Moving to Work Retrospective

A Picture of Moving to Work Agencies' Housing Assistance

Housing Choice and Self-Sufficiency Outcomes at Moving to Work Agencies

The Impact of the Moving to Work Demonstration on the Per Household Costs of Federal Housing Assistance

Evaluating the Effects of Santa Clara County Housing Authority's Rent Reform

Moving to Work Agencies' Use of Project-Based Voucher Assistance

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Moving to Work Agencies' Use of Project-Based Voucher Assistance

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Foreword

The Moving to Work (MTW) demonstration, launched in 1996, is intended to promote innovation in housing assistance. Participating public housing agencies (PHAs) may implement new ways of providing housing assistance intended to achieve the statutory objectives of cost effectiveness, self-sufficiency of assisted households, and increased housing choice for low-income families. This study, one of six reports produced by the U.S. Department of Housing and Urban Development's (HUD's) retrospective evaluation of MTW, focuses on project-based voucher (PBV) assistance, that is, a rental subsidy for low-income households tied to specific units through a long-term contract with a property manager or private owner. The amount of housing choice voucher funding that a PHA may allocate to PBVs is limited by law. Agencies participating in the MTW demonstration, however, may allocate all their voucher funding to PBVs with HUD approval. MTW agencies' uses of PBVs, then, offer insight into the potential uses of expanded authority to allocate voucher funding to PBVs and consequences of expanding the MTW demonstration.

This is the first study to describe the extent to which MTW agencies[1] have used their expanded authority to allocate voucher funding to project-based units, and it presents several new analyses of PBV locations. PBV use is more common among MTW agencies than traditional PHAs, but extensive PBV use is not the norm. PBV use among both MTW and traditional PHAs is higher in expensive markets with increasing rents because PBVs come with long-term contracts. MTW agencies with lower-quality public housing were more likely to use the Rental Assistance Demonstration (RAD) to convert public housing to PBVs. Notably, approximately one-quarter of MTW agencies' PBVs were located in LIHTC properties, which demonstrates how blended subsidies are used to create affordable housing.

In exploring concerns about the neighborhood quality of PBVs, the study shows that MTW agencies' PBVs are located in areas with higher education levels and lower transportation costs, but also higher poverty areas with worse air quality than areas in which their tenant-based vouchers (TBVs) are located. Among both MTW and traditional agencies, more racially segregated areas were more likely to have PBV units in higher-poverty neighborhoods. Because PBVs are anchored to a particular neighborhood, more research is needed to understand how PHAs decide where to locate PBVs.

This report also showcases how three MTW agencies have used PBVs to pursue locally-defined policy goals. In Boulder, Colorado, for instance, the MTW agency converted public housing to PBVs in a partnership with service providers focused on improving the educational attainment of children in assisted households. In Cambridge, Massachusetts, PBVs are a critical tool for preserving affordable housing. In Seattle, Washington, the housing authority uses PBVs to add housing assistance to services for people experiencing homelessness. But more research is needed on local partnerships to uncover whether there are innovative practices and partnerships that can be replicated elsewhere. Given the findings in the previous paragraph, it would be beneficial to understand whether there are models that are more successful in locating PBVs in high-opportunity neighborhoods.

PBVs are an important component within the suite of federal rental assistance programs. This study highlights the power of PBVs, but also indicates where the program has room to improve. Improvements, including those featured in the local case studies, are critical to ensuring that as many households as possible receive rental assistance.

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[1] The data in this report references MTW agencies that were designated as of December 15, 2015.

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Executive Summary

The U.S. Department of Housing and Urban Development (HUD), through the Moving to Work (MTW) demonstration, provides a small group of public housing agencies (PHAs) with policy and funding flexibilities to test assistance models that further this program's three statutory objectives, which are to increase housing choice for low-income families, encourage families to become economically self-sufficient, and reduce costs and achieve greater cost-effectiveness. MTW flexibilities extend to various aspects of PHA administrative policies and housing assistance programs, including project-based voucher (PBV) assistance. In contrast to portable tenant-based vouchers (TBVs), which households use to find private market rental housing, PBVs are attached to specific units through long-term contracts with property managers or owners.

This report explores the extent to which the 39 agencies with the MTW designation as of 2016 used PBVs and how they applied their MTW flexibilities in relation to PBVs. This is the first comprehensive look at PBV use among MTW agencies. It examines several questions about what drives PBV use and locations and the PBV program's interaction with the Rental Assistance Demonstration (RAD) and the Low-Income Housing Tax Credit (LIHTC) program. MTW agencies' motivations for using PBVs are revealed through three case studies of agencies with extensive PBV portfolios. We use a combination of HUD administrative data, publicly available neighborhood-level data, MTW plans and reports, and qualitative data collected from three MTW agencies. We focus on MTW agencies but include a group of similarly sized, traditional PHAs in certain analyses to expand our sample sizes and as a point of comparison for MTW agencies.

MTW agencies have more access to PBVs and flexibility in how they administer them, but PBVs have also become more available to traditional PHAs through RAD and recent regulatory changes. For some PHAs, PBVs may be an appealing alternative to portable TBVs, which can be difficult to use in tight rental markets or where landlords refuse to participate in the voucher program. It is difficult to predict, however, how PHAs may respond to expanded PBV opportunity areas or the potential implications of additional PBV use. Because PBVs limit assisted households' neighborhood options, policymakers worry that expanded PBV use will mean more households are exposed to high-poverty neighborhoods. Understanding MTW agencies' PBV use can shed light on the potential challenges, opportunities, and tradeoffs of expanded PBV use among traditional PHAs.

Findings

MTW PHAs are more likely to use PBVs than traditional agencies, but extensive PBV use is not the norm. Just nine MTW agencies' PBV-use exceeded 20 percent of their HCV budget authority in 2016, while a larger number used PBVs at levels closer to the norm for the comparison traditional PHAs (0 to 5 percent of their budget authority). Even among the case study agencies with extensive PBV use, staff discussed the importance of maintaining TBVs and the residential mobility opportunities they offer.

PBVs are used more in tighter housing markets. Both the quantitative and qualitative findings suggest local housing market characteristics play an important role in PBV use and agency decisions. PHAs in higher-rent markets increased their PBV use more than agencies in more affordable markets. The three case study agencies described PBV costs as more predictable than TBV

costs in expensive markets with rapidly rising rents. These agencies discussed the challenges facing TBV holders in the private market as motivating their agencies' PBV use. Across MTW agencies, PBV use increased more in the Northeast than in relatively more affordable regions of the South and Midwest.

PBV use increased more among agencies that had more distressed public housing. For MTW and large comparison traditional PHAs, receiving five fewer points on a Physical Assessment Subsystem (PASS) score in 2008 is associated with having an additional 0.7 percent of households in PBV units—amounting to an 18-percent increase in PBVs by 2016. This effect appears to be driven more by which agencies use PBVs at all than by the extent of PBV use. A statistical model with only MTW agencies did not detect a statistically significant relationship between distressed developments and PBV use, but the small sample size of MTW agencies makes it difficult to detect results.

MTW agencies use RAD more frequently than the comparison traditional PHAs and are more likely to convert to PBVs versus project-based rental assistance (PBRA). Among MTW agencies, 39 percent had used RAD as of 2016, compared with 12 percent of traditional PHAs. Both MTW agencies and traditional agencies were more likely to convert to PBVs than to PBRA, and this was more so for MTW agencies—which retain MTW flexibilities for PBVs but not for PBRA. In total, as of 2016, 77 percent of MTW RAD conversions were to PBVs versus 55 percent among traditional PHAs.

There is a significant overlap between PBVs and LIHTC properties. More than one-fourth of MTW agencies' PBVs were in LIHTC properties in 2016. Very few of the PBVs in LIHTC properties are RAD conversions (about 1 percent of all MTW PBVs).

There is little evidence that PBVs reach lower-poverty, opportunity-rich neighborhoods. The typical PBV-assisted household at an MTW agency lives in a neighborhood in which poverty is 85 percent higher than the average in the agency's county. At both MTW and comparison agencies, PBV units are in census tracts with higher poverty rates than TBV units and more closely resemble tracts where public housing is located. Additional measures of neighborhood quality provide similar results, with two exceptions: MTW-assisted PBV households live in neighborhoods with better-than-average access to affordable transportation within their county and live in neighborhoods with higher educational attainment than either TBV or public housing households. We found no statistically significant differences in neighborhood poverty rates between MTW and comparison agencies' PBVs, or in location patterns by race or ethnicity for PBVs compared with other housing assistance programs. Although MTW agencies use RAD more than traditional PHAs, we did not find any association between RAD use and PBV locations.

The three case study agencies discussed their PBV use as consistent with goals to ensure low-income households have access to opportunity-rich neighborhoods, but neighborhood location was not the driving motivation.

In more racially segregated counties, PBV households live in higher-poverty neighborhoods. On average, a 10-point difference in the dissimilarity index corresponds to 8.6 percent more PBV households living in high-poverty neighborhoods. PBV locations also appeared more sensitive to racial segregation than TBVs in the same jurisdictions. It may be that in highly segregated cities, developing PBV properties outside of higher-poverty neighborhoods is more difficult than renting in those neighborhoods with a TBV.

The three case studies underscore the diverse ways that MTW agencies use PBVs to pursue the MTW program's statutory objectives. The case studies also highlight the importance of local contexts and priorities in agency decision-making about PBV use. The three agencies' primary PBV goals were to preserve and expand affordable housing opportunities—particularly in tight housing markets—and to improve cost efficiency. PBV use was tied to specific local priorities and partnerships.

Limitations

This report was based primarily on a combination of HUD administrative data and publicly available MTW plans and reports, which can be imprecise or inconsistent and lack some key information about PBV use. For example, we were not able to answer questions about PBVs connected to supportive services or used for high-need groups that may be less successful with tenant-based assistance. No administrative data source identifies housing or households connected to supportive services. In addition, our analyses were limited by the availability of data identifying PBV use in LIHTC properties. We were able to map PBVs and LIHTC properties for MTW agencies, but extending this analysis to traditional PHAs was beyond the project's scope. Finally, the small sample size of 39 MTW agencies was a limiting factor for regression analyses. To increase our sample size and statistical power, we include larger traditional PHAs in several of our analyses.

Implications for Policy and Research

This work surfaced several policy implications and areas for future research. First, our analyses raise concerns about PBV locations and suggest more deliberate attention will be needed to ensure PBVs offer access to lower-poverty, opportunity-rich neighborhoods. Additional research is needed to understand the relationship between PBV locations and racial segregation and ways to address barriers to affordable housing production in low-poverty neighborhoods.

Second, this work exposes the need for more information that describes how MTW agencies use PBVs to identify promising practices and replicable models. The case study agencies were testing novel approaches to using PBVs and were engaged in unique partnerships to address homelessness or to support educational or economic mobility. To reveal programs or practices that can be applied in other settings, such as with smaller PHAs and those located in weaker housing markets, more work is needed.

Third, this work begins to reveal the relationships between the HCV and LIHTC programs. Future work is needed to fully document and understand these relationships, including more precise estimates of PBV and TBV co-location in LIHTC properties for both MTW and traditional PHAs.

Finally, future work should examine supportive service provision among MTW agencies and traditional PHAs. More comprehensive administrative data are needed—from MTW and traditional PHAs—that identify units connected to supportive services and households served through programs that combine housing and services.

1. Introduction

This report explores how Moving to Work (MTW) agencies use project-based voucher (PBV) assistance. It is the first comprehensive look at PBV use among MTW agencies and examines several questions about PBV locations and the roles of the Rental Assistance Demonstration (RAD) and the Low-Income Housing Tax Credit (LIHTC) programs in the PBV program. MTW agency motivations for using PBVs are revealed through three case studies of agencies with extensive PBV portfolios. We use a variety of methodological approaches and a combination of U.S. Department of Housing and Urban Development (HUD) administrative data, document review, and interviews with staff at three MTW agencies. We focus on MTW but, wherever possible, also examine PBV use among comparably sized traditional public housing agencies (PHAs).[2]

The MTW demonstration allows a small group of PHAs to test funding and policy flexibilities to find innovative approaches to providing HUD-funded housing assistance.[3] It has three statutory objectives: to increase housing choice for low-income families, to encourage families to become economically self-sufficient, and to reduce costs and achieve greater cost-effectiveness in federal expenditures.[4] As of 2019, 39 agencies had active MTW designation (see appendix D for a list of MTW agencies). This report is one of several studies completed through the HUD-sponsored retrospective evaluation of MTW to understand how MTW agencies provide housing assistance and their progress in fulfilling the program's statutory objectives (see exhibit 1.1).

MTW agencies' PBV use—and PBV use by traditional PHAs—is relevant to HUD and policymakers for several reasons. First, PBVs have become more available to PHAs. Recent legislation and the RAD program discussed below allow traditional PHAs to project base a larger share of their total voucher allocations than was previously permitted and ease some of the challenges to using PBVs. In some markets, PBVs may be appealing because portable tenant-based vouchers (TBVs) are difficult to use—whether due to tight rental markets or landlords refusing to accept them. It is difficult to predict, however, whether PHAs will shift from TBVs to PBVs and the implications of expanded PBV use. Notably, PBVs limit assisted households' neighborhood options, raising concerns about PBV households' exposure to high-poverty neighborhoods. MTW agencies' PBV activities and locations can shed light on potential challenges, opportunities, and tradeoffs of expanded PBV use. Similarly, documenting the extent to which PBVs are tied to the RAD or LIHTC programs can help policymakers and practitioners understand potential constraints on PBV locations.

[2] Throughout this report we refer to housing agencies with MTW designation as MTW agencies and housing agencies without MTW designation as traditional PHAs or comparison traditional PHAs.

[3] See HUD's Moving to Work Demonstration website for more information: https://www.hud.gov/mtw

[4] See Public Law Section 204 C(3) (A-E): http://www.gpo.gov/fdsys/pkg/PLAW-104publ134/pdf/PLAW-104publ134.pdf (p 283 of PDF). Agencies participating in MTW must also follow several programmatic statutes. These include requirements to have at least 75 percent of admitted families be very-low income; create a rent policy encouraging self-sufficiency and employment; assist "substantially" the same number of low-income families and maintain a similar family mix that they would have otherwise; and ensure housing meets HUD housing quality standards. (For more details, see https://www.hud.gov/sites/documents/PIH2013-02.PDF.)

Exhibit 1.1 The Moving to Work Retrospective Evaluation

The HUD-sponsored Moving to Work (MTW) Retrospective Evaluation includes six reports and an online data feature that examine different aspects of the MTW program and MTW agencies' activities and performance under the program's three statutory objectives.

A Picture of Moving to Work Agencies' Housing Assistance describes MTW agencies, the assistance they provided, and the characteristics of the households they served in 2008 and 2016. A related online data feature provides access to MTW agency-level data.

Moving to Work Agencies' Use of Funding Flexibility examines how agencies have used MTW funding flexibility, alone and with regulatory waivers, and categorizes funding flexibility activities by their primary objectives—cost-effectiveness, self-sufficiency of assisted households, or increased housing choice for low-income families. The study includes an indepth examination of funding shifts for a subgroup of eight agencies.

Housing Choice and Self-Sufficiency Outcomes at Moving to Work Agencies examines the extent to which MTW agencies meet two of the program's three statutory objectives, increasing housing choice and promoting self-sufficiency for assisted households.

The Impact of the Moving to Work Demonstration on the Per Household Costs of Federal Housing Assistance examines how MTW status affects the costs, to HUD, of providing housing assistance to households in the public housing and Housing Choice Voucher (HCV) programs.

Evaluating the Effects of Santa Clara County Housing Authority's Rent Reform examines the impacts on work, earnings, and housing subsidies among assisted households of Santa Clara's unique rent reform, which increased the proportion of income that households must pay toward rent.

Moving to Work Agencies' Use of Project-Based Voucher Assistance examines multiple aspects of MTW agencies' use of project-based voucher (PBV) assistance, including the share of assistance and HCV budget authority devoted to PBVs, the relationships between PBVs and the Low-Income Housing Tax Credit and Rental Assistance Demonstration programs, the locations of PBV-assisted units, and case studies of three agencies' MTW goals and activities.

The report first describes what is known about PBV assistance and its interaction with the RAD and LIHTC programs, and then explains the research design and questions for the study reported here. Answers follow. A final section of the report showcases three different MTW agencies and how they have used PBVs to pursue particular locally defined goals. A concluding section sums up the study's findings. Several appendixes provide additional information. Appendix A describes the data and measures used to answer the research questions. Appendix B contains additional detailed results from the quantitative analyses. Materials related to the qualitative case studies appear in appendixes C, E, and F. Appendix D lists the MTW agencies active as of 2016. A sensitivity analysis related to the LIHTC analysis is included in appendix G.

2. Background

The Project-Based Voucher (PBV) program was enacted by Congress in 1998 through the Quality Housing and Work Responsibility Act, as a component of the Housing Choice Voucher (HCV) program (see exhibit 2.1 for descriptions of the HUD housing programs referenced in this report). Households pay up to 30 percent of their income towards rent and utilities in the project-based HCV program and up to 40 percent in the tenant-based program, and the voucher covers the difference. In both programs, at least 75 percent of families admitted must have extremely low incomes, using HUD's income limits, when they are admitted to the program. Unlike tenant-based vouchers (TBVs), however, PBVs are attached to specific housing units or properties and administered through contracts with property owners for specified periods of time. When a household moves out of a PBV unit, the assistance remains with the unit for the length of the PBV contract.

Exhibit 2.1 Assisted Rental Housing Programs

Public Housing. Originating in 1937, public housing is the nation's oldest housing subsidy program. Approximately 1.035 million public housing units are owned and managed by public housing agencies (PHAs), and tenants pay rent directly to a PHA each month. Households must have income below 80 percent of the area median income (AMI) to qualify, but PHAs are required to target at least 40 percent of new admissions to households that meet HUD's definition of extremely low income (ELI). Additionally, housing agencies often give preference to households that are homeless, elderly and/or disabled, or working families. Most families pay 30 percent of their income in rent or a minimum rent of up to $50 per month.

Housing Choice Vouchers (HCVs). The HCV program provides rental assistance to approximately 2.3 million low-income households annually. HUD requires that not less than 75 percent of families admitted to a PHA's HCV program in a year have incomes at or below the ELI limit. The program includes tenant- and project-based voucher assistance. For both types of vouchers, households typically pay 30 percent of their income or a minimum rent of up to $50 per month.

> ***Tenant-Based Vouchers (TBVs):*** TBVs are provided to individuals or households to enable them to rent privately owned housing. Once a household receives a voucher from their local PHA, they have a minimum of 60 days to find a unit that meets federal quality standards and whose landlord will accept the voucher. When an HCV holder leases a unit, the HCV holder (such as the tenant) pays a portion of the gross rent (rent plus any tenant-paid utilities), and the PHA pays a portion of the gross rent. The program allows households to rent housing in any jurisdiction where a PHA administers an HCV program and a landlord will accept a voucher.
>
> ***Project-Based Vouchers (PBVs):*** PBVs are attached to specific units and properties through contracts with property managers or owners who rent units to eligible families. The rent is subsidized by the PHA through the PBV. Like with a TBV, the tenant pays a portion of the rent, and the PHA pays a portion of the rent. In some cases, PHAs own the PBV properties.

Section 8 Project-Based Rental Assistance (PBRA). PBRA subsidizes housing for 1.2 million households. The program provides long-term contracts to private for-profit or nonprofit owners (including PHA owners) who rent some or all the units in the properties to low-income families. Costs of maintaining and operating the units with low-income tenants are covered by a monthly Section 8 PBRA payment to the private owner. Households must have income below 80 percent of the AMI to qualify, but at least 40 percent of units in each development must go to ELI households. Households pay the higher of 30 percent of income or $25 in rent.

Local, Non-Traditional Programs. MTW agencies can implement local, non-traditional activities that fall outside of the traditional HCV and public housing programs. Local, non-traditional programs may include programs that use MTW funds to provide a rental subsidy to a third-party entity (such as, other than a landlord or tenant) who manages intake and administration of the subsidy program (known as sponsor-basing); in which a PHA uses MTW funds to act as a mortgager; to acquire, renovate and/or build units that are not public housing or HCV units (for example, tax credit partnerships); and to provide services not otherwise permitted or that are provided to nonresidents.

Rental Assistance Demonstration (RAD). Congress authorized RAD in 2012 to stem the loss of public housing units due to a lack of funding for repairs. RAD allows PHAs to convert public housing to project-based Section 8 contracts, to provide a predictable long-term funding stream and allow PHAs to use a wide range of public and private funding sources to pay for property rehabilitation. PHAs using RAD choose Section 8 contracts that are PBVs or PBRA.

Low-Income Housing Tax Credits (LIHTC). The LIHTC program was created by the Tax Reform Act of 1986. Since then, it has placed more than 3 million housing units in service and become the largest federal program that directly promotes building affordable housing. The federal government allocates tax credits to states based on a per-capita formula. States award credits to developers, who sell credits to investors and use the proceeds to pay for construction. Investors who buy the LIHTCs claim the credits starting in the first year that the building is occupied by low-income tenants paying affordable rents, and each year thereafter for up to 10 years. The LIHTC buildings must maintain income and rent restrictions for a minimum of 15 years.

There are several reasons that Moving to Work (MTW) agencies or traditional public housing agencies (PHAs) might choose to convert a portion of their TBV assistance to PBVs (CBPP, 2017; Cunningham and Scott, 2010). PBVs might be attractive to PHAs in tight or expensive markets and offer more predictable rent costs compared with TBVs. For example, long-term PBV contracts set rent increases over time, even in places where private market rents are rising rapidly. Or, PBVs may be a promising option in places where voucher holders have difficulty finding voucher-affordable units or landlords that will accept vouchers—recent research suggests that landlords commonly refuse to rent to TBV holders (Cunningham et al., 2018). PBVs may also allow agencies to serve higher-need households by co-locating supportive services. Or, they may provide a consistent revenue stream to help agencies finance new housing or rehabilitate existing affordable housing—including through the Rental Assistance Demonstration (RAD) program, which allows PHAs to renovate and preserve public housing units by converting them to PBVs or project-based rental assistance (PBRA). Finally, although there is no technical requirement for it, PHAs might view PBVs as an opportunity to create or preserve affordable housing in high-opportunity neighborhoods. As discussed below, HUD provides incentives to traditional PHAs for project-basing in lower-poverty areas.

There are several constraints on traditional PHAs' PBV use.[5] First, PHAs may not allocate more than 20 percent of their total authorized number of HCVs to PBVs. RAD PBVs, however, are exempt from this 20-percent cap, and agencies can project base an additional 10 percent of vouchers if they are connected to supportive services, serve vulnerable populations, or if the property is located in a low-poverty census tract. Second, no more than 25 units or 25 percent of all units in a development (whichever is greater) may be assisted through PBVs unless the property is in a census tract with a poverty rate below 20 percent (in which case the cap is 40 percent of all units). Third, the maximum PBV contract term is capped at 20 years, with the option to renew for an additional 20 years. Finally, to retain neighborhood and housing choice for families in the PBV program, HUD's Family Right to Move requirement allows households to request tenant-based rental assistance once they have lived in their PBV unit for 1 year.[6] PHAs must provide the family with either the next available TBV or other comparable tenant-based rental assistance.

In contrast, with approval from HUD's MTW program office, MTW agencies may waive these restrictions and apply additional flexibilities related to PBVs and/or the HCV program more broadly. Specifically related to PBVs, MTW agencies are permitted to:

- Devote more than 20 percent of HCV program funds/allocations to PBVs;
- Devote more than 25 percent of the units in a single project to PBVs;
- Create initial PBV contract terms that extend beyond 20 years;
- Establish a "local MTW PBV program,"7 using simplified or existing local property selection processes for project-basing units; and

[5] Some of the current restrictions were revised or relaxed from previous program regulations through the Housing Opportunity Through Modernization Act of 2016 (HOTMA). For more information, see https://www.hud.gov/sites/dfiles/PIH/documents/PIH-2017-21.pdf. For example, prior to HOTMA a PHA could use up to 20 percent of its total HCV program funding to PBVs. HOTMA changed the limit to 20 percent of a PHA's authorized number of vouchers, which represented an increase in allowable PBVs for most PHAs.

[6] See 24 CFR 983.261 for more information on the Family Right to Move provision: https://www.govinfo.gov/content/pkg/CFR-2017-title24-vol4/pdf/CFR-2017-title24-vol4-part983.pdf.

[7] For more information on the creation of an agency MTW Section 8 project-based program, see Section D.7 "Attachment C" of the Standard MTW agreement (https://www.hud.gov/sites/documents/DOC_10242.PDF).

- Waive or revise the Family Right to Move requirement.

Additional HCV program flexibilities include the ability to waive or revise:

- Operational policies and procedures, such as the terms of Housing Assistance Payment (HAP) contracts and portability processes;
- Rent policies and term limits;
- Requirements for participants, such as verification procedures;
- Waitlist policies, such as procedures for maintaining waiting lists, and tenant selection procedures and criteria;
- Housing Quality Standards (HQS) certification and inspection procedures; and
- Processes to determine what types of funds may be used to rehabilitate or construct units, and changes to procedures to determine a unit's eligibility for PBVs.

MTW agencies document their activities and use of MTW flexibilities in annual plans and reports, but reporting and the level of detail vary by agency, and they may bundle activities for the purpose of reporting. For example, Boulder Housing Partners has implemented one activity that covers eight elements of their PBV program and uses a combination of PBV-specific and HCV authorizations. The flexibilities include waiving the 20-percent cap on their HCV-authorized units; using a local definition of exception units; waiving the competitive bidding process; establishing local rent limits and reasonableness; allowing owners or service providers to hold the waitlist for their property; allowing Boulder Housing Partners staff to conduct their HQS inspections rather than an independent entity; and allowing tenants without HAP payments to stay on their voucher.

Existing Evidence on Project-Based Voucher Assistance

Prior research has established that MTW agencies use PBVs more than traditional agencies (Mast and Hardiman, 2017) and that MTW agencies' use of PBVs increased between 2008 and 2016 (Galvez, Gourevitch, and Docter, forthcoming). Galvez, Simington, and Treskon's (2017) review of MTW agency plans and reports found that nearly all (36 of the 39) MTW PHAs were engaged in at least one PBV activity as of 2015. In 2016, PBVs represented about 12 percent of all units at MTW agencies compared with about 4 percent of all units at comparably large traditional PHAs serving 750 or more households annually (Galvez, Gourevitch, and Docter, forthcoming). The share of MTW PBV assistance increased by roughly 8 percentage points from 2008 to 2016 (from about 4 to 12 percent), while the share of PBVs at traditional PHAs increased by only 2 percentage points over the same period (from about 2 to 4 percent). Mast and Hardiman (2017) had similar findings and attributed MTW agencies' more frequent use of PBVs to their ability to use their MTW flexibilities.

Prior research also suggests that MTW and traditional agencies serve similar populations through their PBV programs, with negligible differences in terms of the share of work-able household heads, head of household average age, household composition and size, and the share of households headed by a person with disabilities. PBVs at both types of agencies tend to serve more elderly households and fewer disabled households or households with children compared with TBVs or public housing (Galvez, Gourevitch, and Docter, forthcoming; Mast and Hardiman, 2017). At both MTW and traditional agencies, PBV-assisted household heads were slightly more likely to be White and to be male and slightly

less likely to be work-able than public housing or TBV-assisted household heads (Galvez, Gourevitch, and Docter, forthcoming).

There is no systematic evidence on how PHAs make decisions about PBV use. Prior literature suggests PHAs may use PBVs to preserve or finance new affordable housing stock, to overcome challenges finding landlords that will accept TBVs, or to pair housing with supportive services (CBPP, 2017). No research has directly examined what generally motivates PHAs, or MTW agencies specifically, to use PBVs.

