

Housing and Mortgage Market Review

HaMMR – Fall 2021



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Where Do Home Prices Go from Here?

After taking roughly one decade to return to pre-Global Financial Crisis (GFC) peak levels in 2016, U.S. home prices have increased by roughly 50%.

A meaningful amount of these price gains have taken place since the first wave of COVID-19 cases began to abate. Through the second quarter of 2021, the national median single-family sales price was up 23% year-over-year, according to the National Association of Realtors® (NAR), while the Federal Housing Finance Agency (FHFA) purchase-only index increased 19% year-over-year at a national level (Figure 1).

The pace of appreciation is unprecedented and unsustainable, which has raised concerns about affordability, given that incomes have not increased by a commensurate amount. However, mortgage rates have also dropped to record lows over the past year and have remained below 3% for the majority of 2021, which has helped to keep the increase in monthly mortgage payments somewhat in check.

We believe the combination of these factors — home prices, incomes and mortgage rates — are essential to evaluating the relative affordability of home prices over time and the potential for further price gains. In fact, the decline in mortgage rates and rise in incomes since the GFC have allowed the typical cost of

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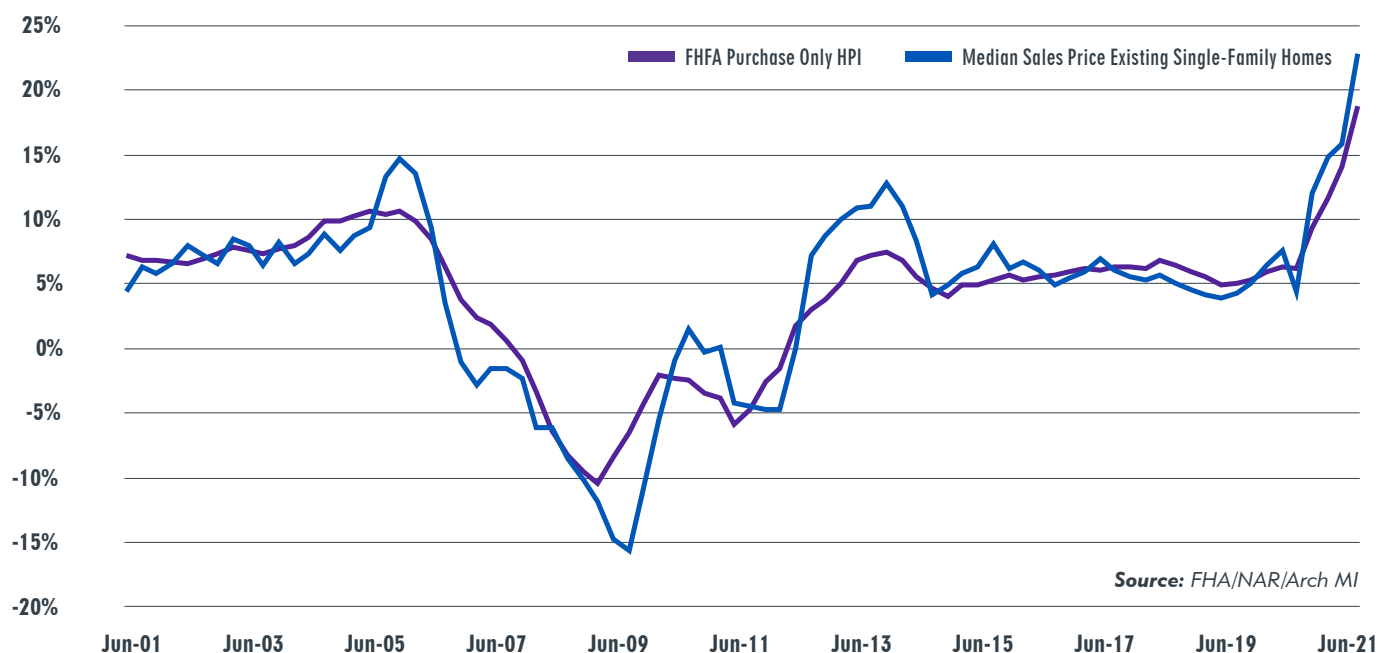
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Where Do Home Prices Go from Here? *(continued from page 1)*

homeownership to remain well below 2006 peak levels and roughly in line with its historical average relative to income and rents.

Nationally, we expect the combination of solid demographics and an acute housing shortage to generate further home-price appreciation, but at a moderating pace over the second half of 2021. In the coming years, we anticipate a further slowing and normalization of price gains as affordability pressures build, along with a backdrop of rising supply as homebuilders work through supply chain issues. This outlook varies significantly across regions and cities, as areas that have already experienced outsized price increases should see more deceleration than those with more balanced market conditions.

Figure 1: National HPI Indexes — Year-over-Year Growth



There are many ways to assess affordability, including the home price-to-income ratio, the home price-to-rent ratio and the median debt-to-income (DTI) ratio, among others. We prefer a metric we refer to as the homeownership cost-to-income ratio, which, similar to the median DTI ratio, considers the proportion of the median household income needed to make mortgage payments on the median home in a market as well as escrow expenses, maintenance costs, mortgage insurance and risk add-ons.¹ This measure best captures the actual cost of ownership for a typical homebuyer by combining the dynamics of home prices, incomes and mortgages with other homeownership costs into a single number. To illustrate why we prefer our homeownership cost-to-income ratio, we'll first consider two alternative measures: the home price-to-income ratio and the home price-to-rent ratio.

¹ Homeownership cost-to-income ratio is the proportion of the median household income needed to cover payments on a mortgage and other costs associated with homeownership for a home at the median price. Calculations are based on pretax median household income, the prevailing 30-year fixed-rate mortgage, a 10% down payment, escrow of annual expenses of roughly 1.50% of the initial home price (for insurance and property taxes, which we vary by state and metropolitan area), plus 0.75% to cover mortgage insurance and risk add-ons, and annual maintenance expenses of roughly 1% of the original purchase.

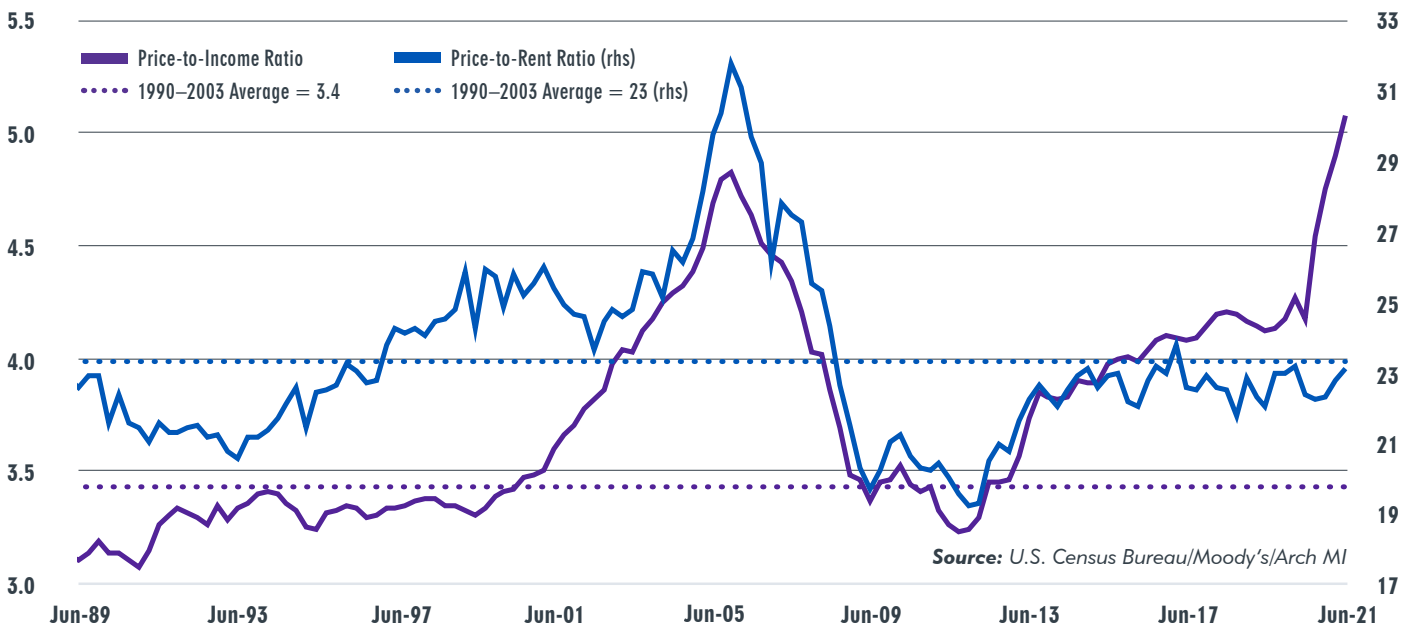
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Where Do Home Prices Go from Here? *(continued from page 3)*

Before we begin analyzing various approaches to assessing affordability, it is important to note that the following ratios reflect the relationships of nationwide measures of housing and income. As all real estate is local and there is no actual “national” housing market, these trends vary significantly by metro area. We find that the ratio of housing costs to income is higher than the normalized historical average in many areas.

The home price-to-income ratio is widely quoted as a simplistic metric (median home price divided by median household income), which would seem to indicate that housing is overvalued — a conclusion apparently obvious when looking at Figure 2. The price-to-income ratio has jumped to slightly above 5 in the second quarter of 2021 from just above 4 a year ago, the fastest increase on record since the late 1980s and nearly twice the annual increase recorded just before the housing crash of the mid-2000s. Not only is the current price-to-income ratio significantly above its historical average of 3.5 from 1990 to 2003 (a period generally considered normal for the housing market), it has also surpassed the peak of 4.8 reached in 2005. Without further context, which we’ll get into below, it would appear home prices are less affordable than the 2005 peak.

Figure 2: Alternative Measures of Affordability



First, we’ll consider an alternative measure of affordability with its foundation in the substitution effect: the price-to-rent ratio. The price-to-rent ratio considers the essential housing choice presented to consumers: whether to buy or rent a home given the relative cost of homes for sale compared with asking rents in a specific market. If asking rents are significantly cheaper on a relative basis than the asking prices of homes for sale, a home seeker will likely choose renting over homeownership (i.e., substitute away from one product for an alternative) and vice versa.

Right away, it should be obvious that this is not a perfect substitution, as the median home for sale in most markets is not comparable to the median vacant rental unit. Additionally, consumers may have many additional reasons for electing to rent rather than purchase, such as a preference for the mobility offered by renting or a lack of savings for a down payment on a home.

Despite these shortcomings, the price-to-rent ratio is a useful metric to consider alongside others when evaluating home-price affordability. Indeed, the ratio spiked during the housing crisis alongside other measures of affordability, indicating home prices were rising much faster than rents. Conversely, the Q2 2021 price-to-rent ratio is roughly in line with its historical average and has been relatively restrained over the past year, unlike the previously discussed price-to-income ratio. The muted move is a result of asking rents surging 19% year-over-year, nearly keeping pace with home-price gains, and leaving households looking for a new residence with limited substitution options other than migration to another market altogether.

Now that we've reviewed the alternative measures of affordability, one of which suggested home prices are in line with their historical relationship to asking rents, while the other indicated that prices have increased much faster than incomes, we'll dive into our preferred measure: the homeownership cost-to-income ratio.

