Pretium

The U.S. Housing Shortage

Areas in Need of Investment

October 2021

SUMMARY

The COVID-19 pandemic laid bare the severity of the U.S. housing shortage – surging demand met limited supply, driving home prices, as well as multi-family and single-family rents to record increases. The pressure on suburban housing supply is only likely to grow as Millennials start families and Baby Boomers increasingly choose to age-in-place.

The pandemic's boost to housing demand has been immediate, but the supply response will take years. Studies estimate that the U.S. has a shortage of 4-5 million housing units, on top of which the U.S. will add another 10+ million households over the next decade. Builders have historically responded to increased housing demand with new construction, but an accumulation of supply constraints – particularly for land – have made this difficult and costly, particularly for single-family homes.

Housing underinvestment also extends to the quality of the housing stock. The median age of U.S. homes is roughly 40 years, suggesting an increasing need for age-related repairs along with improvements to reflect the changing lifestyle preferences of modern households. Such renovations are frequently neglected – for many households they are difficult to finance, as more than 40% of homeowners spend nothing on home improvement.

With these themes as backdrop, we see growth areas in need of substantial investment:

- **Single-family rentals and build-to-rent.** As the shortage of single-family homes and rising home prices both help to put ownership further out of reach, suburban demand will increasingly shift to single-family rentals. However, this demand has fewer places to go. Construction activity, too, has been running below trend for single-family homes whereas multi-family starts have been running near multi-decade highs. The robust demand for homeownership has been taking such rentals off the market, decreasing the single-family rental stock by nearly 700,000 units in the years leading up to the pandemic.

- **Lending to "fix and flip" investors.** The average homeowner tenure is up to nearly 14 years from just 6 years in 2005. An aging, more static housing stock requires repair and remodeling, with over one-third of occupied housing units consequently requiring repair. Additionally, households increasingly desire home improvement to reflect shifts like aging-in-place and working-from-home. Despite this, remodeling remains a largely luxury good undertaken primarily by higher-income households. As with homeownership, the access to financing is a major hurdle in addressing this growing investment deficit.

- **Affordable housing.** Affordable housing is in particularly short supply. Cumulative underinvestment in U.S. housing has created the most acute supply-demand imbalance in affordable housing. Prior to the pandemic, nearly one-third of U.S. households were financially burdened by housing costs and this proportion has likely risen because of the pandemic. As a result of supply constraints, new housing construction no longer serves affordable housing needs – therefore, the burden of meeting affordable housing needs largely falls on existing housing stock.

THE PANDEMIC EXACERBATED THE LIMITED AVAILABILITY AND SUPPLY OF HOMES

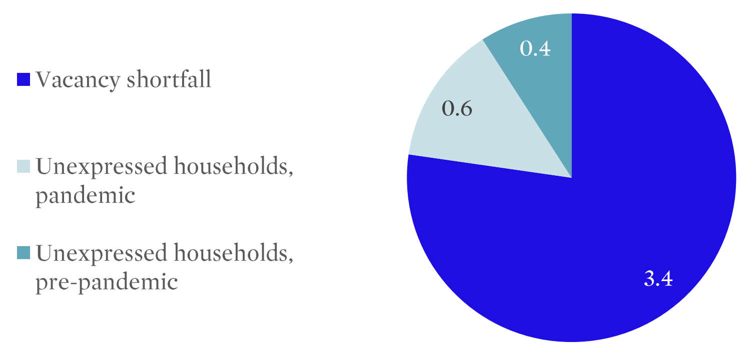
The U.S. Housing Supply Shortage is Estimated to be Roughly 4-5 Million Units

The record setting double-digit pace of home price appreciation and record setting rent growth during the COVID-19 pandemic suggest that housing demand has outpaced supply by a significant margin. Most home price indices show national YoY gains of 15-20%, which exceed gains seen during the mid-2000s housing boom. Single-family and multifamily rents have also shown record double-digit gains during the pandemic that have no comparable period in the historical data.[1]

Although supply-demand imbalance is difficult to measure in housing, there is broad consensus that a supply shortage exists and that it measures in the millions. Analysis from Freddie Mac accounts for both unexpressed household formation as well as shortfalls in vacant housing stock and concludes that the supply-demand imbalance in housing entering the pandemic was roughly 3.8 million.[2] This estimate includes only 0.4 million in unexpressed household formation – an estimate that could prove conservative given the likely durable positive effect of the pandemic on household formation. Assuming that the pandemic has increased unexpressed household formation by roughly 0.5% of total households or 0.6 mm, housing' s supply shortage is roughly 4-5 million as shown in Exhibit 1.

