Housing Affordability – An *Art of the Possible* Use Case to Develop the 21st Century Census Curated Data Enterprise

Edward Wu, https://orcid.org/0000-0001-8647-2567
Joseph J. Salvo, https://orcid.org/0000-0002-1552-3387
Vicki Lancaster, https://orcid.org/0000-0002-1517-3807
Stephanie Shipp, https://orcid.org/0000-0002-2142-2136, Project Lead
Contact: sss5sc@virginia.edu

Social and Decision Analytics Division
Biocomplexity Institute
University of Virginia

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Abstract

There is a growing appetite for timelier and more granular data. Surveys, which have long been a bedrock of data provided by the federal government, are experiencing challenges such as low response rates and lag times in release. However, the increasing amounts of data available presents opportunities to tackle the nation's issues. The 21st Century Census Curated Data Enterprise (CDE) is a proposed shift away from relying on individual surveys and towards the re-use and integration of multiple data sources in order to produce more timely and geographically granular statistical products. Rather than starting with individual surveys and producing products based on these surveys, we propose starting stakeholder questions that provide the context for the statistical product creation.

Because practical applications are the focus of the CDE, we propose the development of the CDE through Use Cases. This report is an *Art of the Possible* Use Case, which explores the feasibility of performing Demonstration Use Cases on housing affordability. A Demonstration Use Case is an implementation of statistical product development that illuminates the capabilities needed to develop and deploy the CDE. We conclude that there are several areas of housing affordability that could be developed into statistical products and provide a starting point for Demonstration Use Cases on the topic. Throughout the report, we highlight the importance of housing affordability, provide a landscape of the housing affordability literature, introduce the reader to available data sources and data gaps, and emphasize areas where data integration could be helpful.

Housing affordability makes for a logical Use Case. It is an important topic, as housing is widely acknowledged as a basic need and the nation experiences a shortage of affordable housing. The issues surrounding housing affordability are complex. A confluence of factors has led to a shortage of affordable housing and the large number of households experiencing high housing cost burdens. The factors are organized by three types: governance, shock events, and economics. Governance includes factors such as exclusionary zoning that has limited where high-density affordable housing can be built (for example, see Ikeda and Washington (2015). Other governance factors include Not In My Backyard sentiments and underfunding of housing assistance programs. Economic factors include wage stagnation and income inequality; local, state, and federal policy, including exclusionary zoning and the underfunding of housing assistance programs. Shock events such as 2007-2008 Financial Crisis and the COVID-19 pandemic. Given this complexity, housing affordability is a topic that would benefit from the integration of multiple data sources, both survey and administrative data.

The Appendix includes a list of housing and housing-related data sources.

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Housing Affordability – An *Art of the Possible* Use Case to Develop the 21st Century Census Curated Data Enterprise

1. Housing Affordability and the Curated Data Enterprise

The 21st Century Census Curated Data Enterprise is a proposed shift of focus away from relying solely on individual surveys and towards the purposes and uses of new statistical products, a more comprehensive approach. This new business model focuses on the end goal; that is, starting with the research questions of interest and constructing statistical products to provide data-driven insights to inform decision-making. This *CDE* approach emphasizes the agile re-use of data, seeking to integrate existing and new data sources from the Census Bureau and external parties to nimbly respond to policy-related questions.

Exhibit 1: Curated Data Enterprise Framework

We propose the development of the CDE through Use Cases. An *Art of the Possible* Use Case explores a topic and related research questions that may be answered through the CDE and provides a starting point for a Demonstration Use Case. A Demonstration Use Case is an implementation of statistical product development that illuminates the capabilities needed to develop and deploy the CDE. (For examples of both kinds, see Use Cases). This report presents an *Art of the Possible* Use Case. The goal is to assess the feasibility of doing a Demonstration Use Case and, if so, to provide a starting point to creating statistical products relating to housing affordability. Throughout, we highlight the importance of housing affordability, introduce the reader to the topic (including a landscape of the literature and an overview of data available), and emphasize areas where data integration can provide timelier and more granular statistical products to answer policy questions. We conclude that there are several areas of housing affordability that could be developed into statistical products.

The center of the CDE framework are purposes and uses – the specific research questions and problems to be addressed. Research questions addressed through the CDE should be impactful and benefit from the CDE's emphasis on data re-use, data integration, and timely and

geographically granular data. The topic of housing affordability fits these criteria. Housing represents one of the largest costs for households, and we further discuss the importance of affordable housing in Section 2. Affordable housing supply and rents are local, varying across states and cities. Many factors that affect housing supply and demand (*e.g.*, migration patterns, job market changes, and housing development) change rapidly, and up-to-date information is needed to inform policy decisions.

The issues surrounding housing affordability are also multifaceted and complicated – integrating multiple data sources presents an opportunity to better understand homelessness and evictions, for example, where single surveys only partially address questions. A lack of a physical address, decreased access to phone and internet, and the financial hardships that may lead to eviction are all significant impediments to reaching participants experiencing these conditions using surveys.

The lessons from the COVID-19 pandemic also help to illustrate the need for timelier and geographically granular housing data. The federal government implemented several policies to promote housing stability in response to the economic uncertainty and job losses created by the pandemic. This included an eviction moratorium (Centers for Disease Control and Prevention, 2020) and two separate Emergency Rental Assistance programs totaling over $46 billion (U.S. Department of the Treasury, 2023b). Given the dire situation, swift implementation of programs to assist vulnerable populations was necessary. However, various barriers have been noted for reaching those in need (for example, see Aiken et al. (2021), Pandemic Oversight (2021), and Elder (2023)). For example, a lack of federal eviction data and demographic data for those assisted by the programs made it difficult to distribute relief dollars efficiently to locations most in need and to determine whether funds were reaching underserved communities.

Moving forward, the need for more comprehensive data on this topic remains, as a basis for potential new legislative efforts aimed at issues affecting affordability. Further, the increasing frequency and severity of disasters due to climate change require a greater understanding of housing resiliency in the face of crises. This is especially the case in communities where large parts of the population age in place, or where weather events may put the most vulnerable at risk. The data to demonstrate need and offer potential solutions related to these issues must go beyond the use of one or two surveys. Statistical products are needed that integrate the multiple data sources capable of tapping key issues.

The presentation that follows begins with a discussion of the importance of housing affordability, followed by a survey of the literature to identify the issues and data gaps associated with housing affordability, a discussion of selected housing affordability policies, and an overview of survey and non-survey data sources that can be brought together to produce better statistical products on the issues affecting housing affordability.

2. The Importance of Housing Affordability

Housing is widely acknowledged as a basic need. Desmond (2016) writes that "it is hard to argue that housing is not a fundamental human need. Decent, affordable housing should be a basic right for everybody in this country. The reason is simple: without stable shelter, everything else falls apart." It is therefore critical that households across the nation have access to housing they can afford.

We define housing affordability as the amount a household can pay for housing and still afford other basic necessities at an adequate standard. Housing affordability is frequently defined as housing that costs less than 30% of household income. This definition is the subject of considerable debate, with some noting that it is overly simplistic and that it does not account for the trade-offs made by households to reduce housing costs (HUD User, 2014). Two households living in the same area with the same income may have different transportation or childcare needs. In addition, the remaining budget after spending 30% on housing would be far less for a household making $30,000 per year than a household making $300,000 per year.

One way to address these critiques is the "residual income" approach, which Michael Stone pioneered in his work on shelter poverty (for example, see Stone (1993) and Stone (2004)). In this approach, one considers whether a household can cover their remaining basic needs after paying for housing. If they cannot, they are considered "shelter-poor."

Stable, high-quality housing is associated with a variety of benefits, while housing insecurity can be highly detrimental (HUD User, 2022b; U.S. Department of Health and Human Services., n.d.-b). Housing is one of the largest costs for households and presents a considerable financial burden to many households, due at least in part to the shortage of affordable units (Stone, 2004; Betancourt et al., 2022; National Association of Realtors, 2023; Joint Center for Housing Studies of Harvard University, 2023). While programs provide assistance to many American households, a lack of funding and long waitlists are impediments to reaching households in need. For example, roughly a quarter of households eligible for the housing choice voucher program receive federal housing subsidies (Fischer, 2021; U.S. Department of Health and Human Services., n.d.-b). Thus, nearly half of renter households spend more than 30% of their income on housing (U.S. Census Bureau, 2022b).

In addition, the pressure on the housing stock due to the lack of affordable units may force many households into substandard housing, characterized by the presence of health hazards, structural deficiencies, and overcrowding. Affordability concerns may also force households into locations with decreased access to necessities such as jobs, grocery stores, and medical care and negatively impact access to public services such as mass transit, law enforcement, and quality schools. Rising housing costs can result in eviction or multiple moves in a short period, which have been noted to be particularly detrimental to the health outcomes of children (U.S. Department of Health and Human Services., n.d.-b).

Given both the prevalence of cost-burdened households and the negative consequences of housing instability, a considerable amount of research and funding is devoted to housing affordability. However, much of this research would benefit from the Census Bureau's efforts to create products that bring together multiple data sources as part of the Census Bureau's modernization efforts, and through the promise of the CDE.

