IMPACT EVALUATION STUDY
HABITAT FOR HUMANITY OF WASHINGTON, D.C.

MAY 25, 2019

CONTENTS

I. EXECUTIVE SUMMARY

A. Overview

1. Habitat for Humanity of Washington, D.C. ("DC Habitat") has a 30-year history of creating and preserving affordable housing in the District. During that time, the organization has emerged as a cornerstone nonprofit agency working to mitigate the housing challenges DC faces. It builds and sells affordable homes, provides low-cost home repairs, offers financial and homeowner education, and purchases land, thereby ensuring a steady pipeline of affordable housing. Since its founding, it has built nearly 200 homes, promoted environmentally friendly construction, and developed innovative financial arrangements to achieve its mission in the District's unique housing landscape. This report examines the value of its work and finds that DC Habitat plays a vital role in the District's housing landscape. Partner households accrue significant amounts of home equity, communities are stabilized through long-term residents, and the District benefits from better educated, more stable residents and quality affordable housing in neighborhoods that need them most.

B. Key Findings

- Almost 100,000 households in Washington, D.C. are cost burdened.
- Renter households are about twice as likely of being cost burdened than homeowner households.
- The average monthly housing cost for a DC Habitat homeowner is about $2,000 less than the estimated market rental rate for homeowners' homes.
- Residents of southeast and northeast DC wards, where DC Habitat builds, are more likely to report overall fair or poor health and they are more likely to suffer from serious and chronic health conditions.
- Homeownership, affordability, and neighborhood demographics play a significant role in childhood education outcomes, such as cognitive development, high school graduation, college attendance, college quality, and college completion. DC Habitat households compare favorably to District students in many regards.
- The internal rate of return of purchasing a DC Habitat home is in excess of 100%.
- Aggregate home value appreciation exceeds $39.5 million for 150 homes analyzed.
- The return on investment to DC Habitat can be as large as 12%.

C. Methodology

2. This report relies primarily on existing research concerning affordable housing and homeownership. Where possible, publicly available data and internal financial data have been used to supplement the findings presented in the literature.

3. DC Habitat also surveyed existing partner households about their experience purchasing a home with DC Habitat. Surveys were mailed beginning in October 2010 to purchasers of DC Habitat homes in the Deanwood and Ivy City neighborhoods. Surveys contained questions about

homeowners' experience with DC Habitat, their current financial situations, and their health and education outcomes since becoming homeowners. Surveys were sent biennially over a six-year time frame. 44 unique households returned responses out of a total 72 that received a survey.[1] The response rates were 62%, 40%, and 34% in the first, second and third survey rounds, respectively.

4. New homebuyers received separate surveys. These surveys contained questions about homebuyers' previous housing situations and their thoughts about the program.[2] Thirteen out of fifteen of these new residents purchased homes in Ivy City and two purchased homes in Deanwood.

5. This report was prepared by Ernesto Matal Sol. Mr. Matal Sol holds dual bachelor's degrees in economics and earth sciences from the University of California, Santa Cruz and a master's degree in economics from New York University. Mr. Matal Sol served as an Americorps Vista with DC Habitat in 2012. He has conducted statistical analyses and litigation support for the civil rights and antitrust bureaus at the Office of the Attorney General of the State of New York, and he currently works at Vega Economics in Berkeley, CA.

II. HOUSING AFFORDABILITY

A. Background

6. In its role as overseer of the nation's housing, the Department of Housing and Urban Development ("HUD") calculates the median family income ("AMI").[3, 4] HUD's Fair Market Rent area ("FMR area") definitions are the geographical unit over which median incomes are estimated.[5] The calculation generally uses *American Community Survey* ("ACS") estimates of income within a FMR area, then adjusts those estimates for expected inflation.[6] A benchmark AMI is calculated based on a household of four, and this figure is multiplied by a HUD designated percentage to determine the median income for households of different sizes.[7]

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[1] The survey mailed to homeowners was designed according to Neighborworks America's community evaluation study. Homeowners that had been living in their homes for longer than one year were mailed the recurring survey. The number of homeowners in this cohort increased from 61 in the first year of the study to 72 in the second and third rounds of the study.

[2] The new homeowner survey was mailed to homeowners that had been in their home between six-months and one year. A total of 15 homeowners received this survey.

[3] NMH-NAA Briefing. "How Subsidized Rents are Set: Area Median Incomes and Fair Market Rents." *NMHC/NAA Joint Legislative Program* (Mar. 27, 2015): 1-6 at 1. <www.nmhc.org/research-insight/Research-Insight-Knowledge-Library/affordable-housing/13/11?p=2> (accessed Feb. 17, 2019).

[4] According to HUD, AMI is synonymous with Median Family Incomes if used in an unqualified manner, but in reference to percentages of AMI or adjustments based on family size, AMI is a reference to income limits. *See*, HUD User. "FY 2018 Income Limits – Frequently Asked Questions." *U.S. Department of Housing and Urban Development* (Apr. 1, 2018): 1-7 at 2. In this report, the same convention is followed.

[5] HUD User. "FY 2018 Income Limits Methodology." *U.S. Department of Housing and Urban Development* (Apr. 1, 2018): 1-29 at 1.

[6] *See* NMH-NAA Briefing, *supra* note 3 at 3.

[7] *See* HUD User, *supra* note 5 at 7.

7. Income limits, also set by HUD, specify the maximum amount of income a household can earn to qualify for certain assistance programs.[8] For example, the income limit designations "low-income" and "very low-income" correspond to households whose incomes do not exceed 80% and 50% of AMI, respectively.[9]

8. Certain housing programs also consider HUD's measurement of regional housing costs. The Fair Market Rent ("FMR") for an area is the monthly amount necessary to pay rent plus utilities for privately owned, decent, and safe rental housing of a modest (non-luxury) nature with suitable amenities and is typically set at the 40th percentile of the distribution of gross rents.[10]

9. Together, AMIs, income limits, and FMRs help housing researchers and stakeholders understand housing affordability in a region. HUD considers households spending more than 30% of their income on housing as "cost burdened" and those spending more than 50% of their income on housing as "severely cost burdened," noting that cost burdened households "may have difficulty affording necessities such as food, clothing, transportation, and medical care."[11] Similarly, the National Low Income Housing Coalition ("NLIHC") estimates a housing wage ("Housing Wage") as the hourly wage a full-time worker must earn to afford a rental home at HUD's FMR without spending more than 30% of their income on housing.[12]

10. Housing expense as a proportion of household income is an important determinant of a household's stability and income available for other necessities.[13] Households facing cost burdens may choose to live in less desirable neighborhoods, live in inadequate housing conditions, or forgo spending on essentials,[14] and as explained more fully below, the consequences of being cost burdened can have negative impacts on childhood outcomes.[15]

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[8] *See* HUD User, *supra* note 5 at 10.

[9] *See* HUD User, *supra* note 5 at 1.

[10] Office of the Assistant Secretary for Policy Development and Research, HUD. "Fair Market Rents for the Housing Choice Voucher Program, Moderate Rehabilitation Single Room Occupancy, and Other Programs Fiscal Year 2019." *Federal Register* 83.170 (Aug. 31, 2018): 44645-44651 at 44645.

[11] U.S. Department of Housing and Urban Development's Office of Policy and Research. "Rental Burdens: Rethinking Affordability Measures." *U.S. Department of Housing and Urban Development* (Sept. 22, 2014) <https://www.huduser.gov/portal/pdredge/pdr_edge_featd_article_092214.html> (accessed Feb. 17, 2019).

[12] National Low Income Housing Coalition. "Out of Reach 2018: The High Cost of Housing." (2018): 1-284 at 1.

[13] Zippel, Claire. "A Broken Foundation: Affordable Housing Crisis Threatens DC's Lowest Income Residents." *DC Fiscal Policy Institute* (Dec. 8, 2016) 1-23 at 1: "Families living in unaffordable housing are at higher risk of being evicted, moving frequently, living in crowded or substandard conditions, or becoming homeless…Families that devote too much of their income to rent are forced to cut back on food, and may be unable to afford transportation to work, school, or the doctor."

[14] Kirkpatrick, Sharon I. and Valerie Tarasuk. "Housing Circumstances are Associated with Household Food Access among Low-Income Urban Families*." Journal of Urban Health: Bulletin of the New York Academy of Medicine* 88.2 (2011) 284-296 at 289-290: "The proportion of income allocated to housing was also inversely associated with food expenditures, consistent with our earlier analysis of Canada's Survey of Household Spending, which revealed a decline in the adequacy of food spending among low-income households as the share of income allocated to housing increased."

[15] Newman, Sandra J. and C. Scott Holupka. "Housing Affordability and Child Well-Being." *Housing Policy Debate* (2014) 1-36.

Nationwide, of low-income households with children, those with cost burdens spend on average 39% less on food and 71% less on healthcare compared to those without cost burdens.[16]

11. Accordingly, the number of cost burdened and severely cost burdened households is an important measure of a region's well-being.

