

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:

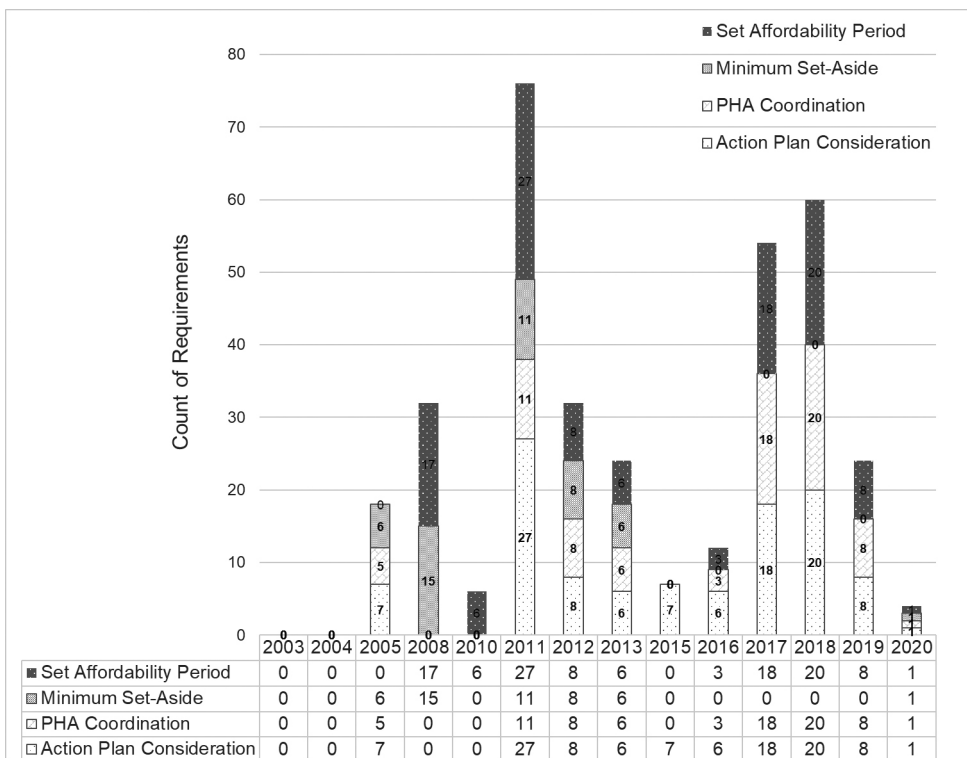
(1) Action Plan Consideration, (2) Coordination with Public Housing Authorities (PHAs), (3) Minimum Set Aside, and (4) Set Affordability Period. The following is a brief description of each rental requirement. The common language of each stipulation is in appendix B.

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



PHA = public housing authority.

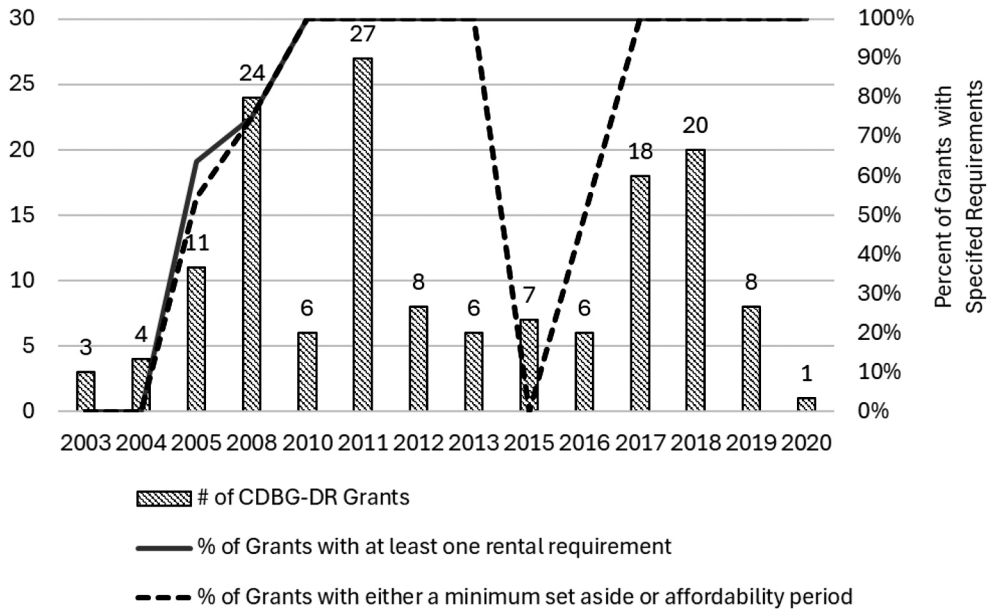
Sources: HUD Disaster Recovery Grants Reporting System; Office of the Federal Register; Code of Federal Regulations