EXHIBIT 1:

Estimated US Housing Supply Shortage



Source: Freddie Mac, "Housing Supply: A Growing Deficit", May 7, 2021; Pretium.

Housing Construction Faces Both Medium-Term and Long-Term Supply Constraints

Housing starts increased during 2020 in response to an increase in demand; however, this pace of construction has proven hard to maintain despite strong demand – single-family starts have been on a downward trajectory through 2021. Construction activity may pick up again in 2022 but the challenges that builders face are both medium-term (materials, labor) and long-term (land, regulations) in nature.

Materials and labor shortages are preventing builders from responding to increased demand

Labor shortages for residential construction have worsened over the past two decades. When housing starts averaged ~1.5 mm during the housing boom of the mid-2000s, 42% of builders on average reported labor shortages during this period (Exhibit 2). In the four years leading up to the pandemic, housing starts averaged only ~850,000 yet nearly two-thirds of builders reported labors shortages; moreover, this percentage was growing over time.

[1] CoreLogic Single-Family Rent Index (SFRI), July 2021; RealPage Axiometrics Summary Report – National Summary, 3Q21.
[2] Freddie Mac, "Housing Supply: A Growing Deficit", May 7, 2021.

EXHIBIT 2

Labor Shortages vs. Construction Levels, 2002-05 vs. 2016-19

	2002-05	2016-19
Single-Family Housing Starts (Avg, 000s)	1,548	849
Percent of Builders Reporting Labor Shortages	42%	64%

Source: National Association of Homebuilders, Housing Market Index, 2Q21 Update.

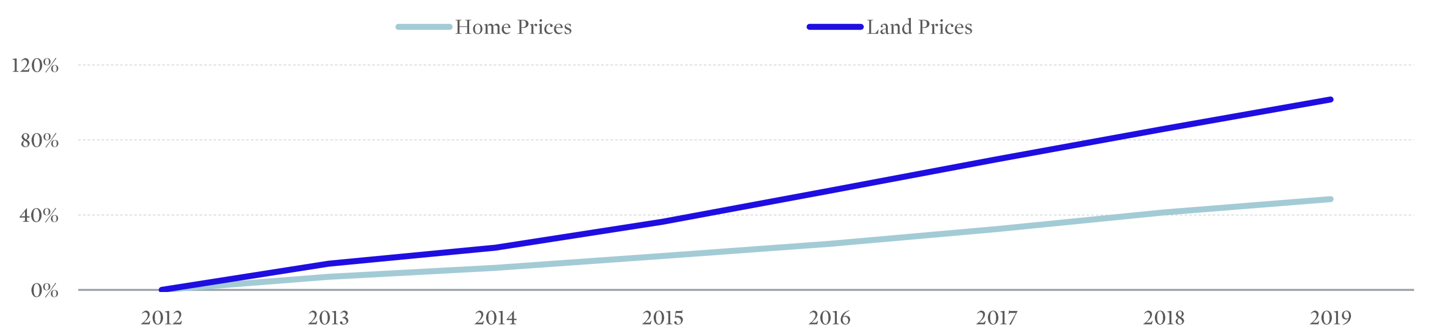
Building products supply shortages that have emerged during the pandemic have compounded labor shortages leading to extended construction cycle times, increased costs and uncertainty about builders' profit margins. Goods used as inputs in residential construction are up 19.0% YTD as of July 2021 – a record level.[3] Including labor, total construction costs are up 22% YoY and nearly all builders have seen cycle times extend as 2021 has progressed.[4] Due to extended cycle times and rapid cost increases, many builders have intentionally reduced sales through the pandemic by instituting sales caps and mainly selling homes that are partially or fully complete.

Limited land supply and local regulation restricts new supply longer-term

To the extent that homebuilders face difficulties in securing land for residential development or see increased costs and project delays due to local regulations, it can have a negative impact on the supply of new single-family homes. The effect of land-driven supply constraints and other regulatory costs on home prices and affordability has long been recognized.[5] Land price trends reflect accumulated supply constraints – in the years leading up to the pandemic, they rose at more than twice the pace of home prices, as shown in Exhibit 3. From 2012 to 2019 US home prices rose 48% while land prices rose 102%.

EXHIBIT 3:

US Home Prices vs. Land Values (2012-19)



Source: AEI Housing Center, "AEI-adjusted Land Price and Land Share Indicators", updated May 2021.