3. Housing Affordability Issues

Housing affordability is highly complex, affected by a multitude of issues including local, state, and federal policies, labor markets, monetary policy, domestic and international migration,

economic conditions, and various forms of discrimination. The lack of affordable housing is tied to the perpetuation of inequity, the inability to build wealth, and homelessness.

In this section, we present a landscape of the housing affordability literature. We limit our discussion to renter households; however, we also note that both renter and owner households can experience financial burdens due to housing costs along with many of the negative effects.

Exhibit 2: Contributing Factors to the Housing Affordability Crisis

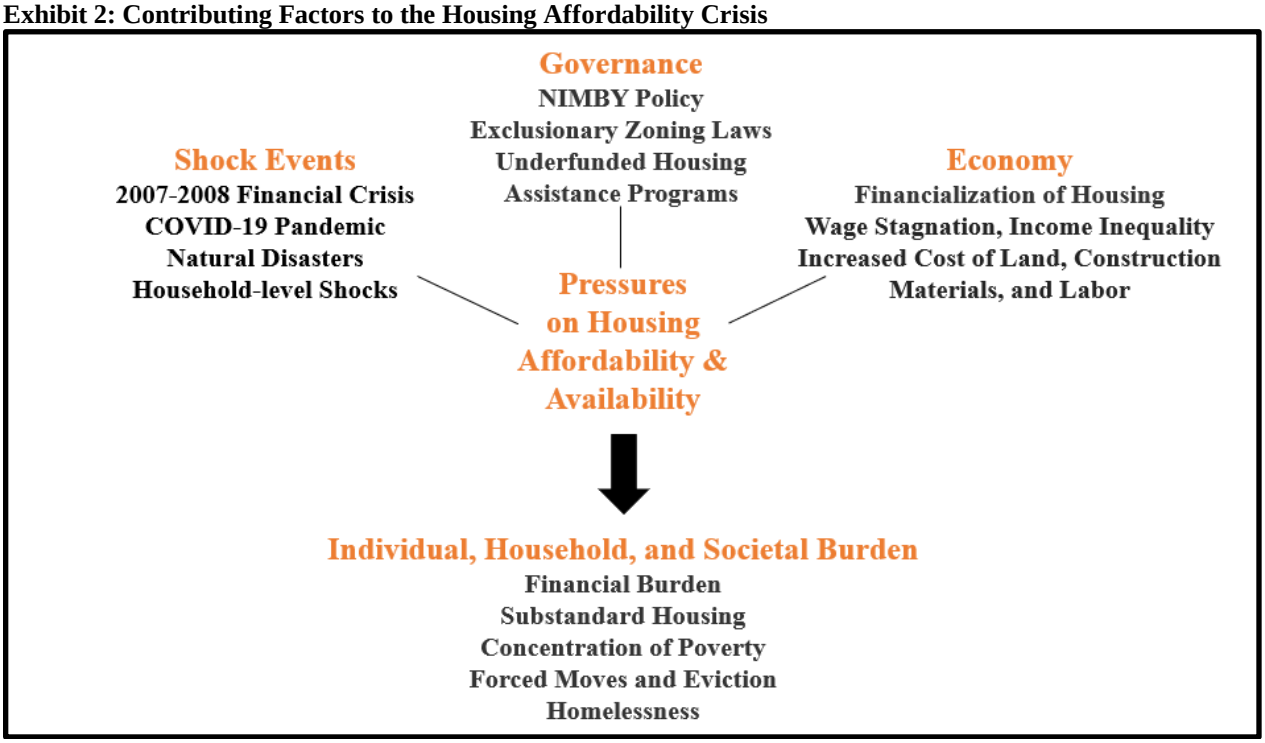


Exhibit 2 provides an overview of the pressures on housing affordability and the associated burdens. **A confluence of factors characterizes the modern housing affordability crisis.** The factors are organized by three types: governance, shock events, and economics.

Governance includes factors such as exclusionary zoning that has limited where high-density affordable housing can be built (for example, see Ikeda and Washington (2015). Other governance factors include Not In My Backyard sentiments and underfunding of housing assistance programs.

Shock events have also impacted the affordable housing supply: Hurricane Katrina resulted in the destruction of a large amount of affordable housing in New Orleans (Herring and Rosenman, 2016), new house construction fell to historical lows in the wake of the 2007-2008 financial crisis (Goldman, 2009), and labor and material shortages due to COVID-19 pandemic have impacted housing starts over the last few years (Jefferson et al., 2022).

Economic factors include the financialization of the housing stock, e.g., Airbnb, wage stagnation, and income inequality, which has driven up rents and incentivized developers to build higher-end houses (Ellen and Goodman, 2023). Other economic factors that

contribute to the decrease in the availability of affordable housing are the increasing costs of land, construction materials, and labor.

These factors – governance, shock events, and economic factors - put pressures on housing affordability and availability and thus negatively affect individuals, households, and society. These negative consequences on individuals and households are financial burdens, substandard housing, and poverty. The consequences on society are concentrations of poverty, forced evictions and moves, and homelessness.

The pressures on affordable housing supply, along with economic factors, have contributed to a rise in cost-burdened households (Whitney, 2023). These economic factors include wage stagnation (DeSilver, 2018), with median rent rising faster than median income over the last several decades (for example, see Mazzara (2019)), and job losses from shock events such as the 2007-2008 financial crisis and the COVID-19 pandemic resulting in long-term financial harm to American families (Kalleberg and von Wachter, 2017). As a result, a large number of families are financially burdened by rent, with roughly half of renters spending over 30% and roughly a quarter spending over 50% (Whitney, 2023). Household-level shock events, such as divorce, medical emergencies, death, or job loss, may also exacerbate affordability concerns.

Lack of affordability has a wide range of consequences, both for society and individuals. Households that spend more on housing will have less to spend on other basic necessities such as food or healthcare. Households facing affordability concerns may also be forced into substandard housing, areas of concentrated poverty, or areas facing greater risks of negative effects due to climate change. They may also face evictions and homelessness.

This section explores these issues in more depth. We begin by exploring definitions for housing affordability in more depth and continue with a discussion on the shortage of affordable housing along with factors contributing to this shortage. We conclude by exploring the consequences of a lack of affordability.

For the reader's reference, we include a table below of the abbreviations used throughout the subsequent sections.

Exhibit 3: Abbreviations and their Definitions

Abbreviation	Definition
ACS	American Community Survey
ADU	Accessory Dwelling Unit
AHS	American Housing Survey
AMI	Area Median Income
CDE	Curated Data Enterprise
ERA	Emergency Rental Assistance
HUD	U.S. Department of Housing and Urban Development
JCHS	Joint Center for Housing Studies of Harvard University
LIHTC	Low-Income Housing Tax Credit

NLIHC	National Low Income Housing Coalition
QAP	Qualified Allocation Plan
SDAD	Social and Decision Analytics Division
SIPP	Survey of Income and Program Participation

3.1 Defining Housing Affordability

3.1.1 The 30% Threshold

A common definition for housing affordability is housing that costs less than 30% of household income. The 30% threshold traces back to the 1969 Brooke Amendment, which capped public housing rent at 25% of a resident's income. Congress raised this to 30% in 1981 (HUD User, 2014). By this definition, nearly half of all renter households are housing cost-burdened (U.S. Census Bureau, 2022b). Among renter households making less than $20,000, 89% are housing cost-burdened (Kontokosta et al., 2020). For an overview on the 30% threshold, including its history, critiques, and alternatives, see Pelletiere (2008).

The 30% definition is the subject of considerable debate. For example, Stone (2004) notes that "for all low-income families, and many moderate-income families, paying 30 percent (or even 25 percent) of their limited income does not leave them with enough money to meet their other needs." Others note that the 30% threshold is overly simplistic and does not account for the trade-offs made by households to reduce housing costs (HUD User, 2014). Households may choose to live in lower quality housing, opt out of paying for medical insurance, or live further from job opportunities to reduce the cost burden. Different households facing financial difficulties may make different trade-offs. One household may choose to spend less on food or healthcare, while another may choose to fall behind on rent payments. Both cases are associated with negative outcomes. Housing instability has been noted to have a detrimental effect on both physical and mental health (U.S. Department of Health and Human Services., n.d.-b). For example, in the case of households that cut back on food purchases, the subsequent food insecurity may put household members at risk, especially children who may face developmental risks from poor nutrition (Bailey et al., 2016). The Department of Housing and Urban Development (HUD) has sponsored development of a Housing Insecurity Index (Murdoch et al., 2023). The report defines housing insecurity as "a significant lapse for a given household of one or more elements of secure housing," and the index includes "lack of affordability; lack of stable occupancy, and lack of safety and decency." Additional research is planned for the development of this index.