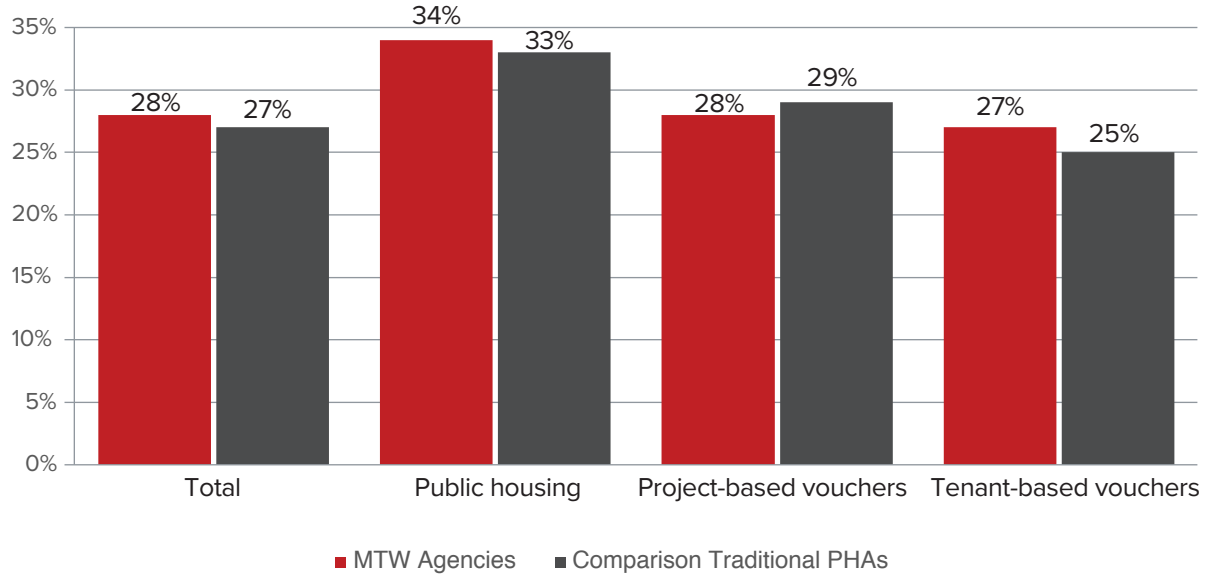
A limited body of research examines PBV locations and finds that, on average, PBVs tend to be in higher-poverty neighborhoods and are less dispersed (for example, found in fewer census tracts) compared with TBVs—but reach lower-poverty, more dispersed neighborhoods compared with public housing (Devine et al., 2003; McClure, Schwartz, and Taghavi, 2015). Mast and Hardiman (2017) look specifically at households with children and find the median-tract poverty rate for PBVs was marginally higher than the median for TBVs (28 percent for PBVs versus 24 percent for TBVs). Galvez, Gourevitch, and Docter (forthcoming) find that MTW PBVs and TBVs were in neighborhoods with nearly identical poverty rates (exhibit 2.2). There is no systematic evidence on MTW agencies' efforts to use PBVs to reach high-opportunity neighborhoods, but Galvez, Simington, and Treskon (2017) found that only four MTW agencies were explicitly using MTW flexibilities to reach low-poverty or high-opportunity areas with PBVs.[8]

None of these analyses examines the role of public housing conversions in PBV locations (as discussed below) or those locations relative to the average poverty rate for their respective PHAs' own jurisdictions. If PBVs originate primarily through RAD public housing conversions, their neighborhoods will most likely resemble those of higher-poverty public housing. Given that MTW agencies tend to be in higher-poverty central city jurisdictions, compared with traditional PHAs, they may perform relatively better within their local markets than when compared with traditional agencies.

There is no research examining PBV location patterns by race/ethnicity to determine if PBVs may offer different neighborhood opportunities for Black or Latino households compared with TBVs or public housing. In tighter or more racially segregated housing markets, for example, where it may be challenging for low-income or non-White households to find housing that will accept vouchers, PBVs could provide a mechanism for PHAs to identify more promising location options than might be feasible with TBVs.

[8] The MTW agencies were Cambridge, Holyoke, Reno, and King County.

Exhibit 2.2 Average Poverty Rate of Census Tracts Containing Assisted Households by Program Type for Moving to Work and Comparison Traditional Public Housing Agencies, 2016



MTW = Moving to Work. PHA = Public Housing Agency

Notes: Excludes households with missing geographic-tract identifiers in HUD Office of Public and Indian Housing Information Center data.

Sources: Urban Institute analysis of HUD Office of Public and Indian Housing Information Center data; 2011–2015 American Community Survey, 5-year data

Interaction with the Rental Assistance Demonstration and Low-Income Housing Tax Credit Programs

The RAD and Low-Income Housing Tax Credit (LIHTC) programs should be considered when examining PBV use, particularly as they relate to PBV locations (see exhibit 2.1 for descriptions of HUD housing programs). Both scenarios typically involve layering PBVs onto existing affordable housing properties—potentially in higher-poverty neighborhoods. There is no research, however, documenting the extent to which PBVs are connected to RAD conversions or are co-located in LIHTC properties.

RAD was authorized under the Consolidated and Further Continuing Appropriations Act of 2012 to help PHAs preserve and improve public housing in need of major rehabilitation. Through RAD, PHAs can convert public housing to either PBVs or PBRA. Because RAD is a housing preservation program, HUD waives the PBV program's poverty deconcentration goal. The Act initially authorized up to 60,000 units, and as of 2019, Congress has raised the cap to 455,000 units. An interim evaluation identified 39,042 RAD conversions (in 359 projects) as of 2016 (Econometrica, Inc., 2016), and as of 2019, approximately 113,540 public housing units have been converted. For both MTW and traditional PHAs, the extent to which PBV-assisted units are in converted public housing properties may be important in explaining PBV locations. If a large proportion of PBV units nationally are in former public housing properties, PBV locations will very likely resemble public housing locations. If MTW agencies use RAD more frequently than traditional agencies, MTW PBVs may be in higher-poverty areas than traditional agencies' PBVs.

The LIHTC program gives private investors a federal income tax credit in return for making equity investments in affordable rental housing.[9] Additional tax credits are awarded to projects in areas with higher poverty and/or a large number of low-income households (Qualified Census Tracts) or areas with particularly high development costs (Difficult Development Areas).[10] Research and anecdotal evidence suggest there is considerable overlap between the two programs (Climaco et al., 2009; O'Regan and Horn, 2013), although no data source comprehensively overlays voucher and LIHTC assistance or differentiates TBVs from PBVs.[11] Prior research also shows that LIHTC properties are more likely to be found in suburban areas compared with HCVs (Ellen, O'Regan, and Voicu, 2009; McClure, 2006; Freeman, 2004), which could suggest lower-poverty locations compared with other place-based assistance programs. As with RAD, the degree of overlap between the PBV and LIHTC programs could have implications for PBV neighborhood locations, but it is difficult to estimate whether co-location of PBV units in LIHTC properties might expand or impede access to lower-poverty neighborhoods.

[9] See Scally, Gold, and DuBois (2018) for information on the LIHTC program.

[10] HUD defines Qualified Census Tracts as tracts where at least one-fourth of the population lives in poverty or where at least one-half of the population have income below 60 percent of area median income. The LIHTC statute defines Difficult Development Areas as areas with high development costs, specifically land, construction, and utility costs, and is intended to provide low-income housing in higher-income areas.

[11] For example, O'Regan and Horn (2012) had access to subsidy information for LIHTC properties in one state and estimated that roughly 23 to 26 percent of households in LIHTC properties had vouchers.

3. Research Questions and Study Design

This study answers six research questions:

1. How extensively do Moving to Work agencies use project-based vouchers?
2. What factors are associated with Moving to Work and traditional agencies' use of project-based voucher assistance?
3. To what extent are Moving to Work agencies' project-based vouchers located in Rental Assistance Demonstration or Low-Income Housing Tax Credit properties?
4. Are Moving to Work agency project-based vouchers in lower-poverty, higher-quality neighborhoods? Do project-based voucher locations vary by household race or ethnicity?
5. What factors are associated with variations in project-based voucher locations?
6. What are the agencies' motivations for project-based voucher use?

For the quantitative analyses (questions 1 through 5), we contrast Moving to Work (MTW) project-based voucher (PBV) use to that of a group of similarly large traditional public housing agencies (PHAs) (defined as serving 750 or more households through any assistance program in 2016). These larger PHAs more closely resemble MTW agencies in terms of size, the mix of housing assistance provided, and local housing market characteristics than do smaller traditional agencies (see Galvez, Gourevitch, and Docter, forthcoming, and appendix A of this report for a discussion of the comparison traditional PHAs). Below, we describe each research question and summarize the methods and data used to answer them. The data sets are summarized in exhibit 3.1, and additional details about the quantitative analyses are in appendix A. We discuss the findings in Section 4.

Research Question 1: How extensively do Moving to Work agencies use project-based vouchers?

The first research question quantifies MTW agencies' PBV activity using HUD administrative data and a database of MTW activities developed for the evaluation. Specifically, we examine:

- How many MTW agencies report PBV-assisted households in HUD administrative data?
- Which MTW agencies have the most active PBV programs?
- How frequently do MTW agencies use their PBV flexibilities?

We identify six measures of PBV activity as of 2016. For the measures calculated using HUD administrative data, we contrast PBV use by MTW agencies to that of the comparison group of similarly large traditional PHAs.

1. The number and percent of MTW agencies with PBV-assisted households.
2. The number and percent of all MTW-assisted households served through PBVs.
3. The percent of housing choice voucher (HCV) budget authority that MTW agencies devoted to PBVs.
4. The total number of PBV activities requiring MTW flexibilities.
5. The total number of MTW activities that involve or impact PBVs.
6. The number and percent of agencies that used their MTW flexibilities to exceed the

cap of 20 percent of HCV budget authority allocated to PBVs.[12]

Relevant MTW PBV activities include any active and ongoing activities that (1) explicitly involve MTW PBV flexibilities (for example, exceeding PBV caps, extending initial contract terms, or establishing a local MTW PBV program) or (2) implicitly involve PBVs in some way.

Research Question 2: What factors are associated with Moving to Work and traditional agencies' use of project-based voucher assistance?

After determining MTW agencies' PBV use, we use linear regression to explore factors associated with PBV use. To increase our sample size and statistical power, the regression model is estimated using a sample of MTW agencies only (N=34) as well as a larger sample that includes large PHAs and MTW agencies (N=446).[13] We use data from the HUD PIH (Office of Public and Indian Housing) Information Center (PIC) and other sources. See exhibit 3.1 and appendix A for additional detail on data sources and analyses.

The regression model estimates the relationship between the ***share of assisted households reported in PIC that were assisted through PBVs in 2016*** and the following measures:

- Logged average rental prices measured with the ***Zillow Rent Index (ZRI)***[14] ***in 2016;***
- The percentage ***change in the ZRI over 5 years*** prior to our analysis year (2011 to 2016);
- The ***Real Estate Assessment Center (REAC) Physical Assessment Subsystem (PASS) scores for 2008;***
- The ***percent of the PHA's assisted households that lived in public housing in 2009;***
- The ***percent of the PHA's assisted households served by PBVs in 2009;*** and
- ***Indicator variables for PHA regional location (South, Midwest, or West)***, using U.S. Census Bureau regions and the ***Northeast*** as the reference region.

Drawing on prior literature (CBPP, 2017) and discussions with HUD and PHA staff, our analysis examines whether PBV use is associated with the need to overcome the challenges of finding units that will accept tenant-based vouchers (TBVs) and/or preserve deteriorating affordable housing stock.

We use high and rising rents as a sign of tight, competitive housing markets where demand for rental housing is growing faster than the supply, and it may be more challenging for low-income households to find housing with a TBV.[15] If MTW agencies view PBVs as a useful tool mainly in competitive, expensive markets, we would expect to see higher PBV use in places with high or rapidly rising rents. We measure rents using the ZRI and differentiate

[12] Prior to HOTMA's implementation in 2017, traditional PHAs were able to allocate 20 percent of their budget authority to PBVs, which is the measure included in this analysis. HOTMA shifted the formula and cap to 20 percent of agencies' voucher allocations.

[13] The full sample of 39 MTW agencies with MTW designation as of 2019 is reduced to 34 agencies because of a combination of data limitations. The housing authorities of the County of Santa Clara and the City of San Jose report data jointly into the HUD PIH (Office of Public and Indian Housing) Information Center (PIC) and were entered into our analysis as a single PHA. Second, missing Physical Assessment Subsystem (PASS) and Zillow data required removing the Massachusetts Department of Housing and Community Development, the Alaska Housing Finance Corporation, the Holyoke Housing Authority and the Housing Authority of Champaign County. The analysis includes 412 comparison PHAs for whom PIC, PASS, and Zillow data were available.

[14] Zillow Rent Index and Zillow Home Value Index data were acquired from www.zillow.com/data on November 28, 2018. Aggregated data on this page is made freely available by Zillow for noncommercial use.

[15] An alternative measure of a competitive or tight rental market is vacancy rates. We elect to use rising rents because it is more likely to be salient to the PHAs. As PHAs make decisions about the use of PBVs, they are likely more sensitive to changes in rents than in vacancy rates.

between markets with rising, falling, or stable rents using the change in ZRI between 2011 and 2016.

We also expect that PHAs with more distressed public housing would be more motivated to take advantage of HUD programs such as the Rental Assistance Demonstration (RAD) or Section 18 Demolition and Disposition that would allow them to improve and convert their public housing stock and transition units to PBVs. We measure public housing distress prior to the RAD launch in 2012 using REAC PASS scores from 2008.

The model also includes indicator variables for PHA regions, the percent of households in PBVs and in public housing in 2009, to control for conditions that pre-date our outcome measures.

A notable limitation of this analysis is that we are unable to explore the relationship between PBVs and supportive services. Traditional agencies are permitted to dedicate up to 10 percent more of their HCV allocations to PBVs above the 20-percent cap if the housing provides access to supportive services or serves vulnerable populations. MTW agencies may have unique opportunities and motivation to provide supportive services through local partnerships or local, non-traditional housing assistance. No data source identifies housing connected with services, however, so it is not possible to measure how often MTW or traditional PHAs take advantage of these incentives.

In analyses presented in appendix B (exhibit B.2), we explore additional factors that could be related to PBV use through models that use the combined sample of MTW agencies and traditional PHAs and include (or control) for a range of regional characteristics.

Research Question 3: To what extent are Moving to Work agencies' project-based vouchers located in Rental Assistance Demonstration or Low-Income Housing Tax Credit properties?

Three measures capture the extent to which MTW agencies' PBV programs interact with the RAD and Low-Income Housing Tax Credit (LIHTC) programs as of 2016:

1. The number and share of each MTW and traditional agency's PBV units that were former public housing units converted to PBVs through RAD (regardless of occupancy status) as of 2016.
2. The number and share of each MTW agency's PBV-assisted households living in former public housing units converted to PBVs through RAD as of 2016.
3. The number and share of each MTW agency's PBV-assisted households living in LIHTC properties in 2016.

HUD administrative data do not directly identify which PBV units were converted from public housing, so it is necessary to use a combination of administrative data sets to differentiate the RAD-converted PBVs from other vouchers and to identify households living in those units in 2016. We first identified all MTW agency public housing addresses reported in PIC in 2012 through 2016 to create an inventory of properties in existence immediately prior to the availability of RAD (which was enacted in 2012). We then matched the MTW public housing addresses to RAD "First Component" address data[16] for more than 44,000 units converted

[16] RAD's First Component allows PHAs to convert public housing properties to either PBV or PBRA; the Second Component allows the conversion of tenant protection vouchers funded under the Rent Supplement, Rental Assistance Payment, and Moderate Rehabilitation programs (see PIH Notice 2012-32). HUD program staff suggested the First Component data were the most relevant to this study because MTW Second Component conversions have been infrequent and TBV-assisted households or units are not consistently identified in HUD administrative data.

and "closed" through 2016 to identify the properties converted during the first 4 years of the program.[17] We then use 2016 PIC data to identify all households reported as living in PBV-assisted units and to identify those in PBVs that were converted through RAD.

There are limitations to this approach. Because our study period ended in 2016, we only include RAD units closed by the end of that year—which omits units still in the lengthy RAD conversion process. The RAD program tripled between 2016 and 2019, to more than 113,000 units. To account for this, we also identify the total number of units at MTW agencies that were in the process of conversion as of March 2018. Our approach may also undercount occupied RAD PBVs as of 2016 due to lags in PHA reporting or any inconsistencies in how MTW PHAs reported RAD conversions to HUD. Nevertheless, our approach provides the most comprehensive accounting possible of MTW public housing units converted through RAD and reported as occupied in our study period.

To identify the overlap between PBVs and LIHTC properties, we used ArcGIS to map the addresses of all MTW PBV-assisted households in 2016 PIC data, and all LIHTC properties active as of 2015 in the National Housing Preservation Database.[18] We drew a radius of 200 feet around each LIHTC property—the equivalent of about one city block—and defined all PBV addresses that fell within that radius as located in the LIHTC property.[19] We then determined the share of each MTW agency's PBV-assisted households located in LIHTC properties. We repeated this analysis for MTW TBV-assisted households for comparison.

This approach is not precise. For example, we could incorrectly match a PBV-assisted address to a LIHTC property if it is near but not actually in the same development. It is also possible that a mix of LIHTC-subsidized and unsubsidized units exist at any given property, although it is often the case that most or all units in a LIHTC property are subsidized (Scally, Gold, and DuBois, 2018). Alternatively, if some LIHTC developments span more than our estimate of a typical city block, we may omit PBVs located in the larger properties. More precise estimates would require research on local variations in LIHTC property characteristics. In addition, we only examine the overlap between LIHTC properties and PBVs for MTW agencies. Including traditional agencies in these analyses would have been computationally difficult and beyond the scope of this project.

[17] The RAD process involves several stages. First, a PHA submits a RAD application to HUD. If accepted, HUD awards a Commitment to Enter into a Housing Assistance Payment Contract (CHAP). The PHA then submits a Financing Plan to HUD detailing the type of conversion (PBV or PBRA), a physical condition assessment, its plans for rehab or new construction, project operating and maintenance costs, and more. If the plan is accepted, HUD issues a RAD Conversion Commitment (RCC) until work is complete and the property is "closed" and formally leaves the public housing program with a new PBV or Section 8 PBRA contract in place.

[18] We use all properties placed in service between 1987 and 2015 with active LIHTC program tax credits as of 2015.

[19] City block sizes vary widely across the country (Handy, Paterson, and Butler, 2003), and can be as small as 200 feet to 800 feet or more (for example, the average city block in New York City is 1,500 feet, see: https://escholarship.org/uc/item/04b2d8xp. We use a radius of 200 feet since existing studies treat 200 feet as a lower bound for the size of an average city block (Galvez et al., 2014). We conducted a sensitivity analysis using varying radii for the LIHTC matching, which we include in appendix G.

Research Question 4: Are Moving to Work agency project-based vouchers in lower-poverty, higher-quality neighborhoods? Do project-based voucher locations vary by household race or ethnicity?

To answer these questions, we first assess whether PBV-assisted households are in higher- or lower-poverty neighborhoods (census tract) relative to three comparison points: (1) other neighborhoods in their same housing markets; (2) households assisted by the same PHA but with TBVs or living in public housing; and (3) the locations of PBV units at traditional agencies. We also compare differences in neighborhood characteristics for PBV, TBV, and public housing locations by the race/ethnicity of the assisted households.

Previous research shows that in the aggregate, neighborhood poverty rates for PBVs are roughly the same at MTW and traditional agencies (Mast and Hardiman, 2017; Galvez, Gourevitch, and Docter, forthcoming). But this comparison does not consider variations in local contexts or voucher holder race/ethnicity. To account for regional variation, we construct indicators of neighborhood quality that are normalized by county, which allow us to compare location outcomes across MTW agencies while accounting for the poverty levels or other characteristics of the housing markets that each agency serves.

Neighborhood poverty rates relative to the county average is the main indicator of overall neighborhood quality. The ***county-normalized neighborhood poverty rate*** of each household is calculated by dividing the poverty rate of the household's census tract by the county poverty rate, using estimates from the 2012–2016 American Community Survey (ACS) 5-year sample. The average county-normalized neighborhood poverty rate for MTW PBV households is compared with that of:

- Households assisted through TBVs by the same MTW agency, and
- Households in public housing assisted by the same MTW agency.

We then examine how PBV locations differ between MTW agencies and comparison traditional PHAs. Specifically, we compare:

- The county-normalized neighborhood poverty levels of MTW PBV locations to that of comparison traditional PHAs' PBV locations;
- The difference between PBV and TBV county-normalized neighborhood poverty levels for MTW agencies and that of comparison traditional PHAs; and
- The difference between PBV and public housing county-normalized neighborhood poverty levels at MTW agencies with that of comparison traditional PHAs.

Each comparison is repeated using six additional county-normalized measures of neighborhood (census tract) quality drawn from a combination of ACS and HUD's Affirmatively Furthering Fair Housing (AFFH) data. The measures are:

- Labor force participation rate (2012–2016 ACS 5-year estimates);
- The percent of adults with a bachelor's degree (2012–2016 ACS 5-year estimates);
- Labor Market Engagement Index (HUD AFFH data);
- Environmental Health Index (HUD AFFH data);
- School Proficiency Index (HUD AFFH data); and
- Low Transportation Cost Index (HUD AFFH data).

Correlation analysis for these six measures is included and discussed in appendix B, exhibit B.4. Generally, there is a positive relationship between the population with a bachelor's degree, labor force participation rate, labor market engagement index, environmental health index, and school proficiency index. Poverty and transportation costs tend to be negatively correlated with the other measures.

The AFFH labor market engagement, environmental health, and low-cost transportation indices are percentile ranks nationally. The school proficiency index is a percentage rank by state. For all four indices, a higher score represents a more desirable or higher-quality area. That is, higher values mean more labor market engagement, fewer environmental hazards, better schools, or lower transportation costs. A county-normalized value of 1 means that the assisted households are in neighborhoods that are typical for the county.

We then examine locations for Black or African-American (non-Hispanic/Latino), Hispanic/Latino, and White households. For example, we compare neighborhood poverty levels for Hispanic/Latino households in PBV units to neighborhood poverty levels for Hispanic/Latino households in TBV and public housing units at the same MTW or traditional PHA. These analyses allow us to examine whether assisted households' race or ethnicity is associated with differential access to lower-poverty, higher-quality neighborhoods depending on the form of housing assistance.

Finally, we test whether being associated with LIHTC or RAD influences neighborhood poverty rates. If RAD or LIHTC units are in higher-poverty areas, PBVs that are not associated with those programs may reach lower-poverty areas.

To this end, we take the following steps:

- We test for differences in county-normalized neighborhood poverty between RAD and non-RAD PBV properties within the same MTW agency.
- We test for differences in county-normalized neighborhood poverty levels between LIHTC and non-LIHTC PBV properties within the same MTW agency.
- We examine the extent to which our initial calculations of differences between PBV and public housing locations change with RAD or LIHTC PBV units removed.
- We examine the extent to which our initial calculations of differences between PBV and TBV locations change with RAD or LIHTC PBV units removed.

Research Question 5: What factors are associated with variations in project-based voucher locations?

To understand the factors associated with variation in MTW and traditional agency PBV locations, we estimate the relationships between local housing market characteristics and PBV locations. We estimate these relationships using a combined sample of MTW agencies (35) and comparison large PHAs (411), as well as with a sample of only MTW agencies.[20]

We define PBV locations using two measures:

- The average (county-normalized) neighborhood poverty rate for PBVs; and
- The share of PBVs in high-poverty neighborhoods.

Both measures are calculated using data

[20] The full sample of 39 MTW agencies with MTW designation as of 2019 is further reduced because of a combination of data limitations. This analysis focuses only on agencies with PBVs reported in PIC (for MTW PHAs, this excludes the Delaware State, Lawrence-Douglas County, and Home Forward [Portland, Oregon] housing authorities). The housing authorities of the County of Santa Clara and the City of San Jose report data jointly into PIC and enter our analysis as a single PHA. Missing PASS and Zillow data required removing the Massachusetts Department of Housing and Community Development, the Alaska Housing Finance Corporation, and the Holyoke and Champaign County housing authorities. Among the comparison traditional PHAs, 415 reported PBV units, and four were excluded because they lacked data necessary to calculate the dissimilarity index. There are 31 MTW agencies and 261 comparison PHAs that appear in analyses for both research questions 2 and 5.

from 2016. High-poverty neighborhoods are defined as those with poverty rates that are more than double the average for their county.[21] The models estimate the relationship between each outcome measure and the following factors:

- Income inequality in the PHA's primary county (Gini Index for 2012–2016);
- Racial segregation in the PHA's primary county, using the Dissimilarity Index (2010);
- The poverty rate in the PHA's primary county (2012–2016);
- The fraction of PBV units in RAD properties in 2016 (MTW models only); and
- The fraction of PBV units in LIHTC properties in 2016 (MTW models only).

The models that include the comparison PHAs do not include the fraction of PBV units in LIHTC or RAD properties because we only calculated those measures for the MTW agencies.

We are also interested in understanding whether these factors affect PBV locations above and beyond any influence that they have on TBV locations and individual voucher holders' housing options. To this end, we estimate the models described above with a control variable that accounts for TBV locations. Specifically, in the model that examines the average (county-normalized) neighborhood poverty rate for PBVs, we add the ***(county-normalized) average neighborhood poverty rate for TBV-assisted households,*** and in the model that examines the share of PBVs in high-poverty neighborhoods, we add the ***share of TBV-assisted households in high-poverty neighborhoods.***

The estimates produced from these models are exploratory and noncausal. They attempt to uncover factors associated with differences between PHAs in PBV locations. Essentially, the models quantify the average differences in local factors between PHAs that have PBV units in lower-poverty neighborhoods (measured relative to the poverty levels in the areas they serve) and PHAs that have units in higher-poverty neighborhoods.

Research Question 6: What are the agencies' motivations for project-based voucher use?

To explore MTW agencies' motivations and goals for PBV use, we select three agencies known to have extensive or innovative PBV programs. The agencies selected are Boulder Housing Partners, the Cambridge Housing Authority, and the Seattle Housing Authority. These case studies are not exhaustive, but they identify common themes across a subset of agencies with substantial PBV use.

To understand the agencies' PBV efforts, we reviewed publicly available documents such as MTW annual reports and plans[22] and agency strategic or administrative plans. Each of the PHAs reviewed and verified PIC data summarizing their PBV use. We also conducted group phone interviews with three to four people in senior leadership roles at each agency who were knowledgeable about the origin and priorities of the agencies' PBV programs. These group phone interviews included executive directors, HCV program directors, asset management directors, or policy staff.

[21] The average poverty rate across counties in the sample is 16 percent, meaning the definition of high poverty on average is 32 percent. Ninety percent of PHAs are in counties with poverty rates between 10 and 27 percent—with the definition of high poverty thus falling between 20 and 46 percent, depending on the jurisdiction.

[22] MTW housing agency plans and reports are available on HUD's website. See "Moving to Work (MTW)–Participating Sites," HUD, https://www.hud.gov/program_offices/public_indian_housing/programs/ph/mtw/mtwagencies

In total, six interviews and follow-up calls were conducted with MTW agency staff in fall 2018. Interview topics focused on an overview of the agencies' PBV programs, agencies' motivations and goals for using PBVs, benefits and tradeoffs of PBV use, and how PBVs help meet MTW statutory objectives or other goals. We also discussed the specific MTW PBV flexibilities that were the most useful and local partnerships that involve PBVs. See appendix C for interview protocols. For the Cambridge Housing Authority, we also had access to information collected through interviews conducted for the companion study to this report focusing on the use of MTW fund flexibility (Levy, Long, and Edmonds, 2019). We supplemented these discussions with followup calls and emails, additional document review, and analysis of HUD administrative data for each agency.

Data

Across the six research questions, we use five HUD administrative data sources, MTW annual plans and reports, data describing ZIP Code and census tract characteristics from three public datasets, and qualitative and administrative data collected from the three MTW agencies. Exhibit 3.1 shows the data sources. Data sources and the methodology for constructing key measures and outcomes are described in detail in appendix A.