Land prices reflect an accumulation of supply and use restrictions because land values are a residual of home prices. Supply and use restrictions take a variety of forms, as described below:

- **Limited Land Supply:** Very few local jurisdictions have explicit numerical restrictions on land use for housing; instead, supply is effectively limited through regulations such as zoning, density restrictions, and lengthy approvals. Such regulations have increased over time across metro areas.[6] Geography also plays a role in restricting land supply in some markets, especially coastal ones.[7]
- **Regulatory Costs:** Local land and building regulations can drive incremental costs for homebuilders directly and indirectly, which

[3] National Association of Homebuilders, "Building Materials Prices: Large Increases Year-to-Date", September 9, 2021.
[4] John Burns Real Estate Consulting, "Home Builder Survey", September 7, 2021.
[5] Glaeser & Gyourko, "The Impact of Zoning on Housing Affordability", NBER Working Paper, March, 2002.
[6] Gyourko, Hartley & Krimmel, "The Local Residential Land Use Regulatory Environment Across US Housing Markets", NBER Working Paper, December 2019.
[7] Albert Saiz, "The Geographic Determinants of Housing Supply", Quarterly Journal of Economics, August 2010.

decreases overall housing supply at a given price point. The NAHB estimates that nearly a quarter of the cost of a new home is driven by regulatory costs, with nearly half accounted for by land use regulations and the remainder accounted for by building regulations.[8] Furthermore, these costs have increased by 44% over the past decade.

- **Local Land Use Restrictions Increase Over Time:** The preponderance of evidence suggests that land and building regulations have generally gone up over time. This was also the case after the Great Financial Crisis, despite the difficult operating conditions for homebuilders.

Longer Tenures and Lower Listings Make It Harder to Access Homeownership

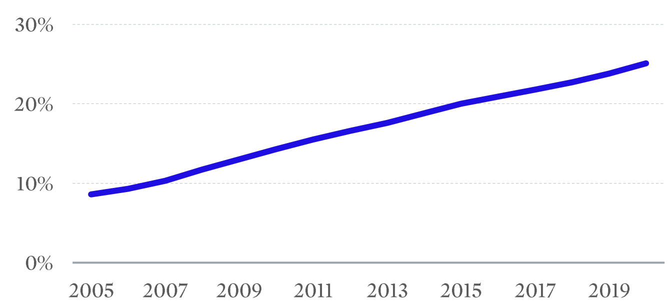
The COVID-19 pandemic drove the supply of resale listings to all-time lows; moreover, as shown in Exhibit 4 this continued a longer-term trend of lower resale listings supply for potential homebuyers to choose from. Limited listings supply makes it difficult to match existing inventory to homebuyers' preferences. Decreasing supply is partially a function of improving technology that makes it easier to search for and bid on homes; however, it is also driven by decreased housing turnover due to lengthening homeowner tenures. In 2020 25.1% of homeowners have been in their homes for more than 20 years, up from 8.6% in 2005 as shown in Exhibit 5. The average homeowner tenure is now roughly 13.8 years, up from 8.7 years in 2010 and 6.4 years in 2005.

EXHIBIT 4:

Months Supply of Resale Listings

EXHIBIT 5:

Homeowners Staying 20+ Years



Source: National Association of Realtors, retrieved through Haver Analytics. Redfin, Homeowner Tenure 2020, January 2021, retrieved via Wall Street Journal.

Financial Hurdles to Homeownership Remain High

Purchasing a home is the largest financial transaction most households undertake, requiring substantial savings, the ability to qualify for a loan, and sufficient income to meet ongoing mortgage, tax, maintenance and other costs. Mortgage markets generally dictate the financial barriers to entry for homeownership; however, changes in households' financial circumstances also affect that ability of households to become homeowners. After the Great Financial Crisis, financial hurdles to homeownership have increased and we expect them to remain elevated.

- **Down Payments:** Most surveys of potential homebuyers find that lack of a down payment is the most significant barrier to homeownership. Over 50% of potential homebuyers say that they don't have sufficient savings for a down payment.[9]
- **Mortgage Access for Low Credit Scores Still Limited:** Some mortgage credit metrics such as down payment levels and debt-to-income ratios have normalized since the Great Financial Crisis; however, mortgage access for consumers with low credit scores remains restricted. As shown in Exhibit 6, median credit scores for mortgages have been consistently higher since the Great Financial Crisis with the pandemic driving median credit scores to new highs. Originations to consumers with credit scores below 660 were as much as a quarter of the market prior to the Great Financial Crisis; now, they are less than 5% as shown in Exhibit 7.

[8] Paul Emrath, "Government Regulation in the Price of a New Home: 2021", Special Study for Housing Economics, May 5, 2021.
[9] LendingTree, Homeownership/Renting Survey, August 31, 2021.

