



AMERICA'S NEEDED HOUSING CONSTRUCTION

January 2023

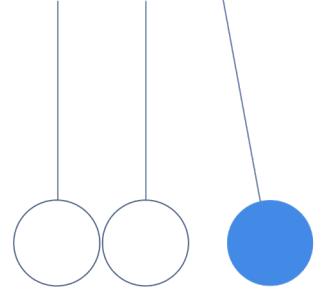


Chris Porter
Senior Vice President, Chief Demographer



JOHN BURNS
REAL ESTATE CONSULTING

Prepared exclusively for JBREC: Rob Flint



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Executive Summary

The Answer for Business Leaders and Investors

The long-term demand for housing in the US is solid, with an estimated 17.1 million additional housing units—single-family, multifamily, and manufactured housing combined—needed between 2020 and 2030 to meet the expected demand. This demand is driven by:

- the net change in households due to demographics,
- second homes and replacement housing, and
- the need to bring demand and supply to more balanced levels, after several years of demand for housing outpacing the available supply.

Projected Housing Demand

July 1, 2020 to July 1, 2030



+ **12.7 Million**
Households Formed



+ **500 Thousand**
New Second Homes



+ **2.3 Million**
Teardowns



+ **1.7 Million**
Undersupplied Homes

This last point—the demand and supply imbalance in the US—is a much debated topic, with a wide range of estimates from a variety of perspectives. We estimate that the US is undersupplied by 1.7 million homes, given current levels of household formations.

Additionally, many others' calculations of the undersupply of housing have included an estimate of delayed household formations relative to expected household formation by age, based on a historical norm. These delayed household formations are the result of societal shifts—a category that can include young adults living with their parents longer, people getting married later, changes in divorce rates, etc. This shortfall of households is sizable and can vary widely depending on the base year used for comparison. For 2020, we estimated:

- 1.5 million fewer households than expected if households-by-age demographic assumptions from 1970 were used
- 5 million fewer households than expected if year 2000 assumptions were used

Housing affordability plays a significant role in why households have not formed at the same rate as in the past. While affordability is not the focus of this analysis, we do believe that if the housing industry could profitably build more attainable homes in places that people want to live, that would surely induce household formation and thus housing demand.

Our clients, who are making business decisions based on the amount of construction that will actually occur, are more focused on demand that could realistically be met with supply.

While not dismissing the shortfall of household formations, our analysis turns to understanding the 1.7 million undersupply of total housing units relative to the households that have formed. With dramatic declines in vacancy rates due to particularly strong demand, rents and home prices accelerated. The most undersupplied markets are those that grew rapidly during the pandemic and where even a growing supply of new construction was challenged to keep up with the rise in demand.

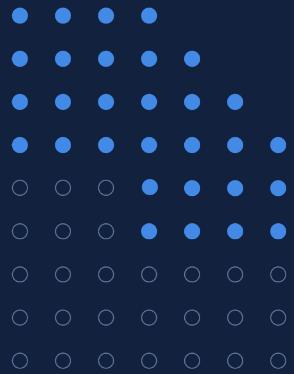
Looking Forward

With the rise in mortgage rates and inflation in 2022—and the looming threat of recession—housing demand has begun to slow, at a time when construction levels are catching up. The relative level of undersupply looks different at 3% mortgage rates than at 7%, given the quick swing in affordability measures. Monitoring supply and demand fundamentals at the local level both in the short term and with a longer-term perspective will help business leaders navigate the next phase of the housing cycle.

From 1970 to 2020, net housing demand has averaged 15.3 million units per decade and has been less lately. Net housing demand ranges from 19 million in the 1970s to 11–13 million in the 2000s and 2010s.

