR, administered by the U.S. Department of Housing and Urban Development (HUD), is integral to long-term disaster recovery efforts. Its flexible funding mechanisms aim to address various needs, including housing, infrastructure, and economic revitalization. Despite its significant role in facilitating community reconstruction after disasters (Rudd, 2024; Theodos, Stacy, and Ho, 2017), evidence regarding the role of this funding in adequately addressing the challenges faced by renters and the rental housing sector is lacking (Martín et al., 2023). Such lack of evidence is understandable because, historically, the focus of CDBG-DR funding has predominantly been on supporting owner-occupied housing reconstruction and rehabilitation and infrastructure projects (Emrich et al., 2020; Spader and Turnham, 2014), thereby neglecting the concerns of renters and the rental housing market (Drew, 2024; Gotham, 2014). Therefore, the limited scholarly attention partly reflects the lack of renter- or rental housing-specific requirements within CDBG-DR.

When compared with homeowners, renters begin at a deficit, with less social and political capital to withstand the impact of disasters (Lee and Van Zandt, 2019). CDBG-DR's traditional orientation toward homeowners at times compounds the disparity in household outcomes based on ownership because it outlines direct pathways for repair and replacement of single-family property but is limited to vouchers and far-off promises of multifamily redevelopment for renters (Martín, Teles, and DuBois, 2022). Moreover, the value of the homeowner benefit remains tied to the property in such a way that cannot be ensured for renters, who often must exit the local housing market permanently without any compensatory benefit. Not only does this system of disaster recovery relief fail to meet the needs of renters, but it also fails to provide sufficient indicators to monitor the assistance renters receive following a disaster.

Of particular concern is the insufficient allocation of CDBG-DR funds by state and local governments toward rental housing development (Boyd and Gonzales, 2011; Theodos, Stacy, and Ho, 2017). Although HUD oversees the program, it does not directly allocate the funding toward specific purposes. Unlike homeowners who may access grants or loans for rebuilding, renters often encounter heightened uncertainty and vulnerability in securing affordable housing post-disaster, as recounted in many surveys, interviews, and workshops investigating the lived experiences of both renters and landlords (Aiken, Ellen, and Reina, 2023; Martín et al., 2023). This discrepancy underscores the pressing need for a more inclusive approach within the CDBG-DR framework, one that addresses the unique challenges renters confront following catastrophic events.

It is worth noting that although CDBG-DR funding holds a pivotal position, it operates within a broader framework of disaster response and recovery efforts. The Federal Emergency Management Agency (FEMA) Individual Assistance (IA) and Public Assistance (PA) programs play vital roles, for instance, in identifying areas of need and providing immediate relief to affected individuals and communities. The housing assistance under IA includes support for temporary housing, such as rental assistance or reimbursement for hotel costs, but IA is not designed to undertake the rebuilding of rental housing or support for long-term recovery. The Small Business Administration also offers low-interest deferred loans to property owners for up to $500,000 to use toward repairing damaged structures and to owners and renters up to $100,000 for replacement of personal belongings (SBA, n.d.).

Natural Disasters and the Rental Housing Market

Recent studies show that rents increase in the aftermath of major natural disasters because of reduced housing availability (An et al., 2020; Best et al., 2023; cf. Harwood, 2023). Decades of disasters also have triggered out-migration systematically throughout the country (Boustan et al., 2020). Evidence suggests that low-income renters in publicly subsidized housing are particularly vulnerable to disasters (like flooding) because the damage to the housing stock results in fewer subsidized units and longer waiting times for tenants to obtain government assistance (Davlasheridze and Miao, 2021). Davlasheridze and Miao (2021) also measure the effect of PA, FEMA's largest grant program providing emergency response and public infrastructure redevelopment, to find its recovery impact on a tenant's share of rents and housing units. Interestingly, they also uncover the positive, independent effect of CDBG-DR funds on these subsidized housing-related outcomes.

However, the current literature is missing direct evidence about the role of CDBG-DR on broader rental housing market outcomes, not just the public housing segment. Because some CDBG-DR grants stipulate one or more rental requirements, they can help stabilize the rental market by accelerating the rebuilding of rental housing in the aftermath of disasters. The rental requirements have not been well researched, and little is known about their role in rental housing outcomes.

This article is part of systematic efforts seeking to fill the gap by examining multiple research questions: Are all rental requirements applied to every disaster? How has their application evolved over time? What is the effect of CDBG-DR rental requirements on rental market outcomes? Do the effects vary by type and number of rental requirements applied to CDBG-DR funds? This article answers the first two questions, uses a case study approach to examine the third question, and paves the way for probing the last question with large comparative case studies.

The following section uses the *Federal Register* to document the extent and evolution of CDBG-DR rental requirements from 2003 to 2020. The remainder of the article empirically measures the likely effect of rental requirements on multifamily rents for a case study in Colorado, comparing disaster-affected areas with and without CDBG-DR funds.

The authors hypothesize that CDBG-DR with rental requirements can help mitigate the rising rent impact of natural disasters, and that their effects would be greater in the areas receiving CDBG-DR grants with more (or stronger) rental requirements.

Rental Requirements in CDBG-DR

Noting challenges in CDBG-DR for renters and the existing policy benefit toward homeowners, the U.S. Congress and HUD introduced requirements in CDBG-DR funding for rental housing recovery following Hurricane Katrina in 2005. Rental requirements fall under four broad categories: (1) Action Plan Consideration, (2) Coordination with Public Housing Authorities (PHAs), (3) Minimum Set Aside, and (4) Set Affordability Period. The following is a brief description of each rental requirement. The common language of each stipulation is in appendix B.

1. **Action Plan Consideration:** States and localities receiving CDBG-DR funds must develop comprehensive action plans outlining how they will allocate resources to address the housing needs of both homeowners and renters. These plans serve as blueprints for disaster recovery efforts and are subject to HUD approval.

2. **Coordination With PHAs:** Collaboration between CDBG-DR grantees and local PHAs is essential for ensuring efficient and equitable distribution of rental assistance and resources. By coordinating efforts, stakeholders can better identify and address the specific needs of low-income renters and vulnerable populations.

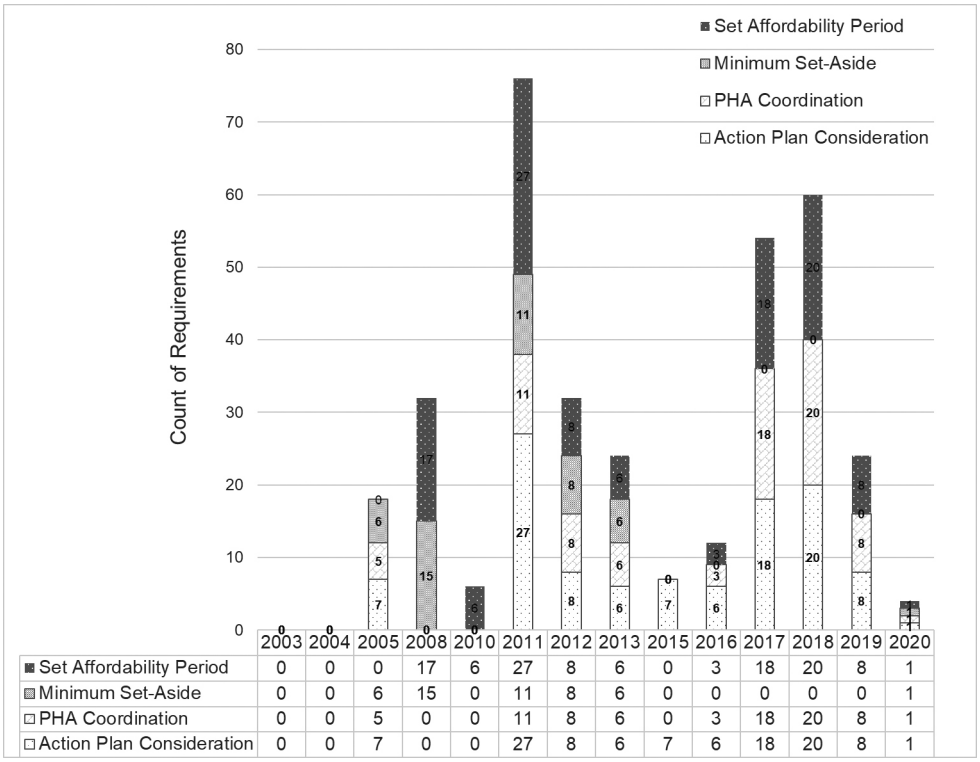
3. **Minimum Amount Set-Aside:** To prioritize rental housing development, a minimum percentage of CDBG-DR funds must be allocated specifically for rental housing projects. This requirement aims to ensure that renters receive adequate support and that the rental housing market is not neglected in the recovery process.

4. **Set Affordability Period:** CDBG-DR grantees are required to designate a certain period to ensure that rental units developed with the funds remain affordable. This requirement ensures that rental housing remains accessible to low- and moderate-income households beyond the immediate post-disaster period.

To understand how these rental requirements have evolved since their inception, the authors review and track all *Federal Register* notices related to CDBG-DR fund allocation from 2003 to 2020. Exhibit 1 presents the temporal evolution of rental requirements for each of the four categories by their counts. Note that, in certain cases, a CDBG-DR grant was awarded to a state grantee, and other grants from the same disaster were awarded directly to a local government grantee in that state. In such cases, despite a geographic overlap issue regarding which local areas see the implementation of the grant along with the rental requirements because they are two different grants, the authors track the category of rental requirements separately in each grant and add their counts in exhibit 1. Another caveat is that, in other cases, a state grantee could have received multiple CDBG-DR grants resulting from the same disaster event. Although the latter grants could be an extension of initial or earlier ones, because rental requirements could be added or dropped in between, the authors capture them per CDBG-DR grant and normalize the count of requirements by the number of grants (exhibit 2).

Exhibit 1

Temporal Evolution of Rental Requirements in Community Development Block Grant Disaster Recovery



	2003	2004	2005	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020
Set Affordability Period	0	0	0	17	6	27	8	6	0	3	18	20	8	1
Minimum Set-Aside	0	0	6	15	0	11	8	6	0	0	0	0	0	1
PHA Coordination	0	0	5	0	0	11	8	6	0	3	18	20	8	1
Action Plan Consideration	0	0	7	0	0	27	8	6	7	6	18	20	8	1

PHA = public housing authority.

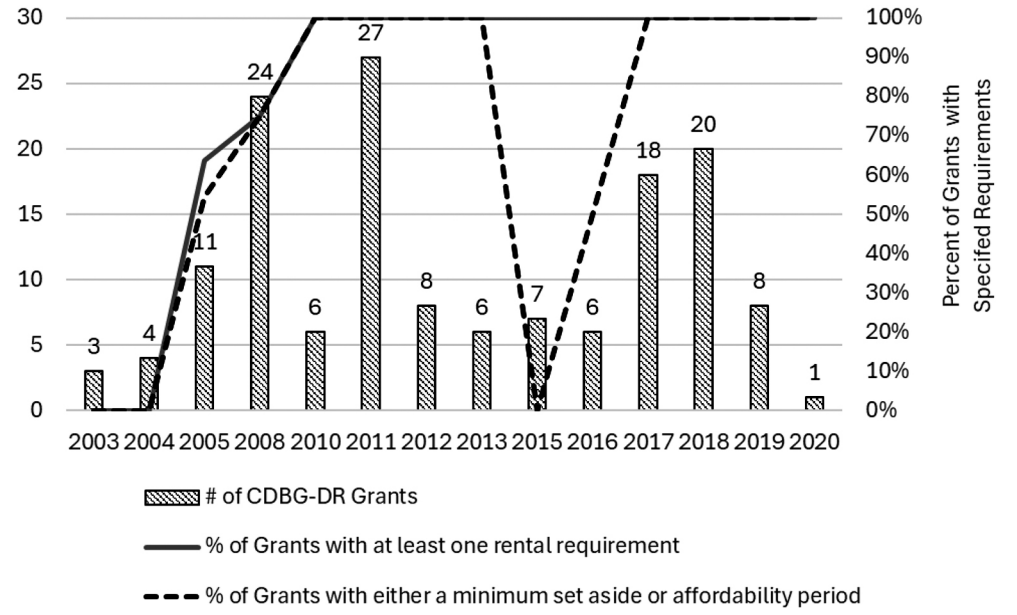
Sources: HUD Disaster Recovery Grants Reporting System; Office of the Federal Register; Code of Federal Regulations

One can observe several trends from exhibit 1. First, except for the years 2008 and 2010, action plan consideration for renters and multifamily rental housing was consistently required in the allocation of CDBG-DR funding to state and local grantees. Logically, action plan consideration, which lays out the plan for rental housing recovery, should be the first step in implementing CDBG-DR for renters and rental housing. As such, the requirement appeared throughout the study period. The requirement of coordinating with local PHAs appeared in tandem with the action plan consideration, although it was not always required.

Interestingly, the minimum set-aside was frequently used from 2005 to 2013, when it was statutorily required, but it was not required from 2015 to 2020. During this latter period, HUD's legal authority to require a minimum set-aside became less clear. Instead, the set affordability period requirement was most frequently stipulated. Although the set affordability period requirement should be helpful in the recovery of affordable rental housing in the longer term, the sporadic stipulation of the minimum set-aside requirement and its absence in recent years pose a question as to whether enough rental housing has been built to stabilize the market post disasters.

Exhibit 2

Rental Requirement Incidence as Share of CDBG-DR Grants



CDBG-DR = Community Development Block Grant Disaster Recovery.
Sources: HUD Disaster Recovery Grants Reporting System; Office of the Federal Register; Code of Federal Regulations

Still, the overall prevalence of rental requirements in administering CDBG-DR funding has grown during the years. Exhibit 2 presents the number of grants with the requirements as a share of the total number of CDBG-DR grants by year. It shows two figures in percentages—the first is the number of grants with at least one rental requirement, and the next is the number of grants with either a minimum set-aside or affordability period. By these two metrics, one can see that all CDBG-DR grants since 2010 have had at least one rental requirement, and except for 2015, they all also had either a minimum set-aside or a set affordability period requirement. The growing presence of rental requirements in CDBG-DR during the past 2 decades makes it possible to evaluate whether they have had any effect on the rental housing market.

Case Study: Colorado 2013

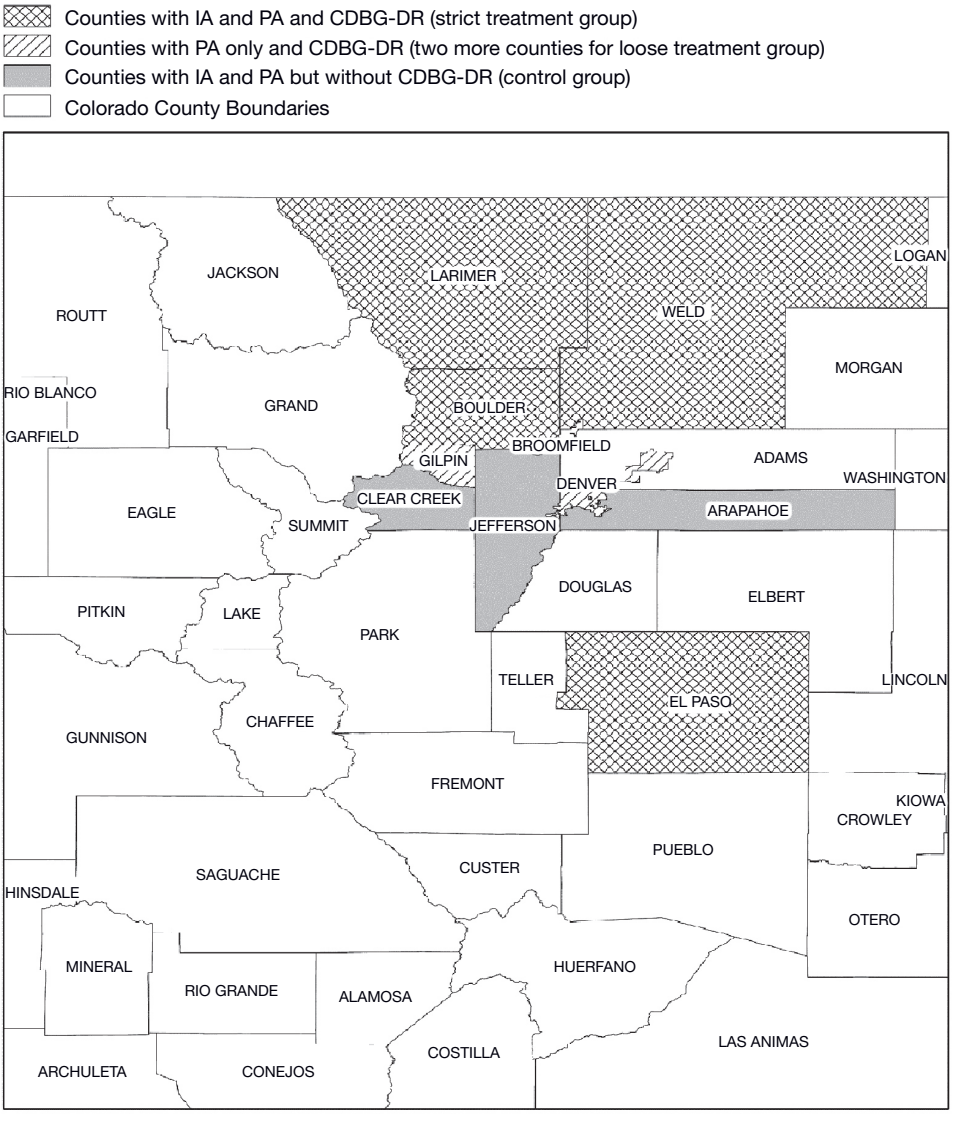
In September 2013, a large section of the state of Colorado experienced severe storms, mudslides, landslides, and flooding, prompting the presidential declaration of a major disaster.[1] This case triggered the allocation of CDBG-DR to certain counties but not to all those affected by the disaster. Therefore, this case creates an ideal setting for evaluating these counties as comparable treatment and control geographic areas. Furthermore, as exhibit 3 shows, both (the strict) treatment and control groups received FEMA IA and PA, with the only major difference being the receipt of a

[1] Federal Emergency Management Agency. 2013. "Colorado Severe Storms, Flooding, Landslides, and Mudslides: DR-4145-CO." https://www.fema.gov/disaster/4145.

CDBG-DR grant. To be clear, the CDBG-DR funds in the selected case study had all four rental requirements in place, suggesting that their effect on the rental housing market could be captured when compared with the disaster-impacted areas that did not receive CDBG-DR.[2]

Exhibit 3

Treatment and Control Area Among the DR-4145 Impacted Counties



CDBG-DR = Community Development Block Grant Disaster Recovery. IA = Individual Assistance. PA = Public Assistance.

Sources: Federal Emergency Management Agency Disasters and Other Declarations; HUD Disaster Recovery Grants Reporting System

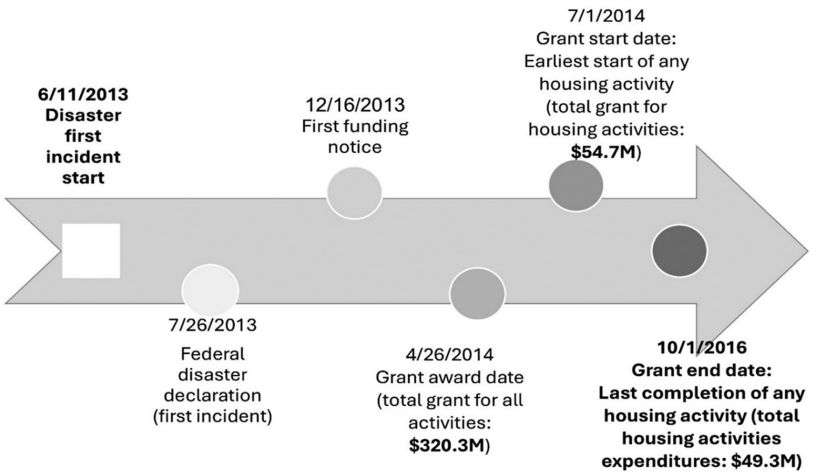
[2] However, as acknowledged, it is unclear in this case which rental requirements among the four categories drive the observed relationship with the outcome of multifamily rents. This limitation is addressed again in the Discussion and Conclusions section.

Three more factors make this case suitable for studying the policy impact on multifamily rents. First, the timing of the disaster was such that the rental requirements were not applied retroactively but consistently throughout the study period. Next, the occurrence of the disaster was relatively isolated from the effects of the Great Recession, which may have affected multifamily rents unrelated to the disaster. Last but not least, this part of Colorado did not have any disasters of a similar scale that elicited both IA and PA policy responses during most of the study period in this select case. FEMA's disaster database indicates that from 2000 to 2023, no other presidentially declared disasters in Colorado triggered both IA and PA, except for the COVID-19 pandemic in 2020 and wildfires and straight-line winds in 2022.[3,4,5] This unique disaster timing ensures that study estimates will be less confounded by other overlapping disasters compared with other cases in which multiple disasters may serially hit the study area.

Before introducing data and methods, understanding the specific timeline of this disaster case and the subsequent CDBG-DR policy responses is key. Exhibit 4 illustrates the timeline for when the disaster's first incident started (June 11, 2013), federal disaster declaration was made (July 26, 2013), the first CDBG-DR funding was notified (December 16, 2013), and $320.3 million was awarded as the grant (April 24, 2014). The CDBG-DR grant started on July 1, 2014, and $54.7 million was allocated to housing activities. The grant's performance ended on October 1, 2016, with $49.3 million spent on housing activities.

Exhibit 4

Policy Response Timeline of "Colorado Severe Storms, Flooding, Landslides, and Mudslides: DR-4145-CO" Emergency Grant



Sources: HUD Disaster Recovery Grants Reporting System; Federal Emergency Management Agency. 2013. "Colorado Severe Storms, Flooding, Landslides, and Mudslides: DR-4145-CO." https://www.fema.gov/disaster/4145

[3] Federal Emergency Management Agency. 2020. "Colorado Covid-19 Pandemic: DR-4498-CO." https://www.fema.gov/disaster/4498.

[4] Federal Emergency Management Agency. 2021. "Colorado Wildfires and Straight-line Winds: 4634-DR-CO." https://www.fema.gov/disaster/4634.

[5] The nearest major disaster that triggered both IA and PA before the study period is DR-1276-CO "Designated Areas: Disaster 1276" for a severe storm in 1999. Although it occurred a year before the first year of the study period, it is substantially far off from the year 2013, when the disaster event in this study occurred.

The timeline of the CDBG-DR award and its completion in this case study is quicker than average. In their review of timing and factors associated with housing activities in CDBG-DR funding, Martín, Teles, and DuBois (2022) found that housing recovery programs across all housing activity types in CDBG-DR had taken an average of 3.8 years from the point of the disaster declaration to completion. All programs in the CDBG-DR grants took an average of 4.7 years to complete.

In this select case, both housing recovery programs and all others took only 3.19 years from the declaration date to the CDBG-DR grant completion, suggesting quicker policy responses than in the average case. Still, as the following sections empirically show, this time lag generates the necessary temporal variations in estimating the effect of CDBG-DR.

Data and Methods

The effect of CDBG-DR receipt on rental outcomes is tested by comparing three groups of ZIP Codes: (1) the disaster-declared areas that received CDBG-DR, IA, and PA, referred to here as the "strict treatment" group; (2) the disaster-declared areas that received CDBG-DR and IA or PA, *or* both, referred to as the "loose treatment" group; and (3) the disaster-declared areas that received IA and PA but not CDBG-DR, referred to as the "control" group. Treatment status coding (that is, receipt of CDBG-DR) is derived from FEMA's disaster declaration database and HUD's Disaster Recovery Grants Reporting (DRGR) system. Specifically, all local jurisdictions (that is, cities and counties) that directly received CDBG-DR either from state grantee Colorado or from HUD are tracked in the DRGR data.

As exhibit 3 shows, four counties—Boulder, El Paso, Larimer, and Weld—compose the strict treatment group. They received IA and PA and later CDBG-DR.[6] Two counties—Denver and Gilpin—received PA but not IA, but they were later awarded CDBG-DR. The loose treatment group is created by adding these two counties to the four strict treatment counties.[7] Three counties—Arapahoe, Clear Creek, and Jefferson—received IA and PA but not CDBG-DR. They serve as the control group.

The primary outcome variable is the quarterly ZIP Code-level average effective rent of multifamily apartments reported by CoStar Group. These rents are weighted averages by the number of buildings and units in each ZIP Code within CoStar Group's database, and they are reported net of rental concessions. The authors downloaded the ZIP Code-level quarterly data from 2000 to 2023 by hand for nine counties in Colorado, all affected by severe storms, flooding, landslides, and mudslides in 2013.[8]

[6] Adams County also received both IA and PA and later CDBG-DR, making the strict treatment group list as well. However, ZIP Code-level multifamily rent data from CoStar Group are unavailable for Adams County. Hence, they are excluded from the analysis.

[7] This procedure is because the control group received both IA and PA. To account for this addition, the strict treatment group should have received both IA and PA as well, whereas the loose treatment group added the ZIP Codes in two more counties that also received CDBG-DR and PA but not IA.

[8] Federal Emergency Management Agency. 2013. "Colorado Severe Storms, Flooding, Landslides, and Mudslides: DR-4145-CO." https://www.fema.gov/disaster/4145.

The authors control for additional factors that may affect rents, such as population, household income, educational attainment, unemployment rate, renter share, multifamily units share, elderly population share, White share, and the share of newly constructed units. ZIP Code-level estimates of these variables are obtained from the U.S. Census Bureau's American Community Survey (ACS) 5-year data, longitudinally, from 2007–2011 to 2017–2021. The monthly building permit data are extracted from HUD's State of the Cities Data Systems (SOCDS), which are available at the county level through 2022 and aggregated to quarterly intervals.

To gauge the effect of CDBG-DR on multifamily rental markets, the quarterly rents are tracked for many quarters before and after the disaster, using a difference-in-differences (DiD) method. The disaster began in the third quarter of 2013, and the housing activities of CDBG-DR and its funding performance ended in the third quarter of 2016. Hence, the third quarter of 2016 and onward is set as the post-treatment period. All the preceding year-quarters are the pretreatment period. Later, the treatment intervention timing is set at the onset of the disaster (that is, the declaration date) as a placebo test.

Two major model specifications are used. The first is a DiD model with two-way fixed effects (FEs), namely both ZIP Code and year-quarter FEs. The second model is the same DiD with year-quarter FEs only. It includes the following time-varying ZIP Code-level control variables from ACS and HUD SOCDS in place of the ZIP Code FEs: log of population, log of median household income, share of adult population with bachelor's degree, unemployment rate, share of renters, share of multifamily housing units, share of elderly population (aged 65 and older), share of non-Hispanic Whites, and share of rental housing units constructed after the year 2000.

The model with ZIP Code FEs yields more observations because the data start from 2000, whereas the model without ZIP Code FEs has fewer observations because our ACS data start from 2007–2011. Although the main dependent variable is the log of effective rent per unit, one mechanism through which CDBG-DR affects multifamily rent is also examined: the construction of multifamily housing during recovery. To this end, the number of building permits logged is considered, especially for multifamily housing construction, as another interim outcome variable.

Results

The results reported in exhibit 5 show the effects of CDBG-DR on market-rate multifamily rents. As introduced in the Data and Methods section, the exhibit presents two treatment groups: (1) ZIP Codes in counties that received either IA or PA and then CDBG-DR (loose treatment group) and (2) ZIP Codes in counties that received both IA and PA and then CDBG-DR (strict treatment group). The control group is a set of ZIP Codes in counties that received both IA and PA but not CDBG-DR. Models 1 and 2 report the results with a loose treatment group, and models 3 and 4 show the findings with a strict treatment group. Both models 1 and 3 report the results without ZIP Code FEs but with their time-varying controls, and models 2 and 4 present the findings with ZIP Code FEs.

Exhibit 5

The Effect of CDBG-DR on Market-Rate Multifamily Rents

Dependent Variable: ln (Effective Rent per Unit)				
Variables	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
Treatment	*Omitted:* IA and/or PA with CDBG-DR	*Omitted:* IA and/or PA with CDBG-DR	*Omitted:* IA and PA with CDBG-DR	*Omitted:* IA and PA with CDBG-DR
Post-CDBG-DR Grant Completion	0.570***	0.508***	0.576***	0.507***
	(0.010)	(0.021)	(0.010)	(0.021)
Treatment * Post-CDBG-DR Grant Completion	**– 0.058*** (0.012)**	**– 0.046*** (0.010)**	**– 0.057*** (0.014)**	**– 0.040*** (0.011)**
ZIP Code-level controls?	No	Yes	No	Yes
Year-Quarter fixed effects?	Yes	Yes	Yes	Yes
ZIP Code fixed effects?	Yes	No	Yes	No
Adjusted R2	0.9748	0.9764	0.9752	0.9768
Observations	12,672	6,864	10,656	5,772

CDBG-DR = Community Development Block Grant Disaster Recovery. IA = Individual Assistance. PA = Public Assistance.

**** $p < 0.001$.*

Notes: Robust standard errors clustered by ZIP Codes in parenthesis. ZIP Code-level controls are the log of population, log of median household income, share of adult population with bachelor's degree, unemployment rate, share of renters, share of multifamily housing units, share of elderly population, share of non-Hispanic Whites, and share of rental housing units constructed after the year 2000.

Source: Authors' analysis based on CoStar, Federal Emergency Management Agency, HUD, and U.S. Census Bureau data

Results across all four models show that the ZIP Codes that received CDBG-DR saw a larger decrease in rent growth on average—between 4.0 to 5.8 percent—following the grant completion than those exposed to the same disaster but not awarded the CDBG-DR grant. To be clear, this finding does not necessarily mean that the level of rent went down in the ZIP Codes that received CDBG-DR, rather that they experienced a less steep increase in rent compared with the ZIP Codes not awarded CDBG-DR. The effect size of monthly rent translates in dollar value as of 2023 to $60 (4.0 percent of $1,510) to $90 (5.8 percent of $1,547). In contrast, the start of the post-treatment period is set to the onset of the natural disasters (third quarter of 2013) as a placebo test. As expected, in appendix exhibit A3, the relationships between CDBG-DR and rents are not uncovered, underscoring the importance of considering the right timing for policy intervention.

To put the findings into perspective, how these ZIP Code rents (the strict and loose treatment group and the control group) fared in the aftermath of the disaster event is also measured compared with the nearby ZIP Codes not exposed to the hazards (no-disaster designation group), using the same DiD model with two-way FEs. The temporal descriptive averages in effective rent per unit support the necessary parallel trends for DiD models for all these models. They are available in appendix exhibits A1 and A2.

The primary difference here is the timing of the post-event, which is the third quarter of 2013 (that is, natural disasters) instead of the third quarter of 2016 (that is, CDBG-DR completion). The results reported in appendix exhibit A4 show that the ZIP Codes that did not receive CDBG-DR later (original control group) experienced a 3.1-percent increase in rent compared with those not

affected by the disaster. On the other hand, the loose treatment group sees a 1.8-percent increase in rent relative to the no-disaster-designation group. The strict treatment group faces a 1.0-percent rent increase compared with the nearby ZIP Codes not affected by the disasters. However, this effect is not statistically distinguishable from zero.

These additional results also likely underscore the positive effect of CDBG-DR in lessening rising rents impacted by the disaster. The ZIP Codes that received CDBG-DR also experienced an increase in market-rate rent overall, but their slope of rent increase is much less steep than that of those exposed to the same disaster but did not receive CDBG-DR. Taken together, the findings signal that the CDBG-DR is strongly associated with a lessened disaster impact on market-rate rent.

Why might CDBG-DR be associated with less rent growth? The Colorado 2013 case study, in which local jurisdictions received CDBG-DR with all four major rental development requirements, suggests that the new, rapid construction of multifamily rental housing helps moderate rent increases in the aftermath of natural disasters. To test this possible mechanism, the authors run the same DiD model with the log of multifamily housing permits as the dependent variable. If CDBG-DR boosted the expedited construction of multifamily rental housing, a higher permit rate in the treatment groups relative to the control group is expected.[9]

The results in exhibit 6 support this hypothesis. The ZIP Codes that received CDBG-DR saw a higher rate of multifamily rental housing permits than those that did not receive CDBG-DR. This finding holds true regardless of whether the treatment group is a loose one (model 1) or a strict one (model 2). In contrast, such a pattern for single-family building permits (models 3 and 4) is not found, lending more support to the role of CDBG-DR working via multifamily rental housing construction.