Exhibit 3.1 Data Sources Used for Each Research Question

Research Question	Data Sources	Year(s)	Measures
1. How extensively do MTW agencies use PBVs?	PIC, VMS, RAD Resource Desk, MTW Plans, and evaluation database	2016	Number and percent of MTW agencies with PBVs Number and percent of MTW-assisted households with PBVs Percent of MTW agency HCV budget authority devoted to PBVs Number of PBV activities requiring MTW PBV flexibilities Number of MTW activities that involve or impact PBVs Number and percent of agencies that use MTW flexibilities to exceed the PBV cap of 20 percent of HCV budget authority
2. What factors are associated with MTW and traditional agencies' use of PBV assistance?	PIC, ACS, AFFH, REAC, Zillow	Outcome Variables: 2016 Explanatory Variables: 2008–2016	Percent of PBV-assisted households (2009, 2016) Percent of households in public housing (2009) REAC Physical Inspection (PASS) scores (2008) Zillow Rent Index (ZRI) in 2016 Change in Zillow Rent Index (2011–2016) Region
3. To what extent are MTW agencies' PBVs located in RAD or LIHTC properties?	PIC, RAD Resource Desk, NHPD	2016	Number and share of PBV units converted from PH through RAD (includes unoccupied units) Number and share of each MTW agency's PBV-assisted households living in units converted from PH through RAD Number and share of each MTW agency's PBVs located in LIHTC properties

(continued)

Exhibit 3.1 Data Sources Used for Each Research Question *(continued)*

Research Question	Data Sources	Year(s)	Measures
4. Are MTW agency PBVs in lower-poverty, higher-quality neighborhoods? Do PBV locations vary by household race or ethnicity?	PIC, RAD Resource Desk, NHPD, ACS, AFFH	2009, 2016	County-normalized: -Neighborhood poverty rate -Labor force participation rate -Percent of adults with a bachelor's degree -Labor market engagement index -Environmental health index -School proficiency index -Low transportation cost index
5. What factors are associated with variations in PBV locations?	PIC, ACS, AFFH, REAC	Outcome Variables: 2016 Explanatory Variables: 2012–2016	County-normalized neighborhood poverty rate of PBV locations Share of PBVs in high-poverty neighborhoods (2.0 times the county average) Characteristics of PHA's primary county: -Income inequality -Racial segregation -County poverty rate Average neighborhood poverty rate for TBV households Percent of TBV households in high-poverty neighborhoods Share of PBV units in RAD properties Share of PBV units in LIHTC properties
6. What are the agencies' motivations for PBV use?	MTW Plans and annual reports, MTW evaluation database, Staff interviews, findings from research questions 1, 2, and 4.	Annual Plans: 2015 to 2019 Annual Reports: 2012 to 2018 MTW evaluation database: 2015 Interviews: 2018	Not applicable

ACS = American Community Survey. AFFH = Affirmatively Furthering Fair Housing. LIHTC = Low-Income Housing Tax Credit. MTW = Moving to Work. NHPD = National Housing Preservation Database. PASS = Physical Assessment Subsystem. PBV = project-based voucher. PH = public housing. PHA = public housing agency. PIC = PIH (Office of Public and Indian Housing) Information Center. RAD = Rental Assistance Demonstration. REAC = Real Estate Assessment Center. VMS = Voucher Management System.

4. Quantitative Results

This section presents findings for our five quantitative research questions. As has been noted elsewhere in the Moving to Work (MTW) evaluation (Levy, Long, and Edmonds, 2019; Galvez, Gourevitch, and Docter, forthcoming; Treskon, Gerken, and Galvez, forthcoming), MTW agencies are diverse—which is also evident in their project-based voucher (PBV) use. There is considerable variation across MTW agencies for every measure we examined. Considered together, however, our findings show that:

- MTW agencies are more likely to use PBVs than traditional agencies, but extensive PBV use is not the norm. Just nine MTW agencies' PBV use exceeded 20 percent of their housing choice voucher (HCV) budget authority in 2016.
- PBV use was associated with being in a higher-rent housing market. Across MTW agencies, PBV use increased more in the Northeast than in relatively more affordable regions of the South and Midwest. After controlling for geographic region and the rate at which rents were rising, a 10-percent difference in rent prices is associated with a 0.4-percentage-point difference in the share of households served with PBVs.
- PBV use increased more among agencies that had more distressed public housing. Between 2009 and 2016, public housing agencies (PHAs) with lower-quality public housing increased their use of PBVs more than agencies with higher-quality public housing. A statistical model of MTW and comparison PHAs shows that receiving five fewer points on a Physical Assessment Subsystem (PASS) score in 2008 is associated with having an additional 0.7 percent of households in PBV units, an 18-percent increase, 8 years later. This effect appears to be driven more by which agencies use PBVs at all than by the extent of PBV use. A model with only MTW agencies did not detect a statistically significant relationship. The small sample size, however, prevents us from ruling out the possibility that the same relationship between public housing quality and PBV use applies to MTW agencies.
- As of 2016, MTW agencies used Rental Assistance Demonstration (RAD) more frequently than the comparison traditional PHAs (39 percent of MTW agencies versus 12 percent of traditional PHAs) and were more likely to convert to PBVs versus project-based rental assistance (PBRA) (77 percent of MTW RAD conversions were to PBV versus 55 percent at traditional PHAs).
- There is a significant overlap between PBVs and Low-Income Housing Tax Credit (LIHTC) properties. More than one-fourth of MTW agencies' PBVs were in LIHTC properties in 2016. Very few of the PBVs in LIHTC properties are also RAD conversions (about 1 percent of all MTW PBVs).
- PBVs do not reach lower-poverty, opportunity-rich neighborhoods; there was no statistically significant difference in neighborhood poverty rates of PBV locations between MTW and comparison agencies. At both MTW and comparison agencies, PBV-assisted households live in higher-poverty neighborhoods than the typical tenant-based voucher (TBV) assisted household at the same PHA. The typical MTW PBV-assisted household lives in a neighborhood in which poverty is 85 percent higher than the average for the agency's county. At both MTW and comparison traditional agencies, PBV units are in census tracts with higher poverty rates than TBV units, with PBV neighborhoods more closely resembling

public housing locations. Using additional measures of neighborhood quality provides generally similar results, with two exceptions. MTW-assisted PBV households live in neighborhoods with better-than-average access to affordable transportation within their county and in neighborhoods with higher educational attainment than either TBV or public housing households. RAD was not associated with ***statistically significant differences in neighborhood quality for PBV units.***

- The concentration of PBV-assisted households in high-poverty neighborhoods is greater at PHAs that serve counties with greater racial segregation. This relationship holds after accounting for TBV locations, which implies that racial segregation has a greater influence on PBV locations than on TBV locations.
- As is the case with other types of housing assistance, White households receiving PBV assistance reach lower-poverty, higher-quality neighborhoods compared with Black or Hispanic/Latino families.

Research Question 1: How extensively do Moving to Work agencies use project-based vouchers?

MTW agencies are more likely to administer PBVs compared with traditional PHAs and, on average, dedicate a larger share of their housing assistance to PBVs (exhibit 4.1). Nearly all MTW PHAs reported at least one PBV-assisted household in the HUD PIH (Office of Public and Indian Housing) Information Center (PIC) data in 2016, versus 56 percent of the comparison traditional PHAs. MTW agencies served more than 41,000 PBV households that year, representing almost 1 in 10 MTW-assisted households. The comparison traditional agencies served slightly more than 105,000 PBV households that year, accounting for about 4 percent of their overall housing assistance.

Exhibit 4.1 Project-Based Voucher Use at Moving to Work and Comparison Traditional Public Housing Agencies

Measures	MTW Agencies	Comparison Traditional PHAs
Total PBV households (2016)	41,270	105,669
Percent of PBV assisted households (2016)	9.7%	4.0%
Percent of PHAs with any PBVs (2016)	92.1%	56.1%
Average budget authority to PBVs (January 2017)	13.1%	5.4%
Average number of activities using MTW PBV flexibilities (2015)	2	N/A
Average number of activities involving PBVs (2015)	3	N/A

MTW = Moving to Work. N/A = not applicable. PBV = project-based voucher. PHA = public housing agency.

Notes: We exclude Moderate Rehabilitation units. Comparison traditional PHAs served more than 750 total households in 2016. The average percent of budget authority devoted to PBVs includes agencies with zero budget authority devoted to PBVs.

Sources: 2016 HUD Office of Public and Indian Housing Information Center data; January 2017 Voucher Management System data; 2015 MTW Annual Plans

On average, the MTW agencies devoted 13 percent of their budget authority to PBVs, compared with 5 percent at comparison traditional PHAs. Nevertheless, most MTW agencies' PBV use falls below the 20-percent budget authority cap applied to traditional PHAs, and extensive use of PBVs among MTW agencies was rare. As of January 2017, only 9 of the 39 MTW agencies devoted more than 20 percent of their budget authority to PBVs.

Variation Across Moving to Work Agencies

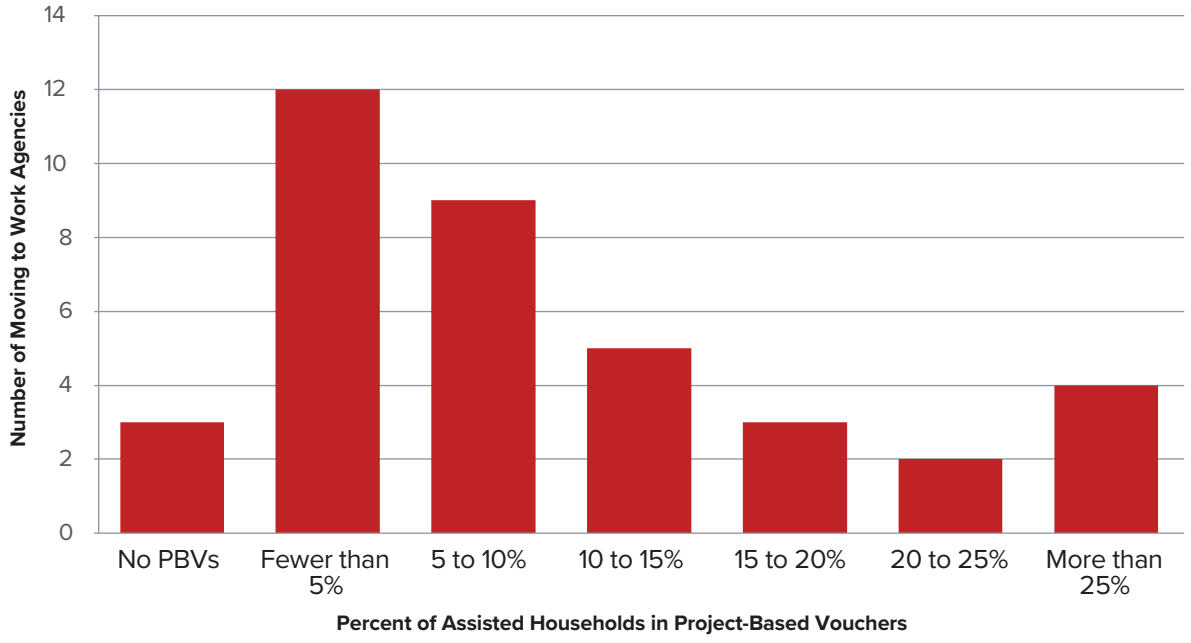
There is considerable variation in PBV use across MTW agencies. We summarize that variation here and provide results for individual MTW agencies in appendix B, exhibit B.1.

In 2016, 12 MTW agencies used PBVs relatively sparingly (fewer than 5 percent of their assisted households), and three MTW agencies had no PBV-assisted units (exhibit 4.2). At the other extreme, four MTW PHAs served more than one-fourth of their assisted households through PBVs. One of these agencies—Cambridge Housing Authority—provided over one-half of their housing assistance through PBVs in 2016. The MTW agencies with the next highest shares of PBV assistance were Keene Housing (48 percent of all assisted households), Boulder Housing Partners (32 percent), and the Atlanta Housing Authority (30 percent). These four agencies combined represent 9,554 units, or 23 percent, of all MTW PBVs.

The MTW agencies with larger shares of households assisted with PBVs also devoted greater shares of their HCV budget authority to PBVs. Cambridge Housing Authority devoted the largest share—two-thirds of its total HCV budget authority—to PBVs. Other MTW PHAs with high shares of budget authority in PBVs include Boulder Housing Partners (41 percent), Seattle Housing Authority (33 percent), and Charlotte Housing Authority (26 percent).

The number of MTW activities requiring MTW PBV flexibility or involving PBVs also varied across PHAs and was not a good indicator of the intensity of agencies' PBV use. As noted previously, agencies may consolidate multiple PBV-related activities or flexibilities into a single reported activity or report activities separately. Some PHAs, such as the Atlanta, Oakland, and Baltimore housing agencies, reported five or more activities in 2015, while others—such as Boulder Housing Partners—had just one or two activities despite having relatively robust PBV portfolios. The four MTW agencies (Atlanta, Oakland, Baltimore City, and County of San Mateo) with relatively large numbers of activities requiring PBV flexibility (between 4 and 12) and related to PBVs generally (between 6 and 12) had PBV assistance ranging from less than 1 percent to 30 percent of their overall household counts.

Exhibit 4.2 Moving to Work Agencies' Project-Based Vouchers as Percent of Assisted Households, 2016



MTW = Moving to Work. PHA = public housing agency.

Notes: Sample excludes Moderate Rehabilitation and includes only project-based vouchers. The Housing Authority of the County of Santa Clara and the Housing Authority of the City of San Jose jointly report data into the HUD Office of Public and Indian Housing Information Center (for a total of 38 MTW observations).

Source: Urban Institute analysis of HUD Office of Public and Indian Housing Information Center data, 2016

Research Question 2: What factors are associated with Moving to Work and traditional agencies' use of project-based voucher assistance?

MTW agencies' use of PBVs grew substantially between 2009 and 2016, from approximately 3 percent of their total assisted households to 11 percent (see exhibit 4.3).[23] During this time, 10 additional MTW agencies began offering PBV units. Among the comparison traditional PHAs, the increase in PBV use was more modest: from about 1 percent of all assisted households in 2009 to approximately 4 percent in 2016.

A statistical model of PBV use clarifies which factors are associated with the growth in PBV use across agencies. The model predicts PBV use in 2016 using the agency's region, the quality and size of the agency's public housing stock in 2008 and 2009, the extent of PBV use in 2009, the level of rents in the agency's service area in 2016, and the growth of rents between 2011 and 2016.

[23] We use a different calculation of total PBV use for the regression analysis compared with the descriptive assessment of MTW agencies' PBV use in research question 1, resulting in a slightly different share of PBV use. For the regression analyses we calculate an average of the percent PBV use at each MTW PHA. That is, the average of each PHA's share of households served by PBVs.

Exhibit 4.3 Summary Statistics for Moving to Work and Comparison Traditional Public Housing Agencies

	Mean	Min	Max	Standard Deviation	Number of PHAs
			MTW Agencies		
Percent PBVs in 2016	10.9%	0.0%	50.2%	12%	38
Percent PBVs in 2009	2.8%	0.0%	20.6%	5%	38
Percent in Public Housing in 2009	25.9%	0.0%	53.0%	13%	38
Physical Inspection (PASS) Score in 2008	24	14	30	3.8	37
Rent Index in 2016	$1,805	$860	$4,443	$786	36
5-Year Change in Rent Index	19.7%	-8.3%	63.4%	14%	35
Northeast	18.4%	0	1	39%	38
South	28.9%	0	1	45%	38
Midwest	15.8%	0	1	36%	38
West	36.8%	0	1	48%	38
			Comparison Traditional PHAs		
Percent PBVs in 2016	3.9%	0.0%	58.9%[24]	7%	765
Percent PBVs in 2009	0.9%	0.0%	20.6%	3%	751
Percent in Public Housing in 2009	25.1%	0.0%	100.0%	22%	751
Physical Inspection (PASS) Score in 2008	24	11	30	3.5	646
Rent Index	$1,463	$605	$4,616	$601	638
5-Year Change in Rent Index	13.3%	-29.8%	63.4%	13%	588
Northeast	22.1%	0	1	42%	751
South	37.2%	0	1	48%	751
Midwest	19.7%	0	1	40%	751
West	19.7%	0	1	40%	751

MTW = Moving to Work. PASS = Physical Assessment Subsystem. PBV = project-based voucher. PHA = public housing agency.

Notes: The number of PHAs included varies based on data availability. Comparison PHAs are those that assisted at least 750 households in 2016. PASS scores are unavailable for the Massachusetts Department of Housing and Community Development in 2008. Zillow Rent Index data are unavailable for the state of Alaska (Alaska Housing Finance Corporation) and Holyoke, Massachusetts (Holyoke Housing Authority) in 2016 and for Champaign, Illinois (Housing Authority of Champaign County) in 2011. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara are reported jointly in the HUD Office of Public and Indian Housing Information Center (PIC) data and listed here as a single PHA.

Sources: Authors' calculations based on PIC, Real Estate Assessment Center, and Zillow data

Using a sample of both MTW and comparison traditional PHAs (exhibit 4.4, column 1), we find that PHAs with more distressed public housing in 2009 used more PBVs in 2016. The model shows that receiving five fewer points on a PASS score in 2008 is associated with having an additional 0.7 percent of households in PBV units 8 years later. While that is a small percentage of total assisted households, considering that the average large PHA (MTW or traditional) relied on PBVs to support only 4 percent of households, it represents a nearly 18 percent increase in PBV units.

[24] The traditional PHA that had 58.9 percent PBVs in 2016 was a small PHA that had converted two public housing developments to PBVs through RAD. Under most other circumstances traditional PHAs could not have more the 20 percent of their voucher funding in PBVs at that time.

Exhibit 4.4 Model Results: Factors Related to the Percent of Assisted Households Assisted by Project-Based Vouchers in 2016

	MTW and Comparison Traditional PHAs	MTW PHAs
Percent Public Housing (2009)	-0.011	-0.019
	(0.018)	(0.232)
REAC PASS Score (2008)	-0.002*	0.000
	(0.001)	(0.006)
Rent Index (2016)	0.040***	0.093
	(0.013)	(0.091)
Change in Rents (2011 to 2016)	-0.036	-0.264
	(0.028)	(0.206)
South	-0.009	-0.169*
	(0.010)	(0.093)
Midwest	-0.008	-0.173*
	(0.010)	(0.100)
West	-0.000	-0.131
	(0.011)	(0.113)
Percent of Households in PBVs in 2009	1.181***	1.019***
	(0.143)	(0.365)
Constant	-0.027	0.001
	(0.033)	(0.300)
Observations	446	34

* p<0.10, ** p<0.05, *** p<0.01.

HH = households. MTW = Moving to Work. PASS = Physical Assessment Subsystem. PBV = project-based voucher. PHA = public housing agency. REAC = Real Estate Assessment Center.

Notes: Samples include MTW PHAs and traditional PHAs with at least 750 households in 2016 and for whom both REAC and Zillow data were available. For MTW PHAs, this excludes Alaska Housing Finance Corporation; Massachusetts Department of Housing and Community Development; Holyoke Housing Authority; and Housing Authority of Champaign County. Standard errors are heteroskedastic robust and displayed in parentheses. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in the HUD Office of Public and Indian Housing Information Center data are reported jointly and listed here as a single PHA.

Using the sample of MTW and comparison PHAs, the model shows that PHAs in higher-rent areas use PBVs more extensively. Even after controlling for geographic region and the rate at which rents are rising, we find that a 10-percent difference in the price of rent is associated with a 0.4-percentage-point difference in the share of households served with PBVs.

The model does not identify a relationship between the percent of assisted households in public housing in 2009 and the percent in PBVs in 2016 or any regional differences in the expansion of PBV use between 2009 and 2016.

The model lacks precision when it uses the smaller sample of only MTW agencies (exhibit 4.4, column 2). It is unable to determine whether the estimated relationships between PBV use and public housing quality and the cost of rent are applicable to MTW agencies specifically. Yet, the model shows that among MTW agencies, PBVs are used more extensively in the Northeast than in the South or the Midwest, with smaller differences between the Northeast and the West.

Additional models appear in appendix B (exhibit B.2). We examine separately how the factors listed in exhibit 4.4 affect whether agencies use PBVs at all and the share of

PBV-assisted households. Using the sample of MTW and comparison PHAs, we find that PHAs in areas with higher rents are more likely to use PBVs and to use them more extensively. PHAs that had a greater share of households in public housing in the past (2009) were less likely to have any PBVs in 2016, but agencies with lower PASS scores in the past (2008) were more likely to have PBVs in 2016. Neither factor (the share of public housing assistance and PASS scores) strongly predicted the share of households assisted with PBVs in 2016 among agencies with PBVs. These results suggest that distressed public housing is affecting which PHAs use PBVs, but not the extent to which they use them.

Research Question 3: To what extent are Moving to Work agencies' project-based vouchers located in Rental Assistance Demonstration or Low-Income Housing Tax Credit properties?

MTW agencies frequently use RAD, and there is considerable overlap between MTW agencies' PBVs and LIHTC properties (exhibits 4.5 and 4.6). In 2016, almost 40 percent of all MTW occupied PBVs, representing 16,331 households, were former public housing units converted through RAD and/or located at LIHTC properties (exhibit 4.6). The remaining 60 percent of PBVs (24,939 households) were not associated with RAD or LIHTC properties.

Rental Assistance Demonstration Use at Moving to Work Agencies

Exhibit 4.5 summarizes MTW agencies' RAD use compared with that of similarly large traditional PHAs. Fifteen of the MTW agencies (39 percent) converted 11,272 public housing units through RAD by the end of 2016, compared with 32,996 units converted by 97 of the traditional PHAs (12 percent of 788 PHAs). In total, MTW RAD conversions represented over one-fourth of all RAD conversions among our sample of PHAs.

The MTW agencies were more likely than the traditional PHAs to convert units to PBVs than to PBRA. MTW agencies converted about 77 percent of their RAD units to PBVs, whereas traditional agencies converted 55 percent of their RAD units to PBVs. The average number of units per RAD property converted to PBVs was similar for MTW agencies and comparison traditional PHAs (105 units on average versus 107).

Differences in RAD use remain if conversions that are still in progress as of March 2018 are included in the analysis: 22 of the 39 MTW agencies (about 56 percent) had RAD projects in progress or completed as of March 2018, compared with 183 of the 788 traditional PHAs (23 percent).

Among the 15 MTW agencies with RAD conversions in 2016:

- Eleven reported PBV-assisted households in PIC who were living in former public housing converted through RAD. The share of these agencies' PBV-assisted households that were living in RAD conversions varied from 12 percent (Tacoma Housing Authority) to 98 percent (Lexington-Fayette Urban County Housing Authority).
- Three agencies—Atlanta Housing Authority, Holyoke Housing Authority, and Philadelphia Housing Authority—had RAD-converted PBV units by the end of 2016 but did not report PBV-assisted households living in those units in that year. RAD units are not occupied immediately after closing, and RAD-converted units at these three PHAs may have been unoccupied for these reasons, or there may have been lags in reporting newly occupied units into PIC.

- One PHA—the Housing Authority of Baltimore City—converted public housing properties exclusively to PBRAs instead of PBVs by the end of 2016 (2,553 units).

In total, in 2016, about 14 percent of all MTW PBV-assisted households reported in PIC were living in public housing converted through RAD (about 5,700 MTW PBV-assisted households).[25]

Exhibit 4.5 presents MTW and traditional agencies' RAD properties that had completed the RAD process by the end of 2016.

Exhibit 4.5 Rental Assistance Demonstration Use at Moving to Work and Comparison Traditional Public Housing Agencies, 2016

	MTW Agencies N=15			Comparison Traditional PHAs N=97		
	Total RAD	RAD PBV	RAD PBRA	Total RAD	RAD PBV	RAD PBRA
Number of RAD Properties	97	83	13	302	170	132
# Units Converted to RAD	11,272	8,719	2,553	32,996	18,215	14,781
% Converted RAD Units	100%	77.4%	22.6%	100%	55.2%	44.8%
Average Units per RAD Property	117	105	196	109	107	112
% PHAs Participating in RAD	38.5%	35.9%	2.6%	12.3%	7.6%	5.5%

MTW = Moving to Work. PBRA = project-based rental assistance. PBV = project-based voucher. PHA = public housing agency. RAD = Rental Assistance Demonstration.

Notes: Comparison traditional PHAs are those that serve more than 750 total households in 2016. Includes conversions closed by December 2016. Shares of PHAs participating in RAD are out of 39 MTW PHAs and 788 comparison traditional PHAs.

Source: RAD First Component data downloaded from the RAD Resource Desk (https://www.RADresource.net) in March 2018

Moving to Work Project-Based Vouchers in Low-Income Housing Tax Credit Properties

Exhibit 4.6 presents the relationships between PBVs, RAD, and LIHTC properties. More than one-fourth of all MTW agencies' PBVs (about 27 percent, or 10,984 households) were in LIHTC properties in 2016, using addresses within 200 feet of a LIHTC property address as a proxy for co-location. The share was substantially smaller for TBVs: about 8 percent of MTW TBVs, or 21,334 households, were in LIHTC properties.

A small number of the MTW agency PBVs (387 of all PBVs, or about 1 percent) were RAD-converted public housing units located in LIHTC properties. Some anecdotal evidence suggests the RAD process can be difficult to coordinate with LIHTC, which may explain the low RAD/LIHTC overlap in the relatively early years of the RAD program.[26]

[25] A small number of MTW RAD units were identified in PIC data as TBVs, likely due to PIC data entry or reporting errors. We omit these units from our analyses.

[26] See for example, *Lessons from RAD* https://www.huduser.gov/portal/pdredge/pdr-edge-featd-article-010818.html.

Exhibit 4.6 Moving to Work Project-Based and Tenant-Based Vouchers in Rental Assistance Demonstration and Low-Income Housing Tax Credit Properties, 2016

	MTW PBVs		MTW TBVs	
	Count	Percent	Count	Percent
Not RAD or in LIHTC property	24,939	60.4%	252,723	92.1%
RAD only	5,347	13.0%	n/a	n/a
In LIHTC property only	10,597	25.7%	21,324	7.8%
RAD and in LIHTC property	387	0.9%	10	0.004%
RAD and/or in LIHTC property	16,331	39.6%	21,716	7.9%
Total	41,270	100%	274,439	100%

LIHTC = Low-Income Housing Tax Credit. MTW = Moving to Work. PBV = project-based voucher. RAD = Rental Assistance Demonstration. TBV = tenant-based voucher.

Notes: Includes RAD conversions that closed by December 2016 and LIHTC properties active as of 2015.

Sources: 2016 HUD Office of Public and Indian Housing Information Center data; RAD Resource Desk; National Housing Preservation Database address data

Variation Across Moving to Work Agencies

RAD use and the extent of overlap between the PBV and RAD or LIHTC programs varied considerably across MTW agencies for every measure calculated. Exhibits B.1 and B.3 in appendix B provide agency-level results. Examples of variation across agencies include the following:

- Among the MTW agencies with closed RAD PBV units by the end of 2016, the total number of units ranged from 88 (Holyoke Housing Authority) to 2,083 (Chicago Housing Authority).
- Twenty-four of the 35 MTW agencies with any PBV-assisted households reported in 2016 had PBVs located in LIHTC properties. The overlap ranged from 3 percent of their PBV-assisted households (Housing Authority of the City of Reno) to 65 percent (San Diego Housing Commission). All MTW agencies had at least some TBVs located in LIHTC units, ranging from about 0.3 percent of all TBV units (Housing Authority of Champaign County) to slightly more than one-fourth (Seattle Housing Authority).

Research Question 4: Are Moving to Work agency project-based vouchers in lower-poverty, higher-quality neighborhoods? Do project-based voucher locations vary by household race or ethnicity?

We calculate county-normalized measures of neighborhood quality to describe the neighborhoods accessed by assisted households. First, within MTW agencies, we compare the neighborhoods of households assisted with PBVs to the neighborhoods of households with TBVs and those of households in public housing. Second, we compare the neighborhoods of MTW PBV households to the neighborhoods of PBV households at traditional PHAs. Third, we describe and examine the neighborhoods accessed by Black (non-Hispanic), Hispanic/Latino, and White (non-Hispanic/Latino) households. Normalized measures allow us to compare locations while accounting for differences in local contexts.

Project-Based Voucher Neighborhoods at Moving to Work Agencies

PBV neighborhood poverty rates relative to that of their county average are presented in exhibit 4.7.