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>.

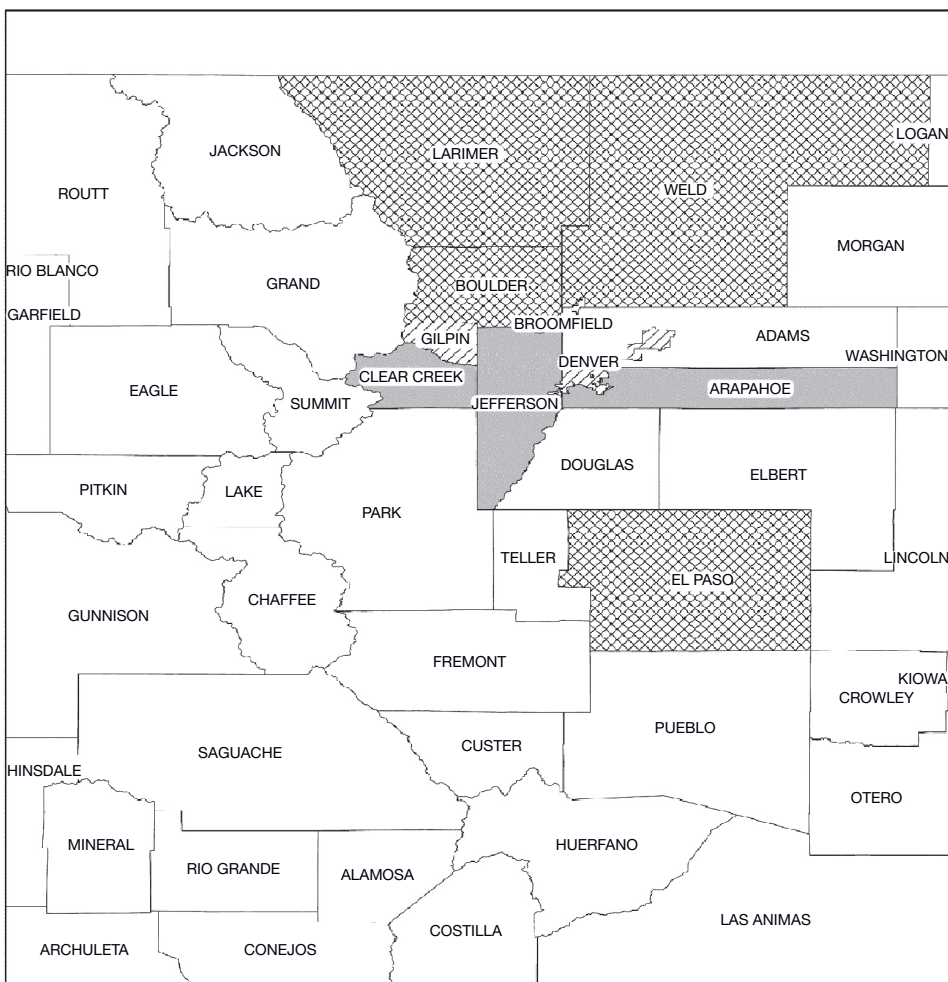
CDBG-DR grant. To be clear, the CDBG-DR funds in the selected case study had all four rental requirements in place, suggesting that their effect on the rental housing market could be captured when compared with the disaster-impacted areas that did not receive CDBG-DR.²