Exhibit 6

The Effect of CDBG-DR on Multifamily Building Permits

Dependent Variable	ln (1 + Number of Multifamily Building Permits)		ln (1 + Number of Single-Family Building Permits)	
Variables	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
Treatment	*Omitted:* IA and/or PA with CDBG-DR	*Omitted:* IA and PA with CDBG-DR	*Omitted:* IA and/or PA with CDBG-DR	*Omitted:* IA and PA with CDBG-DR
Post-CDBG-DR Grant Completion	– 5.876***	– 5.856***	– 6.524***	– 6.615***
	(0.114)	(0.120)	(0.080)	(0.078)
Treatment * Post-CDBG-DR Grant Completion	**0.660*** **	**0.807*** **	**– 0.006**	**– 0.041**
	(0.069)	**(0.074)**	**(0.027)**	**(0.025)**
ZIP Code-level controls?	No	No	No	No
Year-Quarter fixed effects?	Yes	Yes	Yes	Yes
ZIP Code fixed effects?	Yes	Yes	Yes	Yes
Adjusted R^2	0.563	0.556	0.945	0.957
Observations	13,536	11,520	13,536	11,520

CDBG-DR = Community Development Block Grant Disaster Recovery. IA = Individual Assistance. PA = Public Assistance.
**** $p < 0.001$.*
Note: Robust standard errors clustered by ZIP Codes in parentheses.
Source: Authors' analysis based on CoStar, Federal Emergency Management Agency, HUD, and U.S. Census Bureau data

[9] Please note that the building permit data are from HUD's SOCDS database.

However, this result could be merely one of various possible mechanisms. For instance, it is unknown how resident out-migration affects the relationships uncovered in these models. If out-migration systematically happens at a larger scale, it would lower the demand for rental housing and, therefore, lower rent. In those circumstances, the construction of rental housing due to CDBG-DR rental development requirements likely outpaces such out-migration forces, and the net effect is still increased rental housing supply rather than reduced demand. Future studies could jointly consider both the demand and supply of rental housing in the aftermath of natural disasters in their empirical models.

Discussion and Conclusions

This study contributes to a scholarly understanding of the important but understudied CDBG-DR funding in two ways. First, it documents the extent and evolution of rental requirements among CDBG-DR grants. The authors found that since their introduction in 2005, rental requirements have become a permanent fixture of CDBG-DR grants. Every CDBG-DR grant in the 2010s had at least one attached rental requirement, and nearly every instance had either a minimum set-aside or an affordability period. Second, the study presents a case study of CDBG-DR's effect on rents and housing supply. The case of Colorado's 2013 storms had all four rental requirements, and another presidentially declared major disaster during the bulk of the study timeline (2000–2020) did not affect the counties in question. The authors found that rent increases were slower in disaster-affected ZIP Codes that received CDBG-DR than those that did not receive CDBG-DR but received only FEMA's Individual Assistance and Public Assistance funding. This pattern was the case regardless of whether CDBG-DR recipient ZIP Codes were awarded IA, PA, or both. The authors also found that multifamily permitting increased in disaster-affected ZIP Codes, with CDBG-DR relative to control ZIP Codes that received IA and PA but not CDBG-DR.

The authors' methodology presents one way to evaluate the effect of CDBG-DR on rental housing. Their externally valid case provides a "best case scenario" with no overlapping disasters and no major macroeconomic shocks but with local variation in disaster declaration and aid receipt between FEMA and CDBG-DR. As such, study results provide a clean estimation of CDBG-DR's effect on rents and housing supply. The study is likely generalizable to similarly clear-cut cases. However, for more complex cases with overlapping disasters, macroeconomic shocks, or less clear spatial treatment or variation, research will require additional care in estimating impacts.

These results are encouraging for the policy impact of CDBG-DR, even with the caveats mentioned previously. CDBG-DR is the largest source of disaster recovery funding in the United States. Even if the mechanisms are not fully understood, seeing its design has a positive effect on renters in slowing down rent growth and creating more multifamily redevelopment is encouraging. It suggests that rental requirements have helped balance out CDBG-DR's prior lean toward homeowners in housing recovery.

Such rental requirements may be even more effective in fostering equitable recovery outcomes for renters if combined with other adjustments to policy and funding processes for CDBG-DR. Those adjustments may include better information sharing and process alignment between HUD and other federal disaster recovery agencies, more resources provided to grantees to communicate

with residents about CDBG-DR regulations and timelines, and more guidance for residents to understand what expenses CDBG-DR funds can and cannot cover (Drew, 2024).

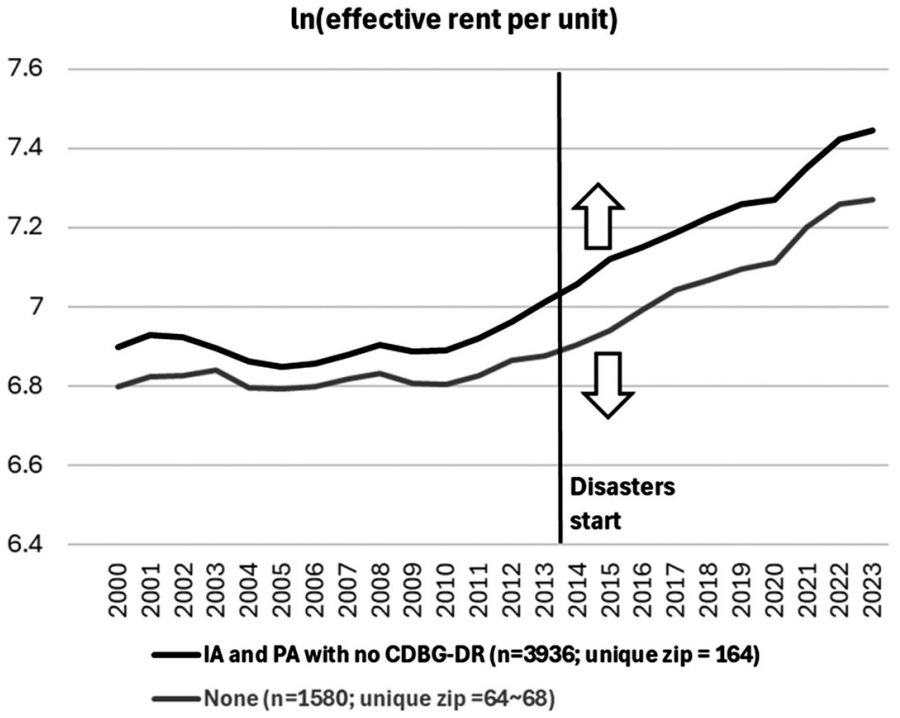
In addition, faster allocation and implementation of CDBG-DR funding would facilitate better outcomes for all households, but especially renters who are less likely to have insurance or reserve funds to weather gaps between a disaster and receipt of assistance (Drew, 2024; Martín, Teles, and DuBois, 2022). A key solution to speeding up fund delivery would be the permanent authorization of CDBG-DR funds to all state and local governments that experience major disasters. However, only an act of Congress made after and specific to each disaster may currently provide CDBG-DR assistance. This cumbersome process not only lengthens the time to receive funds but also means the rules and requirements applicable to CDBG-DR funds are rewritten for each disaster, creating uncertainty and inconsistency across grantees and complicating disaster response processes. Thus, the evaluation presented here provides additional support for CDBG-DR to receive permanent statutory authority, which would greatly relieve some of its operational challenges when disasters strike (Martín, 2021).

Despite the promising results obtained, this study suffers from limited external validity because it is a single case study. Future research can use a comparative study design to better understand the role of different rental requirements in CDBG-DR. Ideally, researchers could leverage variation in rental requirements across disaster and CDBG-DR grant cases, using them as the main variables of interest. Also, qualitative research that addresses renters' lived experiences and any challenges and opportunities developers and local housing authorities face with respect to rental housing redevelopment and rental housing assistance during the implementation of CDBG-DR could complement this study's quantitative research focused on the rental housing market.

Appendix A

Exhibit A1

Parallel Trend Between the Group With IA and PA but Without CDBG-DR, or Original Control Group, and no Designation Group

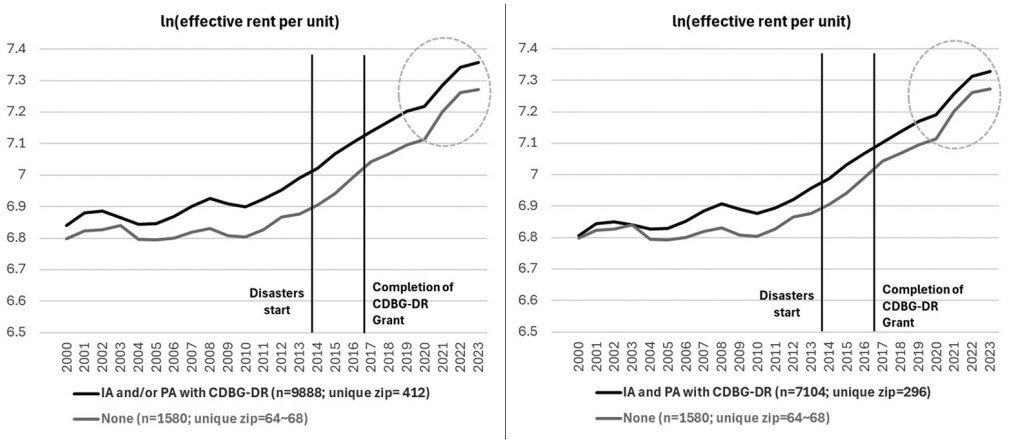


CDBG-DR = Community Development Block Grant Disaster Recovery. IA = Individual Assistance. PA = Public Assistance.

Sources: CoStar Multifamily Rent; Federal Emergency Management Agency Disasters and Other Declarations; HUD Disaster Recovery Grants Reporting System

Exhibit A2

Parallel Trend Between the Loose (IA or PA, or Both, With CDBG-DR) and Strict Treatment (IA and PA With CDBG-DR) and no Designation Group



CDBG-DR = Community Development Block Grant Disaster Recovery. IA = Individual Assistance. PA = Public Assistance.

Notes: The figures descriptively show parallel trends in the multifamily rent between the loose and strict treatment groups and the no designation group (that is, not impacted by the natural disasters). Post-completion of CDBG-DR grant activities shows a lessening in the gap of natural log of effective rent per unit between the groups (highlighted in a dotted circle), likely indicating the recovery impact of the CDBG-DR grant on rental housing market.

Sources: CoStar Multifamily Rent; Federal Emergency Management Agency Disasters and Other Declarations; HUD Disaster Recovery Grants Reporting System

Exhibit A3

Placebo Test for Table 1 Using the Fake Policy Intervention Timing

Dependent Variable: ln (effective rent per unit)				
Variables	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
Treatment	*Omitted:* IA and/or PA with CDBG-DR	*Omitted:* IA and/or PA with CDBG-DR	*Omitted:* IA and PA with CDBG-DR	*Omitted:* IA and PA with CDBG-DR
Post-Disaster (third quarter of 2013)	0.284***	0.193***	0.287***	0.196***
	(0.011)	(0.015)	(0.011)	(0.015)
Treatment * post-disaster	– 0.007	0.014	– 0.014	0.009
	(0.010)	(0.010)	(0.010)	(0.010)
ZIP Code-level controls?	No	Yes	No	Yes
Year-Quarter fixed effects?	Yes	Yes	Yes	Yes
ZIP Code fixed effects?	Yes	No	Yes	No
R-squared	0.9732	0.9752	0.9736	0.9759
Observations	12,672	6,864	10,656	5,772

CDBG-DR = Community Development Block Grant Disaster Recovery. IA = Individual Assistance. PA = Public Assistance.

**** $p < 0.001$.*

Note: Robust standard errors clustered by ZIP Codes are in parentheses.

Source: Authors' analysis based on CoStar, Federal Emergency Management Agency, HUD, and U.S. Census Bureau data

Exhibit A4

The Effect of Natural Disaster on Multifamily Market-Rate Rent

Dependent Variable: ln (Effective Rent per Unit)	Model (1)	Model (2)	Model (3)
Treatment (versus no designation)	Treatment Group *Omitted:* IA and PA but without CDBG-DR (i.e., original control group)	Treatment Group *Omitted:* IA and/or PA with CDBG-DR (i.e., loose treatment group)	Treatment Group *Omitted:* IA and PA with CDBG-DR (i.e., strict treatment group)
Post-Disaster (third quarter of 2013)	0.250***	0.267***	0.272***
	(0.010)	(0.008)	(0.009)
Treatment * post-disaster	**0.031*** **	**0.018** **	**0.010**
	(0.007)	(0.007)	(0.007)
Year-Quarter fixed effects?	Yes	Yes	Yes
ZIP Code fixed effects?	Yes	Yes	Yes
R-squared	0.9837	0.9778	0.9796
Observations	5,516	11,468	8,684

CDBG-DR = Community Development Block Grant Disaster Recovery. IA = Individual Assistance. PA = Public Assistance.

**** $p < 0.001$. ** $p < 0.05$.*

Note: Robust standard errors clustered by ZIP Codes are in parentheses.

Source: Authors' analysis based on CoStar, Federal Emergency Management Agency, HUD, and U.S. Census Bureau data

Appendix B. Examples of Rental Requirements in CDBG-DR

Action Plan Consideration

"The Action Plan must contain (1) An impact and unmet needs assessment. Each grantee must develop a needs assessment to understand the type and location of community needs to enable it to target limited resources to areas with the greatest need. At a minimum, the needs assessment must evaluate three core aspects of recovery— housing, infrastructure, and the economy (for example, estimated job losses). The assessment of emergency shelter needs and housing needs must address interim and permanent; owner and rental; single family and multifamily; public, HUD assisted, affordable, and market rate…"[10]

Coordination with Public Housing Authorities

"A description of how the grantee will identify and address the rehabilitation (as defined at 24 CFR 570.202), reconstruction, and replacement of the following types of housing affected by the disaster: public housing (including administrative offices), HUD-assisted housing (defined at subparagraph (1), above), McKinney Vento funded shelters and housing for the homeless—including emergency shelters and transitional and permanent housing for the homeless, and private market units receiving project-based assistance or with tenants that participate in the Section 8 Housing Choice Voucher Program. **As part of this requirement, the grantee must identify how it will address the rehabilitation, mitigation, and new construction needs of each impacted Public Housing Authority (PHA) within its jurisdiction. The grantee must work directly with the PHA in identifying necessary costs and ensure that adequate**

[10] Published in the Federal Register as a final rule on December 16, 2013. 78 Fed. Reg. 241.

funding is dedicated to addressing the unmet needs of damaged public housing. In its Action Plan, each grantee must set aside funding to specifically address the needs described in this subparagraph; Grantees are reminded that public housing is eligible for the Federal Emergency Management Agency (FEMA) Public Assistance and must ensure that there is no duplication of benefits when using CDBG-DR funds to assist public housing. Information on the public housing agencies impacted by the disaster is available on the Department's Web site."[11]

"To begin expenditure of CDBG–DR funds, the following expedited steps are necessary: Grantee adopts citizen participation plan for disaster recovery in accordance with the requirements of this Notice and the March 5, 2013, Notice; • Grantee consults with stakeholders, including required consultation with affected local governments and public housing authorities."[12]

Minimum Set Aside

"A description of how the grantee will identify and address the rehabilitation (as defined at 24 CFR 570.202), reconstruction, and replacement of the following types of housing affected by the disaster: public housing (including administrative offices), HUD-assisted housing (defined at subparagraph (1), above), McKinney Vento funded shelters and housing for the homeless—including emergency shelters and transitional and permanent housing for the homeless, and private market units receiving project-based assistance or with tenants that participate in the Section 8 Housing Choice Voucher Program. As part of this requirement, the grantee must identify how it will address the rehabilitation, mitigation, and new construction needs of each impacted PHA within its jurisdiction. The grantee must work directly with the PHA in identifying necessary costs and ensure that adequate funding is dedicated to addressing the unmet needs of damaged public housing. In its Action Plan, each grantee must set aside funding to specifically address the needs described in this subparagraph; Grantees are reminded that public housing is eligible for FEMA Public Assistance and must ensure that there is no duplication of benefits when using CDBG-DR funds to assist public housing. Information on the public housing agencies impacted by the disaster is available on the Department's Web site."[13]

Set Affordability Period

"Relocation assistance. The Section 104(d) relocation assistance requirements at section 104(d)(2)(A) and 24 CFR 42.350 are waived to the extent that they differ from the requirements of the URA and implementing regulations at 49 CFR part 24, as modified by this Notice, for activities related to disaster recovery. Without this waiver, disparities exist in relocation assistance associated with activities typically funded by HUD and FEMA (for example, buyouts and relocation). Both FEMA and HUD funds are subject to the URA; however, HUD's CDBG funds are also subject to Section 104(d), while FEMA funds are not. **The URA provides that a displaced person is eligible to receive a rental assistance payment that covers a period of 42 months.** By contrast, Section 104(d) allows a lower-income displaced person to choose between the URA rental assistance payment and a rental assistance payment calculated over a period of 60 months. This waiver of the

[11] Published in the Federal Register as a final rule on December 16, 2013. 78 Fed. Reg. 241.

[12] Published in the Federal Register as a final rule on December 16, 2013. 78 Fed. Reg. 241.

[13] Published in the Federal Register as a final rule on December 16, 2013. 78 Fed. Reg. 241.

Section 104(d) requirements assures uniform and equitable treatment by setting the URA and its implementing regulations as the sole standard for relocation assistance under this Notice."[14]

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The Effects of Minimum-Lot-Size Reform on Houston Land Values

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Abstract

In 1998, Houston policymakers cut minimum-lot-size requirements by about two-thirds—from 5,000 square feet to 1,400 square feet—within the center city. A 2013 expansion of this minimum-lot-size reform is the policy change at the center of this study. Relative to recent zoning changes intended to facilitate denser construction in single-family neighborhoods, such as those in Minneapolis and Oregon, Houston's reform has received less media attention but has facilitated greater rates of construction. One concern critics raise about increasing property owners' development rights is that the resulting greater option value of the land may increase the prices of the existing stock of housing, with the potential to worsen housing affordability, at least in the short term. This study uses a difference-in-differences design to estimate the effect of the 2013 reform on land values. Across many specifications, no evidence emerged that the reform increased land values, and in some models, the evidence showed that the reform reduced land values relative to land in the control group. This result may have occurred because Houston's reform has facilitated a large amount of housing construction. The downward pressure on rents due to increased housing supply—and downward pressure on land values as a result—may offset the effect of an increase in land's option value.

Section 1: Introduction

From California to Maine, policymakers are passing reforms intended to improve housing affordability by liberalizing land use restrictions that stand in the way of housing construction. Many recent reforms have focused on permitting slightly greater density per lot in existing neighborhoods of single-family houses (Manville, Monkkonen, and Lens, 2019).

Before this recent wave of reform, policymakers in Houston took a different approach to liberalizing the city's already relatively loose land use regulations. In 1998, they reduced the by-right minimum lot size from 5,000 square feet to 3,500 square feet within the city's I-610 Loop, permitting subdivisions to an average lot size of 1,400 square feet when each lot met open space requirements.

Then, in 2013, they extended the reform to cover all the land in the city with wastewater collection services. Since those reforms, tens of thousands of small-lot, single-family houses have been built across the city.

Some recent research (Freemark, 2020; Kuhlmann, 2021) on the effects of land use liberalization has found that land prices have increased after upzoning—policy changes that permit denser development than previous rules—presumably reflecting the greater option value of land following deregulatory reform. Houston is the only major U.S. city without use zoning, but its reforms permitting denser small-lot development over time can nonetheless be considered an example of upzoning. Just before passage of the 2013 reform, residents expressed concerns that permitting more density in Houston would have the effect of increasing land values and property taxes (Johnson, 2013). This article uses a difference-in-differences model to explore the effects of Houston's 2013 reform on assessed land values outside the I-610 Loop. The reform created a discontinuity in policy across a border, and the author exploits this discontinuity to estimate the causal impact of the 2013 reform. Estimates of the effect of the reform are sensitive to specification, but in some cases, the evidence shows that the 2013 reform had a negative effect on assessed land values. No evidence indicated that the reform increased land values.

Section 2 reviews the literature on minimum-lot-size requirements and the effects of upzoning on prices. Then, section 3 provides details on Houston's minimum-lot-size reform, as well as its land use restrictions and entitlement process more broadly. Section 4 presents the data, section 5 describes the methodology, section 6 provides the results, and section 7 concludes.

Section 2: Literature Review

This article contributes to the growing body of literature on the effects of land use regulations on house prices (Hamilton, 2020) and the effects of minimum-lot-size requirements in particular. Boudreaux (2016) explores the centrality of minimum-lot-size requirements to U.S. land use restrictions and determines that they are one of the most effective tools that local governments have for restricting population density and housing construction. He concludes that minimum-lot-size requirements benefit a locality's current residents who prefer low-density living while harming homebuyers and furthering segregation and sprawling patterns of development. Fischel (2004) points to minimum-lot-size requirements as a core tool that local government policymakers use to exclude low-cost housing developments and, as a result, low-income people. Gray and Furth (2019) study minimum lot size in Texas suburbs, which are some of the most liberally zoned, fastest-growing parts of the United States, and find evidence that actual lot sizes bunch together at some of these localities' required minimum lot sizes, indicating that lot-size requirements are likely binding.

One set of studies estimates the costs of minimum-lot-size requirements, finding that larger minimum-lot-size requirements lead to less housing construction (Glaeser, Schuetz, and Ward, 2006) and higher house prices (Zabel and Dalton, 2011). Gyourko and McCulloch (2023) use survey data to study the effects of minimum-lot-size requirements at borders between jurisdictions. They find that places with larger lot-size requirements have larger lots, slightly larger houses, and higher house prices. Some studies indicate that although relatively small lot-size requirements

may not bind construction, particularly large lot-size requirements do (Isakson, 2004; Kopits, McConnell, and Miles, 2009).

Glaeser and Gyourko (2003) point out that in highly constrained housing markets, houses with larger yards do not sell for substantial premiums over houses with smaller yards. In this context, the right to build a house on a lot contributes much more to its value than the size of the lot. Furth (2021) develops a model of the costs of minimum-lot-size and lot-coverage restrictions and uses data from Harris County and Dallas County to estimate those costs. He finds that minimum lot sizes bind in most cases, even in these relatively liberally regulated places.

In a study of vacant lot sales, White (1988) finds that minimum-lot-size requirements are binding and that, *ceteris paribus*, relaxing the lot-size requirement for one parcel would increase its value. White makes the important point that the price effect of liberalizing land-use restrictions in a small area cannot be extrapolated to estimate the price effect of broad-based land-use deregulation:

> [My] results show the difference in land prices under a market equilibrium with zoning. The estimated coefficients cannot be used to infer either the magnitude or direction of land price changes if the zoning on a significant portion of the lots in the residential land market was to be changed. Grieson and White [1981] showed, using a general equilibrium model, that in such a case the prices of all land and structure would change. Therefore, the results are evidence that zoning is binding; they are not an estimate of what land prices would have been with no zoning in the market.

A few studies examine the effects of Houston's lot-size reforms. Gray and Millsap (2020) find that the 1998 reform created a by-right process for development that was previously being permitted within the I-610 Loop through variances. Following the rule change, however, townhouse construction shifted to higher-income neighborhoods relative to where it had taken place through the variance process. Mei (2022) studies the effect of Houston's 1998 lot-size reform on house size and finds that the policy change reduced the size of new-construction houses, as expected. He also finds that a typical Houston household benefited from the reform by a windfall equivalent to $18,000, with lower-income households benefiting more than higher-income households. Wegmann, Baqai, and Conrad (2023) study the factors that lead to single-family houses being redeveloped as smaller-lot single-family houses in Houston. They find that this accounts for only 20 percent of townhouse development, with the rest occurring on commercial, industrial, or vacant land. They also report that townhouses most often replace single-family houses on relatively large lots within I-610, displacing relatively low-value houses in areas with relatively high house prices.

This article is most similar to Shortell's (2022) master's thesis on the same 2013 Houston lot-size reform, analyzing the effects of the reform on residential properties in Harris County outside the city of Houston relative to land inside the border but outside the I-610 Loop. Shortell finds that the reform increased the value of land and houses in unincorporated Harris County. Using a different

study design, this study finds some evidence of a negative effect of the reform on land prices and no evidence of a statistically significant positive effect.[1]

In addition to the literature on minimum-lot-size requirements, this study builds on recent studies of the effect of upzoning on land prices. Freemark (2020) uses land use liberalization surrounding Chicago transit stations in 2013 and 2015 to study the effect of zoning liberalization on property sale prices and building permits. Using a difference-in-differences approach, he finds evidence that those policy changes increased prices by 15 to 23 percent but did not increase permitting during his study period.

Kuhlmann (2021) studies the effects of a Minneapolis planning reform on house prices. In 2019, Minneapolis policymakers adopted a new, binding comprehensive plan that permits up to three units on all residential lots. As is the case with Houston's lot-size reform in many of its single-family neighborhoods, the Minneapolis triplex reform permits three houses to be built where only one was permitted previously. Relative to Houston, however, the Minneapolis reform permits much less new residential square footage because of its limits on the height and bulk of new triplexes. Kuhlmann uses hedonic regression, comparing houses near Minneapolis borders to those outside it with a difference-in-differences study design. He estimates that the option to replace single-family houses with triplexes in Minneapolis increased single-family house prices by 3 to 5 percent. Whereas Houston has seen extensive small-lot development following its policy changes, Minneapolis has seen only a small number of duplexes and triplexes built due to its reform.

Kuhlmann writes that land use reforms that lead to increased housing construction "must first increase the price of affected houses" (2021: 385). Is this true? Increasing the rate at which landowners put their properties on the market for potential sale to home builders perhaps requires upzoning to increase the price of the affected properties. However, in general, developers and home builders will provide more housing until the marginal revenue is equal to the marginal cost. Upzoning may facilitate increased housing supply by lowering the unit cost of building, regardless of its effect on the prices of land and rental rates. In addition, new development will have positive and negative local externalities, including potentially facilitating the improvement of neighborhood amenities or causing congestion disamenities. In different conditions, upzoning could potentially increase or decrease property values.

Phillips (2022) draws a distinction between geographically narrow upzonings and broader upzonings, such as the Minneapolis example. He defines the "zoning buffer" as the difference between a city's current housing stock and the total number of housing units permissible under its zoning code. He argues that in cases where broad upzoning creates new development opportunities on many new parcels, it may have a small effect on land prices. Houston's 2013 reform is an

[1] Some of the land in Shortell's untreated group is part of Houston's Extraterritorial Jurisdiction, which was subject to the same reform in 1998 as land in the city but is located outside I-610; small-lot development has been permitted there since 1998 with compensating open space. Shortell uses Harris County Appraisal District (HCAD) data on individual parcels with no reported clustering of standard errors. Section 4 explains why the data in this study are aggregated to the level of HCAD's neighborhoods and standard errors are clustered at the census tract level. Whereas Shortell chose to study the effects of the 2013 reform on land outside the I-610 Loop but inside Houston's city limits, section 4 proposes that estimating the effect on land outside I-610 relative to land inside it is the best study design for identifying effects of the reform.

example of very broad upzoning in a region characterized by a large zoning buffer both before and after the reform.

In the extreme, upzoning a single parcel in a tightly constrained housing market very likely will increase that parcel's land value. But in a much broader context, land prices are higher in markets where land use restrictions are more binding than in markets where they are less binding. Land prices ultimately reflect the net present value of the stream of income that land can produce (in urban areas, generally rents for buildings). In a case where upzoning leads to a large amount of newly built space, the effect on reduced rents may be equal to or greater than the value of the right to build more on a given piece of land.

The effects of a specific reduction in minimum-lot-size requirements thus depend on the extent to which land use restrictions limit housing construction before the zoning change and the extent to which the upzoning facilitates construction that puts downward pressure on rents and potential positive or negative externalities of new construction. This study builds on past work on minimum-lot-size requirements and land use deregulation by analyzing the effects of an upzoning that, unlike the policy changes in Chicago and Minneapolis, has facilitated extensive construction of a type of housing that was not permitted previously. That change took place in what was already the least regulated land market among large U.S. cities.

Section 3: Houston Land Use Regulations and Minimum-Lot-Size Reform

In Houston, zoning proposals have been on the ballot three times, and three times residents have voted against adopting a zoning ordinance. The city's relative permissiveness toward housing construction has helped it maintain a median house price below the national median in spite of decades of population growth faster than national population growth (Zillow, 2022a). Comparing Houston to other fast-growing Sunbelt metropolitan areas again paints a favorable picture of its relative affordability. Selecting benchmarks for affordability in Houston, this study uses other Sunbelt cities that do not have major geographic barriers to development and excludes California cities due to statewide affordability problems. Because the city of Houston makes up a disproportionately large share of its metropolitan area relative to other principal cities, the study compares prices at the regional level. Houston has a lower median house price than all the other Sunbelt regions with more than 2 million residents except San Antonio, as shown in exhibit 1. Adjusting for income, Houston is the most affordable of the regions, with a median house price 3.3 times its median income. Median house price divided by median household income for all the regions is shown in exhibit 2.

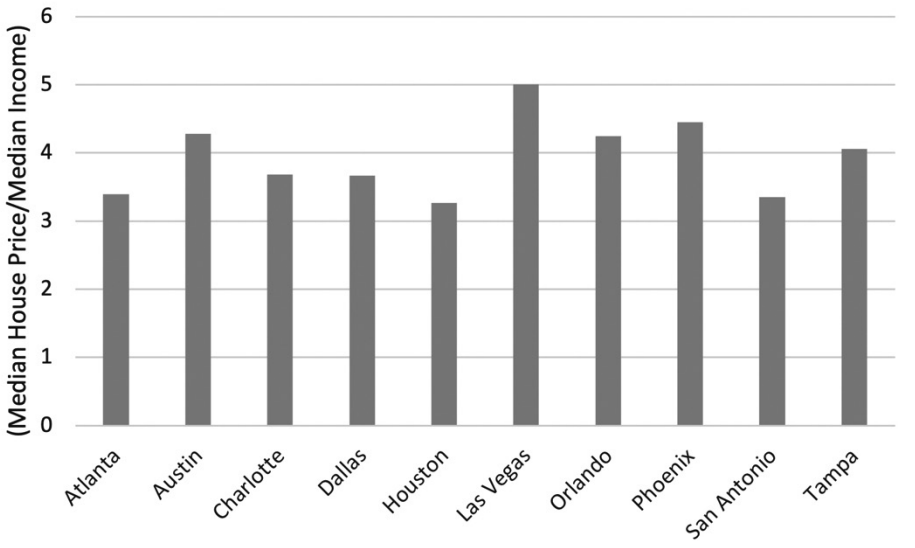
Exhibit 1

Median House Prices Across Metropolitan Statistical Areas (in 2021 dollars)

Source: Zillow, 2022b

Exhibit 2

Median House Price Relative to Median Household Income



Sources: U.S. Census Bureau, 2022; Zillow, 2022b

Putting Houston's minimum-lot-size reform in context, at the time of the 2013 reform, the median lot size for a new-construction single-family house in Houston outside the I-610 Loop was about

5,500 square feet. By comparison, new-construction houses nationwide have a median lot size between 7,000 and 8,999 square feet (U.S. Census Bureau, 2023).

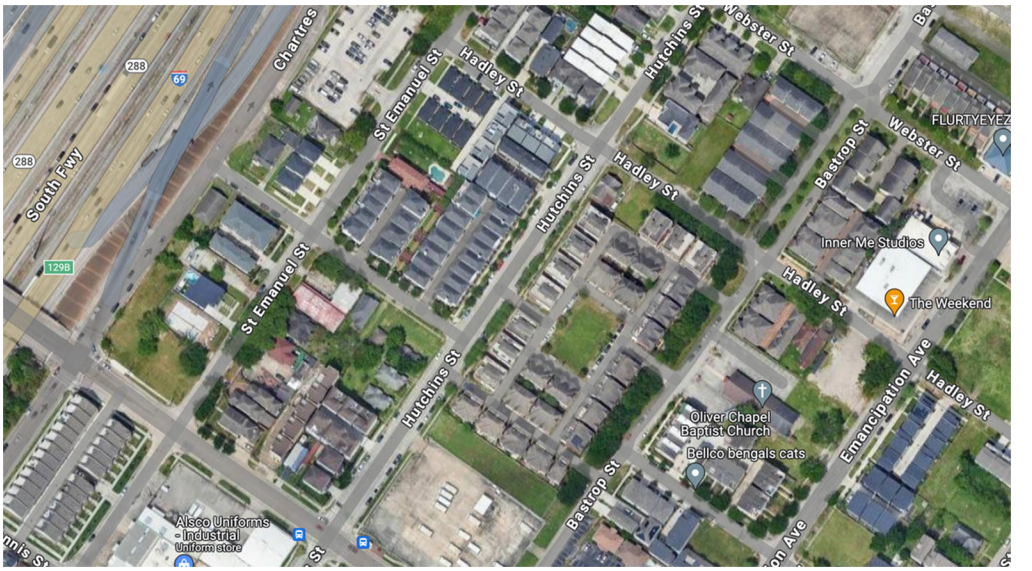
Although before 1998, the city's minimum-lot-size requirement for detached houses was 5,000 square feet, attached townhouses were allowed by-right on lots as small as 2,500 square feet. Gray and Millsap (2020) point out that pre-1998 townhouse regulations encouraged the construction of large, wide townhouses and precluded low-cost townhouse construction. The 1998 reform reduced the by-right minimum lot size to 3,500 square feet within the I-610 Loop. It also created the opportunity to create subdivisions within the I-610 Loop with average lot sizes as small as 1,400 square feet for subdivisions with 600 square feet of compensating open space per lot less than 3,500 square feet. As an alternative, subdivisions may result in average lot sizes as small as 1,400 square feet if they meet performance standards that include having adequate wastewater collection service, buildings that cover no more than 40 percent of each lot, and at least 150 square feet of permeable area on each lot (Houston Code of Ordinances 42–184).

