



Assessing Costs and Benefits of Chicago's CDBG-funded HomeMod Program



ASSESSING COSTS AND BENEFITS OF CHICAGO'S CDBG-FUNDED HOMEMOD PROGRAM

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September 2020

ACKNOWLEDGMENTS

The authors would like to thank all the staff at Woodstock Institute who contributed to this report: Patricia Woods-Hessing, Beverly Berryhill, Jenna Severson, Lauren Nolen, Dory Rand, and Jean Pogge. In addition, we thank the consultants, Wendy Joice-Dennard and John Abbate, who helped so much with the interviews and added their insights. We thank the staff at the Mayor's Office for People with Disabilities, Aubrey Wells and Mark Nobriga, whose cooperation and assistance provided the essential data and program information for this report. We also want to thank the many HomeMod Program participants who agreed to be interviewed and share their experiences and stories with us. They brought the human dimension to this work and showed us just how important and life-altering home modifications could be. The authors would also like to thank the U.S. Department of Housing and Urban Development Office of Policy Development and Research for funding this report and the HUD staff, including Jagruti Rekhi, Kinnard Wright, and Mike Early, who helped keep the project focused and on track. Without their support, this work would not have been possible.

Disclaimer

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FOREWORD

The Centers for Disease Control and Prevention (CDC) estimates the number of adults 65 years or older will reach 71 million by 2030 and 98 million by 2060—when older adults will make up nearly 25 percent of the population. As people age, they are more likely to have or develop a mobility impairment. Coupled with a substantial shortage of housing units suitable for people with mobility difficulties, home modifications and programs like those funded using Community Development Block Grant (CDBG)-funding can provide much-needed resources to allow residents to safely remain in their homes. The savings from the modifications are realized by various government agencies, such as Medicare/Medicaid, health services, and other direct service providers.

The three main objectives of this study, the *Assessing Costs and Benefits of Chicago's CDBG-Funded HomeMod*, were: (1) to determine whether the program delivers cost-savings to the government; (2) to develop a set of quantifiable outcome measures for CDBG-funded activities around home renovations; and (3) to show evidence of positive community or social impacts of the CDBG funding as realized by the HomeMod program.

The study seeks to understand the cost-effectiveness of the money spent on home modification to avoid the high costs of residents moving to higher cost nursing homes or using the emergency room due to falls. It provides further insight into growing literature on the cost savings associated with providing modifications for safely aging in place. Using HUD's Integrated Disbursement and Information System (IDIS) and the City of Chicago's Mayor's Office for People with Disabilities HomeMod program datasets to estimate the cost associated with the modification and savings realized from safely remaining at home were used.

Although the study only includes savings realized by the member who qualified for the modification, not the member's household or community, they found that HomeMod program's modifications save the government money over time—a measure of its efficiency. As with the benefit of the costs avoided by HomeMod program participants not moving into an assisted-living facility or nursing home, the benefit from the reduced use of emergency services is an annual benefit flowing from a one-time cost of the modifications of between \$12,200 and \$15,150. Furthermore, if the benefit continues for 3 years and then returns to the same level before the HomeMod program installed the modifications, the total savings would be between \$350 and \$2,223 per unit. Those savings would reduce the effective cost of the modifications to between \$9,977 and \$14,800 per unit.



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EXECUTIVE SUMMARY

The City of Chicago’s HomeMod Program provides home modifications for low- and moderate-income people who are under the age of 60 and who have disabilities. This report examines and compares the costs and benefits of the HomeMod Program from the perspective of the government because the U.S. Department of Housing and Urban Development (HUD) provides roughly 71 percent of the program’s funding through its Community Development Block Grant (CDBG) program. The report is in response to a Notice of Funding Availability (NOFA) that sought research to link CDBG-funded activities with quantifiable outcome measures that showed evidence of CDBG’s efficiency or impact on communities. One purpose of the analysis in this report is to demonstrate a method and the types of data needed to assess the effects of a specific CDBG-funded activity—the HomeMod Program. Another purpose is to determine whether the home modifications might provide more in quantifiable benefits to the government—in avoided future costs for services to people with disabilities, such as home health aides or nursing home care—than the upfront costs of the modifications, which is a measure of the efficiency of the CDBG-funded activity.

The importance of understanding the costs and benefits of the HomeMod Program go well beyond determining the impact of CDBG funding or whether the program saves the government money. The population of the United States is aging, and as people age, they are more likely to have or develop a mobility impairment. If current trends hold true, the number of people with mobility impairments will increase from 12.0 million to 15.6 million between 2020 and 2030. As of 2011, less than 4 percent of housing units are livable for people with moderate mobility difficulties, and less than 0.2 percent of units are suitable for a person in a wheelchair living alone. Decisionmakers have two options to address the shortage: build more accessible units or modify existing units to make them accessible. The consequence of not addressing the shortage will be a dramatic increase in the number of people with disabilities having to move to assisted-living facilities or nursing homes.

In this report, the analysts estimated the costs of modifications from HomeMod Program data for the period from 2003 to 2018 based on data compiled from the program. The analysts estimated the benefits from costs avoided for three types of services: (1) the cost of living in an assisted-living facility or nursing home; (2) the cost of in-home personal care attendants or home health aides, and (3) the cost of using emergency services for transportation to healthcare appointments. The data used to quantify the benefits are from interviews with HomeMod Program participants and cost-of-service figures from Medicaid and the City of Chicago.

Summary of Findings

The analysis estimated the average total cost of the modifications to be between \$12,200 and \$15,150 per unit, based on the program data. CDBG funding constituted 71 percent of the total that the HomeMod Program spent on more than 1,100 home modifications for low- and

moderate-income people with disabilities, based on data that HUD compiled in its Integrated Disbursement and Information System (IDIS).

The method and data used for this analysis demonstrated that it is possible to compare the costs and benefits of the CDBG-funded HomeMod Program and show the program's efficiency or impact on improving the community. The comparison, however, required the use of data from the program and interviews with program participants; the analysis might not have been feasible with data only from IDIS.

The estimated benefit from cost savings from the reduced use of personal care attendants and home health aides was an average of \$6,668 per program participant. The estimated benefit from the reduced use of emergency services was between \$120 and \$759 per program participant. Based on those estimates, the modifications would have to allow between 2.5 and 4.6 percent of program participants to defer moving to an assisted-living facility for 5 years or between 0.5 and 1.0 percent of program participants defer moving to a nursing home for 8 years in order for the program to save the government more in costs avoided than it paid for the modifications (without any consideration of other potential cost-saving benefits).

The findings as to the benefits of the program suggest that the modifications provided by the HomeMod Program save the government money over time—a measure of the efficiency of the program. The savings come from modifications that allow even a small percentage of the people with disabilities who receive modifications to remain in their homes and from reductions in the level of in-home services and the use of emergency services to get people with disabilities to healthcare appointments.

The findings for cost-saving benefits to the government are based on a limited scope of benefits. The analysis does not attempt to quantify additional benefits—such as savings on medications or treatments—that the interviews suggested might occur, nor does the analysis include other potential benefits suggested in the literature, such as avoiding medical expenses that Medicaid might cover due to falls or injuries to caregivers. The omission of those additional benefits suggests that more comprehensive data collection could show that the CDBG-funded activity has an even greater outcome than demonstrated in this analysis.

Finally, the findings concerning the comparative costs and benefits to the government include no value for the benefits that flow to the people with disabilities who receive the modifications. The analysis does not place any monetary value on the mental state of the people with disabilities, their safety, or benefits to other members of their households—such as avoiding injuries or increasing their incomes.

Recommendations

The analysis in this report suggests five measures that policymakers might consider. The first recommendation is to expand data collection substantially to increase HUD's ability to evaluate

the efficiency of CDBG-funded activities or the impact that they are having in the community. The data collected must go beyond the information used for the management of expenditures or the immediate effects, such as the number of square feet of commercial space created to assess the longer term impacts that CDBG-funded activities have. This analysis used HomeMod Program data and semi-structured interviews with former program participants to estimate costs and benefits.

The second recommendation is for HUD to consider collaborating with other agencies to access data. Other agencies, such as Medicaid service and payment records, could facilitate the evaluation of the longer-term impacts of CDBG-funded activities, such as the percentage of people with disabilities who can delay moving to an assisted-living facility or nursing home following the installation of modifications. Many of the spillover effects of CDBG-funded activities affect the activities and expenditures of other government agencies at federal and state levels, and collaborative analysis could show the interaction of CDBG funding and the need for other government agencies to provide services.

The third recommendation is to expand the HomeMod Program to allow it to provide modifications to more low- and moderate-income people with disabilities and do more to address the lack of accessible housing. Demographic analysis suggests that the need for accessible housing will increase dramatically over the coming years. The government needs to prepare for that increased need, and modifying existing units will be an important component of any response. The expansion may be funded through additional CDBG allocations or from other state-level resources.

The fourth recommendation is to allow the HomeMod Program to provide multiple modifications to applicants at one time to better meet the needs of applicants. A substantial percentage of HomeMod Program participants received multiple modifications over a period of years, and, in some instances, doing all the needed work at one time might be more cost-effective and meet the participants' needs more efficiently.

The fifth and final recommendation is to provide funding in the HomeMod Program for ongoing maintenance of the modifications installed to ensure that the applicants continue to benefit from the accessibility improvement that the modification provides. One common modification was a vertical power lift to allow people with mobility impairments to get in and out of their homes without assistance. The lifts, however, need periodic maintenance to remain in working order. The low- and moderate-income people with disabilities the program serves may not have sufficient income to afford to pay for that maintenance.

INTRODUCTION

The City of Chicago uses the HomeMod Program to address the shortage of accessible housing and increase the supply of units suitable for people with disabilities. Under the administration of the Mayor’s Office for People with Disabilities (MOPD), the HomeMod Program has provided home modifications for more than 20 years for people under the age of 60 who have disabilities.¹ Although the HomeMod Program is open to people with any type of disability—such as cognitive, mental, physical, or sensory—the vast majority of participants, nearly 90 percent, have a mobility impairment.²

Most of the funding for the HomeMod Program comes from the U.S. Department of Housing and Urban Development (HUD) through its Community Development Block Grant (CDBG) program.³ The city supplements the CDBG funds with corporate and private donations, funding from the Chicago Housing Authority, foundations, and other sources. In a few cases, participants also contribute funds to pay for the modifications.

This report examines and compares the costs and some of the benefits of the HomeMod Program from the perspective of the government as the primary funding source for many of the services and residential options that people with disabilities use. The report was compiled in response to a Notice of Funding Ability (NOFA) for research that could link CDBG-funded activities with quantifiable outcomes to provide evidence of the program’s efficiency or impact on communities. One purpose of the analysis, therefore, is to demonstrate a method and the type of data that may be used to examine the quantifiable effects of this CDBG-funded program on government expenditures—a measure of efficiency. The method, comparing costs and benefits of the program, can show whether it might save the government more in avoided costs for present and future services to people with disabilities than the cost of the modifications that the CDBG funds help provide.

For purposes of this report, the cost side of the analysis will use the total cost of the modifications. Those costs include the installation of the modification and ancillary work, such as lead paint abatement, required for the installation. The costs are covered by CDBG funds, as well as by funds from other sources that MOPD uses to pay for the HomeMod Program.

¹ Based on age at time of application, 16 percent of applicants were younger than 18 years old, 44 percent were between 18 and 49 years old, and 40 percent were 50 years old or more. The City of Chicago has other programs specifically targeted to people older than age 60 who have disabilities.

² The MOPD data generally identify only one form of disability per applicant, but many of the HomeMod Program participants interviewed for this report indicated that they had two or more types of disability.

³ HUD created the CDBG program in 1974 to provide funding to states and local jurisdictions to benefit low- and moderate-income persons, prevent or eliminate blight and slums, and meet urgent needs that threaten the health or welfare of communities. See HUD’s page on community development at https://www.hud.gov/program_offices/comm_planning/communitydevelopment.

Assessing the benefits of the program is more complex. Some benefits that allow people with disabilities to continue to live in their homes rather than moving to an institutional residential setting, such as an assisted-living facility or nursing home, may be quantified in terms of the avoided cost of the alternatives to remaining in the home. Other benefits, such as the impacts on people's sense of independence, are harder to quantify because there is no readily identifiable market alternative for comparison.

In addition, the benefits accrue to different parties. The cost savings for institutional care, for example, go to the party that would have paid for the care, whereas the benefits of an increased feeling of independence go to the people with disabilities and, perhaps, members of their families and households. From the perspective of the entities paying for institutional care, the cost-saving benefit may be of more interest than the benefits of the increased sense of independence that the individual gains. The people with disabilities, however, may consider their independence as more significant than the avoided cost of institutional care, which they were not paying for. This report focuses on the quantifiable benefits to the government for comparison with the costs to the government of providing the modifications.

The benefits to individuals and the members of their households are discussed separately because those benefits are essential to understanding the impact of the HomeMod Program. In many instances, those benefits may also save the government money. For example, ramps that allow people in wheelchairs to go in and out without assistance may allow them to do their own grocery shopping, reducing the need for home health aides to do that task for them.

Comparing the costs and benefits of the HomeMod Program demonstrates a means to identify a quantifiable outcome measure as evidence of the impact of this CDBG-funded activity. The importance of understanding the costs and benefits of the HomeMod Program, however, go well beyond determining whether the program saves the government more in avoided costs than it pays for the modifications. The population of the United States is aging, with the number of people 65 years or older increasing from about 56.0 million in 2020 to a projected 72.8 million in 2030. People aged 65 and older make up about 16.8 percent of the population in 2020, increasing to a projected 20.3 percent in 2030 (Ortman, Velkoff, and Hogan, 2014). As people age, they are more likely to have or develop a mobility impairment. Only 3.9 percent of the population under 65 have some form of mobility impairment, compared with 21.4 percent of those 65 years and older.⁴ If those trends hold true, between 2020 and 2030, the number of people with mobility impairments will increase by more than 30 percent: from 12.0 million to 15.6 million people.

Thirty years after Congress passed the Americans with Disabilities Act (ADA), less than 4 percent of housing units in the United States are livable for people with moderate mobility

⁴ 2018 American Community Survey, 1-year data, Table S1810.

difficulties, and less than 0.2 percent are livable for a person in a wheelchair living alone (Bo'sher et al., 2015). By comparison, nearly 7 percent of the population, more than 20 million people, have some degree of mobility impairment.⁵ Those data suggest that there is currently a substantial shortage of housing units suitable for people with mobility difficulties, and other data bear that out. For example, less than 47 percent of people who use a mobility device (such as a wheelchair, cane, or walker) live in units that they can enter and leave without having to climb or descend stairs. Less than 11 percent of people with mobility impairments live in units which (1) can be entered without navigating stairs, and (2) have both an accessible bathroom (with grab bars) and bedroom on the entry level or an elevator in the unit to reach them (Bo'sher et al., 2015). The shortage of noninstitutional housing for people with mobility impairments is almost certainly going to get much worse if policymakers do not take steps to increase the supply of suitable housing units. Decisionmakers have two options to address the shortage: build more units that are accessible or modify existing units to make them accessible.

One of the primary goals of the HomeMod Program is to allow participants to continue living in their homes. Given the prevalence of mobility impairments among the applicants, it is not surprising that most of the modifications that the program provides address two common attributes that make units unsuitable for people with mobility impairments. The first is the need to navigate stairs to enter and leave the unit (about 48 percent of projects), and the second, the lack of an accessible bathroom (about 33 percent of projects). The modifications are badly needed, especially considering the age of the housing stock in Chicago. Most homes in Chicago were built before 1960,⁶ and homes that older are less likely than newer homes to have bathrooms and bedrooms on the entry level (Bo'sher et al., 2015). In addition, homes in Chicago tend to be built well above ground level because of the consistently snowy winters, so most homes require residents to climb stairs to reach the entry level. The combination of those design elements suggests that homes in Chicago are likely less suitable for people with disabilities than are the national average of homes.

⁵ 2018 American Community Survey, 1-year data, Table S1810.

⁶ 2018 American Community Survey, 1-year estimates, Table B25034.

Front Stairs



Source: HUD

This report is divided into six sections. The first section describes the HomeMod Program briefly. The second section is a review of the literature on the need for housing for people with disabilities, the benefits of home modifications, and studies that have compared the costs and benefits of home modification programs. The third section covers the costs of the HomeMod Program. The fourth section examines the three benefits of the HomeMod Program that the analysis quantifies and compares with the costs, as well as some additional benefits which are not included in the comparison. The fifth section summarizes and discusses the findings from the analysis. The sixth section contains conclusions and suggestions for future research.

DESCRIPTION OF THE HOMEMOD PROGRAM

The Mayor’s Office for People with Disabilities (MOPD) has been offering the home accessibility modifications through the HomeMod Program since 2000. To be eligible for the HomeMod Program, the applicant must be younger than age 60 with a verifiable disability, live in the city of Chicago, have income below 80 percent of the area median income (AMI), and be current with her/his property taxes. Although most of the applicants are homeowners, the program may install modifications in rental units with the owner’s permission or in the common area of condominiums with the association’s permission. Most applicants, nearly 90 percent, indicated that they had a mobility impairment, with 9 percent indicating a cognitive impairment and slightly more than 1 percent indicating a visual or hearing impairment, although many applicants have multiple disabilities.⁷

The program provides home modifications “that will allow people with disabilities, under the age of 60, to make their living environment accessible. Modifications can include: ramps, porch and stair lifts, roll-in showers, widened doorways, [and] accessible sinks and cabinets” (City of Chicago MOPD, 2020). The appropriated budget for the entire MOPD was \$5.74 million in 2018, of which \$3.36 million, or 58.5 percent, was from Community Development Block Grant (CDBG) funding. For the HomeMod Program, within the overall MOPD budget, the amount was \$1.83 million, which includes funding for staff and other services that support independent living, such as home accessibility modifications, individualized needs assessment, in-home assistive devices, and personal assistance or homemaker services.⁸

The HomeMod Program allows people to apply for one modification at a time, but people may apply for additional modifications in different years as long as all first-time applicants have been served.⁹ Once MOPD approves the application, it contracts with licensed, insured, and experienced home remodeling companies to perform the construction and installation on the program participant’s home. MOPD requires that all work meet federal, state, and municipal accessibility codes. The HomeMod Program pays a maximum of \$15,000 of the project cost, an amount that was increased from \$10,000 in 2020 due to increased costs for labor and materials.

The HomeMod Program received 1,496 applications and completed 1,205 projects, an average of more than 75 completed projects per year between 2003 and 2018, and 291 projects were closed without being completed, an average of slightly more than 18 projects per year. In some years, the program received more applications than it could fund, so the totals reflect only

⁷ Of the 48 HomeMod Program participants interviewed for this report, approximately 80 percent had multiple disabilities.

⁸ Data downloaded from https://www.chicago.gov/content/dam/city/depts/obm/supp_info/2019Budget/2019Budgetoverview.pdf on April 1, 2020.