A separate but related concept is affordable housing. Bratt and Vladeck (2014) consider the term "affordable housing" problematic in part "because all housing is affordable to some household." The 30% definition is conditional on the income of a particular household, and therefore what is "affordable" to one household may not be to another. Many definitions for affordable housing try to quantify what is affordable within an area. Bratt and Vladeck study four locales and how they address the issue of exclusionary zoning, and each locale has a definition of affordable housing based on the area median income (AMI). For example, Massachusetts defines affordable housing as units with rent/house payments no more than 30% of income for households earning less than 80% of AMI. In Montgomery County, Maryland, household income must be less than 65% of AMI for rentals and 70% of AMI for homeownership units to be eligible for the "Moderately

Priced Dwelling Unit" program. Similarly, Weicher et al. (2017) define affordable rental housing as units where "the sum of rent, utilities, and related costs, adjusted for the number of bedrooms, is less than or equal to 30 percent of 50 percent of local area median income."

3.1.2 Estimating Total Housing Costs

Understanding housing cost burdens and the risk of housing insecurity is closely linked with financial insecurity more generally. While many other financial factors could be considered when studying housing cost burdens, some researchers argue that transportation and utility costs in particular should be included in housing costs (for example, see Kontokosta et al. (2020)).

Housing that may be considered affordable to a household based on rent alone may not be when factoring in transportation and utility costs. In some cases, moving farther from one's workplace to find affordable rents could result in increased transportation costs, decreased access to mass transit, and increased commute times. Similarly, low-income households tend to have a higher utility cost burden than higher income households, as low-income households tend to live in more energy inefficient housing and are less able to make energy efficiency improvements (Kontokosta et al., 2020). Utilities are included in rent in some cases but not in others. Direct comparison between rents therefore requires measuring utility costs.

Urban form plays a role in both transportation and utility costs. For example, Hamidi et al. (2016) analyze transportation costs for households eligible for HUD rental assistance using proprietary data from household travel databases in 15 regions across the United States. They observe that transportation costs tend to increase with distance from centrally located areas within cities and argue that location characteristics should be included when directing HUD subsidies. Makarewicz et al. (2020) analyze data from the Panel Study of Income Dynamics and note that while housing costs tend to increase for more urban areas, these costs are often mostly or entirely offset by a corresponding reduction in transportation costs. The authors argue that both housing and transportation investments are needed to support low-income households. Gawrys and Carswell (2020) observe a similar trade-off for housing and utility costs based on an analysis of data from the American Housing Survey. They note that urban renters spend an average of 23.2% of their income on housing costs, while rural renters spend an average of 19.8%. However, urban renters spend an average of 25% on housing and utilities, and rural renters spend an average of 26.2%.

The need to quantify multiple factors when estimating housing costs points to the need for data integration in the study of affordable housing. One example is the Housing and Transportation Affordability Index from the Center for Neighborhood Technology (n.d.), which seeks to quantify housing and transportation costs at the local level. Researchers have noted difficulties in measuring both energy costs and access to transportation. For example, Kontokosta et al. (2020) note the costs of utilities are the least understood of what they call the three primary components of housing affordability measures (rent, transportation, and utilities) and that utilities consumption and their associated costs are hard to measure. Both the American Community Survey and the American Housing Survey include utility costs in housing costs (for example, see U.S. Census Bureau, 2022b). Smith et al. (2021) argue that comprehensive transit accessibility metrics should be incorporated into funding criteria for locating affordable housing sites. They note that while comprehensive accessibility metrics are computationally complex and data-

intensive, the use of such metrics would present an improvement over the simpler metrics currently used.

3.1.3 Residual Income Approach

Various researchers have discussed the use of a "residual income" approach to measuring housing affordability (for example, see Stone (1993), Stone (2004), Jewkes and Delgadillo (2010), Herbert et al. (2018), and Airgood-Obrycki et al. (2022)). That is, households need to have sufficient income to meet basic non-housing costs after paying for housing. In this approach, one calculates a household's minimum costs for basic needs and subtracts this amount from the household income. The residual amount is what is available for housing. When this amount is lower than housing costs, a household may suffer from "shelter poverty," which is the inability to pay for other basic necessities due to high housing expenditures. This is because housing spending is often the least flexible expense in a household's budget.

Airgood-Obrycki et al. (2022) use a residual income approach to estimate the number of renter households that do not have enough income to afford other basic necessities after paying rent and utilities. They compare this approach to the 30% threshold and find that 62.1% of renter households are cost burdened under the residual income approach, while 47.9% are cost burdened under the 30% threshold.

Herbert et al. (2018) note that the main issue with the residual income approach is its complexity relative to simpler metrics such as the 30% threshold. This issue highlights the importance of the Curated Data Enterprise, which emphasizes data integration and re-use, as well as the development of capabilities to be applied to new research questions. Integrating data sources to quantify the costs associated with a household's basic needs is necessary for the residual income approach. By reusing data tools developed within the CDE, this process can be made more efficient.

The Social and Decision Analytics Division (SDAD) within the Biocomplexity Institute at the University of Virginia has developed a tool for estimating the Household Living Budget at the Census tract level. This tool calculates, for different household compositions, the cost necessary to pay for an adequate level of necessities such as housing and utilities, food, transportation, healthcare, childcare, broadband, and other necessities. While initially developed for the purpose of studying food insecurity, this tool is also relevant for the study of housing affordability using the residual income approach (Lancaster et al., 2023). In Box 1 below, we outline a potential research area that would benefit from the integration of multiple data sources to better understand housing cost burdens. This starting point includes the background, potential data challenges and research questions, and data sources that may be useful. We present 3 other potential research areas later in this report in a similar format.

Box 1. Estimating Housing Cost Burdens

Background: Understanding the need for affordable housing requires defining affordable housing; however, various definitions have been proposed. The most common is the 30% threshold, which some note is overly simplistic and does not account for the trade-offs made

by households to reduce housing costs. A residual income approach may more comprehensively assess the financial burdens posed by housing.

Data Challenges: One downside of the residual income approach is its increased complexity relative to simpler metrics. It requires the integration of many data sources to get a complete picture of household finances. Data sources may also require adjustments to obtain timely and locally relevant estimates. The source and reliability of a household's income may also affect housing stability. For example, a household may have a sufficient average monthly income that is inconsistent on a monthly basis, resulting in housing instability.

Research Questions: What proportion of households are burdened by housing costs? How would a change in housing subsidies change this proportion? How would a change in local rents change this proportion?

Data Sources: The Household Living Budget calculator developed by SDAD allows for a residual income approach for studying housing costs and is an example of a capability that could be built into the CDE (Lancaster et al., 2023). The calculator integrates the following information and data sources: HUD Fair Market Rents; U.S. Department of Agriculture Food Plan Reports; Feeding America's Map the Meal Gap; Consumer Price Index; Center for Neighborhood Technology's Transportation Affordability Index; U.S. Centers for Medicare and Medicaid Services' Health Insurance Market Place; Bureau of Labor Statistics' National Compensation Survey; Department of Labor Women's Bureau National Database of Childcare Prices; BroadbandNow cost data, Department of Transportation's National Address Database, and the tax liability calculator from National Bureau of Economic Research.

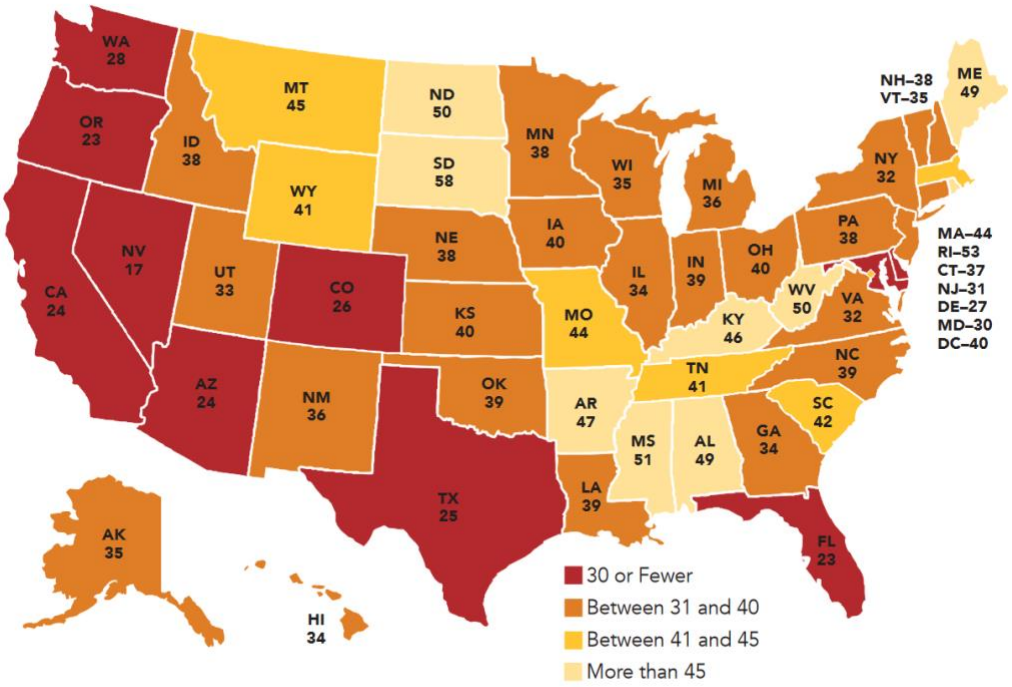
3.2 Affordable Housing Supply

3.2.1 Affordable Housing Shortage

Various researchers and organizations have noted a shortage of affordable rental housing (for example, see Joint Center for Housing Studies of Harvard University (2023) and National Low Income Housing Coalition (2023)). Using the definition adopted by the National Low Income Housing Coalition (NLIHC), there is a shortage of 7.3 million rental homes that are affordable and available to renters with extremely low incomes (income below the greater of the federal poverty guideline and 30% of the area median income). NLIHC estimates that there are 3.7 million units that are both affordable and available to the 11 million renter households in the country with extremely low incomes.