Under the 1998 reform, the by-right minimum lot size outside the I-610 Loop for land with wastewater collection services remained 5,000 square feet, but smaller lot development was permitted with larger amounts of compensating open space relative to subdivisions within the Inner Loop. The same rules applied to the land within the city of Houston outside I-610 and land in the Extraterritorial Jurisdiction, which falls outside city limits but under the city's ordinance. In those areas, the 1998 rules allowed for lots as small as 1,400 square feet with 720 square feet of compensating open space. Before 2013, all small-lot development outside the I-610 Loop was permitted with compensating open space; variances were not issued for minimum lot sizes outside the Inner Loop (Margaret Wallace Brown, personal communication, April 14, 2022). Performance standard subdivisions—those meeting standards for wastewater collection, lot coverage, and permeable space—were not allowed outside I-610.

The rule at the center of this article is a 2013 reform that extended the 1998 rules to all the land in the city of Houston with wastewater collection services. Outside I-610, the change reduced the compensating open-space requirements for small-lot subdivisions and created the option for subdivisions that qualify on the basis of performance standards. Subdivisions built to the performance standards often take the form of "shared-driveway townhouses," as shown in exhibit 3 west of Hutchins Street. The townhouses are oriented toward a driveway that runs perpendicular to a city street. Small-lot houses with compensating open space are pictured east of Hutchins Street. Shared-driveway townhouses allow about 50 percent more townhouses to be built on a given piece of land relative to subdivisions with compensating open space under the 1998 rules outside I-610. Shared-driveway developments are more easily achieved on large parcels; many subdivisions of 5,000-square-foot lots result in two 2,500-square-foot lots. One Houston homebuilder explained how the rules before 2013, which required more land for subdivisions outside I-610, made building there infeasible for him: "I'd like to build outside the Loop. It's just, right now, because of the different rules under Chapter 42 between suburban and urban, it's not competitive to be able to build homes there, and I've tried" (Morris, 2012).

Exhibit 3

Small-Lot Subdivisions Relying on Performance Standards and Open Space Provision



Note: Shared driveway townhouses are west of Hutchins St; older small-lot houses with open space are to the east.

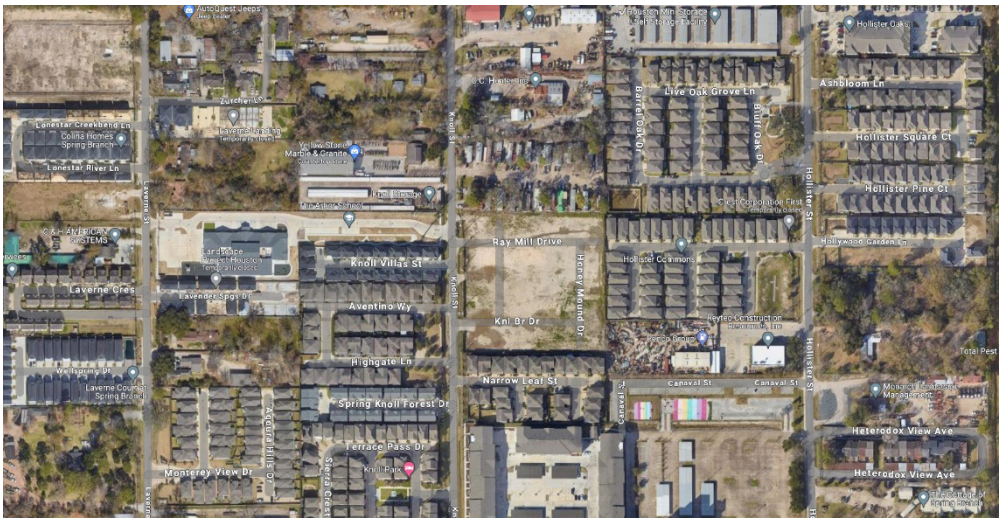
Source: Imagery copyright 2002 CNES/Airbus, Houston-Galveston Area Council, Maxar Technologies, Texas General Land Office, U.S. Geological Survey, USDA/FPAC/GEO, Map data 2022, https://www.google.com/maps/@29.7403815,-95.36251,511m/data=!3m1!1e3

Houston property owners have the option to seek a Special Minimum Lot Size Block that is larger than the city's requirements if 70 percent of the houses in their area (60 percent of houses in historic districts) would comply with the larger lot-size requirements. Gray and Millsap (2020) argue that the opportunity for residents to live in neighborhoods with restrictions that are less permissive than citywide land-use restrictions has helped make Houston's minimum-lot-size reductions politically feasible.

Since the 2013 reform was implemented, some neighborhoods that sit just outside the Inner Loop, particularly those northwest of it, have been transformed by shared-driveway townhouse development (Hamilton, 2023). The Spring Branch neighborhood is one example, with Spring Branch Central pictured in exhibit 4. These houses were built to the performance standard option made possible by the 2013 rule change. Historical images on Google Street View show that townhouses in Spring Branch replaced single-family houses, light industrial buildings, and strip malls.

Exhibit 4

Spring Branch Central Townhouses



Source: Imagery copyright 2002 CNES/Airbus, Houston-Galveston Area Council, Maxar Technologies, Texas General Land Office, U.S. Geological Survey, USDA/FPAC/GEO, Map data 2022, https://www.google.com/maps/place/Spring+Branch+West,+Houston,+TX/@29.8061518,-95.5110672,717m/data=!3m1!1e3!4m5!3m4!1s0x8640c4d1e3fe62e7:0x79b1bdebce356dbb!8m2!3d29.7908472!4d-95.5446297

In part to allow neighborhoods to establish Special Minimum Lot Size Blocks, the subdivision reforms adopted in 2013 did not go into effect immediately.[2] Subdivision plats of one acre or more submitted within 1 year after the ordinance was signed on April 24, 2013, had to meet the previous requirements, and subdivision plats of less than 1 acre submitted 2 years after the ordinance needed to meet the previous requirements. Those delays in the new subdivision rules taking effect created delays in permitting small-lot development with less open space or with shared driveways in Houston outside the I-610 Loop. However, changes in land values brought about by the policy change are expected to happen quickly, because future development opportunities and the effects of new construction should be reflected in current values.

Section 4: Data

This study uses data from the Harris County Appraisal District (HCAD) for Houston land values from 2005 to 2021. Relying on tax assessment data for land prices has the downside of not reflecting market transactions. However, all sources of data on urban land prices have their own weaknesses. Observing vacant land sales in an urban context generally leads to relatively small datasets and may not be representative of a locality's land prices generally, given that developed and vacant parcels likely have unobserved differences. Hedonic regression on transactions has the benefit of capturing market exchanges, but it also has the downside of relying on more limited data for isolating land value from improvements. These regressions may suffer from omitted variable bias that would affect studies of upzoning on land prices if, for example, larger lot sizes are correlated with houses that have unobserved improvements that increase the property value. These

[2] City of Houston, Texas. 2013. Ord. No. 2013-343.

same unobserved repeat sales indices cannot disentangle land from improvement value without hedonic controls and their limitations.

As a nondisclosure state, Texas presents a particular challenge for using transaction data in social science research. Unlike many states, property owners in Texas are not required to provide the sale prices of their properties to their counties. One source of real estate transaction data, Zillow's ZTRAX, includes sale price data for only about 5 percent of transactions in the city of Houston between 1998 and 2021 (Zillow, 2022a). In about one-half of those transactions, the seller was a government entity, and the other one-half appears to include many non-arm's-length transactions that are not easily identified.[3] The Federal Housing Finance Agency (Sunbelt) (FHFA) also provides land price estimates at the census tract and ZIP Code levels based on appraisal data provided to government-sponsored enterprises. Analysis in this study is limited to land within 2 miles of I-610. The FHFA provides estimates for only 19 of the 194 tracts that include neighborhoods within 2 miles of I-610. Of the 53 ZIP Codes that include land within 2 miles of I-610, 27 cross the freeway, so neither dataset is well suited to studying Houston's 2013 reform.

Although property owners in Texas are not required to disclose transaction prices to county assessors, any listing broker who lists a property on a multiple listing service (MLS) is required to disclose the sale price to that MLS. HCAD appraisers have access to the Houston Association of REALTORS (HAR) MLS, giving them the same access to transaction data that area realtors have, so the lack of data available to the public on Harris County real estate sales prices does not affect their access to this information. One benefit of using tax appraisal data is that tax assessors likely have better information about improvements and their values than social scientists do (Clapp, Salavei Bardos, and Wong, 2012).

Other recent studies also use tax appraisal data. Shortell (2022) uses the same HCAD data source that this study does. Furth (2021) also uses tax assessment data from Harris County, as well as Dallas County. He points out that in Harris County, 27 percent of owners protested their assessed values in 2019, indicating a process that likely pushes assessed values close to market values. Furth also points to Avenancio-Leon and Howard (2020), a study that identifies significant racial bias in tax assessments across the country but not in Texas, where contested assessments are common. Other recent research relying on tax assessment data includes Epple, Gordon, and Sieg (2010) and Resseger (2022). In an important paper on the effects of rent control, Autor, Palmer, and Pathak (2014) use tax assessment data as a preferred data source, which they complement with transaction data. However, this strategy is ruled out here due to the paucity of transaction price data in Houston and the unusual nature of many transactions for which HCAD records price.

In this study, appraised land values are aggregated to the neighborhood level as HCAD defines them, using neighborhoods' land value per acre as the dependent variable. HCAD estimates a primary land price for a 5,000-square-foot lot in each neighborhood, with some adjustments for lots based on their size, topography, view, and other characteristics. This study uses neighborhoods rather than parcels as the unit of observation because the HCAD methodology likely biases all lots toward the price of the neighborhood's standard primary lot, and the extent to which HCAD's

[3] Nolte et al. (2021) have developed a set of helpful tools for filtering ZTRAX data, but following their methods for dropping non-arm's-length transactions left many below-market-rate transactions in the Harris County data with no discernible pattern.

propensity to give the same land value to 5,000-square-foot lots in a single neighborhood reflects the actual value of those lots as opposed to their correctly adjusted lot prices is not known to the author. About 13 percent of neighborhoods in the 2021 HCAD data have identical appraised land values for all of their 5,000-square-foot lots.

Most of HCAD's neighborhoods are quite small. The sample in this study includes neighborhoods close to the I-610 Loop between the years 2005 and 2021, which totaled 1,230 neighborhoods in 2021. The mean area of these neighborhoods is 55.2 acres, with a range of 0.005 acres to 1,022 acres.

To identify neighborhoods inside and outside the I-610 Loop, this study uses shapefiles provided by HCAD and QGIS (2022). A small number of neighborhoods lie on both sides of I-610; those neighborhoods are not included in the sample. Regressions rely on subsets of those neighborhoods within 2 miles, 1 mile, and 0.5 mile of the I-610 Loop. If a neighborhood includes any parcel with a centroid that lies within those bounds, it is included in the relevant sample.

Houston townhouse development occurs on a wide variety of types of land, including vacant land, land in existing residential neighborhoods, and land developed for commercial or light-industrial use. For that reason, this study includes parcels of all existing uses in the sample; however, the study excludes parcels of more than 100 acres. Those parcels are outliers and likely difficult to appraise accurately. Parcels that have an assessed value of zero are also dropped, which removes large parcels owned by nonprofit entities, including universities.

In addition to HCAD data, this study uses census tract-level data from the 2000 Decennial Census and the 2010 through 2020 American Community Surveys for census tract-level demographic controls. Many HCAD neighborhoods cross census tracts, so the author identifies the percentage of each neighborhood's land area that falls within a 2010 census tract and creates a weighted average of the census data based on those proportions. The regression specifications that have demographic controls include independent variables on population density, the percentage of individuals in poverty, the percentage of individuals aged 25 or older with a Bachelor of Arts (B.A.) degree or higher, the natural log of median household income, the percentage of individuals who are White and not Hispanic, and mean commute time. Whereas many studies of land prices use parcel distance from a region's central business district as a control variable, this study instead uses census data on mean commute at the census tract level because of Houston's polycentric employment centers. For the years 2005 to 2009, the author uses linear interpolation to estimate these demographic controls for the years between the 2000 Census and the start of American Community Survey data. Some specifications also include a ZIP Code-specific linear time trend for the 53 ZIP Codes in the sample, using ZIP Codes in HCAD's address data. Neighborhoods sometimes cross ZIP Codes, in which case the author matches each neighborhood to the ZIP Code that contains the largest share of that neighborhood's land area.

Exhibits 5 and 6 provide the summary statistics for parcel-level data and the census tract-level data for parcels that appear in the 2005-through-2021 HCAD data that are within 2 miles of the I-610 Loop and in the city of Houston. For context, the I-610 Loop encircles an area that is about 9 miles north to south and 11 miles east to west. Although the regressions use neighborhood-level data for land values, the summary statistics given in these tables use parcel-level data to convey the complete dataset.

Exhibit 5

Parcel-Level Summary Statistics for Parcels in the Sample Within 2 Miles of the I-610 Loop, 2005–21

Variable	Number of Observations	Mean	Standard Deviation	Minimum Value	Maximum Value
Lot Size (square feet)	2,721,292	11,623.88	45,225.08	1	4,117,291
Land Value	2,720,944	$170,197	$628,472	$1	$144,722,400
Building Value	2,720,944	$162,065	$1,183,378	$0	$374,951,030
Year Structure Built	2,212,771	1960	24.42	1840	2021

Source: Harris County Appraisal District data, 2005–21

Exhibit 6

Tract-Level Summary Statistics for Tracts with Parcels Within 2 Miles of the I-610 Loop, 2005–21

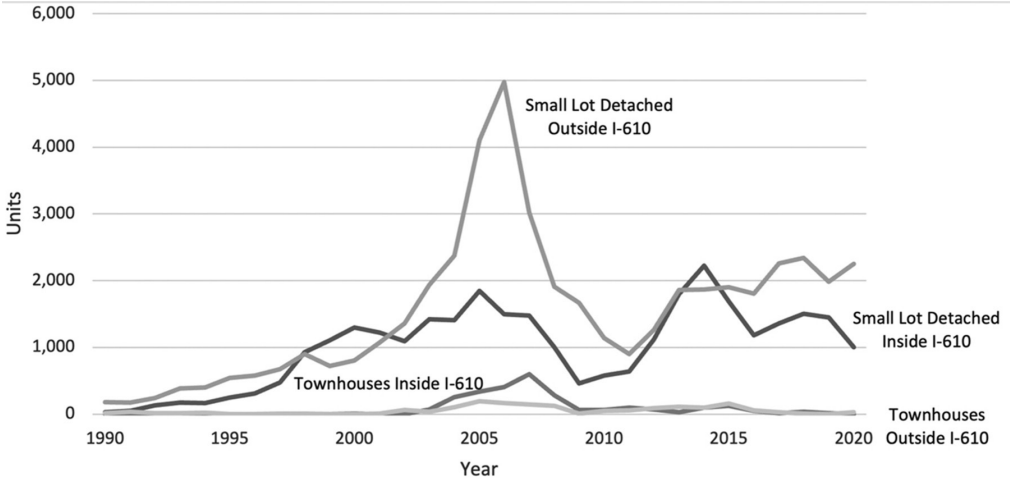
Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Population	3,293	4,118.67	1,618.92	562.00	15,023.00
Population Density per Square Mile	3,293	6,107.10	5,779.05	388.13	68,892.06
Percentage of Individuals in Poverty	3,293	21.98	12.18	0.00	54.50
Percentage of Individuals 25 or Older with a B.A. Degree or Higher	3,293	32.54	27.44	0.00	99.30
Median Household Income	3,293	$58,137.65	$46,631.36	$8,678.00	$244,219.00
Percentage of Individuals who Are White and Not Hispanic	3,293	27.02	26.16	0.00	100
Mean Commute (minutes)	3,293	25.52	5.03	14.20	41.40

Note: Observations, means, and standard deviations reflect linear interpolation of missing years.
Sources: American Community Survey, 2010–21; U.S. Census Bureau, Decennial Census 2000

Exhibits 7 and 8 show small-lot construction in Houston from 1990 to 2021, first in raw numbers and then as a percentage of all single-family and townhouse development inside and outside the I-610 Loop. Throughout, small-lot, single-family construction is defined as that done on lots less than 5,000 square feet. Both charts show that small-lot construction began increasing inside the I-610 Loop before 1998 and outside the I-610 Loop before the 2013 reform reduced the amount of land needed for small-lot construction. Before 1998, small-lot construction was permitted through a variance process inside the I-610 Loop. Before 2013, small-lot construction was exclusively permitted outside the I-610 Loop, with compensating open space, and variances were not offered to allow performance standard subdivisions.

Exhibit 7

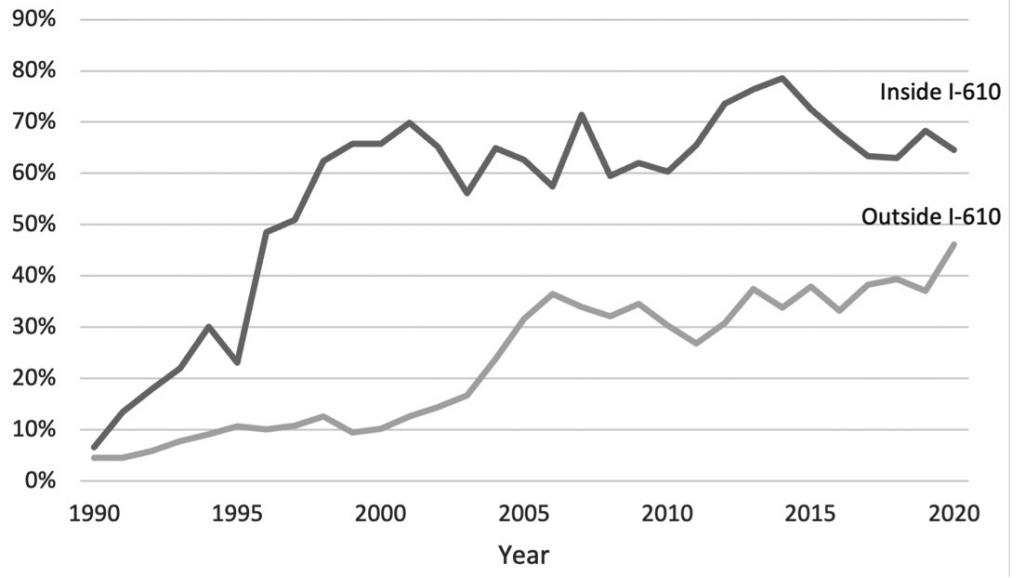
Units on Lots Less Than 5,000 Square Feet, by Year Built



Source: Harris County Appraisal District data on lot size and year built for detached single-family houses and attached townhouses, 2021

Exhibit 8

Single-Family Houses and Attached Townhouses on Lots Less Than 5,000 Square Feet as a Percentage of All Single-Family Houses and Attached Townhouses, by Year Built

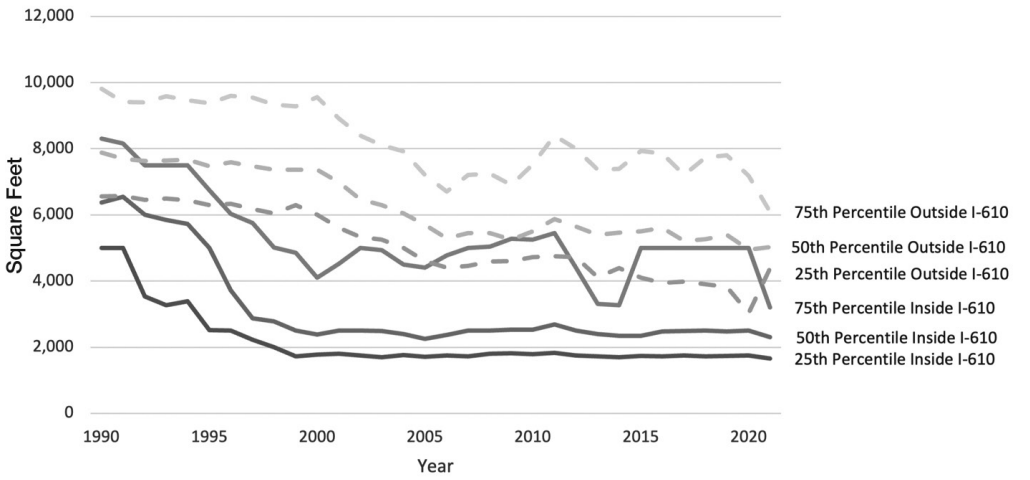


Source: Harris County Appraisal District data on lot size and year built for detached single-family houses and attached townhouses, 2021

Exhibit 9 provides more granularity on Houston residential lot sizes over time, breaking out the 25th-, 50th-, and 75th-percentile single-family lot size inside and outside the I-610 Loop. In 1998, when the minimum-lot-size reform was adopted within the I-610 Loop, the 25th-percentile lot size for new residential construction size reached 2,000 square feet. Although lot sizes outside the I-610 Loop are unsurprisingly larger, the 25th-percentile lot size fell below 5,000 square feet several years before the 2013 reform increased opportunities for small-lot development.

Exhibit 9

Lot-Size Percentiles Over Time in the City of Houston



Source: Harris County Appraisal District data on lot size and year built for single-family houses, 2021

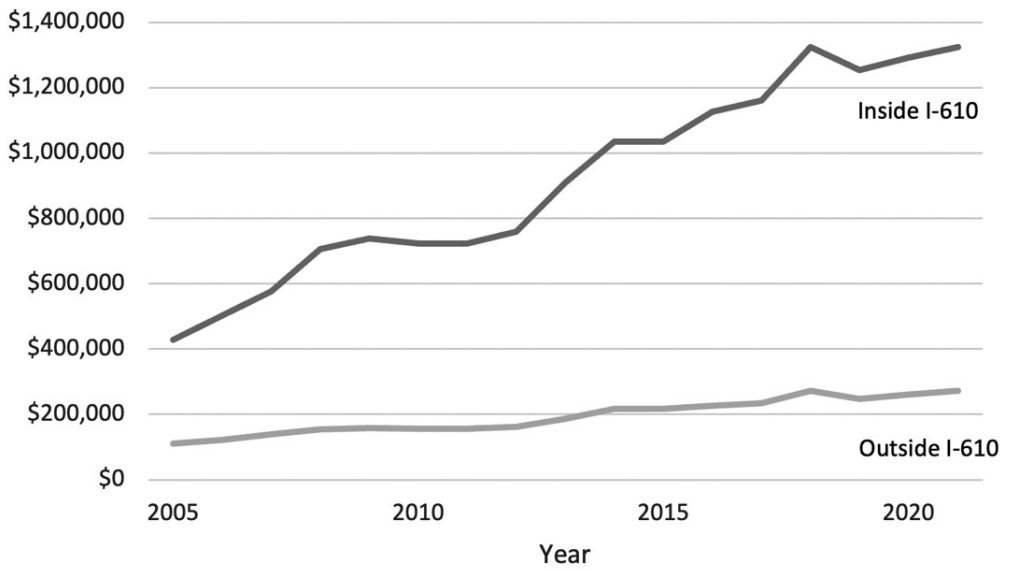
Although small-lot, single-family-house development was common outside the I-610 Loop before 2013, the reform reduced the amount of land required to build small-lot houses and reduced their land costs, as described in section 3. As a result, the author hypothesizes that the 2013 reform increased assessed land values outside the I-610 Loop relative to land inside the I-610 Loop as a result of its increased option value, the effect identified in prior upzoning event studies.

Turning now to data on assessed land values in Houston, exhibit 10 shows assessed land values per acre over time for parcels that appear in the HCAD data every year from 2005 to 2021.

Exhibit 11 shows assessed land values per acre over time for the subset of those parcels that are in neighborhoods within 2 miles of the I-610 Loop, indexed to 2005 values. Unlike the full dataset, the price per acre for parcels within 2 miles of the I-610 Loop demonstrates qualitatively parallel trends before the 2013 minimum-lot-size reform. As exhibits 10 and 11 show, appraised land values increased substantially over the study period. After adjusting for inflation, the appraised land value within 2 miles of the I-610 Loop more than doubled.

Exhibit 10

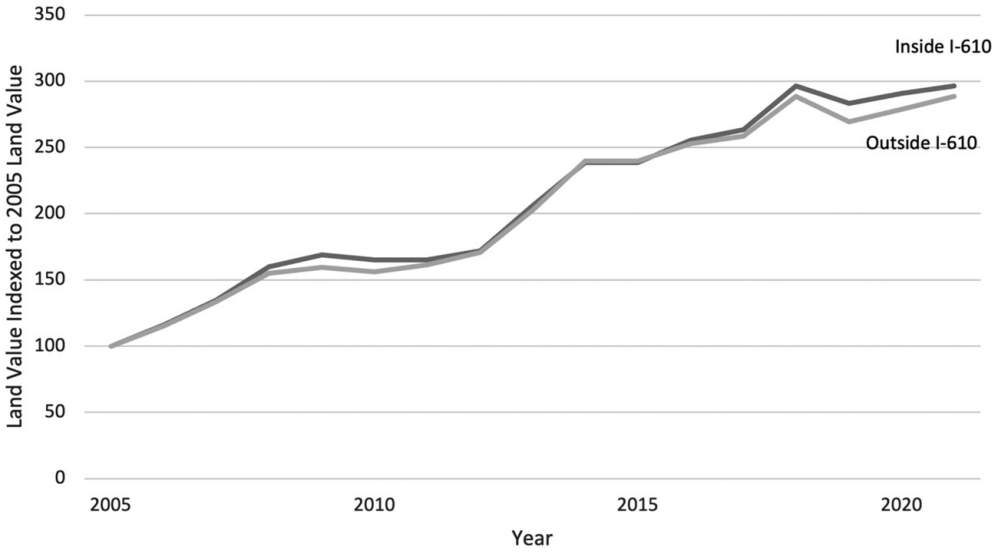
Land Value per Acre Over Time in Houston



Source: Harris County Appraisal District data on land values and lot sizes, 2005–21

Exhibit 11

Land Value per Acre in Neighborhoods Within 2 Miles of the I-610 Loop, Indexed to 2005 Values



Source: Harris County Appraisal District data on land values and lot sizes, 2005–21

Exhibit 12 shows the geography of assessed land prices in Houston at the census tract level. Whereas the regressions in this study rely on neighborhood-level data, here the author uses census tracts because of the availability of a shapefile for creating the maps shown here. The sample of neighborhoods used in the regressions hews closer to 2 miles on either side of the I-610 Loop because HCAD neighborhoods are much smaller than census tracts. Per-acre land prices are highest closer to the center of the I-610 Loop and to the west of the city's center. Land prices seem to correlate highly between adjacent census tracts, which is not surprising. From 2005 to 2021, the average price per acre of land in the 2-mile band inside the I-610 Loop increased from $747,000 to $1,454,000 in 2021 dollars relative to an increase from $279,000 to $569,000 for the 2-mile band outside the I-610 Loop. Houston's core within the I-610 Loop is outlined in exhibit 12.

Exhibit 12

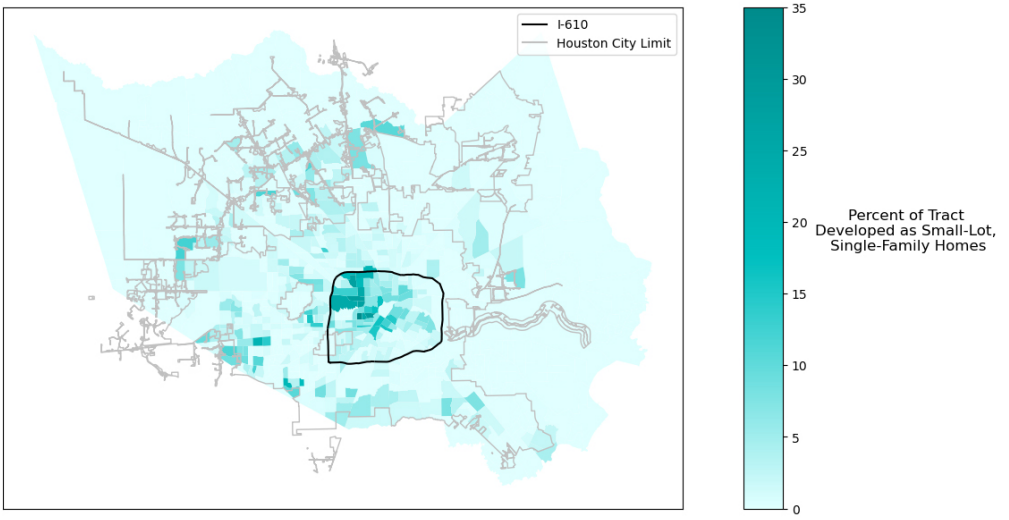
Average Price per Acre in Houston Census Tracts That Include Neighborhoods Within 2 Miles of the I-610 Loop

Sources: Harris County Appraisal District data on land values and lot sizes, 2005, 2012, and 2021; maps by Eli Kahn

Exhibit 13 shows the percentage of land area in 2021 by census tract that is developed with small-lot, single-family housing, including detached houses and attached townhouses on lots of less than 5,000 square feet. Exhibit 14 then shows the percentage of land area developed on lots of less than 2,500 square feet (the citywide minimum lot size for attached townhouses before 1998). Shared-driveway subdivisions that have been permitted inside the I-610 Loop since 1998 and outside the I-610 Loop since 2013 generally have less than 2,500 square feet of land per house.

Exhibit 13

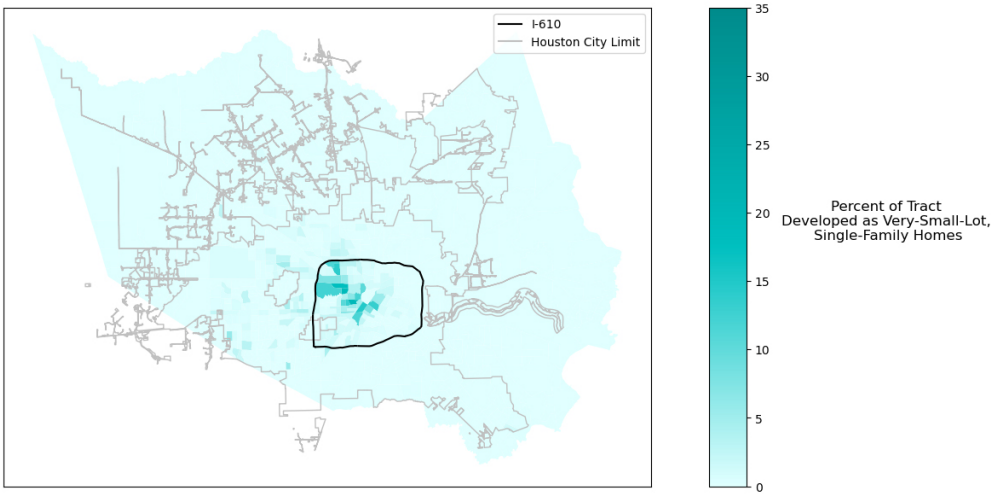
Acreage in Each Harris County Census Tract Developed as Single-Family Housing on Lots of Less Than 5,000 Square Feet, as a Percentage of the Census Tract's Total Parcel Acreage



Sources: Harris County Appraisal District data property type and lot size, 2021; map by Eli Kahn

Exhibit 14

Acreage in Each Harris County Census Tract Developed as Single-Family Housing on Lots of Less Than 2,500 Square Feet, as a Percentage of the Census Tract's Total Parcel Acreage



Sources: Harris County Appraisal District data property type and lot size, 2021; map by Eli Kahn

This study explores the effects of the 2013 reform on land immediately outside the I-610 Loop border. As exhibits 12, 13, and 14 show, prices in this area have changed significantly, and

although pockets of high levels of small-lot construction are occurring throughout Harris County, this development has been particularly concentrated inside the I-610 Loop and in neighborhoods just outside it to the north and west of the Loop. In particular, construction on lots of less than 2,500 square feet, the developments most likely to have been affected by the 2013 reform, are highly concentrated inside the I-610 Loop, and exhibit 14 shows that they are visible just outside the I-610 Loop, including in Spring Branch. So far, small-lot development on lots of less than 2,500 square feet has a very low concentration in areas farther from downtown. The effect of the 2013 reform on land's option value and on rents through the effect of new supply may be heterogeneous across different parts of Harris County, and this study examines the reform in the geography where the author thinks the reform is most likely to have had an effect.