Exhibit 3

Treatment and Control Area Among the DR-4145 Impacted Counties

Legend

-  Counties with IA and PA and CDBG-DR (strict treatment group)
-  Counties with PA only and CDBG-DR (two more counties for loose treatment group)
-  Counties with IA and PA but without CDBG-DR (control group)
-  Colorado County Boundaries



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

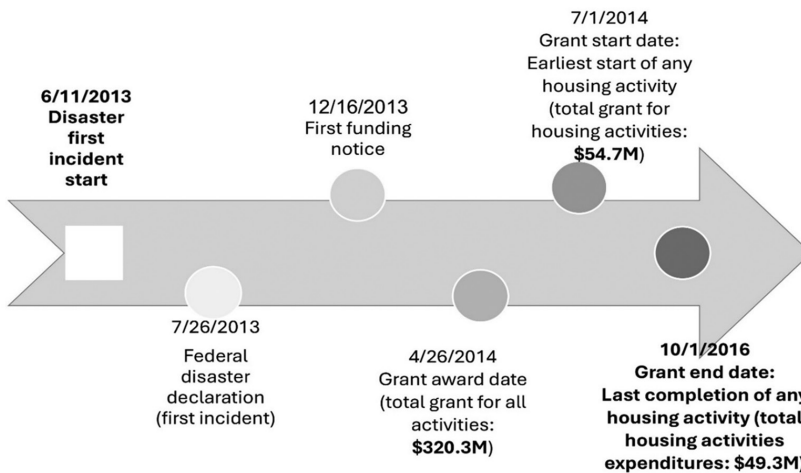
² However, as acknowledged, it is unclear in this case which rental requirements among the four categories drive the observed relationship with the outcome of multifamily rents. This limitation is addressed again in the Discussion and Conclusions section.

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	<i>Omitted: IA and/or PA with CDBG-DR</i>	<i>Omitted: IA and/or PA with CDBG-DR</i>	<i>Omitted: IA and PA with CDBG-DR</i>	<i>Omitted: IA and PA with CDBG-DR</i>
Post-CDBG-DR Grant Completion	0.570*** (0.010)	0.508*** (0.021)	0.576*** (0.010)	0.507*** (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)	
	Model (1)	Model (2)	Model (3)	Model (4)
Variables				
Treatment	<i>Omitted: IA and/or PA with CDBG-DR</i>	<i>Omitted: IA and PA with CDBG-DR</i>	<i>Omitted: IA and/or PA with CDBG-DR</i>	<i>Omitted: IA and PA with CDBG-DR</i>
Post-CDBG-DR Grant Completion	- 5.876*** (0.114)	- 5.856*** (0.120)	- 6.524*** (0.080)	- 6.615*** (0.078)
Treatment * Post-CDBG-DR Grant Completion	0.660*** (0.069)	0.807*** (0.074)	- 0.006 (0.027)	- 0.041 (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).