MTW agency PBV-assisted households lived in neighborhoods with poverty rates nearly twice that of their county average in 2016. Relative to the average neighborhood in the county, the PBV neighborhoods also had lower levels of educational attainment, lower labor market engagement, lower environmental quality (more potential exposure to environmental toxins), and lower-performing schools. The fraction of the population with a bachelor's degree in PBV neighborhoods is 17 percent lower than the county average, while labor force participation is only 4 percent lower than the county average.

PBV-assisted households, however, tend to live in neighborhoods with lower transportation costs (better access to public transit)—which is consistent with being in central-city neighborhoods versus suburban or exurban locations.

As is typically the case with MTW agencies, there is significant variation in outcomes across PHAs. Exhibit B.5 displays the average county-normalized neighborhood poverty measures for the 35 MTW PHAs that provided any PBVs in 2016, as per PIC data. Neighborhood poverty rates for PBVs ranged from 1.09 times the county average for the Tulare County Housing Authority to 2.95 times the county average for the Tacoma Housing Authority. Meaning that PBVs served by the Tulare County Housing Authority are in neighborhoods that are fairly similar to the typical county census tract, while Tacoma Housing Authority PBVs are in neighborhoods with poverty rates 2.95 times the average in Pierce County, Washington.

To provide greater local context, we compare MTW PBV locations in 2016 with those of households assisted through TBV or public housing at the same PHA. Differences in neighborhood measures between PBV and TBV and between PBV and public housing appear in exhibit 4.7, with p-values in parentheses.

Exhibit 4.7 County-Normalized Measures of Neighborhood Quality for Assisted Households at Moving to Work Agencies by Program, Averages and Differences, 2016

	MTW PHAs with PBVs and TBVs			MTW PHAs with PBVs and PH		
	Means		Differences (p-value)	Means		Differences (p-value)
	PBV	TBV	PBV-TBV	PBV	PH	PBV-PH
Poverty Rate	1.85	1.58	0.27***	1.87	2.03	-0.16
			(0.001)			(0.124)
Percent with Bachelor's Degree	0.83	0.74	0.10**	0.82	0.71	0.11
			(0.029)			(0.064)
Labor Force Participation	0.96	0.97	-0.02	0.96	0.94	0.01
			(0.123)			(0.334)
Labor Market Engagement Index	0.67	0.69	-0.01	0.66	0.60	0.05
			(0.729)			(0.202)

(continued)

Exhibit 4.7 County-Normalized Measures of Neighborhood Quality for Assisted Households at Moving to Work Agencies by Program, Averages and Differences, 2016 *(continued)*

	MTW PHAs with PBVs and TBVs			MTW PHAs with PBVs and PH		
	Means		Differences (p-value)	Means		Differences (p-value)
	PBV	TBV	PBV-TBV	PBV	PH	PBV-PH
Environmental Health index	0.61	0.77	-0.15***	0.60	0.64	-0.05
			(0)			(0.383)
School Proficiency Index	0.71	0.67	0.03	0.69	0.66	0.03
			(0.232)			(0.416)
Transportation Cost Index	1.24	1.14	0.10***	1.23	1.22	0.02
			(0.001)			(0.58)
Agencies	35			32		

* p<0.10, ** p<0.05, *** p<0.01.

MTW = Moving to Work. PBV = project-based voucher. TBV = tenant-based voucher.

Notes: All statistics are normalized to the county mean. Raw values for the labor market engagement index, environmental health index, and transportation cost index are national percentile ranks with higher values signifying better outcomes. School proficiency index is percentile ranked at the state level. This exhibit excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any PBV units. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in the HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single public housing agency.

At MTW agencies, PBVs are in neighborhoods with higher poverty rates than TBVs. The difference in county-normalized poverty rates is 27 percent of the regional average. For example, for MTW agencies in metropolitan areas with an average poverty rate of 14 percent, this translates into an average PBV neighborhood poverty rate of about 26 percent and an average TBV neighborhood poverty rate of about 22 percent. This difference is statistically significant (p=0.001).

MTW agencies' PBVs are in neighborhoods with similar poverty rates as public housing neighborhoods. Public housing neighborhoods have higher poverty rates than PBV neighborhoods (an average of 2.0 times the county average compared with 1.85 for PBVs). The difference is not statistically significant, however.

Compared with both TBV and public housing households, PBV households at MTW agencies live in neighborhoods with higher educational attainment. The average MTW PBV household lives in a neighborhood in which the share of adults with a bachelor's degree is 17 percent below the county average. Yet, the typical MTW household assisted with TBVs is in a neighborhood in which the share of adults with a bachelor's degree is 26 percent below the county average, and the typical MTW household in public housing lives in a neighborhood in which the share of adults with a bachelor's degree is 29 percent below the county average (exhibit 4.7).

Compared with TBV households, PBV households live in neighborhoods with lower transportation costs. Transportation costs were measured using HUD's AFFH data. Lower transportation costs were expected because census-tract poverty rates and the transportation cost index are inversely correlated.

Moving to Work Project-Based Voucher Locations Compared With Traditional Public Housing Agencies' Project-Based Voucher Locations

Differences in PBV locations between MTW agencies and comparison PHAs are presented in exhibit 4.8.

Both MTW and comparison traditional PHAs' PBVs are in neighborhoods with higher poverty relative to the average for their counties. PBV households at the typical comparison PHA live in neighborhoods that have poverty rates 67 percent higher than the county average. This is somewhat lower than the average normalized poverty rate for MTW-assisted PBVs (85 percent higher than the county average), but the difference is not statistically significant (p=0.175).

Exhibit 4.8 County-Normalized Measures of Neighborhood Quality for Project-Based Vouchers at Moving to Work and Traditional Public Housing Agencies, 2016

	Means		Difference (p-value)
	MTW PBV	Traditional PBV	MTW PBV - Traditional PBV
Poverty Rate	1.85	1.67	0.17
			(0.175)
Percent with Bachelor's Degree	0.83	0.74	0.05
			(0.424)
Labor Force Participation	0.96	0.97	0.00
			(0.855)
Labor Market Engagement Index	0.67	0.69	-0.02
			(0.768)
Environmental Health Index	0.61	0.77	-0.16***
			(0.003)
School Proficiency Index	0.71	0.67	-0.01
			(0.856)
Transportation Cost Index	1.24	1.14	-0.03
			(0.604)

* p<0.10, ** p<0.05, *** p<0.01.

MTW = Moving to Work. PBV = project-based voucher.

Notes: All statistics are normalized to the county mean. Raw values for the labor market engagement index, environmental health index, and transportation cost index are national percentile ranks with higher values signifying better outcomes. School proficiency index is percentile ranked at the state level. This exhibit excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any PBV units. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single public housing agency.

After accounting for regional differences, MTW PBVs are in neighborhoods with poorer air quality than PBVs at traditional PHAs. At both MTW and traditional agencies, PBVs are in neighborhoods that score lower on the Environmental Health Index than the county average. The index ranks census tracts based on potential exposure to harmful toxins as measured in the 2005 National Air Toxins Assessment. At comparison agencies, the typical PBV household lives in a neighborhood that ranks 23 percent lower than the county as

a whole. At MTW agencies, this difference is 39 percent. The gap in normalized measures of environmental health between MTW and comparison agencies is statistically significant (exhibit 4.8).

At both MTW and comparison PHAs, the average PBV-assisted household lives in a neighborhood with a higher poverty rate than TBV-assisted households and a lower poverty rate than public housing residents. We compare the differences between PBV neighborhoods and TBV and public housing neighborhoods at MTW agencies (shown in exhibit 4.8) with the same differences at traditional PHAs. Along most measures, there is no statistically significant difference between MTW and comparison agencies at even the 10-percent level (appendix exhibit B.6). The one exception is that the gap in air quality between PBV and TBV neighborhoods—with PBV households in neighborhoods with worse air quality—is greater at MTW agencies.

Project-Based Voucher Location Patterns by Race and Ethnicity

Differences in PBV locations by race/ethnicity and assisted housing program are in exhibit 4.9.

White families reach lower-poverty, higher-quality neighborhoods than Black or Hispanic/Latino families, across PBVs and other types of housing assistance. Across all assistance types, households headed by a non-Hispanic White person tend to live in census tracts with lower poverty and higher education attainment than households headed by people who identify as Hispanic/Latino or as non-Hispanic Black or African-American (exhibit 4.9). PBV-assisted households live in neighborhoods with worse air quality than TBV households of the same race and ethnicity, but in areas with higher education attainment and better access to transportation than TBV households of the same ethnicity (exhibit 4.9).

Exhibit 4.9 County-Normalized Measures of Neighborhood Quality for Assisted Households at Moving to Work Agencies by Program and Race/Ethnicity, 2016

	Means			Differences (p-value)	Number of PHAs	Differences (p-value)	Number of PHAs
	PBV	TBV	PH	PBV – TBV		PBV – PH	
Poverty Rate							
Black (non-Hispanic)	1.88	1.61	2.10	0.27***	35	-0.18	31
				(0.002)		(0.136)	
Hispanic/Latino	1.81	1.53	1.97	0.29***	34	-0.16	31
				(0.007)		(0.241)	
White (non-Hispanic)	1.70	1.43	1.80	0.27***	33	-0.08	30
				(0.004)		(0.494)	
Percent with Bachelor's Degree							
Black (non-Hispanic)	0.84	0.73	0.69	0.11**	35	0.13**	31
				(0.011)		(0.027)	
Hispanic/Latino	0.84	0.73	0.76	0.11**	34	0.07	31
				(0.038)		(0.272)	
White (non-Hispanic)	1.01	0.88	0.86	0.14**	33	0.15*	30
				(0.045)		(0.083)	

(continued)

Exhibit 4.9 County-Normalized Measures of Neighborhood Quality for Assisted Households at Moving to Work Agencies by Program and Race/Ethnicity, 2016 *(continued)*

	Means			Differences (p-value)	Number of PHAs	Differences (p-value)	Number of PHAs
	PBV	TBV	PH	PBV – TBV		PBV – PH	
Environmental Health Index							
Black (non-Hispanic)	0.60	0.76	0.65	-0.16***	33	-0.07	28
				(0.001)		(0.249)	
Hispanic/Latino	0.60	0.74	0.63	-0.14***	34	-0.05	30
				(0.001)		(0.395)	
White (non-Hispanic)	0.57	0.75	0.63	-0.18***	31	-0.08	27
				(0.000)		(0.252)	
Transportation Cost Index							
Black (non-Hispanic)	1.26	1.14	1.22	0.12***	35	0.04	31
				(0.001)		(0.283)	
Hispanic/Latino	1.24	1.14	1.24	0.10***	34	-0.01	31
				(0.004)		(0.823)	
White (non-Hispanic)	1.25	1.17	1.24	0.08***	33	0.01	30
				(0.003)		(0.771)	

* p<0.10, ** p<0.05, *** p<0.01.

MTW = Moving to Work. PBV = project-based voucher. PH = public housing. PHA = public housing agency. TBV = tenant-based voucher.

Notes: All statistics are normalized to the county mean. Raw values for the environmental health index and transportation cost index are national percentile ranks with higher values signifying better outcomes. School proficiency index is percentile ranked at the state level. Additional measures appear in appendix exhibit B.7. This exhibit excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any PBV units. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single PHA.

The Relationship Between Rental Assistance Demonstration, Low-Income Housing Tax Credit, and Project-Based Voucher Locations

Exhibit 4.10 summarizes county-normalized neighborhood quality measures for PBV households in properties financed by RAD and LIHTC for MTW PHAs that have households both in RAD and non-RAD PBV units, or PBVs in both LIHTC and non-LIHTC properties.

Among MTW agencies with RAD conversions, we found no statistically significant differences in neighborhood quality measures between RAD and non-RAD PBV units. MTW households in RAD and LIHTC-financed PBV properties live in similar neighborhoods to households in other PBV properties. Among the MTW agencies with LIHTC-financed PBV properties, only two measures showed statistically significant differences: households in LIHTC-financed PBV properties live in neighborhoods with somewhat better access to transportation and somewhat worse air quality. Otherwise, PBVs in LIHTC-financed properties were in similar neighborhoods as other PBV households with regards to poverty, educational attainment, labor force participation, and school proficiency.

We also examined differences between MTW PBV, TBV, and public housing neighborhoods, with RAD and LIHTC units removed from the analyses, to determine if the RAD or LIHTC units were driving location outcomes.

We found few notable differences within MTW agencies or between MTW and comparison agencies when these units were removed. PBV-assisted households live in higher-poverty neighborhoods than TBV-assisted households and in lower-poverty neighborhoods than public housing residents.

The difference in normalized average neighborhood poverty rates between PBVs and public housing is slightly larger when LIHTC and RAD units are excluded, however, and statistically significant at the 5-percent level.

Exhibit 4.10 County-Normalized Measures of Neighborhood Quality for Project-Based Vouchers at Moving to Work Agencies in Rental Assistance Demonstration and Low-Income Housing Tax Credit Properties, 2016

	Means					Differences (p-value)	
	All PBV	RAD PBV	Non-RAD PBV	LIHTC PBV	Non-LIHTC PBV	RAD – non-RAD	LIHTC – non-LIHTC
Poverty Rate	1.85	1.79	1.88	1.80	1.81	-0.08	-0.01
						(0.707)	(0.926)
Percent with Bachelor's Degree	0.83	1.02	0.85	0.86	0.84	0.17	0.02
						(0.281)	(0.704)
Labor Force Participation	0.96	0.98	0.95	0.95	0.96	0.03	0.00
						(0.431)	(0.756)
Labor Market Engagement Index	0.67	0.83	0.68	0.67	0.74	0.15	-0.07
						(0.215)	(0.138)
Environmental Health Index	0.61	0.57	0.65	0.60	0.68	-0.08	-0.08**
						(0.275)	(0.015)
School Proficiency Index	0.71	0.61	0.74	0.67	0.72	-0.13	-0.06
						(0.314)	(0.136)
Transportation Cost Index	1.24	1.31	1.23	1.23	1.16	0.08	0.07**
						(0.187)	(0.018)
Observations	35	10		24		10	24

* p<0.10, ** p<0.05, *** p<0.01.

LIHTC = Low-Income Housing Tax Credit. MTW = Moving to Work. PBV = project-based voucher. RAD = Rental Assistance Demonstration.

Notes: All statistics are normalized to the county mean. Raw values for the labor market engagement index, environmental health index, and transportation cost index are national percentile ranks with higher values signifying better outcomes. School proficiency index is percentile ranked at the state level. This exhibit excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any PBV units. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single public housing agency. Observations are limited to agencies with LIHTC or RAD and PBV units.

Research Question 5: What factors are associated with variations in Moving to Work project-based voucher locations?

We use statistical models to estimate the relationship between local factors and PBV locations. The models estimate the relationship between income inequality, racial segregation, and poverty rates in the PHA's primary county and (1) county-normalized average poverty rate of the PBV-assisted households' or (2) the share of PBV households that live in high-poverty neighborhoods. For MTW agencies, the models also account for any relationship between PBVs, RAD, and LIHTCs.

In more racially segregated counties, PBV households live in higher-poverty neighborhoods. There is a positive relationship between racial segregation in the PHA's county and both (1) PBV-assisted households' average county-normalized poverty rate and (2) the share of PBV-assisted households that live in high-poverty neighborhoods (exhibit 4.11, columns 1 and 3). On average, a 10-point difference in the dissimilarity index corresponds to 8.6 percent more PBV households living in high-poverty neighborhoods (exhibit 4.11, column 3).

Adding the measure of TBV neighborhood poverty to the model estimates the extent to which racial segregation in the county might correspond to PBV locations differently than TBV locations. The relationship between racial segregation and the share of PBV households remains positive and significant (p=0.01) after accounting for the share of TBV households in high poverty neighborhoods (exhibit 4.11, column 4). This implies that PBV household locations in highly racially segregated counties are more sensitive to segregation patterns than are TBV locations at the same PHA. The models do not have enough precision to determine whether these relationships hold using the smaller sample of only MTW agencies (exhibit 4.12).

Exhibit 4.11 Model Results: Factors Related to Neighborhood Poverty of Project-Based Vouchers at Moving to Work and Traditional Public Housing Agencies

	Average County-Normalized Neighborhood Poverty Rate of PBV Locations		Percent of PBVs in High-Poverty Neighborhoods	
	(1)	(2)	(3)	(4)
Income Inequality	-1.853	-1.392	-0.865	-0.430
	(1.432)	(1.133)	(0.659)	(0.584)
Racial Segregation (Dissimilarity Index)	1.457***	0.342	0.856***	0.360***
	(0.290)	(0.223)	(0.130)	(0.114)
County Poverty Rate	-3.894***	0.138	-2.320***	-0.700**
	(0.674)	(0.554)	(0.310)	(0.312)
Average Neighborhood Poverty Rate of TBV Households		1.131***		
		(0.079)		
Percent of TBV Households in High-Poverty Neighborhoods				0.942***
				(0.077)

(continued)

Exhibit 4.11 Model Results: Factors Related to Neighborhood Poverty of Project-Based Vouchers at Moving to Work and Traditional Public Housing Agencies *(continued)*

	Average County-Normalized Neighborhood Poverty Rate of PBV Locations		Percent of PBVs in High-Poverty Neighborhoods	
	(1)	(2)	(3)	(4)
Constant	2.544***	0.438	0.729***	0.252
	(0.584)	(0.454)	(0.268)	(0.238)
Observations	446	446	446	446

* p<0.10, ** p<0.05, *** p<0.01.

PBV = project-based voucher. TBV = tenant-based voucher.

Notes: Average neighborhood poverty is the average county-adjusted poverty rate of the census tracts of PBV households. High poverty neighborhoods are census tracts with poverty rates of at least 2.0 times the county average. Samples include public housing agencies (PHAs) with PBV units and at least 750 households in 2016 and for whom both American Community Survey and Affirmatively Furthering Fair Housing data were available. For Moving to Work PHAs, this excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any PBV units. Standard errors, displayed in parentheses, are heteroskedastic robust. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in HUD Office of Public and Indian Housing Information Center data are reported jointly and listed here as a single PHA.

PBV locations tend to mirror TBV locations. PBV-assisted households were more likely to live in high-poverty neighborhoods at PHAs with more TBV households living in high-poverty neighborhoods (exhibits 4.11 and 4.12). The estimated relationship between PBV and TBV location outcomes is close to one in all four versions of the model (columns 2 and 4 of exhibit 4.11 and columns 2 and 4 of exhibit 4.12). This implies that differences between PBV and TBV neighborhoods are generally consistent across PHAs. Additionally, the estimated relationships between poverty and racial segregation at the county level and PBV neighborhood poverty are closer to zero in the model that accounts for TBV locations. This implies that these factors are associated with both PBV and TBV locations.

Exhibit 4.12 Model Results: Factors Related to Neighborhood Poverty of Project-Based Vouchers at Moving to Work Agencies

	Average County-Normalized Neighborhood Poverty Rate of PBV Locations		Percent of PBVs in High-Poverty Neighborhoods	
	(1)	(2)	(3)	(4)
Income Inequality	-2.515	-1.433	-1.296	-0.842
	(3.810)	(3.677)	(2.014)	(1.950)
Racial Segregation (Dissimilarity Index)	0.517	-0.895	0.451	-0.432
	(0.719)	(0.801)	(0.511)	(0.547)
County Poverty Rate	-2.203	1.757	-1.657*	0.787
	(1.821)	(2.006)	(0.925)	(1.176)
Fraction of PBV Units in RAD Properties	0.266	0.233	-0.045	-0.134
	(0.346)	(0.335)	(0.206)	(0.196)
Fraction of PBV Units in LIHTC Properties	0.619	0.562	0.249	0.230
	(0.455)	(0.412)	(0.307)	(0.259)
Percent of TBV Households in High-Poverty Neighborhoods		0.966***		1.118***
		(0.235)		(0.280)

(continued)

Exhibit 4.12 Model Results: Factors Related to Neighborhood Poverty of Project-Based Vouchers at Moving to Work Agencies *(continued)*

	Average County-Normalized Neighborhood Poverty Rate of PBV Locations		Percent of PBVs in High-Poverty Neighborhoods	
	(1)	**(2)**	**(3)**	**(4)**
Constant	2.976*	0.948	1.042	0.544
	(1.594)	(1.619)	(0.793)	(0.784)
Observations	35	35	35	35

* p<0.10, ** p<0.05, *** p<0.01.

LIHTC = Low-Income Housing Tax Credit. MTW = Moving to Work. PBV = project-based voucher. RAD = Rental Assistance Demonstration. TBV = tenant-based voucher.

Notes: High-poverty neighborhoods are census tracts with poverty rates of at least 2.0 times the county average. Samples include public housing agencies (PHAs) with PBV units and at least 750 households in 2016 and for whom both American Community Survey and Affirmatively Furthering Fair Housing data were available. For Moving to Work PHAs, this excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any PBV units. Standard errors, displayed in parentheses, are heteroskedastic robust. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in HUD Office of Public and Indian Housing Information Center data are reported jointly and listed here as a single PHA.

5. Case Studies of Three Moving to Work Agencies' Project-Based Voucher Use

In this section, we summarize findings from research question 6, our review of three public housing agencies' (PHAs') project-based voucher (PBV) programs. The three agencies included are Boulder Housing Partners, Cambridge Housing Authority, and the Seattle Housing Authority. We first discuss common themes that emerged from the three agencies about how and why they use PBV assistance. We then present summaries of each agency's PBV activities along with additional detail on each agency.

These agencies were selected because they are among the highest users of PBVs among all PHAs nationally. For example, the average Moving to Work (MTW) agency with any PBV units devotes approximately 13 percent of their housing choice voucher (HCV) budget authority to PBVs, while these three agencies, on average, devote 47 percent (see exhibit B.1). Combined, the PBVs of these three agencies represent approximately 18 percent of all MTW PBV assistance in 2016. All three agencies also operate in tight, expensive housing markets that have experienced rapidly increasing rental costs. For example, rental vacancy rates were below 4 percent in 2016 in all three jurisdictions as per 2013–2017 American Community Survey (ACS) 5-year sample data, compared with 10 percent on average for MTW agencies and 15 percent for all traditional agencies. Exhibits 5.1, 5.2, and 5.3 summarize key characteristics for each agency, including PBV use and local market characteristics.

Common Perspectives on Project-Based Voucher Use

Several common themes emerged about how and why the three agencies use PBV assistance. Appendix E summarizes the specific MTW activities and waivers related to each agency's PBV use, as documented in MTW plans and recorded in the database of MTW activities created for the broader MTW evaluation.

The three PHAs maximize their MTW flexibilities to pursue MTW housing choice and cost-effectiveness objectives. As summarized in the overview of the MTW PBV flexibilities section above, there are five main PBV flexibilities available to MTW agencies. Agencies may exceed the PBV funding cap; exceed the cap on the share of PBV units in a single property; establish contracts longer than 15 years; use flexibilities related to selecting properties for PBVs; and waive or revise the Family Right to Move requirement for PBV units. All three agencies included in our case studies use at least two of the PBV flexibilities, combined with flexibilities available for HCV program administration generally. In MTW plans and reports, all three agencies tie their PBV activities and waivers to the housing choice and cost-effectiveness objectives—although each agency noted in interviews that PBVs can also indirectly impact the MTW self-sufficiency objective.

Specifically, all three agencies waive the cap on the share of HCV budget authority that may be applied to PBVs and the cap on the number of PBV units that may be in a single property. Among the three agencies, the share of budget authority applied to PBVs in 2016 was the lowest for Seattle (31 percent) and highest for Cambridge (67 percent). Each of the agencies subsidizes properties that are 100 percent PBVs. Cambridge does not use additional MTW PBV flexibilities, while Boulder uses one of the remaining flexibilities related

to property selection but does not waive the 15-year maximum contract term. Seattle uses all four flexibilities. Each of the agencies also applies additional HCV program flexibilities to their PBVs, such as adjusting unit or income eligibility requirements, waitlist policies, or Housing Quality Standards inspection processes. Each of the agencies retains partial or full ownership in at least one property with PBVs. Additionally, both Cambridge Housing Authority and Seattle Housing Authority use their flexibility to limit the Family Right to Move requirement in some capacity: the Seattle Housing Authority waives the requirement completely, and the Cambridge Housing Authority extends the timeframe when assisted households become eligible to request a mobile voucher from 1 to 2 years.

Agencies use PBVs to facilitate partnerships. PBVs were described by each of the three PHAs as facilitating a variety of partnerships with community stakeholders (for example, city or county officials, housing providers, or service providers) to further local affordable housing priorities or initiatives. For example, this included a longstanding partnership between the Seattle Housing Authority and the city of Seattle to use PBVs to augment local Housing Tax Levy funds to address homelessness. In Boulder, the housing authority launched a multi-partner, place-based education initiative in several PBV-assisted communities. The ability to pursue common goals with local partners and be responsive to local housing needs was noted as a key motivation for all three agencies' PBV use.

PBVs allow the PHAs to be more effective in tight housing markets. As noted, each of the three agencies is in expensive housing markets with low vacancy rates. Agency staff noted advantages to PBVs compared with tenant-based vouchers (TBVs) in such market contexts. For example, all three noted that PBVs provide opportunities to preserve or secure affordable units in areas with high or rapidly rising rents, whereas TBV families have difficulty finding voucher-affordable housing or landlords that accept vouchers. Boulder Housing Partners and the Cambridge Housing Authority discussed their local housing markets as challenging for TBV holders citywide, whereas the Seattle Housing Authority said specific neighborhoods or submarkets were difficult for TBV-assisted households to enter.

Staff from each of the agencies also said that year-to-year increases in housing assistance payment costs could be more predictable for PBVs compared with TBVs in areas where rents are rising quickly. Whereas individual landlords may raise rents substantially at the end of a lease period—triggering increased housing assistance payments, a move by the assisted family, or increased rent burdens, PBV Housing Assistance Payments (HAPs), and annual increases are established in PBV contracts. This allows agencies to build increases in their longer-term financial planning. For example, PBV contract rents are determined by the lowest of the following: up to 110 percent of the fair market rent, reasonable rent, or rent requested by the owner.[27] In Cambridge, between 2011 and 2016, the fair market rent for a two-bedroom unit increased about 16 percent. In contrast, the average rent of a two-bedroom unit in Cambridge increased about 31 percent between 2011 and 2016 (Zillow Rental Index data). A tradeoff for this increased predictability is that PBV program costs are comparatively difficult to reduce in the short- to medium-term in times of financial constraint because PBVs are tied to contracts ranging from 15 to 40 years across the agencies. TBV costs can be reduced in the shorter term by

[27] See 24 CFR 983.301, subpart G, for more information: https://www.govinfo.gov/content/pkg/CFR-2017-title24-vol4/pdf/CFR-2017-title24-vol4-part983.pdf.

slowing voucher issuances or not re-issuing vouchers after normal program attrition, but both options involve serving fewer assisted households.

PBVs offer opportunities for administrative efficiency. Agency staff said the MTW PBV flexibilities offered opportunities for administrative efficiencies—and subsequent cost offsets for the agencies—that TBVs do not. For example, Boulder Housing Partners' staff discussed site-based waiting lists administered by individual property owners and managers as allowing the PHA to free up staff time for other tasks, in addition to helping the agency efficiently connect households to suitable units and properties. The Seattle Housing Authority staff also noted that conducting inspections at properties with multiple PBV-assisted units is more efficient than inspecting geographically dispersed units or units that require interacting and coordinating with multiple owners or managers. In addition, by allowing owners to conduct their own turnover inspections for mid-year vacancies, the Seattle Housing Authority reduced the number of annual staff hours spent conducting inspections.

Maintaining a balance of TBVs and PBVs. Each of the PHAs discussed the need to maintain a portfolio of TBVs as well as PBVs, and the limitations on PBV use. None expected to transition to 100 percent PBVs, and all acknowledged the importance of maintaining the residential mobility opportunities that TBVs offer. Agency leadership said they periodically discuss the appropriate balance of HCV use and whether to expand PBVs. The Cambridge Housing Authority, with the most aggressive PBV use among the three agencies, said they had maximized their PBV use. Their 2017 MTW Annual Report documented a benchmark of 70 percent of their HCV budget authority to be applied to PBVs, and as of 2016, PBVs accounted for 67 percent of their budget authority.