Section 5: Methodology

This study uses a difference-in-differences design to estimate the average treatment effect of the minimum-lot-size reduction on land prices outside the I-610 Loop. Neighborhoods outside the I-610 Loop are the treatment group, and years after 2013 are the treatment years. The control group—parcels inside the I-610 Loop—were "treated" with the 1998 minimum-lot-size reform. However, no major reforms to land-use policy were adopted within 2 miles of the I-610 Loop inside the Loop during the period of interest, from 2005 to 2021.[4]

This study disregards the year of treatment, 2013, using 2012 as the final year when the neighborhoods outside the I-610 Loop were untreated. Online records of Houston City Council agenda and meeting minutes only extend back to 2015, so the time or extent to which this issue played in council meetings before passage of the reform is unknown. However, minimal mention of the proposed 2013 reform appears in the media before 2013. Two 2012 articles in the *Houston Chronicle* discussed a proposed reform to subdivision rules outside the I-610 Loop but described different details of the proposed reform than what were actually adopted (Baird, 2012; Shauk, 2012). A third, published in December 2012—at the very end of the pretreatment period and only 4 months before the final reform was signed—described the proposed reform as it was adopted but emphasized the uncertainty of passage:

> A council committee will discuss the changes next month, but Mayor Annise Parker has no timeline for bringing the proposed changes to the full council, spokeswoman Janice Evans said (Morris, 2012).

Given the scant coverage of the reform, it was likely not anticipated by market actors or reflected in HCAD data before 2013.

[4] Houston policymakers adopted some relatively minor changes to subdivision right-of-way provisions in 2013 and 2018, which apply both inside and outside the I-610 Loop. In 2015, policymakers reformed the special minimum-lot-size program to permit residents to seek a larger lot-size requirement for primarily residential neighborhoods if at least 70 percent of the lots in the area meet the larger lot-size requirements or 60 percent of lots in a historic district. For program details, see City of Houston, "Minimum Lot Size (MLS)/Minimum Building Line (MBL)," Planning and Development, https://www.houstontx.gov/planning/Min-Lot_Size-Min_Bldg_Line.html. The special minimum-lot-size rules apply both inside and outside the I-610 Loop. During the period this study covers, Houston policymakers adopted a policy known as "market-based parking," which eliminated parking requirements downtown and expanded market-based parking to cover the East End and parts of the Midtown neighborhoods. Market-based parking does not apply to any parcels in this study sample, which are limited to those within 2 miles of the I-610 Loop (City of Houston, "Code of Ordinances," Ch. 26, Sec. 26–471).

Both before and after the 1998 and 2013 minimum-lot-size reforms, land in Houston inside and outside the I-610 Loop has been subject to the same local and national factors that affect the supply and demand of built space and land prices. Although parcels inside the I-610 Loop were subject to minimum-lot-size reform before the 2005–2021 period, any price effect of that treatment probably ultimately affected the price level of land inside the I-610 Loop relative to land outside it rather than creating disparate price trends. After a period of adjustment to a new postreform price level, parcels inside and outside of the I-610 Loop would likely follow parallel trends. Exhibit 9, earlier in this article, shows that in fact, this circumstance appears to have been the case.

This study uses a model similar to other studies of recent land use deregulatory reforms, including Freemark (2020) and Kuhlmann (2021). The basic model is shown in equation (1) here:

$$\ln(V_{ilt}) = \alpha_i + \beta_1 \, Treated_l * After_t + \varepsilon_{ilt} \quad (1)$$

where V_{ilt} indicates the appraised value of land in neighborhood i in treatment area l (either inside or outside the I-610 Loop) in year t. *Treated* is equal to 1 for land outside I-610, and *After* is equal to 1 for years after 2013. β_1, the coefficient on the interaction of the treatment area and treatment time, is the parameter of interest. It provides an estimate of the effect of 2013 minimum-lot-size reform on land values of the treated neighborhoods outside I-610. Also included are specifications that include year fixed effects, demographic controls at the census tract level, and a ZIP Code-specific linear time trend. Following Freemark and Kuhlmann, this model is applied to parcels within 2 miles, 1 mile, and 0.5 mile of the I-610 Loop. All available years between 2005 and 2021 are used except the treatment year, 2013.

Next, the author tests whether minimum-lot-size reform had a measurable effect on land values within only those census tracts most likely to see small-lot, single-family construction. Census tract-level characteristics in 2012 are regressed on small-lot construction between 2013 and 2021, and then a prediction function is used to estimate the level of small-lot development across tracts. Drawing on the findings of Wegmann, Baqai, and Conrad (2023), the author uses many of the factors that they find affect small-lot redevelopment on formerly single-family homes in this regression. Included are median house value, median house value squared, median year structure built, median land value per acre, mean commute time, the percentage of residents who are White and not Hispanic, median household income, the percentage of residents older than 25 with a B.A. or higher, the number of vacant lots by tract, median lot size, and the number of likely subdivision target lots—those that are at least 1 acre and where the ratio of assessed improvement value to land value is 0.2 or less. This regression explains about 21 percent of the variation in small-lot development across census tracts between 2013 and 2021. The bottom three-quarters of census tracts citywide are then dropped, those predicted to see fewer than about 60 townhouses built between 2013 and 2021 on the basis of their economic and demographic characteristics.

The author hypothesizes that the effects of the 2013 reform are most likely to be significant for those tracts with a high likelihood of townhouse construction within 0.5 mile of I-610. For this sample, the estimated individual annual coefficients before and after 2013 are plotted, as shown in equation (2):

$$ln(V_{ilt}) = \alpha_i + \lambda_t + \sum_{k \neq 2013} \beta_k \, Treated_l * After_t + \varepsilon_{ilt} \quad (2)$$

The results are shown in a coefficient plot in exhibit 21 in section 6.

As shown in exhibit 11, land prices in Houston are geographically clustered. A Moran test confirms this visual assessment; the residuals in equation (1) are neither independent nor identically distributed (p-value 0.0002). Therefore, equation (1) is also estimated using Conley standard errors, allowing for spatial autocorrelation within standard errors (Colella et al., 2019).

Whereas Freemark and Kuhlmann use total property values as their dependent variables, this study uses assessed land values, the portion of total property value potentially directly affected by the option to subdivide land. In the city of Houston, assessed land values for single-family houses make up about 40 percent of the total assessed value of those properties. Thus, a given estimate of the effect of the 2013 reform on land value would likely have a much smaller effect on total property values.

Section 6: Results

In exhibit 15, the author applies the basic model in equation (1) to 1,226 neighborhoods over 16 years in an unbalanced panel of neighborhoods within 2 miles of the I-610 Loop. The regression in column 1 reflects equation (1) directly. Columns 2 through 6 add combinations of year fixed effects, a ZIP Code-specific linear time trend, and a vector of census demographic variables. In each case, the coefficient on the treatment dummy is insignificant.

Exhibit 15

Effect of Minimum-Lot-Size Reform on Ln (Land Value) Within 2 Miles of the I-610 Loop, 2005–21

Variables	1	2	3	4	5	6
Minimum-Lot-Size Reform	– 0.067	– 0.061	– 0.001	0.003	– 0.007	– 0.003
	(0.072)	(0.074)	(0.056)	(0.057)	(0.057)	(0.050)
Demographic Controls	No	No	No	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	No
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
ZIP Code-Specific Time Trend	No	No	Yes	Yes	Yes	Yes
R^2	0.417	0.550	0.612	0.579	0.616	0.585
Number of Neighborhoods	1,226	1,226	1,226	1,226	1,226	1,226

Ln = natural log.

** p < 0.1. ** p < 0.05. *** p < 0.01.*

Note: Robust standard errors clustered by ZIP Code in parentheses.

Sources: Harris County Appraisal District data, 2005–21; U.S. Census Bureau, Decennial Census 2000; American Community Survey, 2010–21

Exhibit 16 shows the same regressions as those in exhibit 15 using only those census tracts that are both within 2 miles of the I-610 Loop and among the top quarter of census tracts citywide in terms of predicted townhouse construction. Because census tracts near the I-610 Loop are disproportionately well suited to small-lot, single-family construction, more than one-quarter of the neighborhoods in the regressions in exhibit 15 are retained in the regressions in exhibit 16.

Exhibit 16

Effect of Minimum-Lot-Size Reform on Ln (Land Value) Within 2 Miles of the I-610 Loop, Top Quarter of Predicted Townhouse Tracts, 2005–21

Variables	7	8	9	10	11	12
Minimum-Lot-Size Reform	– 0.060	– 0.047	– 0.103	– 0.098	– 0.113	– 0.117
	(0.052)	(0.054)	(0.087)	(0.086)	(0.085)	(0.087)
Demographic Controls	No	No	No	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	No
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
ZIP Code-Specific Time Trend	No	No	Yes	Yes	Yes	Yes
R^2	0.453	0.599	0.640	0.599	0.641	0.602
Number of Neighborhoods	611	611	611	611	611	611

Ln = natural log.

** p < 0.1. ** p < 0.05. *** p < 0.01.*

Note: Robust standard errors clustered by ZIP Code in parentheses.

Sources: Harris County Appraisal District data, 2005–21; U.S. Census Bureau, Decennial Census 2000; American Community Survey, 2010–21

Here, each specification reveals a negative but insignificant coefficient on the treatment variable. In exhibit 17, those same regressions are repeated for neighborhoods within 1 mile of the I-610 Loop. Exhibit 18 then shows neighborhoods within 1 mile of the I-610 Loop and among the city's census tracts most likely to see townhouse construction. With this sample, most specifications are highly statistically significant.

Exhibit 19 shows the results for neighborhoods within 0.5 mile of the I-610 Loop, revealing a negative effect of the reform on land values, significant at the 10-percent level in one specification and negative, insignificant coefficients in others. Exhibit 20 shows the results for neighborhoods within 0.5 mile of the I-610 Loop and among the city's census tracts most likely to see townhouse construction. This sample is located where the effects of the 2013 reform are most likely to show up and reveals negative effects of minimum-lot-size reduction significant at the 1-percent level in most specifications.

Exhibit 17

Effect of Minimum-Lot-Size Reform on Ln (Land Value) Within 1 Mile of the I-610 Loop, 2005–21

Variables	13	14	15	16	17	18
Minimum-Lot-Size Reform	– 0.075	– 0.071	– 0.041	– 0.039	– 0.040	– 0.038
	(0.088)	(0.090)	(0.058)	(0.058)	(0.062)	(0.063)
Demographic Controls	No	No	No	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	No
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
ZIP Code-Specific Time Trend	No	No	Yes	Yes	Yes	Yes
R2	0.384	0.508	0.578	0.548	0.583	0.554
Number of Neighborhoods	655	655	655	655	655	655

Ln = natural log.

** p < 0.1. ** p < 0.05. *** p < 0.01.*

Note: Robust standard errors clustered by ZIP Code in parentheses.

Sources: Harris County Appraisal District data, 2005–21; U.S. Census Bureau, Decennial Census 2000; American Community Survey, 2010–21

Exhibit 18

Effect of Minimum-Lot-Size Reform on Ln (Land Value) Within 1 Mile of the I-610 Loop, Top Quarter of Predicted Townhouse Tracts, 2005–21

Variables	19	20	21	22	23	24
Minimum-Lot-Size Reform	– 0.069	– 0.062	– 0.246***	– 0.246***	– 0.246***	– 0.258***
	(0.076)	(0.077)	(0.081)	(0.080)	(0.078)	(0.079)
Demographic Controls	No	No	No	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	No
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
ZIP Code-Specific Time Trend	No	No	Yes	Yes	Yes	Yes
R^2	0.425	0.572	0.628	0.585	0.631	0.588
Number of Neighborhoods	319	319	319	319	319	319

Ln = natural log.
** p < 0.1. ** p < 0.05. *** p < 0.01.*
Note: Robust standard errors clustered by ZIP Code in parentheses.
Sources: Harris County Appraisal District data, 2010–21; U.S. Census Bureau, Decennial Census 2000; American Community Survey, 2010–21

Exhibit 19

Effect of Minimum-Lot-Size Reform on Ln (Land Value) within 0.5 Mile of the I-610 Loop, 2005–21

Variables	25	26	27	28	29	30
Minimum-Lot-Size Reform	– 0.143	– 0.133	– 0.103	– 0.099	– 0.106*	– 0.100
	(0.100)	(0.103)	(0.061)	(0.062)	(0.063)	(0.064)
Demographic Controls	No	No	No	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	No
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
ZIP Code-Specific Time Trend	No	No	Yes	Yes	Yes	Yes
R^2	0.341	0.456	0.537	0.507	0.539	0.511
Number of Neighborhoods	383	383	383	383	383	383

Ln = natural log.
** p < 0.1. ** p < 0.05. *** p < 0.01.*
Note: Robust standard errors clustered by ZIP Code in parentheses.
Sources: Harris County Appraisal District data, 2005–21; U.S. Census Bureau, Decennial Census 2000; American Community Survey, 2010–21

Exhibit 20

Effect of Minimum-Lot-Size Reform on Ln (Land Value) within 0.5 Mile of the I-610 Loop, Top Quarter of Predicted Townhouse Tracts, 2005–21

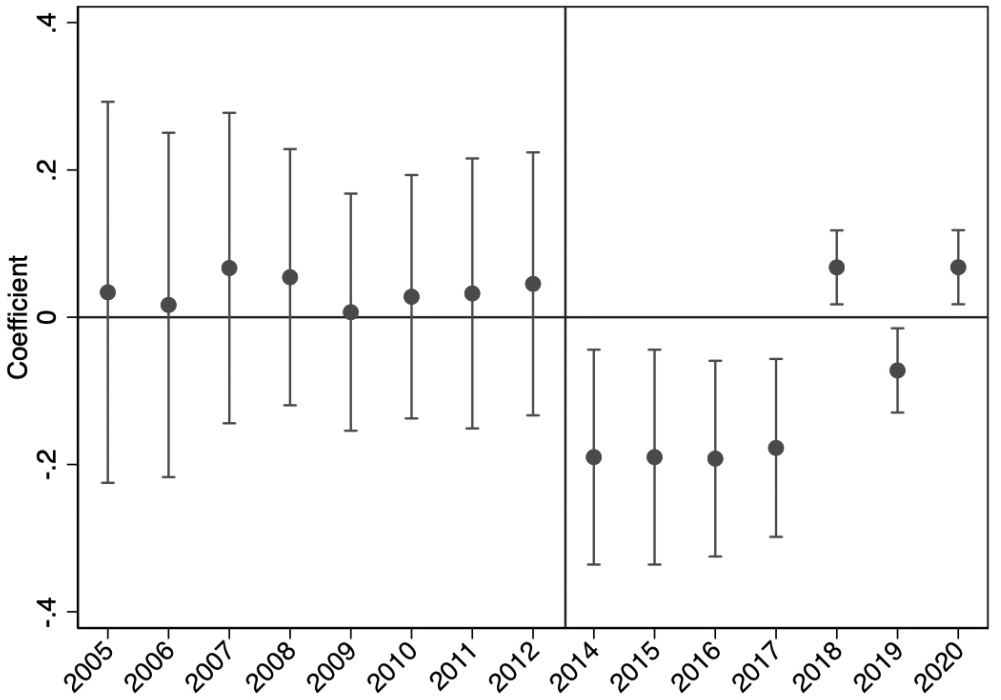
Variables	31	32	33	34	35	36
Minimum-Lot-Size Reform	– 0.156	– 0.159	– 0.277***	– 0.267***	– 0.283***	– 0.279***
	(0.096)	(0.098)	(0.076)	(0.073)	(0.065)	(0.069)
Demographic Controls	No	No	No	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	No
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
ZIP Code-Specific Time Trend	No	No	Yes	Yes	Yes	Yes
R^2	0.432	0.565	0.637	0.594	0.637	0.596
Number of Neighborhoods	186	186	186	186	186	186

Ln = natural log.
** p < 0.1. **p < 0.05. *** p < 0.01.*
Note: Robust standard errors clustered by ZIP Code in parentheses.
Sources: Harris County Appraisal District data, 2005–21; U.S. Census Bureau, Decennial Census 2000; American Community Survey, 2010–21

Exhibit 21 presents the results of equation (2) for this narrowest sample. During each pretreatment year, the coefficients are statistically insignificant, indicating parallel trends. Although the annual coefficients are noisy, most years after 2013 have statistically significant, negative estimated effects. As expected, those negative effects are largest in the years immediately after 2013, with the treatment effect appearing to dissipate over time.

Exhibit 21

Effect of Minimum-Lot-Size Reform on Ln (Land Value) within 0.5 Mile of the I-610 Loop, Top Quarter of Predicted Townhouse Tracts, Annual Coefficient Estimates 2005–21



Turning now to a spatial model, the author uses equation (1) with Conley standard errors, first using all of the observations within 0.5 mile of I-610 and then only those within census tracts in the top quarter of predicted townhouse construction. With each sample, the author first applies equation (2) directly, then adds year fixed effects and then demographic controls. Exhibit 22 shows the results of those regressions.

Exhibit 22

Effect of Minimum-Lot-Size Reform on Ln (Land Value) in a Spatial Model, 2005–21

Variables	0.5 Mile		0.5 Mile Top Tracts			
	37	38	39	40	41	42
Minimum-Lot-Size Reform Total Effect	– 0.104**	– 0.093*	– 0.051	– 0.094*	– 0.071	– 0.028
	(0.041)	(0.038)	(0.037)	(0.053)	(0.046)	(0.051)
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Demographic Controls	No	No	Yes	No	No	Yes
Number of Neighborhoods	275	275	275	136	136	136
R^2	0.344	0.005	0.047	0.105	0.207	0.073

Ln = natural log.

** p < 0.1. ** p < 0.05. *** p < 0.01.*

Note: Robust Conley standard errors clustered by ZIP Code in parentheses.

Sources: Harris County Appraisal District data, 2005–21; U.S. Census Bureau, Decennial Census 2000; American Community Survey, 2010–21

The author's preferred models are shown in exhibit 22 in columns 40, 41, and 42. It is the most restrictive sample—those parcels within 0.5 mile of the I-610 Loop and in census tracts predicted to be most likely to see townhouse construction—where the author would expect the reform to be most likely to have a measurable effect and with fully robust standard errors that account for spatial autocorrelation. In the basic model shown in column 40, the reform was found to reduce land values outside I-610 relative to that inside by 9.4 percent, significant at the 10-percent level, and a positive effect of the reform any larger than 1 percent at a 95-percent confidence level can be ruled out. The more highly significant results with the full 0.5-mile sample shown in columns 37, 38, and 39 indicate that the author's preferred sample may be underpowered.

Section 7: Conclusion

Houston's 2013 lot-size reforms enabled more small-lot, single-family houses to be built on a given amount of land outside the I-610 Loop, increasing the option value of that land relative to land across this border. The reform, however, also increased the "zoning buffer" over a huge area of land—the 541 square miles of the city of Houston that lie outside the Inner Loop. This policy change differs starkly from, for example, Freemark's study of upzoning in Chicago, which increased development potential within small radii around transit stations, about 6 percent of the city's land area.

Relative to the Chicago upzoning and Minneapolis triplex reforms that have had only muted effects on construction, townhouse construction in Houston has transformed large swaths of the city with infill construction. In contrast to the Chicago and Minneapolis studies, the Houston case may provide an example of upzoning that reduces land value relative to a control or at least does not increase it.

The statistically significant estimates of the effect of the 2013 reform range from -9 percent to -28 percent. Taking the midpoint of that range and a 40-percent share of total property value for land value, the reform reduced property values outside I-610 relative to those inside I-610 by about 7.5 percent. As exhibit 11 illustrates, that result is in a context of large increases in assessed land values on both sides of the border during the study period; although the reform may have reduced land price appreciation relative to the counterfactual, both sides of I-610 saw large increases in land values over the study period.

Houston's experience of minimum-lot-size reform has facilitated infill construction, including in single-family neighborhoods, to a level unprecedented in U.S. history since the adoption of zoning in the 20th century. Before the adoption of the 2013 reform, some Houston residents expressed concern that the upzoning would increase property tax bills for homeowners outside the Inner Loop; however, across many specifications, no evidence emerged that the reform increased assessed land values, and some evidence indicated that it had the opposite effect. Houston has developed a set of institutions that facilitate growth and a highly elastic housing supply (Gray, 2022). Minimum-lot-size reform, first in 1998 and then in 2013, has been one part of maintaining that trajectory.

Acknowledgments

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Departments

In this issue—

- *Affordable Design*
- *Data Shop*
- *Graphic Detail*
- *Industrial Revolution*

Affordable Design

This department seeks to identity and develop new, forward-looking planning and design solutions for expanding or preserving affordable housing. This department also reports on design competitions and their winners. Professional jurors determine the outcome of these competitions.

The 2024 Innovation in Affordable Housing Student Design and Planning Competition

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Office of Policy Development and Research

The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. Government.

The Jury:

Ivan Rupnik, PhD, (Head Juror) Founding Partner, MOD X; Associate Professor of Architecture, Northeastern University
Mona Hodge, Associate Principal, Smith Gee Studio, AIA, LEED AP, NOMA
Connor Jansen, Technical Services Director, Slipstream Group, Inc.
Anne Neujahr Morrison, Owner and Founder, New Year Investment
Heather Stouder, Planning Director, City of Madison, WI
Tyler Pullen (Alternate Juror), Senior Technical Advisor and Researcher, Terner Labs and Terner Center, University of California, Berkeley

Winning Team: Harvard University

Emily Hsee
Erik Larson
Aaron Smithson
Maggie Weese

Runner-up Team: University of California, Berkeley

Zhenyang Terence Chan
Jonathan Coles
Hailey Gil
Sophia O'Neil-Roberts
Phuong Nyny Vu

The 2024 first-place winners of the Innovation in Affordable Housing Competition from Harvard University pictured on stage with Solomon Greene (far left), Principal Deputy Assistant Secretary for the Office of Policy Development and Research, and Dominique Bloom (far right), General Deputy Assistant Secretary for Public and Indian Housing. (Photo by HUD)

Introduction

This year marks the 11th anniversary of the U.S. Department of Housing and Urban Development (HUD) Innovation in Affordable Housing (IAH) Student Design and Planning Competition. Each year, this competition invites graduate students enrolled in accredited U.S. educational institutions to respond to an existing affordable housing design and planning issue. The multidisciplinary teams—composed of graduate students studying architecture, planning and policy, finance, and other areas—must address social, economic, environmental, design, financial, and construction issues in addition to the affordable housing design challenge.

The primary goal of the competition is to encourage innovation in the design of affordable housing. The students address the social and economic issues outlined by the public housing agency in their plans and designs and identify improvements to promote durability, reduce energy consumption, increase the quality of housing, and enhance the social and economic vitality of the surrounding community.

The competition occurs in two phases. During Phase I, a jury of six practitioners evaluates initial submissions and selects four finalist teams to advance to Phase II of the competition. In Phase II, the finalist teams further refine their proposals following a site visit—this year, to Madison, Wisconsin—to address complex issues, incorporate more detail, improve their design plans, and conduct additional analyses on the financing needed to create viable housing.

Students from the finalist teams pictured with Mayor Satya Rhodes-Conway (center, in green shirt), Community Development Authority staff, and HUD employees during their site visit to Madison, Wisconsin. (Photo by Schatz Publishing Group, LLC)

The site visit enables the finalists to expand on their original proposal and submit a revised final project. Several weeks after this year's site visit, on April 18, 2024, the jurors and the four finalist teams traveled to HUD headquarters in Washington, D.C., to present their refined project plans for the final awards ceremony. Each student team delivered a 20-minute presentation addressing how their plans respond to the economic, social, and environmental challenges of the development site. The students were then provided 10 minutes to field questions from jurors. Following the presentations, the jury selected the Harvard University team as the first-place winner; the University of California, Berkeley (Blue Team), was the runner-up.

For the 2024 competition, HUD's Office of Policy Development and Research (PD&R) partnered with the City of Madison [WI] Community Development Authority (CDA). CDA challenged students to devise innovative solutions to transform Romnes Apartments, a 169-unit public housing building situated on a 7-acre site at 540 West Olin Avenue in Madison.

Aerial view of 540 West Olin Avenue in Madison, Wisconsin, project site for the 2024 Innovation in Affordable Housing Student Design and Planning Competition. (Photo courtesy of the Madison Community Development Authority)

The two-story, horseshoe-shaped building was built in 1968; today, the existing structure faces overwhelming rehabilitation and modernization costs. CDA is considering demolishing the current property to construct new buildings with improved amenities and sustainable features, including, perhaps, additional housing units. The demolition and reconstruction effort would involve relocating the existing 169 public housing residents.

CDA aims to create a mixed-income community with affordable housing options that integrate well into the surrounding neighborhood. In addition, CDA wants to increase the housing density on the site while maintaining the neighborhood's character. The ideal final plan would provide onsite community amenities, including healthcare services, self-sufficiency programs, and supportive services and spaces for administrative uses such as project planning and staff meetings. Preferably, current residents can stay on site and move only once; however, remaining on site presents logistical challenges because of the current building's location and space constraints.

The Winning Team: Harvard University

The winning design by Harvard University, dubbed Lakeside Grove, uses phased construction to create L-shaped buildings and requires current residents to move only one time (exhibit 1). The design consists of five development sites strategically placed to divide the current site's open space into smaller, more intimate courtyards while also maintaining as many of the current mature trees as possible. The proposal increases the housing density of the site, resulting in 270 affordable housing units with a mixture of one to three bedrooms in four buildings (exhibit 2).

Exhibit 1

Illustration of the Amenities Included in the Winning Team's Final Proposed Building Design, Including Green Roofs, Solar Panels, All-Electric Buildings, and Other Amenities

Source: Harvard Team Presentation

Exhibit 2

Three-Phase Construction Development Process and L-Shaped Building Orientation Proposed by the Harvard University Team

Source: Harvard Team Presentation

The team designed the interiors using universal principles that prioritize the health and well-being of residents and staff through inclusive design, accessibility, natural light, and access to nature. On the basis of feedback from the current residents and staff of the Romnes Apartments, the team's design includes resident amenities such as balconies for all units, generous green spaces, and onsite parking. In addition, their design strongly focuses on healthy indoor air quality through the incorporation of passive house air filtration and low volatile organic compound materials. The development also features rain gardens, permeable paving, and native plants.

In addition, the team's trauma-informed design includes community spaces at the hinge of the building, different-colored corridors, spaces at the front door to display personal items, ample natural light, and central washers and dryers on each floor (exhibit 3).

Exhibit 3

Digital Renderings of Building Design Conceptual Integrations of the Winning Team's Universal and Trauma-Informed Design Showing Interior Areas of the Apartments and Common Spaces

Source: Harvard Team Presentation

Overall, Lakeside Grove's design strategy was a well-balanced combination of environmental sustainability, transit connectivity, and community vitality.

The Runner-up Team: The University of California, Berkeley (Blue Team)

The runner-up team was the University of California, Berkeley. Their design, dubbed the Villages at Monona Bay, is a three-phase, mixed-income, and mixed-use community that would provide the Madison's Bay Creek neighborhood with senior care, new homes for inclusive and intergenerational living, and thoughtful amenities and services for the community (exhibits 4 and 5). The Villages at Monona Bay would provide 290 rental units and 100 affordable townhomes for homeownership while preserving green space, which was a concern of the current residents. Of these homes, 87 percent are for low-income families, seniors, veterans, and those with supportive needs and will be affordable to families earning 80 to 120 percent of the Area Median Income (AMI), with 50 units specifically earmarked for those earning below 80 percent AMI.

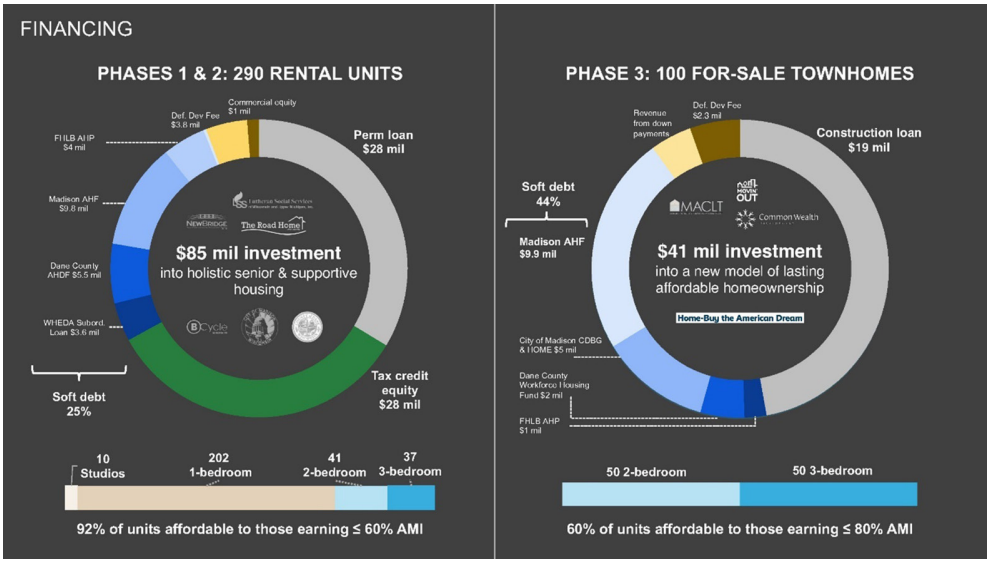
Exhibit 4

The Villages at Monona Bay Proposed Community Plan and Site Map

Source: The University of California, Berkeley, Team Presentation

Exhibit 5

Overview of the Three-Phase Financing Plan Proposed for Residents at the Villages at Monona Bay



Source: The University of California, Berkeley, Team Presentation

Through a hyper-local, village-style approach, the development provides a network of amenities to promote health and foster connections while preserving the natural beauty and character of the neighborhood. The proposal includes financing and ownership contracts to offer affordable rental and homeownership opportunities to its residents. Redevelopment will occur in three phases, with detailed financial planning to maintain long-term affordability.

The proposal features four villages, each with an open courtyard with programmed outdoor spaces, scaling the development to neighborhood proportions and fostering a sense of community and eyes on the street. Each interior has abundant natural light and a cross-ventilation window scheme to support natural ventilation in each unit. A major concern of the current staff was the high cost of maintenance; therefore, the Villages will transition into an all-electric community to promote sustainability and operational efficiencies. Electrifying the development simplifies mechanical systems, minimizing repairs and operational costs.

Thoughts From the Jury

The jury for the 2024 Innovation in Affordable Housing Student Design and Planning Competition faced the difficult task of deciding which of the four outstanding finalist team site plans best exemplified an innovative design. As the jurors deliberated on the final four designs, they were struck by the creativity and effort shown by the students. They were particularly impressed by the changes the students had made to their original designs based on their site visit. As the deliberation continued, the jurors realized that they faced a tough decision.

Ultimately, the jury selected the Harvard University team as the first-place winner for being multifaceted and meaningful, including the trauma-informed design, well-thought-out unit layouts, sustainability features, and balance between offering residents privacy and openness at the same time. One of the jurors, Anne Neujar Morrison, commented, "I liked the branding exercise of calling the corner of the building a hinge. I was like, almost every L-shaped building, in my experience, has something in the middle, but this was a brand-new concept." Another juror, Heather Stouder, further appreciated that "they [the Harvard team] didn't put a unit there. I've seen so many L-shaped buildings with units that then get that kind of poorly used space in the elbow—they just acknowledged that and used it for common space."

Moreover, the jurors collectively praised the Harvard team's ideas about trauma-informed design, the WELL Building Standard, and concepts of community spaces, such as the laundry facilities, that demonstrate how the Harvard team considered the small details and took into consideration the residents' needs. Overall, the jury believed that Harvard's proposal stood out because the team had thoughtfully considered a plan to provide a sense of place, focusing on individuals and how they occupy that space and feel in the neighborhood.

The 2024 jury selected the University of California, Berkeley (Blue Team), as the runner-up. They praised the team's design for their comprehensive approach to the project, including aging-in-place aspects, plans for childcare and senior care, and cost-effective natural systems. The jurors were impressed with the amount of research the Blue Team had put into their design. They especially

appreciated that their financing reflected a large investment in the building's systems rather than the development's aesthetics.