B. Washington, D.C.

12. In 2018, the AMI for the Washington-Arlington-Alexandria, DC-VA-MD HUD metro FMR area was $117,200, fourth of all metropolitan areas in the continental US.[17] The FMR for a two-bedroom unit was approximately $1,733, sixteenth highest across all HUD reported metro FMR areas.[18, 19] According to the NLIHC, DC had the second highest Housing Wage among all states, equal to approximately $34.48 per hour.[20] A person earning minimum wage would need to work approximately 2.6 jobs in order to afford a two-bedroom unit at FMR.[21]

13. In 2016, approximately 700,114 (31.9%) DC metropolitan area households were cost burdened.[22] In DC, as of 2017, approximately 99,925 (35.5%) households were cost burdened.[23] An additional 11,128 individuals were homeless within the Metropolitan Washington Council of Governments, a geographic region that includes DC, suburban Maryland and Northern Virginia.[24] Of these homeless, approximately 3,280 were children.[25]

14. These statistics reveal that median incomes and housing costs move in proportion to one another. However, not all are affected equally. In DC, most cost burdened households are low-income, do not hold a college degree, and are likely to be people of color.[26] According to

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[16] State of the Nation's Housing 2018. *Harvard Joint Center for Housing Studies* <www.jchs.harvard.edu> (accessed Feb. 10, 2019) at Figure 34.

[17] *See* HUD User, *supra* note 5 at Attachment 4.

[18] HUD User. "Fair Market Rents: Small Area FMRs.xlsx." *U.S. Department of Housing and Urban Development* (Oct. 1, 2018).

[19] Based on mean of small area FMRs reported within HUD Metro FMR areas. HUD reports that it "defines Small Areas using ZIP Codes within the metropolitan area."

[20] *See* National Low Income Housing Coalition, *supra* note 12 at 51.

[21] *Id*.

[22] *See* State of the Nation's Housing 2018, *supra* note 16 at Appendix Table W-10.

[23] U.S. Bureau of the Census. "Table B25070: Gross Rent as a Percentage of Household Income in the Past 12 Months" and "Table B25091: Mortgage Status By Selected Monthly Owner Costs as a Percentage of Household Income in the Past 12 Months." *2005-2017 American Community Survey, 1-year estimates*.

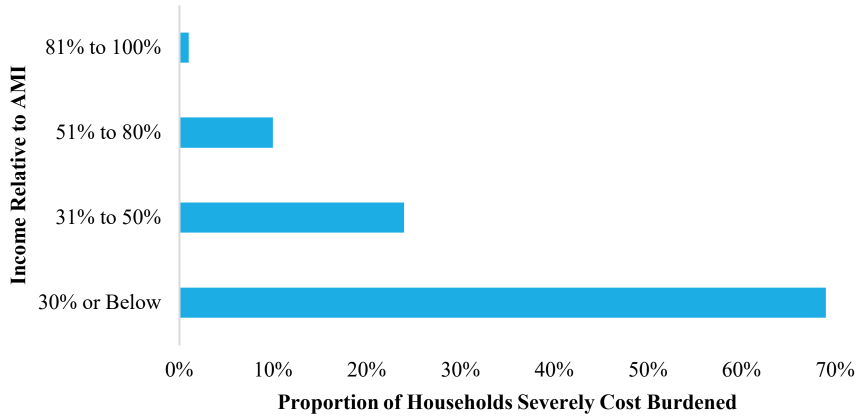
[24] Homeless Services Planning and Coordinating Committee. "Homelessness in Metropolitan Washington: Results and Analysis from the Annual Point-in-Time (PIT) Count of Persons Experiencing Homelessness." *Metropolitan Washington Council of Governments* (May 10, 2017) 1-119 at 1.

[25] *Id.* at 14.

[26] *See* Zippel, *supra* note 13 at 3: "62 percent [of extremely low-income renters] pay more than half of their income for rent and utilities…The District's severely cost burdened, extremely low income renters are overwhelmingly people of color: 91 percent of residents in such households are African American, and 10 percent are Latino[,]" and at 5: "Just 15 percent of people in severely rent burdened, extremely low income households have a college degree or more."

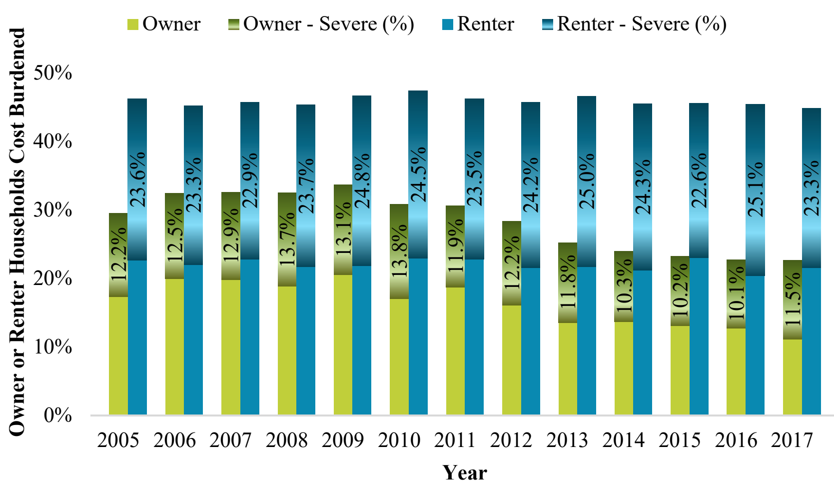
NLIHC, households making below 30 percent of AMI are 70 times more likely to be severely cost burdened than a household making 80 – 100 percent of AMI.[27] *See* **Figure 1**.[28]

Figure 1
Proportion of Households Severely Cost Burdened by Income



15. Similarly, renter households are more likely to be cost burdened than owner households, and while the share of cost burdened and severely cost burdened owner households decreased after the great recession, there has been no corresponding decrease of cost burdened and/or severely cost burdened renter households in DC; the rate has remained constant. *See* **Figure 2**.[29]

Figure 2
Cost Burden By Household Type in DC



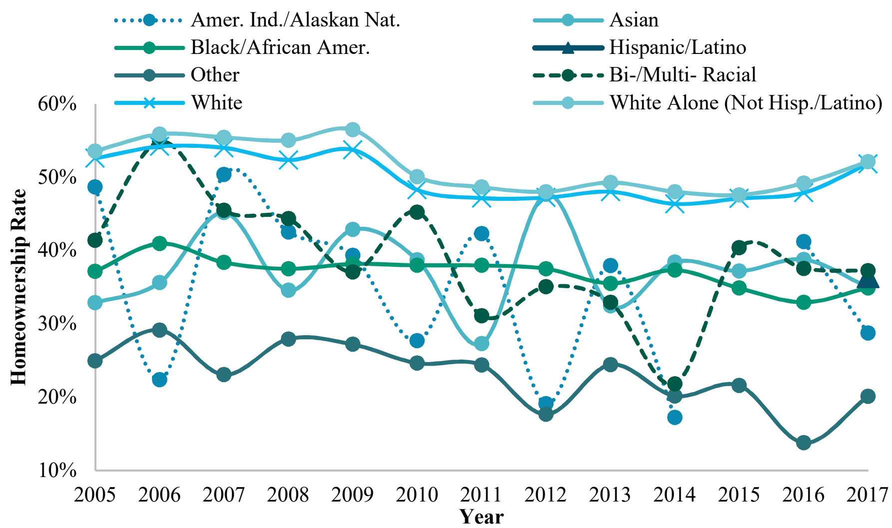
[27] National Low Income Housing Coalition. "The Gap: A Shortage of Affordable Homes." (March 2018): 1-20 at Appendix A.

[28] *Id*.

[29] *See* U.S. Bureau of the Census, *supra* note 23.

16. Homeownership rates in DC are highest for white households, and this has held true for at least twelve years. As of 2017, white households were almost 50% more likely to own a home than a black or asian household and about 40% more likely to own a home than a latino or bi-/multi-racial household. *See* **Figure 3**.[30]

Figure 3
Homeownership Rate by Race in DC



C. DC Habitat

17. Eligibility for DC Habitat's housing program is typically set at 40 – 80% of AMI. Accepted participants must have stable income to satisfy this requirement, as well as a solid credit history and the ability to contribute a $500 down payment. In addition, DC Habitat partner households must complete approximately 500 hours of "sweat equity," which includes home construction and financial literacy courses. DC Habitat stresses that it partners with participants to help them achieve homeownership. This includes selling houses below the market value and helping participants secure thirty-year, fixed-rate mortgages that cap payments at approximately 35% of their incomes.

18. Over 560 people have been housed by DC Habitat since its inception,[31] and survey data suggests that approximately 80% of households have had minors residing in them. Because DC Habitat sells homes below market value and works with homeowners to make monthly payments affordable, none of these households were cost burdened at closing.

19. Survey results of new participants reflect that 11 out of 15 new Habitat homeowners paid rent at their previous residence. DC Habitat's emphasis on affordable *homeownership* creates stability for families and neighborhoods even in the face of sharply rising housing costs.

[30] U.S. Bureau of the Census. "Tables B25003A, 25003B, 25003C, 25003D, 25003E, 25003F, 25003G, and 25003H: Tenure." *2005-2017 American Community Survey, 1-year estimates*.

[31] Figures based on DC Habitat portfolio and the mean household size based on survey responses.

III. HEALTH

A. Research Evidence

20. Housing quality, housing cost, tenure, ownership status, location, neighborhood stability, and community safety all affect health outcomes.[32]

21. The quality of housing conditions, for example, has been shown to affect brain and nervous system development in children, respiratory diseases and infections, cardiovascular disease, cognitive and psychomotor development, anxiety, and aggression.[33] Residential instability has been linked to increased risk of teen pregnancy, early drug use, and depression among children.[34] Affordability has been linked to self-reported health status and health care utilization.[35] Frequency of contact and social interactions with neighbors have been shown to affect the risk of stroke mortality.[36]

B. Washington, D.C.

22. There exist marked patterns of disparate health outcomes along geographic, economic, and racial divides in DC.

23. For example, life expectancy at birth in two neighborhoods DC Habitat builds in, Ivy City and Deanwood, is approximately 70.8 and 73.4 years, respectively, compared to an average of 87.6 and 85.3 years in wards 3 and 2, respectively.[37] The proportion of adults having no exercise in the past 30 days is also greater in wards 7 (38.0%) and 5 (27.7%) than in wards 2 (8.4%) and 3 (6.0%).[38] Similarly, ward 7 residents are likelier to have arthritis, cancer, high blood pressure, activity limitations, and lower fruit and vegetable consumption, while residents in ward 5 are likelier to have diabetes, be overweight, and to have suffered from a head injury.[39] *See* **Table 1**.