This shortage of affordable housing has increased over time: the NLIHC figure increased from 6.8 million to 7.3 million from 2019 to 2021. Similarly, the Joint Center for Housing Studies of Harvard University (JCHS) noted a decrease of 3.9 million low-rent units (defined as units renting below $600 per month) between 2011 and 2021, with 1.2 million of this decline occurring between 2019 and 2021. While some states suffer from a larger shortage than others, NLIHC notes that every state has a shortage of affordable and available rental homes for extremely low-income households (see Exhibit 4). Similarly, JCHS notes that nearly all states faced declines in low-rent units from 2019 to 2021.

Exhibit 4: National Low Income Housing Coalition Calculations for Rental Homes Affordable and Available per 100 Extremely Low-Income Renter Households



Note: Extremely low-income (ELI) renter households have incomes at or below the poverty level or 30% of the area median income. Source: NLIHC tabulations of 2021 1-Year ACS PUMS Data.

3.2.2 Contributing Factors

Researchers have noted several issues that contribute to the pressures on housing supply. One issue is *competition from higher income households in the private market*. Of the 7 million homes affordable to extremely low-income households, NLIHC estimates that 3.3 million units are occupied by households with higher incomes. JCHS also notes competition from higher-income renters. A combination of high house prices, high interest rates, and low stock has driven many prospective homeowners to rent instead, which has contributed to a higher proportion of cost-burdened low-income renters. In addition, the increased number of higher-income renters may also create an incentive for landlords to upgrade units or raise rents.

Affordable housing has also been constrained by a *lack of development*. The stock of low-rent units has decreased over time despite an increase in the development of new rental units overall. JCHS posits that this is in part due to the rising costs of construction and increased demand from higher-income households, pushing developers to build higher-end units. While these units are not initially affordable, they may become affordable over time through filtering, which is "the process by which properties age and depreciate in quality and price, becoming more affordable to lower-income households" (HUD User, 2020).

Research performed by Freddie Mac suggests that filtering is the primary mechanism for the housing market to provide affordable housing (HUD User, 2020). Rosenthal (2014) finds that renter-occupied housing has an inflation adjusted filtering rate of roughly 2.2% per year. That is,

for each new household that moves into a property, the inflation adjusted income is lower by 2.2% per year on average than the prior owner. Rosenthal concludes that filtering is a "viable long-run market-based source of lower-income housing." However, he also notes that filtering is less pronounced in areas with high house price appreciation. Zuk and Chapple (2016) argue that filtering may occur too slowly to alleviate the shortage of affordable housing, particularly in areas with strong housing markets. In addition, the filtering rate is also not the same as rent depreciation. In many cases, filtering happens more quickly than rent depreciation, implying that the same unit may present a higher cost burden to tenants. For example, Zuk and Chapple note that existing units filter down at a rate of 1.5% a year within the San Francisco Bay Area, while rents decline by 0.3% a year. Finally, rental housing is not guaranteed to filter down. In a longitudinal analysis from 1985 to 2013, Weicher at al. (2017) note that while 4.6 million houses entered the affordable housing stock through filtering, roughly 1.7 million were removed from the affordable housing stock due to rent appreciation. Weicher et al. (2017) define a rental unit to be affordable if rent and utilities is less than or equal to 30 percent of 50 percent of the local area median income.

Ellen et al. (2021) argue that *rising income inequality* has had a compounding effect on increasing rent burdens. They note that increased competition from high-income and high-wealth households can result in increased rents, and that developers are building more new homes for very high-income households. However, these higher-end homes take longer to filter down to lower- and moderate-income households. That is, "the widening gap between the rich and the poor means fewer hand-me-down homes for lower-income households and higher rents (owing to limited supply) for the few older, lower-tier homes that are available."

Another barrier to development is *exclusionary zoning laws*, which restrict the types of housing that can be built in an area. This includes prohibiting multifamily housing or having minimum lot size or square footage requirements (Bratt and Vladeck, 2014; Rouse et al., 2021). Exclusionary zoning has a considerable impact on the supply of affordable housing, as it has been noted to result in reduced housing supply and increased house prices (Glaeser and Gyourko, 2003; Gyourko and Molloy, 2015; Ikeda and Washington, 2015; Rouse et al., 2021). Exclusionary zoning has also been argued to exacerbate social and racial segregation (Rothwell and Massey, 2009; Bratt and Vladeck, 2014; Rouse et al., 2021).

In the past, many affordable housing units were developed in the form of public housing. However, starting in the 1970s, federal housing subsidies shifted to housing vouchers, and there has been limited expansion of public housing since (National Low Income Housing Coalition, 2019b). As we will discuss later, the Low-Income Housing Tax Credit (LIHTC) program is currently the primary engine for the development of affordable housing.

Public housing faces a variety of challenges. One issue is the *lack of replacement*. For example, many of New Orleans' public housing units were torn down and rebuilt in the aftermath of Hurricane Katrina; however, the number of new affordable units was far below the pre-Katrina levels (Fessler, 2015; Herring and Rosenman, 2016). As of 2013, 6,171 pre-Katrina public housing units were replaced with 2,114 new units, but only half of the new units were subsidized or public housing. Another issue is *aging stock and maintenance backlogs*. As of 2019, there was

an approximately $70 billion backlog in capital needs for public housing maintenance and repairs (National Low Income Housing Coalition, 2019c).

Shock events have also impacted the supply of affordable housing. Natural disasters, such as the Hurricane Katrina and Hurricane Harvey, have resulted in the destruction of affordable housing. By one estimate, Hurricane Harvey damaged 25% of Houston's affordable housing stock (National Low Income Housing Coalition, 2019a). The number of and costs stemming from weather-related disasters has increased over time, due in part to climate change (Smith, 2023). The supply of affordable housing has also been affected by sustained economic effects of other shocks. New home construction fell to historical lows in the wake of the 2007-2008 financial crisis (Goldman, 2009) and the labor force of the construction industry had not yet fully recovered by the start of the COVID-19 pandemic, which negatively impacted housing construction due to labor and material shortages (Jefferson et al., 2022).

Since the 2007-2008 financial crisis, the number of *institutional investors* has risen (for example, see National Association of Realtors (2022), Ellen and Goodman (2023)). Some have argued this has driven up rents and reduced the supply of affordable housing (Vogell, 2022; HUD User, 2023b). Ellen and Goodman note mixed evidence on the effect of institutional investors on single-family rentals. Ellen and Goodman note that institutional investors file evictions sooner and may raise rents more quickly than "mom-and-pop owners." However, rental appreciation may lead changes in investor share and not the other way around, as institutional investors tend to target markets with "the potential for strong job growth, strong demand for rentals and low overall housing supply versus demand." They also note that it is not clear whether institutional investors crowd out homebuyers.

More granular and transparent data may help to address the open questions on the effects of institutional investment. Ellen and Goodman argue for the importance of greater data transparency on ownership and for the federal government to develop a model registry to help local and state jurisdictions implement their own registries. Finally, on a related note, various authors have argued that *short-term rentals* (such as Airbnb) have resulted in an increase in both house prices and rents because of the increased pressure on the housing stock available for longer-term renters (for example, see Zou (2020) and Barron et al. (2020)).

Box 2. Financialization of Housing and Multiple Property Ownership

Background: There are open questions regarding the effects of the financialization of housing, a phenomenon where housing is treated as a vehicle for wealth and investment rather than as a social good. For example, the rise of institutional investors for rental properties may be associated with an increase in rents, but it is unclear whether increased institutional investment leads rental appreciation or vice versa. Some have also argued that short-term rentals (*e.g.*, through Airbnb) have resulted in local housing shortages as well as increased home prices and rent. In some cases, these short-term rentals are registered as the host's primary address. However, other short-term rentals may be owned solely for the purpose of being a short-term rental, rather than for residency or long-term rentals. Quantifying the prevalence of short-term rentals and private equity real estate investment along with their effects on local affordable housing supply and rents may be helpful for making policy

decisions. A related topic is understanding vacant housing units. This includes understanding the value, location, and ownership of vacant units, as well as why they are not being released into the housing stock.

Data Challenges: Surveys, such as the American Community Survey and American Housing Survey, generally ask about the home in which respondents reside, but not about other properties they may own. The American Housing Survey does collect information on units occupied by persons with usual residence elsewhere. In some cases, these units may be second homes; however, this does not provide a complete picture of multiple property ownership. In addition, adding questions to such surveys is challenging. As a result, understanding multiple property ownership through surveys alone is difficult. It may also be difficult to disaggregate the effects of short-term rentals or institutional investors from rental market trends that would have occurred regardless.