Upon the jury's decision, the winning team receives a $20,000 prize, with $10,000 awarded to the runner-up and $5,000 to each of the remaining two finalist teams.

Acknowledgments and Honorable Mentions

HUD thanks the award-winning student teams from Harvard University and the University of California, Berkeley, for sharing their thoughts and for all the hard work they put into their submissions. HUD also thanks the remaining two finalist teams who participated this year—from the University of Maryland and the University of California, Berkeley (Gold Team).

University of Maryland (Team 359): The Village at Bay Creek design was deeply informed by research on community preferences and history. The team's interests in participatory design, public space, financial equity, community resilience, and emerging construction methods were integrated into their environmentally and economically sustainable proposal. They emphasized connection by fostering integration across generations and income levels, and they highlighted community by prioritizing indoor and outdoor gathering spaces. The development's natural environment was accentuated through various garden types to support human flourishing, and healing was promoted through similar integration principles. The housing mix included townhomes, garden-style apartments, and condos; solar energy and geothermal walls supported community resilience.

University of California, Berkeley (Team 370: Gold Team): The Romnes Commons plan leveraged innovative volumetric modular construction methods. The ambitious and creative proposal aimed to excel programmatically, architecturally, environmentally, and financially. Central to their design was a commitment to transparency, openness, and minimal disruption to prevent displacement and engage residents actively. The proposal emphasized community building and healthy living through placemaking and high-quality public spaces. The plan incorporated advancements in construction and sustainability to enhance long-term resiliency. Lastly, it focused on providing pathways to economic mobility and wealth building by offering affordable rental and homeownership opportunities for all households.

HUD would like to thank all the teams that submitted site plans for the 2024 competition. Although only four teams were selected for the final phase of the competition, six additional teams were ranked as noteworthy by the jurors. Highlights from the teams' plans are as follows, in chronological order by team number.

University of Kansas (Team 353: Ad Astra Group): The Romnes Terrace plan prioritizes innovation in wellness and healthy living while transcending class and social boundaries. The site reconnects with the original neighborhood and adds features such as a medical clinic, a community center, and a didactic park that honors Madison's heritage. Their solution, which contains more units than the original structure without sacrificing the

many benefits of the city, promotes the physical and mental health of the residents by incorporating a walking trail and access to parks and other neighborhood amenities.

Pennsylvania State University (Team 354: The Hamer Center Collective): The Bay View Commons plan enhances a sense of community by being responsive to the surrounding neighborhood context and respectful of the site's environmental and historical conditions. The proposal provides a variety of missing middle and full life-cycle housing that will increase density, accommodate the needs of existing residents, and be highly energy efficient, universally accessible, and transit oriented. Jurors noted that the team put considerable thought and research into understanding the goals for the City of Madison regarding housing, transit, sustainable outcomes, and the expected demographics of the development. Further, the team's use of 45L tax credits tied to sustainable project outcomes meets Madison's energy goals. It is a good solution to support increased costs to go beyond typical code-built construction practices.

University of Miami (Team 358: UM Team 1 Architecture Real Estate and Law): The Renaissance Madison plan offers 168 replacement units for current residents and addresses the needs of the broader Madison community by providing an additional 41 one-bedroom and 114 two-bedroom apartments and 42 single-family townhomes available for purchase by low-income families. The team's plan to promote physical and mental well-being, provide access to a variety of neighborhood amenities, and bring in commercial tenants to help generate additional "market rate" income were highly creative.

The Ohio State University (Team 361: Knowlton School): The Rhize plan is an innovative system grounded in the innovation of a prefab pod. This foundational unit is engineered to serve multiple functions, embodying the principles of modularity and adaptability. Each pod functions as a standalone three-bedroom home, complete with a single-bedroom apartment attached to its rear. The team's plan for adaptable prefab units exhibits innovation and adds strength to the proposal, and the overall proposal is consistent with Madison's long-range plans. Its components, including ideas for adaptable modular housing, are positioned to meet a variety of housing needs over time by providing building blocks that can be arranged and easily modified over the next few decades.

The University of Colorado, Denver (Team 363: CU Denver CAP): The Lakeview Commons plan brings together innovative housing concepts and flexible self-sufficiency programming to enhance the community and integrate residents across generations, incomes, and backgrounds. The project centers on bridging gaps and elevating lives to create an affordable and sustainable mixed-income community by creating 236 units of varying sizes, including rental units and opportunities for ownership in an innovative co-living community. The overall design approach was extremely cohesive, and attention to detail on proposed floor plans demonstrates a clear overall concept of the tenants' use of space.

University of Kansas (Team 365: Team ArcD): The team's goal was to create a moderately dense and sustainable mixed-income community with affordable and

market-rate housing. The plan included multifamily rental developments and affordable homeownership opportunities while connecting the site to the surrounding Bay Creek neighborhood. The team divided the current site into three integrated city blocks by extending Emerson Street through the site to a new street connecting Lakeside and Olin Streets. By breaking up the mass of the site, the plan allows for higher density and greater integration with the surrounding neighborhood context. Moreover, improving site circulation by extending Emerson Street and adding a new street will strengthen the site's connection to the surrounding neighborhood, and the mix of building sizes and types will help the Madison CDA meet its goals.

By initiating and funding this competition, HUD hopes to inspire and support aspiring members of fields such as architecture, planning, policy, and finance in advancing affordable and sustainable housing for low- and moderate-income Americans. HUD would like to acknowledge and commend all the teams who participated in the 2024 IAH Student Design and Planning Competition. HUD hopes to continue building capacity for affordable housing as the younger generation begins to think about creating homes and communities that are inclusive, equitable, and climate resilient.

In addition, HUD would also like to express sincere gratitude and appreciation for the 2024 Innovative Affordable Housing jury members' dedication and hours devoted to the awards selection process. Lastly, HUD thanks Schatz Publishing Group, LLC, for their planning and logistics efforts. Their hard work and flexibility made this year's competition a success.

The competition is thoroughly documented on line; for more information, please visit huduser.gov/portal/challenge/home.html.

A Decade of Innovation: Reflecting on the Past 10 Years of the HUD Innovation in Affordable Housing Student Planning and Design Competition

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The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. Government.

Introduction

The U.S. Department of Housing and Urban Development's (HUD's) Innovation in Affordable Housing (IAH) Student Planning and Design Competition has successfully organized more than a decade of competitions. The competition continues to serve as a platform for innovation and knowledge exchange, driving progress in the field of affordable housing and empowering public housing authorities to tackle housing challenges effectively. With each competition, valuable insights and ideas to shape the future of affordable housing have come about, emphasizing the importance of equitable access to housing and the integration of smart technologies and sustainable practices. Moving forward, these initiatives will continue to play a crucial role in advancing affordable housing solutions and building resilient communities across the United States.

This article explores the competition's evolution—from 2014 through 2023—and its key objectives, achievements, challenges, and lessons learned, highlighting the transformative power of creativity and collaboration in addressing housing inequality. Moreover, in reflecting upon the past 11 years, the competition's impact becomes evident and extends far beyond the bricks and mortar of housing structures to how HUD conceptualizes, designs, finances, and implements affordable housing initiatives. From innovative design concepts to groundbreaking financing models, the

competition has catalyzed a wave of innovation, highlighting the importance of sustainability, community engagement, and inclusivity.

Background

The Innovation in Affordable Housing Student Planning and Design Competition was launched in January 2014 by the Office of Policy Development and Research (PD&R) under the leadership of the late Rachelle Levitt. The IAH competition encourages research, innovation, and community planning in affordable housing and enhances future practitioner capacity. This competition requires collaboration among graduate students from various disciplines, such as design, finance, public policy, and planning, to promote awareness of affordable housing at a multidisciplinary level. By initiating and funding this competition, HUD and PD&R hope to inspire a new generation of professionals to advance the design and production of sustainable and livable housing for low- and moderate-income individuals.

The competition invites multidisciplinary teams to participate, with a minimum of three students and a maximum of five plus one faculty advisor. Each team must have members representing three different graduate-level programs; one must be from an architectural or design-related program and one must be from a non-architectural program.

Over the past decade, students have been tasked with designing and reimagining housing for various groups, including seniors, veterans, families, and migrant workers. HUD encourages students to prioritize building a sense of community, connectivity, inclusion, long-term financial viability, and resilience while incorporating creativity and innovation in both site design and financial solutions.

The year 2024 marks the 11th anniversary of the IAH competition and the 11th time HUD has partnered with public housing agencies (PHAs) from all over the country to provide a real-world affordable housing challenge for student teams to reimagine and propose plausible solutions. During Phase I of the two phases of the competition, HUD invited student teams nationwide to submit proposals (site plans and designs) to address the challenges set up by the partnering PHAs and the competition guidelines. The students are asked to apply innovative design strategies while being thoughtful of the cultural and social context of the partnering community. The teams provide a schematic design-level site plan, floor plans, and section and building massing. Teams include a narrative explaining their rationale, demonstrating an understanding of the community, planning and zoning requirements, resident needs, financing, and community services. Their design must include a preliminary pro forma supporting their financial calculations and fund leveraging. In general, teams are encouraged to think outside the box.

A jury of subject matter experts reviews the submitted proposals for innovative, creative approaches and original thinking. The jury considers each proposal against review criteria, including the following:

- Environmental impacts (i.e., the design's durability, impact on residents' health, water and energy efficiency, environmental resilience, and lifecycle costs).

- Financial impacts (i.e., the design's affordability or funding sources, the leveraging of various financial instruments such as tax credits, cash flow and creative alternatives, and innovative financing).
- Social implications (i.e., the design's effect on access to employment and services; accessibility; social networking; creating a sense of place, control, and comfort; and redressing past social injustices).
- Innovation (i.e., the design's integration of new ideas into the neighborhood and community relative to the restrictions and opportunities of the site).
- Redress for historical injustices (i.e., the design's ability to advance social, racial, or economic equity).

On the basis of those criteria, the jury selects four student teams. In Phase II of the competition, in March, the four finalist teams are invited to visit the partnering PHA site to refine their proposals and include local context. In mid-April, after the site visit, the jurors and the four final teams travel to Washington, D.C., for the final competition event at HUD headquarters. At this event, the finalists present their revised project designs to the jury and an audience and answer juror questions on their design. After the student presentations, the jury deliberates and selects the competition's first-place winner and runner-up teams.

The winning team receives $20,000, the runner-up team receives $10,000, and the remaining two teams receive $5,000 each.

Past Challenges

The Innovation in Affordable Housing competition has facilitated more than a decade of challenges and innovative solutions, each addressing the most pressing housing concerns. Since its beginning in 2014, the competition has evolved to engage various stakeholders, including students, professionals, and interdisciplinary teams, and participants have been tasked with designing and planning affordable housing units that prioritize sustainability, community engagement, and cost-effectiveness. Themes such as energy efficiency, inclusivity, and resilience have been central to these competitions, reflecting the ongoing priorities in the affordable housing landscape. By encouraging collaboration and creativity, the competitions also foster a culture of innovation, driving progress in the field and empowering communities to address housing needs effectively. With each competition, participants contribute valuable insights and ideas to shape the future of affordable housing, emphasizing the importance of equitable access to housing and the integration of smart technologies and sustainable practices. Moving forward, these initiatives will continue to play a crucial role in advancing affordable housing solutions and building resilient communities across the United States.

Year 1

For the competition's inaugural year, HUD partnered with the Housing Authority of Bergen County (HABC), New Jersey. HABC wanted to create affordable housing for disabled veterans on a 1.5-acre

project while preserving a historic house used as an American Legion headquarters, known as the Peter DeBaun House.

On May 6, 2014, the jurors selected a student team from The Ohio State University as the winner of the competition for their design to upgrade the first floor into a community living room that could be partitioned to accommodate small-group meetings, private meetings for social workers, and a gym (exhibit 1). The second floor design was upgraded to include an open office area for various services to allow for interaction between coworkers, including Veterans Affairs social workers and coordinators (as specified in the HUD-Veterans Affairs Supportive Housing program best practices). The student team presented the seven dimensions of wellness as a mechanism to support the target residents. Their transportation plan included partnering with New Jersey Transit and the Bergen County Line (Emerson light rail) and Zip Car to connect the site to other areas. They incorporated the residents' needs via public engagement strategies (e.g., town hall meetings) and engaged residents via design charrettes to incorporate and celebrate the DeBaun House's history and honor the community's veterans.

Exhibit 1

Site Plan from The Ohio State University Student Team Proposal

Source: The Ohio State University Team Presentation

The inaugural runner-up team, made up of students from New York University and Columbia University, was chosen for their multilayered design approach to addressing the residents' needs by creating a rehabilitation and activity center in the renovated DeBaun House and a resident-maintained vegetable garden on site (with produce used by the community's café), both of which provide resources within the veteran community and engage the larger community in the development (exhibit 2).

Exhibit 2

Site Plan from the New York University and Columbia University Student Team Proposal

Source: The New York University and Columbia University Presentation

On June 29, 2016, a groundbreaking ceremony was held to mark the beginning of construction on affordable homes for veterans named Emerson Veteran Supportive Housing. The new homes were to be built on the land behind the American Legion headquarters (the DeBaun House) and consisted of 14 single-story, one-bedroom units in seven duplex-style buildings. Per the housing authority's website, "the design was developed by Arcari & Iovino Architects in connection to a U.S. Department of Housing and Urban Development competition.… Funding for the project will come from the N.J. Housing and Mortgage Finance Agency, the Housing Development Corporation, and Bergen County HOME." Each unit is air-conditioned; has a kitchen, living room, and dining room; and comes equipped with washing machines, dryers, and handicap-accessible bathrooms.

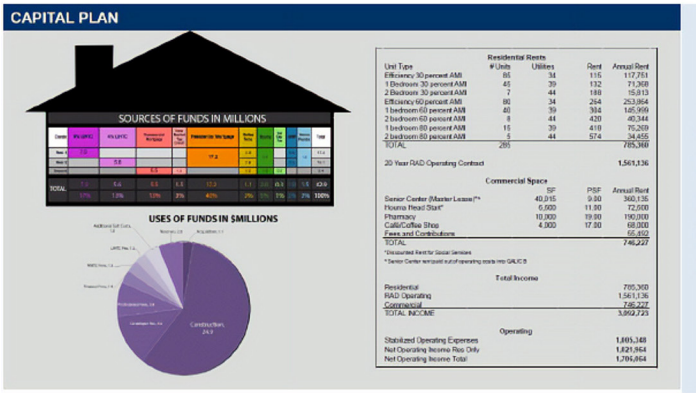
Year 2

In 2015, HUD partnered with the Houma-Terrebonne Housing Authority (HTHA) in the state of Louisiana. HTHA manages Bayou Towers, an 11-story senior housing development in Houma. First occupied in 1971, Bayou Towers contain 300 dwelling units; however, the aging infrastructure led HTHA to consider a gut rehab of the existing structure or build a new structure to ensure that seniors in Houma have access to safe, affordable rental housing. The students entering the competition that year were asked to consider the needs of the residents, local zoning restrictions, and funds-leveraging opportunities.

The New York University team was announced as the winner for its innovative financing scheme, which included using a mixed-use strategy that incorporated retail for income purposes, creating a positive community-wide impact (exhibit 3). The construction plan also included an early childcare center, a variety of onsite services and activities to address the needs of the community, walkable streetscapes to create inviting outdoor spaces, a pharmacy, a local coffee chain, direct access to the adjacent park, and a new gazebo. Each unit was equipped with a recessed balcony and operable shutters. The team's energy efficiency measures included solar panels for domestic hot water on the roof and a passive house approach to the building envelope, which fed into maximizing thermal insulation, installing low u-value windows, and specifying energy recovery ventilation.

Exhibit 3

Financing Scheme from the New York University Team Proposal



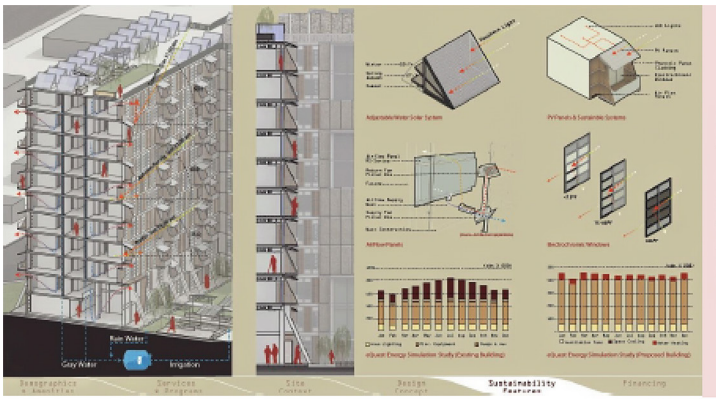
The proposed income profile was comprised of residential rent, HUD Rental Assistance Demonstration (RAD) Program operating funds, and commercial rent.

Source: The New York University Presentation

The runner-up team was the student team from the University of California, Los Angeles. The team designed a gut rehab of the existing Bayou Towers structure with an emphasis on rebuilding with energy efficiency coupled with strong healthcare partnerships (exhibit 4). The plan also emphasized a progression of indoor and outdoor spaces, areas for family and community events, and an intergenerational center through a partnership with Nicholls State University. Further, the team combined an onsite healthcare suite with a tele-healthcare suite, wherein the residents can communicate with doctors and nurses via video conferencing. The jurors believed that the team demonstrated a deep understanding of the senior population and its needs, reuse of materials, and an innovative modular façade design.

Exhibit 4

Energy Efficiency Features Proposed by the University of California, Los Angeles, Student Team



Active features include a water filtration system to conserve water for irrigation and flush toilets; solar panels on the roof for DHW; and PV on balconies to generate enough electricity to power LED hallway lighting.

Source: The University of California, Los Angeles, Presentation

On August 29, 2021, Hurricane Ida made landfall off the coast of Louisiana and caused severe damage to Bayou Towers. The building sustained significant roof damage, and the insurance adjusters determined that residents could not return to live in the units. As of April 23, 2023, the housing authority is waiting for the Federal Emergency Management Agency to complete its assessment on whether Bayou Towers is more than 50 percent damaged—if so, it will be eligible for demolition.

The housing authority submitted a Section 18 Demolition application to the HUD New Orleans Field Office. HTHA intends to demolish Bayou Towers; the property is set to be sold as clear, vacant land.

Year 3

The Housing Authority of the City of Santa Barbara (HACSB), California, partnered with HUD for the 2016 competition. The site, Monteria Village, is a 56-unit multifamily housing development built in 1973. The complex has 28 rental housing units: 20 three-bedroom units, 4 four-bedroom units, and 4 five-bedroom units. All units are townhouse-style apartments contained in seven two-story buildings. The challenge was to develop a site plan to improve and expand quality housing options for families living in the complex. HACSB was interested in team proposals for either gut rehabilitation (for a deep energy retrofit plus new amenities) of the existing buildings or new construction. The secondary interest of HACSB was to incorporate the provision about social amenities for the residents into the solution.

The winning team from the University of Texas at Austin focused on family, lifelong education, and holistic sustainability. The team proposed new construction focusing on the importance of social networks and leveraging existing community amenities, such as the Family Opportunity Center and nearby public transportation. Their design included new features, such as an education center and an outdoor common area. The new development would include 65 new units and incorporate sunscreens and trellises, entry arbors and gates, private terraces, and patios, which support the goal of providing a strong connection to the community's social heart (exhibit 5). Some units would have built-in flexibility that would allow for combining units for larger or extended families. Also noteworthy is an integrated purification system that reuses gray water and stormwater runoff.

Exhibit 5

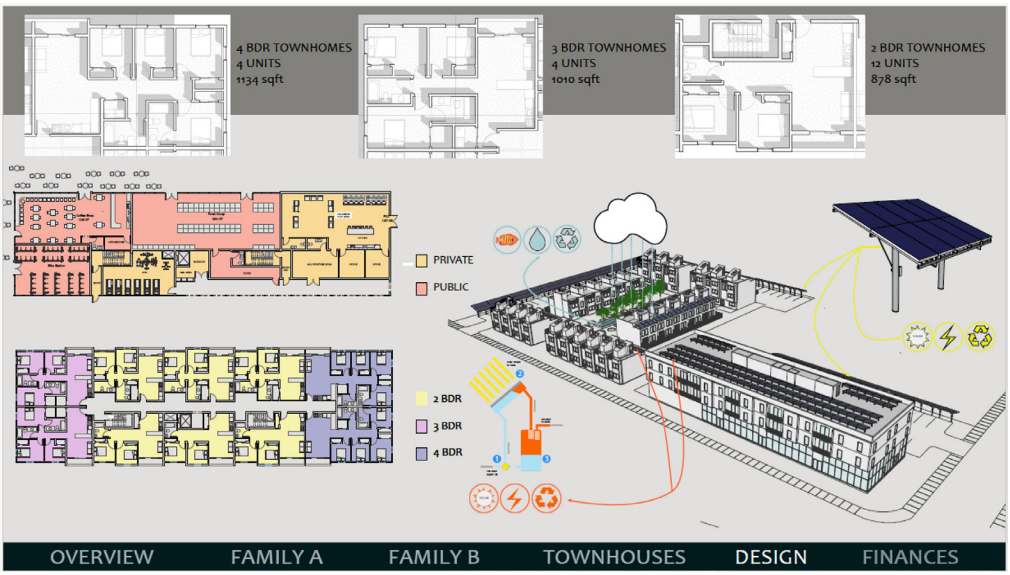
A Cross-Sectional Representation from the University of Texas at Austin Student Team Proposal

Source: University of Texas at Austin Presentation

The runner-up team from the University of Maryland, College Park, presented a proposal for new construction on the site, consisting of two-, three-, and four-bedroom units (exhibit 6). The plan emphasized energy-efficient, durable materials incorporated into the site's buildings. To reduce operating and maintenance costs, the team proposed a passive cooling system featuring clerestory roofs and windows to remove heat during the summer. Each unit included a pallet wall for plants and herbs. A two-pronged approach to financing the project—using either 9- or 4-percent Low-Income Housing Tax Credit (LIHTC) funds, combined with other grant funding allowed the student team more flexibility in addressing the site's specific challenge of expanding affordable housing options for families living on site. The team focused on preserving and creating affordable rental housing that emphasized lifestyle opportunities through community, health, affordability, and education. The proposal built on the existing amenities—such as proximity to primary schools and college or university campuses, the beach, and public transportation—while actively addressing existing site challenges, including poor aesthetics, lack of defensible space, and awkward site design.

Exhibit 6

Site Plan Overview from the 2016 University of Maryland, College Park, Student Team Proposal



Source: The University of Maryland, College Park, Team Presentation

HUD staff interviewed current PHA staff about their thoughts on the designs proposed during the 2016 competition. They were impressed with the teams' emphasis on environmental and mitigation efforts but thought that some ideas were a little far reaching, such as rooftop gardens. The staff thought a few of the ideas did not consider the local context, and some of the financial schemes were hard to achieve.

On April 20, 2021, the housing authority issued a request for proposal (RFP) to solicit creative ideas on the redevelopment and revitalization of Monteria Village. The RFP included the 2016 competition designs and plans from the winning and runner-up student teams.

Year 4

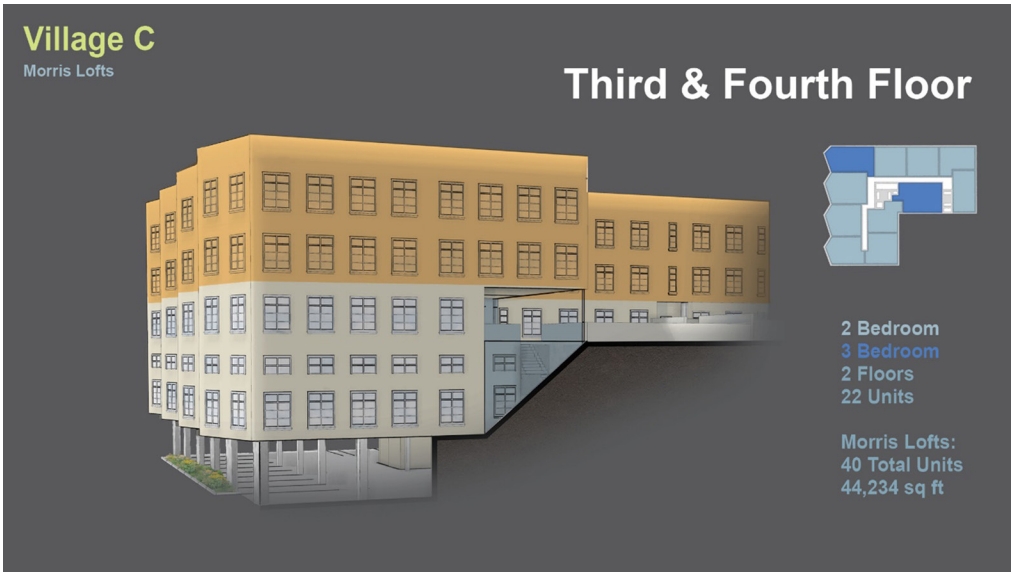
Cuyahoga Metropolitan Housing Authority (CMHA) was HUD's partnering agency for the IAH competition in 2017. CMHA wanted to redevelop an existing public housing project, Woodhill Homes, in an urban environment with a focus on family housing. Woodhill Homes is a 478-unit multifamily development on the outskirts of downtown Cleveland, Ohio. Although its proximity to the city should generate more economic opportunities for Woodhill Homes residents, the property is isolated from the surrounding neighborhoods by a street barrier or a physical structure such as a large dumpster, an iron or wooden fence, or raised terrain, making it difficult or unsafe to cross over from building to building. Inadequate transportation options hinder access to the urban core. The primary goals set for the students were to improve connectivity to the urban grid, expand upon proposed mass transit, and increase housing density. The PHA anticipated that these goals would be accomplished through the design and development of infill housing options, renovation

of existing buildings, and improvement of the site plan to tie the project more effectively to the surrounding neighborhood.

The team from Rutgers University was the winner, with a design focused on community empowerment, sustainability, and connectivity (exhibit 7). Their design addressed the substantial elevation changes encountered on the site with the proposed grid development and a new building, Morris Lofts, to be built into the topography to passive house standards, increasing the density and adding backyard space. Morris Lofts would be a 40-unit building that provided shared space for arts, training, and community development activities. The student team's proposal uniquely transformed underutilized spaces into shared outdoor gathering areas to encourage more interaction between residents.

Exhibit 7

The Proposed New Building



Source: Rutgers Team Presentation

The runner-up was the student team from the University of Michigan; they also proposed an innovative design centered around environmental sustainability and a healthy community (exhibit 8). They proposed a mixed-income community (by including a few market-rate units in the portfolio), a community garden, new planters, trees, recycled materials, and parking alongside pedestrian and bike paths. Their green infrastructure included bioswales, permeable pavement, native plants and trees, and low-impact and recycled materials. The landscape would allow residents to have private space with front yards.

Exhibit 8

Site Plan from the University of Michigan Student Team Proposal

Source: The University of Michigan Team Presentation

In 2021, HUD awarded a $35 million Choice Neighborhoods Implementation grant to CMHA and the City of Cleveland; an additional $10 million grant was awarded on April 12, 2023. Residents of Woodhill Homes began to move out in the summer of 2022. The plan includes the six-phase redevelopment of Woodhill Homes into high-quality, mixed-income apartments.

The transformation plan included new housing, streets, public space, and programming for the community. Changes include creating infrastructure to link people, places, and opportunities; targeted placemaking; public space enhancements; and opportunities for employment, ownership, entrepreneurship, and wealth building. For example, they proposed creating a healthcare center to remove a barrier to high-quality preventive health care.

In May 2021, HUD staffers interviewed CMHA Executive Director James Patterson about his experience with the competition. Director Patterson spoke of needing a new perspective, and the students presented designs that his staff would have never thought about. In addition, he thought that some designs were more realistic than others, but they provided ideas to consider.

Year 5

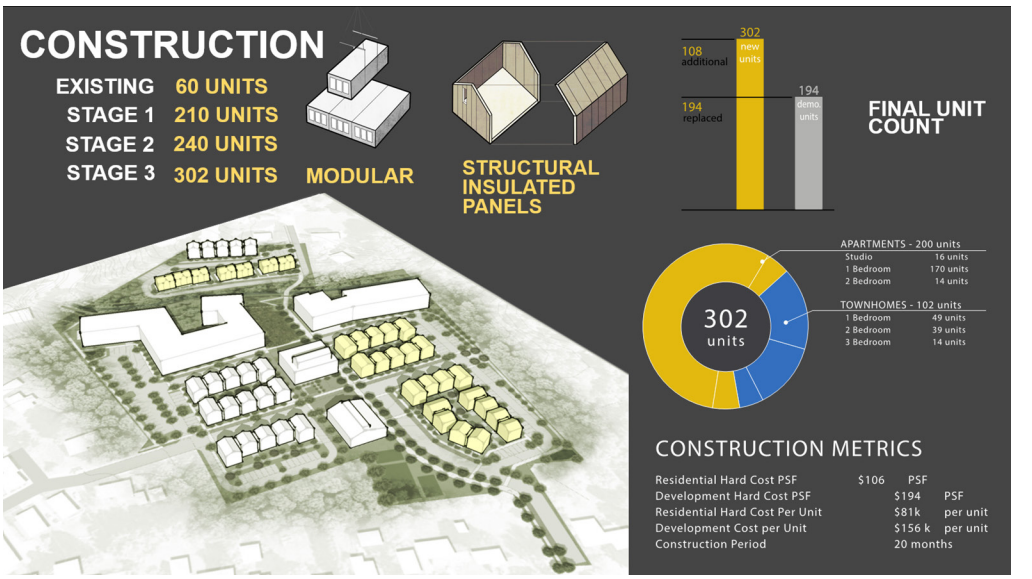
In 2018, HUD partnered with the Dover Housing Authority (DHA) in New Hampshire. DHA wanted to incorporate innovative design techniques for community engagement strategies for seniors, veterans, and persons with disabilities for properties managed by the housing authority. They needed to consider the environment (e.g., using durable and resilient materials that could

withstand natural disasters and require little maintenance), several design approaches (e.g., designs to improve the health, safety, and well-being of residents), and energy- and water-efficient appliances (e.g., to help preserve natural resources and lower energy costs). Students were asked to allot space in their design for 154 new dwellings located between two existing DHA projects—Edgar Bois Terrace apartments on Niles Street and Nile Park apartments on Union Street. The site containing these two properties and the buildable area between them was considered by the City of Dover to be a single parcel; the intent was to dramatically increase the housing density of the site.

The winning student team, from the University of Maryland, College Park (UMCP), named their proposed development "Beacon Crossing." It would be a new construction with an updated functional space for the existing community center, including a youth center, a food co-op, and a new community garden with a greenhouse to provide food throughout the year (exhibit 9). The three pillars of the student team's design were to (1) enhance access to community supportive services, (2) create a connected community to encourage social interaction and engagement, and (3) improve the health and well-being of all those living in the community. Also noteworthy is the integration of green, sustainable materials throughout the community, such as a new purification system that reuses gray water and stormwater runoff.

Exhibit 9

Site Plan from the 2018 UMCP Student Team Proposal



Source: University of Maryland, College Park, Presentation

The runner-up, the student team from the University of Colorado Denver, created a sense of place with public spaces, a dog park, and outdoor activity areas, adding to the availability of public amenities and hoping to draw in residents from surrounding neighborhoods (exhibit 10). Sustainable design and building practices were included, such as passive house principles, natural daylighting, building orientation, and photovoltaic panels on the east and west wings of the site.

Exhibit 10

Site Plan from the University of Colorado Denver Student Team Proposal

Source: The University of Colorado Denver Team Presentation

HUD staff interviewed DHA Executive Director Allan B. Krans Sr. about the teams' proposals. He thought that the teams were successful in addressing the issues outlined by the PHA; however, certain particulars needed to be included, including possible access points to the site, and the financial schemes provided were unrealistic. Although impressed that the four finalist teams provided differing designs, he noted that for new construction, he would have liked the teams to focus more on energy conservation techniques and internet accessibility. Nonetheless, he appreciated the competition, which served as a morale booster for his staff in witnessing more than 20 students thoroughly engaged with improving affordable housing.

Year 6

The sixth housing authority to partner with HUD was the San Antonio Housing Authority (SAHA) in 2019. SAHA wanted student teams to design a new mixed-use development for low- and moderate-income residents along the San Antonio Riverwalk. The sites provided an exciting opportunity for teams to create living and retail spaces that reinforce essential services, ensuring that residents are not isolated from the surrounding community and are proximate to employment opportunities. The site, an undeveloped, approximately 2.5-acre corner lot at the intersection of Brooklyn Avenue and North St. Mary's Street, was zoned for high-density development, requiring new constructions to allow at least 5.5 hours of solar access in the winter solstice and 7.5 hours in summer. SAHA wanted the teams to plan for approximately 100 new mixed-income dwellings with a mix of studio, one-bedroom, two-bedroom, and three-bedroom units, with one-half having two bedrooms. The minimum area requirement for each dwelling based on bedroom count is regulated by several different governmental agencies.