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[32] DC Health. "Health Equity Report: District of Columbia 2018. The Social & Structural Determinants of Health." *Office of Health Equity, District of Columbia, Department of Health* (2018) 1-265 at 151.

[33] Exploring the Social Determinants of Health. "Housing and Health." *Robert Wood Johnson Foundation* (May 2011) 1-11 at 2.

[34] Health Affairs. "Housing and Health: An Overview of the Literature." *Robert Wood Johnson Foundation* (June 2018) 1-6 at 2.

[35] Stahre, Mandy, Juliet VanEenwyk, Paul Siegel, and Rashid Njai. "Housing Insecurity and the Association With Health Outcomes and Unhealthy Behaviors, Washington State, 2011." *Preventing Chronic Disease* (July 2015) 1-6 at 1.

[36] Clark, Cari Jo, et al. "Neighborhood Cohesion is Associated with Reduced Risk of Stroke Mortality." *American Heart Association* (2011) 1212-1217 at 1215: "Controlling for age, sex, education, and race (Model 1), neighborhood social cohesion was significantly associated with reduced risk of stroke mortality."

[37] *See* DC Health, *supra* note 32 at Figure 2. Ivy City life expectancy is taken from neighborhood group 48, Trinidad, and Deanwood life expectancy is taken from neighborhood group 32, Eastland Gardens.

[38] *See* DC Health, *supra* note 32 at Figure 10.

[39] District of Columbia Behavioral Risk Factor Surveillance System (BRFSS). "2015 Annual Report." *DC Health* (2015) 4-112 at 4.

Table 1: Income, Race, and Health Metrics by DC Ward								
Ward	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Median Income ($)[40]	99,085	105,835	136,832	88,544	82,520	102,777	38,110	34,824
% White[41]	57.7	69.0	81.7	30.0	29.5	48.2	2.8	4.1
% Black[42]	22.2	13.9	5.4	48.1	57.9	40.9	92.4	92.1
Life Expectancy (yrs.)[43]	80.9	85.3	87.6	81.0	76.4	79.1	74.7	72.0
% Fair or Poor Health[44]	10.8	5.8	3.5	14.5	12.9	11.4	19.8	24.2
% Obese[45]	17.0	10.7	13.0	20.7	26.2	23.0	31.4	43.6
% Current Smokers[46]	8.0	16.7	8.2	14.3	16.0	19.5	27.2	28.4
% Have Diabetes[47]	4.5	3.6	3.0	9.0	17.9	9.7	12.8	18.2
% High Blood Pressure[48]	29.0	28.3	19.7	28.0	39.5	33.0	50.6	42.2

C. DC Habitat

24. DC Habitat survey responses on self-reported health suggest that generally, DC Habitat homeowners are in good health. Less than 18 percent of homeowner respondents over the course of the study reported being in fair or poor physical health, and less than 5 percent reported being in fair or poor mental health. These figures are supported by a national survey of Habitat for Humanity homeowners in which 74 percent of homeowners stated that their families' overall health had improved since moving into their homes.[49]

25. In DC, 94.2% of all residents, 96.5% of white residents, 93.6% of black residents, and 86.5% of hispanic residents are reportedly covered by health insurance.[50] According to survey results, 90% of DC Habitat homeowners have health insurance.[51] That is an important figure considering that nationwide, DC Habitat's target population tends to be uninsured.[52]

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[40] DC Health Matters. "2019 Demographics." <http://www.dchealthmatters.org/demographicdata> (accessed Mar. 16, 2019).

[41] *Id*.

[42] *Id*.

[43] *See* DC Health, *supra* note 32 at Figure 2.

[44] *See* District of Columbia Behavioral Risk Factor Surveillance System (BRFSS), *supra* note 39 at 64.

[45] *Id*. at 94.

[46] *Id*. at 96.

[47] *Id*. at 80.

[48] *Id*. at 67.

[49] "Beneficial impacts of homeownership: A research summary." *Habitat for Humanity International* <http://www.habitatbuilds.com/wp-content/uploads/2016/04/Benefits-of-Homeownership-Research-Summary.pdf> (accessed Mar. 16, 2019).

[50] *See* DC Health, *supra* note 32 at 5.

[51] Based on the number of respondents who answered "Yes" to the question "Does your family have any form of health coverage, including health insurance, prepaid plans such as HMO's, or government plans such as Medicare or Indian Health Services?" on the most recent response provided by each homeowner.

[52] "Key Facts About the Uninsured Population." *Henry J. Kaiser Family Foundation* (Dec. 2018) 1-14 at 1: "Most uninsured people are in low-income families and have at least one worker in the family. Reflecting the more limited

Furthermore, 90% of survey respondents' last responses indicate that in the prior year, they did not experience a time when they needed medical attention but could not afford it because of the cost.

26. Homeowner responses related to respiratory illnesses indicate that out of approximately 164 people housed in Habitat homes, approximately 146 (89%) did not suffer from a respiratory illness. Of those households with someone suffering a respiratory illness, approximately 50% reported a slight or significant improvement since moving into their Habitat home.

27. DC Habitat homes are typically significant improvements for most homeowners. 11 of the 15 new residents surveyed reported living in an apartment prior to purchasing their Habitat home. One lived in transitional housing while another lived in a basement. Only two households reported living in a single-family home prior to purchasing their Habitat home. Additionally, 13 of the homeowners that responded about the quality of their Habitat home said it was "much better" or "better" than their previous residence, and more than 85% of the new homeowners responded that their Habitat home was "larger" or "much larger" than their previous residence.

28. DC Habitat's mission to build quality housing is driven by the importance housing plays on health. DC Habitat homes are built to green building standards that ensure superior indoor air quality and use of low-emission, non-toxic materials. Likewise, the affordability requirements on home price keep housing costs below 30 percent of income, freeing up funds for health-related expenses such as insurance, physician visits, and food. The favorable health outcomes experienced by DC Habitat homeowners may be directly tied to the affordable, quality housing it promotes.

IV. EDUCATION

A. Research Evidence

29. The benefits to education are well recognized and include better paying job opportunities, knowledge of how to access needed resources, and increased community stability.[53] For this reason, the long-term, educational outcomes of children are a primary driver of DC Habitat's emphasis on affordable homeownership.

30. Homeownership plays an important role in the lives of children.[54] Much of this can be attributed to the stability and wealth gains that homeownership provides. For example, research has shown

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availability of public coverage in some states, adults are more likely to be uninsured than children. People of color are at higher risk of being uninsured than non-Hispanic Whites."

[53] Abel, Jaison R. and Richard Deitz. "Do the Benefits of College Still Outweigh the Costs?" *FRBNY Current Issues in Economics and Finance* (2014) 20.3 1-12 at 7: "[F]or the average student, a college degree remains a good investment." *See also*, Kolesnikova, Natalia A. "The Return to Education Isn't Easily Calculated." *St. Louis Fed: The Regional Economist* (Jan. 2010) 12-13 at 12: "Most studies estimate that the return to one year of schooling is, on average, between 8 and 13 percent. In other words, each additional year of education is associated with an 8-13 percent increase in hourly earnings. For practical applications, 10 percent, on average, is a good estimate of the return."

[54] Green, Richard K. "Do Kids of Homeowners Do Better Than Kids of Renters?" US Department of Housing and Urban Development. *Cityscape: A Journal of Policy Development and Research* 15.2 (2013) 223-225 at 224: "Unless we change how real estate institutions in the United States work, homeownership will continue to play an important role in producing positive outcomes for children."

that residential mobility during the early years of children's lives has negative effects on their educational achievement.[55] There is also evidence that homeownership is positively correlated with college attendance, quality of college attended, and college graduation for low-income families, mostly due to the wealth effects of owning a home.[56] Homeownership has also been linked with a decreased likelihood of dropping out of high school by age 17 and of daughters having a child by age 17.[57]

31. Housing affordability, too, is linked to childhood education outcomes. For example, one study found that cost burdens have a negative and statistically significant effect on the reading and math achievement of children.[58]

32. Neighborhood characteristics complete the picture of housing and education. The effect on children younger than thirteen of moving from a high-poverty housing project to a lower-poverty neighborhood has been shown to have positive and significant effects ranging from improving college attendance rates, increasing earnings as adults, decreasing the likelihood of becoming a single parent, and increasing the likelihood of living in better neighborhoods as adults.[59]

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[55] Voight, Adam, Marybeth Shinn, and Maury Nation. "The Longitudinal Effects of Residential Mobility on the Academic Achievement of Urban Elementary and Middle School Students." *Educational Researcher* 41.9 (2012) 385-392 at 385: "[R]esidential moves in the early elementary years have a negative effect on math and reading achievement in third grade and a negative effect on the trajectory of reading scores thereafter. Further, there is a negative contemporaneous effect of mobility on math scores in third through eighth grade but no such contemporaneous effect on reading scores." *See also*, Cutuli, J.J., et al. "Academic Achievement Trajectories of Homeless and Highly Mobile Students: Resilience in the Context of Chronic and Acute Risk." *Child Development* 84.3 (2013) 1-28 at 1: "Math and reading achievement were lower and growth in math was slower in years of HHM [homeless or highly mobile] identification, suggesting acute consequences of residential instability."