Another issue is understanding the impact of accessory dwelling units (ADUs). In some cases, ADUs are permitted and will be on the Census Master Address File. However, unpermitted ADUs will not be on the Master Address File and will therefore not be sampled in Census surveys. These unpermitted ADUs are likely to be lower rent but may not meet code, resulting in additional risks to vulnerable populations (for example, see Zaveri et al. (2021)). Finally, there is a lack of transparent ownership data at the local level.

Research Questions: How many housing units are owned by private equity firms? What is the proportion of short-term rentals that are not primary residences? Is there a difference in rent for buildings owned by private equity firms vs. other landlords? What are the effects of institutional investors and short-term rentals on house prices and rents? What are the effects of policies that aim to regulate short-term rentals?

Data Sources: Property tax records, property sales records, parcel data, Survey of Income and Program Participation (SIPP), address databases, housing data aggregators, data scraped from websites (*e.g.*, http://insideairbnb.com/), rent data (*e.g.*, HUD fair market rent), Rental Housing Finance Survey.

3.3 The Consequences of Lack of Affordability

The shortage of affordable housing has contributed to the burden of housing costs for many households. As noted earlier, roughly half of all renter households (and nearly 90% of renter households making less than $20,000) spend 30% or more on housing.

Facing affordability concerns, many households have been forced to make trade-offs. One such trade-off is moving into substandard housing, which can result in negative health effects. Healthy People 2030 is an initiative that provides health objectives in order to "promote, strengthen, and evaluate the nation's efforts to improve the health and well-being of all people" (U.S. Department of Health and Human Services, n.d.-a). Sufficient housing quality (*e.g.*, not overcrowded and free of health and safety risks) is noted to be related to several of these objectives (U.S. Department of Health and Human Services, n.d.-b and n.d.-c). According to the U.S. Department of Housing and Urban Development's "Worst Case Housing Needs 2023

Report to Congress" (Alvarez and Steffen, 2023), roughly 5.6 percent of "worst case needs" renter households experience severely inadequate housing, which are units that have one or more serious physical problems related to heating, plumbing, electrical systems, or maintenance. Worst case needs households are renter households with lower than 50 percent area median income that do not receive housing assistance and also experience at either severe rent burden or severely inadequate housing (or both). Housing quality can be difficult to assess – while existing surveys highlight extreme instances of housing inadequacy, they may fall short in highlighting more minor quality issues.

Cost-burdened households may also be forced to move into locations further from necessities such as transportation, jobs, healthcare facilities, and grocery stores. Benner and Karner (2016) note the importance of jobs-housing fit, which is the extent to which the affordability of local housing matches the quality of locally available jobs. Low-wage jobs-housing fit is the extent to which affordable housing supply is adequate for the low-wage workforce of an area. Benner and Karner stress that low-wage jobs-housing fit is important, as low-wage workers benefit disproportionately from reduced transportation costs. A lack of proximity to transportation can compound issues of financial insecurity and poverty. For example, a household that is forced to move further from mass transit or into poorer quality homes with higher utility costs may endure further financial insecurity to rectify these new issues.

Researchers have used various data sources to investigate the trade-offs made due to lack of affordability. This includes the Consumer Expenditure Survey and Household Pulse Surveys (Joint Center for Housing Studies of Harvard University, 2022). Shamsuddin and Campbell (2022) use the Survey of Income and Program Participation (SIPP) to investigate the relationship between housing cost burden and material hardship and conclude that "higher housing cost burdens may contribute to decreased well-being through multiple forms of material hardship." Angst et al. (2023) use a survey of households in South and Central Los Angeles and find that rent-burdened households are more likely to reduce consumption, work more hours, or alter their homes to accommodate more residents.

Housing affordability is also closely related to disaster preparedness and community resilience. One of the trade-offs households facing cost burdens may make is moving to housing or locations that are more vulnerable to climate-related disasters, as housing tends to be more affordable in vulnerable areas. Consequences from natural disasters are often disproportionately borne by cost-burdened households (Georgetown Climate Center, n.d.; Ortiz et al., 2019). For example, affordable housing is more likely to be in flood zones and constructed of lower quality materials and less likely to be rebuilt after natural disasters. While most of the focus is on the effects of climate change on housing affordability, Greenberg (2021) posits that the housing affordability crisis can be a contributing source to disasters such as wildfires and disease spread. Given the increasing frequency of climate-related disasters, many have stressed the need for the development of resilient affordable housing (Georgetown Climate Center, n.d.; Vale et al., 2014; Ortiz et al., 2019). Improved construction standards could help affordable housing be better prepared for climate-related disasters. For example, Corbley (2022) notes an example of a community designed around resilience that experienced minimal damage during Hurricane Ian.

Box 3. Climate Change and Affordability

Background: Climate change has resulted in an increase in the frequency and cost associated with climate-related disasters, as well as more extreme temperatures. Affordable housing is particularly vulnerable to the effects of climate change. It tends to be less energy efficient and is therefore more sensitive to increased costs associated with heating and cooling. It is also more likely be located in flood zones, more likely to be built of lower quality materials, and less likely to be rebuilt after natural disasters.

Data Challenges: There is a large amount of information involving complex and uncertain systems. For example, we may be interested in climate modeling, estimating migration due to climate change and its corresponding effects on the housing market, or understanding the current housing supply. It may be difficult to estimate which buildings are prepared for particular climate-related events, especially for older buildings. There may also be difficulty in measuring utility usage and costs or measuring housing quality.

Research Questions: Which areas are most vulnerable to increased energy bills because of climate change and how will that affect the proportion of residents who are housing burdened? How will climate-related disasters affect the current affordable housing stock? What are good locations for high-quality affordable housing construction that is less vulnerable to the effects of climate change? Are these locations also in proximity to mass transit and other necessities?

Data Sources: Climate models, data from data aggregators (*e.g.*, housing characteristics, building permits), the Building Permits Survey, comprehensive transit accessibility metrics (*e.g.*, the Transit Opportunity Index), scraped data on businesses and healthcare facilities, Federal Emergency Management Agency Flood Maps, American Housing Survey, Housing Vacancy Survey, local housing code violations databases

Even with trade-offs, housing may remain unaffordable to households, resulting in evictions or homelessness. Given that non-payment of rent is a leading cause of eviction and eviction is a leading cause of homelessness, it follows that lack of affordable housing is a contributing (but not the only) factor leading to evictions and homelessness (Desmond and Gershenson, 2017; HUD User, 2021a). Low-income households may also be particularly vulnerable to household-level shock events. A wide range of events, such as job losses, medical emergencies, or declines in income, may result in an inability to afford housing.

Both evictions and homelessness are associated with a wide range of negative outcomes. Homelessness is associated with shorter life expectancy and higher morbidity (for example, see O'Connell (2005) and Stafford and Wood (2017)). Various authors have noted the wide-ranging negative effects of homelessness on children, including health problems and poor nutrition, developmental delays and educational achievement, and psychological issues (for example, see Rafferty and Shinn (1991), Hart-Shegos (1999), and Mccoy-Roth et al. (2012)).

Desmond (2016) argues that evictions are not just a symptom of poverty but also a cause. In a study of New York City evictions, Collinson and Reed (2018) find small negative causal effects of evictions on employment and earnings but argue that evictions are not a principal driver of poverty in New York City. Rather, they claim most experiencing eviction are already in poverty and that poverty does not substantially change their labor market outcomes. However, they do note that evictions could have a larger effect on poverty through negative effects on children. They also find that evictions have causal effects associated with increased homelessness and worse health outcomes. In a study of Cook County, Illinois, Humphries et al. (2019) find that eviction has a negative causal effect on credit access, credit scores, and durable goods consumption, but that these effect sizes are small in comparison to the financial strain experienced by both evicted and non-evicted tenants in the years leading to an eviction case.

There are various issues with studying and tracking evictions (HUD User, 2021b). For example, court records do not include informal evictions that occur outside of the legal system. In addition, there is a lack of centralized, standardized evictions data, and considerable effort is needed to compile and standardize data across states. Differences in local policy can make it difficult to compare evictions data across localities. A report to Congress by HUD's Office of Policy Development and Research (2021) discusses the feasibility of creating a national evictions database. This report notes that states need grant funding, data standards, and technical assistance in order to develop more systematic collection and storage of eviction records and to develop their capacity to contribute to a national evictions database. Finally, studying evictions through surveys presents challenges, as the families and individuals most likely to experience eviction are difficult to reach through traditional survey methods. One major source of national evictions data is Eviction Lab (2023). See Box 4.

Graetz et al. (2023) present an analysis illustrating the integration of survey data with administrative records. They examine a data set linking ACS data with court records compiled by Eviction Lab. Graetz et al. (2023) find that children are most at risk for eviction and that there are racial disparities in eviction, with black individuals being the most likely to be evicted.

Box 4.Evictions

Background: Research about evictions will help to better understand the consequences of the lack of housing affordability. Housing affordability has been noted to contribute to evictions, which have been associated with a wide range of negative health and financial effects. These effects occur directly as a result of the eviction itself and indirectly through its effects on other negative outcomes such as homelessness.