The winning team, from the University of Maryland, College Park, proposed a mixed-use, mixed-income project containing 177 affordable units and 13,000 square feet of commercial space (exhibit 11). Their approach included five priorities: diversity, connectivity, wellness, sustainability, and growth. The proposal also included a range of building types and housing options with various services and amenities. Live/work units, grocery, and a BiblioTech branch, Bexar County's first digital public library, were proposed.

Exhibit 11

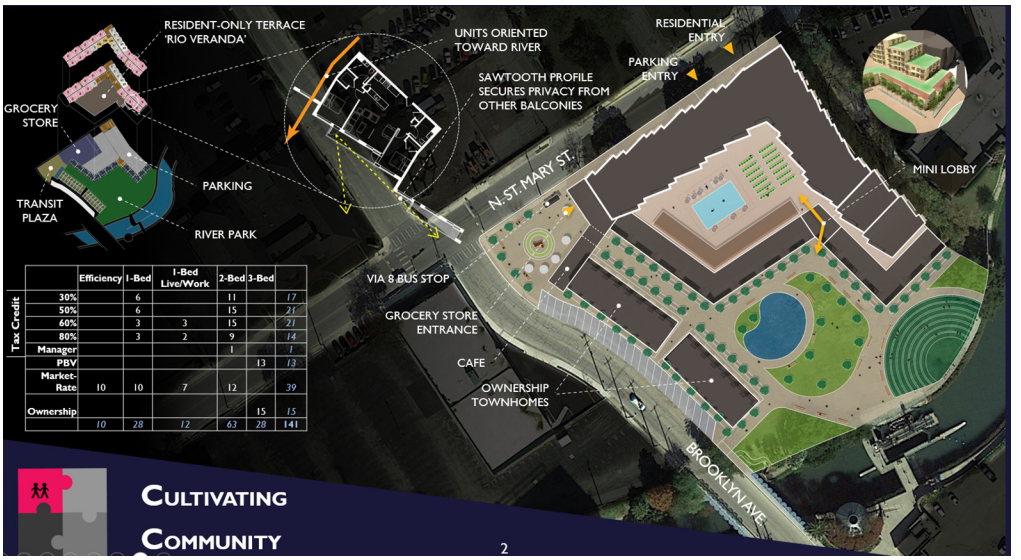
Site Plan from the University of Maryland, College Park, Student Team Proposal

Source: The University of Maryland Team Presentation

The runner-up, the University of California, Berkeley, designed a diverse mix of programs and housing types, including a five-story building atop a two-story podium, which defines the edge of the site and provides steps down to the San Antonio Riverwalk. Their design includes townhomes for ownership, a 7,000-square-foot transit plaza, a grocery store, and a pedestrian path to the river (exhibit 12). The team's sustainability aspect included the homes being built according to passive house principles.

Exhibit 12

Site Plan from University of California, Berkeley, Student Team Proposal



		Efficiency	1-Bed	1-Bed Live/Work	2-Bed	3-Bed	
Tax Credit	30%		6		11		17
	50%		6		15		21
	60%		3	3	15		21
	80%		3	2	9		14
	Manager				1		1
	PBV					13	13
	Market-Rate	10	10	7	12		39
	Ownership					15	15
		10	28	12	63	28	141

Source: The University of California, Berkeley, Team Presentation

During the HUD interview with SAHA staff, they spoke highly of the students' innovative ideas and how the competition helps them to view alternative ways to develop property. As such, they would like their staff to participate in the selection process in future competitions so they can better understand the student designs. SAHA also discussed the intricacies of developing affordable housing, including obtaining the approvals needed from the city, the PHA board, and the housing authority's executive director. As of March 2021, the site remains undeveloped for those reasons. However, the site has increased in value, making the PHA reconsider whether to develop the land or sell it as is; SAHA staff may sell the land to help fund the redevelopment of an existing public housing site with a funding gap of $70 million. In fact, one of the student teams proposed selling the land, allowing the housing authority to build more affordable units.

Year 7

For the 2020 competition, HUD partnered with the Santa Fe County Housing Authority in New Mexico. The County of Santa Fe purchased a vacant lot of 6.6 acres of land in the fastest-growing part of the city of Santa Fe, which has a very uncoordinated pattern of development in that area. The parcel also adjoins some infill sites and a commercial power center. Student teams were challenged to be innovative but also to preserve and celebrate the unique culture of Santa Fe. The teams were asked to design a new mixed-use development for low- and moderate-income residents, with a particular focus on expanding housing for women with children, with the usual planning constraints: zoning requirements, local economic conditions, financial feasibility, the built environment, and the larger social needs of the community.

The developer of the power center is working on zoning that will allow for more pedestrian-oriented, high-density mixed-use, and mixed-income residents. The land is zoned to allow for up to 29 units per acre, the highest allowable density in the city of Santa Fe. The housing authority preferred using low-income housing tax credits and other sources of capital to finance the development.

The proposal submitted by the winning student team, from Yale University, included a design for "Jacob Commons"—a 181,000-square-foot multifamily development with 62 of the 158 mixed-income units reserved as affordable, 10 percent reserved for households who make less than the 30-percent Area Median Income, and 38 percent reserved as market rate. The project's site plan reflects New Mexico's rich Indigenous history while also promoting sustainability, durability, and healthy living through the use of outdoor space (exhibit 13). The team's design also promoted communal living to enrich the tenants' lives. Inspired by the pueblos, the site plan visually reflected the rich history of the Indigenous people of New Mexico. It endeavored to develop a strong community among the residents and the surrounding neighbors by creating community paths that provide access to local shopping centers and neighbors.

Exhibit 13

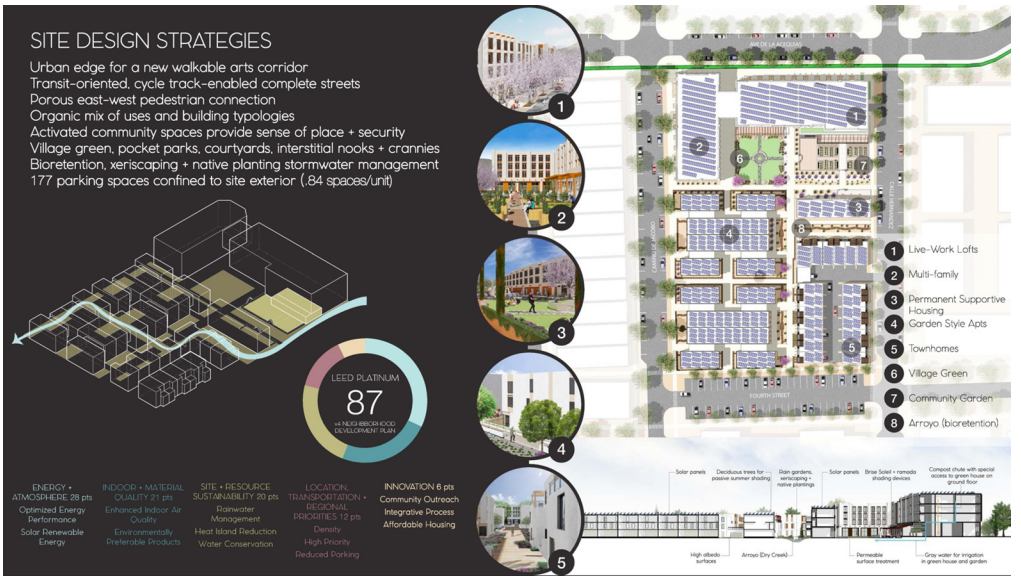
Site Plan from the Yale University Student Team Proposal

Source: Yale University Team Presentation

The runner-up team, from the University of Maryland, College Park, proposed "Nueva Acequia," a mixture of multifamily residences, townhomes, garden-style apartments, and permanent supportive housing for 210 units (exhibit 14). The team proposal addressed three goals: (1) increase the availability and affordability of housing, (2) extend a pathway to homeownership, and (3) reduce homelessness. Drawing from the Taos Pueblos tradition of shared irrigation systems, Nueva Acequia was designed with shared community resources to provide residents with sustainability and opportunities for economic opportunity, diversity, and health and wellness. The design provided flexible live/work units and space for both a youth education center and a daycare center with an enclosed outdoor play area.

Exhibit 14

Site Plan from the University of Maryland, College Park, 2020 Student Team Proposal



Source: University of Maryland, College Park, Team Presentation

In the summer of 2021, the Santa Fe County Commission approved a $600,000 architectural contract with the local design firm Autotroph to draw up designs for the project to be presented to the New Mexico Mortgage Finance Authority for the agency's 4-percent LIHTC program. Furthermore, County Manager Katherine Miller said that Autotroph will use the Yale team's proposal as the basis for its design work.

The HUD team interviewed outgoing Housing Authority Executive Director Joseph Montoya about his thoughts on the competition and future plans for the site. He wanted to partner with the IAH competition because it presents a way to show the challenges that PHAs have that are not the same nationwide and showcase the differences between low- and high-density areas and western and eastern states. Further, Montoya wanted to take the opportunity to engage with young minds to see how they would develop the land the PHA had just purchased. The housing authority was able to purchase the land below market price because the previous landowner's intention was for the land to be used for affordable housing, which is viewed in Sante Fe as a social justice issue. The housing authority wanted to work with the other nearby landowners to create a larger area for shopping and recreation.

At the time of the IAH competition, the housing authority already had an architect looking into developing the land. That person was available to listen to the ideas presented by the student teams. The architect reviewed the proposals and used some of the students' ideas to influence the final design (e.g., walk and bike paths). He also noted that aspects of the designs were sometimes inappropriate for their development; for example, the design incorporated services for elders or created financial pro forma based on bringing in a health clinic. He stated that he would like students to build for the local context.

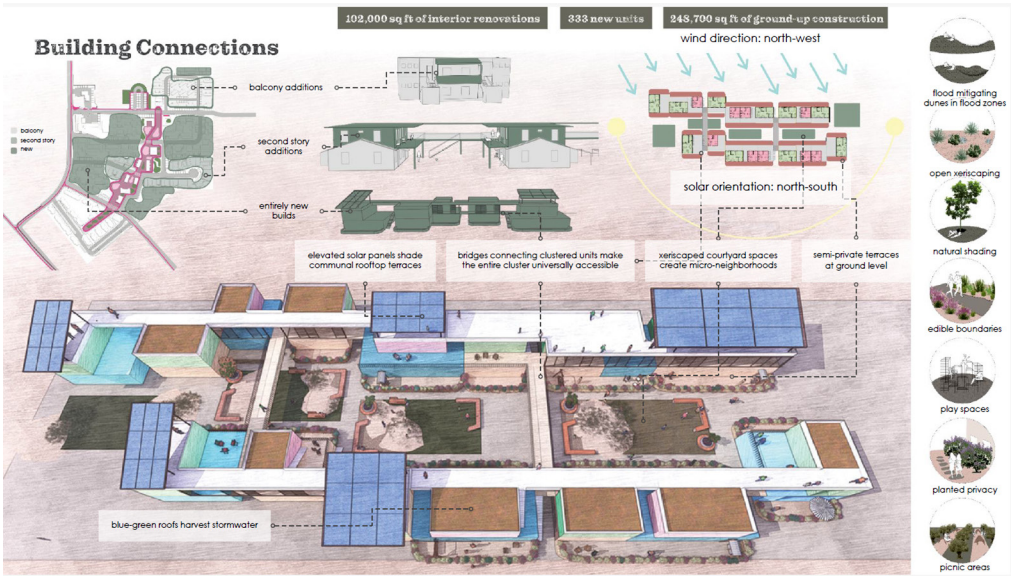
Year 8

HUD partnered with the Fresno Housing Authority (FHA) in California in 2021—the first year that HUD partnered with a rural site, which provided a unique challenge with an added layer of complexity. The students were tasked with finding innovative solutions to create a single, cohesive community from five contiguous properties in the city of Firebaugh. The sites proposed for the competition were on contiguous properties; however, they were separated by unappealing fencing, leaving residents without the option for community connectedness. The sites serve low-income families, seniors, and farmworkers. Hence, the students were asked to redesign more than 210 units of workforce housing for farm laborers, migrant workers, senior citizens, and low-income families. Current residents indicated that an ideal design plan would remove the fencing, add green space and recreational elements, and improve the infrastructure necessary to support a car-centric, rural community.

The first-place winner was the student team from Pratt Institute and New York University. Their design, "A Breathable Connected Community," addressed the intergenerational and agricultural needs of Firebaugh (exhibit 15). The teams proposed three ranges of development, from minor upgrades to full rebuilds. Their designs created micro-communities using architectural features within buildings to encourage interactions between residents and to facilitate time outdoors. The jurors praised the team's financing, innovation, and environmental sustainability, including self-sustaining energy, water, and waste systems.

Exhibit 15

Site Plan from the Pratt Institute and New York University Student Team Proposal

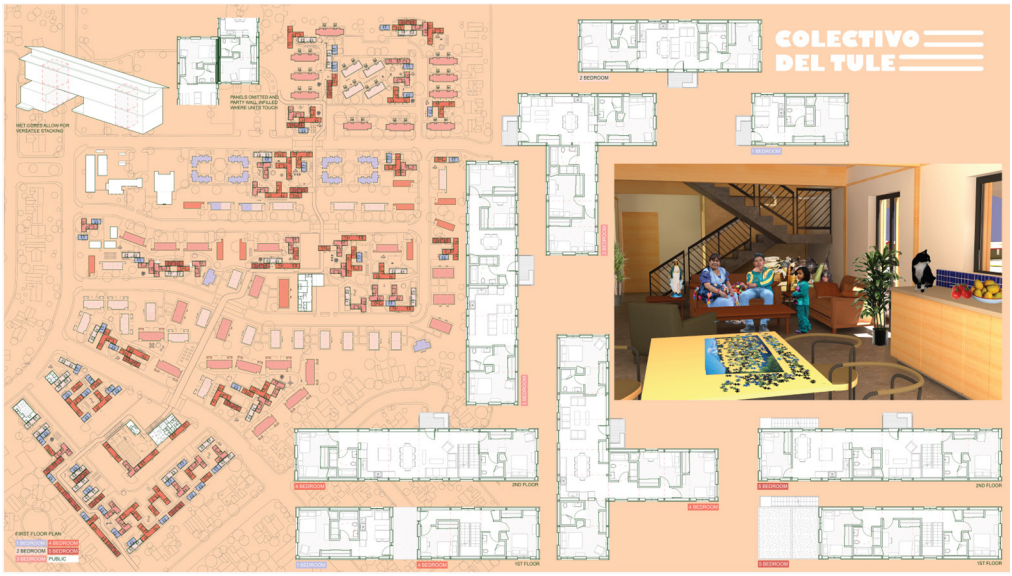


Source: Pratt Institute and New York University Team Presentation

The runner-up team, from the University of Michigan and Harvard University, proposed "Tachi Creciente," a 414-unit complex across the five developments (exhibit 16). The development created an integrated, green, and service-enriched community promoting social cohesion, health and wellness, digital inclusion, educational achievement, and workforce development. All units were equipped with outdoor living spaces and designed to rethink the single-family home typology, maintaining a residential feel while adhering to the City of Firebaugh's growth strategy. Furthermore, the design encompassed walkable and bikeable green corridors and incorporated sustainable design practices for climate-smart communities.

Exhibit 16

Site Plan from the University of Michigan and Harvard University Student Team



Source: University of Michigan and Harvard University Team Presentation

FHA Chief Real Estate Officer Michael Duarte recently reported that they were days away from starting construction on the La Joya Commons project, and they were looking to redevelop the project area in phases. Although they are not using a specific student proposal, they believe that they learned a lot from each presentation, which will influence their overall approach.

Year 9

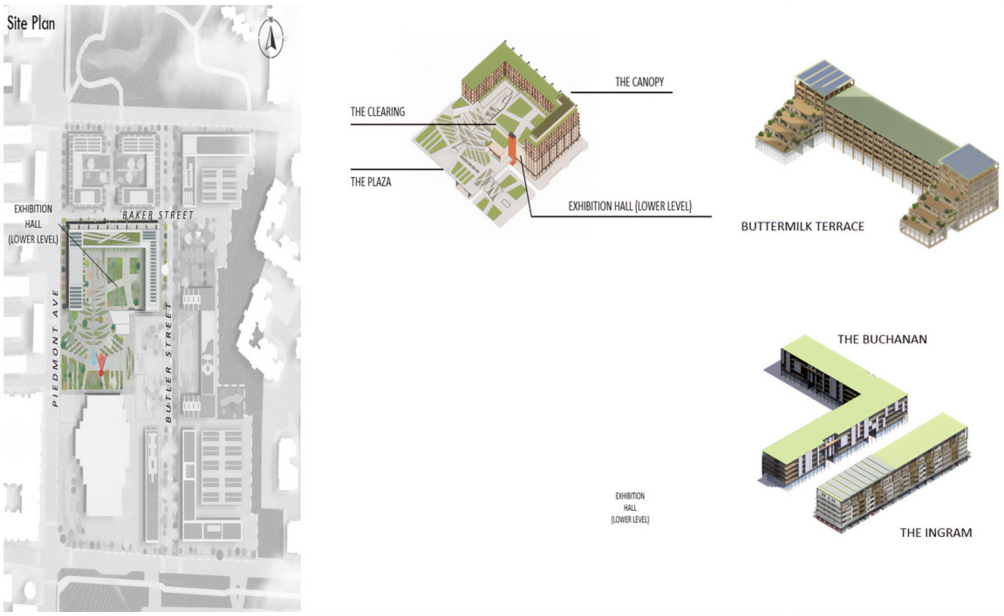
In 2022, HUD partnered with the Atlanta Housing Authority (AHA) in Georgia. This year's design centered around the Boisfeuillet Jones Atlanta Civic Center building complex and the land it sits on. Student teams were asked to find solutions to convert the 13.12 acres of developable land into affordable housing in a mixed-use and mixed-income setting while preserving the cultural, historical, and social significance of the Civic Center.

AHA asked the students to advance innovation in the design of affordable housing, with solutions that could be implemented on site to promote durability, reduce energy consumption, increase the quality of housing, and enhance the social and economic vitality of the surrounding community.

The winning team, from the University of Maryland, designed a site plan dubbed "Rise of Pines," addressing the need for a mixed-use and mixed-income community in the heart of Atlanta. Rise of Pines proposed 1,394 residential units across seven structures: three cross-laminated timber highrise buildings and four wood-frame mid-rises (exhibit 17). The Rise of Pines structures are designed to be compatible with the EarthCraft program for multifamily homes and to be certified Platinum under the LEED for Neighborhood Design v4 guidelines. Solar panels and geothermal heat pumps, supported by tax credits, would reduce the project's carbon footprint.

Exhibit 17

Site Plan from the University of Maryland Student Team Proposal



Source: University of Maryland Team Presentation

The runner-up team, from the University of California, Berkeley, designed "Civic Oaks," creating 748 new residences, approximately 80,000 square feet of office space, 500,000 square feet of green and open space, and 14,600 square feet of retail space to enhance the culture and unique flavor of Atlanta's Old Fourth Ward neighborhood (exhibit 18). Their vision includes subdividing the current "super-block" complex into smaller, neighborhood-scale streets. The team considered community opposition to highrise construction and created a medium-height ensemble of buildings. Civic Oaks incorporates various housing types and unit sizes, from studios to three-bedroom units, condominiums, townhomes, and live/work lofts. An exposed amphitheater in the central plaza would serve as a centerpiece for the community, housing a combination of cultural, educational, and art programs intended to promote community health.

Exhibit 18

Site Plan from the University of California, Berkeley, Student Team Proposal

Source: University of California, Berkeley, Team Presentation

In a recent interview, AHA's Trish O'Connell, chief real estate officer for Planning and Development, mentioned to HUD's Dr. Regina Gray, director of the Affordable Housing and Technology Division, how the students put effort in their design to think about how people would live in the units, how they would circulate and created access to green spacing, both internal and external. She was impressed with the deep thinking that students put into their designs, including the planning for stormwater management and the materials that should be used.

Recently, AHA is working with developers and other stakeholders to reimagine the site. The proposal incorporated ideas from the University of Maryland's winning design. AHA anticipates groundbreaking at the site before the end of the year, which will include new restaurants, retail and office space, and about 1,500 housing units—approximately 30 percent will be reserved as affordable.

Year 10

For the 10th year, in 2023, HUD partnered with the Chicago Housing Authority (CHA). The design challenge was to maximize the number of affordable units on a 0.45-acre, underdeveloped CHA-owned site located at 420–430 West North Avenue, Chicago, IL 60610. The site sits within a thriving neighborhood and currently contains two vacant, low-rise, six-unit public housing buildings past their useful life. The priorities are to densify and add amenities on the site to ensure congruity with the surrounding neighborhood and alignment with the City of Chicago's Climate Action Plan; retrofitting and electrification goals are additional priorities.

The winning proposal, "Garden City," from the University of Illinois Chicago team was anchored on four principles: community, opportunity, health, and accessibility. They purposely designed a two-tower design to foster a sense of community and provide direct access to outdoor spaces, created passive heating, and designed a streetscape that blends in with the surrounding neighborhood (exhibit 19).

Exhibit 19

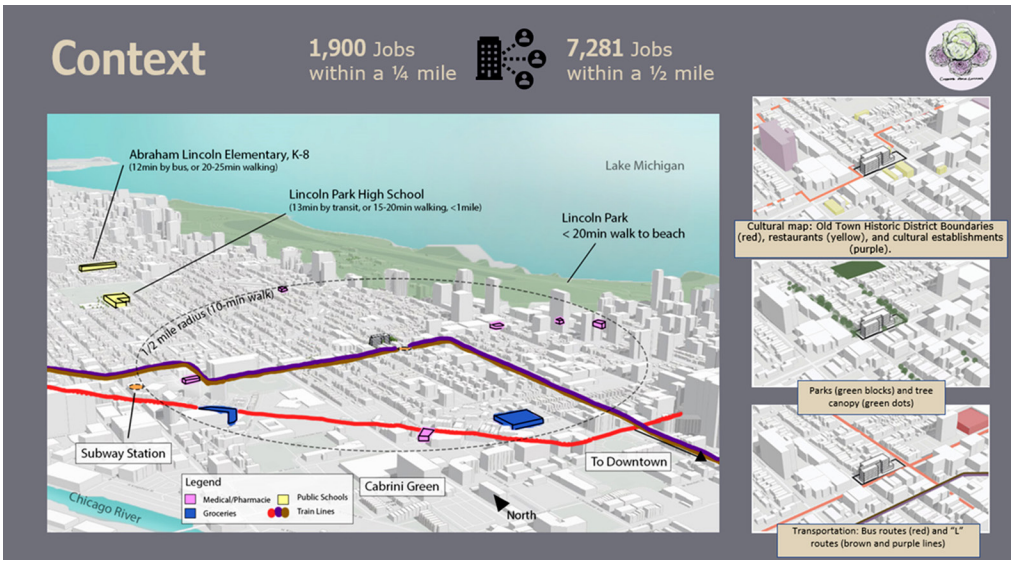
Site Plan from the University of Illinois Chicago Student Team Proposal

Source: University of Illinois Chicago Team Presentation

The runner-up team from the University of Texas at Austin considered the short- and long-term impacts of the development on the environment, the neighborhood, and its residents. With "Cabbage Patch Commons," they envisioned housing as a human right and a foundation for opportunity, and they endeavored to incorporate that perception in their work by thinking beyond physical design and into social and programmatic elements (exhibit 20).

Exhibit 20

Site Plan from the University of Texas at Austin Student Team Proposal



Source: University of Texas at Austin Team Presentation

Staff from CHA are using the student designs to evaluate their options, and the proposals and pro formas have been helpful and informative. The UIC team presented their design to the housing authority's executive team and separately at an Earth Day event.

Year 11

For the 2024 competition, HUD partnered with the Madison Community Development Authority in Madison, Wisconsin. An article detailing the results of the competition is found elsewhere in this publication.

Conclusion

The Innovation in Affordable Housing competition has grown and expanded to include the growing challenges facing public housing agencies. Over the years, the competition has addressed the needs of older adults, multigenerational families, veterans, and migrant laborers and addressed longevity, climate change, and issues around equity and equitable development. Staff from the Office of Policy Development and Research reached out to staff from each of the partnering PHAs to learn about improvements needed to refine the competition as HUD helps PHAs with the issues they are facing with affordable housing.

Since the inception of the IAH student competition, PHAs have used student designs to evaluate proposed designs from construction firms or include them to solicit bids for development. Although many of the PHAs have not developed the sites featured in the competition, the PHA staff interviewed said that they valued the insight the student designs brought to light. It was the

students' outside-the-box thinking they needed to view the site from different angles. As HUD approaches the 2025 competition, providing PHAs from across the country with creative ideas for developing affordable housing remains a top commitment. HUD is dedicated to nurturing the interdisciplinary essence of community development and encouraging students to collaborate and work seamlessly across various academic and career disciplines.

PHA staff suggested some changes to the competition's process, including using local stakeholders as members of the jury to ensure that the local context (e.g., zoning requirements, city and state ordinances, and local preferences) are included in the designs that are selected. The PHAs also asked that pro formas include references for the assumptions the teams used to create their funding idea. PHAs suggested that the students create realistic funding stacking and reduce their overreliance on grant funding. Finally, PHA staff would like to have a briefing with the final four teams to ask pointed questions of interest to the PHA. The presentations and the question-and-answer session during the final presentation were helpful, but they left PHA staff with unanswered questions.

The IAH Student Planning and Design Competition has thrived on collaborative efforts, forging partnerships with various stakeholders to drive innovation and address housing challenges effectively. Over the past decade, these collaborations have played a pivotal role in the competition's success, fostering creativity, leveraging resources, and maximizing impact. HUD's collaboration with federal, state, and local government agencies has facilitated the alignment of policies, funding, and resources to support innovative housing initiatives. Engaging local communities and grassroots organizations has been instrumental in tailoring housing solutions to meet the specific needs and preferences of residents. Collaborations with community development corporations, resident associations, and advocacy groups have ensured that projects are culturally sensitive, inclusive, and responsive to community priorities. These collaborative efforts have fostered a culture of innovation, partnership, and shared responsibility, leading the HUD IAH Student Planning and Design Competition to achieve significant outcomes and make a tangible difference in addressing the nation's housing needs. Collaboration and partnerships will remain essential to sustaining and scaling the competition's impact, driving progress, and building resilient and inclusive communities for all.

For future challenges, the competition organizers envision a continued emphasis on sustainability—both environmental and economic. This objective entails the integration of green building practices, renewable energy solutions, and resilient design principles into affordable housing projects. By harnessing the power of innovation and technology, the competition seeks to minimize environmental impact while maximizing energy efficiency and cost-effectiveness. Furthermore, the competition recognizes the imperative of ensuring equitable access to affordable housing for all individuals and families, regardless of socioeconomic status, race, or background. This goal entails a proactive approach to addressing systemic barriers and disparities within the housing market, including discriminatory practices, housing segregation, and lack of access to financing and resources.

By centering equity and inclusion in its initiatives, organizers of the competition aim to create housing solutions that uplift and empower marginalized communities, fostering social cohesion and economic opportunity. In addition, the competition organizers remain steadfast in their

commitment to fostering partnerships and collaboration across sectors. Recognizing that no single entity or organization can solve the complex challenges of affordable housing, the competition coordinators seek to forge alliances with government agencies, nonprofits, the private sector, and local communities. By leveraging the collective expertise, resources, and networks of diverse stakeholders, the organizers aim to amplify the impact of the competition and drive meaningful change at scale. As society navigates the uncertainties and complexities of the future, the HUD IAH Student Planning and Design Competition remains steadfast in its mission to catalyze innovation, foster sustainability, and promote equity in the realm of affordable housing.

Acknowledgments

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Data Shop

Data Shop, a department of Cityscape*, presents short articles or notes on the uses of data in housing and urban research. Through this department, the Office of Policy Development and Research introduces readers to new and overlooked data sources and to improved techniques in using well-known data. The emphasis is on sources and methods that analysts can use in their own work. Researchers often run into knotty data problems involving data interpretation or manipulation that must be solved before a project can proceed, but they seldom get to focus in detail on the solutions to such problems. If you have an idea for an applied, data-centric note of no more than 3,000 words, please send a one-paragraph abstract to datashop@hud.gov for consideration.*

Residential Mobility and Big Data: Assessing the Validity of Consumer Reference Datasets

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Abstract

The increasing availability of privately produced longitudinal Consumer Reference Datasets (CRDs) presents substantial opportunities for housing and urban studies research, permitting the analysis of processes, including residential mobility, migration, and neighborhood change. Despite their growing popularity in academic and policy research, these datasets—which are produced by private companies for sale primarily to commercial interests—are not explicitly designed for research purposes and have not been comprehensively assessed in terms of data quality or representativeness. This article carries out a comparative analysis of the CRDs that two of the most prominent sources of consumer reference data—Data Axle and Infutor Data Solutions—produce for King County, Washington. Comparing these datasets with estimates from the American Community Survey at the county and census tract scales, this article identifies substantial limitations associated with each dataset in terms of population counts,

Abstract, continuted

demographic characteristics, distribution across census tracts, and residential mobility rates. It concludes that despite notable advantages, including the ability to provide valuable and novel insights into heretofore unobserved patterns of residential mobility at a range of spatial scales, these datasets contain systematic biases. These biases may lead researchers to underestimate population counts and mobility rates for low-income households, renters, young adults, and people of color, and should, therefore, be used with caution in social, demographic, and policy research.

Introduction

Data for residential mobility research in the United States have traditionally been largely confined to longitudinal surveys, which track mobility outcomes over time but have limited temporal and spatial resolution due to small sample sizes and privacy concerns. Recently, researchers have increasingly employed a new form of data to address these issues—Consumer Reference Data. Data companies produce Consumer Reference Datasets (CRDs) by synthesizing an array of public and private datasets about the characteristics of individuals (that is, tax assessment records, utility bills, change-of-address data), designed for sale to commercial interests. Data Axle (formerly known as "Infogroup," "InfoUSA," and "RefUSA") and Infutor Data Solutions provide two of the most prominent CRDs in the United States. Data Axle and Infutor are private companies with long histories of aggregating, repackaging, and selling consumer marketing data to commercial interests. These datasets have several potential advantages over other longitudinal population datasets; they provide more detailed locational information than is generally available in traditional population data and are more deliberately structured than big "exhaust" data such as social media posts. Despite the growing use of CRDs in housing and demographic research—including the measurement of neighborhood-level population flows, assessing the effects of displacement on locational outcomes, and testing the relationship between housing market changes and population mobility—a systematic assessment of how well these datasets capture the true population composition and mobility patterns needed for evidence-based policymaking has been limited. The lack of validation of CRDs raises concerns about the reliability and equity implications of using these data to inform critical policy decisions around housing, community development, and segregation. Without a clear understanding of which populations and residential moves are being represented or misrepresented in CRDs, researchers and policymakers risk drawing misleading conclusions and perpetuating inequities. This article compares Data Axle and Infutor estimates with American Community Survey (ACS) estimates, analyzing the representativeness of the two CRDs with respect to population counts, demographic composition, and in-migration rates at both the county and tract levels for King County, Washington. This analysis provides a reference for using CRDs in housing research, pointing to limitations in respect to demographic and geographic validity.

Consumer Reference Datasets in Contemporary Research

Recent studies have employed CRDs in a variety of ways to study neighborhood-level population flows, leveraging the availability of longitudinal address-level information for large numbers of individuals. CRDs have been used to calculate neighborhood-level migration rates, determine the destinations of particular households, and assess move volumes between locations (Acolin et al., 2022; Greenlee, 2019; Pan et al., 2020; Song and Chapple, 2024). CRDs also enable the study of the long-term locational effects associated with certain types of residential moves such as evictions (Asquith, 2022; Collinson et al., 2022). These datasets have also been employed to examine the effects of specific housing policies. Diamond, McQuade, and Qian (2019) used Infutor to show that rent control in San Francisco reduces renter mobility and limits residential displacement while also reducing rental housing supply. Several studies have also explored the issue of displacement from public housing, using CRDs to trace the residential outcomes associated with public housing demolitions (Blanco, 2022; Phillips, 2020; Richardson, 2022). Mast (2019) shows that the longitudinal nature of these datasets may be leveraged to uncover the longer-term effects of residential moves, using Infutor to identify multi-year mobility chains generated when the vacancy created by one household's move is filled by another household, and so on. Finally, CRDs have been used to study the relationship between development and displacement, examining the effect of new construction on mobility rates (Asquith, Mast, and Reed, 2019; Chapple et al., 2022; Chapple and Song, 2024; Pennington, 2021).