⁹ Analysis of the MOPD application data suggest that about 21 percent of applicants submitted more than one application over the period between 2003 and 2018.

those applications that the program could accept and process, not those that it had to put on a waiting list. In addition to the accessibility modifications, the HomeMod Program provided lead paint remediation in nearly 300 homes between 2006 and 2018, as well as some other services, such as weatherization, on approximately 150 homes in conjunction with the modification.¹⁰

More than 80 percent of the projects MOPD completed were either to allow people to enter and exit the unit without having to navigate stairs, such as installing a vertical power lift or ramp (47.6 percent of completed projects), or to provide an accessible bathroom with a roll-in shower and/or grab bars (32.7 percent of completed projects). Other types of modifications that the HomeMod Program provided included interior chair lifts, ceiling lifts, kitchen modifications, widening of doorways, and accessibility devices to complete specific interior modifications, such as bathing chairs.

Vertical Power Lift (left) and Lift and Stairs (right)



Source: HUD

The total cost of projects completed between 2003 and 2018 was \$13.3 million,¹¹ or an average of \$11,072 per completed project, as shown in exhibit 1. The projects that MOPD closed

¹⁰ The figure for lead paint remediation reflects only those projects for which it was accounted for as a separate cost.

¹¹ The dollar figures presented in this paragraph are adjusted for inflation in 2017 dollars, using the construction cost inflation data from <https://edzarenski.com/2016/10/24/construction-inflation-index-tables-e08-19/>, downloaded on April 9, 2020.

without the project being completed¹² cost a total of \$152,281, an average of \$523 per project. Overall, the MOPD data show that the HomeMod Program spent nearly \$14.5 million on the 1,496 projects that for which it received applications, an average of \$9,682 per project.¹³

Exhibit 1: HomeMod Program Projects and Expenditures

Year	Completed		Closed		Total	
	Projects	Amount	Projects	Amount	Applications	Amount
2003	52	\$641,745	15	\$7,318	67	\$649,064
2004	60	\$731,219	17	\$17,891	77	\$749,110
2005	88	\$847,871	7	\$3,931	95	\$851,802
2006	73	\$677,670	10	\$5,343	83	\$742,692
2007	75	\$689,123	9	\$5,163	84	\$842,919
2008	75	\$795,722	10	\$6,826	85	\$926,368
2009	79	\$867,035	16	\$7,226	95	\$1,005,491
2010	77	\$975,221	25	\$15,987	102	\$1,064,220
2011	78	\$904,141	16	\$7,604	94	\$992,623
2012	74	\$905,711	18	\$9,856	92	\$958,027
2013	83	\$923,581	27	\$9,608	110	\$989,013
2014	82	\$914,455	38	\$4,435	120	\$961,719
2015	64	\$748,485	10	\$3,893	74	\$800,580
2016	88	\$1,017,766	20	\$6,818	108	\$1,052,677
2017	77	\$864,100	29	\$7,675	106	\$913,310
2018	80	\$837,894	24	\$32,706	104	\$984,853
Total	1,205	\$13,341,739	291	\$152,281	1,496	\$14,484,467
Average per Project		\$11,072		\$523		\$9,682

Note: Amounts are adjusted for inflation to constant 2017 dollars.

¹² A project might be closed without completion for a variety of reasons, including the death of the applicant or the applicant's decision not to proceed once he or she understood the changes that the modification would require. In some cases, projects were closed when the contractors or designers realized that the modification could not physically fit in the available space.

¹³ The total cost figure includes amounts for other work, such as weatherization or lead abatement, that was included in the invoices for some projects between 2007 and 2009, as well as invoices for pending projects from 2017 and 2018 that were not reported as complete by the close of reporting for 2018.

LITERATURE REVIEW

For the literature review, studies from the rehabilitation and geriatrics fields on home modifications for people with disabilities, as well as literature on the healthcare cost savings and benefits from home modifications were surveyed. This review first looked at studies that document the growing need for and shortage of suitable housing for people with disabilities. Next, it examined studies that describe the benefits that home modifications can provide. The studies address two categories of potential program benefits. Benefits in the first category are those that reduce expenses that are likely subsidized by public-sector funding and represent a potential cost to the government. Benefits in the second category are those that are not directly linked to government expenditures but that inure to the person with disabilities, such as an increased sense of independence and autonomy. Although benefits in this category may be more difficult to quantify in market values, they are important in considering the overall cost-benefit analysis for the HomeMod Program and may offer some savings to the government as well.

Benefits in the first category provide two related types of potential savings. One type is the cost savings from reducing expenditures that are already being incurred. For example, a home modification, such as installing an exterior ramp and zero-barrier entry, may allow a person with disabilities to move from a nursing home back into her or his own house. A modification such as replacing a tub with an accessible shower with grab bars and a seat may allow the person with disabilities to maintain her or his personal hygiene without the continued assistance of a paid professional caregiver. The other potential cost savings are from avoiding future costs for healthcare or other services that are not already being used, such as the costs of treating injuries from falls or infections associated with immobility and the lack of ability to maintain adequate personal hygiene. Those cost savings may also be from avoiding medical expenses for injuries to family members providing unpaid care to the person with disabilities, such as back injuries from lifting the person with disabilities from a wheelchair into and out of a bathtub. Given that the HomeMod Program serves low- and moderate-income¹⁴ individuals with disabilities, many of the costs of medical care and assisted-living services are likely subsidized, to some extent, by public-sector funding, including care for family members living in the person's household.

¹⁴ For Community Development Block Grant (CDBG) program purposes, *low income* is defined as less than 50 percent of area median income (AMI), and *moderate income* is less than 80 percent of AMI. In 2018, the upper limit for low income for a family of four in Chicago was \$42,300, and the upper limit for a family of four was \$67,700.

Exterior Wheelchair Accessible Ramp



Source: HUD

Benefits in the second category are those that go to the person with disabilities receiving the modifications, such as improved mental health or fewer bouts of depression because of a greater sense of independence or involvement in the community, as well as similar benefits for family members who are providing unpaid care. Those benefits may not be easily quantifiable in market values; still, they represent an important part of the effects that the HomeMod Program may be having on the lives of the persons receiving the modifications. A few studies suggest methods for quantifying those intangible benefits to individuals that may not be apparent in the more common measures of monetary values.

The authors then discuss ways of comparing the respective costs and benefits of home modification programs. Most of the studies in the literature that have examined either the costs or benefits of home modifications have not compared the two, focusing on one or the other alone. Of those studies, most have focused on benefits in the first category, those directly affecting the level of expenditures for medical services and personal assistance. Some have looked at clinical benefits that are not as easily quantified, such as the impact of home modifications on the mental health of the person benefiting from modification, without further analysis of how the change may affect the need for medical or other support services. Others have looked at the effect of home modifications on the ability of persons with disabilities to participate in their communities,

take part in civic activities, or enter gainful employment. Relatively few studies have explored the costs or benefits of home modification work from the perspective of a governmental funder, as this study does. Most of those studies are from countries with national, single-payer healthcare systems, such as the United Kingdom, so the distinction between the healthcare system in the United States and those in other countries may be important in any analysis.

Finally, the authors discuss the importance of government programs to help people with disabilities modify their homes. The studies suggest that the programs are especially crucial to meet the needs of low- and moderate-income households.

The Need for, and Lack of, Housing for People with Disabilities

Studies and reports have long documented the shortage of and growing need for housing that is suitable for people with disabilities in the United States. Some studies note that the population of the United States is aging and that older people are more likely than younger people to have disabilities (Ortman et al., 2014; The Center for Universal Design, 1997). Other studies mention additional factors affecting the growth in demand—beyond the aging of the baby boom generation and the correlation between aging and disabilities—including the preference among the general population to stay in their homes, or “age in place,” for as long as possible (Bayer and Harper, 2000). Studies also suggest that people with disabilities may be living longer than in past years due to improvements in healthcare and living conditions, adding to the number of people needing home modifications (Hutchings, Olsen, and Moulton, 2008; Oaks, 2017; Wilson et al., 2009). Some of the studies not only discuss the extent of the shortage of accessible housing, they also suggest ways to address the situation, including recommendations for specific home modifications to adapt existing units to meet the needs of people with disabilities and increasing the supply of those units (Bo’sher et al., 2015; The Center for Universal Design, 1997).

Respondent Stories

One HomeMod Program participant who received an exterior power lift spoke about the daily challenges he experienced before the installation of the lift. “I had a lift on [my porch], but it was completely unreliable. Some days it would work, some days it wouldn’t. I just didn’t have any confidence that I would even get out of the house that day without having to call for some help.” He said that he frequently needed to ask family members, friends, or even neighbors who happened to be outside on the block to help carry him down his porch stairs to the sidewalk. Since the HomeMod Program installed the lift, he has been able to go in and out of his home without having to ask anybody for help. “It can get depressing sometimes when you just can’t get out when you want to or when you need to. [Without the HomeMod Program], it would have just been a struggle, like it had been, like it has been for a while. I had an older lift, and no technicians knew how to work on it, which was one of the biggest problems—even just getting it fixed and in working order. So the HomeMod Program was a godsend.”

After the HomeMod Program installed the power lift, he felt that the quality of his life had improved significantly, knowing that he could get in and out of the house on his own at any time because he had a reliable power lift. “It helps me with my health because I’m more active now. I just didn’t like having to be carried out, and it’s just something that weighs on you. I think this HomeMod Program is definitely beneficial for those who need it. As far as I’m concerned, they’re doing a great job.”

Benefits from Home Modifications—Reduced Costs

An extensive body of literature in the rehabilitation and geriatrics research fields examines individual cost savings from reduced use of healthcare services or assistance in the performance of routine, daily living tasks from home modifications for people with disabilities or older adults. The majority of work in those fields estimates cost savings as a matter of avoided healthcare costs, that result from the household purchasing the home modifications (Adams, 2015; Kochera, 2002; Smith and Widiatmoko, 1998). The literature also includes randomized trials between groups of people receiving or not receiving home modifications (Campbell et al., 2005; Mann et al., 1999) and existing public programs to pay for home modifications (Solano and McDuffie, 2003). Some studies also calculate cost savings as a matter of avoided costs from hired assistance in the performance of routine, daily living tasks (Massachusetts Rehabilitation Commission, 2009).

The consensus in the literature is that home modifications produce individual cost savings from reduced use of healthcare services or assistance in the performance of routine, daily living tasks. Studies conclude that home modifications reduce or eliminate costs from personal assistance services (Mann et al., 1999; Massachusetts Rehabilitation Commission, 2009) and that they reduce costs resulting from the use of healthcare services in the form of avoided institutional care (Adams, 2015; Kochera, 2002; Mann et al., 1999; Massachusetts Rehabilitation

Commission, 2009; Smith and Widiatmoko, 1998; Solano and McDuffie, 2003). Research suggests that, to the extent possible, people with disabilities or their caregivers should be consulted on home modifications, involved in the home modification process, and provided with alternate modifications, when possible, to enable them to select the modifications that are made (Pettersson, Löfqvist, and Fänge, 2012). When people with disabilities and their caregivers are not consulted, they may not use the modifications because they find them too cumbersome, unattractive, or simply not useful (Stark et al., 2009).

The literature is more divided on whether home modifications provide significant cost-saving benefits in the form of reducing future medical expenses required to treat injuries to the people receiving the modifications. Most studies that examine the issue focus on whether modifications help prevent falls, primarily among seniors. The majority of those studies find that home modification does reduce falls (Adams, 2015; Campbell et al., 2005; Mann et al., 1999; Smith and Widiatmoko, 1998; Solano and McDuffie, 2003). Very little of the research, however, links injuries from falls—such as hip fractures—with the costs of health care and rehabilitation associated with those types of injuries. One study that discusses the cost-benefit of home modifications in reducing injuries from falls suggests that the cost of a hip fracture is 4.7 times the average cost of a major housing adaptation and 100 times the cost of fitting hand or grab rails to prevent falls (Heywood and Turner, 2007).

Benefits from Home Modifications—Nonfinancial Benefits to Individuals

An extensive body of literature in the rehabilitation research and geriatrics fields examines the effectiveness of home modifications in providing nonfinancial benefits for individuals, such as improvements in the health and daily living experience of seniors with disabilities (Carnemolla and Bridge, 2018; Gitlin et al., 2006; Hwang et al., 2011; Keall et al., 2015; Massachusetts Rehabilitation Commission, 2009; Stark et al., 2009). Although the focus of the studies may be on nonfinancial benefits, those benefits may also provide—directly or indirectly—substantial cost savings as well.

Most of the studies looking primarily at nonfinancial benefits focus on the benefits from the physical modifications themselves. The most common modifications in those studies include handrails for outside steps and internal stairs; bathroom modifications, such as replacing bathtubs with roll-in showers; ramps for indoor and outdoor stairs; modifications to make rooms more accessible; and slip-resistant surfacing for outside areas (Adams, 2015; Massachusetts Rehabilitation Commission, 2009). For example, improved bathroom access provides recipients with not only improved hygiene but also a greater sense of independence, dignity, and privacy (Massachusetts Rehabilitation Commission, 2009).

Studies report significant benefits to senior recipients of home modifications in reduced difficulty performing activities such as bathing, dressing, or getting around the house (Gitlin et

al., 2006; Petersson et al., 2008, 2009; Stark et al., 2009), improved safety (Carnemolla and Bridge, 2015; Oaks, 2017); and self-reported comfort of living (Tanner, Tilse, and de Jonge, 2008). Although the primary focus of the studies is on the nonfinancial benefits, those benefits may translate into cost savings to the extent that they allow the recipients to remain in their homes (Hwang et al., 2011), avoid the need for the person to move to an institutional living arrangement, or reduce or eliminate the need for paid assistance for activities of daily living (Massachusetts Rehabilitation Commission, 2009).

Beyond essential activities of daily living, the literature reports that home modifications may provide additional benefits to older and disabled people, such as improved access to both internal and external areas of their home that were previously inaccessible, which gives participants a greater sense of autonomy and independence. External ramps allow access to outdoor gardens; lifts and handrails may allow recipients access to the second floor of their home or the basement, which may have been inaccessible before the modifications (Massachusetts Rehabilitation Commission, 2009). In many older homes, all bedrooms and full bathrooms may be located on the second floor and laundry facilities in the basement. Those types of interior design elements may force people with disabilities to sleep in living rooms, make it difficult for them to bathe, or require the help of another person to do their laundry for them.

A few studies mention other nonfinancial benefits, such as activities related to one's ability to participate in the community. Those types of benefits include the ability to participate in activities, such as grocery shopping and other day-to-day errands or activities (Oaks, 2017; Petersson et al., 2008; Pettersson, Löfqvist, and Fänge, 2012), the ability to have increased social interaction with neighbors and friends, such as attending the neighborhood block party, going to church, or getting coffee with friends (Oaks, 2017), and the return of recipients to the workforce (Massachusetts Rehabilitation Commission, 2009; Solano and McDuffie, 2003). Finally, the literature suggests that being able to perform everyday life tasks may lead to lower levels of depression and social isolation and may improve the perception of self-worth (Petersson et al., 2009).

According to some research, benefits from home modifications extend beyond the recipient to nonpaid primary caregivers, including spouses, parents, and children. Participants and their nonpaid caregivers frequently mention the caregiver's ability to experience greater personal freedom from not being tied to the house (Massachusetts Rehabilitation Commission, 2009; Tanner, Tilse, and de Jonge, 2008). They also mention no longer needing to carry disabled family members up and down stairs or into and out of the bathroom (which may lead to reduced injury and healthcare costs for both the disabled individual and the caregiver) (Heywood and Turner, 2007; Massachusetts Rehabilitation Commission, 2009; Oaks, 2017). This benefit allows nonpaid caregivers to return to activities beyond caregiving, including work, job training, or school (Massachusetts Rehabilitation Commission, 2009).

Comparing Program Costs and Benefits

Only one study, conducted in the United Kingdom, attempts to perform a comprehensive cost-benefit analysis on home modifications in a survey of prior studies (Garrett and Roys, 2017). Most of the other studies either quantify the costs or cost savings of existing home modification programs (Campbell et al., 2005; Heywood and Turner, 2007; Stark et al., 2009) or quantify the benefits of existing home modification programs (Massachusetts Rehabilitation Commission, 2009; Oaks, 2017). Some studies quantify both costs and benefits of existing home modification programs, but they do not compare the two (Mann et al., 1999). In the studies that quantify benefits or savings, they most frequently mention the reduction in costs associated with institutionalized care and, to a lesser extent, nurse and case manager visits (Mann et al., 1999). Some studies quantify the approximate savings that government health systems, such as the United Kingdom's National Health Service and other publicly funded social services, would save if modifications were made versus the cost of institutional or intensive in-home care (Heywood and Turner, 2007).

A couple of studies examine the costs of home modifications and compare them to the benefits of avoiding the costs of falls (Eriksen, Greenhalgh-Stanley, and Engelhardt, 2015; Kochera, 2002). One study focuses on seniors and has two important findings that can inform a cost-benefit analysis. The first finding is that safety and accessibility features do not reduce the overall number of falls, but they do reduce the severity of the injuries resulting from falls. The study suggests that lessening the severity of injuries from falls reduces the likelihood of a nursing home stay due to those injuries by 10.4 percentage points (Eriksen, Greenhalgh-Stanley, and Engelhardt, 2015). The study finds that, over a 2-year period on average, each dollar invested in home safety and accessibility features is associated with a 93-cent reduction in medical costs from nonfatal falls (Eriksen, Greenhalgh-Stanley, and Engelhardt, 2015).

Importance of Government Programs, Such as the Community Development Block Grant, for Home Modifications

The literature shows the need for government-funded programs, such as CDBG and HomeMod, as well as subsidized home loans and grants provided by not-for-profit organizations to assist people with disabilities who could benefit from home modifications. Higher-income people with disabilities pay for the modifications out-of-pocket, use long-term care insurance, or have other private medical insurance that covers certain modifications (Pynoos and Nishita, 2003). Lower- and moderate-income people with disabilities may not have access to those funding options and sources, and loan payments may be beyond their means (Oaks, 2017). In addition, Medicare does not cover home modifications (Pynoos and Nishita, 2003), and Medicaid covers home modifications only in a very limited fashion. Federal Medicaid funding may be available from state governments through home and community-based services; however, those programs have strict criteria for qualifications, limited resources, and often, long waiting lists (Oaks, 2017).

Even if funding is available, many home modification programs have long waiting lists for both approval and implementation of modifications (Pynoos and Nishita, 2003). Research shows that many programs are underfunded or regularly run out of funding during the year (Heywood and Turner, 2007). Research also documents that people with disabilities waiting for modifications may, while waiting, fall and injure themselves. Those injuries, which could have been avoided by the prompt installation of the modifications, increase healthcare costs and the need for additional at-home care. In some cases, the person with the disabilities died before the installation was performed, before he or she could realize any benefits from the home modification (Heywood and Turner, 2007).