EXHIBIT 6:

Median Credit Scores on Mortgage Originations

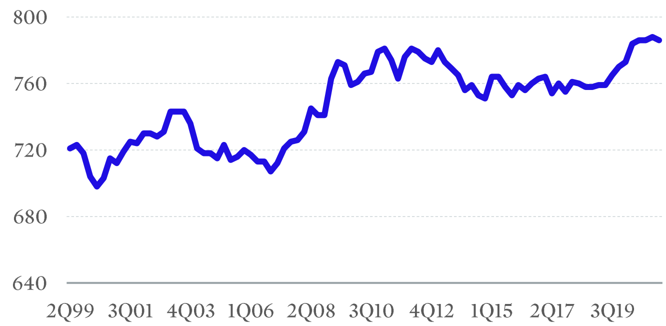
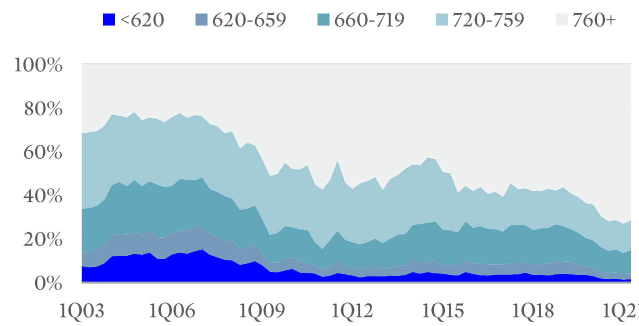


EXHIBIT 7:

Mortgage Originations by Credit Score

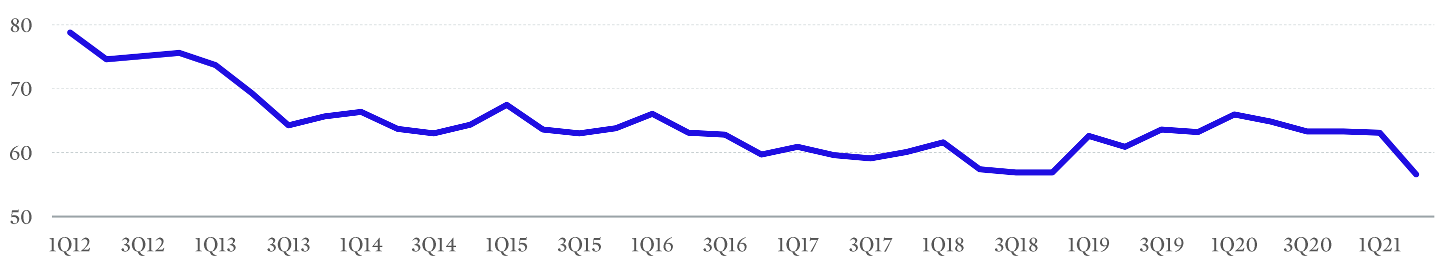


Source: New York Fed Consumer Credit Panel/Equifax, data through 2Q21.

- **Declining Affordability:** The pandemic driven surge in home prices has outpaced the affordability boost from lower rates and driven housing affordability to a cycle low. The NAHB Housing Opportunity Index (Exhibit 8) measures the percent of homes sold that would have been affordable to a household earning the area median income. Only 56.6% of homes sold in 2Q21 meet this criterion, down from a range of 60-65% prior to the pandemic.

EXHIBIT 8:

Percent of Homes Affordable at Area Median Income



Source: National Association of Homebuilders, Housing Opportunity Index, 2Q21 Update.

WHERE HOUSING NEEDS INVESTMENT MOST

1) There Aren't Enough Single-Family Homes, Especially Rentals

Following the Great Financial Crisis, single-family housing starts fell below their long-term average of 1.0 million in mid-2007 and stayed there for 13 years.[10] It was only after the pandemic driven housing demand surge that single-family construction levels exceeded their long-term average as shown in Exhibit 9. The sustained period of low levels of single-family construction has created an undersupply situation that would take many years to resolve even if production levels increased substantially.

Multifamily housing's construction path has been materially different than single-family's as shown in Exhibit 10. In mid-2008, multifamily starts fell below their long-term average but stayed there for less than 6 years. Multifamily starts have been above their long-term average for most of the last 8 years and are nearer to their historical highs than to their long-term average.

[10] U.S. Census, New Residential Construction, through July 2021.