[56] Lovenheim, Michael F. "The Effect of Liquid Housing Wealth on College Enrollment." *Journal of Labor Economics* 29.4 (2011) 741-771 at 766: "The effect of housing wealth is most pronounced for those with the fewest resources: a $10,000 increase in home equity leads to a 13.8% increase in college attendance among families that earn less than $70,000 per year." *See also,* Urahn, Susan K., et al. "Housing Wealth and Higher Education: Building a Foundation for Economic Mobility." *The Pew Charitable Trusts Economic Mobility Project* (Dec. 2011) 1-40 at 14-15: "[F]or every $35,000 of home equity, the college enrollment rate increased by 5 percent from the no-home-equity baseline…Increasing home equity from zero to $35,000 among low- and middle-income families increased their college attendance rate by more than 210 percent[,]" and at 21: "A $60,000 increase in home prices while the student is in high school increased the probability of graduations [from college] by more than 4 percentage points (14 percent)."

[57] Green, Richard K., Gary D. Painter, and Michelle J. White. "Measuring the Benefits of Homeowning: Effects on Children Redux." *Research Institute for Housing America Special Report* (2012) i-42 at 21: "Homeownership by parents is negatively related to whether children drop out and the relationship has a statistically significant and economically important impact – children of homeowners are 2.6 percentage points less likely to drop out than children of renters. Homeownership by parents is also negatively and significantly related to whether daughters have a child by age 17, and the relationship is again economically important, reducing the probability of child bearing by 5 percentage points[.]"

[58] Newman, Sandra J. and C. Scott Holupka. "Housing Affordability and Child Well-Being." *Housing Policy Debate* 1-36 at 21: "[A]lthough cognitive achievement is worse when the housing-cost burden exceeds HUD's 51% threshold definition of a severe burden compared with 30%, this effect is roughly half that at a housing-cost burden of 60%. Thus, at least from the perspective of children's cognitive achievement, the most deleterious consequences are not observed until the housing cost burden reaches about 60%."

[59] Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." *American Economic Review* 106.4 (Apr.

B. Washington, D.C. and DC Habitat

33. *American Housing Survey* ("AHS") data show that in the DC metro area, of the people that had moved in the past year, 77% were renters.[60] Poor households in DC also have higher rates of residential mobility.[61]

34. DC Habitat homeowner surveys asked homeowners how long they had lived in their Habitat home. Based on their responses, the mean tenure of surveyed homeowners is 7.2 years.[62] That stability has likely influenced the success of homeowners' children that has been visible through survey responses over the course of the study.

35. For example, the mean GPA reported among homeowners' children was approximately 3.35. Additionally, 26 unique households reported having a child older than 18 that lives or had lived in their home. These households reported a total of 50 such young adults, 46 (92%) of whom had graduated from high school and 27 (54%) of whom had enrolled in college. Of those that went to college, 9 (33%) had graduated as of the last survey response.

36. These educational statistics compare favorably to DC, where the 2017 district-wide public high school graduation rate was 69% for all races and 70% for an arguably more comparable sub-group: black, hispanic, or multiracial students graduating from high school in Wards 5 or 7.[63]

37. Moreover, of the DC students that graduated from public high school, 43% and 33% of black and hispanic students, respectively, enrolled in college within 180 days of their high school graduation.[64] This means that approximately 30% and 23% of black and hispanic students, respectively, go to college, compared with 54% of those reported by DC Habitat homeowner surveys. Furthermore, these students' persistence rate, defined as the percentage of college enrollees who remained in college the year following their initial enrollment, is about 70%, meaning that of a hypothetical 10 black or hispanic students that enroll in a DC public high school, about two will be enrolled in college one year and 180 days after graduating from high school. Approximately the same proportion has graduated from college according to DC Habitat survey responses.

2016) 855-902 at 899: "We find robust evidence that children who moved to lower-poverty areas when they were young (below 13) are more likely to attend college and have substantially higher incomes as adults. These children also live in better neighborhoods themselves as adults and are less likely to become single parents themselves, suggesting that some of the benefits of the initial [Move to Opportunity] voucher treatment will persist in the following generation[.]"

[60] U.S. Bureau of the Census. "Table C-07-AO-M: Housing and Neighborhood Search and Satisfaction – All Occupied Units (Selected Metropolitan Areas)." *2013 American Housing Survey*.

[61] U.S. Bureau of the Census. "Table B07412: Geographical Mobility in the Past Year by Poverty Status in the Past 12 Months for Residence 1 Year Ago in the United States." *2017 American Community Survey, 5-year estimates.*

[62] If a homeowner responded to the survey in 2012 or 2014 but failed to respond in subsequent survey years, current tenure was imputed by adding two years to their last self-reported tenure. Using all homes in the DC Habitat portfolio built since 1993 yields a mean tenure of approximately 14 years.

[63] District of Columbia Public Schools. "DCPS 2018 Graduation Data Overall Subgroup." *DCPS Dataset – Graduation Rates* (Dec. 17, 2018) <https://dcps.dc.gov/node/1018352> (accessed Mar. 24, 2019). Sub-group calculation weighted by graduating class size, excluding sub-group graduating class sizes of less than ten.

[64] Atchinson, Drew and Laura B. Stein. "Looking Back to Move Forward: Progress and Opportunity in District of Columbia Public Schools." *American Institutes for Research* (Sept. 2017) 1-16 at 11.

38. Parents' educational attainment is also notable. The highest educational level attained by 86.4% of survey respondent households was an associate degree, and only 13.6% of all responding households had attained a bachelor's degree or higher. Moreover, greater than half (52.3%) of responding homeowners had returned to school since becoming homeowners.

V. NEIGHBORHOOD DEVELOPMENT

A. Research Evidence

39. The role of homeownership in community involvement and neighborhood development has been widely studied. Homeownership has been linked to increased tenure and sense of control.[65] Homeowners are also more likely than renters to develop relationships with neighbors and have social support networks for issues such as asking for a ride or talking about personal issues.[66] Homeownership has been shown to predict political participation, especially in local contexts, as well as participation in neighborhood and community groups.[67] Homeownership has also been linked with decreased crime.[68] Research evidence suggests that vacancies in particular affect crime.[69] Overall, homeownership appears to be linked with stable and healthy communities.[70]

B. Washington, D.C.

40. Even with all of homeownership's benefits and with a significant need for affordable units, luxury apartments dominate the DC real estate market. Over the past few years, complexes such

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[65] Manturuk, Kim R. "Urban Homeownership and Mental Health: Mediating Effect of Perceived Sense of Control." *City & Community* 11.4 (Dec. 2012) 409-430 at 420: "Being a homeowner is associated with a 16-month increase in the length of time someone lives in the same place[,]" and at 422: "[H]omeownership predicts sense of control."

[66] Rohe, William M., Roberto G. Quercia, and Shannon Van Zandt. "The Social-Psychological Effects of Affordable Homeownership." In *Chasing the American Dream: New Perspectives on Affordable Homeownership* Eds. William M. Rohe and Harry L. Watson. London: Cornell University Press (2007) 215-232 at 227: "[H]omebuying had a significant positive impact on social support network size[.]"

[67] McCabe, Brian J. "Are Homeowners Better Citizens? Homeownership and Community Participation in the United States." *Social Forces* 91.3 (Mar. 2013) 929-954 at 941: "[H]omeownership remains a significant predictor of participation in both local and national elections…homeownership is positively associated with participation in neighborhood groups and civic groups."

[68] Ni, Jinlan and Christopher Decker. "The Impact of Homeownership on Criminal Activity: Empirical Evidence from United States' County Level Data." *Economics & Business Journal: Inquiries & Perspectives* 2.1 (Oct. 2009) 17-37 at 1: "[O]ur results indicate that a one percent increase in (lagged) homeownership leads to a 1.253 and 1.513 percent drop in the subsequent per capita property crime and a 1.043 and 1.123 percent drop in the subsequent per capita violent crime[.]"

[69] Cui, Lin and Randall Walsh. "Foreclosure, vacancy and crime." *Journal of Urban Economics* 87 (May 2015) 72-84 at 72: "[W]e find that it is foreclosure driven vacancies that lead to increased crime in the immediate neighborhood of foreclosures – these increases are on the order of 19% when comparing outcomes in a 250 foot buffer of the foreclosed home to those in the area between 250 and 353 feet away. The crime effect appears to peak and then level off at between 12 and 18 months following the initial period of vacancy and then attenuates once the house is re-occupied."

[70] Mallach, Alan. "Homeownership and the Stability of Middle Neighborhoods." *Federal Reserve Bank of San Francisco, Community Development Innovation Review* 11.1 (Aug. 2016) 63-83 at 76: "[T]here is a compelling link between homeownership and a host of factors associated with stable, healthy neighborhoods[.]"

as 450K (Mt. Vernon), Dock79 (Navy Yard), The Louis (U St. Corridor), 1221 Van (Navy Yard), The Apollo (H St.), F1RST Residences (1st St. SE), and Hecht Warehouse (Ivy City) have spread across the region. These "Class A" apartments typically have one to three bedrooms that are intended for high earners. During the first quarter of 2018, condo market sale prices in DC rose year-over-year by 5.9 percent,[71] and in 2018, Class A apartment rents rose by 3.9%.[72] Approximately 3,854 Class A Apartments were absorbed in the District in 2018, and approximately 16,426 are scheduled to deliver in DC over the next three years.[73] The average rents for these apartments range from $2,337 to $2,817 per month.[74]

41. These apartments are predominantly rented by new residents to the District,[75] millennials (59%) and Gen Xers (27%), and they occupy those apartments on average for approximately 19 and 23 months, respectively.[76] Between 2012 and 2016, the average annual net domestic migration of people aged between 26-34 years has been negative in DC, losing an average of 867 people in that age range yearly.[77]

42. Affordable housing in DC is not able to keep pace with the market rate real estate market in DC. *See* **Figure 4**.[78]

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71 Perry-Brown, Nena. "A Resurgence of New Condo Sales in Parts of the DC Area." *Urban Turf* (Apr. 25, 2018) <https://dc.urbanturf.com/articles/blog/a-resurgence-of-new-condo-sales-in-some-dc-area-submarkets/13891> (accessed Mar. 24, 2019).