Data Challenges: Tracking evictions using surveys or administrative data is a challenge. People who are at risk of evictions or have been evicted are among the most difficult to reach using traditional survey methods. There is also a lack of federal administrative data tracking evictions. Researchers have endeavored to fill in this gap. For example, Eviction Lab tracks formal eviction filings. Others have investigated the use of American Housing Survey (AHS) data to understand the prevalence of evictions (Bucholtz, 2021; Collyer et al., 2021; Gromis and Desmond, 2021); however, these articles also note that estimates based on the AHS are likely an undercount. The lack of federal eviction data is also speculated to have hampered

efforts to reach vulnerable communities with Emergency Rental Assistance during the COVID-19 pandemic.

Research Questions: How prevalent are informal evictions? How many people are at risk of eviction? What would the effect of economic (or other) crises be on evictions and those at risk of evictions? What was the effect of the Emergency Rental Assistance Program on evictions? Are there differences in eviction rates between different demographic groups after accounting for income and wealth?

Data Sources: Eviction records, Eviction Lab data, UVA SDAD Household Living Budget calculator, SIPP, American Housing Survey (AHS), American Community Survey (ACS), Milwaukee Area Renters Study

Finally, affordable housing is often built in proximity to other affordable housing (Dawkins, 2011), which can exacerbate the concentration of poverty. Concentrated poverty is noted to result in a range of negative outcomes, including limiting educational opportunities and leading to increased crime rates and poor health outcomes (Kneebone et al., 2011). One approach to addressing concentrated poverty is the mixed-income housing strategy (HUD User, 2013a). While there is no universally accepted definition of mixed-income housing (Levy et al., 2013; Vale and Shamsuddin, 2017), Levy et al. (2013) note that the following definition by Brophy and Smith (1997) captures the key elements of the strategy: "a deliberate effort to construct and/or own a multifamily development that has the mixing of income groups as a fundamental part of its financial and operating plans." Mixed-income housing is hypothesized to benefit low-income families through various mechanisms, such as by alleviating issues related to the concentration of poverty (*e.g.*, see Joseph et al. (2007) and Levy et al. (2013)) or by allowing people of various backgrounds to "cooperatively interact to provide greater opportunities for economic and social advancement" (Hyra, 2013). These authors also note that there is ongoing debate about the actual benefits of mixed-income development.

4. Housing Affordability Policies

4.1 Federal Housing Assistance

Several programs exist to assist low-income families with housing, including public housing, subsidized rental housing, and housing choice vouchers. U.S. Department of Housing and Urban Development (HUD) (n.d.-b) notes that public housing was established to provide rental housing to eligible low-income families, as well as the elderly and persons with disabilities, and that roughly 970,000 households live in public housing units. These units are managed by local housing agencies, which receive Federal Aid from HUD. In the case of subsidized housing (project-based assistance), the government pays apartment owners to offer reduced rents to low-income tenants (USAGov, 2023).

The Housing Choice Voucher Program is the largest low-income housing subsidy program managed by HUD, providing assistance to over 2 million households each year (Ellen, 2020). Under this program, participants find their own housing that meets the requirements of the program (HUD, n.d.-a). Public housing agencies receive federal funds from HUD to administer

the program. Voucher recipients pay 30 percent of their income towards rent, while a housing subsidy is paid to the landlord by the public housing agency to cover the rest of rent (up to the local maximum payment based on the Fair Market Rent). Ellen (2020) notes that various studies provide strong evidence that vouchers reduce rent burdens, improve affordability, and reduce homelessness, but have had more limited success in allowing low-income families to live in neighborhoods with better schools and opportunities for economic advancement.

While these programs provide assistance to many American households, a lack of funding and long waitlists are impediments to reaching households in need. Acosta and Guerrero (2021) examine data for 44 of the public housing agencies administering the voucher program. Of the 44 agencies, 18 have more households waiting for vouchers than households currently receiving vouchers. In addition, 32 of the 44 households have closed waitlists, indicating that waitlists may underestimate the need for vouchers. Roughly a quarter of households eligible for the housing choice voucher program receive any form of federal housing subsidies (U.S. Department of Health and Human Services, n.d.-b; Ellen, 2020; Fischer, 2021). In addition, of the housing vouchers authorized as of November 2020, 319,917 vouchers or 12.4 percent went unused (Office of Inspector General, HUD, 2021). Of these vouchers, roughly 81,000 had leasing potential (*i.e.*, vouchers that could be leased based on a public housing agency's available funding). An additional 191,000 vouchers were unfunded, which would require an additional appropriation of roughly $1.8 billion to fund. Bailey et al. (2016) note that making subsidized housing available to 5% more of the eligible population would make a considerable improvement in housing security, decreasing the odds of overcrowding by 26% and the odds of making multiple moves by 31%.

Another barrier to assisting households is housing voucher discrimination. In many jurisdictions, landlords may refuse to accept housing choice voucher holders as tenants. Bell et al. (2018) estimate that non-discrimination laws cover 34% of households receiving vouchers as of December 2018. A pilot study of jurisdictions performed by the Urban Institute for HUD found that landlord discrimination against voucher holders was more common in jurisdictions without legal protections (Cunningham et al., 2018). However, families that live in areas with anti-discrimination laws may still experience discrimination (for example, see Cunningham et al. (2018) and Office of the Attorney General for the District of Columbia (2023)).

HUD sets income limits for many housing assistance programs based on the Area Median Family Income (Office of Policy Development and Research, 2023b). However, these income limits do not factor in cost of living. While income is a proxy for cost of living, there are disparities between the two (for example, see Congressional Research Service (2022)). These income limits are also calculated for Fair Market Rent areas, which may span locations with varying cost of living. For example, Arlington County, VA is located within the "Washington-Arlington-Alexandria, DC-VA-MD HUD Metro FMR Area," which includes the District of Columbia, 14 counties in Virginia and Maryland, and 6 independent cities in Virginia (HUD User, 2023a). Calculating Area Median Family Income at a more granular level and incorporating cost of living could help to guide assistance programs.

Finally, Congress created the Emergency Rental Assistance (ERA) program to support housing stability in response to the COVID-19 pandemic. Two separate ERA programs were established

and administered through the U.S. Treasury Department. Given the recent and unprecedented nature of the pandemic, the effects of these programs require further research (HUD, 2022); however, others have noted the positive impacts of the program (*e.g.*, Airgood-Obrycki (2022)). In addition, these programs may prove illustrative for examining the impacts of housing policy. For example, Aiken et al. (2022) note that the ERA programs provide a unique opportunity to study the challenges of targeting short-term rental assistance with the goal of preventing homelessness, but caution that the results may not generalize beyond the COVID-19 pandemic. Congress also authorized the Coronavirus State and Local Fiscal Recovery Funds program through the American Rescue Plan Act of 2021, which delivers $350 billion to "state, territorial, local, and Tribal governments… to support their response to and recovery from the COVID-19 public health emergency" (U.S. Department of the Treasury, 2023a). U.S. Department of the Treasury (2022) provides a guide for using these funds for the development and preservation of affordable housing.

4.2 Other Policies

Affordable housing development is also often incentivized in the private market through policies such as the Low-Income Housing Tax Credit (LIHTC) program. The LIHTC program provides tax incentives to encourage the development of affordable housing and is the largest federal subsidy for developing and preserving affordable housing (NYU Furman Center, 2017). The LIHTC program requires each state to have a Qualified Allocation Plan (QAP), which sets each state's eligibility priorities and criteria for awarding tax credits to housing properties (Gramlich, 2014). This presents opportunities to improve the quality of housing. Shi et al. (2017) note that QAPs can be used to support health outcomes, including by promoting better balance in the location of affordable housing and improved housing quality. Both Mehta et al. (2020) and Shamsuddin and Leib (2022) argue that states can use QAPs to encourage the development of affordable housing to protect vulnerable residents from the risks of climate change but note that adoption of such changes has been uneven. For example, Mehta et al. (2020) investigated the 2017 QAPs for 53 states and territories and find that only 24 include provisions to prepare or recover from disasters.

There has been debate on the effectiveness of the LIHTC program. In neighborhoods with a median income below $24,000, LIHTC development has led to increased house prices and lower crime rate. Tenants in LIHTC developments also have slightly improved access to better schools. Some have noted that the program does little to combat the concentration of poverty or may exacerbate segregation (NYU Furman Center, 2017; Scally et al., 2018). Weiss (2018) argues that states disproportionately fund LIHTC developments in areas where there are already a high number of housing units available at similar rents. Weiss suggests revisions to allocation rules to ensure that housing developed under the LIHTC program provides a rent advantage relative to the local private market. Similarly, McClure (2018) argues that the LIHTC program contributes to the concentration of poverty, does not promote mixed-income housing, and is not serving those with need. McClure recommends that states adopt allocation standards to "deconcentrate poverty and affirmatively further fair housing." National Housing Conference (n.d.) notes that the LIHTC program can be a barrier to the development of mixed-income housing, as mixed-income developments with market-rate components may not qualify under a state's QAP. Olsen and Early (2023) compare the benefits to households receiving assistance from various HUD programs using data from the 2013 American Housing Survey. These programs include housing

vouchers, public housing, subsidized privately owned projects, and LIHTC. Of these programs, Olsen and Early conclude that vouchers have the greatest benefit relative to costs, while LIHTC has the least. Data curated and integrated through the CDE may help inform the debates surrounding the effects of the LIHTC program.