EXHIBIT 9:

Single-Family Housing Starts (1990-Current)

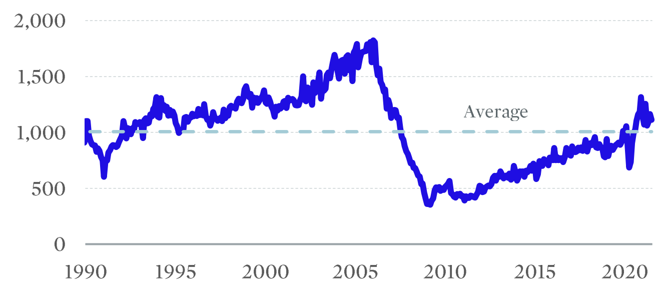
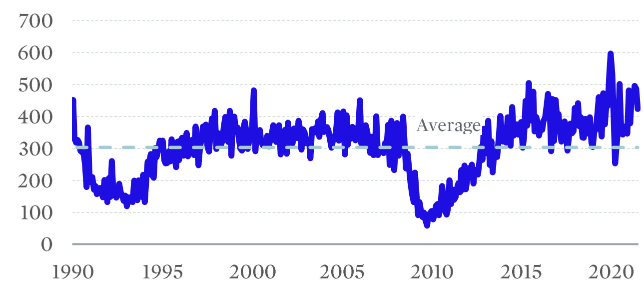


EXHIBIT 10:

Multifamily Housing Starts (1990-Current)



Source: U.S. Census Bureau and U.S. Department of Housing and Urban Development, New Residential Construction, New Privately-Owned Housing Units Started, retrieved via Haver, through July 2021.

Single-Family Rental Stock Has Decreased in Recent Years

The total number of renter households has been stable since 2016, including through the pandemic as shown in Exhibit 11. Nearly all household growth has occurred in owner households. At the same time, the rental market has shifted away from single-family rentals towards multi-family rentals as shown in Exhibit 12. Single-family rentals were 35.0% of the rental market in 2014 but were less than 33% immediately prior to the pandemic. In absolute terms, the single-family rental stock has shrunk by nearly 700,000 units over the past 4-5 years.

EXHIBIT 11:

Owner vs. Renter Households (1Q10-2Q21)

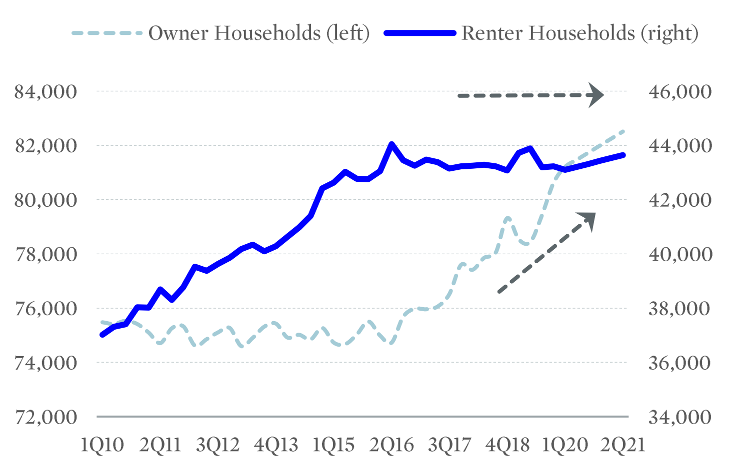
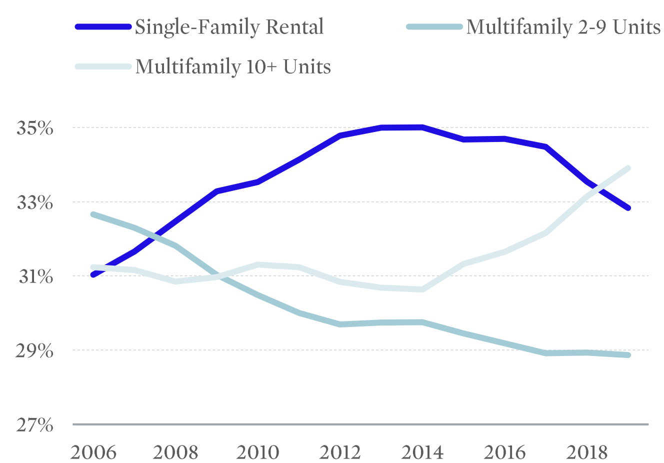


EXHIBIT 12:

Rental Market Composition (2006-2019)