An additional complication in providing home modifications in older units is the need to address structural or code deficiencies before the modifications can be installed. For example, the homeowner may need to repair or replace an existing set of stairs before he or she can have a ramp installed (Pynoos and Nishita, 2003). Also, many older homes have lead paint issues that must be addressed before any modifications can occur. The cost to repair or replace existing deficiencies may be an additional barrier that people with disabilities and their families face when considering the overall cost of home modifications.

Finally, moderate- and lower-income people with disabilities are more likely than higher-income people with disabilities to rent rather than own their homes. Some landlords may be willing to pay for home modifications, but they are not required by law to do so. If landlords choose not to pay for the modifications, the tenants must choose to continue living in a unit that lacks the modifications; relocate to a new, more suitable home; or attempt to cover the cost of modifications on their own (Beresford and Oldman, 2002; Pynoos and Nishita, 2003).

HOMEMOD PROGRAM COSTS

The costs of the HomeMod Program included in this analysis are the invoiced amounts for all home modifications the program provided, including costs the program incurred for applications that did not result in a completed modification. Two datasets provide those amounts, one from the Mayor's Office for People with Disabilities (MOPD) and the other from HUD in its Integrated Disbursement and Information System (IDIS).

Mayor's Office for People with Disabilities Cost Data

For the cost side of the cost-benefit analysis, the primary data were the individual application and invoice records from MOPD for the period from 2003 through 2018. MOPD compiled the data to help it track applications for modifications through the permitting, construction, and billing process, with the data linked to the organizations performing the modifications. Because the primary purpose for which MOPD collected the data was to allow it to track applications from the initial receipt, through permitting and construction, to the final budget allocation of the project cost to specific service providers and accounts, the data allow for analysis of the cost of the modifications with some degree of precision. The dataset, however, has a few issues that complicate and inject a measure of uncertainty into the analysis.

First, the MOPD dataset includes all applications for modifications, not just those that were completed. Overall, MOPD reported that roughly 20 percent of applications closed without completion of the modification. The data, in many instances, also specify the reason for noncompletion, such as the death of the applicant or the inability to obtain permission from the property owner to perform the work. Even though an application might not have resulted in a completed modification, the contractor may still have submitted an invoice for preliminary inspection and planning. In general, the payments for projects closed without completion were relatively small, around \$350 or less per application. Although those expenditures did not result in any modification, they must be included as a program cost.

Second, because MOPD collected the data to track the progress of each project and invoicing, some entries for individual applicants duplicated others for a single modification project.¹⁵ In some cases, two organizations helped install the modification and submitted separate invoices, resulting in two entries, one for each organization. In other cases, the modification may have required two distinct categories of work involving separate contractors. For example, the installation of bathroom modifications may also have required lead remediation or insulation of an exterior wall, and each contractor may have billed its portion of the work separately from the other contractor. Because the contractors invoiced the two elements of the

¹⁵ The MOPD data summaries, for example, report 1,496 projects, but the program received 1,531 individual applicant records.

project separately, MOPD may have recorded two entries in the individual applicant records yet consolidated them in the data summaries for the modification. In still other cases, MOPD seems to have spread the payment for a single modification project over 2 years, with a separate entry for the applicant for each year.

Third, some percentage of individuals applied for and received modifications in more than 1 year. The participant interviews confirmed that MOPD provided multiple modifications for a significant percentage of applicants, with slightly more than one-third of the participants interviewed saying that they had received multiple modifications. For the cost side of the analysis, therefore, identifying applicants who received multiple modifications is important to ensure that the full cost of modifications provided is included in the cost-benefit analysis. For example, if an individual received an exterior power lift in 2016 and bathroom modifications in 2018, and if that person then reported during the interview in 2019 that the modifications allowed them to remain in their home rather than moving into a Medicaid-funded nursing home, the cost side of the equation will include the cost of both modifications, not just one or the other.

Although the original dataset may contain variables that could allow MOPD to determine whether any applicant had previously received a modification through the HomeMod Program, the purpose of the data was to manage individual projects and account for expenditures on an annual basis, not to link applicants over different years. In any case, nothing in the design of the HomeMod Program suggested that applicants could not receive all the modifications they needed as long as they met the eligibility requirements. For example, people with mobility impairments requiring them to use a wheelchair to get around may need one modification—an exterior power lift or ramp—to allow them to come and go from their homes without assistance and another modification to adapt a bathroom to accommodate their wheelchairs, with a wider entry, roll-in shower, shower chair, Americans with Disabilities Act-compliant toilet, and grab bars. Both modifications are necessary and contribute to their ability to remain in their homes, and the design of the HomeMod Program allows MOPD to fund both for a single applicant.

To include the total cost of modifications for those individuals in the cost-benefit analysis, however, identifying participants who received multiple modifications is desirable. MOPD anonymized the data for purposes of this project, censoring the last name, address, and other variables that might have allowed Woodstock to identify specific applicants and determine precisely how many had received more than one modification. The data MOPD provided, however, contained data on applicant characteristics, such as first name, age, gender, race, ward, and ZIP Code, which did allow Woodstock to identify applicants with multiple common data characteristics. For example, suppose a 28-year old applicant named “Michael”—who was male, White, and lived in ward 30 and ZIP Code 60634—applied in 2016 for an exterior ramp, which was completed and invoiced for \$12,000. Two years later, in 2018, a 30-year old applicant with the same first name and race, gender, and geographic characteristics applied for a bathroom

modification, which was completed and invoiced for \$10,000. The common data suggest that it may have been the same person submitting the two applications, and, for the cost component of

Respondent Stories

One HomeMod Program participant who has a mobility impairment received both an exterior power lift and a bathroom modification. Before the HomeMod Program installed the modifications, the respondent struggled to leave his home, as well as get in and out of his bathtub without assistance from various family members. After the HomeMod Program installed the modifications, he said that he experienced a significant change in his quality of life. On the bathroom modifications, he commented, “Now...I have more privacy. It makes it easier for me to keep my personal hygiene up. I can [shower] with a minimum amount of help.” Talking about the exterior power lift, he said that he no longer had to struggle with his wheelchair getting out of his home to make it to his medical appointments.

“The lift made a great, great difference as far as keeping all my appointments. Before I had the lift, I had to go up nine steps, and it was hard getting up on that porch. But with the lift, it takes no time. That made a big difference.”

He also commented on the personal freedom that the home modifications allowed him. “[The modifications] made me more independent. They enabled me to do things I wasn’t able to do at first. I was able to go up and down the steps. I was able to clean myself. It changed my life. It gave me more self-esteem. I’m so grateful. The work that [they] did has made my life a thousand times better.”

the analysis, Woodstock aggregated those applications, resulting in a cost of \$22,000 for “Michael’s” modifications.

Fourth, in 2013, MOPD changed the way it gathered data on income and household size. Before that year, MOPD data included the household size, income, and percentage of the area median household income for each application. From 2013 on, MOPD recorded household size as one for all applicants and did not enter the percentage of area median income. The change means that it is not possible to determine for applicants from 2013 on whether they might have been eligible for Medicaid assistance for an assisted-living facility or nursing home on the basis of their income, an element of the benefits that the HomeMod Program may provide for funding agencies.

Integrated Disbursement and Information System Data

Additional cost data are from the Integrated Disbursement and Information System (IDIS) dataset. HUD provided the IDIS data, which allows it to track a variety of performance indicators for the funding it provides, including Community Development Block Grant (CDBG) funding to local governments. IDIS includes HomeMod Program data because Chicago uses part of its CDBG funding for the program. Data extracted from IDIS on CDBG funds for the

HomeMod Program are based on the vouchers that MOPD submitted to HUD for payment. There are, however, important differences in how MOPD reports the data for the two datasets—the data it provided to Woodstock Institute for this analysis and the data it submitted to IDIS—and those differences affect any comparison between the MOPD and IDIS data.

First, the voucher amounts that MOPD submits, which HUD reports in IDIS, are aggregated from multiple projects rather than provided separately for each project, as in the MOPD data. Second, the IDIS data are reported for program years (presumably the federal fiscal year, or FY), whereas MOPD reported its data by calendar year, with dates for most of the invoices included. The date, however, is the date on which MOPD received the invoice from its contractor, not the date on which it included the amount invoiced in the voucher it submitted to HUD for payment.

For example, for FY 2016, IDIS shows payments for 19 vouchers that MOPD submitted, totaling \$653,371, with payments made between 10/6/2015 and 3/26/2016.¹⁶ The vouchers ranged from a low of \$120.34 to a high of \$128,241.44. During FY 2016, MOPD data show 82 separate invoices from contractors, dated between 10/1/2015 and 9/30/2016, totaling \$758,108, and four additional undated invoices for the program year 2016, totaling \$14,535. Because MOPD uses funds from sources other than the CDBG funding accounted for in the IDIS data, the two datasets do not provide a direct link between individual projects and the CDBG funds MOPD is using for modifications.

The IDIS data do, however, show the percentage of overall HomeMod Program funding coming from CDBG funds. Using figures not adjusted for inflation, the overall CDBG funding for the HomeMod Program came to slightly less than \$7.7 million, or 71 percent of the \$10.8 million in total HomeMod Program expenditures for the period between 2003 and January 2018.¹⁷

¹⁶ The payment on 3/26/2016 was the last made before the end of FY 2016 on 9/30/2016.

¹⁷ The invoices in the IDIS dataset were paid between 6/16/2003 and 2/24/2018. The \$10.8 million in HomeMod expenditures is for invoices dated between 1/1/2003 and 1/31/2018, which could have been included in the payments documented in the IDIS dataset.

HOMEMOD PROGRAM BENEFITS

Definition of HomeMod Program Benefits

For several reasons, an analysis of HomeMod Program benefits is much more complicated than an analysis of the costs. The first complicating factor is that, unlike costs that the program incurs, there may be multiple dimensions to the benefits from even a single modification. Consider, for example, the multiple potential forms of benefits from the installation of a ramp or exterior power lift. Among other benefits, the ramp may—

- Allow the person with a mobility impairment to remain in her or his home rather than move to an assisted-living facility or nursing home (benefit: cost saving from avoiding a more expensive alternative).
- Allow a member of the household to increase her or his income by switching from part-time to full-time employment because he or she no longer has to help the person with mobility impairment get up or down exterior stairs to get to appointments (benefit: increase in household income).
- Reduce the risk of injury to the person with a disability or her or his helper during the process of helping the person with a mobility impairment exit or enter the home or maintain her or his personal hygiene (benefit: avoided medical costs from treating injuries or infections).
- Allow the person with a mobility impairment to be more physically and socially active (benefit: better health and reduced need for medication).
- Give the person with a disability a greater feeling of independence and freedom (benefit: improved self-esteem and less depression).

Not only do modifications potentially have multiple types of benefits, but those benefits also do not all inure to the same entity. For example, government programs that fund housing modifications for people with disabilities may save the government money if the modifications allow those people to remain in their homes rather than moving to supportive or assisted-living facilities that are more expensive than the cost of the modifications. The funding for the modification, however, may not come from the same level of government that pays for the supportive housing. For example, a state government program may fund the modifications, whereas the federal government might reap the benefit of not paying through Medicaid for a nursing home. In addition, many of the potential cost-saving benefits go to the people with disabilities or their households rather than the government that paid for the modification. For example, if a ramp allows one member of the household to work for pay outside the home because he or she no longer needs to be available to help a spouse navigate stairs to get to

appointments, the government pays for the modification, but the household receives the direct benefit.¹⁸

In cases in which the benefit is in the form of medical costs saved, such as in reducing the risk of injury to the person with a disability or member of her or his household, the analysis becomes even more complex. Many of the HomeMod Program participants are also Medicaid recipients, so the savings benefits Medicaid. Many members of participants' households, however, are not receiving their health insurance from a government program and have private or employer-provided health insurance. In that case, the benefit might be split between the household member (not having to cover a co-pay) and the private insurance company.

Finally, many of the benefits are not readily quantifiable. A ramp that allows a person with a mobility impairment to exit or enter the home without assistance may give the person a greater sense of independence than he or she had before the modification; however, the market value of that sense of independence is hard to determine. In a similar vein, a person with a mobility impairment may become more socially involved with her or his community than before the modification, but that change in activity level also does not have a clear market value.¹⁹

The cost-benefit analysis in this report will focus on benefits that flow primarily to the government and that have some relatively clear market value. Those benefits include the following:

- Avoided costs of care in an assisted-living facility or nursing home.
- Avoided costs of providing in-home personal care attendants and home health aides.
- Avoided costs of providing transportation to healthcare appointments in municipal ambulances.

Limiting the benefits to those few categories will understate the full extent of the cost savings to the government overall because the analysis will omit other savings, such as reduced medical services or drug costs that are, in many instances, paid for by government sources. For example, two commonly expressed concerns in the literature on the benefits of home modifications were the fear of injury from falls and injury to caretakers, such as back strains, incurred while assisting the person with a disability. Treating those injuries imposes a cost, so avoiding them confers a benefit on the entity paying for the treatment, including some government programs. The limitation also understates the benefits by omitting those that go to the person with a disability or members of her or his household, even if the benefit could be

¹⁸ The government might benefit if the additional earnings increased the household's income enough to make it ineligible for assistance, such as Medicaid, and if the household paid more in income taxes than it did before the HomeMod Program installed the modification.

¹⁹ Sunstein (2007) provides a good discussion of the various ways of quantifying intangible benefits and the inherent flaws in the different approaches.

quantified with reasonable precision. For example, the installation of a ramp to allow a person with a mobility impairment to go to appointments without help from a household member may allow that person to spend more time at work, earning more money for the household.

Data Sources for HomeMod Program Benefits

Key Informant Interviews: One source of data on program benefits is the responses to semi-structured interviews with 10 key informants recruited from nonprofit organizations, disability rights advocates, local government programs, healthcare and service providers, and building contractors. All the key informants worked with people with disabilities, specifically people with mobility impairments, and most also had clients with difficulties with independent living or self-care. All the key informants also had experience working with, or referring clients to, home modification programs. The key informants mostly served clients that were homeowners, although a number also served renters. All the key informants were aware of the HomeMod Program, and most had clients who had received modifications through the program.

Woodstock Institute developed guides for the key informant semi-structured interviews following a review of the literature on the effects of home modifications on the lives of people with disabilities and seniors. The literature review informed Woodstock Institute's work by suggesting possible benefits of home modifications, which the interviewers could include in their questions to the key informants. The guides for key informants, as well as the subsequent interview guides for program participants, went through multiple stages of review and revision, including vetting by a member of Woodstock Institute's research team who has the lived experience of mobility impairment.

Woodstock Institute chose the semi-structured interview format to focus the responses on potential benefits suggested in the literature yet allow the respondent sufficient flexibility to add narratives or expand beyond the scope of the question. Woodstock conducted interviews by telephone during April 2019. Each interview was recorded with the respondent's permission, and the two-person interview team also took notes of the responses on the interview guide form.

Participant Interviews: Another data source for the analysis of program benefits is the semi-structured interviews Woodstock Institute conducted with recent HomeMod Program participants. MOPD agreed to assist the Woodstock Institute in recruiting participants for the interviews by sending letters to HomeMod Program clients who had completed modifications. The letter explained the purpose of the study and how to enroll, with a letter from Woodstock that instructed the recipients to email, call, or mail back a pre-stamped form to Woodstock expressing interest. MOPD added a letter of support to the mailer and then affixed the addresses and sent the mailer (this two-step process was done to protect the privacy and not disclose the identity of the city's clients).

The initial goal was for Woodstock Institute to conduct 40 participant interviews. Not knowing how willing HomeMod Program participants might be to discuss their experiences and the effect of the program on their lives, Woodstock and MOPD wanted to maximize the number of interviews with the most recent group of participants. They decided to begin recruiting among the HomeMod Program participants from the 3 most recent calendar years (2019, 2018, and 2017), with plans to recruit from earlier years if too few participants from the first round agreed to be interviewed.

MOPD sent the first round of mailers to 211 program participants (38 clients from 2019, 98 clients from 2018, and 75 clients from 2017). The response to those mailers was more positive than anticipated. It produced 48 program participants who completed the interviews, without the need for follow up to increase the response rate or additional mailings. Woodstock conducted all the interviews by phone and, after receiving permission from the person being interviewed, audio-recorded the interviews in addition to taking written notes of the responses. The people interviewed were, for the most part, the person with a disability who qualified for the HomeMod Program, but some were either the parent or caregiver of the person with a disability.

Woodstock Institute developed the guides for the HomeMod Program participant semi-structured interviews using data gathered from the key informant interviews and the review of the literature on the effects of home modifications on people with disabilities and seniors. The data provided indications of the kinds of benefits that the participants might receive, including those that could lead to cost savings for government programs and some that would go to the participants or members of their households. The interview guides went through multiple revisions and reviews, including by a member of Woodstock's research team who has a mobility impairment.

As with the format for key informant interviews, Woodstock Institute chose to use semi-structured interviews to focus on potential benefits suggested by the key informant interviews and the literature review yet allow the respondent to add her or his narrative to the data. The interview guides contained a mix of categorical and open-ended questions. Woodstock used two-person teams to conduct all the participant interviews between April and July 2019. With the respondents' permission, Woodstock recorded all the interviews and had the interview team take notes on the interview guide form. Two members of the research team then coded all the responses independently, with a third member comparing the responses and verifying inconsistencies in the coding against the recorded responses.

Medicaid Reimbursement Rates: Woodstock Institute used publicly available Medicaid reimbursement rates for assisted-living facilities and nursing homes, personal care attendants and home health aides, and basic ambulance service, plus the City of Chicago rate for ambulance service.

ANALYSIS OF COSTS AND BENEFITS OF THE HOMEMOD PROGRAM

Costs

One clear measure of the cost of the HomeMod Program is the total amount that the program spent on modifications, as shown in exhibit 1—that is, \$14.5 million, or an average of about \$9,700 per application. That figure reflects the total program cost, including applications that incurred expenses without the modification being installed and ancillary work, such as lead abatement.

Using the gross amount or average per application, however, does not reflect the cost of modifications per applicant, which is the appropriate metric for estimating the cost-benefit ratio from the perspective of the government. The estimation of HomeMod Program benefits, such as avoiding the need for Medicaid to pay for institutional care for a person with disabilities, is based on the government's savings in expenditures for an individual, so that is the relevant unit of measurement. For example, a person with mobility impairments may need both an exterior power lift and bathroom modifications to avoid having to move to an assisted-living facility. The benefit—saving the cost of paying for the facility—requires both modifications, and the cost-benefit analysis should be compared with the combined costs of the two modifications. Because the Mayor's Office for People with Disabilities (MOPD) and participant interview data both show that a substantial percentage of participants receive multiple modifications over time, the cost data need to be adjusted to reflect that fact.