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Where Do Home Prices Go from Here? *(continued from page 5)*

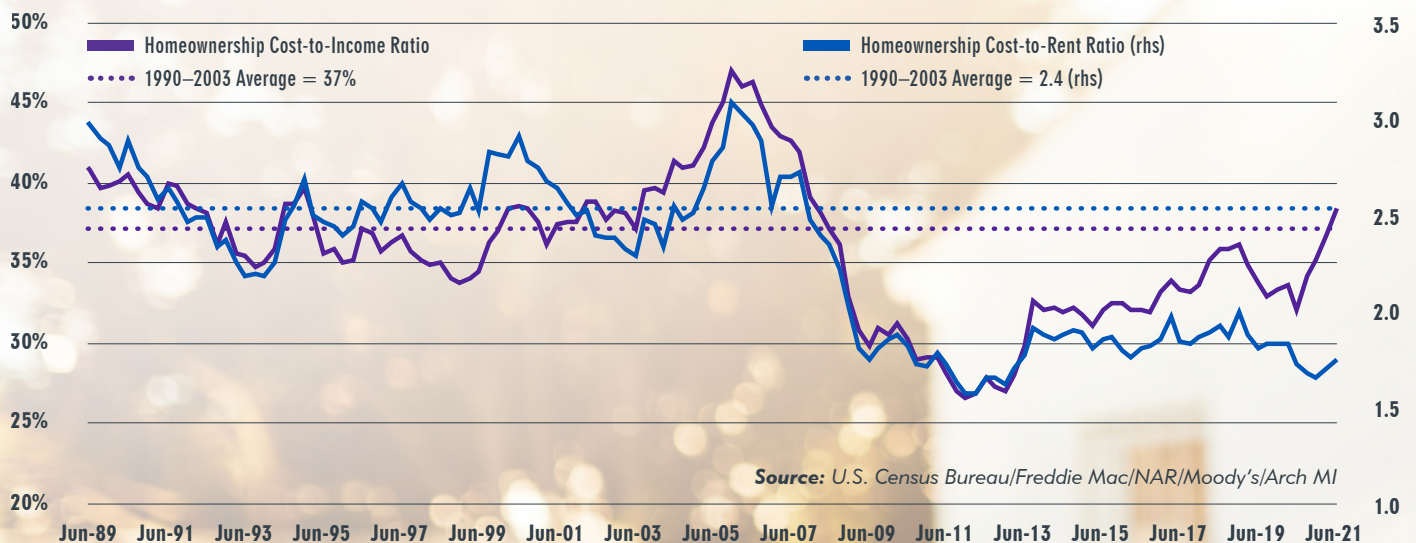
Most home purchases in the U.S. are at least partly funded by mortgages, accounting for nearly 90% of home purchases according to NAR. As a result, the asking price of a home is a factor, but certainly not the figure most homebuyers (or their lenders for that matter) are focused on when evaluating whether a home is affordable. The size of the mortgage payment for the home, including escrow expenses, mortgage insurance, plus annual maintenance costs, are all essential to determining affordability within the homebuyer's budget.

Accordingly, the impact of the sharp jump in prices on affordability has been partially offset by lower mortgage rates relative to the beginning of the pandemic. As of the second quarter of 2021, the national homeownership cost-to-income ratio was 38%, up 6 percentage points compared with a year ago but just above the historical pre-GFC average (i.e., 1990–2003) of 37% and well below the 2005 peak of 47% (Figure 3).

Although the homeownership cost-to-income ratio currently suggests the median home remains affordable for the typical homebuyer, this calculus could change soon if home-price gains continue to far outpace income growth and mortgage rates normalize as anticipated. To illustrate the relative importance of mortgage rates in the calculation, if the 30-year fixed rate mortgage was currently 4.0% instead of 3.0% as of Q2 2021, the homeownership cost-to-income ratio would climb 4 percentage points to 42%.

However, as a counterfactual, had mortgage rates been at 4.0% over the course of the pandemic, we would expect home-price appreciation to have been much more muted. If we instead assume mortgage rates are held constant and home-price appreciation were to outpace income growth by 5 percentage points over the next year, the homeownership cost-to-income ratio would increase nearly 2 percentage points to 40%.

Figure 3: Preferred Measures of Affordability



Lastly, the homeownership cost-to-rent ratio leverages the concept of the price-to-rent ratio but replaces the home price with the mortgage payment, plus the other costs associated with ownership that underpin our homeownership cost-to-income ratio calculation. This measure provides a more comparable benchmark for the cost tradeoff considered between buying and renting a home. As shown in Figure 3, the homeownership cost-to-rent ratio, currently at 1.7 compared with a historical average of 2.4, has generally followed the homeownership cost-to-income ratio. The current low homeownership cost-to-rent ratio suggests that homeownership is more affordable than renting compared with the relative trade-off during normal market conditions. Recently, the ratio has been relatively stable between 1.5–2.0, as asking rents have increased a proportionate amount to the cost of owning a home.



Is There a Housing Shortage?

A generally agreed-upon argument is that there is a shortage of housing in the U.S., in particular for affordable housing, but estimates of the shortage vary from fewer than 1 million housing units to nearly 7 million units. We decided to first evaluate this question from a top-down perspective and plan to consider shortages below the national level in a future HaMMR article as national aggregates can mask some localized pockets of stress.

For example, when comparing our top-down aggregate analysis to other estimates, it is important to note that some other estimates based on subnational data do not aggregate both oversupplied and undersupplied markets and only count the undersupplied markets, which would lead to a larger estimate for the shortage. In order to estimate whether there is indeed a shortage, we must define a balanced market (i.e., stable vacancy rate) and estimate the supply (i.e., housing units) relative to the level of demand (i.e., new households) over time. Also, our time horizon matters if we want to calculate an accumulated deficit. As mentioned above, the early 2000s were the last years generally considered to be normal for the housing market — in the decades since, we experienced a period of overbuilding that ended with the housing crisis, followed by more than a decade of construction that didn't keep pace with demand. As we'll show below, underbuilding was appropriate during the early years of the housing recovery as there were plenty of surplus/vacant housing units that needed to be absorbed.

For supply, we consider the number of housing units completed each year, both single-family and multifamily, as reported by the U.S. Census Bureau, as well as the number of manufactured homes shipped annually. For some historical context, an average of nearly 1.6 million housing units were completed annually during 1970–2006, with annual completions climbing to nearly 2 million in 2006 before crashing below 600,000 by 2011 in the aftermath of the Global Financial Crisis (GFC). Annual completions have gradually climbed since 2011, reaching nearly 1.3 million by 2020. Meanwhile, shipments of manufactured homes followed a similar pattern, although the pace of shipments had already slowed starting in

2000, prior to the GFC. During 1970–2000, shipments averaged about 270,000 per year, then declined to less than 50,000 by 2010 and have gradually recovered to roughly 95,000 by 2020. Combining completions and shipments, nearly 26.5 million housing units, or an annual average of just over 1.3 million units, were added to the national housing stock during 2000–2020.

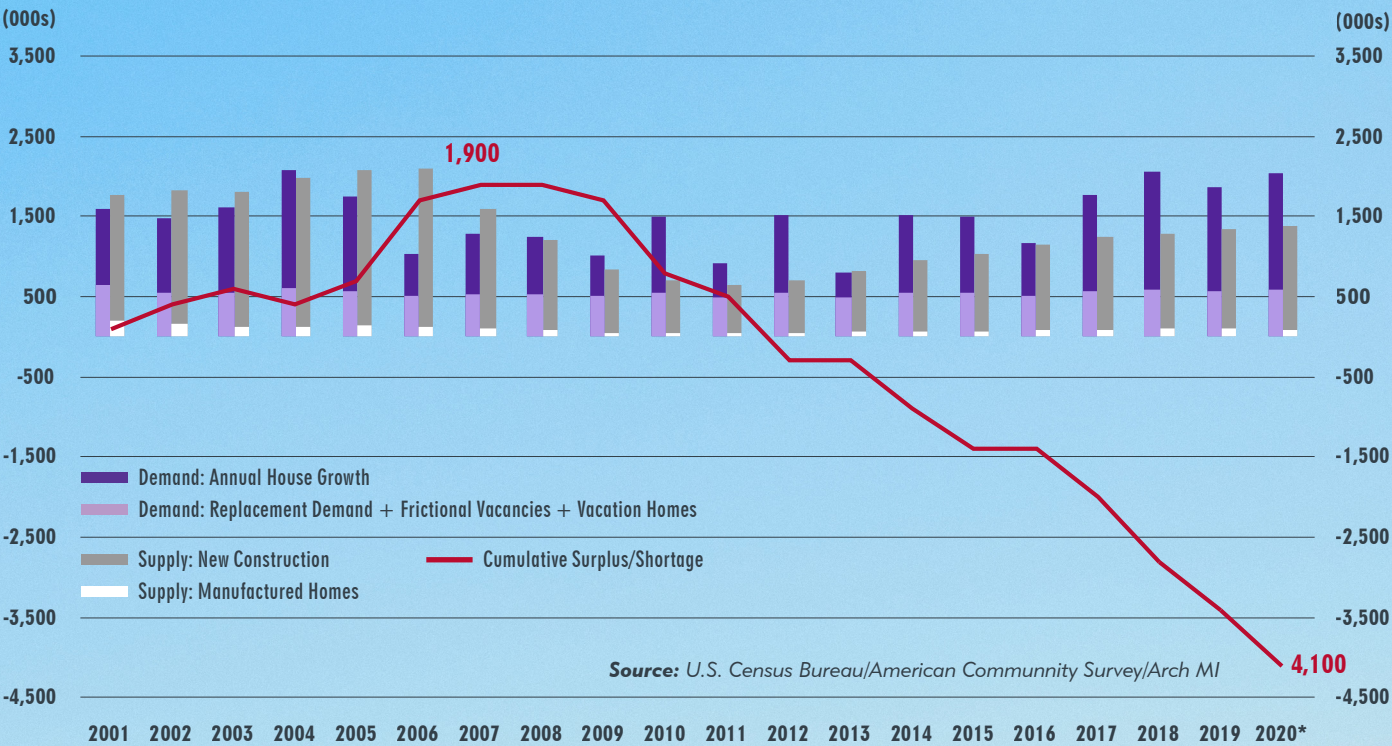
For demand, we consider the aggregate change in occupied households, the incremental need for an appropriate level of vacancies (i.e., frictional vacancies), incremental demand for vacation homes and the replacement demand for housing units lost from the inventory. Annual household formation averaged just over 1.4 million during 1970–2006, then slowed to about 700,000 for the next decade due to a combination of demographic factors and households doubling up after the great recession, then accelerated to an estimated average of 1.4 million from 2016 to 2020.

For the appropriate level of vacancies, we estimate the incremental number of units that need to be constructed to allow for a well-functioning for-sale and for-rent market, which we assume to be roughly 10%, based on the prevailing vacancy rate in the early 2000s. For vacation homes, we assume incremental demand required to maintain the supply of vacation homes at its current share of the housing stock, or roughly 3%.

Lastly, for the replacement demand for units lost from the inventory due to natural disasters, demolition, merging/conversion and other reasons, we refer to the Components of Inventory Change (CINCH) reports from the U.S. Department of Housing and Urban Development, which use data collected every two years from the American Housing Survey. Since 2000, permanent losses from the housing stock averaged roughly 450,000 per year. Combining the demand from household growth, frictional vacancies, vacation homes and the need to replace damaged/destroyed units, from 2000 to 2020 about 30.1 million housing units were needed, or an annual average of 1.5 million units.

With an average of only 1.3 million housing units added annually to the housing stock over the past 20 years, when there was annual demand for about 1.5 million units, we estimate there was a shortage of roughly 4.1 million housing units by 2020 (Figure 4). As mentioned above, the early 2000s was dominated by overbuilding, particularly as demand collapsed in 2006, which resulted in 2 million excess units by 2007. Underbuilding was initially a rational response by homebuilders to the oversupplied market that allowed demand to gradually absorb these housing units, leaving the market relatively balanced by 2013. As has been well publicized, homebuilders have not been able to accelerate the pace of completions commensurate with the surge in demand, leaving an undersupplied housing market just as the Millennial generation is becoming a driving force behind new household formation.

Figure 4: Housing Supply & Demand



Source: U.S. Census Bureau/American Community Survey/Arch MI

*Note: 2020 annual household growth is estimated based on USPS Delivery Statistics data.

The Truth about Migration during the Pandemic

Migration has increased significantly since the beginning of the COVID-19 pandemic, with many residents of large high-cost cities such as New York and San Francisco taking advantage of newly embraced work-from-home/anywhere rules to seemingly move to more affordable nearby suburbs, exurbs or alternative locations altogether.

However, migration patterns have generally reflected an acceleration of pre-pandemic trends rather than a dramatic change. Official migration data from the U.S. Census Bureau is released with a considerable lag, so we must turn to alternative data sources to understand which markets have grown more quickly during the pandemic. One alternative data source we evaluated, U.S. Postal Service Delivery Statistics, has traditionally been used by researchers to understand the magnitude of population changes in the aftermath of natural disasters such as hurricanes. Every month, the USPS reports the number of residents actively receiving mail at established addresses. The USPS considers an address active if mail has been picked up within the previous 90 days.

We analyzed the USPS Delivery Statistics data at the county level, calculating the average annual growth in active addresses during 2014–2019 (the pre-pandemic period) as well as the average annualized growth since the fourth quarter of 2019 (the pandemic period). We then compared the growth rates to understand which areas accelerated the most during the pandemic period and which slowed or contracted. We categorized more than 3,000 counties into a six-level, urban-rural classification scheme established by the National Center for Health

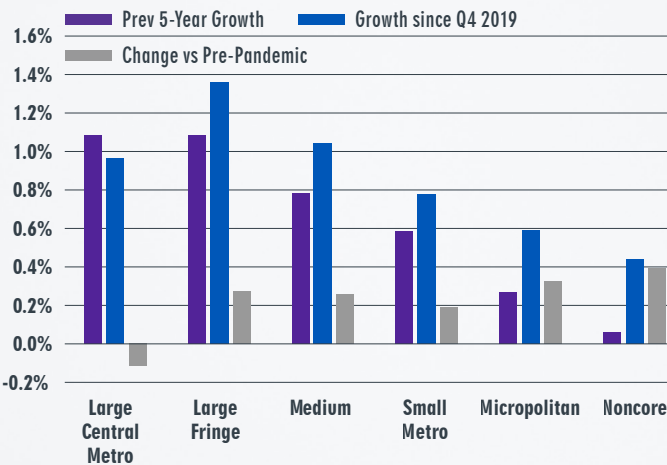
Statistics (NCHS). The most urban category consists of “central” counties of large metropolitan areas (e.g., New York County in New York City) and the most rural category consists of non-metropolitan “noncore” counties.