The shift towards LIHTC represents a shift toward shallow assistance, as the LIHTC program provides "an up-front subsidy to developers... in return for a commitment to charge below-market rent levels" (Kingsley, 2017). Both public housing and housing choice vouchers are deep subsidies, households pay no more than 30 percent of their monthly income and the subsidy fills the gap.

Inclusionary zoning programs are another way to promote the development of affordable housing. These programs require or encourage developers to set aside some number of housing units for low-income residents (HUD User, 2013b). Inclusionary zoning has been noted to lead to positive outcomes, including increasing the supply of affordable housing, encouraging mixed-income communities, and reducing achievement gaps for low-income students (HUD User, 2013b; Bratt and Vladeck, 2014; Wang and Fu, 2022). However, other studies have argued that inclusionary zoning can have negative effects on housing supply and prices (Bento et al., 2009; Schuetz et al., 2010; Hamilton, 2021).

For some states and jurisdictions, rent stabilization policies regulate how much and how often landlords can increase rent (HUD User, 2022a). Rent stabilization is relatively rare: as of 2023, six states and the District of Columbia have jurisdictions with some form of rent stabilization, while over 30 states have laws preempting rent stabilization (National Multifamily Housing Council, 2023). Rent stabilization policies also take different forms (HUD User, 2022a). For example, in some cases, rents may continue to be regulated during vacancy. In other cases, rents are allowed to reset to market rate when they become vacant. These policy differences highlight the need for data that provide more geographic detail, as housing policy differs by location.

Finally, there are also several policy approaches to improving housing quality. While QAPs within the LIHTC program can incentivize adequate housing quality for new development, funding may be available to repair or rehabilitate affordable housing units, such as the National Housing Trust Fund (HUD, 2021) and Housing Preservation Grants (U.S. Department of Agriculture, 2023). Funding is also available at the state and local level for affordable housing preservation. Examples include the Washington State Housing Trust Fund, Washington, D.C.'s Affordable Housing Preservation Fund, Delaware's Housing Development Fund, the Ohio Preservation Compact, and the Preservation Compact of Cook County.

Other policies are geared towards the improvement or replacement of public housing. For example, Rental Assistance Demonstration was created in order to preserve and improve public housing properties and to address the backlog of deferred maintenance for public housing (HUD, n.d.-c). Since the early 1990s, Congress has authorized two major public housing redevelopment programs, HOPE VI and Choice Neighborhoods (O'Brien and Popkin, 2020). HOPE VI ran from 1992 to 2011 and funded the demolition of 155,000 public housing units and the construction of 97,389 units, which were a mix of affordable and market-rate units (Gress et al., 2019). By contrast, Choice Neighborhoods requires the one-to-one replacement of units. One of the goals

of HOPE VI and Choice Neighborhoods is to replace severely distressed public housing with mixed-income housing.

5. Housing and Related Data Sources

Researchers have examined a wide variety of data sources to address the myriad questions and complexities associated with the study of housing affordability. This includes both surveys (conducted by the Census Bureau and by other federal statistical agencies, the Federal Reserve Board, the private sector, and other research and survey organizations) and non-survey data. We give a brief overview of some of the sources used by researchers below and include a more comprehensive list in Appendix I.

The American Community Survey (ACS) and American Housing Survey (AHS) are foundational to the study of affordable housing. Both the ACS and AHS provide information on housing units, housing costs, income, and other demographic information. However, there are key differences between the two surveys. The ACS is conducted by the Census Bureau, with new data released every year (U.S. Census Bureau, 2023a). The AHS is a longitudinal survey sponsored by HUD and conducted by the Census Bureau, with housing unit surveys conducted biennially in odd-numbered years (U.S. Census Bureau, 2021a). Vandenbroucke (2015) notes that the ACS focuses primarily on the population, while the AHS is a survey of the housing stock. As such, the AHS provides more information on housing specifically. However, the ACS allows for more geographic granularity due to its larger sample size. ACS has roughly 3 million housing units sampled yearly vs. roughly 100,000 units sampled biennially in the AHS (U.S. Census Bureau, 2022a; U.S. Census Bureau, 2023c).

The ACS and AHS are also the basis for many other data products. For example, annual reports issued by the Joint Center for Housing Studies of Harvard University (2023) have data derived from both ACS and AHS data. Similarly, the National Low Income Housing Coalition (2023) issues an annual report on the shortage of affordable rental homes with data derived from the ACS. HUD Fair Market Rent for 2023 are calculated based on "available 2016-2020 American Community Survey (ACS) 5 year data and updating to FY 2023 including information from local survey data" (Office of Policy Development and Research, 2023a). ACS data have also been linked to HUD administrative records to provide more information on HUD-assisted households (U.S. Census Bureau, 2021b; Office of Policy Development and Research, n.d.).

Other examples of Census surveys relating to housing include the Building Permits Survey and Survey of Construction (U.S. Census Bureau, 2022c), the Housing Vacancy Survey (U.S. Census Bureau, n.d.), and the Household Pulse Survey (U.S. Census Bureau, 2023b). The Household Pulse Survey was created early in the COVID-19 pandemic to address the nation's desire for more timely data; however, this survey has also been noted to have lower response rates than other federally sponsored surveys (for example, see National Center for Health Statistics (2023)).

Researchers also make use of a variety of other surveys. These include surveys from government entities, such as the Energy Information Administration Residential Energy Consumption Survey (U.S. Energy Information Agency, 2023) or the Consumer Expenditure Survey, which is collected by the Census Bureau for the Bureau of Labor Statistics (U.S. Bureau of Labor Statistics, 2023). Examples of surveys with housing-related questions from other entities include

the Freddie Mac Primary Mortgage Market Surveys, the National Association of Realtors Existing Home Sales, and the University of Michigan Panel Study of Income Dynamics.

Other data sources include data compiled by real estate listing companies, such as Zillow, Redfin, or Realtor.com, and data aggregators such as Black Knight, CoreLogic, and Moody's. Much of these data are obtained from administrative records. For example, CoreLogic (n.d.) notes that its data sources include property records, tax assessments, and property characteristics, while Black Knight (n.d.) notes that its residential property databases include public records, building permits, and local school information. Another notable example of data compiled using administrative records is the national eviction data from Eviction Lab. Eviction Lab combines formal eviction records with demographic information from the Census Bureau (Gromis et al., 2022).

6. Conclusion

This report is a starting point for a Demonstration Use Case (or multiple Use Cases) on housing affordability within the Curated Data Enterprise. We provide an overview of issues, policies, and data sources relating to affordable housing. Throughout, we identify areas where greater understanding could be helpful. This includes data gaps, including the need for more data on eviction, multiple property ownership, and housing quality. Other examples relate to the debate on policy impacts, such as the effects of the COVID-19 Emergency Rental Assistance programs, the Low-Income Housing Tax Credit program, and mixed-income housing. We also emphasize the need for timely and granular data in understanding the supply and demand for affordable housing.

In our discussion of housing affordability issues, we also identified four potential research areas that could benefit from the integration of multiple survey and non-survey data sets to produce timely and granular statistical products. These research areas are understanding housing cost burdens, the effects of climate change on affordable housing, the financialization of housing and multiple property ownership, and evictions. For each area, we briefly discuss potential data challenges and research questions and suggest some data sources that may be useful.

We conclude with a brief discussion on potential capabilities that housing-related Demonstration Use Cases may help to develop within the CDE. First, as we noted above, the Household Living Budget is a tool developed with the initial goal of studying food insecurity. However, it can also be used to take a residual income approach to estimating housing affordability. The Household Living Budget could also be helpful in studying economic vulnerability more broadly. Similarly, the methods and models used to help predict the effects of climate change on affordable housing could be applied elsewhere. Finally, Demonstration Use Cases could provide the opportunity to develop tools, methods, and processes to be applied elsewhere within the Curated Data Enterprise. For example, combining the Household Living Budget with survey estimates to estimate housing affordability in smaller subgroups may require the implementation of small area estimation methods. Studying evictions using court records would require the development of relationships and processes with state and local governments.