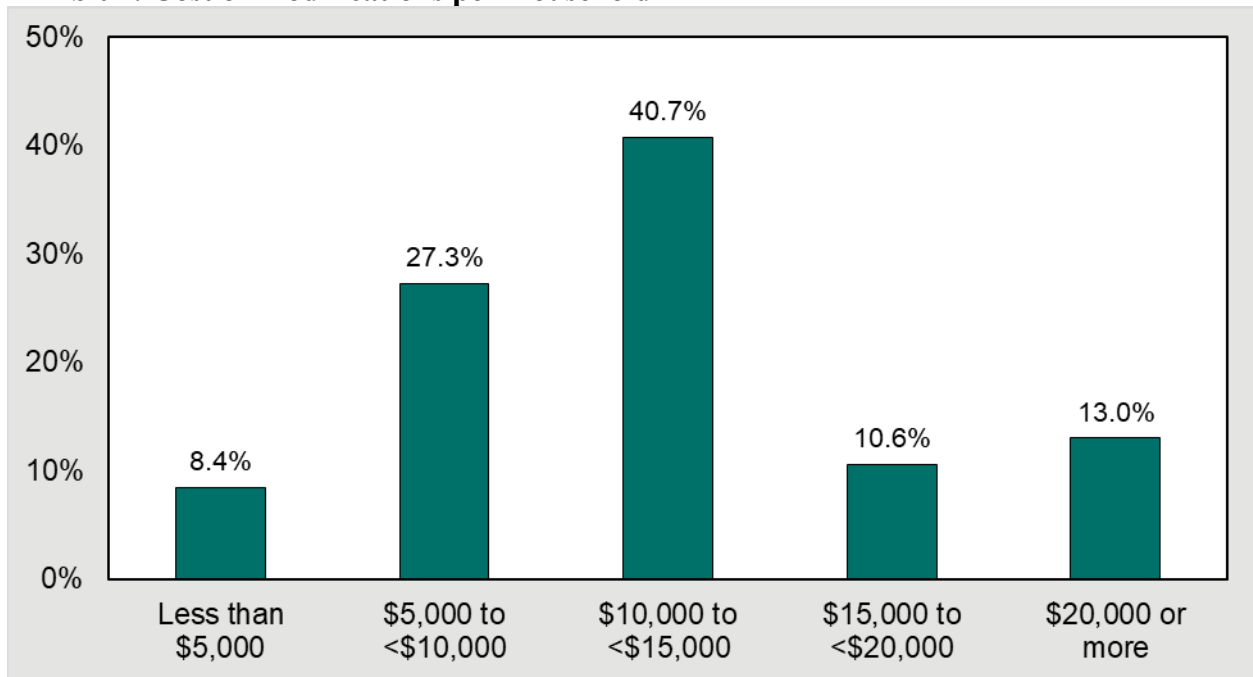
As noted in the description of the MOPD data, Woodstock Institute used common characteristics of applicants to estimate the number of applicants who received more than one modification. Based on the characteristic matching, 1,187 unique people with disabilities applied for modifications, and 252 applicants—about 21 percent—received more than one modification. The participant interview data suggest that an even higher percentage of HomeMod Program participants received multiple modifications. Sixteen, or about 36 percent, of the 44 participants interviewed (whose data are included in the MOPD data) stated that they had received more than one modification.

Assuming that the entire \$14.5 million cost of the modifications that MOPD provided is for 1,187 units, then the average cost per individual participant would be \$12,202. Using the participant interview rate for multiple modifications—36 percent—then the HomeMod Program would have served 957 individuals with disabilities, and the average cost per individual would be \$15,135. The cost, therefore, of obtaining the benefits from the modifications that the HomeMod Program provided is roughly between \$12,200 and \$15,150 for purposes of this analysis,²⁰ and

²⁰ The cost estimates do not include administrative or overhead costs. The MOPD budget does not provide a separate accounting for those costs for the HomeMod Program.

the distribution of the costs of modifications per household shows that the majority of modifications cost between \$5,000 and \$15,000 per household,²¹ as shown in exhibit 2. Based on the analysis of Integrated Disbursement and Information System (IDIS) data showing that Community Development Block Grant (CDBG) funding accounted for roughly 71 percent of HomeMod Program expenditures, the cost to CDBG is between \$8,690 and \$10,800 per individual participant.

Exhibit 2: Cost of Modifications per Household



Benefits—Avoided Costs of Care in an Assisted-Living Facility or Nursing Home

One of the commonly mentioned benefits from home modifications for people with disabilities is allowing them to remain in their homes rather than their having to move to an institutional living situation, such as a nursing home or an assisted-living facility (facility). The benefit to the government is the additional costs avoided by not having to pay for the alternative living arrangement and associated services. Quantifying that benefit, however, is complicated by a few factors.

The first complicating factor is determining the percentage of participants who might have moved to a facility had the HomeMod Program not installed the modifications. Three-fourths of participants interviewed said that the modifications had allowed them to avoid moving to a facility. Other data from the interviews, however, suggest that some participants may not

²¹ The cost figures in exhibit 2 are not adjusted for inflation.

have needed to move to a facility immediately. Others might have avoided moving to a facility—at least temporarily—by relocating to a different unit, such as one in a single-level, accessible unit or to a building with an elevator. The interviews also showed that some HomeMod Program participants were dependent on support from other members of their households and, without that support, they certainly could not continue to live outside an assisted-living setting or nursing home.

Twelve of the 48 participants interviewed said that they would have had to change their living arrangements if the HomeMod Program did not exist, with a few suggesting that the move could have been to a single-story home instead of a facility. That number is similar to the change in the level of concern over having to move between the time before and after the modifications had been installed. Of the 46 participants whose modifications had been completed, 24 were very or somewhat concerned about having to move before the modifications, but only 13 were somewhat concerned after the HomeMod Program had completed the modifications. Together, the different responses in the interview data suggest that the modifications may have allowed about one-fourth of the participants to remain in their homes and that some of those who did move may have been able to relocate to alternative units not in a facility.

Respondent Stories

The parent of a child with a disability said that she had to use ad hoc solutions to help her child get up and down stairs before the HomeMod Program installed the interior chair lift and ramp. “We had to purchase temporary ramps to get her in and out of the garage. They were very steep. She was also smaller at the time, so they were doable, but it was a bit of effort for me still. I don’t think currently I would be able to push her up those ramps.” She commented that without the HomeMod program, installing the modifications would have cost the family all of its savings.

She also said that she and her family experienced another, unanticipated benefit from the chair lift that the HomeMod Program installed: “The chair lift allows us to have space in our living room so that we can enjoy family in a way that we couldn’t before. It let us move her exercise equipment into the basement. All of that was in our living room previously, and we couldn’t have family over, and since family in the area doesn’t have wheelchair access, it’s not like we could go over to their house either. The biggest benefit [of the modifications] is the ability to enjoy extended family.” She felt that the increase in quality of life that she and her daughter experienced as a result of the HomeMod Program installing the chair lift and ramp was a huge benefit. “It was a very helpful program for us. We probably would have been able to afford [the modifications], but it would have completely eliminated our savings.”

A second complicating factor in quantifying this benefit is in determining the duration of the benefit. The cost of modifications is, essentially, a one-time expense²²—that is, it is incurred only when the modifications are installed—whereas the benefit from avoiding the additional expense of a facility is ongoing. That means that the total benefit to the government will differ, depending on the age, gender, and race of the participant, among other factors. Allowing a 30-year-old White male with a life expectancy of more than 47 additional years to remain in his home would statistically save the government more over that person’s lifetime than allowing a White male who is 55 years old, with a life expectancy of fewer than 26 more years, to remain in his home.²³ Women generally outlive men by about 3 years, so modifications for women with disabilities would tend to save the government more than modifications for men the same age with disabilities. Finally, Latinx individuals tend to outlive non-Latinx Whites, and non-Latinx Whites tend to outlive non-Latinx Blacks. The duration of the benefit, therefore, will vary by the age and demographic characteristics of the person receiving the modifications. The HomeMod Program data do show the age, gender, and race of most of the applicants, so the calculation of the benefit could be adjusted to reflect their average life expectancy based on those factors.

Not only would the duration of the benefits be affected by the age and demographic characteristics of the recipient, it would also be affected by the start date. Just because the interview data suggest that HomeMod Program participants might have moved to some kind of residential facilities, the data do not provide any clear indication as to when that move might occur. For example, some of the HomeMod Program participants interviewed had degenerative conditions, meaning that their mobility impairment would become more severe over time. Modifications that were sufficient to allow those individuals to remain in their homes when installed might not be sufficient as their conditions worsened. Other participants relied on the assistance of household members even after receiving the modifications. In the event that those household members ceased to be able to provide the necessary assistance, the participants might need to move to a facility even though they had received modifications. In either situation, the benefits to the government do not begin immediately; they would start at some indeterminate time in the future, lessening their present value.

The third complicating factor is determining whether the person with a disability is eligible to have the government pay for, or contribute to, the cost of residence in a facility. Eligibility has three components: income, assets, and medical needs. Medicaid, which pays for a large percentage of nursing home care, is means tested, with maximum income limits based on the federal poverty level. Based on the HomeMod Program data, more than 29 percent of

²² Actually, about one-third of HomeMod Program participants received multiple modifications over a period of years. The expense is “one-time” in the sense that all modifications are fully paid for at the time of installation and do not require periodic payments over time, unlike ongoing expenses for services or a unit in a residential facility.

²³ Life expectancy data are from Arias and Xu (2019), Table A.

program participants have a household income below the federal poverty level.²⁴ The Illinois Supportive Living Program, which helps to pay for assisted-living facilities, has a minimum income limit equal to the Supplemental Security Income amount (\$771 in 2019) and requires the person with a disability to cover part of the cost. Medicaid and the Illinois Supportive Living Program also have limits on the number of assets a person may have, with exemptions for a primary residence, car, and some other items of personal property. To be eligible for either type of facility, the person with a disability must require nursing home-level care, which is generally a higher standard than simply help with activities of daily living.

Although the eligibility criteria for the different residential options are complicated, whether a person with a disability meets those criteria is, in part, within the control of the individual. For example, people with incomes above the limit may spend some of their income on medical expenses, which reduces the income counted toward the limit. If they have too many nonexempt assets to qualify, they may convert some to exempt assets to get below the asset limit.

The data from the HomeMod Program and interviews with program participants are not sufficiently detailed to allow an independent determination as to whether any individual participant might qualify for government assistance with the cost of living in a facility, and, if so, the level of care for which the person would qualify. First, the HomeMod Program data only indicate the nature of the participant's disability, not the severity. That means that the data do not show whether any participant might require nursing home-level care or some lesser level, such as assisted living. The participant interviews suggest that some participants definitely would qualify for nursing home care, whereas others clearly would not.

The fourth complicating factor is the uncertainty over the future cost of care to the government, assuming that the person with a disability is eligible for government assistance. In Cook County, where the city of Chicago is located, the Medicaid rate effective 10/1/2019 for the Supportive Living Program is \$37,872 per year, and the average rate for nursing home care is \$68,678 per year.²⁵ Those rates change periodically, so the amount that the government actually might save from avoiding the cost of care will depend on what the rate is at the time the person with a disability enters the facility, not the cost at the time the modifications are installed.

This analysis uses three different scenarios to estimate the break-even point for the cost of HomeMod Program modifications, considering the degree of uncertainty in any attempt to quantify the benefit in terms of cost savings from allowing people with disabilities to remain in

²⁴ The data are from 2003 to 2012 only. As of 2013, the MOPD data have household size as one for all applicants, even if their actual household size is more than one.

²⁵ The annual cost for assisted living is based on the published daily rate of \$103.76 for Cook County, and the annual cost for nursing homes is based on the average of the published rates for 75 nursing homes in Chicago from the Centers for Medicare & Medicaid Services website.

their homes instead of moving to some form of government-subsidized residential facility. The three scenarios are as follows:

First scenario: The people with disabilities receiving the modifications would have continued to live in their homes for a period of 10 more years before moving to a facility. The modifications allowed people to avoid moving to a facility for the remainder of their lives, so the avoided cost is the present value of the future payments for the facility for the expected life of the participants starting in year 11 after the modifications.

Second scenario: Without the modifications, the people with disabilities receiving the modifications would have continued to live in their homes for 2 more years before moving to a facility. The modifications allowed the people to remain in their homes for a period of 8 years longer than they would have if the HomeMod Program had not installed the modifications—that is, through the 10th year after the modifications. After that delay of 8 years, the people with disabilities move to a facility. The avoided cost is the present value of the future payments for the 8 years that the people did not move into a facility when they would have in the absence of the modifications.

Third scenario: Without the modifications, the people with disabilities receiving the modifications would have continued to live in their homes for 2 more years before moving to a facility. The modifications allowed the people to remain in their homes 5 years longer than they would have if the HomeMod Program had not installed the modifications. After the 5 years, in the eighth year following the modifications, the people with disabilities move to a facility. The avoided cost is the present value of the future payments for the 5 years that the people did not move into a facility when they would have in the absence of the modifications.

For all three scenarios, the calculations use the following assumptions and data simplifications:

- The average cost of the HomeMod Program modifications is between \$12,200 and \$15,150 per unit.
- The discount rate is 6 percent.²⁶
- The rate of cost inflation for Medicaid payments for residential facilities in Chicago is 3.5 percent per year.²⁷

²⁶ The rate is assumed for purposes of estimating the avoided costs. If the discount rate is higher than 6 percent, the present value of the avoided costs would be less than the estimate, so more people would have to be able to defer or avoid going to an assisted-living facility or nursing home than projected by the estimate.

²⁷ The rate is assumed for purposes of estimating the avoided costs. If the inflation rate is higher than 3.5 percent, the present value of the avoided costs would be more than the estimate, so fewer people would have to be able to defer or avoid going to an assisted-living facility or nursing home than projected by the estimate.

- The cost of housing a person with a disability in an assisted-living facility is \$37,872 per year.
- The cost of housing a person with a disability in a nursing home is \$68,678 per year.
- The life expectancy for HomeMod participants is 5 years less than for the population in general.
- For the first scenario, HomeMod Program participants are grouped by age to estimate lifetime costs for living in a residential facility, with all participants under the age of 18 years being treated as if they were 15 years old, participants 50 years or older being treated as if they were 55 years old, and all other participants being treated as if they were 40 years old.²⁸
- For the first scenario, the percentage of participants in each age range is based on the percentage of all applicants in the range using the data from all MOPD applications—that is, 16 percent under the age of 18, 44 percent between 18 and 49 years old, and 40 percent 50 years old or more.

First Scenario Data: In the first scenario, the government saves the cost of the residential facilities for participants starting 10 years after the HomeMod Program installed the modifications, and the government pays the cost for the rest of the participants' lives. Assuming the cost of modifications is at the lower end of the range, \$12,200 per unit, and if the avoided cost is for assisted living, \$37,872 per year, the modifications save the government their full cost for all units if the modifications allow 2.3 percent of participants to avoid ever moving to an assisted-living facility.²⁹ Assuming the cost of the modifications is at the higher end of the range, slightly less than 2.9 percent of participants would have to avoid ever moving to a facility to save the government the full cost of all of the modifications. The HomeMod Program served an average of about 80 participants per year, so even at the higher end of costs for the modifications, the modifications would have to allow only three of those participants to avoid moving to a facility and to live in their homes for the rest of their lives to save the government more than the cost of the program.

If the avoided moves would have been to the expensive nursing home facilities, at \$67,678 per year, then between 1.3 percent (at the lower-cost end) and 1.6 percent of participants would have to avoid moving for the program to save the government more than it cost—that is,

²⁸ The assumptions were made to simplify the calculations.

²⁹ The actual number of participants avoiding moves to save more in avoided costs for residing in an assisted-living facility or nursing home would depend on the life expectancy of those avoiding or delaying the move. For example, fewer young participants would have to avoid moving than older participants because the younger people have a longer life expectancy over which the government would be paying the costs.

only 2 of the 80 participants³⁰ would have to avoid moving for the HomeMod Program to provide net savings to the government.

Second Scenario Data: In this scenario, the government saves the cost of the facilities for the period of 8 years that the modifications allowed the participants to delay their moves—that is, from year 3 to year 11 after the HomeMod Program installed the modifications. The savings are based on all moves occurring more than 2 years after the program installed the modifications—that is, the people with disabilities would have moved to a facility in the third year if the modifications had not been installed. Instead, because of the modifications, people who would have moved into a facility in year 3 did not move until year 11.

If the cost of modifications is at the lower end of the range, then 4.7 percent of participants, or four people, would have to delay moving into an assisted-living facility for those 8 years for the government to save more than the cost of the modifications. At the higher end of the cost range, 5.8 percent, or five people, would have to delay their moves into an assisted-living facility for those 8 years to generate net savings to the government. If the delayed moves would have been to nursing homes, then the figures are 2.6 percent, or two people, at the lower end of the cost range and 3.2 percent, or three people, at the higher end of the cost range for the government to realize net savings from the modifications.

Third Scenario Data: In this scenario, the government saves the cost of the facilities for the period, 5 years, that the modifications allowed the participants to delay their moves. The savings are based on moves occurring during the third year after the program installed the modifications—that is, the people with disabilities would have moved to a facility in the third year if the modifications had not been installed. Instead, because of the modifications, people who would have moved into a facility in the third year did not move until the eighth year after the HomeMod Program installed the modifications.

If the cost of modifications is at the lower end of the range, then 7.3 percent of participants, or six people, would have to delay moving into an assisted-living facility for the 5 years for the government to save more than the cost of the modifications. At the higher end of the cost range, 9.0 percent, or slightly more than seven people, would have to delay their moves into an assisted-living facility for 5 years to generate net savings to the government. If the delayed moves would have been to nursing homes, then the figures are 4.0 percent, or slightly more than three people, at the lower end of the cost range and 5.0 percent, or four people, at the higher end of the cost range for the government to realize net savings from the modifications.

³⁰ The HomeMod Program has served an average of more than 75 people with disabilities per year—more in recent years. The estimate of 80 participants is to approximate the current level of activity.

Analysis of Scenarios, Discussion, and Comments: The number and percentage of HomeMod Program participants, based on an average of 80 participants per year, who would have to avoid or delay moving under each of the three scenarios are shown in exhibit 3.

Exhibit 3: Number and Percent of Participants Not Moving or Delaying Moves to Break Even

	Lower Cost		Higher Cost	
	Assisted Living	Nursing Home	Assisted Living	Nursing Home
Avoided Moving	1.8 (2.3%)	1.0 (1.3%)	2.3 (2.8%)	1.3 (1.6%)
Delayed Move for 8 Years	3.8 (4.7%)	2.1 (2.6%)	4.7 (5.8%)	2.6 (3.2%)
Delayed Move for 5 Years	5.8 (7.3%)	3.2 (4.0%)	7.2 (9.0%)	3.8 (5.0%)

One goal of the HomeMod Program is to allow people with disabilities to continue to live in their homes. Whether the program saves the government money in the long run partly depends on the extent to which it accomplishes that goal.