72 Banister, Jon. "D.C. Apartment Rents Rose 4% in 2018 After Falling in 2017." *Bisnow* (Jan. 11, 2019). <https://www.bisnow.com/washington-dc/news/multifamily/dc-apartment-rents-rose-4-in-2018-after-falling-the-year-before-96670> (accessed Mar. 24, 2019).

73 Perry-Brown, Nena. "6500 Class A Apartments Will Deliver in DC This Year While Amazon Bolsters NoVa Market." *Urban Turf* (Jan. 15, 2009) <https://dc.urbanturf.com/articles/blog/6500-class-a-apartments-will-deliver-in-dc-this-year/14884> (accessed Mar. 24, 2019).

74 *Id.*

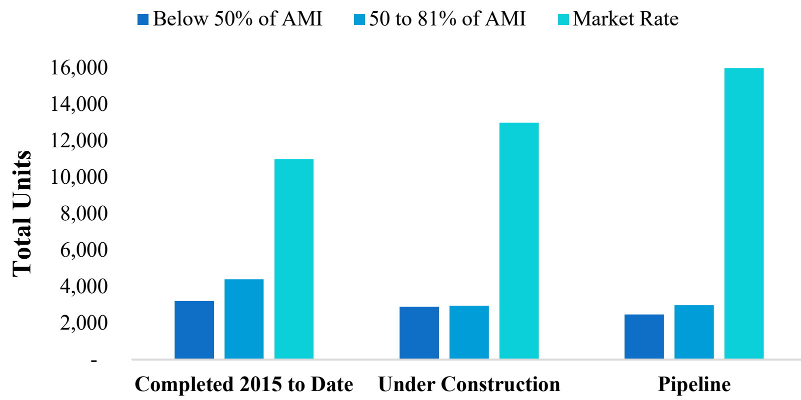
75 Fahimullah, Fahad, Yi Geng, and Daniel Muhammad. "A Study of the District of Columbia's Apartment Rental Market from 2000 to 2015: The Impact of Millenials." *DC.gov* (May 2018) 1-17 at 1: "We find that while the recent surge of premium apartment buildings in the city is likely evidence of continued gentrification, resident's in the city's newest and pricier apartment buildings tended to be new residents to the city, single, younger, and had income below the city average, which are typical of youthification."

76 "TrendLines Washington 2018: Trends in Washington Commercial Real Estate" *Delta Associates* (Feb. 1, 2018) <https://deltaassociates.com/media/files/15175844122018trendlinespresentation-web.pdf> (accessed Mar. 24, 2019).

77 *See* State of the Nation's Housing 2018, *supra* note 16 at Figure 19.

78 Open Data DC. "Affordable Housing." *DC.gov* (Feb. 4, 2019) <http://opendata.dc.gov/datasets/affordable-housing?geometry=-475.312%2C-54.344%2C-115.312%2C85.145> (accessed Mar. 24, 2019). Pipeline figures for market rent units are estimates based on Class A apartments in DC, *see* Perry-Brown *supra* note 71. Under construction figures for market rent units are estimates, *see* Fahimulla, Geng, and Muhammad *supra* note 75 at 5. Neither of these figures include Class B units and are thus likely to be conservative.

Figure 4
Affordable and Market Rate Housing Units in DC



43. As visible in the chart, the number affordable units completed, under construction, and in the pipeline is vastly lower than the number of market rate units in each of those categories. Considering the need for affordable housing described above, it is unlikely the units currently under construction are enough to reverse the current shortage of affordable housing. By building numerous luxury rental apartments for young, temporary residents instead of affordable homes for DC residents, the market foregoes the potential benefits attendant to homeownership, and DC leaves itself vulnerable to losing its tax base if changing economic conditions spur temporary residents to leave.

C. DC Habitat

44. DC Habitat's business model benefits communities by enabling homeownership, and it ensures DC residents benefit from that change through its DC residency requirement.

45. New homeowners were asked to what extent partnering with DC Habitat resulted in developing relationships with other Habitat homeowners, developing relationships with other members of the community, or becoming involved in community activities. There were fourteen respondents to these questions, and of those, all developed relationships with other DC Habitat homeowners, twelve (86%) developed relationships with other community members, and eleven (79%) became involved in community activities.

46. In recent years, both Ivy City and Deanwood have elicited positive media attention. For example, the Washington Post called Ivy City "the next cool D.C. neighborhood," and Doug Jemal, an Ivy City developer, called it the "new [affordable] 14th Street."[79] Adele Chapin, a writer for *Eater* online magazine, wrote, "In just a few short years, Ivy City has developed a reputation as D.C.'s unofficial distillery district."[80]

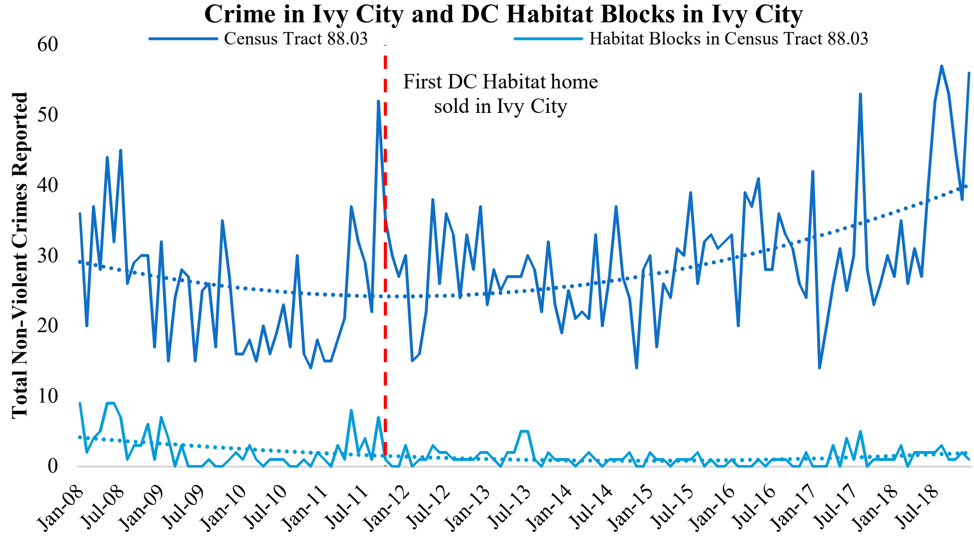
[79] Judkis, Maura. "The next cool D.C. neighborhood you have never heard of." *Washington Post* (Nov. 2, 2015) <https://www.washingtonpost.com/sf/style/2015/11/02/the-next-cool-d-c-neighborhood-you-have-never-heard-of/?noredirect=on&utm_term=.cf48205fa030> (accessed Mar. 31, 2019).

[80] Chapin, Adele. "Where to Eat, Drink, and Tour Distilleries in Ivy City: The Northeast neighborhood is hotter than ever." *Eater Washington DC* (Jan. 30, 2017) <https://dc.eater.com/maps/ivy-city-restaurants-bars-neighborhood-dining-guide> (accessed Mar. 31, 2019).

47. Deanwood too has received positive media attention. It was ranked the 7th "Hottest Neighborhood" in the country by Redfin based on home listing page views and favorites on Redfin's website.[81] It was ranked "in" by *The Washington Post*[82] and "the next Brookland" by DCist.[83]

48. According to the Urban Institute, Ivy City experienced one of the largest declines in aggravated assaults between 2000 and 2013.[84] Building on that momentum, DC Habitat sold its first home in Ivy City in 2012 and has continued construction there through 2018. Homeownership's connection to healthy and stable communities has partly influenced that decision. Its business model in Ivy City has relied in large part on buying vacant lots and homes. Six years later, analysis of crime trends on the Ivy City blocks on which DC Habitat has built homes suggests that these homebuilding and homeownership projects have had potentially visible reductions on the crime rate. *See* **Figure 5**.[85]

Figure 5
Crime in Ivy City and DC Habitat Blocks in Ivy City



49. Monthly reported non-violent crimes in census tract 88.03, predominantly composed of Ivy City, are graphed in dark blue, while the light blue line represents the same figure for blocks in Ivy City with at least one DC Habitat home. The dotted lines are fitted lines charting the trend over time. The dashed red line denotes when the first DC Habitat home was sold in Ivy City.

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[81]Whitely, Jon. "Hot or Not? Redfin Reviews its Hottest Neighborhood Predictions and Identifies 10 Areas that are Just Heating Up." *Redfin* (Aug. 18, 2017) <https://www.redfin.com/blog/2017/08/hot-or-not-hottest-neighborhood-predictions.html> (accessed Mar. 31, 2019).

[82] Contrera, Jessica. "The List 2017." *The Washington Post* (Dec. 28, 2016) <https://www.washingtonpost.com /graphics/lifestyle/year-in-review-in-out-list/2017/> (accessed Mar. 31, 2019).