Neither the Seattle Housing Authority nor Boulder Housing Partners has documented a maximum PBV target in MTW annual plans or reports, and neither agency had immediate plans to expand substantially over their current use (about 33 and 41 percent of HCV budget authority in 2016, respectively). Boulder Housing Partners described an opportunistic or entrepreneurial approach to PBV expansion decisions and suggested that shifting to more PBV units could be appropriate if the right partnership or strategic opportunity emerged that would benefit from PBV use. Staff also noted the housing authority's board would not support a transition to 100 percent PBV use, and there would be limitations on their expansion. In Seattle, a primary consideration for assessing the appropriate level of PBV use was described as the need to maintain a balanced portfolio of housing assistance available to meet the needs of different populations. The PBV program and Seattle Housing Tax Levy partnership tends to serve primarily single adults, which contrasts with the pressing need for housing assistance among low-income families on the TBV waitlist.

Project-Based Vouchers and Neighborhood Location

None of the three agencies explicitly use PBVs to target low-poverty or high-opportunity neighborhoods. Each of the agencies, however, tied their PBV activities to a broad definition of housing choice—emphasizing that PBVs increase local affordable housing options for low-income people citywide and the benefits associated with their current PBV locations.

For example, the Cambridge Housing Authority and Boulder Housing Partners described their jurisdictions as generally wealthy and opportunity-rich. The Cambridge Housing Authority staff viewed the city

as a whole—which is only 7 square miles and is home to Harvard University and the Massachusetts Institute of Technology—as a resource-rich environment that is difficult for TBV holders to access. This characterization of their PBV efforts as generally offering access to opportunity areas is reflected in the MTW activities reported to HUD. Galvez, Simington, and Treskon (2017) found that the Cambridge Housing Authority was one of only four PHAs that reported PBV activities related to neighborhood mobility outcomes. Boulder Housing Partners similarly highlighted the city's relatively low poverty rates as a reason for not explicitly prioritizing low-poverty neighborhood locations. In addition, many of the Boulder Housing Partners and Cambridge Housing Authority PBV units are former public housing units converted through RAD and tied to the original public housing locations.

The Seattle Housing Authority staff noted the city's downtown area, where many of their PBV units are located, was identified as an opportunity area by a Kirwan Institute and Puget Sound Regional Council analysis—in part because of the proximity to public transportation and social services.[28,29] For formerly homeless PBV residents, who account for most of their PBV occupants, access to these resources can be essential to helping them be successful.

PIC data show that the three agencies' PBVs tend to be in neighborhoods with moderate poverty rates: the average neighborhood poverty rate for PBVs was 21 percent for the Cambridge and the Seattle Housing Authority, and 23 percent for Boulder Housing Partners. For the Seattle Housing Authority, average PBV neighborhood poverty rates were similar across the TBV, PBV, and public housing programs (close to 20 percent). The Boulder Housing Partners and Cambridge Housing Authority PBV-assisted households lived in slightly higher (4 to 5 percentage points) poverty areas than the agencies' TBV-assisted households.

Notably, two of the three agencies revise or waive the PBV program family right to move requirement. The Cambridge Housing Authority requires PBV-assisted households to remain in their unit for 2 years (instead of 1) before they are eligible for a portable voucher, and the Seattle Housing Authority waives the requirement entirely. A preliminary scan of the MTW activities database for activities related to the family right to move requirement found that, as of 2015, at least 15 agencies reported an activity that mentioned waiving or revising the requirement (see appendix F). This is likely an undercount since agencies may have started an activity after 2015, may report policy changes separately from an activity (as does the Boulder Housing Partners), or use different terminology in their reporting (for example, "exit vouchers") that would require a more thorough document review to identify. The most common change listed in the activities database was to extend the length of time a household must live in a PBV-assisted property before being eligible for a TBV to 2 years instead of 1.

Boulder Housing Partners: Public Housing Conversion and Local Partnerships

They're bringing their services and we're bringing the housing, so it's a match made in heaven.

—Boulder Housing Partners

Since receiving MTW designation in 2011, the Boulder Housing Partners has focused their PBV efforts on converting their public housing stock to PBVs and transitioning fully to HCV

[28] For more information, see the Puget Sound Regional Council's "Opportunity Mapping": https://www.psrc.org/opportunity-mapping.

[29] Seattle Housing Authority is also piloting a neighborhood mobility program using TBVs to support moves to opportunity-rich neighborhoods. For more information, see: https://www.seattlehousing.org/creating-moves-to-opportunity-seattle-king-county-pilot-project-fact-sheet.

assistance. (See exhibit 5.1.) They also have partnered with local housing and service providers to pursue a comprehensive place-based education initiative and in their 2015 MTW plan committed to contributing 2,000 new affordable units to Boulder's permanently affordable inventory by 2025.

Staff said in interviews that MTW PBV flexibilities were a motivation for pursuing MTW status. MTW status generally and MTW PBV flexibilities specifically are central to pursuing the agency's goals. Waivers to the PBV budget authority and units per property caps were included in the agency's first MTW Annual Plan after receiving MTW designation (BHP Annual Plan, 2012). The agency's 2018 annual plan specifically calls out "strategic use of project-based vouchers" among the MTW flexibilities and approaches needed to achieve their 2,000-unit production goal.

Exhibit 5.1 Boulder, Colorado and Boulder Housing Partners (BHP)

- Boulder had a population of about 106,000 people in 2017—an increase of nearly 10 percent since 2010. HUD's estimate of the median family income for 2018 was $108,594.
- Median rent for a two-bedroom unit in Boulder was $2,650 in 2016 and, between 2011 and 2016, the average rent increased by about 18 percent. The rental vacancy rate was 3.5 percent in 2017.
- BHP received Moving to Work (MTW) designation in 2011.
- BHP served 1,288 households in 2016, primarily through housing choice voucher (HCV) assistance:
  - » 417 project-based voucher (PBV) households (32 percent);
  - » 822 tenant-based voucher households (64 percent); and
  - » 49 public housing units (4 percent).
- BHP applied 41 percent of its HCV budget authority to PBVs in 2016 and operates 10 sites with PBV units. PBV use increased from 32 units in 2011 to 417 in 2016 (from 3 to 32 percent of all BHP assistance).
- BHP's PBV-assisted households were more likely to be families with children compared with their typical assisted households (46 percent of PBV households versus 38 percent of all assisted households). They also were less likely to be White (57 percent compared with 67 percent) and more likely to be Hispanic/Latino (37 percent compared with 26 percent).

Sources: 2013–2017 American Community Survey, 5-year estimates; HUD Fiscal Year 2018 Median Family Income Documentation System: https://www.huduser.gov/portal/datasets/il/il2018/2018MedCalc.odn; HUD Office of Public and Indian Housing Information Center dataset; Zillow Rental Index: https://www.zillow.com/research/data/

Boulder Housing Partners formally ties its PBV use to the housing choice and cost-effectiveness MTW statutory objectives, although staff said in interviews that their PBV program also addresses family self-sufficiency. In 2018, the agency consolidated MTW activities enacted in previous years into a single PBV program activity. In addition to waiving the PBV caps, the activity allows Boulder Housing Partners to project base 100 percent of units in a single project and to use site-based waitlists. The activity also modifies several administrative policies for their HCV program, including local rent reasonableness tests, rent limits, HQS inspections, and income requirements.

Staff described how PBVs and the combination of PBV flexibilities help the agency impact the MTW statutory objectives. For example, site-based waiting lists can help the agency more efficiently place households into properties and units that meet their needs and offer more housing choices. Staff said that converting units to PBVs as opposed to TBVs also allowed Boulder Housing Partners to maintain the same demographic mix in their properties as in their traditional public housing. The Bringing School Home initiative, located at five former public housing communities converted to 100 percent PBVs, is intended to help close gaps in educational achievement for low-income

children and support long-term economic self-sufficiency.

Agency staff identified three specific programmatic efforts they believe have been supported by MTW PBV flexibilities.

Partnerships. Strong partnerships with local service providers are central to Boulder Housing Partner's organizational goals. Staff noted that the re-naming of the organization in 2001 from the Housing Authority of the City of Boulder to Boulder Housing Partners reflects a longstanding emphasis on service partnerships that predates their MTW status. These partnerships do not usually come with additional service dollars attached; rather, staff emphasized that both the Boulder Housing Partners and their affiliates see the value in connecting families already receiving services to Boulder Housing Partners-assisted units. For example, Boulder Housing Partners joins with the Boulder Shelter for the Homeless, which provides case management for homeless individuals and families and helps them transition into PBV-assisted housing.

Project Renovate. Completed in 2017, Project Renovate converted 279 public housing units in 6 properties to PBV units using RAD and Section 18 (Demolition and Disposition). Boulder Housing Partners converted units to PBVs instead of PBRAs through RAD to retain the use of MTW PBV flexibility for these units. Staff said that a goal for the conversions was to retain the same households, demographic mix, and level of affordability for the converted properties as in their original public housing portfolio. The housing authority has converted 135 units to PBVs through RAD, amounting to about 33 percent of their PBV-assisted units. Two additional PBV public housing property conversions have been completed through the Section 18 Demolition and Disposition program (2018 annual report).

Bringing School Home. Bringing School Home is a place-based initiative currently operating in five former public housing properties that were converted to 100 percent PBVs. Local partners manage the PBV communities and provide a variety of on-site services for children up to 6 years old through a variety of educational and enrichment supports for them and their families. The Emergency Family Assistance Association manages the waitlist for these properties and is responsible for the screening and admission. An example of services offered to residents includes the "I Have a Dream" Foundation's programming. The program seeks to reduce the gap in educational outcomes between low-income students and their peers by maximizing the amount of time children spend in educationally enriching activities.[30]

Cambridge Housing Authority: Preserving Affordable Housing with Project-Based Vouchers

"The Project-Based Voucher (PBV) Program is considered a community resource, both to support and preserve existing housing, and to expand affordable housing development in Cambridge."

—Administrative Plan for the Federal HCV Program
Cambridge Housing Authority (2013)

Rapidly rising rents and extreme pressure on the affordable housing stock in and around the city of Cambridge provides the motivating context for the PHA's MTW and PBV program priorities. In 2014, only 54 units of housing were available to every 100 extremely low-income households in Middlesex County; 35 of these units were HUD-subsidized (Poethig et al., 2017). Approximately 30 percent of Cambridge's population is students, which

[30] For more information about the Bringing School Home program, see: https://boulderhousing.org/bringing-school-home.

places additional demands on the lower end of the rental housing market.[31] Rents have been rising rapidly in the Cambridge area since 1994, when rent control ended in the state of Massachusetts. (see exhibit 5.2)

The housing authority's MTW and PBV programs center on creating and preserving affordable units in Cambridge. In interviews, staff emphasized that TBVs are difficult to use locally, with 47 percent of TBVs porting out of the jurisdiction. TBV holders who remain in Cambridge may face annual rent increases beyond the TBV voucher payment standard—set at 126 percent of fair market rent—potentially triggering a move, higher HAPs, or additional rental costs and higher rent burdens for assisted households.

Agency staff identified three specific programmatic efforts that they believe are facilitated by MTW PBV flexibilities.

Exhibit 5.2 Cambridge, Massachusetts and the Cambridge Housing Authority (CHA)

- Cambridge's population is approximately 111,000.
- The median family income is $107,845.
- Median rent for a two-bedroom unit in Cambridge was $2,930 in 2016. The rental vacancy rate was 3.4 percent.
- CHA received Moving to Work designation in 1999.
- CHA served 6,431 households in 2016:
  - » 3,240 project-based voucher (PBV) households (50 percent);
  - » 1,742 tenant-based voucher (TBV) households (33 percent); and
  - » 970 public housing units (15 percent).
- Since 2008, the PBV program expanded from 99 households to 3,240. This includes 1,150 public housing units converted through the Rental Assistance Demonstration (28 percent of the CHA PBV-assistance). The Cambridge Housing Authority applied about 67 percent of its Housing Choice Voucher budget authority to PBVs in 2016.
- CHA PBV households were more likely to be headed by a man and to be single adults compared with CHA's public housing or TBV-assisted households. The Cambridge Housing Authority does not target a specific population with PBVs.

Sources: 2013–2017 American Community Survey, 5-year estimates; HUD Fiscal Year 2018 Median Family Income Documentation System: https://www.huduser.gov/portal/datasets/il/il2018/2018MedCalc.odn; HUD Office of Public and Indian Housing Information Center dataset; Zillow Rental Index: https://www.zillow.com/research/data/

The Expiring-Use Preservation Program. About one-half of the Cambridge Housing Authority PBVs—about 1,800 vouchers in 18 properties—were issued through the Expiring-Use Preservation Program, which focuses on preserving units in and around Cambridge. Through this program, the Cambridge Housing Authority identifies units in the private rental market with an existing subsidy that are nearing their expiration date (for example, the prepayment or expiration of a Section 236 mortgage, HUD legacy programs like Rent Supplement program and Rental Assistance Payment). Upon expiration of these subsidies, eligible residents may receive an Enhanced Voucher,[32] which allows them to remain in their unit; however, if the resident leaves their original unit, the Enhanced Voucher converts to a mobile voucher, and the original unit becomes unsubsidized and likely converted to a market-rate unit. Through the Expiring-Use Preservation Program and their MTW authority, the Cambridge Housing Authority is able to work with the owner to preserve the tenancies of the existing residents in addition to preserving the long-term affordability of these units. While initially used solely in the city of Cambridge, the Cambridge Housing Authority has expanded this program to owners in surrounding cities, including

[31] "Demographics and Statistics FAQ." Cambridge Development Department, accessed February, 2019, https://www.cambridgema.gov/CDD/factsandmaps/demographicfaq.

[32] For more information about HUD's Enhanced Vouchers, see: https://www.hud.gov/sites/documents/ENHANCED_VOUCHERS_ENG.PDF.

Lynn, Southbridge, Worcester, and several neighborhoods of Boston. The preservation program relies on partnerships between the PHA, property owners, residents, community stakeholders, and, if outside of Cambridge, the local PHAs.

Public housing conversion through RAD. Just under 30 percent of the agency's PBV-assisted units are in former public housing properties converted through RAD. The Cambridge Housing Authority converted units to PBVs rather than PBRAs to retain MTW flexibilities for rent simplification and to retain voucher administrative fees, providing additional cash flow to leverage debt for capital improvements. Staff asserted that it was a priority to retain the same assisted households through the conversion and avoid disrupting their experience with the housing authority—including building management and recertification staff. According to agency staff, few residents, if any, have taken advantage of Choice Mobility TBVs because of the challenges finding housing with a mobile voucher in Cambridge.

Partnerships. The Cambridge Housing Authority has several partnerships with service providers and housing developers that incorporate PBV assistance to develop or preserve affordable units. Many of these partners provide services on site in PBV-assisted properties. For example, the Cambridge Housing Authority partners with Just-A-Start to place their PBV-assisted units. As a community development corporation, Just-A-Start provides resident services in all their affordable rental developments, including supportive services and education programs.[33] In Levy, Long, and Edmonds (2019), the Cambridge Housing Authority similarly identified MTW fund flexibility as a tool to preserve and develop affordable housing and partner with other local entities. The Cambridge Housing Authority noted that their development partners could access properties or neighborhoods that the housing authority may not be able to access alone. They also stated that most of their partnerships are long-standing and formalized through Memoranda of Understanding and were formed when organizations approach the PHA with collaboration ideas.

Seattle Housing Authority: Using Project-Based Vouchers to Serve People Exiting Homelessness

"Our primary interest in the project-based voucher has been in the population that it serves and the services that come with it."

—Seattle Housing Authority

Since the early 2000s, the Seattle Housing Authority has partnered closely with the city, county, and local service providers to address homelessness and support service-enriched housing for high-need populations. Most of the Seattle Housing Authority's 3,600 PBVs are connected to these efforts, with a small share going to replacement vouchers in their HOPE VI communities. Seattle Housing Authority staff stated that to date, their use of PBVs has, in large part, been guided by community priorities identified by local partners.

The Seattle Housing Authority applies the smallest share of its HCV units and budget authority to PBVs among the PHAs included in the case studies in this report (33 percent), but is the largest of the three agencies and supports the largest number of PBV vouchers (see exhibit 5.3). The Seattle Housing Authority is also the only agency that uses all four MTW PBV flexibilities, along with applying several HCV general flexibilities to their PBV program.

[33] For more information on Just-A-Start, see: https://www.justastart.org/.

A tradeoff discussed by the Seattle Housing Authority staff of the focus on homeless and high-need households is that the Seattle Housing Authority's PBVs disproportionately house White, single adult men compared with their TBV program. The PBV population mix is driven by priorities set through the city's Housing Tax Levy efforts and the county's 10-Year Plan to End Homelessness, and not by explicit Seattle Housing Authority targets. Although staff said that single adults can inherently carry some cost efficiencies because they tend to live in studios that have lower HAP costs than larger units, it has also meant serving fewer families than might be expected through the TBV program. Unlike the PBV population, staff said, roughly half of the TBV waiting list tends to be families with children.

The Seattle Housing Authority has not formally established a maximum PBV allocation, and staff stated that PBVs may be used if promising opportunities emerge, but they are not currently planning to expand its PBV portfolio substantially. This is based on both the demand for family housing through their TBV program and budget considerations. Additionally, the use of PBVs necessarily impacts the agency's ability to issue TBVs because PBV HAP contracts require a long-term financial commitment that cannot be broken without placing housed families at risk of instability. Staff stated that the PBV commitments must be considered carefully before entering, while if necessary, TBV savings can be found by temporarily freezing new issuances without directly harming existing assisted households. Staff said that the Seattle Housing Authority leadership is in the early stages of assessing their current PBV portfolio and agency priorities for future PBV use.

Exhibit 5.3 Seattle, Washington and the Seattle Housing Authority (SHA)

- Seattle's population is approximately 690,000. The population increased by more than 15 percent between 2010 and 2017.
- The median family income is $103,447.
- Median rent for a two-bedroom unit in Seattle was about $2,550 in 2016. The rental vacancy rate was 4 percent.
- SHA received Moving to Work designation in 1998.
- Between 2008 and 2016, SHA added nearly 1,700 new households to their programs. In 2016, SHA served 15,141 households:
  - 3,603 project-based voucher (PBV) households (24 percent);
  - 4,937 tenant-based voucher (TBV) households (33 percent); and
  - 6,054 in public housing (40 percent).
- About 33 percent of SHA's Housing Choice Voucher budget authority was applied to PBVs in 2016. Since 2008, their PBV program increased marginally, from 3,026 to 3,603 households.
- SHA's PBV households are more likely to be single adults and to be White compared with households assisted through TBVs (72 percent single adults compared with 53 percent, and 43 percent White compared with 34 percent). This is a decrease from 2008 when PBV-assisted households were 81 percent single adults and 53 percent White.

Sources: 2013–2017 American Community Survey, 5-year estimates; HUD Fiscal Year 2018 Median Family Income Documentation System: https://www.huduser.gov/portal/datasets/il/il2018/2018MedCalc.odn; HUD Office of Public and Indian Housing Information Center dataset; Zillow Rental Index: https://www.zillow.com/research/data/

Staff discussed their PBV efforts and MTW flexibilities as allowing them to pursue both housing choice and cost-effectiveness goals. In meeting housing choice goals, staff emphasized that PBVs provide deeply subsidized housing options for high-need populations who might not be successful in other forms of assistance. The Seattle Housing Authority's PBV units also tend to be located close to social and health service providers in Seattle's downtown area or offer supportive services. This proximity to services was described as providing high-need and formerly homeless residents

access to the resources they need to be successful.

Examples of cost-effectiveness efforts tied to PBV efforts, described in more detail below, included administrative efficiencies such as streamlined inspections and admissions processes, site-based waiting lists, waiving PBV exit vouchers, and noncompetitive PBV allocation processes, among others. Staff noted the efficiencies gained through these efforts, as well as challenges reporting or monetizing the value of the administrative efficiencies that flexibilities allow.

Agency staff identified two main programmatic efforts as facilitated by MTW PBV flexibilities.

Local partnerships to end homelessness. Two main partnerships were discussed as driving the Seattle Housing Authority PBV use: the Seattle Housing Tax Levy[34] and the King County 10-Year Plan to End Homelessness.[35] The Housing Tax Levy raises funds to support affordable housing creation and preservation. The first levy was passed in 1986, and Seattle residents vote every 7 years to provide funding to create and preserve affordable housing. The Seattle Housing Authority leadership said that for each levy process, they determine whether to participate and at what scale. The Seattle Housing Authority has contributed PBVs to each of the levies passed since they received MTW status—in 2002, 2009, and 2016—committing 500, 500, and 300 new PBVs, respectively. In total, roughly one-half of the Seattle Housing Authority PBVs are units connected to the levy.

Staff said that prior to the Tax Levy collaboration and through to approximately 2009, additional ad hoc partnerships were formed that account for the balance of the Seattle Housing Authority PBV units. Many centered on the county's Plan to End Homelessness and efforts to braid housing assistance with service dollars from the county or other sources to serve high-need populations. For example, in 2000, the Seattle Housing Authority committed 400 PBVs to the Sound Families Program, which provided transitional housing for homeless families.[36] Sound Families was described as one of the few PBV partnerships to focus on families.

Cost-effectiveness through PBVs. The Seattle Housing Authority has made several efforts to pursue efficiencies through its PBV program specifically and HCV program generally. Staff highlighted two PBV flexibilities as particularly useful to sustaining service-enriched housing: waiving the PBV exit voucher requirements[37] and site-based waiting lists. Waiving exit vouchers was described as allowing continuity and predictability for service partners and removing pressure from the TBV waitlist to absorb households exiting PBV units. Staff said that site-based waiting lists in partner owned or operated sites maintained by partners allowed high-need populations to be connected to properties that offered appropriate services. Additionally, the Seattle Housing Authority has implemented combined program management and LEAN processes[38] within the HCV program. The combined program management activity enables the Seattle Housing Authority to

[34] For more information on the Seattle Housing Levy, see: https://www.seattle.gov/housing/levy.

[35] For more information on the King County 10-year Plan to End Homelessness, see: http://www.cehkc.org/plan.html.

[36] "Administrative Plan for the Seattle Housing Authority Housing Choice Voucher Program," Seattle Housing Authority, approved 2003 and updated 2015, https://www.seattlehousing.org/sites/default/files/housing_choice_voucher_administrative_plan.pdf.

[37] As a part of the "Family Right to Move," a traditional PBV household can move from the PBV unit and keep their rental assistance by requesting another voucher or comparable tenant-based rental assistance (referred to as an "exit voucher"). Through their PBV MTW activity, the Seattle Housing Authority provides housing choice at the beginning of the PBV process through site-specific waiting lists and have waived the "exit voucher."

[38] *Lean Six Sigma* is a process improvement methodology, aimed at reducing waste and improving operations. The Seattle Housing Authority tailored the Washington State Auditor's office program to fit the needs of their HCV program. To learn more about Lean methodology, see: https://www.sao.wa.gov/improving-government/learn-to-be-lean/; https://goleansixsigma.com/what-is-lean-six-sigma/.

streamline management and policies for PBV and public housing units that are co-located at the same property, which reduces administrative redundancies. It also allows the Seattle Housing Authority to ensure that their residents don't see a difference in their services or program management, no matter what kind of assistance they receive. The LEAN process is focused on creating a culture of accountability and collaboration. This has allowed the Seattle Housing Authority's leadership to identify areas where the program was succeeding and areas where streamlining or other improvements are needed.

6. Conclusions

This study documents various aspects of the use of project-based vouchers (PBVs) by Moving to Work (MTW) agencies and a group of comparably sized traditional agencies through analysis of administrative data and case studies of three MTW agencies with large PBV portfolios. We examine PBV locations in detail to explore concerns about PBVs concentrating in high-poverty areas and whether MTW agencies may use PBVs as a tool to reach opportunity-rich places.

PBV use is more common among MTW agencies than among traditional public housing agencies (PHAs), but extensive PBV use is not the norm. Most MTW agencies used PBVs to some extent as of 2016 and reported activities requiring MTW PBV flexibilities. Yet, only nine agencies exceeded the 20-percent budget authority cap on PBV use in 2016, and only four of those agencies used PBVs for more than 25 percent of the assisted housing they provided. More MTW agencies used PBVs and their flexibilities sparingly, at a level closer to the norm for the comparison traditional PHAs (0 to 5 percent of their budget authority). Even among the three case study agencies with extensive PBV use, in markets where tenant-based vouchers (TBVs) are challenging to use, staff discussed the importance of maintaining a portfolio of TBVs and the residential mobility opportunities they offer.

Local housing markets play an important role in PBV use and agency decisions, which was evident in both the quantitative and qualitative findings. Across MTW agencies, PBV use increased more in the Northeast than in relatively more affordable regions of the South and Midwest. And, our analysis of MTW and traditional PHAs shows that agencies in areas with higher rents increased their PBV use more than agencies in more affordable markets. Staff at the three case study agencies stated that PBV costs—which are tied to long-term contracts with gradual rent increases—are more predictable than TBV costs when rents are rising quickly. All three agencies discussed the challenges TBV holders face finding private market housing citywide or in specific submarkets as motivating their PBV use.

Our results also show a relationship between distressed public housing and PBV use. MTW and traditional agencies with lower-quality public housing in 2008 (measured as Physical Assessment Subsystem [PASS] scores) were more likely to increase their PBV use by the end of our study period (2016). The MTW agencies were more likely than the traditional agencies to use the Rental Assistance Demonstration (RAD) to convert public housing—and to convert to PBVs. This may reflect MTW agencies' ability to use funding or other flexibilities to navigate the RAD conversion process and that MTW agencies can retain their funding and other flexibilities for converted PBV units (but not for project-based rental assistance, or PBRA).

We find no evidence that PBVs are used as a tool to improve access to low-poverty or opportunity-rich neighborhoods by MTW agencies or our sample of traditional PHAs. For both sets of agencies, PBVs are in more distressed neighborhoods compared with TBVs and tend to be in areas that more closely resemble public housing neighborhoods. Also, on average, both MTW and traditional PHAs' PBV-assisted households live in more distressed neighborhoods than the typical neighborhood in their counties. The RAD conversions did not explain PBV neighborhood locations.

Results were similar across neighborhood quality measures, with two exceptions: MTW PBVs were in neighborhoods with better access to affordable transportation

compared with the average for their counties, most likely because MTW agencies tend to serve dense central cities with better public transportation compared with other parts of their counties. And, MTW agencies' PBVs are in neighborhoods with higher educational attainment than TBVs or public housing.

We did not find any differences in location patterns by race or ethnicity for PBVs compared with other assistance programs. As is the case for the TBV program, non-White PBV-assisted households tend to live in higher-poverty, more distressed neighborhoods than White PBV-assisted households. We found that racial segregation was associated with PBV locations—with agencies in more racially segregated areas more likely to have PBV units in the higher-poverty neighborhoods. Notably, PBV locations appeared more sensitive to racial segregation than TBVs in the same jurisdictions. It may be that, in highly segregated cities, developing PBV properties outside of high-poverty neighborhoods is more difficult than renting in those same neighborhoods with a TBV.

The case study agencies, although not representative of all MTW agencies, did not approach PBVs as a tool to create housing in opportunity-rich neighborhoods. The agencies' primary PBV goals were to preserve and expand housing opportunities more broadly and to improve cost efficiency—and PBV use tended to be tied to specific local priorities, partnerships, and market considerations. The agencies discussed their PBV use as consistent with neighborhood choice goals in that PBVs were in areas that likely offered tangible benefits to assisted households—but neighborhood location was not driving PBV decisionmaking. Notably, the agencies each waived or revised the Family Right to Move requirement to some degree, citing cost concerns and the potential impact on their TBV waiting lists.

There was considerable variation across MTW agencies in the extent and nature of their PBV use for every measure we examined. The three case studies underscore the diverse and creative ways that MTW agencies may use PBVs to pursue the MTW program's statutory objectives and the importance of local contexts and priorities in agency decisionmaking.