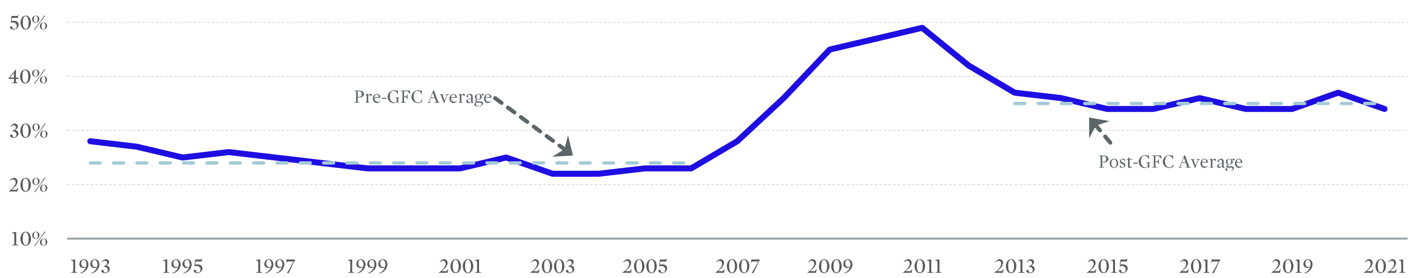
Source: U.S. Census Bureau, 2019 American Community Survey 1-Year Estimates, Housing Vacancy Survey; Pretium. Housing Vacancy Survey data adjusted 2Q20-1Q21 due to pandemic related data collection issues.

2) An Aging, More Static Housing Stock Requires Repair and Remodeling

The difficulty of building new homes and the aging of the housing stock has increased the relative importance of maintaining and adapting the existing housing stock to the needs of the population. This is reflected in the increased proportion of residential construction spending that now goes to remodeling as shown in Exhibit 13. Prior to the Great Financial Crisis, roughly 24% of residential construction spending was accounted for by remodeling; afterwards it has increased to 35% of residential construction spending.

EXHIBIT 13:

Percent of Residential Construction Spending That is Remodeling



Source: US Census, Construction Put-in-Place.

Increased household tenures have been found to drive increased remodeling as households adapt their existing homes to their changing needs as opposed to moving. For example, work-from-home has driven the need for separation of spaces; also, households that choose to age-in-place typically make aging-related modifications.

The lifespan of many building systems and products is between 10-25 years[11], so as homes age the need for repairs accumulates. Since housing supply growth has slowed over the decades relative to the size of the existing housing stock, the overall housing stock is aging steadily. As shown in Exhibit 14, the median age of owner-occupied housing increased to 39 years in 2019 from 31 years in 2005. The percentage of homes that need repairs and the cost of those repairs increases with a home's age, as shown in Exhibit 15. Roughly 26% of homes built after 2000 require repairs whereas 45% of those built before 1939 require repairs.

EXHIBIT 14:

Median Age of Owner-Occupied Housing

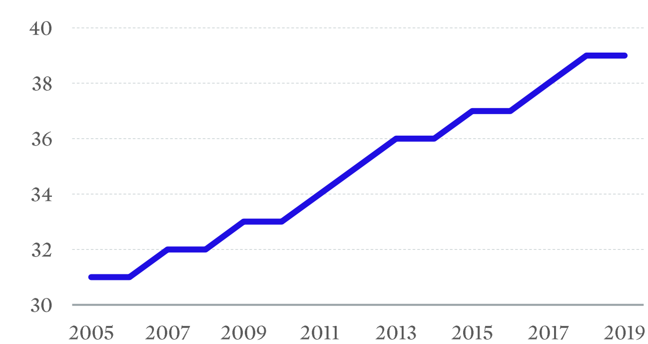
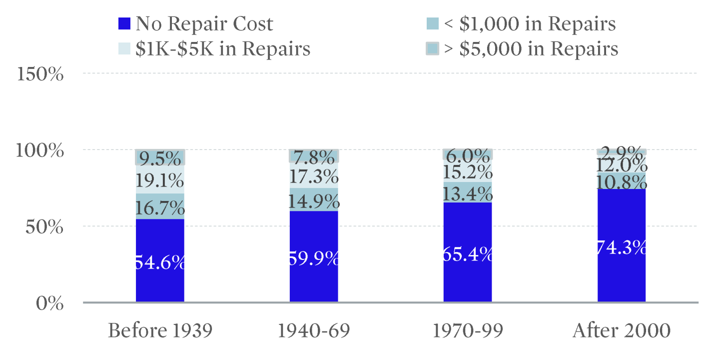


EXHIBIT 15:

Repair Costs Needed by Age of House



Source: U.S. Census Bureau, 2015-19 American Community Survey 1-Year Estimates, retrieved via NAHB. Federal Reserve Bank of Philadelphia and PolicyMap, using American Housing Survey and RSMeans.