One-fourth of the HomeMod Program participants interviewed said that they would have had to move if the program had not provided the modifications. That response is, of course, based on conditions at the time of the interview. Some participants may, over time, still have to move to a facility. As the three scenarios show, however, the program does not have to help people with a disability avoid moving altogether. It only has to allow those people to delay their moves to save the government some of the cost of paying for the people to live in either an assisted-living facility or a nursing home. For example, if four program participants in a single program year can remain in their homes for 8 years longer than they would have without the modifications, and if those people move to an assisted-living facility whenever they do move (sooner without modifications, later with modifications), then the government avoids more in costs for housing people with a disability in that facility than it paid for modifications for all of the HomeMod Program participants that year.

Benefits—Avoided Costs of Providing In-Home Personal Care Attendants and Home Health Aides

Another possible benefit from the modifications that the HomeMod Program installed is reducing the cost of in-home services provided to people with disabilities by personal care attendants and home health aides. The services that both specialists offer help people with disabilities with the activities of daily living and routine personal care needs, such as bathing and dressing. Personal care attendants, in general, focus more narrowly on medical needs, such as

monitoring blood pressure or collecting specimens for lab tests, whereas home health aides offer more general assistance with routine tasks, such as grocery shopping and transportation to doctor’s offices and other appointments. Medicaid may cover the cost of both personal care attendants and home health aides for people with disabilities.

If the modifications that the HomeMod Program installs allow some participants to get to appointments or to manage their self-care more independently than before the modifications were installed, that could reduce the need for—and cost of—either personal care attendants or home health aides. For example, modifying a bathroom by replacing a tub with a roll-in shower and adding a seat and grab bars might enable a person with a mobility impairment to maintain her or his personal hygiene without the need for an assistant to lift her or him into and out of a bathtub.

Data from the 48 participant interviews show that six of the interviewees had only a personal care attendant, four had only a home health aide, and four had both before the HomeMod Program installed their modifications. All of the people with disabilities who had either also had incomes below the poverty level, and 10 were permanently disabled, 2 were children, 1 was retired, and 1 was not working. After the modifications were installed, four of the six still had only a personal care attendant, one of the four still had only a home health aide, and two of the four people who had both a personal care attendant and home health aide had neither and two still had both, as shown in exhibit 4. One participant who had neither a personal care attendant nor a home health aide before the program installed the modifications had both after the modifications were installed.

Exhibit 4: Use of Personal Care Attendants and Home Health Aides

Age	Personal Care Attendant		Home Health Aide		Modifications
	Before Modifications	After Modifications	Before Modifications	After Modifications	
57	Yes	No			R/L, BA
37	Yes	No			R/L
34	Yes	Yes			R/L, BA, KIT
51	Yes	Yes—reduced			R/L, BA, KIT, CHL
55	Yes	Yes—reduced			R/L, BA, CHL
54	Yes	Yes			R/L
59	Yes	No	Yes	No	BA
58	Yes	No	Yes	No	BA

51	Yes	Yes – reduced	Yes	Yes – reduced	R/L
35	Yes	Yes	Yes	Yes	R/L
4			Yes	No	Railings
56			Yes	No	BA, CHL
57			Yes	No	R/L
10			Yes	Yes	R/L, CHL

BA = bathroom. CHL = interior chair lift. KIT = kitchen. Railings = exterior stair railings. R/L = ramp or vertical power lift.

Of the four interviewees who still had a personal care attendant after the modifications, two indicated that the modifications had reduced the amount of assistance they needed somewhat.³¹ One of the two who still had both a personal care attendant and a home health aide after the modifications also said that the modifications had somewhat reduced the need for their help.

Analysis, Discussion, and Comments

Overall, 14 of the HomeMod Program participants interviewed—slightly less than 30 percent—had a personal care attendant, home health aide, or both before the modifications were installed; after the modifications, only seven—slightly more than 14 percent—still did. Of those seven still receiving services, three interviewees indicated that the modifications had reduced the amount of assistance they needed.

The benefit in cost savings depends on the type of provider, the level of services that were being provided before the modifications, the extent to which the level decreased following the modifications, and how long the cessation or reduction in assistance will last before participants require the former level of service again. If the Medicaid reimbursement rate for a personal care attendant is the same as for a Certified Nurse Aide, the rate would be \$20.00 per hour. The rate for a home health aide is \$111.00 per visit.

The data from the participant interviews does not specify how often or for how long each type of service occurred, either before or after the modifications. There is no way to predict with any certainty how long any given participant’s needs might be met appropriately with a reduced level of service. For purposes of quantifying the benefit, therefore, data must be assumed.³² The analysis will use the following:

³¹ The participant interviews do not contain data on the level of personal care attendant or home health aide assistance used before or after the modifications.

³² If the assumptions overstate the duration or frequency of service or understate the extent of the reduction in the frequency or duration, then the estimated savings will be less than the estimate.

- Each personal care attendant visit lasts 4 hours.
- A personal care attendant visits twice per week.
- A home health aide visits twice per week.
- If the amount of assistance is “somewhat reduced,” the visits occur once per week.
- The level of service will return to the pre-modification level after 3 years.

Based on those assumptions, the government was providing twenty 4-hour personal care attendant visits per week,³³ for a total of 80 hours of personal care attendant service, and 16 home health care aide visits per week³⁴ before the modifications, as shown in exhibit 5. After the modifications, the government was providing nine 4-hour personal care attendant visits per week³⁵ and five home health aide visits per week.³⁶ As a result, the cost of personal care attendants dropped from \$83,200 to \$37,440 per year, and the cost of home health aides dropped from \$92,352 to \$28,860 per year. The total savings, therefore, from the modifications that the HomeMod Program installed are \$109,252, or an average of \$2,276 per participant for the 48 participants interviewed in 1 year.

Exhibit 5: Personal Care Attendant and Home Health Aide Costs

	Before Modifications			
	Personal Care Attendants		Home Health Aides	
	Full	Reduced	Full	Reduced
A) Number	10	0	8	0
B) Hours per visit	4			
C) Visits per week	2		2	
D) Total hours/visits per week (AxBxC)	80	0	16	0
E) Cost per hour/visit	\$20		\$111	
F) Cost per year (Fx52)	\$83,200	\$0	\$92,352	\$0
G) Total cost (Full + Reduced)	\$83,200		\$92,352	
	After Modifications			
A) Number	3	3	2	1
B) Hours per visit	4	4		
C) Visits per week	2	1	2	1
D) Total hours/visits per week (AxBxC)	24	12	4	1
E) Cost per hour/visit	\$20	\$20	\$111	\$111
F) Cost per year (Fx52)	\$24,960	\$12,480	\$23,088	\$5,772
G) Total cost (Full + Reduced)	\$37,440		\$28,860	

As with the benefit of the costs avoided by HomeMod Program participants not moving into an assisted-living facility or nursing home, the benefit from the reduced use of personal care attendants and home health aides is an annual benefit flowing from a one-time cost of between \$12,200 and \$15,150 for the modifications. If the benefit continues for 3 years and then returns

³³ Ten participants at two 4-hour visits per week.

³⁴ Eight participants at two visits per week.

³⁵ Three participants at two visits per week and three participants at one visit per week.

³⁶ Two participants at two visits per week and one participant at one visit per week.

to the same level it was before the HomeMod Program installed the modifications, the total savings would be \$6,668.³⁷ Those savings would reduce the effective cost of the modifications to between \$5,532 and \$8,482 per unit.

Benefit—Avoided Cost of Ambulance Service to Get to and From Medical Appointments

A third benefit to the government from the modifications that the HomeMod Program installs may be a reduction in the cost of providing ambulance or emergency services to get people to medical appointments, such as doctor's visits or dialysis. Those are not the only reasons that people with disabilities may call an ambulance. For example, a person might call emergency services if he or she fell and could not get back up. That type of call, however, is event specific and not predictable. Getting to routine medical appointments is predictable, and the cost of providing that service could be avoided if the modifications removed the impediments that prevented the person from getting to the appointment without the assistance of emergency services. Eight of the 48 participants interviewed said that they had used emergency services to get out of their houses for doctor's appointments, dialysis, or other healthcare needs before the HomeMod Program installed the modifications. Of those eight, seven said that they used emergency services for those reasons much less, and one said that he used emergency services a little less after the modifications were installed than before they were. All seven of the respondents saying they used emergency services much less after modifications had had vertical power lifts or ramps installed.

³⁷ Using the same 6-percent discount rate and 3.5-percent cost inflation rate as the estimation of savings from avoided moves to an assisted-care facility or nursing home.

As with the other potential benefits, the level of savings is dependent on the frequency of use before the modifications and the change, if any, in the frequency after the modifications. One person said that she used emergency services to get to dialysis, which would be two to three times per week. Another said that she used emergency services about once per quarter. Assuming that the latter level of use is more typical of participants—getting to quarterly doctor’s appointments, for example—that may be used as the pre-modification level for the other seven participants using emergency services for that purpose. If the person using emergency services to get to dialysis calls them for one-half of her appointments, that would be 26 calls per year, plus 28 calls for the other seven participants, for a total of 54 calls per year. If “a little less often” is quantified as one-half as often, and “a lot less” as one-fourth as often, then the post-modification level would be 13.5 calls per year.

Respondent Stories

The mother of a child who has mobility issues received both an exterior lift and a ceiling lift from the HomeMod Program. As her son’s primary caretaker, she largely bore the responsibility of carrying her son to areas of the home where he needed to go, such as the bathroom. “When we got the ceiling lift, it was a godsend. I didn’t need to worry about dropping him or hurting my back. It’s amazing. It’s a huge gift because otherwise, I don’t know what I would have done. I mean, I’m his caretaker. If something happens to me, then what’s going to happen to him?”

With the exterior lift, she noted that her son was able to go on walks to the park, go to school, and have the personal freedom to go out and engage in activities he couldn’t participate in before the installation of the lift. “He’s able to do things—go places—instead of sitting in the home all day.” His mother commented that one of the most significant benefits of the modifications was that she no longer had to be as concerned about hurting herself or hurting her son. “That was my major issue and worry all the time: was I still going to be strong enough to pick him up, and when was I was going to hurt my back or hurt [my son] by not being able to hold him and then him falling?” When asked to give any final thoughts, she simply suggested that the program needed to do more advertising so that it could help more people.

The benefit also depends on the cost of the service being used. Medicaid reimbursement for routine ambulance service is \$142.63 per call, or \$285.26 for the round-trip from home to the appointment and back. The City of Chicago charges \$900.00 plus mileage, which would come to \$1,800 or more per round-trip. Assuming that the round-trip is billed as a single call, the savings would be about \$120 per participant at the Medicaid rate and \$759 at the City of Chicago rate each year.

As with the benefit of the costs avoided by HomeMod Program participants not moving into an assisted-living facility or nursing home, the benefit from the reduced use of emergency services is an annual benefit flowing from a one-time cost of the modifications of between

\$12,200 and \$15,150. If the benefit continues for a period of 3 years and then returns to the same level it was before the HomeMod Program installed the modifications, the total savings would be between \$350 and \$2,223 per unit.³⁸ Those savings would reduce the effective cost of the modifications to between \$9,977 and \$14,800 per unit.

Summary of Costs and Benefits

Analysis of the costs of the modifications shows that the per-unit cost is between \$12,200 (low estimate) and \$15,150 (high estimate). The modifications provide three quantifiable benefits to the government: avoiding or reducing (1) the costs of an assisted-living facility or nursing home; (2) the cost of personal care attendants or home health aides; and (3) the cost of emergency services used to get to doctor’s appointments and for other medical needs. Unlike the estimates for the potential benefits from avoiding the cost of assisted-living facilities or nursing homes, the estimated savings from reducing the use of personal care attendants, home health aides, and emergency services for transportation to healthcare appointments are not as likely to be delayed for a period of years. Those savings generally begin as soon as the modification is installed, as shown by the data on the changes in use from the participant interviews. Recalculating how many HomeMod Program participants have to defer moves to assisted-living facilities or nursing homes to achieve more savings than the initial cost of the modifications is therefore possible by deducting the savings from the reduced use of services from the estimated cost of the modifications—that is, instead of calculating the break-even point for avoided moves on the basis of the full cost of the modifications, the break-even point can be based on the cost of modifications net of the savings from the reduced cost of services, as shown in exhibit 6.

Exhibit 6: Estimate Range for Costs and Benefits, per Participant

Cost	High Estimate	Low Estimate
Cost of HomeMod Program modifications	\$15,150	\$12,200
Benefit (Cost Saving to the Government)	Low Estimate	High Estimate
Reduced PCA/HHA Costs (3 years)	\$6,668	\$6,668
Reduced Emergency Services Use (3 years)	\$ 759	\$2,223
Estimate of Savings on Cost of Services	\$7,427	\$8,991
Cost of Modifications Net of Savings on Cost of Services	\$7,723	\$3,209

HHA = home health aide. PCA = personal care attendant.

As noted in the earlier analysis of the benefits from avoided or delayed moves to assisted-living facilities or nursing homes, the uncertainty in projecting when, if ever, moves might occur

³⁸ Using the same 6-percent discount rate and 3.5-percent cost inflation rate as the estimation of savings from avoided moves to an assisted-care facility or nursing home.

and to which type of facility makes direct comparison of costs and benefits problematic. The break-even point, however, for various scenarios shows the effect that the HomeMod Program would have to have to make it revenue-neutral, with any performance beyond that providing net benefits to the government in terms of the monetary costs and benefits of the program, as shown in exhibit 7.

Exhibit 7: Level of Deferrals Needed to Break Even, Participants per Year

	High-Cost Estimate—\$7,723		Low-Cost Estimate—\$3,209	
	Assisted Living	Nursing Home	Assisted Living	Nursing Home
Avoided Moving	0.9 (1.0%)	0.5 (0.6%)	0.4 (0.4%)	0.2 (0.3%)
Delayed Move for 8 Years	2.4 (3.0%)	1.3 (1.6%)	1.0 (1.2%)	0.5 (0.7%)
Delayed Move for 5 Years	3.7 (4.6%)	2.0 (2.5%)	1.5 (1.9%)	0.8 (1.1%)

The data analysis shows that, even at the high end of the cost estimate—assuming the higher cost for modifications and lower benefits from expenses saved and allowing 5 of 160 participants receiving modifications over a 2-year period to remain in their homes for 8 years rather than moving to an assisted-living facility—the HomeMod Program saves the government more than it costs. At the low end, allowing two people per year to remain in their homes for 5 years saves the government money.

CDBG funds account for approximately 71 percent of the total that MOPD spent on modifications through the HomeMod Program. Determining the break-even point for CDBG funds is more complex, however, than simply adjusting the cost of modifications to reflect the 71 percent that the CDBG funds. That adjustment would show that, on average, CDBG funds account for between \$10,756 (high estimate) and \$8,662 (low estimate) of the cost of the modifications. Those estimates are based on the assumption that the analysis is only to consider CDBG funding. Any other federal funds used in the HomeMod Program or the remainder of the funding that comes from other sources, such as state funds or private charitable contributions, would be ignored in the analysis.

The question of allocating the cost-saving benefits remains. The savings from reducing the use of personal care attendants or home health aides, for example, go to the entity paying for the services. If the participant receiving the modification is covered under Medicaid, then it may pay for at least part of the services. In Illinois, the federal government’s share of overall Medicaid spending is 58 percent, with the state paying 42 percent. Using the cost and savings estimates for personal care attendants and home health aides shown in exhibit 5, and assuming

that Medicaid paid for the services in full, then the federal government's share of the savings would be 58 percent³⁹ of the \$6,668 per participant savings, or \$3,867 per participant.⁴⁰ The remainder of the savings goes to reduce the state's share of the cost and does not directly benefit the federal government.

Adjusting the savings from reduced use of emergency services to get to healthcare appointments is complicated by the fact that the low estimate in exhibit 5 is for Medicaid-reimbursed services, but the high estimate is based on the \$900 fee that the City of Chicago charges for basic ambulance services provided to the general public. For the sake of simplicity, the analysis of the break-even point for CDBG funds assumes that the savings are based on the low estimate, which is for Medicaid-reimbursed services, as shown in exhibit 5. Using the 58-percent share of the estimated savings of \$759, the federal savings due to the reduced use of emergency services would be \$440 per HomeMod Program participant.

Respondent Stories

A person who received bathroom modifications previously struggled to get in and out of his bathroom, get to the toilet, and more generally navigate his bathroom space while using a wheelchair. He said that before the modifications, he was very concerned about safety while using the bathroom. "I had to be really cautious about how I'd get into the bathroom. I had to be really careful about it because I could fall. The wheelchair only went in so far, so I had to get up and hop on one leg to get to the toilet." He also remarked that being dependent on family members and the cost of having paid assistance were major concerns.

When asked if he would have been able to afford the bathroom modifications without assistance from the HomeMod Program, he said, "No. Nowhere close. Not even close. And since I found out about it, I've been able to help a lot of other people. When I'm traveling in like the Pace car and all that, I run into my nurses and they tell me about these patients that are in the same situation that I was. And I was able to pass the [MOPD] number to them so that they could get that help. And it's been very helpful to a lot of people, I've heard." He finished by saying that, with the bathroom modifications installed, he was no longer concerned about falling and injuring himself.

Adding the two adjusted estimates of the benefits from the cost savings due to reduced use of personal care attendants, home health aides, and emergency services, the total cost savings resulting from the HomeMod Program modifications is \$4,307 (\$3,867 + \$440) per participant. Those savings make the effective per-participant cost of modifications in CDBG funds between \$6,449 (high estimate) and \$4,355 (low estimate).

³⁹ The actual savings may be different because the federal and state share of Medicaid expenses may vary, depending on the service and whether the person was added to the Medicaid rolls under the Affordable Care Act.

⁴⁰ Those savings do not go to replenish CDBG funds, which come from HUD. They would go to Medicaid, which is under the Department of Health and Human Services.

Those revised estimates may then be applied using the same assumptions for the scenarios as for exhibits 6 and 7 and considering only the costs and benefits for federal funding through either CDBG or Medicaid. Based on the revised estimates, the number of participants needing to defer moves annually to either an assisted-living facility or nursing home for the savings to exceed the net cost of the modifications is shown in exhibit 8.

Exhibit 8: Level of Deferrals Needed to Break Even, Participants per Year, Federal Funds Only

	High-Cost Estimate—\$6,449		Low-Cost Estimate—\$4,355	
	Assisted Living	Nursing Home	Assisted Living	Nursing Home
Avoided Moving	0.8 (1.0%)	0.4 (0.5%)	0.5 (0.6%)	0.3 (0.4%)
Delayed Move for 8 Years	2.0 (2.5%)	1.1 (1.4%)	1.3 (1.7%)	0.7 (0.9%)
Delayed Move for 5 Years	3.1 (3.8%)	1.7 (2.1%)	2.1 (2.6%)	1.1 (1.4%)

In each of the scenarios, the number of participants needing to defer moves to either an assisted-living facility or nursing home is greater when only federal funds are considered than when all funding is included because CDBG accounts for an average of 71 percent of the cost of the modifications, whereas only 58 percent of the benefits from cost savings go to Medicaid.