We believe the demand for housing will be higher in the 2020s, at 17.1 million units, than the 2010s due to:

- **Households formations:** Slower overall adult population growth, but growth in the right age categories, and a recent societal shift that has placed more emphasis on the home and household formation
- **Second homes:** Likely higher now due to work from anywhere
- **Teardowns:** Challenging to calculate but trending up due to aging housing stock
- **Vacancies:** A need to bring housing from an undersupplied situation to more balance



AMERICA'S NEEDED HOUSING CONSTRUCTION



America's Needed Housing Construction

The US has undersupplied total housing demand—including single-family, multifamily, and manufactured housing—by 1.7M units.

Combined with the need for housing due to demographic demand, second-home demand, and replacement housing, the need to bring demand and supply back into balance because of this undersupply means that the US will need to construct 17.1M housing units over the 10 years from 2020 to 2030.

Projected Housing Demand

July 1, 2020, to July 1, 2030



+ **12.7 Million**
Households Formed



+ **500 Thousand**
New Second Homes



+ **2.3 Million**
Teardowns



+ **1.7 Million**
Undersupplied Homes

The strong demand dynamics that emerged as the pandemic began in early 2020 coupled with challenges in getting supply to market have led to an increasing undersupply of housing across the board. Very few housing markets feel oversupplied today, especially when one considers:

- High occupancy rates and rising rents in apartments and single-family rental homes
- Extremely low available supply and rapidly rising prices in the existing home and new construction segments

However, while the debate over housing demand and supply has escalated during the pandemic, the focus has largely been on the national estimate. Different local housing dynamics mean the balance between these two housing fundamentals do not play out the same everywhere.

- If land or regulatory constraints limit the amount of new construction that can be brought to market in areas where people do want to live, housing may be permanently undersupplied and cause prices/rents to climb.
- If there is an oversupply of homes in places that people do not wish to live, it will be more challenging to restore the balance.

The goals of this paper are to:

- Illustrate the balance of demand and supply dynamics nationally
- Explain the delay in household formations that many groups have used to reach a much higher level of undersupply, comparing actual household growth with a calculation of how many household might have formed using demographic estimates based on historical trends
- Show at a local level our best estimate of where this demand and supply imbalance exists today
- Forecast the demand and supply dynamics nationally, including a long-term outlook for construction needed to meet the demand from demographic and other factors



Beware Policy Advocate Undersupply Calculations

The undersupply calculation is different for policy advocates who have different intents than business people, who need to plan for demand that can be satisfied under current laws.

Policy Advocates

Numerous papers and press releases have attempted to calculate the undersupply of US housing, and the numbers seem to continually get larger and larger: 4 million. 5 million. 6 million.

Many of these analyses have been conducted by housing policy groups to advocate for more construction—particularly more affordable construction in expensive areas where rents and home prices are high because demand is high and supply is low.

We certainly applaud the advocacy for attainable workforce and low-income housing and understand the assumptions used in these estimates. However, we believe that many of these estimates may not fully consider the practical realities of land availability and financial feasibility of development in the desired locations, both of which will constrain the amount of housing that can be brought to market.

These estimates also tend to focus on the number of households that, based on historical rates of household formation by age, might have formed but have not for a variety of reasons, namely societal shifts, which we address later in this paper.

In our view, these estimates of the undersupply tend to be on the high side, call for more supply in expensive areas, and often have a low correlation to what will actually get built. Business people should not use them.

Business People

Business people—including home builders, rental developers, building product manufacturers, financial institutions, and construction service providers like us—want to plan, with confidence, for how much more construction is needed and will likely be built, so they can plan for the future. They realize that significant supply is unlikely to be added in land-constrained areas without significant government intervention and subsidy, including zoning shifts.

Business people are most focused on:

- **Adult population growth:** How many homes will need to be built for the growing adult population, including immigrants?
- **Migration to areas where homes can be built:** Where will the growth occur, including where will people relocate that will result in the need for more construction?

As a result, business people will likely have a lower undersupply calculation that will be based on the reality of what *can* be built.