[83] Sturdivant, Christina. "Is Deanwood Really The Next Brookland?" *DCist* (Dec. 30, 2016) <http://dcist.com /2016/12/deanwood_is_in.php> (accessed Mar. 31, 2019).

[84] "Our Changing City: Public Safety." *Urban Institute* <http://apps.urban.org/features/OurChangingCity/dc-public-safety/> (accessed Mar. 24, 2019).

[85] Metropolitan Police Department. "Crime Statistics Data." *DC.gov* <http://crimemap.dc.gov/Download.aspx> (accessed Mar. 24, 2019). Non-violent crimes include burglary, motor vehicle theft, robbery, and theft.

50. It is encouraging to note that non-violent crimes seem to have lessened slightly on blocks with DC Habitat homes, and while the overall trend of non-violent crimes has increased slightly since 2012 in all of census tract 88.03, it has remained somewhat below its pre-2012 level on DC Habitat blocks.

VI. WEALTH

A. Background

51. Racial and socioeconomic disparities in net wealth and homeownership exist in the district and nationwide.[86]

52. Wealth and homeownership exhibit a strong correlation, and low-to-medium income and minority households can build wealth through homeownership.[87] This relationship remained true even during the most recent financial crisis.[88] Because housing costs must be paid whether one rents or owns, ensuring housing payments are allocated to savings via homeownership is a primary way in which homeownership helps to build wealth.[89] In fact, homeownership is arguably the most effective method for low to moderate income households to build savings.[90]

B. Internal Rate of Return

53. To demonstrate how effective homeownership through DC Habitat has been as an investment option for partner households, the internal rate of return is calculated for the average homeowner that purchased a home through DC Habitat in one of two neighborhood development projects, Deanwood and Ivy City.[91] The internal rate of return is used to decide between investments and is defined as the rate of return that sets an investment's net present

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[86] Gebriel, Tinsae. "Economic Inequality in DC Reflects Disparities in Income, Wages, Wealth, and Economic Mobility. Policy Solutions Should Too." *DC Fiscal Policy Institute* (Aug. 2018): "[T]he median household wealth of white residents in DC is 81 times that of black residents."

[87] Freeman, Allison and Roberto G. Quercia. "Low- and Moderate-income Homeownership and Wealth Creation." *UNC Center for Community Capital Working Paper* (Apr. 2014) 1-14 at 9: "[W]e found a strong correlation between homeownership and wealth[,]" and at 11: "[W]ith long-term, fixed rate, amortizing loans that are carefully underwritten, homeownership can help lower-income families build wealth."

[88] Herbert, Christopher E., Daniel T. McCue, and Rocio Sanchez-Moyano. "Is Homeownership Still an Effective Means of Building Wealth for Low-income and Minority Households? (Was it Ever?)" *Joint Center for Housing Studies* (2013) 1-55 at 48: "Even after the tremendous decline in housing prices and the rising wave of foreclosures that began in 2007, homeownership continues to be a significant source of household wealth, and remains particularly important for lower-income and minority households."

[89] Freeman, Allison and Bruce A. Desmarais. "Portfolio Adjustment to Home Equity Accumulation among CRA Borrowers." *Journal of Housing Research* 20.2 (2011) 141-160 at 155: "[Affordable home loans made through the Community Reinvestment Act lending program] serv[e] as an effective means for promoting stable wealth-building for [low-to-medium] income households through the forced-savings mechanism of equity accumulation."

[90] Goodman, Laurie S. and Christopher Mayer. "Homeownership and the American Dream." *Journal of Economic Perspectives* 32.1 (2018) 31-58 at 43: "There is little evidence of an alternative savings vehicle (other than a government-mandated program like Social Security) that would successfully encourage low-to-moderate income households to obtain substantial savings outside of owning a home."

[91] DC Habitat homes sold in Deanwood between June 2004 and July 2011 and those sold in Ivy City between August 2011 and July 2016 are considered.

value equal to zero.[92] Because net present value is a measure of change in wealth accounting for the time until payments are received, the internal rate of return allows comparison between investments of differing time lengths.

54. Homeowner mortgage information was estimated using DC Habitat's internal financial data. For Deanwood homes, a $90,546 mortgage, a $500 down payment, and a 5% fixed-rate interest were assumed, yielding a $486 monthly principal and interest payment, or $5,833 annually. For Ivy City homes, a $170,668 mortgage, a $500 down payment, and a 5% fixed-rate interest were assumed, yielding a $916 monthly principal and interest payment, or $10,994 annually.

55. DC Habitat's shared equity appreciation condition was also incorporated into the internal rate of return calculation. According to this condition, increases in home value that accrue within the first fifteen years of a homebuyer's purchase are shared between the home buyer and the affiliate. For the first five years after purchase, DC Habitat has all the equity in the home. After this, the homeowner accrues 10 percent of the home equity yearly until earning full equity on the fifteenth year. The purpose of this condition is to prevent homebuyer's from "flipping" homes for a profit, as the main goal of DC Habitat is to foster homeownership.

56. The results of the analysis demonstrate that purchasing a home through DC Habitat is an effective means for homebuyers to accrue wealth. Given an initial investment of approximately $2,311 for Deanwood homes and of approximately $3,913 for Ivy City homes, imputed cashflows suggest an average internal rate of return of approximately 545% and 262% in Deanwood Parcel and Ivy City Parcel, respectively.[93]

57. Selling homes below market rates effectively serves as a transfer of wealth to home buyers. Even given Habitat's shared appreciation policy, home buyers experience large positive returns on both their purchase costs and monthly mortgage payments.

58. On aggregate, for the 150 homes DC Habitat has built since 1993 that were analyzed as a part of this study, home values have risen approximately $39,531,209 over the original mortgages taken out on those properties. DC Habitat homebuyers have benefitted from those increased home values and have been protected from concurrent increases in rents. To determine the average difference in DC Habitat homeowner housing costs to average monthly rents, average current home owner monthly mortgage payments were subtracted from fair market rents on DC Habitat properties as estimated by Zillow. The average homeowner is saving approximately $2,000 per month on housing and allocating those housing payments to equity accumulation. This is consistent with survey responses, which indicate that about 40% of households have experienced increases in savings since becoming DC Habitat homeowners, with about 14% of those reporting "significant" increases in savings.

VII. RETURN ON INVESTMENT

59. A home plays a central role in homeowners' lives but its role in measurable outcomes is often indirect, its impact to homeowners' lives is often intangible, and its returns are realized over many years. To demonstrate just how significant this impact can be, an illustrative return on

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[92] Brigham, Eugene F. and Joel F. Houston. "The Basics of Capital Budgeting." *Fundamentals of Financial Management* Concise 5th ed. Mason, Ohio (2007): 357-386 at 360-363.

[93] *See* **Technical Appendix** and **Exhibit 1** for further details.

investment calculation is performed assuming a $1 million investment in DC Habitat. This calculation suggests that the return on investment can be as large as 12%, as realized through educational achievement, health care savings, and land improvement value. *See* **Table 2**.[94]

Table 2: Estimated Value of a $1 Million Investment in DC Habitat	
Return	*Net Present Value*
Increased likelihood of college attendance	$167,155
Decreased likelihood of dropping out of high school	$32,928
Decreased likelihood of teenage pregnancy	$948
Value of land improvements	$918,848
Total	**$1,119,879**

60. Estimates of the financial return to examined outcomes are taken from various sources. The financial return to education is estimated using ACS estimates of median incomes by education level in DC,[95] and the cost of teen pregnancy is sourced from Power to Decide, an organization devoted to reducing teenage and unplanned pregnancies.[96] The value of land improvements is based on data from the DC Office of Tax and Revenue.[97] Because many returns are realized over many years, future cashflows are discounted at 5%, the coupon rate on DC general obligation bonds.[98]

61. These calculations are conservative in many regards. For example, the costs of teenage pregnancy are limited to pregnancy and the first year of infancy, and they do not consider the long-term impacts or costs to society. These calculations also do not consider that many outcomes interact with each other. Attending college, for example, not only leads to greater income it is also associated with better health outcomes and lower incarceration rates.

62. Further, a NeighborworksAmerica tool designed to measure the impact of construction expenditures on the local economy suggests that these returns are potentially much larger.[99] This tool estimates that the construction of four DC Habitat homes can result in approximately $78,061 in local business income, $352,143 in local wages and salaries, and 9.54 full-time equivalent jobs.

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[94] *See* **Technical Appendix** and **Exhibit 2** for further details.

[95] U.S. Bureau of the Census. "Table B0004: Median Earnings in the Past 12 Months (In 2017 Inflation-Adjusted Dollars) By Sex By Education Attainment For the Population 25 Years and Over." *2017 American Community Survey, 5-year estimates*.

[96] Power to Decide. "Progress Pays Off: DC Fact Sheet." (Jan. 2018) <https://powertodecide.org/what-we-do/information/why-it-matters/progress-pays> (accessed Apr. 13, 2019).

[97] Office of Tax and Revenue. "Real Property Assessment Database." *DC.gov* <https://www.taxpayerservicecenter.com/RP_Search.jsp?search_type=Assessment> (accessed Dec. 8, 2018).

[98] Bloomberg, L.P. (accessed Apr. 6, 2019).

[99] NeighborworksAmerica. "H12.1: Local Economic Impact of New Construction / Renovation for Homeownership."

VIII. CONCLUSION

63. DC Habitat's work addresses DC's affordable housing need. It builds in DC neighborhoods with the most need and it helps make affordable homeownership a reality for DC residents that have a demonstrated need, an ability to pay, and a willingness to partner. In so doing, DC Habitat creates the opportunity for partner households to experience the joy of homeownership and the many economic and social benefits that it brings. The District also benefits, and illustrative calculations demonstrate that those returns can be substantial.