The anecdotal shift to the suburbs and exurbs is readily apparent in USPS data as seen in Figure 5 at right: Growth rates in active addresses decelerated in large central metros since Q4 2019 relative to the 2014–2019 pace but accelerated in large fringe and medium metros (akin to suburbs). In fact, all areas outside of large central metros recorded accelerating growth during the pandemic, with the increase most notable in micropolitan and noncore counties.

It is worth highlighting that while large central metros were the only type of geography to see growth slow, their growth rates remain close to the pre-pandemic trend and continue to outpace the smallest geographies (i.e., small metros, micropolitan and noncore). The modest slowing of growth in large central metros is far from the exodus that many predicted for the likes of Manhattan (New York County) and San Francisco. Both counties recorded positive growth in active addresses despite slowing, more decidedly so in Manhattan than San Francisco, during the pandemic (Figure 6). This likely reflects some of the temporary migration that occurred during the pandemic, where households moved out of core urban counties during the worst of the pandemic in 2020 but returned to their home cities in 2021 once COVID-19 case counts and lockdowns had subsided.

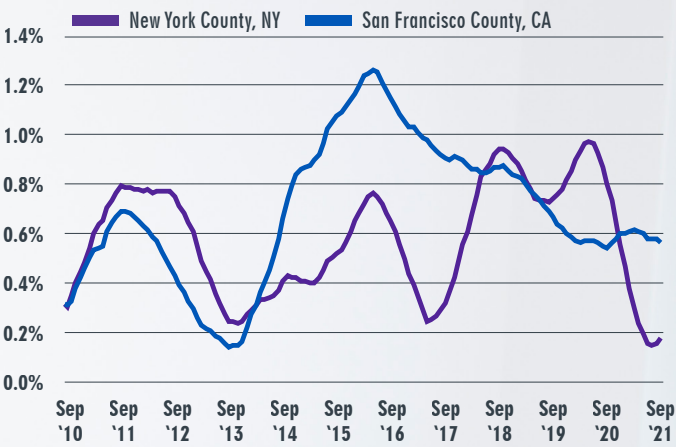


Figure 5: Average Annualized Household Growth by Geography Type



Source: USPS/Moody's/Arch MI

Figure 6: Average Annual Change in Active Residential Addresses



Source: USPS/Moody's/Arch MI



Breaking Down Millennial Housing Demand

One of the most important drivers of housing demand is the size of the population aging into prime household formation years. For homeownership specifically, that age has generally been in the low 30s for decades and 33 years old as of the latest survey conducted by NAR. As you can see in Figure 7, the size of the U.S. population turning 33 peaked at just over 4.5 million in 1995, which roughly marked the end of the era for the Boomer generation reaching typical homeownership age — the youngest Boomer was 31 in 1995. Just over a decade later in 2007, the size of the population reaching 33 years of age had declined to less than 3.8 million and remained below 4 million until 2012, when the oldest members of the Millennial generation started to reach their 30s. Going forward, the U.S. Census Bureau expects the number of people turning 33 to peak at nearly 5 million in 2024 before stabilizing at roughly 4.8 million per year through 2040.

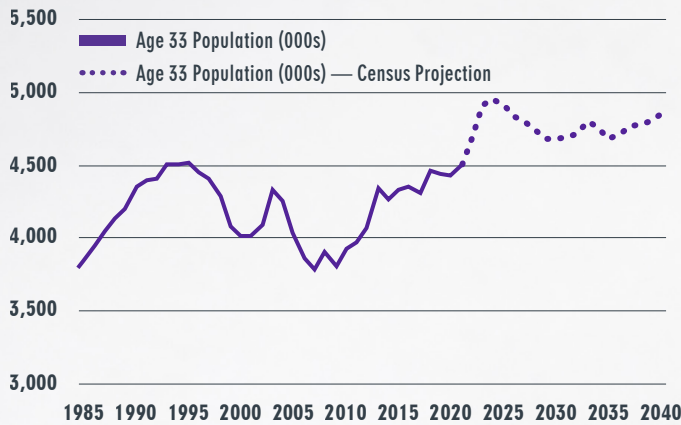
The Millennial generation, currently ranging in age from 25 to 40, surpassed Boomers in 2019 as the largest generation by population and has started to make its presence felt in the housing market. Going forward, Millennials will be an unmistakable presence in the housing market as they age into the 35–44-year-old age group, which has a roughly 20 percentage point higher homeownership rate than the under-35-year-old age group (Figure 8).

Although Millennials have trailed somewhat behind prior generations in marriage and homeownership, these milestones are likely delayed, not forgone. The current homeownership rate for Millennials is only 5 percentage points below the 25–40-year-old age group in 1995 when Boomers were at a similar point in the homeownership journey. There is also other evidence to suggest that Millennial preferences regarding owning a home have not declined meaningfully. Over the next decade, as Millennials continue to move out of their family homes, leave roommates behind and create their own families, there will be robust demand for starter homes.

The Millennial population is not evenly distributed across the U.S. Among large metropolitan areas — those with a population over 750,000 — the five with the largest share of Millennials as a percentage of the total population as of 2020 were Austin, Texas (26%), Seattle, Washington (25%), Denver, Colorado (25%), Salt Lake City, Utah (24%), and San Jose, California (24%), compared with a national share of 21%.

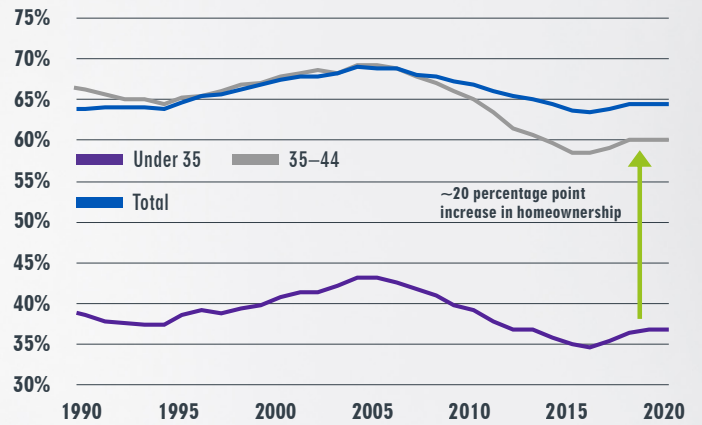
Some of the Millennials in these metro areas are home-grown, but many have also moved to these cities. Looking at the five fastest-growing Millennial populations among large metro areas in the five years preceding the pandemic (2015–2019), two of the same metro areas appear: Seattle, Washington (3.5% average annual growth) and Austin, Texas (3.4%), along with Colorado Springs, Colorado (3.6%), and Orlando (3.5%), and Cape Coral-Fort Myers (3.4%) in Florida.

Figure 7: 33-Year-Old Cohort — History and Forecast



Source: U.S. Census Bureau/Arch MI

Figure 8: Homeownership Rate by Age Group



Source: U.S. Census Bureau/Arch MI



America's Most Affordable Cities for Millennial Homebuyers

As described in our lead story, national affordability has deteriorated somewhat during the recent acceleration of home-price appreciation but is now in line with its historical average. The strong price appreciation has been driven by surging demand far outpacing supply, in part due to the large number of Millennials forming households as well as a shift in where demand is located as a result of an increase in migration across metro areas. Rapid price gains have stretched affordability, particularly in some of the Millennial-dominated metro areas we highlighted in our story on Millennial Housing Demand. However, some Millennial hot spots remain affordable and are poised to provide enough new supply for their growing populations.

Below, we identify the top five most affordable large metro areas with larger-than-average Millennial populations, which we define as those with a population above 750,000 and where the Millennial share of the total population is more than 1 percentage point greater than the national average (20.6%). Given the recent disruption to migration patterns, we also limited our sample to metro areas that have maintained or accelerated their pace of household formation during the pandemic, as measured by the USPS active delivery address data we described above. We also only considered metro areas where the labor market recovery from the pandemic is outpacing the national recovery, as measured by the ratio of current jobs relative to pre-pandemic levels. Lastly, to avoid selecting metros at risk of housing supply shortages, we restricted our list to metros where housing construction has kept pace with population growth over the past five years.

Despite median home-price appreciation of 17–29% year-over-year in these metros, all have homeownership cost-to-income ratios that remain at or below the 38% national ratio. All five of the cities on the list also are considered markets where homeownership is relatively more affordable than renting with median homeownership costs, relative to median asking rents on three-bedroom units for each metro being less than the national ratio of 1.6.

The top five metro areas also share some desirable characteristics for Millennials beyond affordability:

- Not only is the share of Millennials greater in these metros, the growth rate of Millennials has also outpaced the overall population growth rates for each metro on average since at least 2015.
- The cost of living is generally the same or better than the national average, as measured by the regional price parities produced by the U.S. Bureau of Economic Analysis.
- Each metro is generally more educated than the national average, with a higher share of the 18-and-over population having at least a bachelor's degree compared with the national average of 33%.

Top Five Fastest-Growing Millennial Metros That Are Still Affordable

1. Raleigh, North Carolina

Raleigh's recovery from the pandemic-induced hit to employment is nearly complete, with August 2021 payrolls at 98.9% of pre-pandemic levels. The Raleigh metro area is part of the famous Research Triangle, anchored by Duke University, North Carolina State University and the University of North Carolina at Chapel Hill, and has become a thriving tech hub with leading employers that include IBM Corporation, Cisco Systems, Inc. and SAS Institute Inc. Accordingly, the median household income of \$82,190 is more than 20% higher than the national median income. Raleigh's population grew by an annual average of 2.3% over the five years ending in 2020, making it the fastest-growing metro area on our list. However, the supply of new homes in Raleigh has generally kept pace with demand as construction of new housing units added an average of 2.9% per year to the metro's housing stock. As of the second quarter of 2021, the median price of homes sold in Raleigh was \$369,270, up 24% compared with a year ago. Despite the strong home-price appreciation, Raleigh's homeownership cost-to-income ratio is the lowest on our list at 33%, the cost of living is 3.9% below the national average and the median list price per square foot of \$194 make it the most affordable Millennial market.

2. Dallas-Fort Worth, Texas

The Dallas-Fort Worth metroplex is by far the largest metro area on our list, with a 2020 population of 7.7 million, which also makes it the fourth-largest metro area in the United States. Despite its size, the population of Dallas-Fort Worth has continued to grow by an average of 1.9% per year since 2015, with the Millennial population rising even faster at 2.2% over the same period. The metro area is home to 22 Fortune 500 companies and many large companies have recently announced meaningful expansions of existing operations or relocations of headquarters to the metro area, including CBRE (HQ), Schwab (HQ), Goldman Sachs (expansion) and Vanguard (expansion). Even prior to these announcements, the metro area had established itself as a financial center with leading employers such as Bank of America, JPMorgan Chase & Co. and Fidelity. The metro area also has outsized

employment concentrations in professional services, airlines and manufacturing, giving Dallas-Fort Worth a broad base of industries for newcomers. The median income for the metroplex was \$74,038 as of the second quarter of 2021, roughly 9% higher than the national, while the cost of living is roughly in line with the national average. Impressively, Dallas-Fort Worth has permitted an average of nearly 61,000 housing units each year from 2015 to 2020, representing a 2.3% growth rate for the housing stock, which surpasses the area's population growth. As of the second quarter of 2021, the median price of homes sold in the Dallas-Fort Worth area was \$325,049, up 20% compared with a year ago. The metroplex offers the lowest median price per square foot of the metros on our list at \$184 and a homeownership cost-to-income ratio of 36% despite the strong home-price appreciation, making it an affordable and relative value option for Millennials.