Limitations

A significant limitation of this report is that it does not examine the extent to which PBVs are combined with supportive services or house high-need households. MTW agencies have unique opportunities to provide supportive services by making creative use of funding or policy flexibilities—and staff from the case study agencies discussed tying supportive services to PBV properties for veterans, homeless people, and others. HUD also encourages traditional PHAs to use PBVs to provide supportive services and serve "hard to house" families. No data source documents whether PBVs house high-need families or are linked to services, however. MTW annual plans and reports provide some relevant information, but the scale or nature of services cannot be determined consistently.

Our analysis of the relationships between the PBV and Low-Income Housing Tax Credit (LIHTC) programs was also limited by available data. Administrative data do not identify vouchers used in LIHTC properties. We estimate the intersection of these programs for MTW agencies based on addresses, but these estimates are sensitive to assumptions about property and block sizes and could be improved by adjusting for local contexts. Future research could also expand this analysis to traditional PHAs.

The small number of MTW agencies itself was a limiting factor for cross-agency analysis of PBV use or locations. We include comparison

traditional PHAs in regression analyses to increase our sample sizes and ability to detect statistical relationships, but the extent to which our findings are representative of MTW agencies, specifically, could not be determined. Similarly, we include case studies of just three MTW agencies that are not typical of the average PHA because they are the highest PBV users among all PHAs nationally and in some of the nation's most competitive rental markets. Their insights are useful to understand the benefits of PBVs in tight markets and ways that PBVs can be used to facilitative partnerships or increase administrative efficiencies—but they tell us little about PBV use in weaker markets or decisionmaking among agencies that do not use PBVs.

Policy Implications and Future Research

Our findings have implications for PBV policy and raise new questions for additional research. First, our findings suggest some cause for concern about PBV locations and PBV-assisted households' access to low-poverty, opportunity-rich neighborhoods. More research is needed to understand ways to improve PBV neighborhood locations, including the mechanisms driving PBV location options and MTW agency decisionmaking. For example, more qualitative research with MTW and traditional agencies could shed light on how agencies select PBV properties and identify opportunities for HUD to encourage improved locations. More work is also needed to examine the relationship between PBV locations and racial segregation—for example, to understand whether local opposition to affordable housing development contributes to PBVs' concentration in high-poverty areas. Finally, research is needed to fully document how often MTW agencies waive or revise the PBV Family Right to Move requirement, the agencies' reasons for doing so, and ways to make it more feasible for agencies to implement it in the way HUD intends.

Second, the case studies identified examples of unique approaches to PBV use and of productive local partnerships from three high-capacity agencies, but a rigorous investigation of promising MTW agency activities was not possible. More information about innovative practices and partnerships from a diversity of agencies could help identify replicable models. Future case studies or qualitative work should include a range of MTW PHA sizes, local market characteristics, and agencies with different levels of PBV use to understand the challenges and opportunities that PBVs present to pursue MTW's objectives.

Third, our analyses begin to document the relationships between the Housing Choice Voucher (HCV) program and LIHTC properties, but more work is needed to fully understand the extent to which the HCV and LIHTC programs are mutually dependent. A more precise estimate of PBV and TBV co-location in LIHTC properties at both MTW and traditional PHAs would shed light on the role that LIHTC properties play in the HCV program.

Finally, future work should examine the extent to which MTW agencies and traditional PHAs combine PBVs with supportive services or use PBVs to support high-need households. HUD should consider ways to strengthen data and reporting from both MTW and traditional agencies to support research on the availability of supportive services and examine outcomes for households with access to services.

Appendix A: Data and Methodology

This appendix provides additional information about the data sources used to create this report and summarizes the methods deployed to clean and analyze the data. A companion study to this report, "A Picture of Moving to Work Agencies' Housing Assistance" (Galvez, Gourevitch, and Docter, forthcoming), provides additional detailed information about how the HUD PIH (Office of Public and Indian Housing) Information Center (PIC) data were cleaned and processed for the Moving to Work (MTW) evaluation.

Data Sources

HUD Administrative Data

We use five HUD administrative data sources, as noted in exhibit 3.1 in the Study Design section.

Affirmatively Furthering Fair Housing Data

HUD published the Affirmatively Furthering Fair Housing (AFFH) dataset, last updated in September of 2017, for public housing agencies (PHAs) to use to conduct the fair housing analysis required as part of the Assessment of Fair Housing (Mast and Abt Associates, 2017). The dataset includes a series of indices developed at the census-tract level and designed to inform communities about segregation and disparities in access to opportunity. Data and documentation were retrieved from the HUD Exchange.[39] We retrieved the Low Transportation Cost Index, the School Proficiency Index, the Environmental Health Index, and the Labor Market Engagement Index from the AFFH dataset. We also used tract-level racial composition from the dataset to construct a county-level dissimilarity index.

Office of Public and Indian Housing Information Center Data (2009, 2016)

For the retrospective MTW evaluation, HUD provided detailed household-level PIC data for 1995 through 2016 (see Galvez, Gourevitch, and Docter, forthcoming, for information on the MTW retrospective evaluation PIC data). For this study, we use data for 2009 and 2016. The PIC data extracts identify the PHA that provided housing assistance to each household, whether the household lived in public housing or received a housing choice voucher (HCV), the specific type of HCV received (project-based, tenant-based, homeownership, certificates, or moderate rehabilitation), relevant dates of each action and other program milestones (for example, program admission date, exit date, dates of unit inspection), head of household demographics (age, race and ethnicity, income, and marital status of householders, disability status), income information for the households (monthly contributions toward rent, income, sources of income) and the household's Federal Information Processing Standards (FIPS) census tract, county, and state codes. HUD also provided address information for public housing households and HCV households at MTW PHAs for 2012–2016.

Rental Assistance Demonstration (2013–2018)

The First Component of the Rental Assistance Demonstration (RAD) allows PHAs to convert public housing properties to one of two forms of project-based assistance: project-based vouchers (PBVs) or project-based rental assistance (PBRA). A PHA follows several steps in the RAD conversion process.

[39] AFFH Data and Mapping Tool, Published September 2017 https://egis.hud.gov/affht/.

First, the PHA submits an application to HUD, and if accepted, HUD awards the PHA a Commitment to Enter into a Housing Assistance Payment Contract (CHAP). The PHA then adds information on the RAD conversion to its Annual or 5-Year Plan and submits a Financing Plan to HUD detailing the type of conversion (PBV or PBRA), a physical condition assessment, plans for rehab or new construction, operating and maintenance costs, and more. Once HUD accepts the Financing Plan, HUD issues the PHA a RAD Conversion Commitment (RCC), and the PHA's property moves toward closing, or full conversion, which is when the property formally leaves the public housing program and when either the new PBV Housing Assistance Payment (HAP) or Section 8 PBRA contract becomes effective.

We downloaded publicly available First Component RAD data on March 20, 2018, from the RAD Resource Desk.[40] The data include information for each RAD property nationally: the PHA name and size, the development name and PIC Development Number of each converted public housing property, the type of conversion (PBV or PBRA), the number of units converting, the property's stage in the RAD conversion process (CHAP Awarded, Financing Plan Submitted, or Closed), the date the CHAP was issued, whether the RAD conversion entails new construction and the estimated construction costs, whether the RAD conversion used Low-Income Housing Tax Credit (LIHTC) financing and the tax credit amount, whether the RAD conversion is insured by the Federal Housing Administration (FHA), and the anticipated or actual closing date of the RAD conversion.[41]

Real Estate Assessment Center data (2008)

HUD's Real Estate Assessment Center (REAC) monitors and provides data on HUD's real estate portfolio. REAC's Physical Assessment Subsystem (PASS) coordinates inspections for PHAs and provides scores of the physical condition of public housing. REAC determines PASS scores for both individual developments and for PHAs' public housing portfolio as a whole. We use 2008 data because data quality is poor prior to 2008.

Voucher Management System (2002–2017)

HUD provided Voucher Management System (VMS) monthly data from August 2002 through November 2017. The VMS data identify, for each PHA in every month of the year, the number of vouchers of various types and spending on those vouchers. HUD also provided PHA-level VMS Storyboard data for 2002–2017, which includes similar information as the other VMS data, but also includes information on annual budget authority.

Other Data Sources

For regression analyses related to MTW agencies' use of PBVs and unit locations, we link administrative data to information included in publicly available datasets. The included data sources are as follows.

Moving to Work Evaluation Database of Moving to Work Agency Activities

For the MTW Retrospective Evaluation, we created an agency-level database of MTW activities and flexibilities based on information in the publicly available 2015 MTW annual

[40] First Component RAD data are publicly available at http://www.radresource.net/.

[41] Private owners of projects funded by the Office of Multifamily Housing at HUD, including Rent Supplement, Rental Assistance Payment, and Mod Rehab, can convert tenant protection vouchers through RAD's Second Component to either PBVs or PBRA once contracts expire or are terminated. These programs are tracked using contract numbers reported separately in the Tenant Rental Assistance Certification System (TRACS).

plans and reports.[42] The database includes information on all MTW activities implemented by the 39 agencies, including activity name, activity status, year proposed, implementation year, the authorization(s) involved, activity description, and the statutory objectives that the activity addresses.

- **MTW Annual Plans.** MTW agencies must submit an annual plan that describes general housing authority operating information, proposed MTW activities, previously approved MTW activities and their status, sources and uses of funds, and any administrative updates for the upcoming year.
- **MTW annual reports.** MTW agencies must submit an annual report that outlines MTW reporting compliance, housing stock information, leasing information, waiting list information, progress on proposed and approved MTW activities, and administrative information for the current year.

National Housing Preservation Database (1987–2015)

The National Housing Preservation Database (NHPD)[43] was created by the Public and Affordable Housing Research Corporation and the National Low Income Housing Coalition. It is a property-level database that pulls from the HUD LIHTC database and other sources to determine the subsidies attached to properties receiving LIHTCs, Project-Based Section 8, Section 202, State Housing Finance Agency financed Section 236, Section 515, Section 538, HOME, and others. NHPD provides information on up to the two most recent subsidies of each subsidy type on a property. For LIHTC tax credits, NHPD provides the tax credit status (Active, Inactive, or Inconclusive), the tax credit type (9 percent, 4 percent, and others), the tax credit start date, the number of LIHTC-subsidized units, and the tax credit construction type (New Construction, Both New Construction and Acquisition and Rehab, Existing, or Acquisition and Rehab), and other property-level information, such as latitude and longitude coordinates, the property's address, manager, and owner.

There are lags in reporting in the HUD LIHTC database (Scally et al., 2018). Before properties are formerly "placed in service" and entered into the HUD LIHTC database and the NHPD, they must meet strict legal requirements that typically take 3 to 4 years to meet. Therefore, the most recent years of the HUD LIHTC database and the NHPD may not reflect the full set of LIHTC properties or units. LIHTC units cannot be occupied, however, until they are formerly placed in service, so these lags do not impact our analysis of the overlap between the LIHTC program and PBV and TBV assistance at MTW PHAs.

American Community Survey data

The Integrated Public Use Microdata Series (IPUMS)[44] from the National Historical Geographic Information System (NHGIS) provides free online access to summary statistics from the U.S. Census Bureau and American Community Survey (ACS) (Manson et al., 2018).[45] We retrieved ACS 5-year average data on poverty, educational attainment, labor force participation, and inequality at the census tract level for 2005 to 2009 and 2012 to 2016. We also retrieved ACS 5-year average Gini Indices at the county-level for 2012 to 2016.

[42] MTW housing authority plans and reports are available on HUD's website. See "Moving to Work (MTW)—Participating Sites," HUD, accessed December 15, 2016, https://www.hud.gov/program_offices/public_indian_housing/programs/ph/mtw/mtwagencies

[43] NHPD data are publicly available at https://preservationdatabase.org/.

[44] https://ipums.org/what-is-ipums.

[45] IPUMs data are available at: https://www.nhgis.org/.

Zillow Data

We use publicly available data from Zillow, an online real estate database company, to measure the property values and rental costs of the PHA service area.[46] We specifically draw from two time-series: the Zillow Home Value Index (ZHVI) for all homes (ZHVI All Homes: Single Family, Condo/Co-op) and the Zillow Rent Index (ZRI) for all homes (ZRI Time Series: Multifamily, Single Family Residential, Condo/Co-op). Both indices are described in the following section.

Measures and Sampling

Below we describe how we constructed key measures and the comparison group of traditional PHAs.

Public Housing Agency Characteristics

We use VMS data, PIC data, RAD First Component data, NHPD data, and MTW Annual Plans and Reports to describe characteristics of PHAs related to PBV use.

PBV households are defined as any household listed in PIC with the "PBV" program type. We exclude Mod-Rehab units from our analyses.

Public housing households are defined as any household in PIC with the "public housing" program type.

TBV households are defined as any household in PIC with the "tenant-based voucher" program type. We exclude "certificate" program types from our sample of TBV-assisted households.

The percent of PBV assisted households is calculated as the number of PBV households divided by the sum of a PHA's total households.

The percent of households in public housing is calculated as the number of public housing households divided by the sum of a PHA's households.

The number of activities using MTW PBV flexibility (2015) is calculated as activities listed in 2015 MTW annual plans that explicitly use MTW PBV flexibilities and are identified as such in the unpublished database of MTW activities constructed for the retrospective MTW evaluation.

The number of activities that involve PBVs (2015) is calculated as activities listed in 2015 MTW annual plans that rely on PBVs, regardless of whether MTW flexibility is required. Information is drawn from the database of MTW plans that were created for the MTW evaluation.

The percent HCV Budget Authority Applied to PBVs. We use January 2017 VMS data to calculate the total number of PBVs by PHA for that month. After consultation with HUD, we include leased, not leased, and vacant PBV vouchers in the PBV voucher count. We then calculate the per-unit costs (PUC) for voucher units, dividing the HAP field for MTW PHAs by unit-months leased (UML). We then pull in budget authority information from the VMS Storyboard January 2017 data and multiply by 12 to get annual budget authority. To determine the percent of overall HCV budget authority devoted to PBVs, we multiply the number of PBV vouchers by the PUC, multiply by 12 to convert from monthly to yearly, and then divide by the calculated annual budget authority.

Total RAD PBV units and properties. We use RAD First Component data to sum the number of units and the number of properties converting to PBV through RAD, separately for MTW PHAs and comparison traditional PHAs. We only consider Closed properties as of the end of 2016.

[46] Aggregated data are available at https://www.zillow.com/research/data/ and are freely available from Zillow for noncommercial use.

Total RAD PBRA units and properties. We use RAD First Component data to sum the number of units and the number of properties converting to PBRA through RAD, separately for MTW PHAs and comparison traditional PHAs. We only consider Closed properties as of the end of 2016.

Total PBVs and TBVs in RAD properties. We use the PIC extract and addresses along with RAD data to identify the number of MTW PBV and MTW TBV households living in RAD properties in 2016. We only consider Closed RAD properties as of the end of 2016.

Total PBVs and TBVs in LIHTC units. We use the PIC extract and PIC addresses along with data on LIHTC properties in NHPD to determine the number of MTW PBV and MTW TBV households living in LIHTC properties in 2016. We rely primarily on active LIHTC properties for the purposes of this analysis. NHPD contains information on up to the two most recent LIHTC tax credits on a property. A LIHTC property is considered active if it has at least one active LIHTC program tax credit. A LIHTC program tax credit is considered active if its affordability period, which in most circumstances is 30 years, occurs after the date of the most recent refresh of NHPD, suggesting the property the tax credit is attached to must still meet affordability requirements (Gold et al., 2018). We map all 2016 MTW PBV addresses in 2016 PIC data and all LIHTC properties active as of 2015, using ArcGIS. We draw a radius of 200 feet around each LIHTC property and flag all PBV addresses that fall within that radius as located in the LIHTC property.

REAC Physical Inspection (PASS) scores for 2008 are calculated by REAC. Where data for 2008 were unavailable, we use the score from the closest earlier year. We use 2008 PHA-level PASS scores to understand whether PHAs with more distressed public housing are more likely to shift their portfolio from public housing to PBV units. Specifically, we look at the relationship between the PASS scores in 2008 and the percent of households assisted with PBVs in 2016. 2008 is the earliest year for which there is broad coverage and data are of high quality.

Neighborhood Characteristics

We calculate county-normalized neighborhood characteristics. We begin with census tract level measures as described below. We then normalize measures to the county. The county-normalized measures allow us to compare location outcomes across PHAs while accounting for large regional differences. We define these relative measures by dividing the tract-level value of each characteristic by the county average. For example, we define county-normalized rate such that a value of 2.0 signifies a poverty rate of twice the regional (county) average, and a value of 0.5 signifies a poverty rate that is half of the regional average.

Poverty Rate is calculated from ACS data. It is the population with total family income below the poverty line divided by the population for whom poverty status is determined. Total population with family income below the poverty line was calculated by adding the population below 50 percent of the poverty line to the population between 50 and 99 percent of the poverty line. Calculations use data from the 2012–2016 ACS 5-year estimates retrieved from NHGIS.

We also create variables **signifying low-poverty and high-poverty neighborhoods**. We define low poverty neighborhoods as those with a county-normalized rate at or below 0.5 and high poverty neighborhoods as those with county-normalized of at least 2.0.

Percent with a bachelor's degree is calculated as the population of adults age 25 or older with bachelor's degree, master's degree, professional school degree, or doctoral

degree divided by the total population of adults age 25 or over. Calculations use data from the 2012–2016 ACS 5-year estimates retrieved from NHGIS.

Labor force participation is calculated as the total number of people age 16 or older in the labor force divided by the total number of people age 16 or older. Calculations use data from 2012–2016 ACS 5-year estimates retrieved from NHGIS.

Labor market engagement index is an AFFH index based upon the level of employment, labor force participation, and educational attainment in a census tract using data from 2006–2010 ACS 5-year estimates. The index is normalized as a national percentile rank. Higher values represent greater labor force participation and human capital.

Environmental health index is an AFFH index that summarizes the potential exposure to harmful toxins in a census block group using data from the National Air Toxins Assessment (2005). The index is normalized as a national percentile rank. Higher values represent better environmental quality.

School quality is measured using the AFFH School Proficiency Index. The index uses school-level data on fourth-grade performance in 2011–2012 from Great Schools and geographic data from Common Core of Data and the School Attendance Boundary Information System (SABINS). The index is normalized as state percentile ranks. Higher values represent greater school performance in the area.

Transportation cost index is an AFFH index based upon estimates of transportation costs for a three-person, single-parent family with income at 50 percent of the median income for renters in the county. Estimates use Location Affordability Index (2008–2012) data. The index is normalized as national percentile ranks. Low transportation costs are associated with shorter commutes and strong public transportation infrastructure.

Regional and Market Characteristics

Dissimilarity Index is a measure of segregation that represents the extent to which the distribution of two groups differs by level of geography. We use an index that compares the share of White and non-White residents in a census tract (in 2010) to the share of White and non-White residents in the county. A score of 0 represents equal distribution across all tracts. A score of 100 represents complete segregation. For research question 5, we divide by 100 to rescale the dissimilarity index to run from 0 to 1.

Gini Index is a measure of distribution frequently used to describe the income distribution in an area. The index runs from 0 to 1 with a score of zero representing equal incomes across all households. We use county-level estimates from the 2012–2016 ACS retrieved from NHGIS.

Rent Index is the ZRI for all homes (ZRI Time Series: Multifamily, SFR, Condo/Co-op). The ZRI is a smoothed measure of the median estimated market-rate rent for a given home type, region, and year. We collect this data at the ZIP Code by month level. We then create an annual measure by taking a simple twelve-month average. ACS population estimates are used to create a weighted average for each PHA. Prior to including the rent index in regressions, we scale by dividing it by 100 so coefficients can be interpreted as the change associated with a $100 increase or decrease in monthly rents.

Property Values are measured using the ZHVI for all homes (ZHVI All Homes: Single Family, Condo/Co-op). The ZHVI is a smoothed, seasonally adjusted measure of the median estimated home value for a given home type, region, and year. We use the index for all homes, by ZIP Code, for the years 2009 to 2016. We collect this data at the ZIP Code

by month level. We then create an annual measure by taking a simple 12-month average. ACS population estimates are used to create a weighted average for each PHA. Prior to including the rent index in regressions, we scale by dividing it by 1000 so coefficients can be interpreted as the change associated with a $1000 increase or decrease in the value of a "typical" home.

Change in Rents is calculated by taking the as the percentage (from 0 to 1) increase in the ZRI (all homes) from December 2011 to December 2016. This calculation occurs at the ZIP Code level. ACS population estimates are used to create a weighted average for each PHA.

File Construction

For some research questions, we combine elements from various sources to construct analytic files. We construct three files for analysis. The discussion of specific measures constructed for analysis is discussed in the Data Analysis section.

Project-Based Voucher-Assisted Households (2009, 2016)

We create a household-level dataset of all households who received PBV assistance through the HCV program in 2009 and 2016, as recorded in the PIC dataset provided by HUD for the retrospective MTW evaluation. The file includes information on the characteristics of assisted households and the census tracts in which they lived. We calculate total households receiving PBV assistance in those years by PHA for MTW agencies and comparison traditional agencies.

PIC data indicate whether a household was served through public housing, PBVs, TBVs, Section 8 rental certificates, homeownership vouchers, or the moderate rehabilitation program. Program assistance is documented in PIC differently for MTW and traditional PHAs: the MTW PIC data include a single variable indicating program type for each household (MTW 50058 field 1c), while traditional PHA data include a variable identifying whether households received a voucher of any type or lived in a public housing unit, as well as a separate sub-code for the type of voucher received (50058 section 11 and section 12). For the MTW evaluation, we create a single program identification variable that reconciles these two different reporting approaches and allows us to identify all PBV-assisted households at each agency.

Merging the Office of Public and Indian Housing Information Center, National Housing Preservation Database, and Rental Assistance Demonstration Data

Taking this PIC extract from 2009 and 2016, we merge in address information from HUD for PBV- and TBV-assisted households at MTW PHAs to identify, for 2016 only, all households at MTW PHAs living in RAD-converted properties and in LIHTC properties.

Identifying the overlap of assistance with RAD. We use the RAD First Component data to gather the PIC Development Numbers of all RAD PBV properties that had closed or finished the RAD conversion process by the end of 2016. We then use address information for 2012 to 2016 for public housing households at MTW PHAs. The address information has latitude and longitude coordinates of public housing households, along with the PIC Development Number for the properties where they are housed. We use the PIC data and the RAD data, linking by PIC Development Number, to create a full list of latitude and longitude coordinates of public housing properties that converted to PBV through RAD and had closed by the end of 2016. We then combine this list of latitude and longitude coordinates of RAD properties with 2016 PIC addresses for MTW PBV and MTW

TBV households to identify which households were living in RAD properties in 2016.

Identifying the overlap of assistance with LIHTC. We map MTW PBV and MTW TBV households in 2016, using PIC address information, with all LIHTC properties between 1987 and 2015 with active LIHTC tax credits using the NHPD. We then use radius matching to identify all households within a 200-foot radius of LIHTC properties. We identify households located within the radius as living in an LIHTC property.

Neighborhood-Level Dataset

To understand location outcomes (research questions 4 and 5), we create a dataset in which the unit of observation is the census tract. The analytic sample begins with the dataset of PBV-assisted households for the years 2009 and 2016, aggregated to the census-tract level. We combine these data with neighborhood characteristics from the ACS and AFFH. The ACS and AFFH data are defined at the census-tract-level; we also aggregate these data to county. The resulting dataset contains all census tracts with assisted households in 2009 and 2016, the characteristics of both the census tract and county and the number of households in each tract by both assistance type and race and ethnicity. As a next step, we exclude from our analysis all traditional PHAs with fewer than 750 assisted households.

The neighborhood-level dataset is used to answer research question 4. These data are then aggregated to the PHA-level for use in research question 5.

Public Housing Agency-Level Dataset

To identify PHA housing market characteristics, we create a PHA-level dataset using a combination of PIC, Zillow, and small-area fair market rent (SAFMR) data. Zillow and SAFMR data describing local housing markets are defined at the ZIP Code-level. We mapped ZIP Codes to PHAs using the PIC dataset provided by HUD. We then aggregate the Zillow and SAFMR data to the PHA level by taking a population-weighted average. Next, we aggregate the neighborhood-level dataset, described above, to the PHA-level with neighborhood characteristics weighted by the number of households in each census tract.

The PHA-level dataset is used to answer research questions 2 and 5. It includes PIC data on 765 PHAs. Of these, 31 MTW agencies and 261 comparison PHAs are included in both the research question 2 and research question 5 analyses. These agencies had PBVs in 2016 and are covered by the Zillow, REAC, and AFFH datasets. These 292 agencies are included in the regressions for both research question 2 and research question 5. The analysis for research question 2 includes three MTW agencies and 151 comparison with no PBVs in 2016 that are not included in the analysis for research question 5. The analysis for research question 5 includes 4 MTW agencies and 150 comparison agencies that have PBVs but were not included in research question 2 because either REAC or Zillow data was unavailable.

Traditional Public Housing Agency Comparison Group

As discussed in detail in “A Picture of Moving to Work Agencies’ Housing Assistance,” MTW PHAs appear to have more in common with the 788 traditional PHAs who assisted 750 or more households in 2016 than with the remaining, smaller traditional PHAs (see exhibit B.1 for characteristics of MTW agencies and traditional PHAs with 750 or more assisted households). Actual sample sizes may vary for individual analyses based on data quality and availability. Second, ZIP Code-level housing market data and tract-level ACS and AFFH data were not available for all PHAs. Sample sizes are included in all tables.

Defining Housing Markets

PIC household data includes both census tract and ZIP Code for each assisted household. From this data, we create lists of ZIP Codes served by each PHA. Characteristics of the housing market from Zillow are defined by ZIP Code. Because these market characteristics define the entire jurisdiction, we weight ZIP Codes using population estimates drawn from the ACS.

Appendix B: Additional Results

This appendix presents additional detailed results from the quantitative research questions.

Research Question 1: How extensively do Moving to Work agencies use project-based vouchers?