Dated: May 25, 2019

Technical Appendix

I. Internal Rate of Return Calculations

1. In calculating the internal rate of return for DC Habitat homeowners, the methodology of Goodman and Mayer (2018) is employed.[1]

2. First, November 2018 Zillow data specific to DC Habitat homes in Deanwood and Ivy City are compiled. For each home, Zillow reports both a market value estimate (a “Zestimate”) and a monthly rent estimate (a “rent Zestimate”). Zillow’s estimates are calculated using a proprietary formula that considers home features, location, and market conditions.[2]

3. Next, annual historical rents and market values for the same properties were estimated using Zillow’s home value index (“ZVHI”) and Zillow’s rent index (“ZRI”). For Deanwood, the monthly, single-family home ZVHI and ZRI at the neighborhood level are the primary indices used. However, prior to 2010, monthly ZRI data is no longer available at the neighborhood level, and Zillow’s quarterly, chained metropolitan area index does not report information for Washington, D.C., so the mean of that measure for Baltimore, MD and Richmond, VA was used. For Ivy City, the monthly, single-family home ZVHI and ZRI for the 20002 zip code is used.

4. Annual homeowner costs, including maintenance, insurance, and capital improvements, were estimated using data from the AHS specific to the Washington, D.C. metropolitan area. This data, reported every two years, was interpolated for intra-survey years and estimated historically using the Washington, D.C. metropolitan area consumer price index.[3]

5. Annual property tax data at the property level came from the D.C. Office of Tax and Revenue.[4] Assessed home values as of 2018 were multiplied by the appropriate ZVHI to estimate historical assessed home values and then multiplied by the D.C. real property tax rate for residential properties as reported in 2004-2018 D.C. Tax Facts published by the D.C. Office of Revenue Analysis.[5] These estimates are conservative considering that property tax increases in excess of 10% of the previous year’s assessment generally result in nonrefundable credits.[6]

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[1] Goodman, Laurie S. and Christopher Mayer. “Homeownership and the American Dream.” *Journal of Economic Perspectives* 32.1 (2018) 31-58.

[2] Zillow, Inc. “Zestimate (Pronounced ZEST-ti-met).” <https://www.zillow.com/zestimate/#what> (accessed Feb. 10, 2019). Zillow reports that the median error rate for its Washington, D.C. Zestimate is 3.1%, meaning that half of the homes sold in Washington, D.C. sell within 3.1% of the current Zestimate reported.

[3] Bureau of Labor Statistics. “All items in Washington-Baltimore, DC-MD-VA-WV, all urban consumers, not seasonally adjusted (CUUSA311SA0).” *Consumer Price Indexes Database* <https://download.bls.gov/pub/time.series/cu/cu.data.0.Current> (accessed Jan. 12, 2019).

[4] Office of Tax and Revenue. “Real Property Assessment Database.” *DC.gov* <https://www.taxpayerservicecenter.com/RP_Search.jsp?search_type=Assessment> (accessed Dec. 8, 2018).

[5] Office of the Chief Financial Officer. “D.C. Tax Facts.” *DC.gov* (2004-2018).

[6] Lincoln Institute of Land Policy and George Washington Institute of Public Policy. “Assessment Cap Credit.” *Significant Features of the Property Tax* <https://www.lincolninst.edu/tax-limit/assessment-cap-credit-district-columbia-2017> (accessed Feb. 23, 2019).

II. RETURN ON INVESTMENT CALCULATIONS

6. Affiliate financial data suggests that over the past seven years, the affiliate has sold an average of 6.7 homes per year at an average cost of about $260,000 per home and average revenue of about $250,000 per home. Therefore, it is assumed the hypothetical investment would allow DC Habitat to finish construction on four homes. It is also assumed that those homes would be sold using a $500 down payment on 30-year, five percent, fixed-rate mortgages. Further, because survey estimates suggest that 80% of DC Habitat households have contained minors, the construction of four additional homes is assumed to affect the lives of three children.

7. Much of the research evidence cited regarding the benefits of homeownership is empirical. Where that is the case, the literature has presented estimates of the effect of an independent variable, such as homeownership or wealth or tenure, on a desired outcome, such as college attendance. These estimates can be interpreted as the *average* effect of the independent variable on the observed outcome *after* controlling for other independent variables, such as neighborhood characteristics or contemporaneous macroeconomic conditions. In other words, they are the isolated effect of the independent variable on the outcome. Because they are the average effect, they can be interpreted as changes in probabilities.

8. For example, analyzing the effect of changing housing wealth on college attendance rates, Michael F. Lovenheim found that "[f]or families with less than $70,000 in total income, a $10,000 change in home equity leads to a 5.7 percentage point increase in the *likelihood* of college enrollment."[7] This finding can be interpreted as an increased probability of going to college as a result of an increase in home equity.

9. To determine the value associated with increased probabilities, as reported in the literature, an expected value calculation is employed. Expected values are the weighted average of the payoffs associated with all possible outcomes, where the probabilities are used as weights.[8]

10. Two outcomes are considered. Either (i) DC Habitat builds a home and a homeowner or society realizes some changed probability in an outcome, or (ii) DC Habitat does not build a home and there is no change to the probability of an outcome. Because the goal is to measure the *change* in expected value as a result of DC Habitat's efforts, *i.e.* the value of DC Habitat's work as realized through various channels, only changes in probabilities are important. As a result, the latter of the two outcomes has no effect on the expected value calculation – the probability change is zero if DC Habitat does not build a home. The expected value calculation thus becomes the changed probability of some outcome as a result of DC Habitat's homebuilding efforts multiplied by the financial benefit of that outcome. In this way, it is possible to estimate the direct effect of DC Habitat's contributions to generating social value.

11. The effect of housing wealth on the decision to enroll in college has been estimated as a 5.7 percentage point increase in the likelihood of attending college for every $10,000 in home equity for households earning less than $70,000 annually.[9] This income threshold is about the median income for DC Habitat partner households. Also, over the course of ten years, DC

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[7] Lovenheim, Michael F. "The Effect of Liquid Housing Wealth on College Enrollment." *Journal of Labor Economics* 29.4 (2011) 741-771 at 757. Emphasis added.

[8] Pindyck, Robert S. and Daniel L. Rubinfeld. *Microeconomics.* 7^{th} ed. Upper Saddle River, New Jersey (2009): 159-190 at 161.

[9] *See* Lovenheim, *supra* note 7.

Habitat households in Deanwood had accrued nearly $50,000 of home equity by their tenth year of homeownership, so this assumption is used as the amount of home equity each partner household is likely to have accrued as of a child's college enrollment age, yielding an assumed increased probability of attending college of approximately 28.5 percent. Assuming similar rates of college persistence as reported on survey responses, of three children entering college, two are assumed to drop out after one year and one is assumed to graduate.

12. 2017 ACS 5-year estimates of median incomes by education level in DC are used to estimate the difference in earnings by education level.[10] Adults who have attended some college without graduating and adults who graduate with a bachelor's degree earn $9,512 and $35,063 more annually, respectively, on average, than adults with only a high school diploma. Assuming children are about eight years old at the time their parents become homeowners to allow for equity accumulation, their earnings are discounted at 5% annually between the assumed age of leaving college and a retirement age of 65.

13. Under these assumptions, the present value of lifetime increased earnings for two students that attend but do not graduate from college is approximately $208,823. Similarly, a student that does graduate from college realizes a present value of lifetime increased earnings of approximately $377,687. The expected value calculation takes the present value of increased lifetime earnings from attending college and multiplies it by the probability increase of attending college, or ($208,823 + $377,687) * 28.5%, which totals approximately $167,155.

14. A similar calculation yields the potential savings from a decreased likelihood of dropping out of high school. Dropping out of high school has been shown to have costs to both the individual and society, including decreased lifetime earnings, increased likelihood of incarceration, and worse health outcomes.[11] Homeownership has been credited with decreasing the likelihood of dropping out of high school by 2.6 percentage points.[12]

15. The increase in annual earnings from graduating high school are estimated to be about $6,028 per year for three children. Maintaining the assumption that each child is eight at the time their parents become DC Habitat homeowners, the present value of their decreased lifetime earnings totals approximately $220,087.

16. Graduating from high school also has an effect on lifetime health costs and crime related savings. One study estimated that an additional 950 graduates in DC's 2015 class would have resulted in approximately $2.1 million in annual health care cost savings to the District.[13] This

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[10] U.S. Bureau of the Census. "Table B0004: Median Earnings in the Past 12 Months (In 2017 Inflation-Adjusted Dollars) By Sex By Education Attainment For the Population 25 Years and Over." *2017 American Community Survey, 5-year estimates*.

[11] Alliance for Excellent Education. "Saving Futures, Saving Dollars: The Impact of Education on Crime Reductions and Earnings." (Sept. 2013) <https://all4ed.org/reports-factsheets/saving-futures-saving-dollars-the-impact-of-education-on-crime-reduction-and-earnings-2/> (accessed Apr. 13, 2019) 1-12 at 2: "The demonstrated benefits [of high school graduation] include increased lifetime earnings and tax revenues, increased purchases of such as homes and cars, and lower unemployment rates. The benefits also relate to improvements in quality of life such as decreased crime and incarceration rates and improved health conditions and outcomes."

[12] Green, Richard K., Gary D. Painter, and Michelle J. White. "Measuring the Benefits of Homeowning: Effects on Children Redux." *Research Institute for Housing America Special Report* (2012) at 21.