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America's Most Affordable Cities for Millennial Homebuyers

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3. Nashville, Tennessee

Nashville has recovered well from the pandemic, with its August 2021 unemployment rate of 3.9% only modestly above its pre-pandemic level of 3.1% and payrolls at 98.2% of their February 2020 level. The resilient Nashville economy is supported by a well-educated population with over 41% of its 18-and-over population holding at least a bachelor's degree, more than 8 percentage points higher than the national average. Additionally, Nashville's tourism industry is well positioned for the shift in travel to domestic trips during the pandemic as 90% of its visitors come from within the United States. Nashville's population has swelled by 1.7% per year since 2015, with the Millennial growth rate even higher at 2.6%. Meanwhile, construction activity has added an average of 2.8% per year to Nashville's housing stock, keeping the median home price in check at \$337,842 despite being up 18% year-over-year. The homeownership cost-to-income ratio was 33% as of the second quarter of 2021 and the cost of living is about 6% cheaper than the national average.

4. Colorado Springs, Colorado

Although Colorado Springs is the smallest metro area on our list at 753,800, it had the fastest-growing Millennial population over the past five years (3.3% per year) and also the largest share of its population growth coming from Millennials (44%). Housing construction has grown the housing stock by an average of 2.1% over the past five years, which outpaced the annual population growth of 1.6%. Over the last 12 months ending August 2021, the pace of permitting has jumped 50% above the 2015–2020 average, which should help the supply-demand balance even further going forward. The metro area economy, which has a large concentration in defense and related federal jobs, has nearly recovered all of the jobs lost during the pandemic, with August 2021 payrolls at 99.6% of the February 2020 level. With the median price of homes sold in the second quarter of 2021 at \$399,614, Colorado Springs is an affordable option for Millennials looking to partake of the

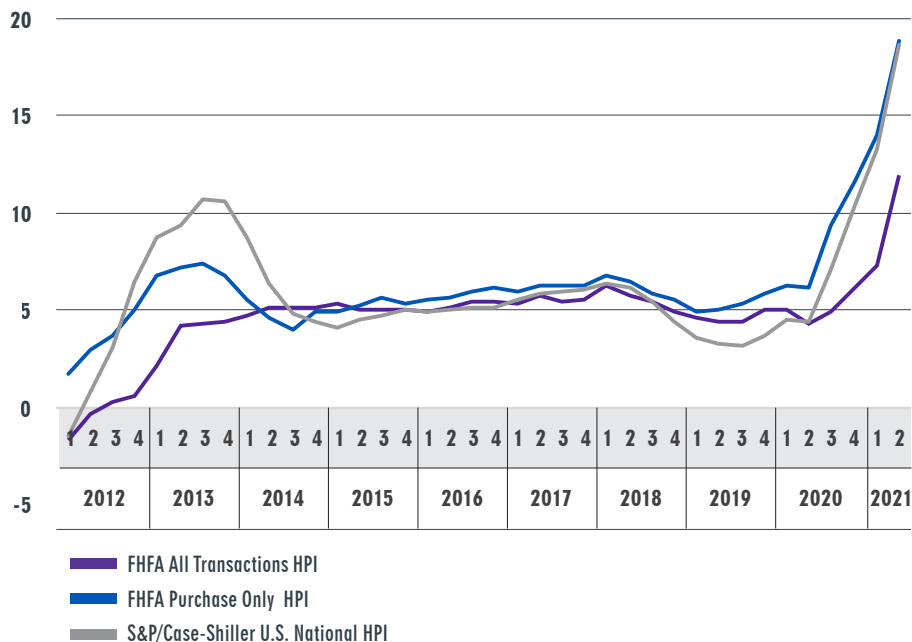
Colorado lifestyle, particularly compared with Denver (\$541,746 median home price) and Boulder (\$720,574) just up the road. With a cost of living just below the national average and a median household income of \$73,164, the metro area's homeownership cost-to-income ratio was 38%, placing it roughly on the same level as the national ratio.

5. Charleston, South Carolina

Charleston, founded in 1670, is the oldest town on our list for Millennials, edging out relative newcomer Raleigh, North Carolina, by 122 years. Although the City of Charleston has been around for many years, the Millennial population has grown by 2.1% over the five years ending 2020, or nearly twice as fast as the national rate and just slightly faster than the metro's total population growth (2.0%). Given the area's outsized concentrations in defense and tourism, Charleston's economy experienced a mixed recovery during the pandemic, with August 2021 payrolls at 97% of their pre-pandemic level, just above the national average. However, Charleston may be a near-term beneficiary of the pandemic-driven shift to domestic tourism as visitors over the summer of 2021 were up relative to pre-pandemic levels and revenue per available room at hotels was recently up more than 8% compared with levels reported two years ago. Charleston recorded the fastest home-price appreciation of the metro areas on our list over the past year, up 29% to \$379,875. The recent appreciation has certainly outpaced income growth and decreased affordability for the metro area, but it was very affordable prior to the recent price gains. The homeownership cost-to-income ratio for Charleston is 36% and the cost of living is about 3% below the national average, making it number 5 on our list of most affordable Millennial metros.

Housing and Mortgage Market Indicators

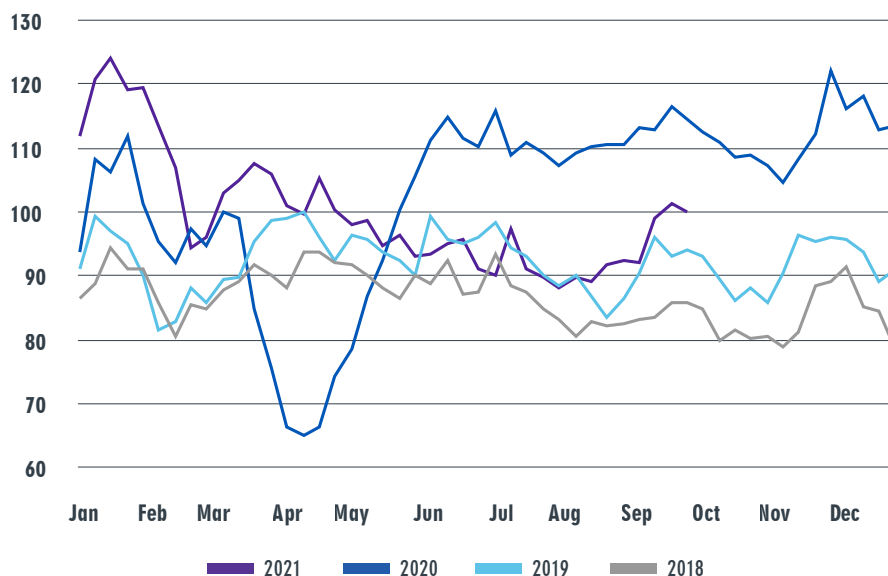
YEAR-OVER-YEAR PERCENTAGE CHANGE IN HOME PRICES



National home prices continue to rise rapidly. Home-price growth in 2Q21 was strong across all three indices, with the FHFA purchase-only index up 18.8% year-over-year — its strongest quarter on record. While these home-price indicators differ in methodologies and data sources (the FHFA only uses GSE loans, while the Case-Shiller Index® includes many jumbo and other types of loans), they all reflect unprecedented year-over-year price gains.

Sources: S&P Case-Shiller/FHFA/Moody's Analytics/Arch MI

MBA MORTGAGE PURCHASE APPLICATION INDEX



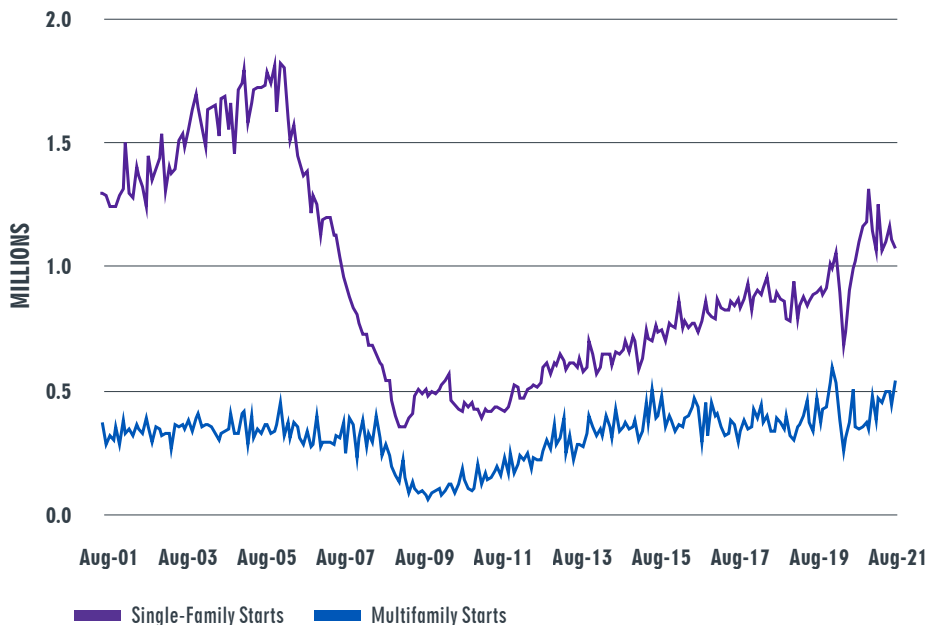
Mortgage purchase applications are down roughly 13% compared with 2020 but remain about 6% higher than 2019 levels. Application activity has increased 13% since hitting a 2021 low point in early August. Still, the recent increase in U.S. Treasury yields is likely to pass through to mortgage rates and become a headwind for purchase activity in the near term.

Note: Index rebased so that current activity level = 100

Sources: MBA/Arch MI

Housing and Mortgage Market Indicators

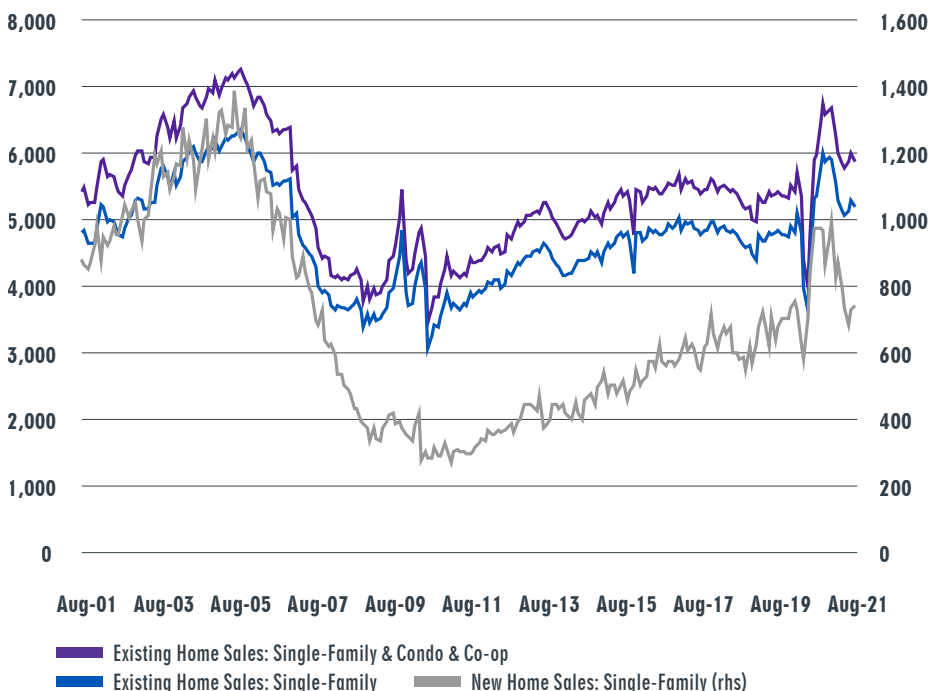
HOUSING STARTS, IN THOUSANDS — SEASONALLY ADJUSTED ANNUAL RATE



Housing starts bottomed out during the peak of the lockdowns, then surged as the economy reopened and demand accelerated. Single-family housing starts reached their highest level since 2007 in December 2020 at 1.3 million units (seasonally adjusted annual rate) but have since slowed to about 1.1 million units in August 2021 as construction activity has been limited by labor and material supply constraints. Despite these constraints, single-family housing starts are more than 20% above the pre-pandemic pace. Additionally, multifamily starts recently increased to about 540,000 units (annualized rate) in August, more than 30% above their pre-pandemic rate.