Financing home improvement is difficult, so it often doesn't happen

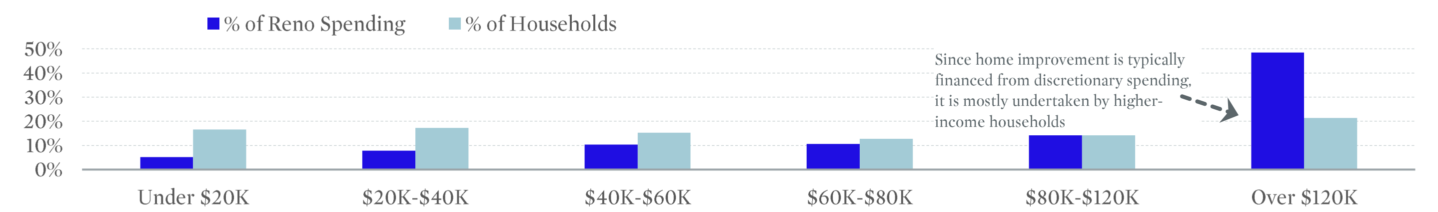
Since financing for home improvements isn't broadly available, it is mostly funded from discretionary spending.[12] This financing constraint results in cumulative underinvestment in the existing housing stock as shown in Exhibit 15 above. In 2019, 43% of homeowners spent nothing on home improvement/maintenance and another 12% spent less than $500.[13] The financing constraints on remodeling spending are evident in

[11] InterNACHI Standard Estimated Life Expectancy Chart for Homes.
[12] US Census, American Housing Survey 2019 estimates.
[13] US Census, American Housing Survey 2019 estimates, retrieved via Harvard Joint Center for Housing Studies.

the distribution of spending across income brackets. As shown in Exhibit 16, households earning over $120,000 account for only 1 in 5 households but 1 in 2 dollars spent on remodeling. Households earning less than $40,000 are more than one-third of overall households but account for just 13% of remodeling spending.

EXHIBIT 16:

Percent of Remodeling Spending by Income Bracket



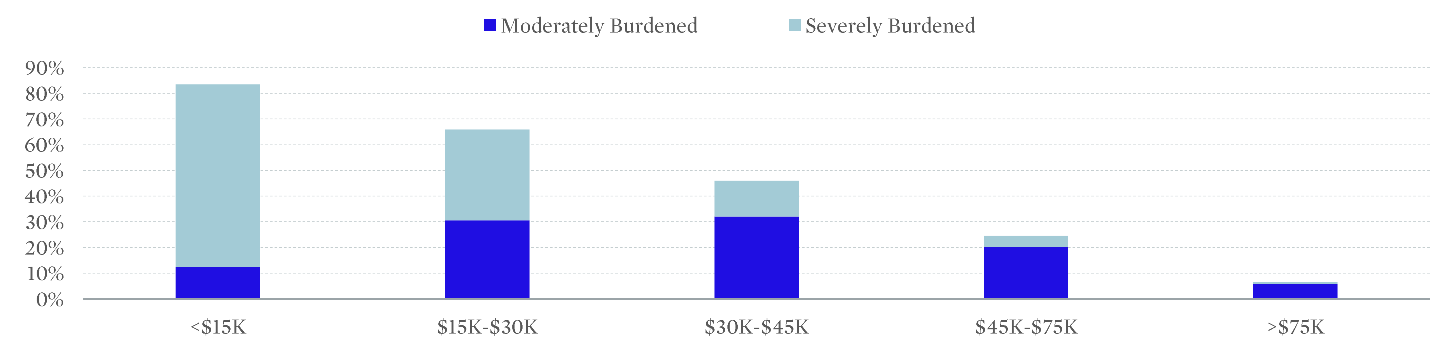
Source: US Census, American Housing Survey 2019 Estimates.

3) Affordable Housing is in Particularly Short Supply

Long-term underbuilding, widening income inequality and increases in home prices and rents have reduced the affordability of housing overall, but especially for lower income households. Prior to the pandemic, 30% of households faced housing cost burdens that consumed more than 30% of their household income, with 16% paying 30-50% of their incomes for housing (moderately burdened) and 14% paying more than 50% (severely burdened). As shown in Exhibit 17, excessive housing cost burdens affect lower income households at a much greater rate than higher income households.

EXHIBIT 17:

Proportion of Households Burdened by Housing Costs by Income Bracket, 2019



Source: US Census, American Community Survey 2019 via Harvard JCHS.