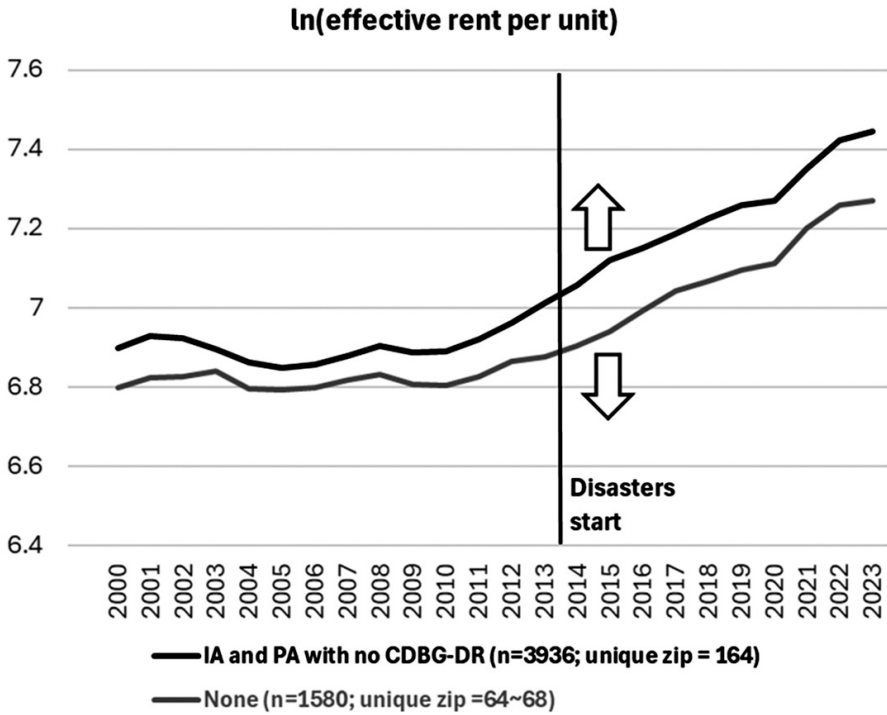
In addition, faster allocation and implementation of CDBG-DR funding would facilitate better outcomes for all households, but especially renters who are less likely to have insurance or reserve funds to weather gaps between a disaster and receipt of assistance (Drew, 2024; Martín, Teles, and DuBois, 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

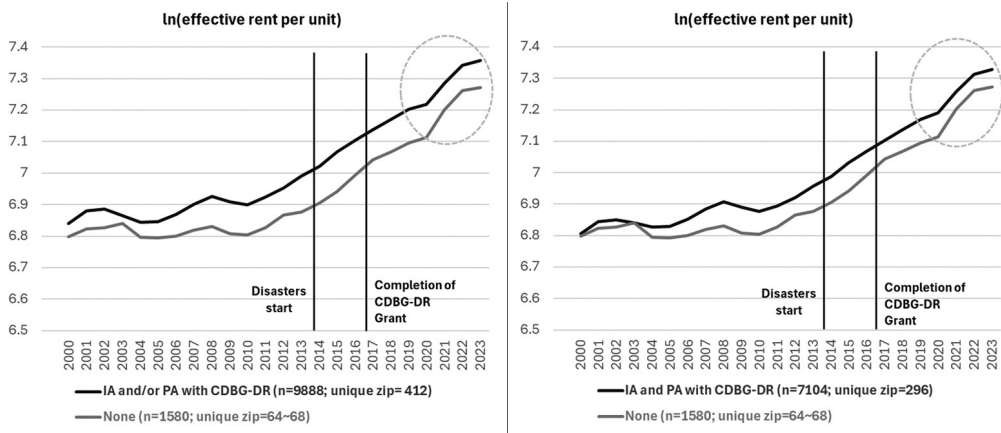


CDBG-DR = Community Development Block Grant Disaster Recovery, IA = Individual Assistance, PA = Public Assistance.

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*** (0.011)	0.193*** (0.015)	0.287*** (0.011)	0.196*** (0.015)
Treatment * post-disaster	-0.007 (0.010)	0.014 (0.010)	-0.014 (0.010)	0.009 (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 <i>Omitted</i> : IA and PA but without CDBG-DR (i.e., original control group)	Treatment Group <i>Omitted</i> : IA and/or PA with CDBG-DR (i.e., loose treatment group)	Treatment Group <i>Omitted</i> : IA and PA with CDBG-DR (i.e., strict treatment group)
Post-Disaster (third quarter of 2013)	0.250*** (0.010)	0.267*** (0.008)	0.272*** (0.009)
Treatment * post-disaster	0.031*** (0.007)	0.018** (0.007)	0.010 (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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