Sources: U.S. Census Bureau/Moody's Analytics/Arch MI

NEW AND EXISTING HOME SALES, IN THOUSANDS — SEASONALLY ADJUSTED ANNUAL RATE

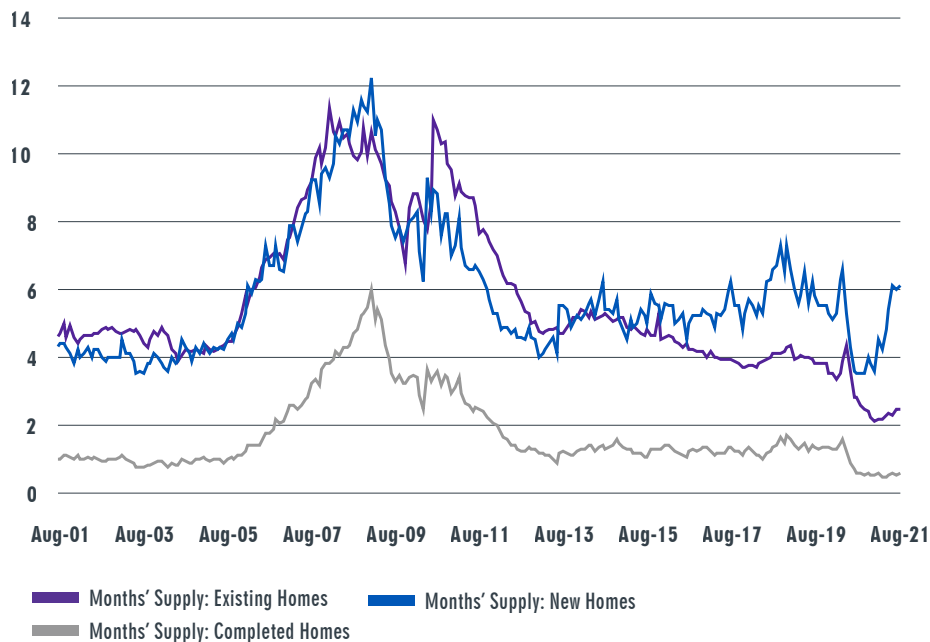


New and existing home sales dropped sharply during the first wave of COVID-19 cases. They bounced back strongly as the economy reopened but slowed as the limited inventory of homes for sale restrained purchase activity. Existing homes sales (including single-family, condo and co-ops) were 5.9 million units (after annualizing the seasonally adjusted monthly number) in August, in line with sales one year ago but nearly 9% above August 2019. New home sales slowed to 740,000 (annualized rate) in August from nearly 1 million units in January but are also up about 9% compared with August 2019 sales. Existing home sales are based on the closing of contracts signed one to two months earlier, while new home sales are counted at the time of signing.

Sources: NAR/U.S. Census Bureau/Moody's Analytics/Arch MI

Housing and Mortgage Market Indicators

MONTHS' SUPPLY OF HOMES FOR SALE

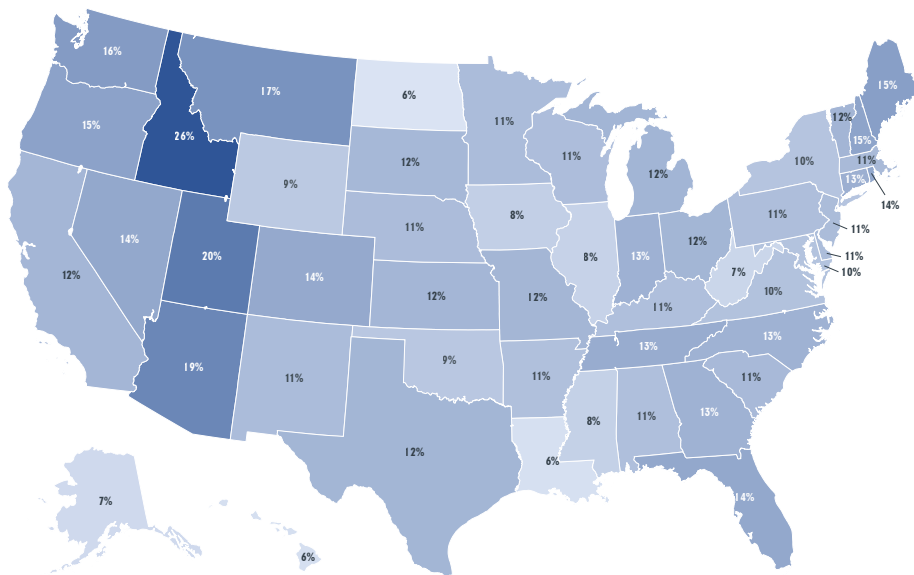


The inventory of homes for sale remains near record lows. The months' supply of existing single-family homes for sale (total current listings ÷ last month's sales) was 2.5 months as of August, the highest level since September 2020, which was a record low. The months' supply of new homes for sale has increased to 6.1 months. However, an unusual share of the new home inventory comprises units still under construction and units not yet started. Considering only the inventory of completed homes for sale, the inventory remains near a record low at 0.6 months. This is much lower than the historical average inventory of 1.7 months for completed new homes.

SA stands for Seasonally Adjusted.

Sources: NAR/Moody's Analytics/Arch MI

HOME-PRICE GROWTH BY STATE: YEAR-OVER-YEAR (%)



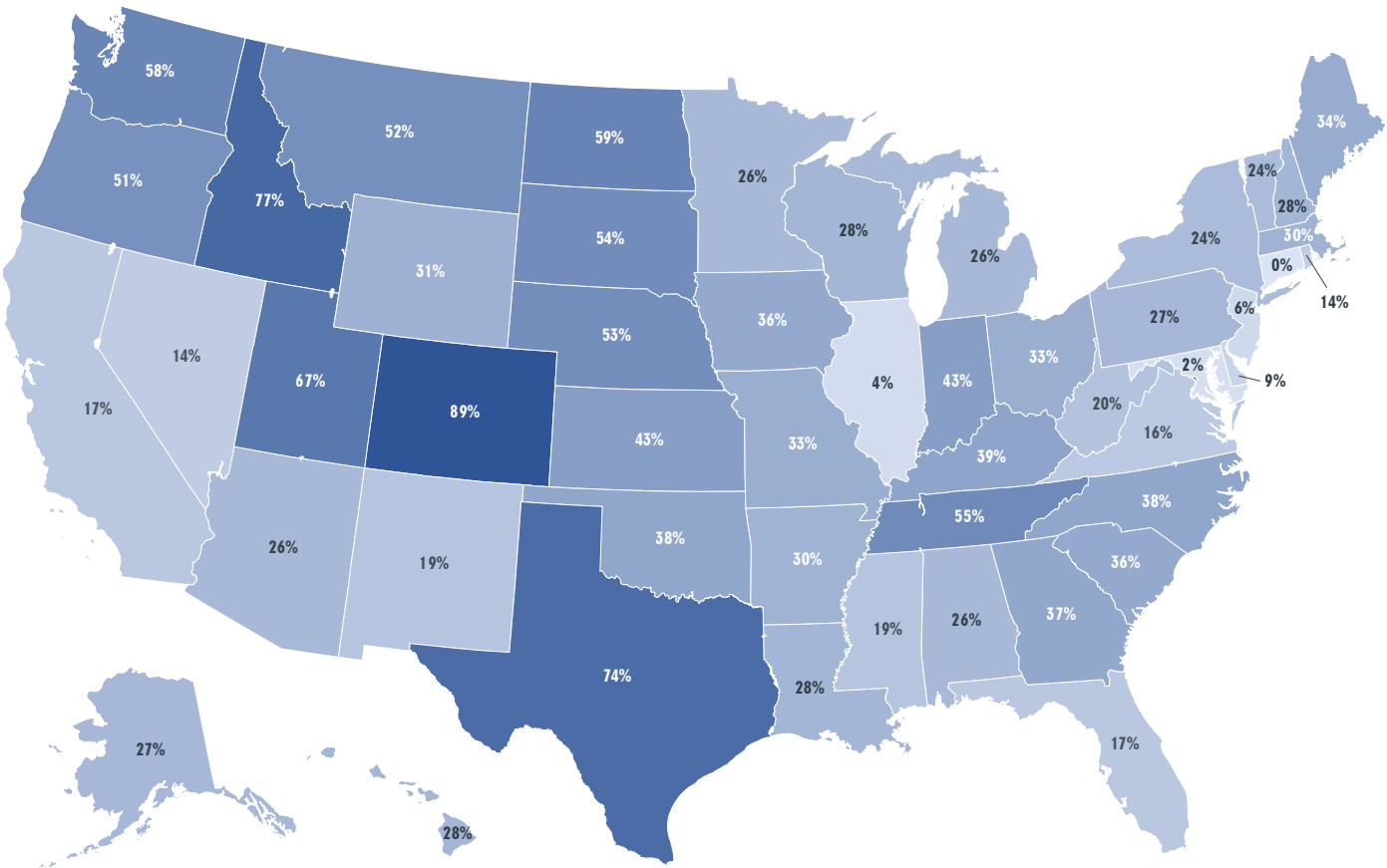
Home prices are up in all 50 states over the past year and also accelerated in all 50 states compared with the prior year. The fastest growth in home prices was in Idaho (26%), Utah (20%) and Arizona (19%). The slowest growth was in North Dakota (6%), Louisiana (6%) and Hawaii (6%).

SA stands for Seasonally Adjusted.

Sources: Federal Housing Finance Agency All-Transactions House Price Index (FHFA HPI®)/Arch MI

Housing and Mortgage Market Indicators

HOME-PRICE GROWTH SINCE PRIOR PEAK

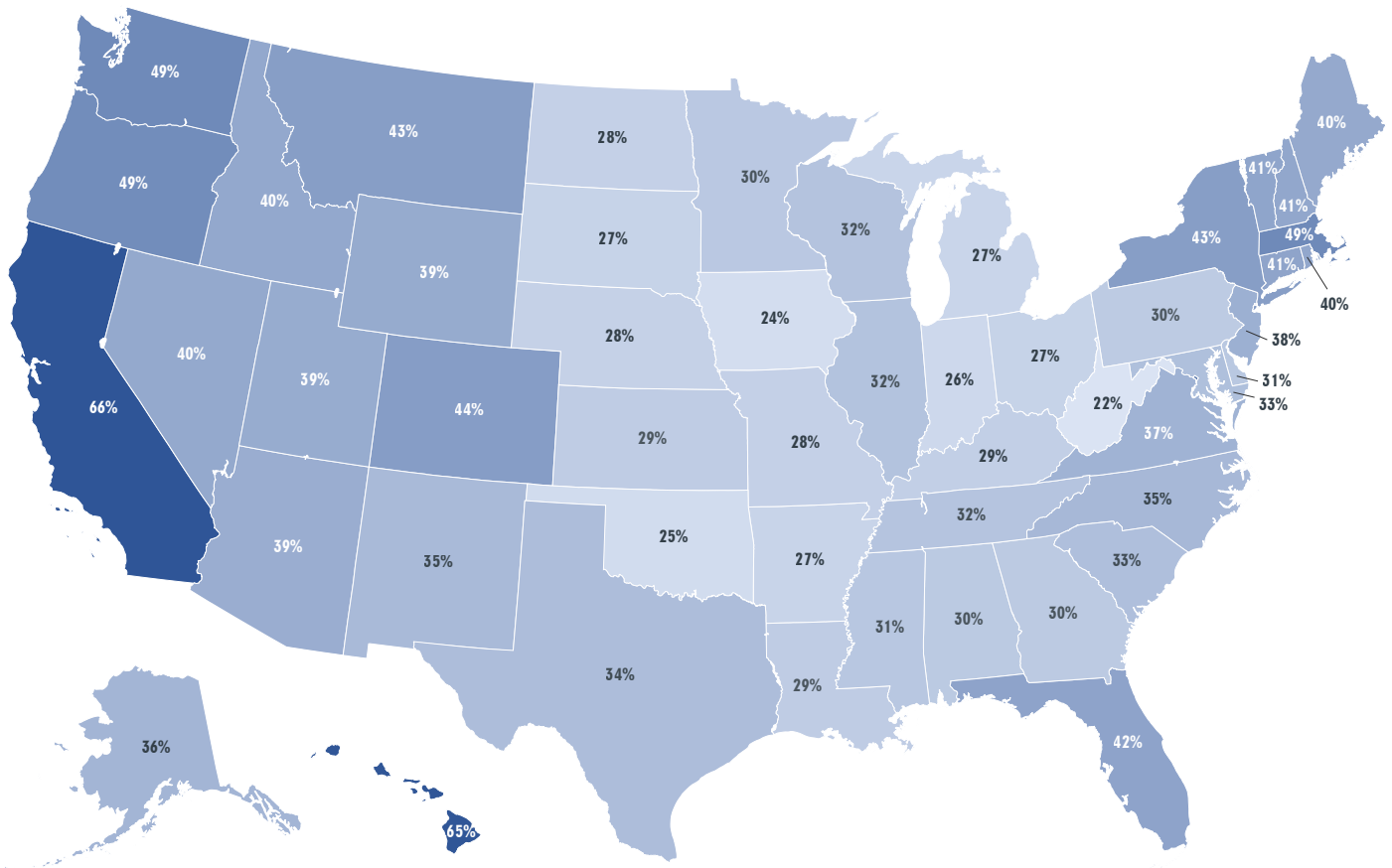


Strong home-price appreciation over the past year resulted in home prices exceeding their prior peaks in all 50 states for the first time since the recovery began. The four states that previously remained below their prior peaks all recorded meaningful appreciation over the past year: Connecticut (13%), Maryland (10%), New Jersey (11%) and Illinois (8%). Cumulative home-price growth has varied widely since prices last peaked around 2006 (we measure since the peak for each state, which varied around 2006/2007). The largest cumulative home-price growth since home prices peaked is in Colorado (89%), followed by Idaho (77%) and Texas (74%), which have gone up more than twice as fast as the national average of 34%. This chart is intended to aid understanding of market strength over the past decade. It doesn't indicate any overvaluation since it doesn't account for changes in income or reasonableness of prices at their prior peak. Values shown are in nominal (not inflation-adjusted) terms.