The growing use of CRDs in social science research has been met with some limited validation. Matching a national dataset of 2008 records from Data Axle (then "InfoUSA") to the U.S. Census Bureau's internal Master Address File (MAF) on geographic fields, Kennel and Li (2009) obtained matches for roughly 85 percent of households nationally, with lower coverage rates for certain housing types such as mobile homes. Given that internal Census Bureau MAF data are not widely available, a more common validation approach compares CRD population counts with census estimates at aggregate spatial scales. Acolin, Decter-Frain, and Hall (2022) align Data Axle records with 2018 ACS estimates at three different scales (county, ZIP Code tabulation area [ZCTA], and census tract), finding that Data Axle household counts in 2018 were within 80 to 120 percent of census estimates in nearly all counties (94 percent) and most ZCTAs (82 percent). Furthermore, they establish that areas with less precise census estimates (larger margins of error), larger shares of young adults, and higher levels of employment were all associated with over- or under-estimates. Diamond, McQuade, and Qian (2019) similarly rely on census comparisons to validate the Infutor dataset, finding that it represents 44 percent of the population in San Francisco as of 1990 and 110 percent of the population as of 2000. The latter overrepresentation is attributed to the lack of recorded deaths in the Infutor dataset, suggesting that their tabulation of the dataset retains households after the point of last observation. This validation also finds that the dataset is most reliable in its representation of individuals between the ages of 30 and 49. Phillips (2020) pursues an alternative validation strategy, leveraging cases of acute residential mobility to demonstrate the value of the Infutor CRD for demographic research, identifying cases in which heightened mobility rates would be anticipated—such as the New Orleans neighborhoods affected by Hurricane Katrina, public housing demolitions and households at imminent risk of homelessness in Chicago, and gentrification in Washington, D.C. Each case exhibits elevated household migration rates

relative to baselines, suggesting that CRDs could be used to capture mobility outcomes of acute mobility events. Ramani and Bloom (2021) compare Data Axle household addresses with public U.S. Postal Service change-of-address files to assess the effects of the COVID-19 pandemic on out-migration from cities. Likewise, Chapple et al. (2022) use an applied validation approach, comparing mobility rates for Bay Area households between Data Axle and Equifax credit records, and find similar patterns of mobility across socioeconomic groups within both datasets.

Although these analyses suggest that CRDs are reasonably representative of overall population and mobility dynamics, several questions remain unanswered. CRDs also contain a number of other household characteristics that could be useful in formulating demographic estimates. The current body of CRD analyses is divided on the use of auxiliary household characteristic fields, with some cautiously adopting those characteristics—for example, Chapple et al. (2022) and Greenlee (2019)—whereas others use only mobility information and assess household characteristics based on origin and destination characteristics—for example, Asquith, Mast, and Reed (2019) and Pennington (2021). Although these household characteristics are imputed using proprietary processes, useful insights may be drawn from these demographic characteristic fields. However, the quality of those fields has not yet been systematically assessed.

Data Description

This article examines CRD records between 2015 and 2019 in King County, Washington. King County is one of the most populous counties in the United States and contains geographic, racial, and economic diversity. It includes much of the Seattle metropolitan area. According to ACS 2015–2019 estimates, the county's population is 58 percent White, 26 percent Hispanic, 19 percent Asian, and 7 percent Black, has a high rate of renting (44 percent), and has a relatively mobile population, with an annual average mobility rate of 21.2 percent for adults compared with the U.S. average of 15.4 percent. This relatively more mobile population makes King County a useful case to examine the effectiveness of CRDs in accurately capturing residential mobility.

This article uses 2015–2019 ACS 5-year estimates as a reference point. It is important to acknowledge that ACS data are limited as a representation of the "true" composition of a population. ACS estimates are based on rolling averages of small random samples of the national population and, thus, have margins of error that may be quite large for small populations and geographies (Spielman, Folch, and Nagle, 2014). Nonetheless, given the widespread use of ACS estimates in a variety of population research contexts, this article treats the ACS as the best available approximation of actual population conditions. With a robust sampling and surveying strategy, the ACS serves as a reliable standard against which the authors evaluate the nonrandomly sampled CRD datasets.

For both Data Axle and Infutor, the authors select households observed in King County, Washington, at least once during the 2015–19 period. The sample for both CRDs consists of adults in households for which both demographic and address history information were available. Each dataset is converted into a complete panel structure, with observations for each individual in each year, filling any missing individual-year observations with information from prior years. Moves are identified by observing whether an individual's recorded location changes from one year to the next within the study period.

Analysis

The validity of these CRD datasets is assessed through two sets of analyses. First, this article examines whether the population count and in-migration rates of different demographics groups closely match between ACS and the CRD datasets for King County as a whole. Second, this article uses both descriptive and statistical methods to assess those same relationships at the census tract level.

Demographic Comparison

The authors begin by comparing counts and mobility rates for demographic groups in each CRD with estimates generated from IPUMS tabulations of public-use 2015–2019 ACS microdata (Ruggles et al., 2023; exhibit 1). The authors find that CRDs systematically underestimate both the population counts and relative shares of different demographic categories. Data Axle comes close to approximating the total size of the adult population, identifying 1.9 million adults compared with the roughly 2.2 million estimated in the ACS. By comparison, Infutor captures a yearly average of only 760,000 individual adults per year. Both Data Axle and Infutor substantially overestimate the share of the population that is White. This issue is particularly severe for Infutor, which treats White as a "default" for the category, thus categorizing more than 97 percent of households as White. Both CRDs also overestimate the share of homeowners and older individuals, which likely reflects the data collection techniques employed to construct these datasets, relying on administrative sources (such as property tax records) from which younger households and renters are more likely to be absent. Finally, Data Axle appears to overestimate the share of the population earning low incomes (less than $35,000) and underestimate the share of the population earning relatively higher incomes (greater than $70,000), whereas Infutor underestimates the low-income population and overestimates the higher-income population.

Exhibit 1

Demographic Characteristics of Adults in King County per ACS PUMS, Data Axle, and Infutor (2015–19) (1 of 2)

	Population Count (Share of Population)			In-Migration Rate		
Variable	ACS	Data Axle	Infutor	ACS	Data Axle	Infutor
Asian	396,401 (18.0%)	238,206 (13.2%)	5,689 (1.4%)	17.5%	7.0%	19.0%
Black	136,634 (6.2%)	30,902 (1.7%)	1,027 (0.2%)	20.4%	7.5%	18.7%
Hispanic	212,135 (9.7%)	111,463 (6.2%)	4,371 (1.1%)	19.6%	7.6%	19.4%
Other	141,192 (6.4%)	2,017 (0.1%)	-	21.1%	7.5%	-
White	1,310,029 (59.6%)	1,416,914 (78.7%)	403,418 (97.3%)	16.3%	6.9%	21.8%
Unknown Race	-	119,781	343,462	-	7.5%	31.3%
Own	1,317,032 (61.0%)	1,329,709 (69.3%)	246,457 (85.1%)	8.5%	4.2%	19.2%
Rent	841,209 (39.0%)	589,573 (30.7%)	43,063 (14.9%)	29.8%	14.2%	21.4%

Exhibit 1

Demographic Characteristics of Adults in King County per ACS PUMS, Data Axle, and Infutor (2015–19) (2 of 2)

	Population Count (Share of Population)			In-Migration Rate		
Variable	**ACS**	**Data Axle**	**Infutor**	**ACS**	**Data Axle**	**Infutor**
Unknown Tenure	-	-	468,447	54.6%	-	30.2%
Female	1,095,021 (49.9%)	913,743 (52.1%)	189,401 (50.3%)	16.9%	7.0%	21.4%
Male	1,101,370 (50.1%)	839,594 (47.9%)	187,436 (49.7%)	17.8%	7.0%	21.5%
Unknown Gender	-	165,945	-	-	6.8%	30.7%
< 25	179,744 (10.3%)	60,671 (3.2%)	-	38.6%	20.0%	-
25–44	725,544 (41.5%)	576,134 (30.0%)	104,120 (34.8%)	25.1%	12.0%	20.2%
45–64	558,841 (32.0%)	833,373 (43.4%)	109,652 (36.7%)	9.3%	4.8%	18.5%
65+	284,107 (16.3%)	449,104 (23.4%)	85,201 (28.5%)	6.7%	4.2%	17.0%
Unknown Age	-	-	458,993	-	-	30.9%
Low Income ($0–$34,999)	267,501 (12.2%)	413,457 (21.5%)	35,272 (4.7%)	20.6%	10.0%	19.6%
Moderate ($35,000–$54,999)	214,301 (9.8%)	268,825 (14.0%)	54,861 (7.2%)	19.4%	8.4%	20.8%
Middle ($55,000–$74,999)	167,767 (7.6%)	181,722 (9.5%)	82,700 (10.9%)	18.5%	7.6%	22.8%
High ($75,000+)	1,546,832 (70.4%)	1,055,278 (55.0%)	239,658 (31.6%)	16.4%	5.5%	22.0%
Unknown Income	-	-	345,476	-	-	31.2%
Total Population	2,196,391	1,919,282	757,966	2,138,180	1,691,641	-

- = not available. ACS = American Community Survey.

Notes: Population shares are from individuals for which demographic attributes are identified. All differences in population shares and mobility rates between ACS and Consumer Reference Datasets are statistically significant at the 99.9 percent level.

Sources: Author tabulations of 2019 ACS 5-year estimates; Data Axle; Infutor

The authors also find that each CRD fails to accurately estimate the share of adults that moved between 2015 and 2019. The average annual in-migration rate for all adults according to the ACS was 17.4 percent compared with only 7 percent of Data Axle individuals and 26.2 percent of Infutor individuals. This finding suggests that CRDs are not effective at capturing when households actually move. The authors hypothesize that Data Axle may underestimate mobility rates either because it continues to record individuals in the same location after they have already moved or because those households disappear from the record when they move. This hypothesis is consistent with the manner in which CRD data are collected, which draw from sources such as property tax records that may take a year or more to find updated information and that may take even longer for other households such as renters, for whom such records are not available.

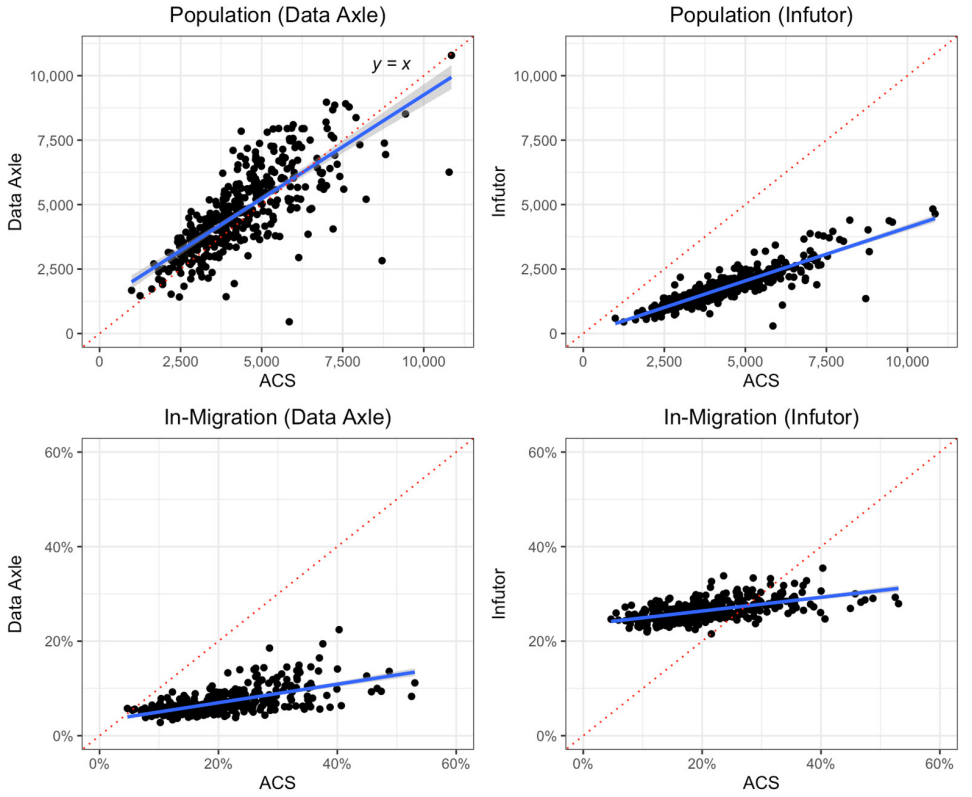
Although Infutor appears to more closely approximate the magnitudes of ACS estimates, Data Axle performs better in capturing the relative differences between demographic groups. For example, Data Axle reflects the substantially higher mobility rate for renters (14.2 percent) than owners (4.2 percent). Although these numbers are roughly one-half the mobility rates reported in the ACS, they reflect the much greater likelihood of mobility for renters. Similarly, Data Axle captures the differential mobility rates across age groups, with a much higher likelihood of mobility among younger households than older households. Data Axle also reflects the relative mobility rates across different income categories, with the highest rates of mobility for low-income households and the lowest for higher-income households. Data Axle shows the weakest relationship to ACS estimates for race. Although it does find lower mobility rates for White and Asian households vis-à-vis Black and Hispanic households, differences between these groups are close to zero. Infutor largely fails to distinguish mobility rates across demographic groups, consistently estimating rates around 20 percent regardless of demographic characteristics. Although the Infutor mobility rate is slightly higher for renters than for homeowners, the difference in these estimates (19.2 versus 21.4 percent) is too small to reflect the actual difference in mobility rates of these groups. Infutor also incorrectly finds the lowest mobility rates associated with low-income households and Black households—the opposite of both ACS and Data Axle.

Neighborhood Comparison

The top panels of exhibit 2 demonstrate the extent to which CRDs represent the census tract-level adult population and in-migration rates reflected in ACS 5-year estimates from 2015 to 2019, with each point representing a single tract within King County. Data Axle roughly approximates census tract populations, with a fitted curve closely aligned with the identity function but with fairly broad dispersion. Although Infutor population counts are clustered more tightly around the fitted curve, they are also far less accurate. Infutor substantially underestimates census tract population across all tracts, although it maintains a linear relationship with true population counts. Both CRDs perform worse with respect to mobility rates, significantly underestimating the share of the population that moved into King County census tracts between 2015 and 2019 (bottom panels of exhibit 2). Data Axle exhibits a positive correlation with ACS in-migration rates but underestimates mobility rates for nearly every census tract. By contrast, although Infutor both under- and over-estimates mobility rates across different census tracts, it is primarily because of a higher baseline mobility rate.

Exhibit 2

Comparison of ACS Population Estimates and Mobility Rate Estimates With 5-Year Population Averages for Data Axle and Infutor



ACS = American Community Survey.
Sources: Author tabulations of 2019 ACS 5-Year estimates; Data Axle; Infutor

The authors use linear regression models with robust standard errors to assess neighborhood characteristics associated with under- or overestimating population counts or mobility.[1] Tract characteristics employed in the model include a control for the ACS population or mobility rate and ACS variables, including median household income, median rent, median home value, populations between 18 to 24 years of age (percent), owner-occupants (percent), one-person households (percent), non-Hispanic White individuals (percent), population density (log), vacant units (percent), foreign born individuals (percent), and housing built after 2010 (percent). The variables were then standardized and mean-centered.

Modeling results suggest that several neighborhood characteristics are significantly related to over- and underestimating neighborhood population and in-migration rates (exhibits 3 and 4). Both CRDs overestimated population in neighborhoods with higher median rents and underestimated

[1] The authors follow Acolin, Decter-Frain, and Hall (2022) in comparing the performance of linear, ridge, and lasso regression models using root mean squared error (RMSE), comparing dependent variable values and predicted values. The authors find that linear regression yields the lowest RMSEs across all models.

population in neighborhoods with a higher share of young adults (aged 18 to 24). However, differences were also present in these relationships between the Data Axle and Infutor datasets. Data Axle underestimated population in higher-income neighborhoods but also overestimated population in neighborhoods with higher ownership rates and home values, whereas Infutor did not. Infutor overestimated population in majority White neighborhoods and neighborhoods with higher shares of one-person households, whereas Data Axle did not.

Exhibit 3

Linear Model Results, Comparing 2015–19 American Community Survey Estimates With 2015–19 Consumer Reference Dataset Averages

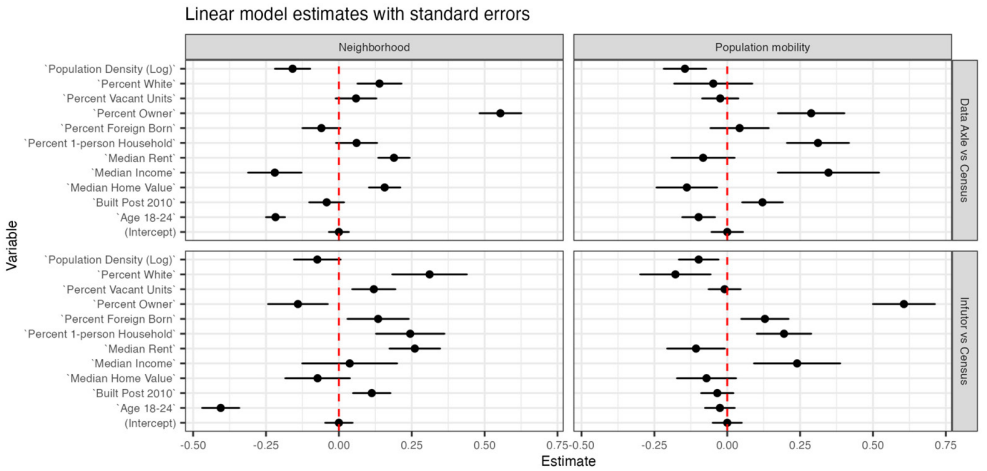
Variable	Population (Data Axle vs. Census)	Population (Infutor vs. Census)	Mobility Rate (Data Axle vs. Census)	Mobility Rate (Infutor vs. Census)
(Intercept)	0.000	0.000	0.000	0.000
Median Income	– 0.220*	0.037	0.347*	0.240
Median Rent	0.189***	0.260**	– 0.083	– 0.107
Median Home Value	0.157**	– 0.073	– 0.139	– 0.071
Age 18–24 (%)	– 0.218***	– 0.405***	– 0.098	– 0.025
Owner (%)	0.554***	– 0.141	0.288*	0.606***
White (%)	0.139	0.311*	– 0.048	– 0.178
1-Person Household (%)	0.061	0.245*	0.311**	0.195*
Population Density (Log)	– 0.159**	– 0.074	– 0.145*	– 0.098
Vacant Units (%)	0.059	0.120	– 0.024	– 0.009
Foreign Born (%)	– 0.060	0.135	0.042	0.129
Built Post 2010 (%)	– 0.042	0.113	0.121	– 0.034
R-squared	0.672	0.371	0.155	0.242

** = p < 0.05. ** = p < 0.01. *** = p < 0.001.*

Sources: Author tabulations of 2019 American Community Survey 5-year estimates; Data Axle; Infutor

Exhibit 4

Linear Model Results, Comparing 2015–19 American Community Survey Estimates With 2015–19 Consumer Reference Dataset Averages



Sources: Author tabulations of 2019 American Community Survey 5-year estimates; Data Axle; Infutor

In terms of mobility rates, the authors observe that neighborhoods with a greater share of homeowners have relatively higher than expected mobility rates across both datasets, as do neighborhoods with a larger share of one-person households and vacancies. On the other hand, a larger share of young adults in a neighborhood predicts underrepresentation of mobility rates for Data Axle, and the share of housing units built in the past decade in a neighborhood predicts underrepresentation for Infutor. In short, in addition to overestimating the volume of homeowners and the population in high-ownership neighborhoods, these datasets also systematically overestimate mobility rates in high-ownership neighborhoods and, in the case of Infutor, overestimates the mobility rates of homeowners. This finding may indicate that CRDs are more likely to capture renters in high-ownership neighborhoods and classify them as homeowners, or it may be indicative of a bias toward homeowners that move more frequently. In any case, given that tenure is a key predictor of residential mobility (Rossi, 1955), these findings raise serious concerns about the ability of CRDs to accurately predict mobility rates at either an individual or neighborhood level.

Conclusion

Both CRDs exhibit clear limitations in terms of external validity, indicating that neither should be treated as equivalent to a complete population census. Each dataset omits or underestimates the share of certain populations—particularly individuals who are lower income, younger, people of color, or renters. Despite the apparent advantages CRDs provide in terms of temporal and spatial detail, they are unlikely to serve as representative alternatives to census microdata. These limitations also pose challenges for the measurement of residential mobility. If CRDs accurately represent only certain neighborhoods and population segments, the calculation of migration rates for any given census tract or demographic group is likely misleading. Given that vulnerable populations such as low-income households, renters, young adults, and people of color are more likely to be systematically undercounted within these datasets, policy research that relies on these datasets risks obscuring those populations and generating erroneous conclusions that could reinforce existing inequalities, whether by underestimating the scale of residential displacement or by undercounting the size of vulnerable populations that could benefit from additional resources. Therefore, the findings suggest that serious reservations should be considered when using these data for studying residential mobility or for producing sociodemographic estimates of an area using raw counts. However, these datasets may still be useful for tracking individual residential moves because they provide a rich longitudinal picture of household locations at multiple points in time. In addition, Data Axle may specifically be useful for comparing the relative differences in mobility rates between demographic groups.

Future research should explore potential strategies to better optimize CRDs for research on residential mobility and demographic change. Notwithstanding the limitations described here, CRDs provide a potentially valuable source of information about mobility patterns, enabling nowcasting of population change and detailed analysis of mobility outcomes in response to acute events (Acolin, Decter-Frain, and Hall, 2022; Phillips, 2020). To address the limitations of these datasets, future research could explore strategies such as population weighting, using existing information from census data regarding demographic characteristics, and population distribution

to reweight CRD observations. Without adjustment strategies, any use of either imputed fields or attempts to aggregate these data for demographic research should be approached with an abundance of caution. The authors' conclusions indicate that it is important for policymakers and researchers using CRDs for social, demographic, and policy research to exercise caution and triangulate them with other data sources to account for biases. Greater transparency in the data collection and imputation methods used to construct these datasets is also essential to ensure that these data sources accurately describe actual population characteristics and mobility patterns. Without these safeguards in place, the use of CRDs has the potential to contribute to misguided policy decisions.

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Graphic Detail

Geographic Information Systems (GIS) organize and clarify the patterns of human activities on the Earth's surface and their interaction with each other. GIS data, in the form of maps, can quickly and powerfully convey relationships to policymakers and the public. This department of Cityscape *includes maps that convey important housing or community development policy issues or solutions. If you have made such a map and are willing to share it in a future issue of* Cityscape*, please contact alexander.m.din@hud.gov.*

A New Index to Estimate Playspace Inequity

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Abstract

Playspace inequity refers to the systemic lack of access to quality playspaces near where kids live and learn. Although literature points to systemic racial and economic disparities in access to playspaces, no high-quality national dataset of playspace inequity currently exists. Entities like park systems and school districts tasked with building and maintaining playspaces sometimes have incomplete or outdated data on their locations and quality. The playground-focused nonprofit KABOOM! created the Playspace Inequity Prioritization Index, which is a geospatial tool that helps estimate where playspace inequity is most likely occurring to better inform investment, maintenance, and programming decisions.

Background

A large body of literature points to systemic disparities in access to high-quality green space, parks, and playgrounds along racial, economic, and geographical lines (Huang et al., 2022). Populations that live in rural areas, racial and ethnic minority groups, and those with lower socioeconomic status tend to have limited access to playspaces in neighborhoods, parks, and schools compared with wealthier, White, and urban groups. Beyond the mere presence of playspaces, their size and quality also tend to vary based on these demographic characteristics.

Playspaces are part of the fabric of neighborhoods, which means that adverse physical and social conditions may limit access to playspaces. These factors include limited public and active transportation opportunities, personal safety concerns, lack of inclusion, and low public awareness of existing playspaces. Disparities in access to and quality of playspaces may also result from historical and contemporary forms of systemic racism, such as discriminatory land use and housing policies or historical segregation and exclusion.

Taken together, these discrepancies in playspace access and quality limit opportunities for all children to fully experience the physical, mental, social, and emotional health benefits of play. Play has important physical benefits, such as helping children develop strength and dexterity while also encouraging physical activity and exercise (Sutterby and Frost, 2002). Play also helps children develop communication skills, resiliency, and various executive functioning skills such as conflict resolution (Ginsburg, 2007). Play can also help children develop self-regulatory behaviors and coping skills to help deal with toxic stress (Bodrova and Leong, 2015; Yogman et al., 2018).

No high-quality national dataset of playground locations and playground quality currently exists, and local entities sometimes have incomplete or outdated data on playground locations and quality. In response, KABOOM! developed the Playspace Inequity Prioritization Index (PIPI) to help meet the need for a data-informed estimate of where playspace inequity is most likely occurring for every census tract in the United States. PIPI incorporates 21 data elements to create a single numerical score that can be used to estimate playspace inequity. With PIPI, data users can identify census tracts experiencing the greatest estimated playspace inequity in any given geography, from local to national.

The overall PIPI score is a value between negative 7.0 (-7.0) and positive 7.0, where a score of 0 represents the estimated mean level of playspace equity across the entire United States. Census tracts with PIPI scores between 0 and 7 are likely to experience playspace inequity, with higher scores representing areas that lack adequate playspaces and, therefore, present greater opportunities for playspace investment. Negative PIPI scores between 0 and -7 are census tracts with less opportunity for investment because there is less estimated playspace inequity.

PIPI consists of three subindexes, which, in turn, consist of several data elements (exhibit 1).

Each data element is standardized for every census tract in the United States, weighted, and combined into a single score (Z-score), which roughly represents the number of positive or negative standard deviations from the mean (zero). In other words, if a census tract has a PIPI score of 1.0, it means that its level of estimated playspace inequity based on the underlying data elements is roughly 1 standard deviation of inequity worse than the average census tract in the United States. Similarly, a census tract with a Z-score of negative 2.0 (-2.0) is roughly 2 standard deviations better than the average census tract in the United States.

Exhibit 1

Playspace Inequity Prioritization Index (PIPI) Subindexes

Population Characteristics Subindex	Inequity Indicators Subindex	Park Access and Built Environment Subindex
• Percentage of Black, Indigenous, and other people of color (non-White) population • Income ≤ 80% of Area Median Income • Population under 18 years of age • Language isolation (Household Language by Household Limited English-Speaking Status) • Children under 18 with disability • Residential properties with two or more units	• Life expectancy at birth • Percentage children receiving public benefits • Excessive owner housing costs • Excessive renter housing costs • HUD subsidized housing units • Unemployment rate	• Number of parks • Percentage of area covered by parks • Number of schools • Commute means of transportation • Pedestrian road network density • Vehicles per occupied housing unit (no vehicles for residents) • Traffic proximity and volume • Children with low access to healthy food • Households without computers or internet

PIPI Data Sources: American Community Survey 5-year estimates 2018–2022; USDA ERS Food Access Research Atlas 2019; OpenICPSR National Neighborhood Data Archive 2018; CDC National Center for Health Statistics 5-year estimates 2010–2015; National Center for Education Statistics school year 2022–2023; HUD Picture of Subsidized Households 2021; EPA Smart Location Database 2019; EPA EJScreen: Environmental Justice Screening and Mapping Tool 2020

Analysis

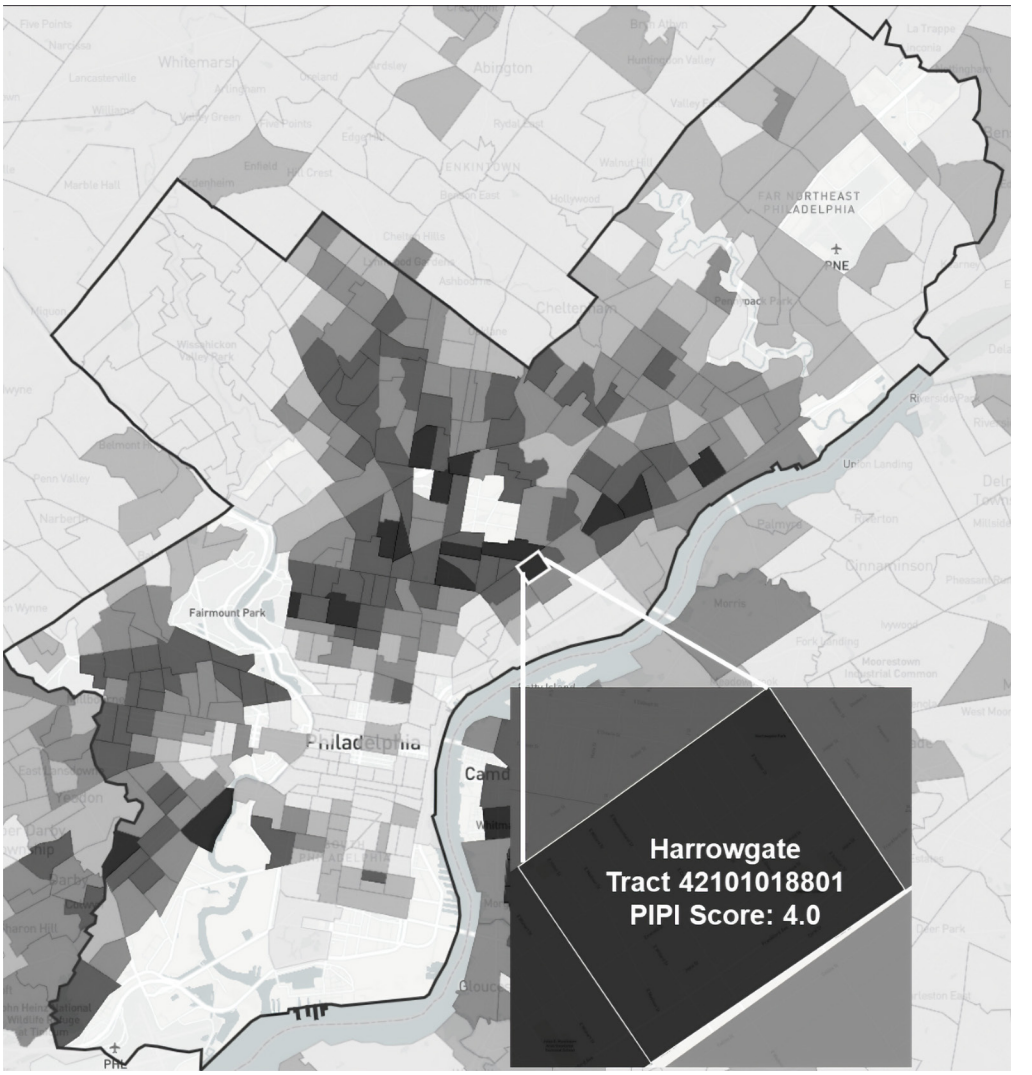
PIPI has been used in a variety of ways, with the most common use being the identification of neighborhoods that may be experiencing playspace inequity. Exhibit 2 shows how PIPI maps can visually identify higher-need census tracts, which are indicated in progressively darker shades. These visualizations provide a valuable basis for conversations with city agencies to prioritize areas for playspace investments.

The overall PIPI map of Philadelphia reflects the well-known geography of inequity in the city, with North and West Philadelphia—to the lower left and center of the map, respectively—appearing in darker shades than the predominantly White and higher-income communities in far Northeast and suburban census tracts.

The census tract highlighted in exhibit 2 is in the Harrowgate neighborhood, which has an overall PIPI score of 4.0. Looking at the underlying conditions driving this high score, nearly 46 percent of the people living in this area are children, 95 percent of whom live in poverty. Most households in this area also rent their homes, and all spend at least 30 percent of their incomes on rent. In addition, 52 percent of households that rent homes do not have access to a vehicle.