Exhibit B.1 Project-Based Voucher Use at Moving to Work Agencies, by Agency

PHA	Total Households (2016)	PBV (2016)	TBV (2016)	PH (2016)	Other (2016)	Budget Authority to PBVs (1/2017)	RAD PBV Units (up to 12/2016)	RAD PBRA Units (up to 12/2016)	# of Activities Using MTW PBV Flexibility* (2015)	Any Activity Using PBVs** (2016)
Alaska Housing Finance Corporation	6,997	160 (2.2%)	5,351 (76.5%)	1,375 (19.7%)	111 (1.6%)	3.1%	0	0	3	4
Atlanta Housing Authority	18,263	5,527 (30.3%)	8,411 (46.1%)	4,290 (23.5%)	35 (0.2%)	25.7%	149	0	12	12
Housing Authority of Baltimore City	26,295	1,950 (7.4%)	15,125 (57.5%)	8,798 (33.5%)	422 (1.6%)	10.4%	0	2,533	6	6
Boulder Housing Partners	1,288	417 (32.4%)	822 (63.8%)	49 (3.8%)	0	41.1%	135	0	1	2
Cambridge Housing Authority	6,431	3,240 (50.4%)	2,102 (32.7%)	970 (15.1%)	119 (1.9%)	67.1%	1,150	0	1	4
Housing Authority of Champaign County	2,055	148 (7.2%)	1,486 (72.3%)	401 (19.5%)	20 (1.0%)	17.2%	145	0	1	1
Charlotte Housing Authority	9,475	1,824 (19.3%)	5,453 (57.6%)	2,195 (23.2%)	3 (0.03%)	26.4%	1,350	0	0	3
Chicago Housing Authority	66,210	4,105 (6.2%)	43,235 (65.3%)	17,183 (26.0%)	1,687 (2.5%)	8.6%	2,083	0	2	5
Housing Authority of Columbus, Georgia	3,741	436 (11.7%)	2,376 (63.5%)	849 (22.7%)	80 (2.1%)	21.7%	783	0	0	0
Delaware State Housing Authority	1,523	0	969 (63.6%)	554 (36.4%)	0	0	0	0	0	0
District of Columbia Housing Authority	19,020	1,408 (7.4%)	10,273 (54.0%)	6,860 (36.1%)	479 (2.5%)	14.6%	0	0	1	1

(continued)

Exhibit B.1 Project-Based Voucher Use at Moving to Work Agencies, by Agency *(continued)*

PHA	Total Households (2016)	PBV (2016)	TBV (2016)	PH (2016)	Other (2016)	Budget Authority to PBVs (1/2017)	RAD PBV Units (up to 12/2016)	RAD PBRA Units (up to 12/2016)	# of Activities Using MTW PBV Flexibility* (2015)	Any Activity Using PBVs** (2016)
Fairfax County Redevelopment and Housing Authority	5,339	434 (8.1%)	3,829 (71.7%)	1,065 (19.9%)	11 (0.2%)	13.1%	0	0	0	1
Holyoke Housing Authority	2,361	58 (2.5%)	1,242 (52.6%)	938 (39.7%)	123 (5.2%)	7.1%	88	0	1	3
Keene Housing	779	370 (47.5%)	402 (51.6%)	0	7 (0.9%)	0	0	0	2	4
King County Housing Authority	14,991	2,164 (14.4%)	10,528 (70.2%)	2,299 (15.3%)	0	23.6%	0	0	2	6
Lawrence-Douglas County Housing Authority	1,263	0	857 (67.9%)	406 (32.1%)	0	0	0	0	0	0
Lexington-Fayette Urban County Housing Authority	4,172	201 (4.8%)	2,834 (67.9%)	1,103 (26.4%)	34 (0.8%)	6.6%	206	0	0	0
Lincoln Housing Authority	3,814	58 (1.5%)	3,399 (89.1%)	357 (9.4%)	0	2.0%	0	0	1	1
Louisville Metropolitan Housing Authority	14,416	1 (0.01%)	9,593 (66.5%)	4,499 (31.2%)	323 (2.2%)	0	0	0	0	0
Massachusetts Department of Housing and Community Development	23,570	3,236 (13.7%)	19,314 (81.9%)	0	1,020 (4.3%)	0	0	0	2	4
Minneapolis Public Housing Authority	12,425	801 (6.4%)	4,697 (37.8%)	6,620 (53.3%)	307 (2.5%)	12.8%	0	0	0	2
Housing Authority of the City of New Haven	5,990	854 (14.3%)	2,989 (49.9%)	2,036 (34.0%)	111 (1.9%)	9.8%	516	0	3	5
Oakland Housing Authority	14,349	2,159 (15.0%)	10,239 (71.4%)	1,633 (11.4%)	318 (2.2%)	14.5%	0	0	9	11
Orlando Housing Authority	5,206	56 (1.1%)	3,569 (68.6%)	1,471 (28.3%)	110 (2.1%)	0	0	0	0	0
Philadelphia Housing Authority	32,036	1,864 (5.8%)	15,774 (49.2%)	13,463 (42.0%)	935 (2.9%)	10.8%	789	0	0	0
Housing Authority of the City of Pittsburgh	9,810	377 (3.8%)	5,385 (54.9%)	4,040 (41.2%)	8 (0.1%)	7.4%	0	0	0	0
Portage Metropolitan Housing Authority	2,213	186 (8.4%)	1,522 (68.8%)	337 (15.2%)	168 (7.6%)	10.5%	0	0	1	1

(continued)

Exhibit B.1 Project-Based Voucher Use at Moving to Work Agencies, by Agency *(continued)*

PHA	Total Households (2016)	PBV (2016)	TBV (2016)	PH (2016)	Other (2016)	Budget Authority to PBVs (1/2017)	RAD PBV Units (up to 12/2016)	RAD PBRA Units (up to 12/2016)	# of Activities Using MTW PBV Flexibility* (2015)	Any Activity Using PBVs** (2016)
Home Forward (Portland, OR)	12,358	0	9,585 (77.6%)	2,176 (17.6%)	597 (4.8%)	25.2%	0	0	1	1
Housing Authority of the City of Reno	3,260	64 (2.0%)	2,379 (73.0%)	816 (25.0%)	1 (0.03%)	0	0	0	2	5
San Antonio Housing Authority	20,571	21 (0.1%)	13,678 (66.5%)	6,562 (31.9%)	310 (1.5%)	0	0	0	1	1
Housing Authority of the County of San Bernardino	11,218	1,731 (15.4%)	8,819 (78.6%)	592 (5.3%)	76 (0.7%)	19.6%	657	0	1	1
San Diego Housing Commission	15,857	570 (3.6%)	15,039 (94.8%)	176 (1.1%)	72 (0.5%)	3.7%	0	0	3	6
Housing Authority of the County of San Mateo	4,453	2 (0.04%)	4,406 (98.9%)	30 (0.7%)	15 (0.3%)	24.8%	0	0	4	7
Housing Authority of the County of Santa Clara/ Housing Authority of the City of San Jose	16,034	1,354 (8.4%)	14,594 (91.0%)	4 (0.02%)	82 (0.5%)	7.0%	0	0	3	7
Seattle Housing Authority	15,141	3,603 (23.8%)	4,937 (32.6%)	6,054 (40.0%)	547 (3.6%)	33.0%	0	0	1	2
Tacoma Housing Authority	5,163	1,246 (24.1%)	3,371 (65.3%)	425 (8.2%)	121 (2.3%)	16.7%	456	0	1	2
Tulare County Housing Authority	4,182	15 (0.4%)	3,341 (79.9%)	826 (19.8%)	0	0	0	0	0	0
Vancouver Housing Authority	3,149	630 (20.0%)	2,514 (79.8%)	0	5 (0.2%)	13.3%	212	0	2	2
MTW PHAs	425,418	41,270 (9.7%)	274,439 (64.5%)	101.452 (23.8%)	8,257 (1.9%)	13.1%	8,719	2,553	67	110
Comparison Traditional PHAs	2,609,445	105,669 (4.0%)	1,715,911 (65.8%)	750,366 (28.8%)	37,499 (1.4%)	5.4%	18,215	14,781	N/A	N/A

MTW = Moving to Work. N/A = data not available. PBRA = project-based rental assistance. PBV = project-based voucher. PH = public housing. PHA = public housing agency. RAD = Rental Assistance Demonstration. TBV = tenant-based voucher. *Includes activities listed in MTW plans as of 2015 explicitly using MTW PBV flexibilities and identified as such in the unpublished database of MTW activities. **Includes any activities in MTW plans that rely on PBVs, regardless of whether MTW flexibility is required.

Notes: Comparison traditional PHAs are those that served more than 750 total households in 2016. Total households exclude local, non-traditional households. Percent PBV, TBV, and PH across MTW PHAs and traditional PHAs in the last two rows are out of total assisted households. Budget authority devoted to PBVs for all MTW PHAs averages across PHAs. "Other" includes households with a homeownership certificate, moderate rehabilitation, or voucher undefined program type and those with no program type.

Sources: 2016 HUD Office of Public and Indian Housing Information Center data; January 2017 Voucher Management System data; 2013–2016 RAD first component data; MTW 2015 plans

Research Question 2: What factors are associated with Moving to Work and traditional agencies' use of project-based voucher assistance?

Exhibit B.2 presents results of alternative versions of the model described in our discussion of research methods in the body of the report. For comparison, the results from exhibit 4.4 are provided here in columns 1 and 4 of exhibit B.2.

To examine project-based voucher (PBV) use, we create an indicator variable equal to 1 if an agency has any PBV units and zero otherwise. Results appear in columns 2 and 5. To examine the intensity of PBV use among agencies with any PBV units, we use the same model presented in our discussion of study design in the body of the report but limit the sample to agencies with PBVs (columns 3 and 6).

We separately examine how the factors listed in exhibit 4.4 affect whether agencies use PBVs at all and the share of assisted families assisted with PBVs. Using the sample of Moving to Work (MTW) and comparison public housing agencies (PHAs), we find that PHAs in areas with higher rents are more likely to use PBVs at all and to use PBVs more extensively. PHAs with a greater share of households in public housing in 2009 are less likely to have had any PBVs in 2016, but agencies with lower Physical Assessment Subsystem (PASS) scores in 2008 were more likely to have PBVs in 2016. Neither factor (the share of public housing assistance and PASS scores) strongly predicted the share of households assisted with PBVs.

We find that PHAs in areas with higher rents are more likely to use PBVs at all and to use PBVs more extensively. PHAs with a greater share of households in public housing in 2009 are less likely to have had any PBVs in 2016, but agencies with lower PASS scores in 2008 were more likely to have PBVs in 2016. Neither factor (the share of public housing assistance and PASS scores) were predictive of the share of households assisted with PBVs.

Exhibit B.2 Model Results: Factors Related to the Use of Any Project-Based Vouchers and to the Percent of Assisted Households With Project-Based Vouchers at Agencies with Any Project-Based Vouchers

	MTW and Comparison Traditional PHAs			MTW Agencies		
	Percent of Assisted Households with a PBV	Agency Uses Any PBV	Percent of Households with a PBV if Agency Uses Any PBVs	Percent of Assisted Households with a PBV	Agency Uses Any PBV	Percent of Households with a PBV if Agency Uses Any PBVs
	(1)	(2)	(3)	(4)	(5)	(6)
Percent Public Housing (2009)	-0.011	-0.317***	0.007	-0.019	-0.528	0.003
	(0.018)	(0.116)	(0.033)	(0.232)	(0.446)	(0.248)
REAC PASS Score (2008)	-0.002*	-0.023***	-0.000	0.000	-0.024	0.002
	(0.001)	(0.006)	(0.001)	(0.006)	(0.015)	(0.007)
Rent Index (2016)	0.040***	0.163**	0.047***	0.093	-0.049	0.098
	(0.013)	(0.074)	(0.017)	(0.091)	(0.110)	(0.096)
Change in Rents (2011 to 2016)	-0.036	0.113	-0.059	-0.264	-0.408	-0.248
	(0.028)	(0.203)	(0.040)	(0.206)	(0.429)	(0.225)
South	-0.009	-0.151***	-0.004	-0.169*	-0.131	-0.159
	(0.010)	(0.056)	(0.014)	(0.093)	(0.117)	(0.094)

(continued)

Exhibit B.2 Model Results: Factors Related to the Use of Any Project-Based Vouchers and to the Percent of Assisted Households With Project-Based Vouchers at Agencies with Any Project-Based Vouchers *(continued)*

	MTW and Comparison Traditional PHAs			MTW Agencies		
	Percent of Assisted Households with a PBV	Agency Uses Any PBV	Percent of Households with a PBV if Agency Uses Any PBVs	Percent of Assisted Households with a PBV	Agency Uses Any PBV	Percent of Households with a PBV if Agency Uses Any PBVs
	(1)	(2)	(3)	(4)	(5)	(6)
Midwest	-0.008	-0.146**	-0.005	-0.173*	-0.152	-0.171
	(0.010)	(0.068)	(0.013)	(0.100)	(0.206)	(0.106)
West	-0.000	-0.082	0.002	-0.131	-0.063	-0.128
	(0.011)	(0.065)	(0.014)	(0.113)	(0.084)	(0.116)
Percent of Households in PBVs in 2009	1.181***	4.436***	0.979***	1.019***	1.862	0.908**
	(0.143)	(0.657)	(0.147)	(0.365)	(1.195)	(0.413)
Constant	-0.024	0.937***	-0.059	0.001	1.886***	-0.054
	(0.033)	(0.277)	(0.047)	(0.300)	(0.621)	(0.322)
	446	446	292	34	34	31

* p<0.10, ** p<0.05, *** p<0.01.

MTW = Moving to Work. PBV = project-based voucher. PHA = public housing agency. REAC = Real Estate Assessment Center.

Notes: Samples include MTW agencies and traditional PHAs with at least 750 households in 2016, and for whom both REAC and Zillow data were available. For MTW PHAs, Alaska Housing Finance Corporation, Massachusetts Department of Housing and Community Development, and the Holyoke and Champaign County housing authorities are excluded. The housing authorities of the City of San Jose and County of Santa Clara report jointly into Public and Indian Housing Information Center and are listed here as a single PHA. Standard errors are heteroskedastic robust and displayed in parentheses.

Research Question 3: To what extent are Moving to Work agencies' project-based vouchers located in Rental Assistance Demonstration or Low-Income Housing Tax Credit properties?

EXHIBIT B.3 Project-Based and Tenant-Based Voucher Assistance at Moving to Work Agencies by Location in Rental Assistance Demonstration or Low-Income Housing Tax Credit Properties, 2016

	MTW PBVs					MTW TBVs				
MTW Agency Name	Total PBV Households (2016)	No Location in RAD or LIHTC	Location in RAD Only	Location in LIHTC Only	Location in RAD and LIHTC	Total TBV Households (2016)	No Location in RAD or LIHTC	Location in RAD Only	Location in LIHTC Only	Location in RAD and LIHTC
Alaska Housing Finance Corporation	160	160 (100%)	0	0	0	5,351	5,079 (94.9%)	0	272 (5.1%)	0
Atlanta Housing Authority	5,527	3,688 (66.7%)	0	1,839 (33.3%)	0	8,411	8,048 (95.7%)	0	363 (4.3%)	0
Housing Authority of Baltimore City	1,950	1,289 (66.1%)	0	661 (33.9%)	0	15,125	14,565 (96.3%)	0	560 (3.7%)	0
Boulder Housing Partners	417	258 (61.9%)	136 (32.6%)	23 (5.5%)	0	822	756 (92.0%)	0	66 (8.0%)	0
Cambridge Housing Authority	3,240	1,545 (47.7%)	847 (26.1%)	785 (24.2%)	63 (1.9%)	2,102	1,907 (90.7%)	14 (0.7%)	180 (8.6%)	1 (0.05%)
Housing Authority of Champaign County	148	101 (68.2%)	38 (25.7%)	9 (6.1%)	0	1,486	1,478 (99.5%)	4 (0.3%)	4 (0.3%)	0
Charlotte Housing Authority	1,824	470 (25.8%)	1,060 (58.1%)	12 (0.7%)	282 (15.5%)	5,453	5,034 (92.3%)	255 (4.7%)	162 (3.0%)	2 (0.04%)
Chicago Housing Authority	4,105	1,359 (33.1%)	1,452 (35.4%)	1,277 (31.1%)	17 (0.4%)	43,235	40,532 (93.7%)	0	2,703 (6.3%)	0
Housing Authority of Columbus, Georgia	436	209 (47.9%)	227 (52.1%)	0	0	2,376	2,242 (94.4%)	42 (1.8%)	92 (3.9%)	0
Delaware State Housing Authority	0	0	0	0	0	969	886 (91.4%)	0	83 (8.6%)	0
District of Columbia Housing Authority	1,408	1,143 (81.2%)	0	265 (18.8%)	0	10,273	9,349 (91.0%)	0	924 (9.0%)	0
Fairfax County Redevelopment and Housing Authority	434	407 (93.8%)	0	27 (6.2%)	0	3,829	3,510 (91.7%)	0	319 (8.3%)	0
Holyoke Housing Authority	58	58 (100%)	0	0	0	1,242	1,109 (89.3%)	0	133 (10.7%)	0

(continued)

Exhibit B.3 Project-Based and Tenant-Based Voucher Assistance at Moving to Work Agencies by Location in Rental Assistance Demonstration or Low-Income Housing Tax Credit Properties, 2016 *(continued)*

	MTW PBVs					MTW TBVs				
MTW Agency Name	Total PBV Households (2016)	No Location in RAD or LIHTC	Location in RAD Only	Location in LIHTC Only	Location in RAD and LIHTC	Total TBV Households (2016)	No Location in RAD or LIHTC	Location in RAD Only	Location in LIHTC Only	Location in RAD and LIHTC
Keene Housing	370	370 (100%)	0	0	0	402	371 (92.3%)	0	31 (7.7%)	0
King County Housing Authority	2,164	1,838 (84.9%)	0	326 (15.1%)	0	10,528	9,599 (91.2%)	0	929 (8.8%)	0
Lawrence-Douglas County Housing Authority	0	0	0	0	0	857	821 (95.8%)	0	36 (4.2%)	0
Lexington-Fayette Urban County Housing Authority	201	5 (2.5%)	196 (97.5%)	0	0	2,834	2,768 (97.7%)	3 (0.1%)	63 (2.2%)	0
Lincoln Housing Authority	58	58 (100%)	0	0	0	3,399	2,890 (85.0%)	0	509 (15.0%)	0
Louisville Metropolitan Housing Authority	1	1 (100%)	0	0	0	9,593	8,808 (91.8%)	0	785 (8.2%)	0
Massachusetts Department of Housing and Community Development	3,236	2,466 (76.2%)	0	770 (23.8%)	0	19,314	18,129 (93.9%)	0	1,185 (6.1%)	0
Minneapolis Public Housing Authority	801	559 (69.8%)	0	242 (30.2%)	0	4,697	4,005 (85.3%)	0	692 (14.7%)	0
Housing Authority of the City of New Haven	854	549 (64.3%)	223 (26.1%)	57 (6.7%)	25 (2.9%)	2,989	2,807 (93.9%)	12 (0.4%)	163 (5.5%)	7 (0.2%)
Oakland Housing Authority	2,159	1,546 (71.6%)	0	613 (28.4%)	0	10,239	9,629 (94.0%)	0	610 (6.0%)	0
Orlando Housing Authority	56	56 (100%)	0	0	0	3,569	3,247 (91.0%)	0	322 (9.0%)	0
Philadelphia Housing Authority	1,864	1,105 (59.3%)	0	759 (40.7%)	0	15,774	15,259 (96.7%)	14 (0.1%)	501 (3.2%)	0
Housing Authority of the City of Pittsburgh	377	330 (87.5%)	0	47 (12.5%)	0	5,385	5,169 (96.0%)	0	216 (4.0%)	0
Portage Metropolitan Housing Authority	186	153 (82.3%)	0	33 (17.7%)	0	1,522	1,442 (94.7%)	0	80 (5.3%)	0
Home Forward (Portland, OR)	0	0	0	0	0	9,585	7,761 (81.0%)	0	1,824 (19.0%)	0

(continued)

Exhibit B.3 Project-Based and Tenant-Based Voucher Assistance at Moving to Work Agencies by Location in Rental Assistance Demonstration or Low-Income Housing Tax Credit Properties, 2016 *(continued)*

	MTW PBVs					MTW TBVs				
MTW Agency Name	Total PBV Households (2016)	No Location in RAD or LIHTC	Location in RAD Only	Location in LIHTC Only	Location in RAD and LIHTC	Total TBV Households (2016)	No Location in RAD or LIHTC	Location in RAD Only	Location in LIHTC Only	Location in RAD and LIHTC
Housing Authority of the City of Reno	64	62 (96.9%)	0	2 (3.1%)	0	2,379	2,138 (89.9%)	0	241 (10.1%)	0
San Antonio Housing Authority	21	21 (100%)	0	0	0	13,678	12,625 (92.3%)	0	1,053 (7.7%)	0
Housing Authority of the County of San Bernardino	1,731	980 (56.6%)	751 (43.4%)	0	0	8,819	8,570 (97.2%)	12 (0.1%)	237 (2.7%)	0
San Diego Housing Commission	570	198 (34.7%)	0	372 (65.3%)	0	15,039	13,553 (90.1%)	0	1,486 (9.9%)	0
Housing Authority of the County of San Mateo	2	1 (50.0%)	0	1 (50.0%)	0	4,406	3,788 (86.0%)	0	618 (14.0%)	0
Housing Authority of the County of Santa Clara/ Housing Authority of the City of San Jose	1,354	947 (69.9%)	0	407 (30.1%)	0	14,594	12,708 (87.1%)	0	1,886 (12.9%)	0
Seattle Housing Authority	3,603	1,906 (52.9%)	0	1,697 (47.1%)	0	4,937	3,691 (74.8%)	0	1,246 (25.2%)	0
Tacoma Housing Authority	1,246	804 (64.5%)	146 (11.7%)	296 (23.8%)	0	3,371	3,077 (91.3%)	0	294 (8.7%)	0
Tulare County Housing Authority	15	15 (100%)	0	0	0	3,341	3,053 (91.4%)	0	288 (8.6%)	0
Vancouver Housing Authority	630	282 (44.8%)	271 (43.0%)	77 (12.2%)	0	2,514	2,320 (92.3%)	26 (1.0%)	168 (6.7%)	0
MTW Agencies	41,270	24,939 (60.4%)	5,347 (13.0%)	10,597 (25.7%)	387 (0.9%)	274,439	252,723 (92.1%)	382 (0.1%)	21,324 (7.8%)	10 (0.004%)

LIHTC = Low-Income Housing Tax Credit. MTW = Moving to Work. PBV = project-based voucher. RAD = Rental Assistance Demonstration. TBV = tenant-based voucher.

Notes: LIHTC counts only include LIHTC properties between 1987 and 2015 with active tax credits. Overlap for all MTW public housing agencies (PHAs) is out of total households at MTW PHAs, rather than averages across PHAs.

Sources: 2016 HUD Office of Public and Indian Housing Information Center data; 2013–2016 RAD First Component data; 1987–2015 National Housing Preservation Database data

Research Question 4: Are project-based vouchers at Moving to Work agencies in lower-poverty, higher-quality neighborhoods? Do project-based voucher locations vary by household race or ethnicity?

Analysis of Correlation Between Neighborhood Measures

Exhibit B.4 displays the results of a correlation analysis of the county-normalized neighborhood measures and shows that the indices provide unique information; correlations have absolute values as low as 0.01.

Generally, we find positive relationships between the fraction of the population with a bachelor's degree, labor force participation rate, labor market engagement index, environmental health index, and school proficiency index. The relationships between percent with a bachelor's degree, labor force participation, and labor market engagement are relatively strong, with correlations ranging from 0.29 to 0.82. Not surprisingly, neighborhoods with higher levels of education tend to have higher levels of labor force participation and labor market engagement. There is also a strong relationship between percent with a bachelor's degree and school proficiency Index.

The relationships between these metrics and the environmental health index are weaker, ranging from -0.01 to 0.18. We also find a positive relationship between the poverty rate and transportation costs index (0.40). This likely reflects the prevalence of high-poverty neighborhoods within the urban core of cities and therefore providing shorter commutes and better access to public transit. Poverty and transportation costs tend to be negatively correlated with other measures of neighborhood quality. The lone exception is a marginally positive (0.01) correlation between percent with a bachelor's degree and transportation costs. Gourevitch, Greene, and Pendall (2018) note that the people living below the poverty line tend to live in census tracts that score better on the transportation cost index and that the transportation cost index is strongly associated with being in a metropolitan area and is inversely correlated with the environmental hazards.

Exhibit B.4 Correlation Matrix for Neighborhood Quality Measures

	Poverty Rate	Percent with Bachelor's Degree	Labor Force Participation	Labor Market Engagement Index	Environmental Health Index	School Proficiency Index	Transportation Cost Index
Poverty Rate	1.00						
Percent with Bachelor's Degree	-0.51	1.00					
Labor Force Participation	-0.37	0.29	1.00				
Labor Market Engagement Index	-0.62	0.82	0.46	1.00			
Environmental Health Index	-0.29	0.009	-0.01	0.13	1.00		
School Proficiency Index	-0.47	0.53	0.19	0.54	0.18	1.00	
Transportation Cost Index	0.40	-0.04	-0.05	-0.15	-0.39	-0.17	1.00

Note: Table displays the correlation between neighborhood quality measures at the census tract level.

Source: Authors' calculations based on data from American Community Survey and Affirmatively Furthering Fair Housing

Supplemental Exhibits

Exhibit B.5 displays the calculation of county-normalized poverty rates for MTW agencies. The county normalized poverty rate is calculated as the ratio of the average neighborhood poverty rate across PBV-assisted households divided by the average poverty rate in the county in which the plurality of assisted households lives. For example, row 1 shows the poverty rate in the consolidated city-borough of Anchorage, Alaska, was 8.1 percent in 2016. The average PBV-assisted household lived in a census tract with a poverty rate of 17.4 percent. The county-normalized poverty measure is (0.174/0.081)=2.148.

Exhibit B.5 County-Normalized Average Poverty Rate for Project-Based Voucher Locations by Moving to Work Agency, 2016

MTW Agency	County Average Poverty Rate	Average Poverty for PBV Locations	
		Poverty Rate	County-Normalized
Alaska Housing Finance Corporation	8%	17%	2.15
Atlanta Housing Authority	19%	36%	1.84
Housing Authority of Baltimore City	23%	27%	1.18
Boulder Housing Partners	13%	23%	1.72
Cambridge Housing Authority	8%	21%	2.00
Housing Authority of Champaign County	20%	26%	1.30
Charlotte Housing Authority	15%	22%	1.44
Chicago Housing Authority	17%	33%	1.90
Housing Authority of Columbus, Georgia	21%	50%	2.36
Delaware State Housing Authority	13%	n/a	n/a
District of Columbia Housing Authority	18%	32%	1.79
Fairfax County Redevelopment and Housing Authority	6%	8%	1.41
Holyoke Housing Authority	18%	26%	1.47
Keene Housing	11%	16%	1.45
King County Housing Authority	11%	14%	1.34
Lawrence-Douglas County Housing Authority	19%	n/a	n/a
Lexington-Fayette Urban County Housing Authority	22%	41%	1.88
Lincoln Housing Authority	15%	43%	2.90
Louisville Metropolitan Housing Authority	17%	41%	2.41
Massachusetts Department of Housing and Community Development	18%	20%	1.52
Minneapolis Public Housing Authority	12%	29%	2.32
Housing Authority of the City of New Haven	13%	28%	2.18
Oakland Housing Authority	12%	28%	2.27
Orlando Housing Authority	18%	47%	2.67
Philadelphia Housing Authority	26%	36%	1.39
Housing Authority of the City of Pittsburgh	13%	35%	2.71
Portage Metropolitan Housing Authority	15%	23%	1.51
Home Forward (Portland, OR)	17%	n/a	n/a
Housing Authority of the City of Reno	15%	19%	1.26
San Antonio Housing Authority	19%	31%	1.67
Housing Authority of the County of San Bernardino	20%	28%	1.41
San Diego Housing Commission	14%	28%	2.02
Housing Authority of the County of San Mateo	8%	14%	1.89

(continued)

Exhibit B.5 County-Normalized Average Poverty Rate for Project-Based Voucher Locations by Moving to Work Agency, 2016 *(continued)*

MTW Agency	County Average Poverty Rate	Average Poverty for PBV Locations	
		Poverty Rate	County-Normalized
Housing Authority of the County of Santa Clara/Housing Authority of the City of San Jose	9%	13%	1.40
Seattle Housing Authority	11%	21%	2.02
Tacoma Housing Authority	13%	38%	2.95
Tulare County Housing Authority	28%	31%	1.09
Vancouver Housing Authority	11%	20%	1.84

MTW = Moving to Work. PBV = project-based voucher.

Note: Table compares county poverty rate, the average poverty rate of census tracts with PBV units (weighted by the number of units), and the county normalized poverty rate for PBV units.

To understand whether differences between PBV and tenant-based voucher (TBV) or PBV and public housing location followed a similar pattern at MTW and comparison agencies, we calculated net differences that are displayed in exhibit B.6. In general, the differences in location characteristics between programs are the same at MTW and comparison agencies. The difference between the average environmental health index in TBV and in PBV neighborhoods is greater at MTW agencies, however.

Exhibit B.6 Qualities of Project-Based Voucher Neighborhoods in Relation to Tenant-Based Voucher and Public Housing Neighborhoods at Moving to Work and Traditional Public Housing Agencies Displayed as Net Differences

	Means		Net Differences (p-values)	
	MTW PBV	Traditional PBV	(MTW PBV - TBV) - (Traditional PBV - TBV)	(MTW PBV - PH) - (Traditional PBV - PH)
Poverty Rate	1.85	1.67	0.12	0.08
			(0.228)	(0.539)
Percent with Bachelor's Degree	0.83	0.74	0.08	0.01
			(0.197)	(0.927)
Labor Force Participation	0.96	0.97	0.01	0.00
			(0.492)	(0.976)
Labor Market Engagement Index	0.67	0.69	0.02	-0.05
			(0.792)	(0.547)
Environmental Health Index	0.61	0.77	-0.11**	-0.04
			(0.016)	(0.458)
School Proficiency Index	0.71	0.67	0.04	0.00
			(0.397)	(0.979)
Transportation Cost Index	1.24	1.14	0.03	0.02
			(0.412)	(0.737)

* p<0.10, ** p<0.05, *** p<0.01.