Sources: FHFA/Arch MI

Housing and Mortgage Market Indicators

PERCENTAGE OF MEDIAN INCOME NEEDED FOR HOMEOWNERSHIP COSTS
ON A MEDIAN-PRICED HOME

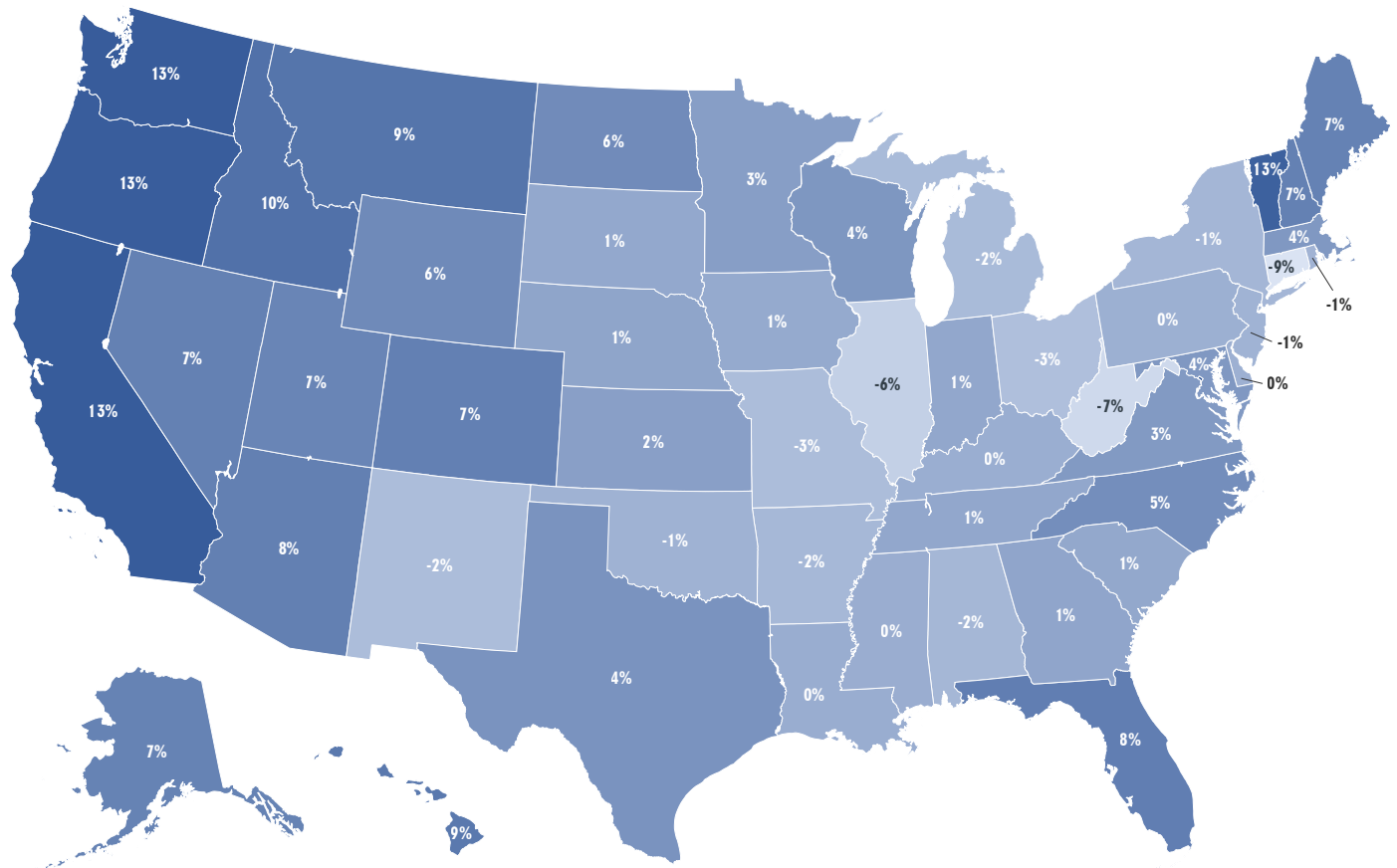


Our affordability measure is the percentage of median household income required to cover homeownership costs on a median-priced home, such as mortgage payments, escrow expenses, maintenance costs, mortgage insurance and risk add-ons. Lower values indicate better affordability, such as in West Virginia (22%), Iowa (24%) and Oklahoma (25%). Calculations are based on pretax median household income, a 10% down payment, escrow of annual expenses of roughly 1.5% of the initial home price (for insurance and property taxes, which vary by state), the prevailing 30-year fixed-rate mortgage rate, plus 0.75% to cover mortgage insurance and risk add-ons, as well as roughly 1% of the initial home price to cover annual maintenance costs.

Sources: U.S. Census Bureau/Freddie Mac/NAR/Moody's Analytics/Arch MI

Housing and Mortgage Market Indicators

DIFFERENCE IN PERCENTAGE OF MEDIAN INCOME NEEDED NOW VS. NORMAL YEARS

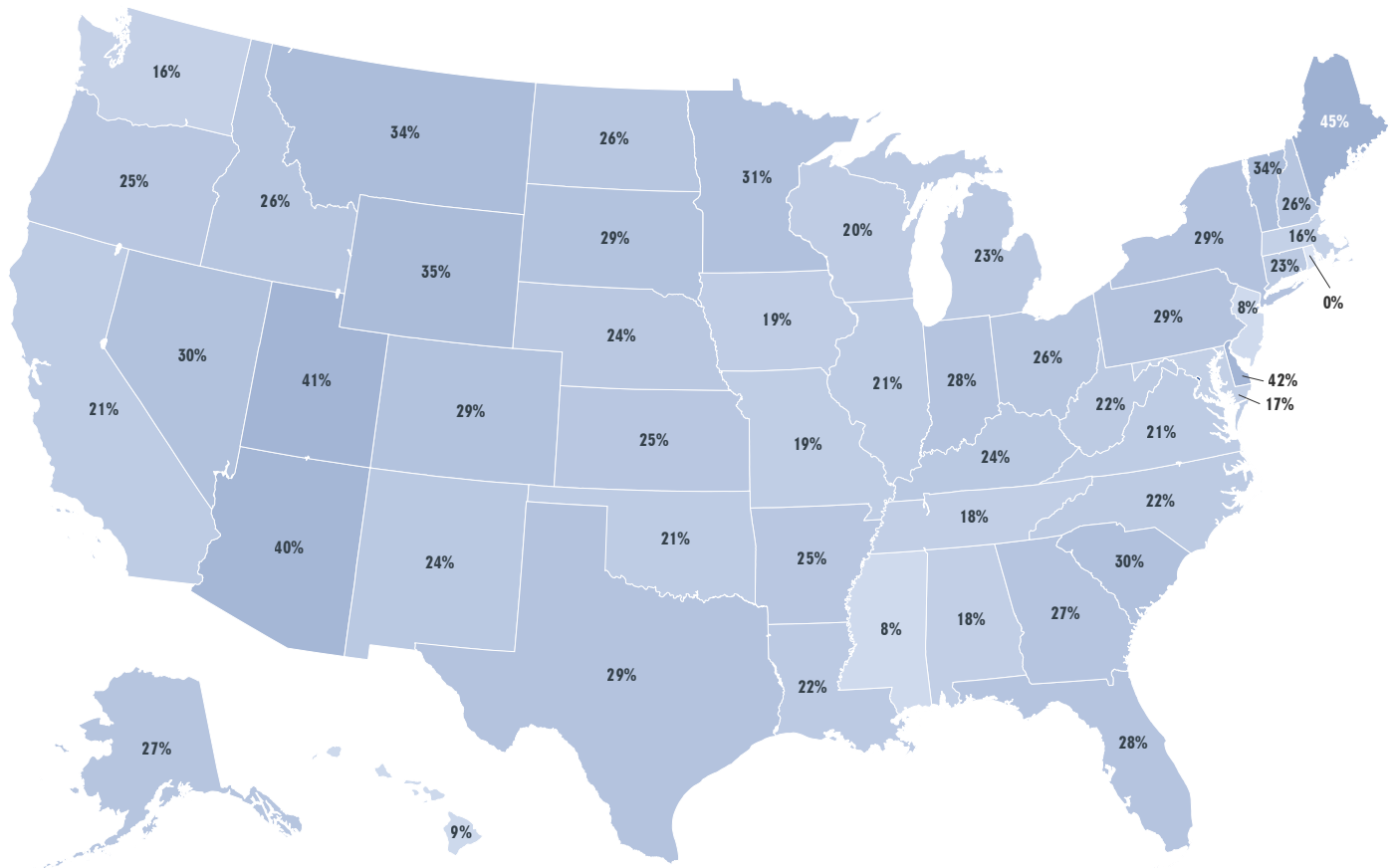


Affordability is now worse than historical norms in all but 16 states, with the Northwest and Mountain West generally the most unaffordable along with Florida and Vermont. This map shows how affordability differs now compared to historical norms; a value of 5 indicates homeownership costs on today's median home requires 5% more of a borrower's income than it did during more typical market conditions. It is the percentage of median income needed to cover homeownership costs on a median-priced home (shown above) minus the average from the pre-bubble years between 1990 and 2003. For the U.S., the median-priced home requires 38% of the median income, up 1 percentage point from its 1990–2003 average of 37%. The District of Columbia has the worst affordability now compared to its 1990–2003 average (+15%), followed by California (+13%) and Washington (+13%). The most affordable markets now compared to their 1990–2003 averages include Connecticut (-9%), West Virginia (-7%) and Illinois (-6%).

Sources: U.S. Census Bureau/Freddie Mac/NAR/Moody's Analytics/Arch MI

Housing and Mortgage Market Indicators

ANNUAL PERCENTAGE CHANGE IN HOUSING STARTS



The percentage change in housing starts varies widely and is strongest in the West and Midwest. The growth in single-family housing starts is weakest in the Northeast. Housing starts increased the most in the District of Columbia (130%) and Maine (45%), followed by Delaware (42%) and Utah (41%). To get a clearer understanding of the trend, unlike numbers seen elsewhere, we smooth the data by showing a 12-month moving average to dampen short-term volatility due to weather, survey limitations, etc.