Exhibit 2

Overall Playspace Inequity Prioritization Index (PIPI) Score Map for Philadelphia, Pennsylvania, by Census Tract, with Harrowgate Neighborhood Highlighted

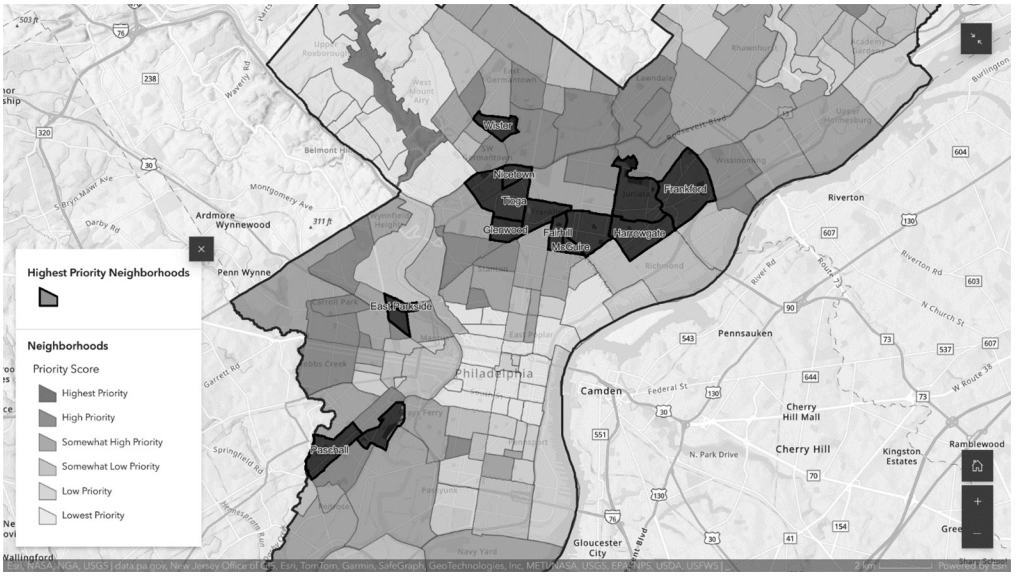


Source: Authors' research

The authors also combined PIPI with additional data on the locations of early childcare providers and neighborhood walkability, which enabled local leaders to focus on playspace needs for 0- to 5-year-olds. Exhibit 3 shows how these combined data were used to identify 15 priority neighborhoods for playspace investment focused specifically on this population.

Exhibit 3

Priority Neighborhoods for Early Learning Playspace Investments in Philadelphia, Pennsylvania



Source: Cooper et al. (2023)

Data Limitations

PIPI is only an estimate of where playspace inequity is believed to be occurring. The authors cannot get a true determination of playspace inequity within a city or community without having verified playground location and quality data to combine with PIPI. The underlying data used to create PIPI are also several years old and, therefore, cannot capture or reflect playspace inequity in real time. Despite these limitations, the authors believe that PIPI and similar indexes provide valuable data-based methods to inform conversations focused on how and where to prioritize investments in playspaces across the United States.

Future Research

Looking forward, the authors hope to complete research that confirms a correlation between PIPI scores and urban heat islands. Prior research found that outdoor areas experiencing high temperatures are used less frequently and that children in those areas participate in less vigorous physical activity (Vanos, Herdt, and Lochbaum, 2017). Quality and safety are two other elements the authors will explore on the municipal level, given prior research demonstrating that lower-income neighborhoods and those of predominately Black, Indigenous, and other people of color have playgrounds that are less safe (Arroyo-Johnson et al., 2016; Cradock et al., 2005; Powell, Ambardekar, and Sheehan, 2005).

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Using a Sankey Chart to Visualize Racial and Ethnic Neighborhood Change in Washington, D.C.

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The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. Government.

Abstract

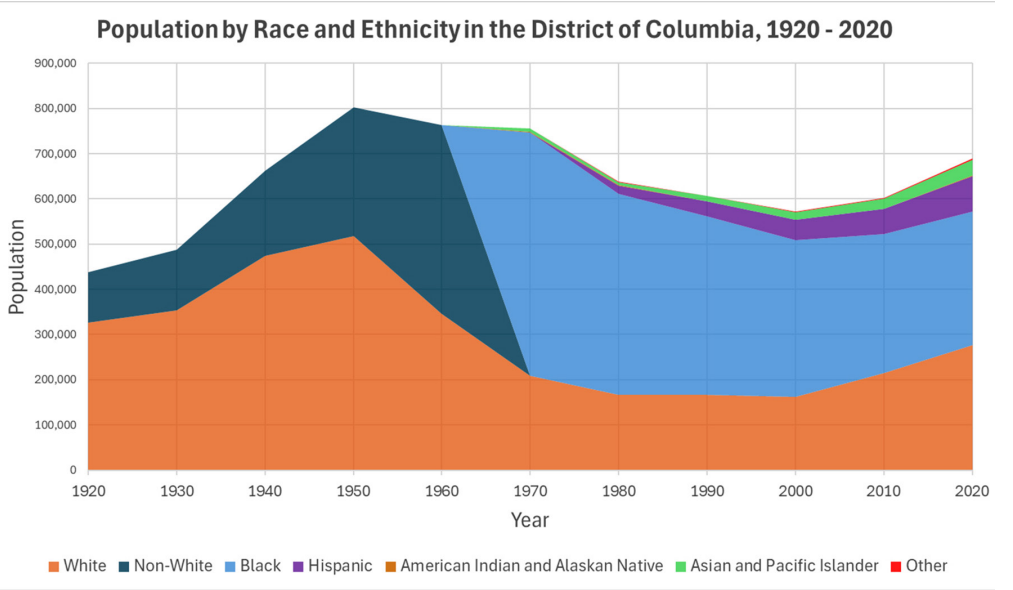
Washington, D.C., has experienced demographic change for the past century. These changes across neighborhoods can be multidimensional and complex to convey. This article uses three visualizations to show racial and ethnic change in Washington, D.C. In particular, the Sankey Chart shows how the dominant racial and ethnic group changed at the neighborhood level from 2010 to 2020, including between different categorizations.

Racial and Ethnic Change in Washington, D.C.

Washington, D.C., has been called the most gentrified city in the United States (Richardson, Mitchell, and Franco, 2019). The District of Columbia, like many other cities, peaked in population in 1950. Soon after, the creation of highways, suburb expansion, and White flight began to deplete the city's total population (Frey, 1979). The 1968 riots further fueled the overall population decline (Walker, 2018). The Black population peaked around 1970 in both absolute numbers and population share, as exhibit 1 shows. Although the chart in exhibit 1 is informative at the citywide scale, it does not show change at the neighborhood level.

Exhibit 1

Population by Race and Ethnicity in Washington, D.C., 1920–2020



Note: See exhibit 4 in the appendix.

Sources: Census Bureau data from IPUMS NHGIS (Manson et al., 2023); author's visualization

Major demographic changes occurred in Washington, D.C., during the past century. Neighborhood-level changes included alley clearance in Foggy Bottom in the 1970s and residential turnover in Mount Pleasant in the 1980s (Summer, 2022; Williams, 1988). Population loss reduced the city's tax base. In the 1990s, the U.S. Congress created the Financial Control Board to oversee the city's finances because of its mounting debt. Chief Financial Officer Anthony Williams sought to fix the District's finances by attempting to attract more than 100,000 new residents to Washington, D.C., to take advantage of the "return to the city" movement (Hyra, 2015; Rivlin, 2003; Sturtevant and Jung, 2011). This movement set the stage for the past 2 decades of gentrification in Washington, D.C. The city changed from being more than 71 percent Black in 1970 to less than 50 percent Black by 2011 (Tavernise, 2011). The loss of Black residents is a quantitative measure typically associated with gentrification (Jackson, 2015). The purpose of this article is to show how a Sankey Chart, which can visualize changes in population flows, illustrates racial and ethnic neighborhood-level change in Washington, D.C.

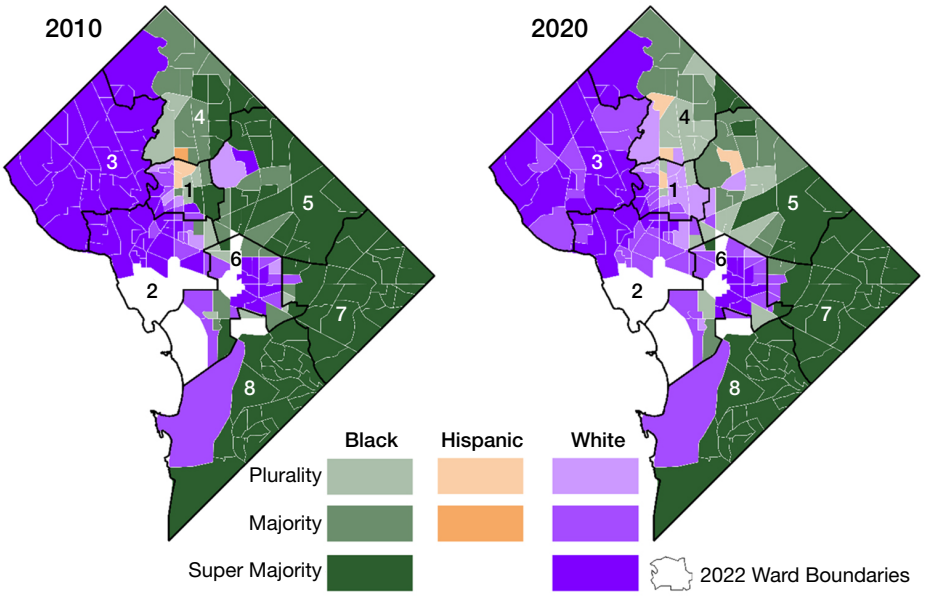
Mapping Racial and Ethnic Change by Neighborhood in Washington, D.C.

The juxtaposed categorical choropleth map in exhibit 2 shows the largest racial and ethnic group harmonized to 2020 census tracts and overlays 2022 political ward boundaries. Three racial and ethnic groups are the majority racial or ethnic group in Washington, D.C., neighborhoods: "White non-Hispanic," "Black non-Hispanic," and "Hispanic of any race." These groups are the majority

by varying thresholds.[1] The map on the left shows Washington, D.C., in 2010, and the map on the right shows the city in 2020. The western half of the maps are mostly White, and the eastern half of the maps are mostly Black. Most White-majority census tracts appear to have a super majority of White residents.

Exhibit 2

Largest Racial and Ethnic Groups by Census Tract in Washington, D.C., in 2010 and 2020



Notes: The map omits census tracts with fewer than 100 residents. Ward boundaries from 2022 are the most recent boundaries available. The numbers on the map indicate wards. Further descriptions of the maps are available as tables in exhibits 5 through 7 in the appendix.
Sources: Census Bureau decennial census data; ward boundaries are from Open Data DC; author's analysis

The map on the right shows the largest racial and ethnic group in 2020 and the majority threshold. The White/west and Black/east pattern largely remains. However, many more lighter shaded census tracts are on the 2020 map, suggesting that the largest racial and ethnic group in those census tracts is now a plurality. The western portion of the city, which previously had exclusively super majority White census tracts, now has multiple majority White census tracts. White plurality census tracts have appeared further east in 2020 than in 2010, particularly in Ward 1. Nearly all census tracts in Wards 7 and 8 and in the southern portion of Ward 5 remained super majority Black in both 2010 and 2020. In contrast, super majority Black census tracts in Ward 4 and northern Ward 5 changed to majority Black census tracts. The small cluster of Hispanic census tracts does not remain, and the four plurality Hispanic census tracts appear more dispersed.

The maps in exhibit 2 provide great insight into racial and ethnic change at the neighborhood level, but understanding the flow of how the census tracts are changing can be difficult. For

[1] Thresholds are defined as *super majority*, where the dominant group accounts for 66.7 percent or more of the census tract's population. *Majority* is where the dominant group accounts for between 50.0 and 66.6 percent of the census tract's population. *Plurality* is where the largest group has a share of less than 50.0 percent of the census tract's population.

example, Black plurality census tracts grew from 12 in 2010 to 20 in 2020. Still, only one census tract had a Black plurality in both periods. What happened to the other 11 census tracts? What were the other 19 census tracts?

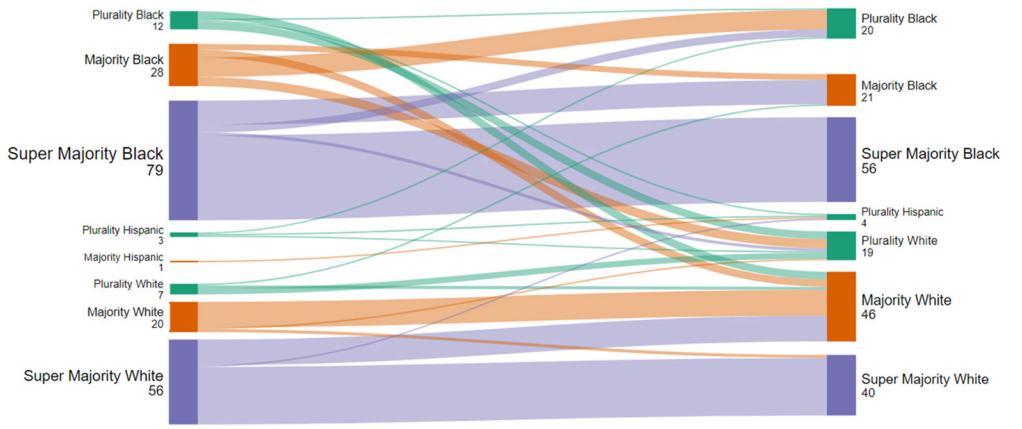
Sankey Chart

Sankey Charts are widely used in engineering fields but not commonly used in social science research. Some uses of Sankey Charts in the social sciences include neighborhood-level analyses to show change in predominant land use and land cover types in Philadelphia (Locke et al., 2023), uncertainties in assigning Rural Urban Commuting Area Codes to census tracts (Fowler and Cromartie, 2023), relationships between redlining and the Social Vulnerability Index (DSL and NCRC, 2023), and relationships between redlining and the Area Deprivation Index (Carlos et al., 2023).

Sankey Charts use counts to visualize flows along arcs between nodes (Otto et al., 2022). In the Sankey Chart in exhibit 3, the nodes on the left represent census tract-level racial and ethnic majority categories in 2010, and the nodes on the right represent the categories in 2020. The size of the node shows the size of the category. The arc represents the change as a flow between groups from 2010 to 2020, and the size of the arc represents the size of the flow between the 2010 to 2020 groups.

Exhibit 3

Sankey Chart Showing Change in Racial and Ethnic Categories and Threshold by Census Tract in Washington, D.C., 2010–20



Notes: Sankey Chart produced using www.sankeymatic.com. Census tracts with fewer than 100 residents are omitted from the Sankey Chart.
Sources: Census Bureau decennial census data; author's analysis

The number of census tracts with a Black plurality increased from 12 to 20 from 2010 to 2020. Exhibit 2 shows the locations of the census tracts along with their categorization in both periods, but comparing how neighborhoods changed from one categorization in 2010 to another in 2020 is difficult. The Sankey Chart in exhibit 3 has a node with these categories in both periods and uses an adjusted size to show that the number grew or declined between the periods. The width of the arc between two nodes shows the strength of the flow between categories in each period. The Sankey Chart shows that of the 12 Black plurality census tracts in 2010, one became plurality Hispanic,

five became plurality White, and five became majority White in 2020. The other 19 plurality Black census tracts had been plurality Hispanic (1), majority Black (13), and super majority Black (5).

Plurality White census tracts is the category that grew the largest, increasing from 7 in 2010 to 19 in 2020, with only 4 census tracts in that category in both periods. The total number of super majority Black or White census tracts declined from 2010 to 2020, with most becoming majority Black or majority White. Although these neighborhood changes are visible in exhibit 2, unlike the Sankey Chart, the maps do not neatly show how neighborhoods were changing from one categorization to the next.

A Sankey Chart is a powerful tool for visualizing racial and ethnic neighborhood change. The size of the nodes allows the chart reader to understand how they changed over time, and the size of each arc shows the reader how the groups shifted between those points in time. In this example, the Sankey Chart helps show how the number of census tracts where Black Washingtonians are the largest racial and ethnic group decreased and the number of census tracts where White Washingtonians are the largest racial and ethnic group increased. The Sankey Chart also shows that the number of census tracts where the largest group has a plurality increased, and census tracts with a super majority of Black or White residents decreased.

Appendix

Section 508 of the Rehabilitation Act requires the federal government, including HUD, to make electronic content, such as websites and documents, accessible to individuals with disabilities. HUD recognizes that, although maps and other data visualizations can powerfully convey relationships to policymakers and the public, doing so has inherent accessibility challenges. The purpose of the exhibits in this appendix is to further expand on the description of the Sankey Chart in exhibit 3. Exhibit 4 shows Washington, D.C.'s population by race and ethnicity for each decennial census between 1920 and 2020.

Exhibit 4

Population by Race and Ethnicity in Washington, D.C., 1920–2020

Year	Total	White	Non-White	Black	Hispanic	American Indian and Alaskan Native	Asian and Pacific Islander	Other
1920	437,571	326,860	110,711	-	-	-	-	-
1930	486,869	353,914	132,955	-	-	-	-	-
1940	663,091	474,326	188,765	-	-	-	-	-
1950	802,178	517,865	284,313	-	-	-	-	-
1960	763,956	345,263	418,693	-	-	-	-	-
1970	756,510	209,272	-	537,712	-	956	8,570	-
1980	638,333	166,803	-	444,808	17,777	954	6,415	1,576
1990	606,900	166,131	-	395,213	32,710	1,252	10,734	860
2000	572,059	162,383	-	345,958	44,953	1,303	15,792	1,670
2010	601,723	214,367	-	308,315	54,749	1,337	21,504	1,451
2020	689,545	276,488	-	296,231	77,652	1,318	34,103	3,753

Sources: Census Bureau decennial census data; author's analysis

The total number of census tracts in this analysis is 206 because census tracts with fewer than 100 residents in 2010 were omitted. Exhibit 5 shows the number of census tracts falling within each category in 2010 and 2020. Exhibits 6 and 7 detail the respective sums for 2010 and 2020.

Exhibit 5

Number of Census Tracts by Racial and Ethnic and Threshold Categories in Washington, D.C., in 2010 and 2020

Year			2020								
	Racial/ Ethnic Group		Black			Hispanic			White		
		Threshold	Plurality	Majority	Super Majority	Plurality	Majority	Super Majority	Plurality	Majority	Super Majority
2010	Black	Plurality	1	0	0	1	0	0	5	5	0
		Majority	13	4	0	0	0	0	6	5	0
		Super Majority	5	16	56	0	0	0	2	0	0
	Hispanic	Plurality	1	0	0	1	0	0	1	0	0
		Majority	0	0	0	1	0	0	0	0	0
		Super Majority	0	0	0	0	0	0	0	0	0
	White	Plurality	0	1	0	0	0	0	4	2	0
		Majority	0	0	0	0	0	0	1	17	2
		Super Majority	0	0	0	1	0	0	0	17	38

Sources: Census Bureau decennial census data; author's analysis

Exhibit 6

Number of Census Tracts by Racial, Ethnic, and Threshold Categories in Washington, D.C., in 2010

	2010				
	Plurality	**Majority**	**Super Majority**	**Total**	**Share**
Black	12	28	79	119	57.8%
Hispanic	3	1	0	4	1.9%
White	7	20	56	83	40.3%
Total	22	49	135		
Share	10.7%	23.8%	65.5%		

Sources: Census Bureau decennial census data; author's analysis

Exhibit 7

Number of Census Tracts by Racial, Ethnic, and Threshold Categories in Washington, D.C., in 2020

	2020				
	Plurality	**Majority**	**Super Majority**	**Total**	**Share**
Black	20	21	56	97	47.1%
Hispanic	4	0	0	4	1.9%
White	19	46	40	105	51.0%
Total	43	67	96		
Share	20.9%	32.5%	46.6%		

Source: Census Bureau decennial census data; author's analysis

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Industrial Revolution

Every home that is built is a representation of compromises made between different and often competing goals: comfort, convenience, durability, energy consumption, maintenance, construction costs, appearance, strength, community acceptance, and resale value. Consumers and developers tend to make tradeoffs among these goals with incomplete information which increases risks and slows the process of innovation in the housing industry. The slowing of innovation, in turn, negatively affects productivity, quality, performance, and value. This department features a few promising improvements to the U.S. housing stock, illustrating how advancements in housing technologies can play a vital role in transforming the industry in important ways.

Heat Pumps: An Attractive Choice for Heating and Cooling Needs

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The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. Government.

Abstract

Heat pumps continue to be a valuable update to traditional heating and cooling systems in buildings, offering significant advantages in energy efficiency and environmental impact. This versatile technology can provide both heating and cooling from a single system, potentially leading to substantial energy savings and reduced greenhouse gas emissions. Although the initial costs can be higher than conventional HVAC systems, long-term savings and various incentives often offset this investment. Heat pumps come in different types, including air-source and ground-source (geothermal), each with its own benefits and applications. Recent advancements have addressed previous limitations, such as performance in extreme cold, with the development of cold climate heat pumps. The heat pump market continues to experience growth, surpassing gas furnace shipments in the U.S.

The Status Quo

Buildings in the United States use different sources of heating that historically have been based on the country's climate zones. These sources include furnaces and boilers using natural gas, propane, oil, or electricity. Some homes have a device for heating and a separate device for cooling. This scenario has created a variety of heating and cooling methods based on both the historical availability of certain technologies and regional preferences. The energy needed to provide heating and cooling to U.S. households and buildings is a major cost to owning and operating a building, and it is a major contributor to greenhouse gas emissions (BP, 2022; IEA, 2021). Reducing energy consumption will provide benefits in the form of cost savings to Americans while lowering emissions. Enter the world of the heat pump.

Some advantages of heat pumps over the status quo include:

- **Energy Efficiency.** Heat pumps are highly energy-efficient because they transfer heat rather than generate it. This efficiency can lead to significant energy savings compared to traditional heating and cooling systems.
- **Dual Functionality.** Heat pumps can both heat and cool a home, providing year-round climate control from a single system. This functionality can offer more convenience and potentially more cost-effectiveness than maintaining separate heating and cooling systems.
- **Environmental Benefits.** Heat pumps use electricity rather than fossil fuels, reducing greenhouse gas emissions and reliance on oil or gas. Using electricity makes heat pumps a more environmentally friendly option, especially if the electricity comes from renewable sources.

However, some disadvantages of heat pumps exist, including:

- **High Initial Cost.** The upfront cost of purchasing and installing a heat pump can be higher than that of traditional heating and cooling systems. High cost can be a significant barrier for some homeowners, despite potential long-term savings.
- **Performance in Extreme Weather.** Heat pumps can be less effective in cold climates, where their efficiency decreases with the outdoor temperature, and they may require a backup heating source. In such conditions, their operational costs can increase. New cold climate heat pumps (CCHPs) are available that retain high efficiency even when operating in colder climates.
- **Complexity and Maintenance.** Heat pumps are more complex systems compared to traditional HVAC units. As a result, heat pumps can have higher maintenance requirements and potential repair costs. Ensuring proper installation and regular servicing is crucial for optimal performance.

History

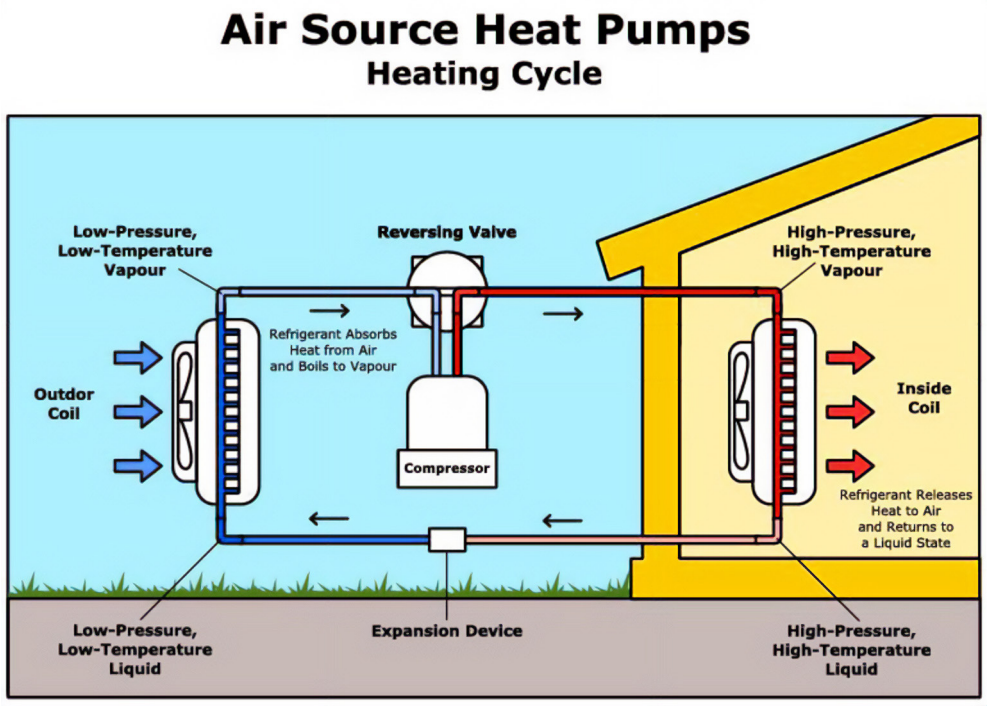
Heat pumps have a history dating back to the mid-19th century, when the concept was first theorized by Lord Kelvin in 1852 (Sandfort, 1951). During the 1930s, groundbreaking heat pump

research was conducted that resulted in many patents (Kerr, Jr., Stotz, and Stotz, 1934; Neeson, 1938; Brace and Crawford, 1938; Labberton, 1939). Heat pump technology gained more attention and refinement in the following decades, particularly during the energy crises of the 1970s, which spurred interest in more energy-efficient heating and cooling solutions. Since then, advancements in materials, refrigerants, and engineering have significantly improved the efficiency and reliability of heat pumps, making them a popular choice for residential and commercial climate control.

The basic operation of a heat pump relies on the refrigeration cycle and involves four main components: a compressor, an evaporator, a condenser, and an expansion valve (exhibit 1). The compressor circulates refrigerant through the system. In heating mode, the evaporator absorbs heat from the outside. The compressor then pressurizes the refrigerant, raising its temperature. The hot refrigerant moves through the condenser, releasing heat into the indoor space. The expansion valve reduces the refrigerant's pressure, cooling it down. This cycle then repeats. In cooling mode, the process is reversed, with heat being absorbed from indoors and released outside (ASHRAE, 2024).

Exhibit 1

Heat Transfer of an Air Source Heat Pump



Source: U.S. Department of Energy, https://www.energy.gov/energysaver/air-source-heat-pumps

One of the key advantages of heat pump operation is its high efficiency. The efficiency is measured by coefficient of performance (COP), the ratio of heat output to the energy input. Most heat pumps have a COP of at least 3.5, meaning they produce 3.5 kWh of heat for every 1 kWh of electricity consumed, whereas a high-efficiency natural gas furnace might only have a COP of 0.95. Thus,

heat pumps can be three to five times more efficient than a high-efficiency gas furnace (ASHRAE, 2024). This high efficiency translates to significant energy savings compared to traditional heating systems. Important to note is that the efficiency of heat pumps can be negatively affected by extreme-cold outdoor temperatures.

Heat Pump Designs for All Needs

Two types of heat pumps exist. *Air-source* heat pumps are the most common type, extracting heat from outdoor air in winter and removing heat from indoor air in summer (exhibit 1). *Ground-source* (geothermal) heat pumps use the constant temperature of the Earth, rather than the outdoor air. Therefore, ground-source heat pumps are more efficient than air-source heat pumps because of the consistent temperature of the ground. However, ground-source heat pumps are initially more expensive to install. Ground-source heat pumps may be installed three ways: vertically, horizontally, or submerged. Vertical installation requires a deep well to be drilled for the piping. Horizontal installation requires a large field where piping can be buried. Submerged installation requires piping to be placed in a nearby body of water as a heat source or sink; however, the vast majority of submerged installations use a system that circulates water through closed loops at relatively shallow depths underground.

Some new applications of heat pump technology have entered the market in recent years. Ductless mini-split heat pumps are appliances (usually hung on walls near the ceilings) that deliver heating/cooling and are ideal for homes without ductwork or for adding temperature control to specific rooms or for additions. Window-mounted heat pumps are like window-mounted air conditioners, but they provide heating as well as cooling. Companies also have introduced heat pumps that can provide hot water for hydronic heating systems. These heat pumps do not fit into all existing systems, but they will for many.

Understanding Heat Pump Ratings

For heat pump systems, two ratings are used: Seasonal Energy Efficiency Ratio (SEER) for cooling efficiency and Heating Seasonal Performance Factor (HSPF) for heating efficiency. SEER measures how efficiently a heat pump can cool a home during warm weather months. The higher the SEER rating, the more energy-efficient the unit is in cooling mode. HSPF, on the other hand, measures the heating efficiency of a heat pump during the cold-weather months. In 2017, the Department of Energy (DOE) announced the adoption of updated rating standards: SEER2 and HSPF2, derived from improved methods of testing and new minimum ratings based on the updated rating standards (DOE, 2017). As of January 1, 2023, heat pumps manufactured must have a minimum SEER2 of 14.3 and a minimum HSPF2 of 7.5 (DOE, 2017). Higher ratings indicate higher efficiency.

When selecting a heat pump, considering both SEER and HSPF ratings is important. In warmer climates, a higher SEER rating is more important, whereas in colder regions, a higher HSPF rating is more beneficial. Specifying heat pumps with an Energy Star label can help simplify product selection. Energy Star-certified heat pumps have a minimum SEER2 of 15.2 and a minimum HSPF2 of 7.8. An Energy Star-certified heat pump intended for cold climates has a minimum HSPF2 of 8.1.

Cost Considerations

The initial cost of an air-source heat pump system for a single-family home can vary widely, ranging from $1,500 to $10,000, with most systems falling between $4,000 and $7,000. Geothermal systems can cost up to $30,000 or more, depending on complexity of the installation of the piping. Although this upfront cost may be higher than traditional HVAC systems, the long-term energy savings often offset the initial investment.

Several factors influence the cost of a heat pump system:

- Type of heat pump (air-source or ground-source).
- Size of home or building.
- Existing ductwork (or lack thereof).
- Local climate.
- Energy efficiency rating of the unit.

In addition to federal incentives, state and local governments and local and regional utilities offer incentives and rebates for installing energy-efficient heat pumps, which can also significantly reduce the upfront costs.

Installation and Maintenance

Proper installation is crucial for optimal heat pump performance. Working with certified HVAC professionals who have experience with heat pump systems is recommended. Some key considerations during installation include correct sizing of the system for the space, proper placement of outdoor units, ensuring adequate insulation and air sealing of the building, and integrating with existing HVAC systems, if necessary.

Heat pumps generally require less maintenance than combustion-based heating systems and have an average lifespan of 15 to 20 years. Regular maintenance tasks include cleaning or replacing air filters, checking refrigerant levels, inspecting electrical connections, and cleaning coils and fans.

A concern for some users is that air delivered by a heat pump does not feel as warm as air delivered by a furnace because heat pumps deliver warm air close to room temperature. Another concern is adopting an automated cycle of heating and cooling the house because changing the temperature significantly via a sudden request can be costly. In such cases, a heat pump may pull upon the assistance of its electric resistance backup to provide supplemental heat, which is inefficient and more costly.

Adoption Rates and Future Developments

Paired with federal and local incentives, heat pumps are the fastest-growing segment of the residential HVAC market. In 2020, heat pump shipments surpassed gas furnaces for the first

time. Heat pumps' share in the heating equipment market reached 53 percent in 2022 (IEA, 2023). The heat pump industry is continuously evolving, with ongoing research and development focused on improving efficiency, cold-weather performance, and integration with smart home systems. Some exciting developments include advanced compressor technologies for better cold-weather performance, integration with thermal storage systems for load balancing, hybrid systems combining heat pumps with other renewable technologies, advances in drilling technologies to make geothermal projects less intrusive, and improved control systems for optimized performance and energy management. The increased demand is likely to drive further innovations and cost reductions in the coming years.

The specific developments of CCHPs, advanced heating and cooling systems designed to operate efficiently in regions with harsh winters, are worth noting. These innovative devices have overcome the limitations of traditional heat pumps, which often struggle in subfreezing temperatures. DOE has been actively promoting the development and adoption of CCHPs through initiatives like the Residential Cold Climate Heat Pump Challenge. This program encourages manufacturers to create heat pumps that perform efficiently in cold climates, with the goal of reducing energy consumption and greenhouse gas emissions. Manufacturers have responded, and many models are on the market today. The North American residential CCHP market was $2.7 billion in 2023 and projected to grow 10 percent per year (GMI Research, 2023). Some utilities are developing customer incentives specifically for CCHPs to increase adoption in colder climates.

Conclusion

Heat pumps represent promising technology for efficient, environmentally friendly heating and cooling. Their ability to provide both heating and cooling, high efficiency, and the potential for significant energy savings make them an attractive option for many homeowners and businesses.

Although challenges remain, particularly in terms of cold-weather performance and upfront costs, ongoing technological advancements and increasing support from governments and utilities are addressing these issues. Heat pumps are playing a crucial role in reducing energy costs and greenhouse gas emissions from the building sector.

When considering a heat pump system, carefully evaluating specific needs, the local climate, and available incentives is important. Consulting with experienced HVAC professionals and energy advisors can help ensure choosing the right system for the specific situation and maximizing the benefits of this innovative technology.

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Symposium

Refereed Papers 157

Departments 187

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VOLUME 26 NUMBER 3 • 2024