MTW = Moving to Work. PBV = project-based voucher. PH = public housing. TBV = tenant-based voucher.

Notes: Tables display the net difference in county-normalized rates-poverty rates normalized by the average poverty rate in the region (county). The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in the HUD Office of Public and Indian Housing Information Center data are reported jointly and listed here as a single public housing agency. Household race and ethnicity are determined by the household head.

Exhibit 4.9 displays average neighborhood characteristics for PBV locations by race/ethnicity and assisted housing program, specifically displaying the poverty rate, share of the population with a bachelor's degree, environmental health index, and transportation cost index. Exhibit B.7 provides a supplement. It displays the labor force participation rate, labor market engagement index, and school proficiency index by program and race/ethnicity.

Exhibit B.7 Supplemental County-Normalized Measures of Neighborhood Quality for Assisted Households at Moving to Work Agencies by Program and Race/Ethnicity, 2016

	Means			Differences (p-value)	PHAs	Differences (p-value)	PHAs
	PBV	TBV	PH	PBV - TBV		PBV - PH	
Labor force participation							
Black (non-Hispanic)	0.96	0.97	0.93	-0.01	35	0.03	31
				(0.293)		(0.088)	
Hispanic	0.96	0.99	0.96	-0.03	34	-0.01	31
				(0.009)		(0.655)	
White (non-Hispanic)	0.97	1.00	0.97	-0.02	33	0.00	30
				(0.095)		(0.937)	
Labor market engagement index							
Black (non-Hispanic)	0.68	0.68	0.56	0.00	35	0.09	31
				(0.893)		(0.041)	
Hispanic	0.70	0.71	0.67	-0.01	34	0.02	31
				(0.741)		(0.632)	
White (non-Hispanic)	0.81	0.84	0.76	-0.03	33	0.04	30
				(0.551)		(0.552)	
School Proficiency Index							
Black (non-Hispanic)	0.69	0.65	0.64	0.04	35	0.02	31
				(0.373)		(0.661)	
Hispanic	0.83	0.82	0.75	0.01	33	0.07	30
				(0.868)		(0.207)	
White (non-Hispanic)	0.70	0.68	0.70	0.01	34	-0.02	31
				(0.75)		(0.759)	

* p<0.10, ** p<0.05, *** p<0.01.

PBV = project-based voucher. PH = public housing. PHA = public housing agency. TBV = tenant-based voucher.

Notes: All statistics are normalized to the county mean. Raw values for the labor market engagement index are national percentile ranks with higher values signifying better outcomes; school proficiency index is percentile ranked at the state level. Additional measures appear in appendix B.9. This exhibit excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any PBV units. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in the HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single PHA.

Exhibit B.8 provides a comparison of PBV neighborhood characteristics in 2009 and 2016, by race and ethnicity. **Among the 24 MTW PHAs with PBVs in both 2009 and 2016, PBVs are in lower-poverty neighborhoods in 2016 than they were in 2009**. The share of MTW-assisted households served with PBVs grew from an average of 3 percent in 2009 to an average of 11 in 2016. Between 2009 and 2016, the average county-normalized neighborhood poverty fell from 2.1 to 1.8.

Exhibit B.8 Difference in County-Normalized Measures of Neighborhood Quality for Assisted Households at Moving to Work Agencies by Program and Race/Ethnicity, 2009 and 2016

	Means		Differences	Number of MTW Agencies
	2009	2016	(p-value)	
Poverty Rate				
All Households	2.07	1.81	-0.26**	24
			(0.032)	
Black (non-Hispanic)	2.09	1.89	-0.20	23
			(0.137)	
Hispanic/Latino	1.98	1.72	-0.26**	22
			(0.03)	
White (non-Hispanic)	1.94	1.61	-0.33**	23
			(0.012)	
Percent with Bachelor's Degree				
All Households	0.79	0.85	0.07	24
			(0.105)	
Black (non-Hispanic)	0.76	0.84	0.08	23
			(0.312)	
Hispanic/Latino	0.76	0.85	0.08	22
			(0.174)	
White (non-Hispanic)	0.97	1.08	0.11	23
			(0.123)	
Labor Force Participation				
All Households	0.90	0.95	0.05***	24
			(0.005)	
Black (non-Hispanic)	0.89	0.96	0.07**	23
			(0.017)	
Hispanic/Latino	0.91	0.96	0.05**	22
			(0.018)	
White (non-Hispanic)	0.92	0.98	0.05**	23
			(0.020)	

* p<0.10, ** p<0.05, *** p<0.01.

MTW = Moving to Work.

Note: The table displays differences in statistics that have been normalized to the county mean. This exhibit excludes Delaware State Housing Authority, Lawrence-Douglas County Housing Authority, and Home Forward (Portland, Oregon), who do not have any project-based voucher units. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in the HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single public housing agency. P-values are derived from paired t-tests. Household race and ethnicity are determined by the household head.

Research Question 5: What factors are associated with variation in Moving to Work project-based voucher locations?

We explored alternative versions of the model presented in exhibits 4.10 and 4.11. Specifically, we add the following to the model: identifier variables for census geographic region; average rental prices measured with the Zillow Rent Index (ZRI) in 2016; the percentage change in the ZRI over the 5 years prior to our analysis year (2011 to 2016); residential property values measured by the Zillow Home Value Index (ZHVI) in 2016, and transportation costs measured using the Affirmatively Furthering Fair Housing (AFFH) Low Cost Transportation index.

Sample sizes are reduced due to data availability. For this reason, we only examined this larger set of factors using the larger sample that includes both MTW and comparison agencies. Results appear in exhibits B.9 and B. 10 in columns 3 and 4, with results from exhibits 4.10 and 4.11 repeated in columns 1 and 2 for comparison.

Exhibit B.9 Model Results: Modeling the Average County-Normalized Poverty Rate of Project-Based Voucher Locations with Additional Explanatory Variables

	(1)	(2)	(3)	(4)
Income Inequality	-1.853	-1.392	0.727	-1.783
	(1.432)	(1.133)	(1.902)	(1.574)
Segregation (Dissimilarity Index)	1.457***	0.342	1.787***	0.976***
	(0.290)	(0.223)	(0.357)	(0.279)
County Poverty Rate	-3.894***	0.138	-6.065***	-0.634
	(0.674)	(0.554)	(1.283)	(1.083)
Percent of TBV households in high poverty neighborhoods		1.131***		1.152***
Fraction of PBV units in RAD Properties		(0.079)		(0.102)
Increase in Rents (2011–2016)			0.343	-0.0810
			(0.337)	(0.280)
Property Values (Zillow Home Value Index 2016)			-0.000292	0.0000286
			(0.000)	(0.000)
Transportation Cost Index			0.000360	-0.00197
			(0.003)	(0.003)
South			-0.0356	0.181*
			(0.116)	(0.095)
Midwest			-0.110	0.0985
			(0.140)	(0.109)
West			0.0870	0.232**
			(0.132)	(0.097)
Constant	2.544***	0.438	2.880***	0.447
	(0.584)	(0.454)	(0.927)	(0.780)

(continued)

Exhibit B.9 Model Results: Modeling the Average County-Normalized Poverty Rate of Project-Based Voucher Locations with Additional Explanatory Variables *(continued)*

	(1)	(2)	(3)	(4)
Observations	446	446	343	343

* p<0.10, ** p<0.05, *** p<0.01.

PBV = project-based voucher. RAD = Rental Assistance Demonstration. TBV = tenant-based voucher.

Notes: Outcome variable is the county-normalized poverty rate of PBV neighborhoods in 2016. Samples include public housing agencies (PHAs) with at least 750 households in 2016 and for whom both Real Estate Assessment Center and Zillow data were available. For Moving to Work PHAs, this excludes Alaska Housing Finance Corporation; Massachusetts Department of Housing and Community Development; Holyoke Housing Authority; and Housing Authority of Champaign County. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in the HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single PHA. Standard errors are heteroskedastic robust and displayed in parentheses.

Exhibit B.10 Model Results: Modeling the Percent of Project-Based Vouchers in High-Poverty Neighborhoods with Additional Explanatory Variables

	(1)	(2)	(3)	(4)
Income Inequality	-0.865	-0.430	0.229	-0.308
	(0.659)	(0.584)	(0.878)	(0.748)
Segregation (Dissimilarity Index)	0.856***	0.360***	1.001***	0.646***
	(0.130)	(0.114)	(0.163)	(0.145)
County Poverty Rate	-2.320***	-0.700**	-3.467***	-1.567***
	(0.310)	(0.312)	(0.564)	(0.517)
Percent of TBV households in high poverty neighborhoods		0.942***		0.930***
		(0.077)		(0.096)
Increase in Rents (2011–2016)			0.148	-0.0448
			(0.169)	(0.153)
Property Values (Zillow Home Value Index 2016)			-0.000120	0.0000286
			(0.000)	(0.000)
Transportation Cost Index			0.000472	-0.000767
			(0.001)	(0.001)
South			0.0174	0.102**
			(0.058)	(0.051)
Midwest			0.00192	0.0759
			(0.065)	(0.056)
West			0.0818	0.148***
			(0.064)	(0.054)
Constant	0.729***	0.252	0.902**	0.375
	(0.268)	(0.238)	(0.431)	(0.372)

(continued)

Exhibit B.10 Model Results: Modeling the Percent of Project-Based Vouchers in High-Poverty Neighborhoods with Additional Explanatory Variables *(continued)*

	(1)	(2)	(3)	(4)
Observations	446	446	343	343

* p<0.10, ** p<0.05, *** p<0.01.

TBV = tenant-based voucher.

Notes: Outcome variable is the county-normalized poverty rate of project-based voucher neighborhoods (2016). Samples include public housing agencies (PHAs) with at least 750 households in 2016 and for whom both Real Estate Assessment Center and Zillow data were available. For Moving to Work PHAs, this excludes Alaska Housing Finance Corporation; Massachusetts Department of Housing and Community Development; Holyoke Housing Authority; and Housing Authority of Champaign County. The Housing Authority of the City of San Jose and Housing Authority of the County of Santa Clara household counts in the HUD Office of Public and Indian Housing Information Center data are reported jointly; they are listed here as a single PHA. Standard errors are heteroskedastic robust and displayed in parentheses.

Appendix C: Interview Protocol

Introduction and Consent

Hello, my name is [NAME], and this is my colleague [NAME], and we are members of the Urban Institute (Urban) research team that is conducting the HUD-sponsored evaluation of the MTW Program. The Urban Institute is a non-profit research organization based in Washington, DC.

As part of the assessment, we are speaking with staff from 3 PHAs with substantial PBV activity to better understand how MTW agencies use PBVs.

[NAME OF NOTE TAKER] will be taking notes and with your permission, it will also be recorded. Your participation, and your agency's participation, in this discussion is completely voluntary and we will not be evaluating any particular initiative or effort – but rather describing your activities, goals, opportunities, and challenges using PBVs.

The information collected from these discussions will be used for research purposes only.

Before we get started, do you agree/consent to this interview, and to recording?

Do you have any questions before we begin?

We appreciate your willingness to participate.

Background

- Can you confirm your title/position?
- How long you have been in this position? *[compare date with agency MTW entry]*
- How long have you worked at the agency?

Motivation

- To start, can you tell us a little about your PBV program? (e.g., the size, planning, long term goals)
- How are you using your PBVs?
  - » How would you describe your agency's primary motivation(s) or goals for using PBVs?
  - » We know that MTW activities need to meet one of three statutory objectives: cost-effectiveness, housing choice, and self-sufficiency.
  - » What is the relationship to your activities and the MTW objectives?
  - » How does your PBV program help you meet the statutory objectives for the MTW demonstration? Which objectives does it help you meet?
  - » Does your PBV program help you to meet other goals?
  - » (e.g. targeting opportunity neighborhoods, preserving affordable housing, serving specific populations, providing supportive services, or improving housing quality?
- Has your agency experienced any constraints in using PBVs?
  - » Financing challenges (e.g., property costs, acquiring financing)?
  - » HUD's PBV caps?
  - » Any other concerns?
- How does the agency determine whether to use PBVs versus other housing programs?
  - » What factors influence this decision?
  - » Who is responsible for these decisions?
  - » Did the implementation of HOTMA impact your use of PBVs?
- How do you measure the impact of your PBV program?

- Has your PBV program made an impact on your agency's overall goals?
  - » [If so, how?]

MTW Flexibilities

- We are trying to understand how MTW flexibilities and PBV programs and activities are related. Can you tell me about the process for implementing an MTW PBV activity?
  - » Prompt: Do you look at the flexibilities first and then plan an activity around them? Or do you have an activity you want to do and make it fit the flexibility?
- What MTW flexibilities have helped your agency regarding the use of project-basing? (ex. waiving either of the PBV caps, waitlist options)?
- How have MTW flexibilities influenced decisions to expand PBV use?
  - » Have they allowed you to serve households with more complex needs through your PBV program?
    - ▪ Are you using PBVs to serve homeless populations?
    - ▪ Are you using PBVs to provide supportive services?
  - » Are you are trying to target other populations with your PBV program (or vouchers, generally) (e.g., family composition, age, gender, or race/ethnicity)?
  - » Would these activities have been possible without the use of MTW PBV flexibilities?
- Have you considered implementing any activities that you decided not to? Why?
- Have you encountered any challenges in implementing your PBV activities?
- (*If applicable*) We see from our data that you have **XX RAD** conversions. Why did you choose to use PBVs over PBRAs? (**not applicable for Seattle Housing Authority**)
  - » Has the use of PBVs with RAD specifically impacted housing quality?
- (*If applicable*) Has the use of LIHTC helped to increase access to opportunity neighborhoods?

Partnerships

- Have you developed partnerships with other local organizations to leverage PBV assistance? If so, with whom?
- Have these partnerships helped you to meet mobility, supportive service, special population, or other locally-relevant goals?
- How do these partnerships function?
  - » Do you have MOUs?
- Have you encountered any difficulty partnering with other local organizations? If so, did that impact your decision to implement PBV activities?

Wrap Up

- Is there anything else that we aren't asking that we should be asking? Anything else you would like to share with us?
- Are there any follow up conversations we should have with partners or other staff members?

Thank you for taking this time to meet with us. If there's anything you think of later that you'd like to share, please don't hesitate to e-mail or call us.

Appendix D. Moving to Work Agencies

Alaska Housing Finance Corporation

Atlanta Housing Authority

Housing Authority of Baltimore City

Boulder Housing Partners

Cambridge Housing Authority

Housing Authority of Champaign County

Charlotte Housing Authority

Chicago Housing Authority

Housing Authority of Columbus, Georgia

Delaware State Housing Authority

District of Columbia Housing Authority

Fairfax County Redevelopment and Housing Authority

Holyoke Housing Authority

Keene Housing

King County Housing Authority

Lawrence-Douglas County Housing Authority

Lexington-Fayette Urban County Housing Authority

Lincoln Housing Authority

Louisville Metropolitan Housing Authority

Massachusetts Department of Housing and Community Development

Minneapolis Public Housing Authority

Housing Authority of the City of New Haven

Oakland Housing Authority

Orlando Housing Authority

Philadelphia Housing Authority

Housing Authority of the City of Pittsburgh

Portage Metropolitan Housing Authority

Home Forward (Portland, Oregon)

Housing Authority of the City of Reno

San Antonio Housing Authority

Housing Authority of the County of San Bernardino

San Diego Housing Commission

Housing Authority of the County of San Mateo

Housing Authority of the County of Santa Clara*

Housing Authority of the City of San Jose*

Seattle Housing Authority

Tacoma Housing Authority

Tulare County Housing Authority

Vancouver Housing Authority

*The housing authorities of the County of Santa Clara and the City of San Jose submit joint Moving to Work plans and reports.

Appendix E. Inventory of Project-Based Voucher-Related Activities for Case Study Moving to Work Agencies

The initiative descriptions provided in exhibit E.1 are from the 2018 annual Moving to Work (MTW) plans for Boulder Housing Partners, Cambridge Housing Authority, and the Seattle Housing Authority.

Exhibit E.1 Inventory of Mobility-Related Initiatives at Moving to Work Agencies

Initiative	Activity Category	PHA	Status	Year	Description
PBV Waivers	PBV flexibility	Boulder	Ongoing	2018	This activity will combine several approved activities related to the PBV rules, as well as implementing three new elements: Waive the 20 percent cap on PBVs; Definition of excepted units; Waive the competitive bidding process; Rent limits and rent reasonableness; Allow owner/service partner to hold waitlist; Allow BHP staff to conduct Housing Quality Standards inspections at our PBV units; Allow participants who are no longer receiving HAPs to remain on the voucher; Allow participant families to continue to pay rent according to their income.
Allow BHP to commit PBVs to cover 100 percent of the units at converted public housing developments	Development	Boulder	Closed	2012	This initiative will project base 100 percent of replacement vouchers at family properties. The goal is to provide services at each site, but we want to be able to project base in advance of such programs being finalized
Rent Limits and Rent Reasonableness for PBVs	PBV flexibility	Boulder	Closed	2014	This activity's main objective is to reduce cost, eliminate redundancy and increase efficiency by allowing the Housing Authority to establish appropriate rent limits in project-based voucher projects and conduct its own rent reasonableness procedures for setting rents at PBV Communities where the developer is required, or has chosen, to conduct a market study.
PBV Applicant Process	Admissions policy	Boulder	Closed	2015	This initiative allows applicants to be chosen by the service provider or the owner of the property, which will provide for a quick turn around on a vacant unit and choosing an applicant who will fit the community and benefit from the services provided.
Implement Local Project-Based Assistance Leasing Program/HCV	PBV flexibility	Cambridge	Ongoing	2001	This program allows CHA to expand its Project-Based portfolio beyond the 20-percent HUD threshold and allows property owners to project base a building beyond the 25-percent HUD threshold. Property owners may coordinate with CHA to project base up to 100 percent of a property.

(continued)

Exhibit E.1 Inventory of Mobility-Related Initiatives at Moving to Work Agencies *(continued)*

Initiative	Activity Category	PHA	Status	Year	Description
Expiring Use Preservation Program	Development	Cambridge	Ongoing	2012	CHA converts Enhanced Vouchers to PBVs for private affordable properties with maturing mortgages
Expand Supply of Permanently Affordable Hard Units of Housing	Development	Cambridge	Ongoing	2000	This initiative focuses on increasing the supply of hard units in CHA's public housing portfolio and through an increase in PBVs.
Implement Recertifications Every 2 Years for Households in Project-Based Units/HCV	Rent reform	Cambridge	Ongoing	2014	Similar to the biennial recertification policy in Public Housing, a biennial recertification schedule would apply to households living in project-based units
PBV in Public Housing	PBV flexibility	Cambridge	Closed	2014	CHA will use MTW flexibility to apply similar public housing policies and procedures to residents in project-based units.
Project-Based Program	PBV flexibility	Seattle	Ongoing	2000	SHA uses MTW to develop and implement a local project-based program, providing vouchers to subsidize units in SHA-owned and nonprofit-owned properties throughout Seattle. SHA's project-based activities include a large number of MTW strategies to reduce costs, make project-based programs financially feasible for owners, and to provide housing choice in Seattle.
Combined Program Management	Development	Seattle	Ongoing	2008	In some of its communities, SHA co-locates units funded through PBVs and low-income public housing. Combining program management and policies for both of these types of units (referred to as Streamlined Low Income Housing Program, or SLIHP, units) within the same community makes sense and reduces costs by eliminating redundancies, including duplicative rent reviews and inspections. It also avoids unnecessary disparities between tenants of the two different types of units. SHA's current implementation of this activity allows for all units subsidized by project-based HCVs to be operated just like public housing subsidized units in communities that receive both types of subsidy. This streamlined approach includes acceptance of slight differences (generally less than $1) in rent calculation caused by different data systems of record for vouchers and public housing.

BHP = Boulder Housing Partners. CHA = Cambridge Housing Authority. HAP = Housing Assistance Payment. HCV = housing choice voucher. MTW = Moving to Work.
PBV = project-based voucher. SHA = Seattle Housing Authority.

Appendix F. Inventory of Moving to Work Agencies with an Activity Related to the Family Right to Move

The initiative descriptions here are taken from or based upon those found in the Moving to Work (MTW) Plans[47] and MTW evaluation database.

Exhibit F.1 Inventory of Activities Related to the Family Right to Move at Moving to Work Agencies

Initiative	Activity Category	PHA	Status	Year	Description of Impact on Family Right to Move
PBV – Waiver of Tenant-Based Requirement	PBV flexibility	Alaska Housing Finance Corporation	Ongoing	2011	Waive the requirement to provide a TBV to a family upon termination of PBV assistance.
Implement Local Project-Based Assistance Leasing Program/HCV	PBV flexibility	Cambridge Housing Authority	Ongoing	2001	Extends the time-frame for requesting mobile vouchers, from 1 to 2 years.
2-Year Requirement for PBV Participant Transition to HCV	Occupancy policy	Chicago Housing Authority	Ongoing	2011	Chicago Housing Authority reduces the turnovers in PBV developments by allowing families only to receive an HCV after 2 years of occupancy rather than 1 year, except for tenants currently residing in a supportive housing unit.
Modify PBV Choice Mobility Criteria	PBV flexibility	Fairfax County Redevelopment and Housing Authority	Not yet implemented	2016	PBV holders are able to go on the waitlist after a year but will not receive preference or automatically receive a voucher after 1 year.
Local PBV Program	PBV flexibility	Housing Authority of Champaign County	Ongoing	2011	Elimination of the automatic conversion to tenant-based assistance after 1 year in the project-based unit.
Local PBV Program	PBV flexibility	Housing Authority of Portland	Not yet implemented	2015	For our fiscal year 2015 Plan, Home Forward is proposing a change to this activity. Under existing regulations, PHAs are limited to project-basing up to 20 percent of the amount of budget authority allocated to the agency by HUD in the voucher program. We are proposing to eliminate this cap on PBV allocations.

(continued)

[47] "Moving to Work (MTW) – Participating Sites," US Department of Housing and Urban Development. Retrieved from: https://www.hud.gov/program_offices/public_indian_housing/programs/ph/mtw/mtwagencies

Exhibit F.1 Inventory of Activities Related to the Family Right to Move at Moving to Work Agencies *(continued)*

Initiative	Activity Category	PHA	Status	Year	Description of Impact on Family Right to Move
Local PBV Program	PBV flexibility	Housing Authority of the County of San Bernardino	Ongoing	2009	HACSB has implemented a local PBV program to increase the availability of quality housing units. The expansion of our housing authority and/or our affiliate nonprofit owned housing stock will allow us to continue to reinvest net income into the acquisition of additional affordable housing units.
Expand the Section 8 PBV Program	PBV flexibility	Housing Authority of the County of San Mateo	Ongoing	2011	Requires participating families to stay at least 24 months in a PBV unit before they are eligible to move with continued assistance
Minimum 2-Year Occupancy in Project-Based Unit	Occupancy policy	Housing Authority of the County of Santa Clara/Housing Authority of the City of San Jose	Not yet implemented	2014	This initiative requires project-based participants to remain in their PBV units for a minimum of 2 years prior to becoming eligible to request a TBV to move with continued assistance.
PBV Discretionary Moves	PBV flexibility	Massachusetts Department of Housing and Community Development	Ongoing	2012	DHCD modified its PBV program guidelines to establish reasonable limits on discretionary moves.
Modified PBVs	PBV flexibility	San Antonio Housing Authority	Not yet implemented	2015	This activity increases cost-effectiveness by removing the automatic provision of a TBV to a household who wishes to relocate from a unit associated with local project-based set-aside voucher.
2-year occupancy term for PBV tenants	Occupancy policy	San Diego Housing Commission	Ongoing	2011	Requires PBV holders to complete 2 years of occupancy before becoming eligible to receive a TBV.
Project-Based Program	PBV flexibility	Seattle Housing Authority	Ongoing	1999	Offers site-specific waiting lists maintained by providers (and, therefore, does not issue exit vouchers)
Local PBV Program	PBV flexibility	Tacoma Housing Authority	Ongoing	2011	Tacoma Housing Authority waived the mobility option that allows PBV tenants to automatically receive a TBV after 1 year of occupancy.
Alternative PBV Program	PBV flexibility	Vancouver Housing Authority	Ongoing	2014	Requirement for a move voucher after 1 year waived.

DHCD = Department of Housing and Community Development. HACSB = Housing Authority of the County of San Bernardino. HCV = housing choice voucher. PBV = project-based voucher. PHA = public housing agency. TBV = tenant-based voucher.

Appendix G. Low-Income Housing Tax Credit Matching Sensitivity Analysis

The size of the standard city block varies widely across the United States, ranging from as small as 200 feet long to 800 feet or more. This variation complicates the task of linking households to properties that applies the same radius across jurisdictions of varying geographies. Research focused on a single jurisdiction can tailor the radius to the local context and, if necessary, manually assign households to properties.

Existing studies suggest that 200 feet is a suitable lower bound for the size of a standard city block. We used a radius of 200 feet for our analysis and then conducted a sensitivity analysis using larger and smaller radii. We repeated our analysis by changing the radius in 50-foot increments to a minimum of 50 feet and a maximum of 350 feet and show how the co-location changes in exhibits F.1 and F.2. There is some tapering in the additional increase in location in Rental Assistance Demonstration or Low-Income Housing Tax Credit for radii above 200 feet for both Moving to Work (MTW) project-based vouchers and tenant-based vouchers. Future research could tailor the radius to more closely match each MTW agency's jurisdiction and local context.

Exhibit G.1 Identifying Co-Location of Project-Based Vouchers in Rental Assistance Demonstration and Low-Income Housing Tax Credit Properties Using Varying Spatial Buffers at Moving to Work Agencies

	50 feet	100 feet	150 feet	200 feet	250 feet	300 feet	350 feet
Not RAD or in LIHTC	76.8%	69.5%	64.6%	60.4%	58.0%	55.0%	52.7%
PBV RAD Only	13.9%	13.8%	13.4%	13.0%	12.9%	12.9%	12.4%
PBVs in LIHTC Only	9.3%	16.6%	21.5%	25.7%	28.1%	31.2%	33.4%
PBV RAD and in LIHTC	0.02%	0.1%	0.5%	1.0%	1.0%	1.0%	1.5%
Total	41,270	41,270	41,270	41,270	41,270	41,270	41,270

LIHTC = Low-Income Housing Tax Credit. PBV = project-based voucher. RAD = Rental Assistance Demonstration.

Notes: Active LIHTC properties as of 2015 are included.

Source: 2016 HUD Office of Public and Indian Housing Information Center (PIC) data for counts of Moving to Work PBVs and tenant-based voucher households, and National Housing Preservation Database data for LIHTC addresses in conjunction with PIC addresses for LIHTC household counts

Exhibit G.2 Identifying Co-Location of Tenant-Based Vouchers in Rental Assistance Demonstration and Low-Income Housing Tax Credit Properties Using Varying Spatial Buffers at Moving to Work Agencies

	50 feet	100 feet	150 feet	200 feet	250 feet	300 feet	350 feet
Not RAD or LIHTC	97.6%	95.4%	93.7%	92.1%	90.6%	89.1%	87.7%
TBV RAD only	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
TBV in LIHTC only	2.3%	4.4%	6.2%	7.8%	9.3%	10.7%	12.2%
TBV RAD and LIHTC	0.0004%	0.001%	0.003%	0.004%	0.004%	0.01%	0.01%
Total	274,439	274,439	274,439	274,439	274,439	274,439	274,439

LIHTC = Low-Income Housing Tax Credit. TBV = tenant-based voucher. RAD = Rental Assistance Demonstration.

Notes: Active LIHTC properties as of 2015 are included.

Source: 2016 HUD Office of Public and Indian Housing Information Center (PIC) data for counts of Moving to Work project-based voucher and TBV households, and National Housing Preservation Database data for LIHTC addresses in conjunction with PIC addresses for LIHTC household counts

Appendix H: References

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