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Appendix: Potential Data Sources for Examining Housing Affordability

Federal Government

1. Board of Governors of the Federal Reserve System, Survey of Consumer Finances - https://www.federalreserve.gov/econres/scfindex.htm
2. Board of Governors of the Federal Reserve System, Survey of Household Economics and Decisionmaking - https://www.federalreserve.gov/consumerscommunities/shed.htm#:~:text=Since%202013%2C%20the%20Federal%20Reserve,potential%20risks%20to%20their%20finances U.S. Bureau of Labor Statistics, American Time Use Survey - https://www.bls.gov/tus/
3. Consumer Financial Protection Bureau, Mortgage Performance Trends - https://www.consumerfinance.gov/data-research/mortgage-performance-trends/
4. Energy Information Administration, Residential Energy Consumption Survey - https://www.eia.gov/consumption/residential/
5. Federal Housing Administration, National Household Travel Survey - https://nhts.ornl.gov
6. Federal Housing Finance Agency, American Survey of Mortgage Borrowers - https://www.fhfa.gov/Homeownersbuyer/Pages/National-Survey-of-Mortgage-Borrowers.aspx
7. Federal Housing Finance Agency, Fair Lending Data - https://www.fhfa.gov/DataTools/Downloads/Pages/Fair-Lending-Data.aspx
8. Federal Housing Finance Agency, House Price Index Datasets - https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index-Datasets.aspx
9. Federal Housing Finance Agency, National Survey of Mortgage Originations - https://www.fhfa.gov/nsmodata
10. Freddie Mac, Primary Mortgage Market Surveys - https://www.freddiemac.com/pmms/archive
11.
12. U.S. Bureau of Labor Statistics, Consumer Expenditure Surveys - https://www.bls.gov/cex/
13. U.S. Bureau of Labor Statistics, Consumer Price Index - https://www.bls.gov/cpi/
14. U.S. Bureau of Labor Statistics, Producer Price Indexes - https://www.bls.gov/ppi/
15. U.S. Census Bureau and BLS, Current Population Survey - https://www.census.gov/programs-surveys/cps.html
16. U.S. Census Bureau, American Community Survey - https://www.census.gov/programs-surveys/acs
17. U.S. Census Bureau, American Housing Survey - https://www.census.gov/programs-surveys/ahs.html
18. U.S. Census Bureau, Annual Business Survey Program - https://www.census.gov/programs-surveys/abs.html
19. U.S. Census Bureau, Annual Survey of School System Finances - https://www.census.gov/programs-surveys/school-finances.html
20. U.S. Census Bureau, Annual Survey of State and Local Government Finances - https://www.census.gov/programs-surveys/gov-finances.html
21. U.S. Census Bureau, Building Permits Survey - https://www.census.gov/construction/bps/index.html

22. U.S. Census Bureau, Census Transportation Planning Products Program - https://ctpp.transportation.org
23. U.S. Census Bureau, Decennial Census of Population and Housing - https://www.census.gov/programs-surveys/decennial-census.html
24. U.S. Census Bureau, Economic Census - https://www.census.gov/programs-surveys/economic-census.html
25. U.S. Census Bureau, Economic Census of Island Areas - https://www.census.gov/programs-surveys/economic-census/island-areas.html
26. U.S. Census Bureau, Household Pulse Surveys - https://www.census.gov/data/experimental-data-products/household-pulse-survey.html
27. U.S. Census Bureau, Housing Vacancies and Homeownership - https://www.census.gov/housing/hvs/index.html
28. U.S. Census Bureau, Longitudinal Employer-Household Dynamics - https://lehd.ces.census.gov
29. U.S. Census Bureau, Population Estimates Program- https://www.census.gov/data/developers/data-sets/popest-popproj.html
30. U.S. Census Bureau, Rental Housing Finance Survey - https://www.census.gov/programs-surveys/rhfs.html
31. U.S. Department of Agriculture, Public and Indian Housing, Real Estate Assessment Center, Customer Satisfaction Survey - https://www.hud.gov/program_offices/public_indian_housing/reac/products/rass/rass_assess
32. U.S. Department of Agriculture, SNAP Community Characteristics - https://www.fns.usda.gov/ops/snap-community-characteristics
33. U.S. Department of Agriculture, Tenure, Ownership, and Transition of Agricultural Land Survey - https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/TOTAL/
34. U.S. Department of Housing and Urban Development, Annual Homelessness Assessment Report - https://www.hudexchange.info/homelessness-assistance/ahar/#2022-reports
35. U.S. Department of Housing and Urban Development, Fair Market Rents - https://www.hud.gov/program_offices/public_indian_housing/programs/hcv/landlord/fmr
36. U.S. Department of Housing and Urban Development, HOPE VI project data - https://www.huduser.gov/portal/pdredge/pdr-edge-research-032017.html
37. U.S. Department of Housing and Urban Development, Location Affordability Index - https://www.hudexchange.info/programs/location-affordability-index/
38. .S. Department of Housing and Urban Development,, Survey of Construction - https://www.huduser.gov/portal/datasets/soc/home.html
39. U.S. IRS, Statistics of Income, Tax Statistics - https://www.irs.gov/statistics/soi-tax-stats-statistics-of-income

Other Data Sources

40. Argonne National Laboratory, Housing Stability Index - https://www.anl.gov/dis/housing-stability-index
41. Black Knight (*e.g.*, Mortgage Monitor) - https://www.blackknightinc.com/mortgage-monitor/
42. Case-Shiller, U.S. National Home Price Index - https://fred.stlouisfed.org/series/CSUSHPINSA

43. Center for Neighborhood Technology, Housing and Transportation Affordability Index - https://cnt.org/tools/housing-and-transportation-affordability-index
44. CoreLogic (*e.g.*, Homeowner Equity Insights, Single-Family Rent Index) - https://www.corelogic.com/category/intelligence/reports/single-family-rent-index/
45. CoStar - https://www.costar.com
46. Economic Policy Institute, Family Budget Calculator - https://www.epi.org/resources/budget/
47. Energy Information Administration, Residential Energy Consumption Survey - https://www.eia.gov/consumption/residential/
48. Eviction Lab - https://evictionlab.org
49. GeoLytics Neighborhood Change Database - https://geolytics.com/products/normalized-data/neighborhood-change-database
50. Grounded Solutions Network, Inclusionary Housing Map and Program Database - https://inclusionaryhousing.org/map/
51. King County, Health and Housing Data Dashboard - https://kingcounty.gov/en/legacy/depts/health/data/health-housing.aspx
52. Manufactured Housing Survey - https://www.census.gov/programs-surveys/mhs.html
53. Moody's Analytics, CRE - https://cre.moodysanalytics.com/capabilities/data/?gad=1&gclid=EAIaIQobChMIxtv3zv36gQMV5RVlCh06gQ-bEAAYASAAEgLaA_D_BwE
54. Mortgage Bankers Association, State Monthly Activity Report - https://www.mba.org/news-and-research/research-and-economics/single-family-research/state-monthly-activity-report
55. MSCI, Real Capital Analytics - https://www.msci.com/our-solutions/real-assets/real-capital-analytics
56. National Association of Realtors Existing Home Sales - https://www.nar.realtor/research-and-statistics/housing-statistics/existing-home-sales
57. National Association of Realtors, Housing Affordability Index - https://www.nar.realtor/research-and-statistics/housing-statistics/housing-affordability-index
58. National Association of Realtors, Housing Statistics and Real Estate Market Trends - https://www.nar.realtor/research-and-statistics/housing-statistics
59. National Low Income Housing Coalition, Out of Reach - https://nlihc.org/oor
60. National Low Income Housing Coalition, the Gap - https://nlihc.org/gap
61. National Low Income Housing Coalition, Treasury Emergency Rental Assistance Dashboard - https://nlihc.org/era-dashboard
62. National Multifamily Housing Council, Renter Preferences Survey Report, https://www.nmhc.org/research-insight/research-report/nmhc-grace-hill-renter-preferences-survey-report/
63. National Multifamily Housing Council, Student Housing Income and Expense Benchmarking Survey - https://www.nmhc.org/research-insight/research-report/student-housing-income-expense-benchmarking-survey/
64. National Zoning Atlas, Zoning Atlases for selected states - https://www.zoningatlas.org
65. NeighborWorks, National Housing and Financial Capability Survey - https://www.neighborworks.org/Homes-Finances/Homeownership/Housing-Survey

66. New Residential Construction Surveys: https://www.census.gov/construction/nrc/index.html
67. Novocogradac, State QAPs and LIHTC Applications - https://www.novoco.com/resource-centers/affordable-housing-tax-credits/2023-qaps-and-applications?gad=1
68. Organisation for Economic Co-operation and Development, Housing Conditions - https://www.oecd.org/housing/data/affordable-housing-database/housing-conditions.htm
69. Organisation for Economic Co-operation and Development, Indices - https://www.oecd.org/sdd/oecdmaineconomicindicatorsmei.htm
70. RealPage Market Analytics - https://www.realpage.com/asset-optimization/market-analytics/
71. Realtor.com - https://www.realtor.com
72. Redfin (*e.g.*, Redfin Housing Market Data) - https://www.redfin.com/news/data-center/
73. University of Michigan, Panel Study of Income Dynamics - https://psidonline.isr.umich.edu
74. Yardi Matrix - https://www.yardimatrix.com
75. Zillow Home Value Forecasts: https://www.zillow.com/research/home-value-sales-forecast-july-2023-32964/#:~:text=Zillow%20forecasts%20the%20national%20Zillow,July%202023%20through%20July%202024.
76. Zillow Home Value Index: https://www.zillow.com/home-values/102001/united-states/
77. Zillow List and Sales Prices: https://www.zillow.com/research/data/