Sources: U.S. Census Bureau/Moody's Analytics/Arch MI

State Housing and Demographic Trends

STATE (Sorted alphabetically)	FHFA HPI (% Y/Y)		HOMEOWNERSHIP COST-TO-INCOME RATIO	
	Q2 2021	YEAR AGO	Q2 2021	VS 1990–2003 AVG
Alabama	11%	5%	30%	-2%
Alaska	7%	3%	36%	7%
Arizona	19%	7%	39%	8%
Arkansas	11%	4%	27%	-2%
California	12%	4%	66%	13%
Colorado	14%	4%	44%	7%
Connecticut	13%	3%	41%	-9%
Delaware	11%	4%	31%	0%
District of Columbia	9%	3%	55%	15%
Florida	14%	6%	42%	8%
Georgia	13%	5%	30%	1%
Hawaii	6%	3%	65%	9%
Idaho	26%	9%	40%	10%
Illinois	8%	2%	32%	-6%
Indiana	13%	5%	26%	1%
Iowa	8%	3%	24%	1%
Kansas	12%	4%	29%	2%
Kentucky	11%	4%	29%	0%
Louisiana	6%	3%	29%	0%
Maine	15%	5%	40%	7%
Maryland	10%	3%	33%	4%
Massachusetts	11%	4%	49%	4%
Michigan	12%	4%	27%	-2%
Minnesota	11%	4%	30%	3%
Mississippi	8%	3%	31%	0%
Missouri	12%	4%	28%	-3%
Montana	17%	5%	43%	9%
Nebraska	11%	3%	28%	1%
Nevada	14%	4%	40%	7%
New Hampshire	15%	6%	41%	7%
New Jersey	11%	4%	38%	-1%
New Mexico	11%	5%	35%	-2%
New York	10%	4%	43%	-1%
North Carolina	13%	5%	35%	5%
North Dakota	6%	1%	28%	6%
Ohio	12%	5%	27%	-3%
Oklahoma	9%	5%	25%	-1%
Oregon	15%	4%	49%	13%
Pennsylvania	11%	4%	30%	0%
Rhode Island	14%	5%	40%	-1%
South Carolina	11%	5%	33%	1%
South Dakota	12%	4%	27%	1%
Tennessee	13%	5%	32%	1%
Texas	12%	4%	34%	4%
Utah	20%	6%	39%	7%
Vermont	12%	4%	41%	13%
Virginia	10%	4%	37%	3%
Washington	16%	6%	49%	13%
West Virginia	7%	4%	22%	-7%
Wisconsin	11%	3%	32%	4%
Wyoming	9%	4%	39%	6%
Population Weighted Total	12%	4%	39%	4%

Sources: FHFA/BLS/U.S. Census Bureau/Freddie Mac/NAR/Moody's Analytics/Arch MI

STATE

(Sorted alphabetically)

	UNEMPLOYMENT RATE			POPULATION (000s)		MEDIAN HOUSEHOLD INCOME	
	JUL '21	COVID PEAK	PRE-COVID (FEB '20)	Q2 2021	% Y/Y	Q2 2021	% Y/Y
Alabama	3.1%	13.2%	2.6%	4,932	0.2	\$ 53,534	1.5
Alaska	6.4%	11.8%	5.1%	739	1.1	\$ 78,308	2.5
Arizona	6.2%	14.2%	4.9%	7,595	2.3	\$ 64,176	1.2
Arkansas	4.2%	10.0%	3.8%	3,046	0.5	\$ 50,267	1.0
California	7.5%	16.0%	4.3%	39,723	0.9	\$ 83,200	0.8
Colorado	5.9%	12.1%	2.8%	5,855	0.8	\$ 79,821	0.9
Connecticut	7.2%	11.4%	3.7%	3,559	0.1	\$ 80,054	0.7
Delaware	5.4%	13.4%	4.5%	992	0.6	\$ 73,313	1.1
District of Columbia	6.5%	11.1%	5.0%	705	-1.2	\$ 95,639	0.5
Florida	5.0%	14.2%	3.3%	22,156	1.9	\$ 61,078	0.8
Georgia	3.5%	12.5%	3.5%	10,820	1.0	\$ 63,673	0.7
Hawaii	7.0%	21.9%	2.1%	1,411	0.3	\$ 85,827	1.4
Idaho	2.9%	11.6%	2.6%	1,849	1.2	\$ 64,034	1.0
Illinois	7.0%	16.5%	3.6%	12,599	0.1	\$ 71,673	1.0
Indiana	4.1%	16.9%	3.2%	6,770	0.2	\$ 59,013	1.0
Iowa	4.1%	11.1%	2.9%	3,157	-0.2	\$ 62,509	0.6
Kansas	3.8%	12.6%	3.2%	2,918	0.1	\$ 64,205	0.8
Kentucky	4.3%	16.9%	4.2%	4,487	0.2	\$ 53,616	0.8
Louisiana	6.2%	13.1%	5.2%	4,650	0.1	\$ 52,989	1.1
Maine	4.9%	9.1%	3.1%	1,351	0.1	\$ 61,314	1.0
Maryland	5.9%	9.0%	3.5%	6,102	0.8	\$ 89,417	1.2
Massachusetts	5.0%	16.4%	2.8%	6,906	0.2	\$ 89,085	1.0
Michigan	4.7%	23.6%	3.7%	9,967	0.0	\$ 61,195	0.6
Minnesota	3.8%	11.3%	3.3%	5,694	0.7	\$ 77,076	0.9
Mississippi	6.0%	15.7%	5.8%	2,969	0.1	\$ 46,735	0.9
Missouri	4.0%	12.5%	3.6%	6,170	0.3	\$ 59,200	0.8
Montana	3.5%	11.9%	3.7%	1,084	0.3	\$ 59,088	1.4
Nebraska	2.2%	7.4%	3.0%	1,938	0.0	\$ 65,439	0.7
Nevada	7.7%	29.5%	3.7%	3,209	2.3	\$ 64,647	-0.4
New Hampshire	3.0%	16.0%	2.6%	1,377	0.8	\$ 79,930	1.1
New Jersey	7.2%	16.6%	3.7%	8,910	0.3	\$ 88,240	0.9
New Mexico	7.2%	12.5%	5.3%	2,111	0.2	\$ 55,269	1.7
New York	7.4%	16.2%	3.9%	19,318	-0.1	\$ 74,429	0.6
North Carolina	4.3%	13.5%	3.6%	10,735	1.3	\$ 59,200	0.7
North Dakota	3.6%	8.7%	2.3%	763	-0.3	\$ 65,322	1.3
Ohio	5.4%	16.4%	4.7%	11,679	-0.1	\$ 60,491	1.2
Oklahoma	3.2%	13.0%	3.1%	3,994	0.3	\$ 56,317	1.6
Oregon	4.9%	13.2%	3.5%	4,290	1.2	\$ 69,056	0.8
Pennsylvania	6.4%	16.2%	5.0%	12,781	0.0	\$ 65,027	1.0
Rhode Island	5.8%	17.4%	4.0%	1,058	0.1	\$ 75,064	1.0
South Carolina	4.2%	11.5%	2.8%	5,251	0.6	\$ 58,447	1.0
South Dakota	2.9%	9.2%	2.9%	892	0.0	\$ 61,046	0.5
Tennessee	4.6%	15.8%	3.9%	6,939	0.8	\$ 57,886	0.6
Texas	5.9%	12.9%	3.7%	29,775	1.4	\$ 66,629	1.5
Utah	2.6%	10.1%	2.5%	3,296	1.4	\$ 78,592	1.2
Vermont	3.0%	14.8%	2.5%	625	0.3	\$ 64,657	1.4
Virginia	4.0%	11.3%	2.5%	8,670	0.9	\$ 79,166	1.1
Washington	5.1%	16.3%	4.1%	7,796	1.3	\$ 80,654	0.4
West Virginia	4.8%	15.6%	5.1%	1,777	-0.4	\$ 51,706	1.8
Wisconsin	3.9%	14.8%	3.3%	5,847	0.2	\$ 66,256	1.0
Wyoming	4.9%	8.5%	4.8%	582	-0.1	\$ 67,304	1.3
Population Weighted Total	5.5%	14.7%	3.8%	331,821	0.7	\$ 69,209	0.9

Sources: FHFA/BLS/U.S. Census Bureau/Freddie Mac/NAR/Moody's Analytics/Arch MI

Housing and Demographic Trends for the 100 Largest MSAs

100 LARGEST METROPOLITAN

	FHFA HPI (% Y/Y)		HOMEOWNERSHIP COST-TO-INCOME RATIO		UNEMPLOYMENT RATE			POPULATION (000s)		MEDIAN HOUSEHOLD INCOME	
	Q2 2021	YEAR AGO	Q2 2021	VS 1990-2003 AVG	AUG '21	COVID PEAK	PRE-COVID (FEB '20)	Q2 2021	% Y/Y	Q2 2021	% Y/Y
New York-Jersey City-White Plains, NY-NJ	8%	3%	47%	-5%	8.6%	18.1%	3.6%	14,181	0.0	\$ 79,073	1.7
Los Angeles-Long Beach-Glendale, CA	11%	4%	73%	15%	10.1%	18.8%	5.0%	10,222	0.9	\$ 74,142	0.7
Houston-The Woodlands-Sugar Land, TX	7%	4%	33%	6%	6.7%	14.2%	3.8%	7,267	1.4	\$ 71,624	1.9
Chicago-Naperville-Evanston, IL	8%	2%	35%	-4%	8.0%	16.4%	3.5%	7,137	0.1	\$ 77,102	0.8
Atlanta-Sandy Springs-Alpharetta, GA	13%	5%	30%	4%	3.5%	12.9%	3.3%	6,146	1.0	\$ 72,800	0.6
Dallas-Plano-Irving, TX	13%	3%	38%	7%	5.2%	12.6%	3.3%	5,226	1.4	\$ 75,372	1.5
Phoenix-Mesa-Chandler, AZ	19%	8%	39%	10%	5.7%	13.5%	4.3%	5,183	2.3	\$ 68,928	0.5
Washington-Arlington-Alexandria, DC-VA-MD-WV	10%	4%	38%	6%	5.0%	10.1%	2.9%	5,015	0.6	\$ 107,041	1.0
Riverside-San Bernardino-Ontario, CA	15%	4%	53%	14%	7.2%	15.3%	4.2%	4,735	0.9	\$ 72,142	0.1
Minneapolis-St. Paul-Bloomington, MN-WI	11%	4%	32%	4%	3.7%	11.8%	3.0%	3,703	0.6	\$ 85,317	0.7
San Diego-Chula Vista-Carlsbad, CA	13%	4%	72%	15%	6.4%	16.0%	3.4%	3,399	0.9	\$ 85,387	0.5
Tampa-St. Petersburg-Clearwater, FL	16%	7%	39%	9%	4.7%	14.0%	3.4%	3,320	1.9	\$ 58,605	0.4
Anaheim-Santa Ana-Irvine, CA	9%	3%	76%	22%	5.7%	14.9%	3.1%	3,234	0.9	\$ 97,496	0.6
Seattle-Bellevue-Kent, WA	14%	4%	54%	13%	5.1%	16.6%	2.6%	3,157	1.3	\$ 101,700	0.6
Denver-Aurora-Lakewood, CO	14%	3%	44%	10%	6.1%	12.3%	2.6%	3,016	0.8	\$ 87,342	0.8
Nassau County-Suffolk County, NY	10%	5%	46%	9%	5.3%	17.5%	3.6%	2,828	-0.1	\$ 115,530	1.5
Oakland-Berkeley-Livermore, CA	11%	2%	67%	3%	6.1%	14.9%	3.2%	2,876	0.9	\$ 110,661	1.0
St. Louis, MO-IL	10%	4%	26%	-2%	4.5%	13.2%	3.4%	2,818	0.3	\$ 68,417	1.3
Baltimore-Columbia-Towson, MD	10%	3%	33%	6%	5.4%	9.2%	3.5%	2,844	0.8	\$ 85,007	1.2
Miami-Miami Beach-Kendall, FL	12%	5%	63%	22%	6.7%	14.9%	2.0%	2,823	1.9	\$ 55,764	0.5
Charlotte-Concord-Gastonia, NC-SC	14%	5%	36%	12%	4.3%	13.7%	3.3%	2,674	1.2	\$ 68,047	1.0
Orlando-Kissimmee-Sanford, FL	12%	5%	40%	10%	5.0%	22.5%	3.3%	2,710	1.9	\$ 62,302	0.0
San Antonio-New Braunfels, TX	11%	4%	36%	8%	5.5%	13.2%	3.3%	2,623	1.4	\$ 63,758	0.8
Warren-Troy-Farmington Hills, MI	11%	4%	28%	-2%	3.6%	23.7%	3.8%	2,572	0.0	\$ 75,449	1.4
Fort Worth-Arlington-Grapevine, TX	13%	4%	32%	5%	5.6%	12.9%	3.3%	2,562	1.4	\$ 72,304	1.1
Portland-Vancouver-Hillsboro, OR-WA	14%	4%	48%	13%	4.7%	13.1%	3.5%	2,552	1.2	\$ 79,908	0.9
Cambridge-Newton-Framingham, MA	10%	4%	52%	3%	4.4%	14.7%	2.5%	2,410	0.2	\$ 100,615	0.9
Sacramento-Roseville-Folsom, CA	15%	4%	47%	9%	6.3%	14.4%	3.7%	2,407	0.9	\$ 78,141	0.4
Las Vegas-Henderson-Paradise, NV	12%	3%	41%	8%	8.7%	33.2%	4.0%	2,371	2.3	\$ 61,153	-0.9
Pittsburgh, PA	10%	4%	24%	-1%	6.3%	16.8%	5.0%	2,317	0.0	\$ 64,587	1.6
Austin-Round Rock-Georgetown, TX	22%	6%	44%	12%	4.2%	12.1%	2.9%	2,290	1.4	\$ 83,087	1.3
Cincinnati, OH-KY-IN	11%	5%	27%	-3%	4.7%	13.5%	4.1%	2,197	0.0	\$ 69,035	1.6
Kansas City, MO-KS	14%	5%	30%	2%	3.9%	13.5%	3.3%	2,169	0.2	\$ 72,376	1.4
Newark, NJ-PA	11%	3%	50%	2%	7.2%	15.5%	3.8%	2,512	0.3	\$ 85,229	1.5
Philadelphia, PA	11%	5%	33%	4%	8.2%	17.4%	5.6%	2,150	0.0	\$ 55,400	2.1
Columbus, OH	13%	5%	32%	0%	4.9%	12.9%	4.1%	2,118	-0.1	\$ 69,161	1.4
Indianapolis-Carmel-Anderson, IN	13%	5%	30%	4%	3.8%	13.2%	2.9%	2,084	0.2	\$ 64,013	1.3
Cleveland-Elyria, OH	12%	5%	28%	-5%	5.3%	21.4%	4.8%	2,044	-0.1	\$ 58,771	1.5
Boston, MA	11%	4%	51%	4%	5.0%	16.5%	2.6%	2,039	0.2	\$ 94,136	1.0
Montgomery County-Bucks County-Chester County, PA	11%	4%	33%	-1%	5.0%	13.8%	4.0%	1,984	0.0	\$ 98,303	2.0
San Jose-Sunnyvale-Santa Clara, CA	4%	-1%	87%	21%	4.6%	12.3%	2.9%	2,027	0.9	\$ 131,518	-0.2
Nashville-Davidson--Murfreesboro--Franklin, TN	13%	5%	33%	4%	3.8%	15.9%	3.1%	1,989	0.8	\$ 72,131	1.3
Fort Lauderdale-Pompano Beach-Sunrise, FL	13%	5%	50%	14%	4.9%	17.2%	3.8%	2,029	1.9	\$ 61,907	0.4
Virginia Beach-Norfolk-Newport News, VA-NC	10%	5%	31%	1%	4.5%	12.6%	2.7%	1,776	0.9	\$ 70,510	0.7
Detroit-Dearborn-Livonia, MI	12%	4%	24%	-3%	5.1%	27.0%	5.1%	1,750	0.0	\$ 52,549	1.4
San Francisco-San Mateo-Redwood City, CA	-1%	-2%	96%	17%	4.7%	12.5%	2.4%	1,678	0.9	\$ 135,546	1.6
Providence-Warwick, RI-MA	14%	5%	42%	0%	5.8%	18.6%	3.8%	1,628	0.1	\$ 73,106	1.3
Jacksonville, FL	13%	5%	34%	5%	4.6%	11.7%	3.3%	1,621	1.9	\$ 67,121	0.6
Milwaukee-Waukesha, WI	11%	4%	41%	6%	4.6%	15.2%	3.5%	1,583	0.2	\$ 67,462	0.9
West Palm Beach-Boca Raton-Boynton Beach, FL	14%	6%	47%	11%	4.5%	14.7%	3.7%	1,555	1.9	\$ 69,055	2.2