[13] Alliance for Excellent Education. "The Graduation Effect: Every Student's Potential to Impact a Community, District of Columbia." (Oct. 2017) <http://impact.all4ed.org/> (accessed Apr. 13, 2019).

translates to approximately $2,210 in annual health savings per graduate. Over the course of three graduating students' lifetimes, assuming students would drop out at age 18 and live to the median DC life expectancy of 79, that amounts to approximately $28,398 in lifetime health savings per child associated with not dropping out of high school.

17. Another study estimated that an increase of five percent in the DC high school male graduation rate would result in approximately $18.5 million in annual crime-related savings to the District.[14] Of the 5,058 students within that class cohort, 58.6 percent graduated.[15] Assuming similar graduation rates among men and women and that half the class was male, the per graduating male annual crime-related savings would be $113,951. The present value of these savings is estimated for twenty years after a child's high school dropout age of 16 and totals approximately $961,170.

18. Multiplying each of these savings by the reduced probability of dropping out of high school as a result of homeownership produces the following equation: ($220,087 + $85,193 + $961,170) * 2.6%, or approximately $32,928 in financial benefits through homeownership's reduction in the high school dropout rate.

19. Teen births have been estimated to cost the District $28,000 in health care and public assistance costs during pregnancy and the first year of infancy.[16] Green, Painter, and White have also found that homeownership is associated with a 5 percentage point reduction in the likelihood of teen childbearing.[17] Assuming that this reduction would be realized within eight years, the present value of this benefit is approximately $18,952, and the expected value of these savings amounts to approximately $948.[18]

20. Value of land improvements is taken from the DC Office of Tax and Revenue.[19] This data reports the land value and the value of improvements to the land. The value used is the mean 2019 estimated improvement value for DC Habitat homes that settled in 2016, the most recent year for which settlement data was available.

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[14] Alliance for Excellent Education, *supra* note 11 at Table 2.

[15] Office of the State Superintendent of Education. "Official Graduation Rates Report: 2007-08 First-Time Ninth Graders." *DC.gov* <https://osse.dc.gov/publication/2010-2011-adjusted-cohort-graduation-rate> (accessed Apr. 20, 2019).

[16] Power To Decide. "Progress Pays Off: DC Fact Sheet." (Jan. 2018) <https://powertodecide.org/what-we-do/information/why-it-matters/progress-pays> (accessed Apr. 13, 2019).

[17] *See* Green, Painter, and White, *supra* note 12.

[18] For further information regarding the expected value calculations, see **Exhibit 2**.

[19] Office of Tax and Revenue. "Real Property Assessment Database." *DC.gov* <https://www.taxpayerservicecenter.com/RP_Search.jsp?search_type=Assessment> (accessed Dec. 8, 2018).

Exhibit 1
Financial Returns From the Purchase of a DC Habitat Home
Deanwood

Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*
Imputed rental "income" (Zillow)	$20,218	$20,871	$21,524	$22,496	$23,940	$24,824	$24,852	$23,631	$23,102	$24,789	$24,513	$25,908	$26,939	$27,678	$27,576
less: Annual maintenance		$411	$426	$441	$461	$462	$470	$486	$496	$504	$602	$700	$600	$500	$537
less: Property taxes		$762	$877	$961	$808	$665	$621	$581	$633	$639	$667	$786	$893	$1,044	$1,211
less: Homeowners insurance		$616	$639	$662	$692	$693	$705	$729	$745	$756	$780	$804	$822	$840	$805
= Net operating income		$19,082	$19,582	$20,432	$21,979	$23,004	$23,056	$21,835	$21,228	$22,890	$22,464	$23,618	$24,624	$25,294	$25,023
less: Capital improvements		$734	$760	$788	$823	$825	$839	$867	$886	$900	$950	$1,000	$1,000	$1,000	$959
less: Mortgage payments		$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833	$5,833
= Imputed cash flow (Net benefit)		$12,515	$12,989	$13,811	$15,323	$16,347	$16,384	$15,136	$14,509	$16,157	$15,681	$16,785	$17,791	$18,461	$18,232
Financial cash flows															
Value of home	$144,718	$195,004	$234,568	$257,056	$223,948	$184,177	$172,100	$160,959	$175,431	$177,097	$184,697	$217,701	$247,374	$289,227	$335,558
Cash to purchase	-$2,311														
sale costs		*$13,650*	*$16,420*	*$17,994*	*$15,676*	*$12,892*	*$12,047*	*$11,267*	*$12,280*	*$12,397*	*$12,929*	*$15,239*	*$17,316*	*$20,246*	*$23,489*
mortgage pay off		*$89,210*	*$87,806*	*$86,330*	*$84,778*	*$83,147*	*$81,433*	*$79,631*	*$77,736*	*$75,745*	*$73,652*	*$71,452*	*$69,139*	*$66,708*	*$64,152*
homeowner equity (shared appreciation)		*0%*	*0%*	*0%*	*0%*	*0%*	*10%*	*20%*	*30%*	*40%*	*50%*	*60%*	*70%*	*80%*	*90%*
Net sale proceeds (each year)		$0	$0	$0	$0	$0	$7,862	$14,012	$25,624	$35,582	$49,058	$78,606	$112,643	$161,819	$223,125
Annualized financial return on equity															
Internal rate of return on equity			530.7%	543.4%	545.5%	545.8%	545.9%	545.9%	545.9%	545.9%	545.9%	545.9%	545.9%	545.9%	545.9%

Notes:

-Calculations are estimates based on actual and imputed data pertaining to DC Habitat homes in the Deanwood neighborhood. Repeat sales and paid-off or assumed mortgages are excluded. An average mortgage of $90,546 for DC Habitat homes sold in 2004 and 2005 in Deanwood is used. Additionally, a 30-year, 5% fixed-rate mortgage is assumed. Cash to purchase assumes 2 percent closing costs and a $500 down payment.

-Net sale proceeds assume 7 percent expenses (for broker and sale costs) and payoff of outstanding mortgage, as well as DC Habitat's shared appreciation condition.

Exhibit 1
Financial Returns From the Purchase of a DC Habitat Home
Ivy City

Year	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*
Imputed rental "income" (Zillow)	$24,485	$24,560	$27,233	$26,559	$27,628	$27,746	$28,387	$27,158
less: Annual maintenance		$496	$504	$602	$700	$600	$500	$537
less: Property taxes		$1,576	$1,778	$2,012	$2,262	$2,397	$2,595	$2,791
less: Homeowners insurance		$745	$756	$780	$804	$822	$840	$805
= Net operating income		$21,743	$24,195	$23,165	$23,862	$23,927	$24,452	$23,025
less: Capital improvements		$886	$900	$950	$1,000	$1,000	$1,000	$959
less: Mortgage payments		$10,994	$10,994	$10,994	$10,994	$10,994	$10,994	$10,994
= Imputed cash flow (Net benefit)		$9,862	$12,300	$11,221	$11,868	$11,933	$12,458	$11,072
Financial cash flows								
Value of home	$256,893	$277,892	$313,481	$354,728	$398,771	$422,633	$457,608	$492,106
Cash to purchase	-$3,913							
sale costs		*$19,452*	*$21,944*	*$24,831*	*$27,914*	*$29,584*	*$32,033*	*$34,447*
mortgage pay off		*$168,150*	*$165,503*	*$162,721*	*$159,796*	*$156,722*	*$153,491*	*$150,094*
homeowner equity (shared appreciation)		*0%*	*0%*	*0%*	*0%*	*0%*	*10%*	*20%*
Net sale proceeds (each year)		$0	$0	$0	$0	$0	$27,208	$61,513
Annualized financial return on equity								
Internal rate of return on equity			243.5%	261.1%	265.6%	266.8%	267.9%	267.7%

Notes:

-Calculations are estimates based on actual and imputed data pertaining to DC Habitat homes in the Ivy City neighborhood. Repeat sales and paid-off or assumed mortgages are excluded. An average mortgage of $170,668 for DC Habitat homes sold in Ivy City is used. Additionally, a 30-year, 5% fixed-rate mortgage is assumed. Cash to purchase assumes 2 percent closing costs and a $500 down payment.

-Net sale proceeds assume 7 percent expenses (for broker and sale costs) and payoff of outstanding mortgage, as well as DC Habitat's shared appreciation condition.

Exhibit 2
Expected Value Calculations

Outcome	*Probability Change*	*Financial Benefit of Outcome*	*Present Value of Financial Benefits*	*Expected Value*
College attendance through wealth gains				
2 children: Increased earnings from one year of college attendance	+5.7%	$9,512 per year	$208,823	$59,515
1 child: Increased earnings from college graduation		$35,063 per year	$377,687	$107,641
=Expected value of college attendance				$167,155
High school dropout reduction through homeownership				
3 children: Increased earnings from high school graduation		$6,028 per year	$220,087	$5,722
3 children: Health care savings from high school graduation	-2.6%	$2,211 per year	$85,193	$2,215
1 male child: Crime related savings from high school graduation		$113,951 per year	$961,170	$24,990
=Expected value of high school graduation				$32,928
Teenage pregnancy reduction through homeownership				
1 female child: Decreased health care and public assistance costs	-5.0%	$28,000	$18,952	$948
=Expected value of reduced teen pregnancy				$948
Total		$28,000 + $166,765 per year	$1,871,911	$201,031

Notes:

-Increased earnings data reflect 2017 ACS 5-year estimates of income by education level in DC.

-Health care and crime related savings associated with high school graduation rates are from Alliance for Excellent Education estimates of DC graduating class sizes and costs.

-Teenage pregnancy costs are Power To Decide estimates of the health care and public assistance costs during pregnancy and the first year of infancy for unintended births among teens.