FINDINGS AND DISCUSSION

First, the findings from the Mayor’s Office for People with Disabilities (MOPD) and Integrated Disbursement and Information System (IDIS) data analysis show the costs of the HomeMod Program and the importance of Community Development Block Grant (CDBG) funding to the program. The data also show what the program was able to accomplish with the funding it received. Between 2003 and 2018—

- CDBG funds accounted for 71 percent of the total amount that the HomeMod Program paid for modifications.
- The average cost of modifications installed, adjusted for inflation, was between \$12,200 and \$15,150 per housing unit modified.⁴¹
- The program received applications from between 950 and 1,200 low- and moderate-income people with disabilities.
- Slightly less than 90 percent of those applicants had a mobility impairment, and many had multiple disabilities.
- The program installed 529 ramps or power lifts to enable people with disabilities to get in and out of their homes without having to navigate stairs.
- The program modified 362 bathrooms to provide roll-in showers, grab bars, Americans with Disabilities Act-compliant toilets, and other features to enable people to maintain their hygiene without—or with less—assistance from family and paid caregivers.
- The program completed 219 other modifications, such as interior chair lifts and kitchen modifications, for low- and moderate-income people with disabilities.

The analysis also clearly shows the need for data beyond what HUD compiles in the IDIS dataset. Both the cost and benefit components of the analysis were based on data that the MOPD provided and the interviews with former program participants. The IDIS data showed the allocation of CDBG funds to the program, but they did not include outside funding or allow for a breakdown of the costs per modification or estimation of potential savings from the modifications that CDBG helped fund.

Second, the findings as to the benefits provided by the HomeMod Program suggest that the program’s modifications save the government money over time. The savings come from modifications that allow people with disabilities to remain in their homes, reducing direct government expenditures for alternative living arrangements, such as assisted-living facilities and nursing homes. Savings also come from reductions in the level of in-home services, such as personal care attendants and home health aides, and from reduced use of emergency services to transport people with disabilities to healthcare appointments.

⁴¹ Not including administrative or overhead costs.

The data show that the benefits to the government at all levels, from the *low end* of the estimates, include the following:

- Avoiding or reducing the ongoing expenses of personal care attendants and home health aides for 3 years.
- Reducing the use of emergency services to get to healthcare appointments for 3 years.
- Saving money by having 4 of 80 people, or 5 percent, with disabilities defer a move to an assisted-living facility for a period of as little as 5 years.

The benefits exceed the *high-end* estimates of the one-time costs of providing the modifications that allow them to remain in their homes (see exhibit 6). The longer modifications allow people with disabilities to delay moves to an assisted-living facility, the fewer have to delay moves for the savings to the government to exceed the cost of the modifications. If the moves would have been to a nursing home, and some of the participants interviewed clearly needed the level of care that would justify moving to a nursing home, then the break-even number of participants delaying moves would be even lower than for moves to an assisted-living facility. Those numbers are calculated under the assumptions least favorable for determining the break-even point. Under more favorable estimates, including the high end of the estimates for savings and the low end of the estimates for the cost of modifications, allowing even one person with a disability to delay moving into a nursing home for as little as 5 years results in a net benefit to the government that is greater than the cost of the modifications. If only federal funds are considered, then the number of participants needing to defer moves increases somewhat, as shown in exhibit 8.

Third, the findings concerning cost-saving benefits to the government are based on a limited scope of benefits. The analysis does not attempt to quantify additional benefits, such as savings on medications or treatments, that the interviews suggested might occur. For example, one participant observed that the ramp that allowed him to leave his home whenever he wanted also allowed him to get more exercise. The additional exercise improved his overall health enough to allow him to reduce his medications and avoid needing treatment for conditions associated with prolonged periods of inactivity. The analysis does not include other potential benefits suggested in the literature, such as avoiding medical expenses that Medicaid might cover due to falls or injuries to caregivers. Adding those cost-saving benefits to the analysis would further reduce the number and percentage of people with disabilities who would have to defer moves to assisted-living facilities or nursing homes, or it would shorten the number of years those moves would have to be deferred, to reach the break-even point.

Fourth, the findings with respect to the comparative costs and benefits to governments include no value for the benefits that flow to the people with disabilities who receive the modifications. No value can be calculated for the feelings of the people with disabilities, such as

increased independence, more involvement in their communities, and their perception of self-worth.⁴² The analysis places no value on the psychological benefits of being able to remain in their homes and neighborhoods or the reduction of depression that can come from a feeling of isolation and helplessness. It includes no value for the spillover benefits to other members of the household, such as from avoiding injuries that occur when helping their family member go outside or to take a bath, or from increased earnings from being able to work outside the home without having to leave to help their family member with a disability get to her or his appointments. It places no value on a person with a mobility impairment being able to get out of the house in the event of a fire or other emergency.

⁴² See Sunstein (2007) for a discussion of the difficulties inherent in valuing intangible benefits.

CONCLUSIONS, RECOMMENDATIONS, AND FUTURE RESEARCH

As the percentage of Americans older than age 65 increases, so will the number with mobility impairments and other disabilities. The housing stock in America is not well suited to meet their needs at the current level, much less as the demand for accessible housing increases. One way to address the shortfall is to adapt existing housing to the needs of people with disabilities, which will allow them to continue to live in their homes and neighborhoods. That is what the HomeMod Program is doing. It provides people with disabilities the home modifications they need, such as vertical power lifts and accessible bathrooms, to be able to remain in their homes.

The findings from this analysis suggest that the program saves the government more than the cost of the modifications. The savings result from reducing the amount the government pays for service providers, such as personal care attendants and home health aides, and from the cost of institutional residential options, such as assisted-living facilities, to which some of the people with disabilities will move if they can no longer remain in their homes. The savings exceed the cost of the modifications if a relatively small number of program participants can defer their moves for as little as 5 years.

The analysis also shows the types of additional data needed for a more comprehensive and definitive comparison of costs and benefits for Community Development Block Grant program (CDBG)-funded activities such as the HomeMod Program. This analysis required numerous assumptions about how long the modifications might allow people with disabilities to defer moving to assisted-living facilities or nursing homes and the extent to which they reduced the need for personal care attendants or home health aides. Neither the Mayor's Office for People with Disabilities (MOPD) nor the Integrated Disbursement and Information System (IDIS) datasets contained the type of information necessary to assess the cost effectiveness of the activity. An even broader examination of the impact that the CDBG-funded HomeMod Program had on the community would require even more data about the effects of the modifications on the lives of the participants and the members of their households.

The data and analysis suggest four specific policies that the government should pursue.

Expand Data Collection

The first policy recommendation is to implement a more rigorous and expanded data collection effort, beyond what is currently collected for IDIS. Although clearly useful for the fiscal management of the CDBG program, the IDIS dataset does not seem to be designed to gather the types of data that are necessary for evaluating initiatives such as the HomeMod Program. The IDIS data provide information about immediate or short-term effects, such as the number of jobs retained, the number of housing units created, the number of people displaced, or the terms of loans provided. As important as those metrics are, they do not capture longer-term effects, such

as whether the businesses funded have closed or expanded 5 to 10 years after they received the CDBG funds or whether private-sector investment in new housing raised property values and rents, resulting in large-scale displacement 5 years after the CDBG-funded activities.

The new data-gathering effort should be designed to address the shortcomings of IDIS as a source of longer-term program evaluation. Data are needed to fill in the gaps in the information about the pre- and post-modification levels of service for personal care attendants and home health aides and to gather longitudinal data to determine the extent to which modifications allow people to delay moving to more institutional residential settings and for how long. This analysis relied on data from the HomeMod Program and participant interviews, as well as assumptions about levels of service and the duration of cost savings from deferred moves. The assumptions need to be tested and verified.

Because the analysis required numerous assumptions about the various factors affecting the value of benefits, such as the duration of the delay in moving to a residential facility, longitudinal data that measure the duration of the benefits more accurately are clearly needed. The assumptions as to duration—3 years for the reduction in services and 5 or 8 years for delaying moves—are not supported by data based on the experience of HomeMod Program participants. No data are available on the type of residential facility program participants move to when they move. Additional data are also needed to more accurately measure the level of services the program participants use both pre- and post-modification.

In addition, this study shows one of the key limitations of the cost-benefit approach to evaluating the HomeMod Program, and the new data should address those limitations. The determination of costs and benefits is from the perspective of the entity paying the costs, and the only benefits that are relevant to the analysis are those that inure to that entity. In this study, the entity is the government. Although clearly a reasonable approach, it overlooks benefits that the participants receive, benefits that may be intangible and personal but that are of vital importance to the people with disabilities who were interviewed. The new data-gathering protocols must ensure that the intangible—but very real—benefits to people with disabilities, such as an increased sense of independence or the ability to participate in the community, are included in any analysis of program impact.

Consider Collaborating with Other Agencies for Data to Assess Longer-Term Effects

Designing a method to gather such longitudinal data may present some challenges. This is not a situation in which participants can easily be divided into treatment and control groups because of the ethical considerations in withholding the treatment—home modifications—from some people with disabilities who might otherwise qualify for them. One possibility might be to compare the Medicaid records for the HomeMod participants with a group of nonparticipants with similar

characteristics, such as the nature and extent of their disabilities, age, overall health, medications, and other factors. The data might show the level and cost of Medicaid-supported services, such as personal care attendants, before and after the modification and whether and when people in each group moved to an institutional residential setting. The use of Medicaid records might also allow for a more complete accounting of costs and benefits. The records might reveal, for example, whether the cost of prescriptions for the treatment and control groups showed significant differences between the pre- and post-treatment periods. The records might also show differences in the use of Medicaid-funded emergency services between the two groups.

Trying to gather the longitudinal data prospectively would also present a challenge because of the uncertainty as to who will choose to apply to the HomeMod Program. Any attempt to constitute a control group would have to allow for the possibility that some people in the group might choose to apply for a modification in the near future. For that reason, the data may have to come from past HomeMod Program participants—those who had modifications done 5 or more years ago—to allow them to have had the time to remain in their homes or use assistive services for a substantial number of years post-modification.

Expand the HomeMod Program

The City of Chicago should expand the HomeMod Program dramatically. At present, the program serves about 80 people with disabilities per year, one modification at a time. At a time when the percentage of the population with disabilities is almost certainly increasing rapidly, as a result of aging if for no other reason, 80 households per year in a city with more than a million occupied housing units is inadequate to address the growth in the number of people with disabilities. The program needs to be expanded to reach more households if it to meet the projected growth.

One way to expand the HomeMod Program is to increase its level of CDBG funding. CDBG funding accounts for an average of 71 percent of the cost of modifications, so increasing the amount of CDBG funding could significantly increase the number of people with disabilities the program could serve. The analysis in this report suggests that the one-time investment in modifications saves the government money within a few years if it allows relatively few people with disabilities to remain in their homes rather than moving to an assisted-living facility or nursing home, which imposes ongoing, annual costs.

Allow the HomeMod Program to Install Multiple Modifications at One Time

The fourth recommendation is to change the HomeMod Program approach from doing one modification at a time to a whole-house approach. The MOPD data and participant interviews show that many of the participants request and need multiple modifications to be able to remain in their homes. The most common combination of modifications are a ramp or vertical power lift

and bathroom modifications, which are consistent with the literature on the housing needs of people with mobility impairments.

Doing one modification at a time may be less cost effective than doing all the modifications at one time. Of course, the desirability of such a change might depend on an increase in funding, as suggested earlier. Doing one modification at a time allows the program to serve more people with disabilities each year. The whole-house approach would spend more on some units, limiting the scope of the program. If more funds became available, the program could continue to serve a larger number of people yet spend more to do all the modifications needed on a given unit at one time.

Provide Funds for Continued Upkeep of Installed Home Modifications

A fifth policy recommendation comes from the participant interviews and their experiences. The HomeMod Program installs modifications, but the recipient is responsible for maintaining the modifications in operating condition, which is essential to allowing the recipient and the government to continue receiving the benefits from the modifications. The program participants currently bear the cost of maintenance. Program participants must have, by program eligibility criteria, low or moderate income. That means they are unlikely to have much excess disposable income to cover regular maintenance of the modifications. For example, vertical power lifts are mechanical devices that are exposed to Chicago weather, including notoriously cold winters with lots of snow. The lifts need periodic maintenance to continue operating, but the HomeMod Program does not include maintenance contracts or funds that the recipients can use to cover the expenses. Additional funding for maintenance and repair should be considered essential and added to the HomeMod Program budget.

Future Research

The analysis in this report suggests that the HomeMod Program saves the government money in the long run. Gaps in the data, however, mean that the findings are based on incomplete data and the assumptions needed to fill those gaps. Moreover, many potential sources of savings for the government are omitted from the analysis.

Analysts who do future research on the HomeMod Program and similar programs need to have access to a more comprehensive dataset, one that provides longitudinal data to see if people with disabilities who receive home modifications remain in their homes for extended periods and when, if ever, they move to assisted-living facilities or nursing homes. The data also need to account for other potential sources of savings, such as reductions in the number of prescriptions or treatments for injuries.

The demographic data about the aging of the population show clearly that the United States is facing an inevitable and growing need for housing suitable for people with disabilities.

The HomeMod Program provides one possible way to reduce the shortfall. The government must have a clear understanding of the costs and benefits of the HomeMod Program approach to know whether it is a model that merits additional funding to increase program capacity to the level needed to meet future needs.

APPENDIX A – PARTICIPANT INTERVIEW GUIDE

Semi-Structured Interview Guide Key Informants

ID: _____

Interviewee's Name: _____

Date of Interview: _____

Moderator Name: _____

SCREENER

Hello, may I please speak with [READ NAME FROM LIST] _____?

I am with Woodstock Institute, a local, Chicago nonprofit organization that has been asked to evaluate the City of Chicago's HomeMod Program. We are trying to find out how receiving modifications through the program or others similar to it has affected the lives of the people the program is meant to serve. We are speaking with professionals who work with individuals with disabilities to understand their impressions of the impact of home modifications. We will use the information you and other people we interview provide to inform the officials running the program of the benefits the program is having.

This interview should take about 30-45 minutes to complete.

Is now a convenient time to conduct the interview? If not, can you provide me with a date and time that would work better for you?

Callback Date: _____, Callback Time: _____

Respondent Name: _____

Confirm that this is the best phone number to reach them at.

INTERVIEW

First of all, let me thank you very much for agreeing to speak with me today. We appreciate the fact that you are willing to help us with our research about the HomeMod Program.

[INTRODUCE SELF AND PROJECT BACKGROUND]

DISCLOSURES

- I want you to know that I'm going to ask you some questions today, but there are no right or wrong answers. This is just about your opinions, viewpoints, and impressions.

- You may not be able to answer all of my questions today and that's perfectly fine. If I ask you a question and you don't know the answer, just tell me you don't know. Similarly, if you do not want to answer a question, just let me know, and we will skip it.
- Please be very open and honest with your opinions; positive comments won't please me, and negative comments won't hurt my feelings or get me upset.
- Our research process is confidential. We don't release the names of people who shared their opinions and ideas with us or any statements connected to your name. We only report the results of the interviews we are conducting as a whole. I am going to audio record our conversation today and that is just a note-taking device for myself, so that I can go back and listen to your comments again later. Is that okay with you? [IF YES, RECORD. IF NO, DO NOT RECORD, BUT CONTINUE INTERVIEWING ON PAPER.]

If you have any questions about this interview or the study, feel free to ask me.

First, I am going to ask some basic questions about you, to get a better idea of your background and knowledge of issues facing people with disabilities who are trying to live independently.

RESPONDENT BACKGROUND

Q1: What organization or agency do you work for?

Q1a: Can you tell me a little bit about them? What services do they provide?

Q1b: [IF NOT MENTIONED IN 1A] What services or assistance, if any, do you or the organization or agency you work with provide to people with disabilities? What are they coming to your organization for or being referred to your organization for?

Q2: What is your title or role at that organization or agency?

Q2a: How long have you worked there?

Q2b: How long have you worked in this field?

Q2c: In what capacity do you work with individuals with disabilities?

Q2d: Approximately how many people with disabilities do you usually work with in an average year?

Q2e: Thinking about the population that you work with, what would you say are their primary needs?

Q3: In general, what types of disabilities do the people you work with have? [DO NOT READ LIST UNLESS RESPONDENT NEEDS PROMPTING. ACCEPT MULTIPLES.]

1. Mobility, such as limited functionality in an arm or leg
2. Cognitive, such as difficulty remembering or concentrating
3. Visual
4. Hearing
5. Independent living/Self-care
6. Mental or behavioral health, such as anxiety or depression
7. Other _____

Q3a: What percentage of your clients are homeowners or living in a home versus renters?

FAMILIARITY WITH HOMEMOD PROGRAM OR OTHERS SIMILAR TO IT

Q4: How familiar are you with the City of Chicago’s HomeMod Program?
 Very Somewhat Slightly Not at all

Q4a: [IF VERY- SLIGHTLY FAMILIAR] What are your impressions of the HomeMod Program? What have you heard about it?

Q4b: Have you ever had a client utilize the HomeMod services?

Q4c: Was their experience positive, negative, or neutral? [PROBE] Why?

[IF NOT FAMILIAR WITH THE HOME MOD PROGRAM, READ:]

The City of Chicago Home Mod program provides home modifications up to \$10,000 for qualifying individuals with disabilities. To qualify for a home modification, individuals must complete an application process and meet the requirements of the program. Some requirements include being under 60 years old, meeting a certain income requirement, and residing in the city of Chicago. Modifications that are typically made include installing ramps, lifts, widening doors, and/or bathroom modifications.

Q5: What other organizations are you aware of—if any—that provide services similar to the HomeMod Program?

Q6: What are your impressions of that program? What have you heard about it?

Q6a: Have you ever had a client utilize that service?

Q6b: Was their experience positive, negative, or neutral? [PROBE] Why?

BENEFITS OF HOME MODIFICATIONS

Q7: What would you say are the primary benefits of home modifications to people with disabilities? [DO NOT READ LIST UNLESS RESPONDENT NEEDS PROMPTING. CLASSIFY ANSWERS.] [ACCEPT MULTIPLES]

1. Independence in daily living activities (bathing, dressing, cooking)
2. Less reliance on nonpaid caregiver (spouse/child/family member)
3. Less reliance on or need for paid caregivers (home health aide, etc.)
4. Less isolation/able to get outdoors more
5. Less risk of falls
6. Other _____

Q8: What would you say are the primary benefits to their caregivers? [DO NOT READ LIST UNLESS RESPONDENT NEEDS PROMPTING. CLASSIFY ANSWERS.] [ACCEPT MULTIPLES]

1. Increased freedom/personal time for caregiver
2. Less worry/stress about loved one
3. Less lifting
4. Less isolation/able to get outdoors more
5. Other _____

Q9: Based on what you know from your experience working with people with disabilities, how important is it **to them** that they be able to continue to live in their homes?