Sources: FHFA/BLS/U.S. Census Bureau/Freddie Mac/NAR/Moody's Analytics/Arch MI

Housing and Demographic Trends for the 100 Largest MSAs

100 LARGEST METROPOLITAN

	FHFA HPI (% Y/Y)		HOMEOWNERSHIP COST-TO-INCOME RATIO		UNEMPLOYMENT RATE			POPULATION (000s)		MEDIAN HOUSEHOLD INCOME	
	Q2 2021	YEAR AGO	Q2 2021	VS 1990-2003 AVG	AUG '21	COVID PEAK	PRE-COVID (FEB '20)	Q2 2021	% Y/Y	Q2 2021	% Y/Y
Oklahoma City, OK	10%	5%	24%	0%	3.1%	13.5%	2.9%	1,419	0.3	\$ 62,542	2.1
Raleigh-Cary, NC	12%	4%	33%	6%	3.7%	12.0%	3.1%	1,426	1.3	\$ 82,190	1.4
Memphis, TN-MS-AR	12%	5%	33%	2%	6.4%	13.3%	4.7%	1,371	0.6	\$ 55,773	0.7
Frederick-Gaithersburg-Rockville, MD	10%	3%	39%	2%	5.7%	8.3%	3.1%	1,331	0.8	\$ 111,385	1.6
Richmond, VA	12%	4%	37%	9%	4.3%	11.7%	2.6%	1,316	0.9	\$ 69,315	0.9
New Orleans-Metairie, LA	8%	4%	32%	2%	7.2%	17.0%	4.9%	1,273	0.1	\$ 59,511	3.6
Louisville/Jefferson County, KY-IN	11%	4%	28%	1%	3.8%	16.9%	3.5%	1,303	0.2	\$ 63,141	1.5
Camden, NJ	14%	5%	30%	-3%	7.0%	16.0%	3.8%	1,251	0.3	\$ 83,635	0.6
Salt Lake City, UT	20%	6%	39%	11%	2.7%	10.9%	2.4%	1,267	1.4	\$ 80,932	-0.1
Hartford-East Hartford-Middletown, CT	11%	3%	33%	-5%	7.0%	11.0%	3.7%	1,207	0.1	\$ 78,176	1.0
Buffalo-Cheektowaga, NY	12%	5%	29%	0%	5.9%	20.7%	4.4%	1,126	-0.1	\$ 61,862	1.2
Birmingham-Hoover, AL	11%	5%	32%	-1%	2.8%	11.8%	2.4%	1,159	0.2	\$ 60,397	2.0
Grand Rapids-Kentwood, MI	15%	5%	30%	5%	3.9%	21.0%	2.7%	1,075	0.0	\$ 67,830	1.5
Rochester, NY	13%	4%	28%	0%	5.6%	15.8%	4.3%	1,068	-0.1	\$ 64,074	1.4
Tucson, AZ	16%	7%	39%	4%	6.3%	13.9%	4.7%	1,097	2.3	\$ 56,959	0.7
Tulsa, OK	11%	5%	28%	2%	3.3%	13.7%	3.1%	1,005	0.3	\$ 60,254	2.5
Fresno, CA	14%	4%	46%	11%	9.2%	16.6%	7.3%	1,017	0.9	\$ 58,588	0.5
Urban Honolulu, HI	4%	2%	73%	5%	6.6%	19.4%	2.0%	980	0.3	\$ 89,008	1.0
Omaha-Council Bluffs, NE-IA	12%	4%	29%	2%	2.6%	8.8%	3.1%	950	0.0	\$ 71,360	0.3
Worcester, MA-CT	14%	5%	39%	0%	5.4%	15.0%	3.1%	951	0.2	\$ 77,541	0.5
Bridgeport-Stamford-Norwalk, CT	13%	2%	51%	-14%	7.0%	11.6%	3.7%	945	0.1	\$ 100,449	2.0
Greenville-Anderson, SC	11%	5%	32%	0%	3.8%	11.8%	2.5%	932	0.6	\$ 60,452	1.4
Albuquerque, NM	13%	5%	35%	0%	6.8%	12.2%	4.9%	922	0.2	\$ 61,405	1.8
Tacoma-Lakewood, WA	18%	8%	45%	12%	5.1%	18.1%	5.4%	929	1.3	\$ 80,397	0.3
Bakersfield, CA	14%	5%	46%	14%	10.4%	18.1%	8.1%	917	0.9	\$ 53,402	0.6
Albany-Schenectady-Troy, NY	9%	4%	29%	-4%	5.0%	13.5%	3.7%	879	-0.1	\$ 75,753	1.5
Knoxville, TN	15%	6%	32%	1%	3.9%	14.1%	3.7%	906	0.8	\$ 57,717	0.7
McAllen-Edinburg-Mission, TX	8%	6%	23%	-4%	9.2%	17.8%	6.8%	893	1.4	\$ 41,659	-0.8
Lake County-Kenosha County, IL-WI	8%	2%	30%	-8%	5.2%	15.7%	3.4%	868	0.1	\$ 86,878	1.0
Baton Rouge, LA	5%	3%	28%	1%	5.7%	12.1%	4.8%	835	0.1	\$ 62,192	1.3
North Port-Sarasota-Bradenton, FL	15%	5%	41%	8%	4.4%	14.8%	3.3%	870	1.9	\$ 67,690	1.4
New Haven-Milford, CT	14%	3%	38%	-3%	7.5%	11.3%	4.0%	856	0.1	\$ 70,499	0.7
Columbia, SC	12%	4%	29%	1%	4.0%	9.0%	2.7%	849	0.6	\$ 56,747	1.3
Allentown-Bethlehem-Easton, PA-NJ	13%	4%	31%	-2%	6.5%	17.0%	4.8%	845	0.0	\$ 72,987	1.3
El Paso, TX	12%	3%	33%	2%	6.3%	14.4%	3.6%	868	1.4	\$ 49,923	0.6
Oxnard-Thousand Oaks-Ventura, CA	11%	3%	65%	15%	5.8%	14.7%	3.8%	861	0.9	\$ 94,381	1.0
Charleston-North Charleston, SC	13%	4%	36%	4%	3.9%	11.6%	2.3%	812	0.6	\$ 73,319	1.5
Dayton-Kettering, OH	12%	5%	27%	-1%	5.5%	15.5%	4.5%	806	-0.1	\$ 58,497	1.4
Cape Coral-Fort Myers, FL	16%	6%	39%	12%	4.6%	15.2%	3.5%	801	1.9	\$ 63,739	1.0
Greensboro-High Point, NC	12%	5%	32%	-1%	5.0%	15.6%	3.9%	792	1.3	\$ 52,585	0.8
Boise City, ID	29%	10%	42%	13%	2.8%	12.2%	2.5%	767	1.2	\$ 68,470	0.7
Stockton, CA	18%	3%	52%	14%	8.4%	17.5%	6.0%	776	0.9	\$ 70,015	0.4
Elgin, IL	9%	2%	28%	-6%	5.9%	16.9%	3.7%	768	0.1	\$ 86,539	0.8
Colorado Springs, CO	17%	7%	38%	7%	6.2%	12.6%	3.2%	758	0.8	\$ 73,164	0.1
Little Rock-North Little Rock-Conway, AR	9%	3%	23%	-2%	4.4%	10.6%	3.6%	750	0.5	\$ 57,872	0.7
Lakeland-Winter Haven, FL	14%	7%	36%	9%	5.4%	18.4%	4.2%	753	1.9	\$ 51,944	0.4
Wilmington, DE-MD-NJ	11%	4%	33%	1%	5.5%	12.3%	4.4%	733	0.6	\$ 77,928	1.6
Des Moines-West Des Moines, IA	9%	2%	29%	3%	3.9%	12.1%	2.8%	660	-0.2	\$ 71,344	0.5
Gary, IN	13%	5%	28%	2%	6.1%	19.7%	4.6%	707	0.2	\$ 63,333	0.7
Akron, OH	11%	4%	26%	-2%	5.7%	14.7%	4.7%	702	-0.1	\$ 58,010	1.4

Sources: FHFA/BLS/U.S. Census Bureau/Freddie Mac/NAR/Moody's Analytics/Arch MI



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The Private Securities Litigation Reform Act of 1995 provides a "safe harbor" for forward-looking statements. This release or any other written or oral statements made by or on behalf of Arch Capital Group Ltd. and its subsidiaries may include forward-looking statements, which reflect our current views with respect to future events and financial performance. All statements other than statements of historical fact included in or incorporated by reference in this release are forward-looking statements.

Forward-looking statements can generally be identified by the use of forward-looking terminology such as "may," "will," "expect," "intend," "estimate," "anticipate," "believe" or "continue" or their negative or variations or similar terminology. Forward-looking statements involve our current assessment of risks and uncertainties. Actual events and results may differ materially from those expressed or implied in these statements. A non-exclusive list of the important factors that could cause actual results to differ materially from those in such forward-looking statements includes the following: adverse general economic and market conditions; increased competition; pricing and policy term trends; fluctuations in the actions of rating agencies and the Company's ability to maintain and improve its ratings; investment performance; the loss of key personnel; the adequacy of the Company's loss reserves, severity and/or frequency of losses, greater than expected loss ratios and adverse development on claim and/or claim expense liabilities; greater frequency or severity of unpredictable natural and man-made catastrophic events, including pandemics such as COVID-19; the impact of acts of terrorism and acts of war; changes in regulations and/or tax laws in the United States or elsewhere; the Company's ability to successfully integrate, establish and maintain operating procedures as well as consummate acquisitions and integrate the businesses the Company has acquired or may acquire into the existing operations; changes in accounting principles or policies; material differences between actual and expected assessments for guaranty funds and mandatory pooling arrangements; availability and cost to the Company of reinsurance to manage the Company's gross and net exposures; the failure of others to meet their obligations to the Company; changes in the method for determining the London Inter-bank Offered Rate ("LIBOR") and the potential replacement of LIBOR and other factors identified in the Company's filings with the U.S. Securities and Exchange Commission ("SEC").

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