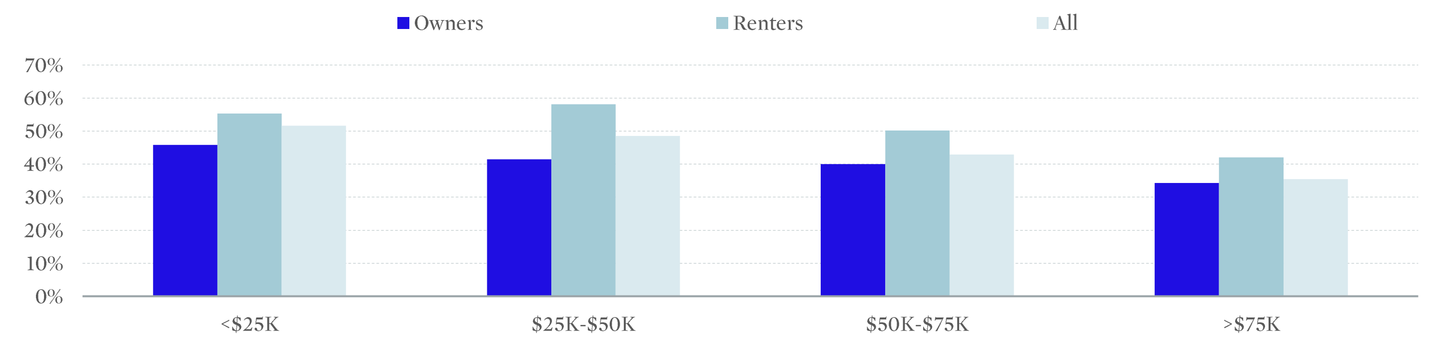
By some estimates, the US housing supply shortage is entirely concentrated in affordable housing. The National Low Income Housing Council estimates that extremely low-income renter households face a shortage of nearly 7 million available and affordable rental units.[14] Expressed differently, there are only 37 available and affordable rental units for every 100 extremely low-income renter households.

The COVID-19 pandemic is likely to have worsened the supply shortage of affordable homes given both increases in home prices/rents as well as the disproportionate economic impact of the pandemic on lower income households. As shown in Exhibit 18, low-income households are more likely to have reported income loss because of the pandemic compared to higher-income households.

[14] National Low Income Housing Coalition, "The Gap: A Shortage of Affordable Homes", March 2021.

EXHIBIT 18:

Proportion of Households Reporting Lost Income by Income Bracket, 1Q21



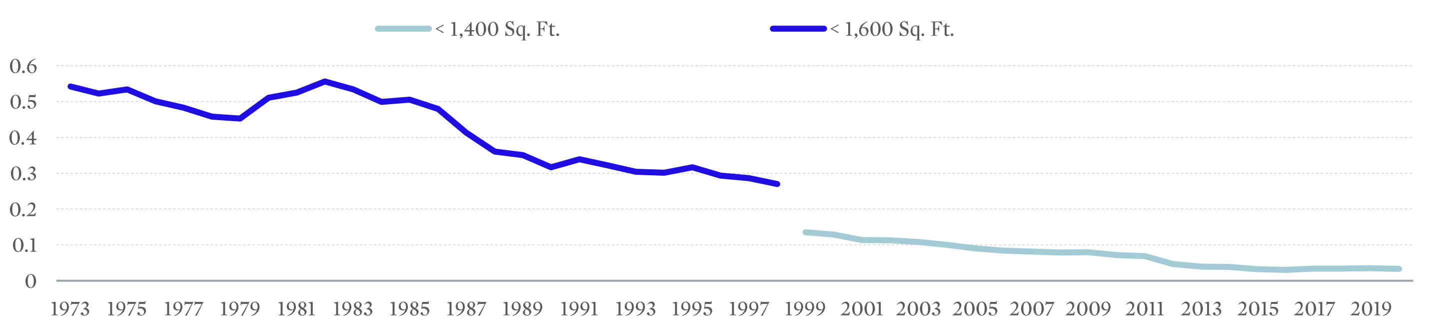
Source: US Census, Household Pulse Survey via Harvard JCHS.

New home construction has moved away from providing affordable housing

The accumulation of land use restrictions for single-family housing over the decades has made it less economically feasible for homebuilders to build small homes on increasingly expensive land. This is reflected in the shrinking percentage of new homes built that are smaller and therefore more affordable. As shown in Exhibit 19, the percentage of new homes sold that are under 1,400 sq. ft. has shrunk to roughly 3% in recent years from as high as 14% in 1999. In the 1970s and early 1980s, half of homes sold were under 1,600 sq. ft.

EXHIBIT 19:

New Single-Family Homes Sold That Are Smaller & Affordable (1973-2020)



Source: US Census, Survey of Construction.

IMPORTANT DISCLOSURES

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