Very Somewhat Slightly Not at all

Q9a: What would you say are the primary benefits to people with disabilities of being able to continue to live in their homes? [DO NOT READ LIST UNLESS RESPONDENT NEEDS PROMPTING. CLASSIFY ANSWERS.] [ACCEPT MULTIPLES]

1. Not needing to move into institutionalized living
2. Comfort in being at home
3. Able to be around family members/friends more
4. Other _____

Q10: What are the **two** changes to the physical structure of the building, inside or outside, that would do the most to enable the people with disabilities you work with to continue to live in their homes? [DO NOT READ LIST UNLESS RESPONDENT NEEDS PROMPTING. CLASSIFY ANSWERS.]

1. Stair lift (interior)
2. Chair lift
3. Ramp or lift (exterior)
4. Kitchen modifications

- 5. Bathroom modifications
- 6. Widen door(s) or change door hardware
- 7. Other _____

Q11: You mentioned earlier that you felt [INSERT RESPONSES FROM Q10] were most important in allowing people with disabilities to stay in their homes. Assuming these changes **were NOT made** to their homes, how likely is it that they will need the following services?

	Very likely	Somewhat likely	Slightly likely	Not at all likely
a. A homemaker or personal care aide/assistant [IF NEEDED]—A paid individual who might assist with activities such as light cleaning, cooking, running errands, and doing laundry, as well as assisting clients with bathing, showering, grooming, and other personal hygiene tasks				
b. Home health aide [IF NEEDED]—A paid individual who may assist with activities similar to a personal care attendant but is also responsible for checking of vital signs and changing simple dressings				
c. A rehabilitation or occupational therapist that comes to their home to work on exercises				

Q12: Now, assuming the changes you say would be most helpful **are made** to the home, how likely is it that the need for those services would be reduced?

Very Somewhat Slightly Not at all

Q13: Thinking now about institutionalized living settings, assuming [INSERT RESPONSES FROM Q10] **were NOT made**, how likely do you think it is that some of those people will need to move to a more institutionalized living setting?

Very Somewhat Slightly Not at all

Q13a: Assuming the person moves to a more institutionalized living setting, how likely is it that the person would move to the following type of setting?

	Very	Somewhat	Slightly	Not at all
a. Nursing home				
b. Assisted-living facility				
c. Acute-care hospital				
d. Rehabilitation hospital				
e. Special-care facility				
f. Other				

Q14: In your experience, do home modifications, such as installing ramps, make it easier for people with disabilities to leave their homes for any of the following activities?

	Yes	No	Sometimes	Don't Know
a. Shopping				
b. Social activities, such as going to religious services, meeting friends for coffee, or attending family events, such as birthday parties				
c. Attending cultural events, such as sporting events, concerts, or theater performances				
d. Going to work				
e. Attending medical or doctor's appointments				
f. Other (SPECIFY) _____				

Q15: Roughly, what percentage of the people with disabilities you work with need assistance with routine activities outside the home, such as shopping?

0–25% 25–50% 50–75% 75–100%

Q15a: Roughly, what percentage of the people with disabilities you work with want to work to earn money?

0-25% 25-50% 50-75% 75-100%

Q15b: How likely will a home modification increase one's ability to find employment outside the home?

Very Somewhat Slightly Not at all

Q16: For family members who are caring for household members with disabilities, how likely is it that providing care limits their ability to work to earn money for the household?

Very Somewhat Slightly Not at all

Q16a: Again, for family members who are caring for household members with disabilities, how likely is it that home modifications might allow them to either (A) return to work or (B) put in more hours to earn money for the household?

Very Somewhat Slightly Not at all

Q17: From your experience, how likely is it for people with disabilities to be injured in a fall in their homes?

Very likely Somewhat likely Slightly Not at all

Q17a: [IF VERY, SOMEWHAT, OR SLIGHTLY LIKELY, ASK] Based on your experience, what percentage of people with disabilities are likely to be injured in a fall in their homes?

0-25% 25-50% 50-75% 75-100%

Q17b: To what extent do you think that modifications to a home—for example, installing ramps, chair lifts, or bathroom modifications such as grab bars—can reduce the risk of people with disabilities being injured in a fall in their homes?

A lot Somewhat Slightly Not at all

Q17c: [IF A LOT, SOMEWHAT, OR SLIGHTLY, ASK] Based on your experience, what percentage of people with disabilities are likely to experience reduced risk from a fall if a home modification is performed?

0-25% 25-50% 50-75% 75-100%

Q17d: To what extent do you think that modifications to a home—for example, installing ramps, chair lifts, or bathroom modifications such as grab bars—can reduce the

use of emergency services, such as 911 calls?

A lot Somewhat Slightly Not at all

Q17e: [IF A LOT, SOMEWHAT, OR SLIGHTLY, ASK] Based on your experience, what percentage of people with disabilities are likely to experience reduced usage of emergency services, such as 911 calls?

0–25% 25–50% 50–75% 75–100%

Q18: What do you think is the **most significant benefit** that home modifications bring to people with disabilities? (DO NOT READ LIST. Allow the interviewee to answer with a narrative, and then mark the response you feel most closely reflects the substance of the answer. If the interviewee does not offer an answer, you can read the list to her/him as suggestions.)

1. Increased independence
2. Improved safety
3. Improved well-being
4. Increased income
5. Reduced need for physical assistance
6. Reduced costs
7. Staying out of institutional living
8. Other (SPECIFY) _____
9. Don't know

Q19: Other than that benefit, what is the **second most significant benefit** that home modifications bring to people with disabilities? (DO NOT READ LIST. Allow the interviewee to answer with a narrative, and then mark the response you feel most closely reflects the substance of the answer. If the interviewee does not offer an answer, you can read the list to her/him as suggestions.)

1. Increased independence
2. Improved safety
3. Improved well-being
4. Increased income
5. Reduced need for physical assistance
6. Reduced costs
7. Staying out of institutional living
8. Other (SPECIFY) _____
9. Don't know

BARRIERS TO HOME MODIFICATIONS

Q20: What barriers or challenges exist in the home modification process? [DO NOT READ LIST UNLESS RESPONDENT NEEDS PROMPTING. CLASSIFY ANSWERS.] [ACCEPT MULTIPLES]

1. Funding/Lack of funding/Funding running out
2. Other work needing to be completed in the home prior to home modification installation
3. Cost of home modification exceeds amount funded
4. Lengthy approval process/Wait time for approval
5. Other _____

Q20a: When clients are coming to you with home modification needs, how do they typically pay for them? [DO NOT READ LIST UNLESS RESPONDENT NEEDS PROMPTING. CLASSIFY ANSWERS.] [ACCEPT MULTIPLES]

1. Cash/Personal savings/Self-pay
2. Using a loan, such as a home equity loan
3. Using a grant service (SPECIFY) _____
4. Family members cover the cost
5. Other _____

Q21: In your experience, would you say that home modifications are typically completed in a timely manner, or would you say they experience delays?

Q21a: [IF DELAYS MENTIONED] What percentage of home modifications would you say are typically delayed?

0–25% 25–50% 50–75% 75–100%

Q21b: How long are home modifications typically delayed? Would you say delays are typically ... [READ LIST]

0–3 months 3–6 months 6–9 months 12 months+

Q21c: Can you explain what the most common reasons are for delays?

Q21d: How is the situation typically rectified or resolved?

Q22: Have you ever encountered a situation where a client was unable to receive the funding they needed for a home modification? [IF YES] Can you tell me a little bit more about that? Were they ultimately able to piece together enough funding to acquire the modification or not?

Q23: Have you ever encountered a situation where a client was planning to get a home modification, but then realized other repairs needed to be made to the home or surrounding area in order to accommodate the modification, such as bringing something up to code or repairing or replacing something? [IF YES] What do clients do in these types of situations? Are they able to fund the additional repair work or not?

Q24: Let's say, for example, that the HomeMod program or some of these other programs that perform home modifications did not exist. Would your clients be able to get these changes made to their home some other way?

Q24a: [IF YES] How? Through what avenues?

Q24b: [IF NO] If not, what would be the impact on their day-to-day living? How, if at all, would their living arrangements change? [PROBE WITH: MOVE IN WITH FAMILY MEMBERS OR HAVE FAMILY MEMBERS MOVE IN, MOVE INTO A NURSING HOME OR ASSISTED LIVING CENTER, OTHER OPTIONS?]

WRAP-UP

Q25: [IF NEEDED] We are looking to speak with other experts—professionals such as yourself who work with individuals who have disabilities and their housing needs. Is there anyone that comes to mind that you think we should speak with – whether that be at your organization or another organization? We're looking to speak specifically with people who work in the Chicago metro area.

Q26: Those are all the questions I have for you today. I'd like to thank you very much for speaking with me. Before I let you go, I want to ask you if there is anything else you'd like to share with me about your experiences with either the HomeMod Program or any other programs like it or about home modifications in general? Any final thoughts or comments?

APPENDIX B – PARTICIPANT INTERVIEW GUIDE

Semi-Structured Interview Guide HomeMod Program Participants

ID: _____

Interviewee's Name:

Date of Interview:

Moderator Name:

SCREENER

Hello, may I please speak with [READ NAME FROM LIST]_____?

My name is [XXX], and I'm calling about your interview about the Home Modification program. Is now still a convenient time for you?

First of all, let me thank you very much for agreeing to speak with me today. We appreciate the fact that you are willing to help us with our research about the HomeMod Program.

[INTRODUCE SELF AND PURPOSE OF RESEARCH]

I am with Woodstock Institute, a local, Chicago nonprofit organization that has been asked to study the City of Chicago's HomeMod Program. We are trying to find out how receiving modifications through the program has affected the lives of the people the program is meant to serve.

DISCLOSURES

I want you to know that I'm going to ask you some questions today, but there are no right or wrong answers. This is just about your opinions, viewpoints, and impressions.

- You may not be able to answer all of my questions today, and that's perfectly fine. If I ask you a question and you don't know the answer, just tell me you don't know. Similarly, if you do not want to answer a question, just let me know, and we will skip it.
- Please be very open and honest with your opinions; positive comments won't please me, and negative comments won't hurt my feelings or get me upset.
- Our research process is confidential. We don't release the names of people who shared their opinions and ideas with us or any statements connected to your name. We only report the results of the interviews we are conducting as a whole. I am going to audio

record our conversation today and that is just a note-taking device for myself, so that I can go back and listen to your comments again later. Is that okay with you? [IF YES, RECORD. IF NO, DO NOT RECORD, BUT CONTINUE INTERVIEWING ON PAPER.]

If you have any questions about this interview or the study, feel free to ask me.

First, I am going to ask some basic questions about you, to get a better idea of your background.

WARM-UP AND DEMOGRAPHIC QUESTIONS

Q01. To start, can you first tell me are you the individual with the disability who received a home modification, are you a parent of a child with a disability, or another family member caring for someone with a disability, or something else?

1. Person with disability
2. Parent of child with disability
3. Caregiver/Other family member of person with disability (SPECIFY)
4.
Something else (SPECIFY) _____

Q02. Are you currently living in a house/single-family home or an apartment?

1. House/Single-Family Home
2. Apartment
3. Other _____

Q03. How long have you been living in your current home?

_____ years

Q04. Who, if anyone, lives with you?

1. Spouse
2. Child
3. Grandchild/Grandchildren
4. Sibling
5. Boyfriend/Girlfriend/Partner
6. Parent
7. Other (SPECIFY) _____

Q05. Which room(s) or area(s) of the house would you say you spend the most time in? Why is that?

Q06. Are there any areas of your home that are currently inaccessible to you? [IF YES] Which ones? Why are they inaccessible? [PROBE WITH A SECOND FLOOR OR BASEMENT—STAIRS, DOORWAY NOT WIDE ENOUGH, OTHER]

Q07. So we can compare your answers to others that we interview, how old are you?

Q08. Which of the following difficulties, impairments, or disabilities do you currently have?

[ACCEPT MULTIPLES]

1. Mobility, such as limited functionality in an arm or legs
2. Cognitive, such as difficulty remembering or concentrating
3. Visual
4. Hearing
5. Independent living/Self-care
6. Mental or behavioral health, such as anxiety or depression
7. Other _____

Q09. Has your modification been completed or are you currently waiting for it to be approved or installed?

1. Completed
2. Waiting
3. Other (SPECIFY) _____

Q10. [FOR THOSE COMPLETED] How long ago was your home modification installed?

PRE-CONSTRUCTION

Q11. [FOR THOSE COMPLETED] Tell me a little bit about your life prior to the HomeMod construction where they installed or constructed [X]? How did you spend your days? What was challenging or frustrating for you?

[FOR THOSE PENDING] Tell me a little bit about your life ... how do you spend your days? What is challenging or frustrating for you?

Q12. [FOR THOSE COMPLETED] Now I want to ask you about any personal assistance you may have received while you were living at home and whether the modifications changed the services you receive. **Before** you received the modifications, did you receive any of the following personal assistance services? [READ LIST]

[FOR THOSE PENDING] Now, I want to ask you about any personal assistance you may be receiving while you are living at home waiting for the home modifications to be completed. Are you currently receiving any of the following personal assistance services? [ACCEPT MULTIPLES] [READ LIST]

1. Personal care attendant
2. Home health aide
3. Homemaker
4. Rehab therapist (Occupational/Physical)
5. Family members
6. Other (SPECIFY) _____

Q13. [FOR THOSE COMPLETED] **After** the modification was completed, did you receive any of the following personal assistance services? [READ LIST]

[FOR THOSE PENDING] **After** the modification is completed, do you expect that you will still be receiving any of the following personal assistance services? [ACCEPT MULTIPLES]

1. Personal care attendant
2. Home health aide
3. Homemaker
4. Rehab therapist (Occupational/Physical)
5. Family members
6. Other (SPECIFY) _____

Q14. [FOR THOSE COMPLETED] How much, if at all, have the modifications reduced the amount of personal assistance you need from [INSERT RESPONSE IN Q.13. REPEAT FOR EACH ITEM]? Would you say ... [READ LIST]

[FOR THOSE PENDING] Once the modification(s) have been completed, how much, if at all, do you expect your need for personal assistance from others will be reduced? Would you say ... [READ LIST]

- A lot
- Somewhat
- A little
- Not at all
- Don't know

Q15. [FOR THOSE COMPLETED] If you can think back to **before** construction happened, how concerned, if at all, were you about ...[READ LIST]?

[FOR THOSE PENDING] How concerned, if at all, are you about [READ LIST]? Would that be very concerned, somewhat concerned, neutral, not very concerned, or not at all concerned?

	Very Concerned	Somewhat Concerned	Neutral	Not very Concerned	Not at all Concerned	Don't Know or N/A
a. Falls?						
b. Having to move out of your home either temporarily or permanently?						
c. Requesting or needing lots of family support?						
d. The cost or reliance on paid caregivers?						

HOW PARTICIPANT GOT CONNECTED TO THE HOMEMOD PROJECT

Q16. If you can think back for a minute, how did you first hear about the HomeMod Project?
Who informed you about it?

Q17. Who helped or assisted you with applying?

Q18. [FOR THOSE COMPLETED] What was the process like?

[FOR THOSE PENDING] What has the process been like so far?

APPROVAL PROCESS [FOR THOSE COMPLETED]

Q19. [FOR THOSE COMPLETED] Approximately how long would you say it took to go through the approval process to get your home modification?

0–3 months 3–6 months 6–9 months 12 months+

Q20. [FOR THOSE COMPLETED] While you were waiting for your modification to be performed, how were you kept informed as to the status of your application? [PROBE: Did you or a family member call? Did you receive a letter? How, if at all, could communication while waiting be improved?]

Q21. [FOR THOSE COMPLETED] What was your interaction like with the people who were working in your home or around your home?

Q22. [FOR THOSE COMPLETED] Next, I want to talk about the modifications that were installed in your home. What kind or kinds of modifications did the HomeMod Program provide for you? [ACCEPT MULTIPLES]

1. Stair lift (interior)
2. Chair lift
3. Ramp or lift (exterior)
4. Kitchen modifications
5. Bathroom modifications
6. Widen door(s) or change door hardware
7. Other _____

Q23. [FOR THOSE COMPLETED WHO HAD EXTERIOR RAMPS INSTALLED] **Before** the modifications, when you needed to go out somewhere (such as a doctor's appointment or to the grocery store), how did you accomplish this? Who assisted you?

Q24. [FOR THOSE COMPLETED WHO HAD BATHROOM ACCESSORIES INSTALLED] **Before** the modifications, when you needed to bathe or shower, were you able to do that independently, or did you acquire assistance?

APPROVAL PROCESS [FOR THOSE PENDING]

Q25. [FOR THOSE PENDING] How long have you been going through the approval process for your Home Modification?

0–3 months 3–6 months 6–9 months 12 months+

Q26. [FOR THOSE PENDING] While you're waiting for your modification, how are you being informed as to the status of your application?

Q27. [FOR THOSE PENDING] How much longer do you expect to wait before your modification is processed or approved?

0–3 months 3–6 months 6–9 months 12 months+

Q28. What modifications are you expecting to have completed in your home? (Check ALL that apply.)

1. Stair lift (interior)
2. Chair lift
3. Ramp or lift (exterior)
4. Kitchen modifications
5. Bathroom modifications
6. Widen door(s) or change door hardware
7. Other _____

Q29. [FOR THOSE PENDING] When you need to go out somewhere (such as a doctor's appointment or to the grocery store), how do you accomplish this? Who assists you?

Q30. [FOR THOSE PENDING] When you need to bathe or shower, are you able to do that independently, or do you require assistance?

FACILITY USAGE

For the next few questions, I will use the term “facility” to mean any of the following types of living situations - a nursing home, an assisted living facility, a hospital, a rehabilitation hospital, any other kind of special care facility.

Q31. Have you ever lived in one of these types of facilities?

Yes No Don't know

Q32. What kind of medical facility was it where you lived? [PROBE] Anywhere else? [ACCEPT MULTIPLES]

1. Nursing home
2. Assisted-living facility
3. A hospital
4. A rehabilitation facility or hospital
5. Any other kind of special-care facility (SPECIFY) _____

[ASK Q33A AND Q33B FOR EACH TYPE OF FACILITY MENTIONED IN Q30]

Q33A. If so, how many years ago did you live/stay in [XX]?

Q33B. For how long did you live/stay in [XX]?

Q34. Did the modifications that you received from the HomeMod Program allow you to move out of the facility?

Yes No Don't know

Q35. Did the modifications you received from the HomeMod Program allow you to stay in your home rather than move to a facility?

Yes No Don't know

EMPLOYMENT OF SELF AND HOUSEHOLD

Q36. Describe your employment status? Are you currently ... [READ LIST]

1. Employed full time
2. Employed part time
3. Looking for work
4. Permanently disabled/On disability/Can't work
5. Not permanently disabled/On disability, but not interested in working
6. Student
7. Child/Under the age of 18
8. Retired
9. Other _____

Q36a. [FOR THOSE WHO ARE WORKING EITHER FULL OR PART TIME]

Are you currently working inside or outside the home?

1. Inside
2. Outside
3. Mix of inside and outside the home

Q36b. [FOR THOSE WORKING OUTSIDE THE HOME] Did the modifications make it easier for you to get to work?

[FOR THOSE PENDING] Do you expect that the modifications will make it easier for you to get to work?

Yes No Don't know

Q36c. [FOR THOSE COMPLETED, LOOKING FOR WORK] Did the modifications make it easier for you to look for work?

[FOR THOSE PENDING] Do you expect that the modifications will make it easier for you to look for work?

Yes No Don't know

[SKIP IF RESPONDENT LIVES ALONE]

Q37. Are other members of your household ... [READ LIST]

1. Employed full-time
2. Employed part-time
3. Looking for work
4. Permanently disabled/On disability/Can't work
5. Not permanently disabled/On disability, but not interested in working
6. Student
7. Retired
8. Other _____

Q37a. [FOR THOSE WHO ARE WORKING EITHER FULL OR PART TIME] Are members of your household currently working inside or outside the home?

1. Inside
2. Outside
3. Mix of inside and outside the home

Q37b. [FOR THOSE COMPLETED WHO ARE WORKING] Did the modifications make it easier for members of your household to work?

[FOR THOSE PENDING WHO ARE WORKING] Do you expect that the modifications will make it easier for members of your household to work?

Yes No Don't know

Q37c. [FOR THOSE COMPLETED, WHO ARE LOOKING FOR WORK] Did the modifications make it easier for your household member(s) to look for work?

[FOR THOSE PENDING, WHO ARE LOOKING FOR WORK] Do you expect that the modifications will make it easier for your household member(s) to look for work?

Yes No Don't know

EMERGENCY SERVICE USAGE

Q38. [FOR THOSE COMPLETED] Prior to completion of your home modification, have you ever called emergency services/911 for any of the following reasons:

[FOR THOSE PENDING] While you are waiting for your home modification to be performed, have you ever found yourself needing to call emergency services/911 for any of the following reasons:

1. A fall
2. Needing assistance getting out of the house such as for doctor's appointments, dialysis, or other healthcare needs
3. Other (SPECIFY)
4. [DO NOT READ] None of these

Q39. [FOR THOSE COMPLETED] Since the modifications have been installed, would you say you are contacting emergency services/911 much more often, a little more often, about the same, a little less often or much less often?

[FOR THOSE PENDING] Once the modifications have been completed, do you see yourself contacting emergency services/911 much more often, a little more often, about the same, a little less often or much less often?

- Much more
- A little More
- About the Same
- A Little Less
- Much Less
- Don't know

FUNDING OF HOMEMOD

Q40a. [FOR THOSE COMPLETED] How was your home modification funded or paid for?
[READ LIST]

[FOR THOSE PENDING] How are you expecting your home modification to be funded or paid for? Would that be ... [READ LIST]

1. Paid for entirely by the City of Chicago's Home Modification Program
2. Covered partially by City of Chicago's Home Modification Program and the remainder of the charges covered by me or my family
3. Covered partially by City of Chicago's Home Modification and partially by another program (SPECIFY) _____
4. Paid for or partially covered by Medicaid
5. Other (SPECIFY) _____
6. Don't know/Not sure

Q40b. [FOR THOSE COMPLETED] If you can recall, how much money was paid for or contributed by [INSERT RESOURCE FROM Q40A] for your home modification?

[FOR THOSE PENDING] How much money are you expecting [INSERT RESOURCE FROM Q40A] to pay for or contribute to your home modification?

\$ _____

\$ _____

Q41. Let's say, for example, that the City of Chicago Home Modification program did not exist. Would you have been able to get these changes made to your home some other way? If not, what would be the impact on your day-to-day living? How, if at all, would your living arrangements change? [PROBE WITH: MOVE IN WITH FAMILY MEMBERS OR HAVE FAMILY MEMBERS MOVE IN, MOVE INTO A NURSING HOME OR ASSISTED-LIVING CENTER, OTHER OPTIONS?]

POST-CONSTRUCTION [FOR THOSE COMPLETED ONLY]

Q42. [FOR THOSE COMPLETED] When the project was completed, in what ways, if any, did your life change? Were there any positive surprises? Any disappointments? What was the impact on your independence, if any? Did the modifications change your participation in activities in your community? [IF YES] How?

Q43. [FOR THOSE COMPLETED] How satisfied are you with the construction that took place in your home? [PROBE FOR WHY]

- Very satisfied
- Somewhat satisfied
- Neutral
- Somewhat dissatisfied
- Very dissatisfied

Q44. [FOR THOSE COMPLETED] To what extent have the modifications allowed **you** to increase your participation in:

	Strongly increased	Somewhat increased	No change	Slightly Decreased	Strongly Decreased	N/A
a. School/college						
b. Job training						
c. Employment						
d. Social activities (such as meeting friends for coffee, attending family birthday parties, playing cards, or going to church)						
e. Civic activities (such as voting, attending jury duty)						
f. Cultural activities (such as attending sporting events, concerts, museums, or theater)						
g. Anything else? (SPECIFY)						

Q46. [FOR THOSE COMPLETED] [SKIP IF RESPONDENT IS LIVING ALONE] To what extent have the modifications allowed **other members of your household** to increase their participation in:

	Strongly increased	Somewhat increased	No change	Slightly Decreased	Strongly Decreased	N/A
a. School/college						
b. Job training						
c. Employment						
d. Social activities (such as meeting friends for coffee, attending family birthday parties, playing cards, or going to church)						
e. Civic activities (such as voting, attending jury duty)						
f. Cultural activities (such as attending sporting events, concerts, museums, or theater)						
g. Anything else? (SPECIFY)						

Q47. [FOR THOSE COMPLETED] Now that construction has been completed, how concerned, if at all, are you about ... Would that be very concerned, somewhat concerned, neutral, not very concerned, or not at all concerned?

	Very Concerned	Somewhat Concerned	Neutral	Not very Concerned	Not at all Concerned	Don't Know or N/A
a. Falls?						
b. Having to move out of your home either temporarily or permanently?						
c. Requesting or needing lots of family support?						
d. The cost or reliance on paid caregivers?						

OVERALL IMPACT

Q48. What do you think is the **most** significant benefit that the modifications brought you? (Allow the interviewee to answer with a narrative, and then mark the response you feel most closely reflects the substance of the answer. If the interviewee does not offer an answer, you can read the list to her/him as suggestions.)

1. Increased independence
2. Improved safety
3. Improved well-being
4. Increased income
5. Reduced need for physical assistance
6. Reduced costs
7. Staying out of institutional living
8. Other (SPECIFY) _____
9. Don't know

Q49. Other than that benefit, what is the second most significant benefit that the modifications brought you? (Allow the interviewee to answer with a narrative, and then mark the response you feel most closely reflects the substance of the answer. If the interviewee does not offer an answer, you can read the list to her/him as suggestions.)

1. Increased independence
2. Improved safety
3. Improved well-being
4. Increased income
5. Reduced need for physical assistance
6. Reduced costs
7. Staying out of institutional living
8. Other (SPECIFY) _____
9. Don't know

Q50. [FOR THOSE PENDING] Once the modifications to your home are completed, how do you expect your life to change? What do you feel the impact will be on your independence, if any?

WRAP-UP

Q51. Those are all the questions I have for you today. I'd like to thank you very much for speaking with me. Before I let you go, I want to ask you if there is anything else you'd like to share with me about your experiences with the HomeMod program? Any final thoughts or comments?

Q52. [CONFIRM IF RESPONDENT WOULD LIKE A TARGET GIFT CARD OR A CHECK]
And finally, in order to send your gift card/check, can you provide me with your name and address?

APPENDIX C – COST DATA FROM MOPD

Type	Year	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost	
Assistive Device	2003	3	\$20,357	\$6,786	3	\$20,357	\$6,786	
	2004	4	\$20,213	\$5,053	4	\$20,213	\$5,053	
	2005	0	\$0	\$0	0	\$0	\$0	
	2006	3	\$13,916	\$4,639	3	\$13,916	\$4,639	
	2007	3	\$19,747	\$6,582	3	\$19,747	\$6,582	
	2008	11	\$30,007	\$2,728	8	\$29,657	\$3,707	
	2009	4	\$13,451	\$3,363	2	\$13,101	\$6,550	
	2010	4	\$27,156	\$6,789	4	\$27,156	\$6,789	
	2011	2	\$3,301	\$1,651	2	\$3,301	\$1,651	
	2012	2	\$2,965	\$1,482	1	\$1,658	\$1,658	
	2013	3	\$12,583	\$4,194	3	\$12,583	\$4,194	
	2014	3	\$7,878	\$2,626	3	\$7,878	\$2,626	
	2015	2	\$6,579	\$3,289	2	\$6,579	\$3,289	
	2016	0	\$0	\$0	0	\$0	\$0	
	2017	0	\$0	\$0	0	\$0	\$0	
	2018	0	\$0	\$0	0	\$0	\$0	
			44	\$178,152	\$4,049	38	\$176,145	\$4,635
	Bathroom							
		2003	11	\$90,805	\$8,255	10	\$90,475	\$9,048
2004		15	\$139,104	\$9,274	15	\$139,104	\$9,274	
2005		17	\$162,887	\$9,582	17	\$162,887	\$9,582	
2006		25	\$230,886	\$9,235	25	\$230,886	\$9,235	
2007		21	\$221,675	\$10,556	20	\$221,675	\$11,084	
2008		29	\$339,237	\$11,698	24	\$338,137	\$14,089	
2009		27	\$277,805	\$10,289	24	\$277,455	\$11,561	
2010		30	\$275,373	\$9,179	29	\$275,023	\$9,484	

Bathroom	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2011	32	\$276,239	\$8,632	30	\$271,962	\$9,065
2012	25	\$205,607	\$8,224	23	\$205,607	\$8,939
2013	22	\$202,156	\$9,189	21	\$201,806	\$9,610
2014	27	\$278,279	\$10,307	27	\$278,279	\$10,307
2015	21	\$205,431	\$9,782	21	\$205,431	\$9,782
2016	36	\$354,890	\$9,858	33	\$354,890	\$10,754
2017	29	\$248,689	\$8,575	22	\$230,709	\$10,487
2018	28	\$268,068	\$9,574	21	\$239,345	\$11,397
	395	\$3,777,131	\$9,562	362	\$3,723,671	\$10,286

Interior Chair Lift	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2003	1	\$11,048	\$11,048	1	\$11,048	\$11,048
2004	0	\$0	\$0	0	\$0	\$0
2005	0	\$0	\$0	0	\$0	\$0
2006	0	\$0	\$0	0	\$0	\$0
2007	1	\$10,408	\$10,408	1	\$10,408	\$10,408
2008	9	\$58,319	\$6,480	5	\$57,969	\$11,594
2009	4	\$25,627	\$6,407	3	\$25,277	\$8,426
2010	4	\$1,488	\$372	2	\$1,138	\$569
2011	3	\$18,244	\$6,081	2	\$17,894	\$8,947
2012	9	\$79,539	\$8,838	8	\$79,539	\$9,942
2013	6	\$39,118	\$6,520	6	\$39,118	\$6,520
2014	7	\$72,519	\$10,360	7	\$72,519	\$10,360
2015	8	\$96,118	\$12,015	8	\$96,118	\$12,015
2016	3	\$23,839	\$7,946	3	\$23,839	\$7,946
2017	8	\$77,539	\$9,692	8	\$77,539	\$9,692
2018	13	\$101,602	\$7,816	11	\$101,602	\$9,237
	76	\$615,409	\$8,097	65	\$614,009	\$9,446

**Ceiling
Lift**

	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2003	0	\$0	\$0	0	\$0	\$0
2004	0	\$0	\$0	0	\$0	\$0
2005	0	\$0	\$0	0	\$0	\$0
2006	0	\$0	\$0	0	\$0	\$0
2007	0	\$0	\$0	0	\$0	\$0
2008	1	\$10,980	\$10,980	1	\$10,980	\$10,980
2009	2	\$8,679	\$4,340	1	\$8,329	\$8,329
2010	1	\$10,745	\$10,745	1	\$10,745	\$10,745
2011	1	\$11,805	\$11,805	1	\$11,805	\$11,805
2012	0	\$0	\$0	0	\$0	\$0
2013	4	\$23,444	\$5,861	4	\$23,444	\$23,444
2014	1	\$4,314	\$4,314	1	\$4,314	\$4,314
2015	3	\$30,623	\$10,208	3	\$30,623	\$30,623
2016	2	\$24,000	\$12,000	2	\$24,000	\$24,000
2017	0	\$0	\$0	0	\$0	\$0
2018	2	\$13,276	\$6,638	2	\$13,276	\$13,276
	17	\$137,866	\$8,110	16	\$137,516	\$8,595

Kitchen

	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2003	2	\$2,793	\$1,396	0	\$0	\$0
2004	1	\$9,237	\$9,237	1	\$9,237	\$9,237
2005	1	\$7,045	\$7,045	1	\$7,045	\$7,045
2006	1	\$11,806	\$11,806	1	\$11,806	\$11,806
2007	1	\$11,020	\$11,020	1	\$11,020	\$11,020
2008	2	\$0	\$0	0	\$0	\$0
2009	4	\$28,415	\$7,104	4	\$28,415	\$7,104
2010	1	\$14,051	\$14,051	1	\$14,051	\$14,051
2011	0	\$0	\$0	0	\$0	\$0
2012	1	\$4,275	\$4,275	1	\$4,275	\$4,275

Kitchen	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2013	1	\$5,688	\$5,688	1	\$5,688	\$5,688
2014	5	\$27,498	\$5,500	4	\$27,498	\$6,875
2015	3	\$26,213	\$8,738	3	\$26,213	\$8,738
2016	4	\$27,855	\$6,964	4	\$27,855	\$6,964
2017	2	\$3,101	\$1,550	1	\$3,101	\$3,101
2018	3	\$22,804	\$7,601	2	\$22,804	\$11,402
	32	\$201,799	\$6,306	25	\$199,007	\$7,960

Ramp or Lift	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2003	44	\$285,917	\$6,498	29	\$279,947	\$9,653
2004	24	\$201,224	\$8,384	22	\$201,224	\$9,147
2005	26	\$238,696	\$9,181	26	\$238,696	\$9,181
2006	37	\$351,998	\$9,513	37	\$351,998	\$9,513
2007	30	\$288,488	\$9,616	25	\$281,711	\$11,268
2008	0	\$0	\$0	0	\$0	\$0
2009	0	\$0	\$0	0	\$0	\$0
2010	0	\$0	\$0	0	\$0	\$0
2011	0	\$0	\$0	0	\$0	\$0
2012	0	\$0	\$0	0	\$0	\$0
2013	0	\$0	\$0	0	\$0	\$0
2014	0	\$0	\$0	0	\$0	\$0
2015	0	\$0	\$0	0	\$0	\$0
2016	0	\$0	\$0	0	\$0	\$0
2017	0	\$0	\$0	0	\$0	\$0
2018	0	\$0	\$0	0	\$0	\$0
	161	\$1,366,323	\$8,486	139	\$1,353,576	\$9,738

Ramp	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2003	0	\$0	\$0	0	\$0	\$0
2004	0	\$0	\$0	0	\$0	\$0
2005	0	\$0	\$0	0	\$0	\$0
2006	0	\$0	\$0	0	\$0	\$0
2007	1	\$14,292	\$14,292	1	\$14,292	\$14,292
2008	0	\$0	\$0	0	\$0	\$0
2009	1	\$9,741	\$9,741	1	\$9,741	\$9,741
2010	4	\$34,836	\$8,709	3	\$33,786	\$11,262
2011	1	\$7,850	\$7,850	1	\$7,850	\$7,850
2012	2	\$17,181	\$8,591	2	\$17,181	\$8,591
2013	4	\$26,628	\$6,657	4	\$26,628	\$6,657
2014	1	\$7,697	\$7,697	1	\$7,697	\$7,697
2015	0	\$0	\$0	0	\$0	\$0
2016	0	\$0	\$0	0	\$0	\$0
2017	3	\$34,155	\$11,385	3	\$34,155	\$11,385
2018	3	\$14,349	\$4,783	2	\$12,036	\$6,018
	20	\$166,729	\$8,336	18	\$163,367	\$9,076

Vertical Power Lift	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2003	0	\$0	\$0	0	\$0	\$0
2004	0	\$0	\$0	0	\$0	\$0
2005	0	\$0	\$0	0	\$0	\$0
2006	0	\$0	\$0	0	\$0	\$0
2007	6	\$50,255	\$8,376	5	\$50,255	\$10,051
2008	31	\$292,171	\$9,425	25	\$290,021	\$11,601
2009	34	\$320,641	\$9,431	27	\$318,541	\$11,798
2010	47	\$431,840	\$9,188	38	\$430,790	\$11,337
2011	42	\$383,468	\$9,130	33	\$380,968	\$11,544
2012	34	\$351,652	\$10,343	29	\$350,252	\$12,078

**Vertical
Power Lift**

	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2013	42	\$497,958	\$11,856	41	\$497,608	\$12,137
2014	36	\$392,368	\$10,899	33	\$392,018	\$11,879
2015	24	\$316,658	\$13,194	24	\$316,658	\$13,194
2016	48	\$566,075	\$11,793	45	\$566,075	\$12,579
2017	38	\$494,001	\$13,000	35	\$494,001	\$14,114
2018	52	\$542,630	\$10,435	35	\$461,782	\$13,194
	434	\$4,639,717	\$10,691	370	\$4,548,969	\$12,295

**Widen
doorways**

	Applications	Total Cost	Average Cost	Complete	Total Completed Cost	Average Completed Cost
2003	0	\$0	\$0	0	\$0	\$0
2004	2	\$8,546	\$4,273	1	\$8,546	\$8,546
2005	0	\$0	\$0	0	\$0	\$0
2006	2	\$14,002	\$7,001	2	\$14,002	\$7,001
2007	1	\$10,950	\$10,950	1	\$10,950	\$10,950
2008	1	\$12,525	\$12,525	1	\$12,525	\$12,525
2009	2	\$12,953	\$6,477	2	\$12,953	\$6,477
2010	0	\$0	\$0	0	\$0	\$0
2011	0	\$0	\$0	0	\$0	\$0
2012	0	\$0	\$0	0	\$0	\$0
2013	1	\$350	\$350	0	\$0	\$0
2014	3	\$18,711	\$6,237	3	\$18,711	\$6,237
2015	0	\$0	\$0	0	\$0	\$0
2016	0	\$0	\$0	0	\$0	\$0
2017	3	\$24,817	\$8,272	3	\$24,817	\$8,272
2018	4	\$21,285	\$5,321	3	\$21,285	\$7,095
	19	\$124,139	\$6,534	16	\$123,789	\$7,737

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Washington, DC 20410-6000



April 2021