Given that our clients are on the business side of housing and our goal is to help them make more informed decisions, our focus is on the demand that could realistically be met with supply. At the same time, we realize that regulatory, financial, and affordability constraints can limit the supply in the places where housing demand is highest. Absent of some of these constraints, the ability to produce more attainable housing supply could induce additional housing demand.



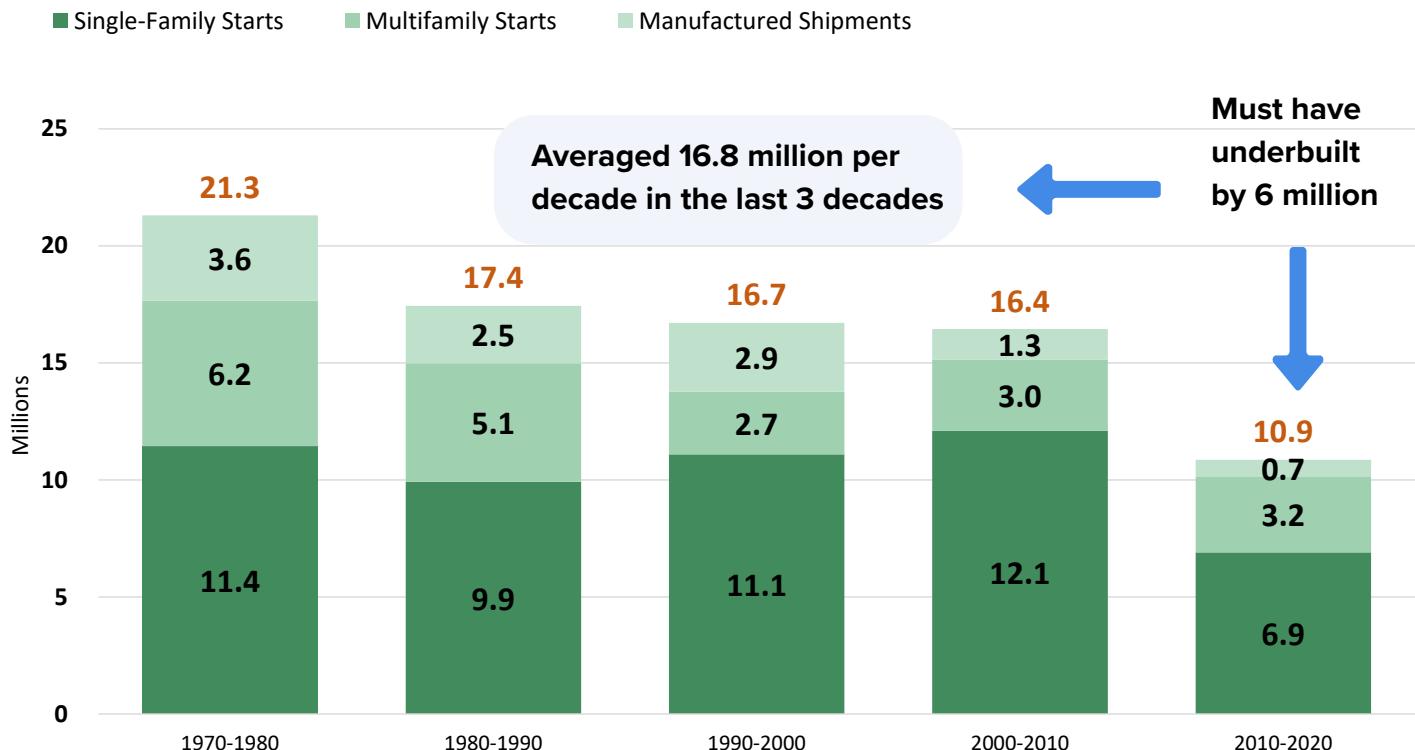
Misleading Themes in Demand/Supply Analysis

Some very simple math can lead to an errant conclusion that the US built 6 million too few homes from 2010 to 2020:

- After three decades of housing starts and manufactured housing shipments that averaged 16.8M per decade, new supply added just 10.8M from 2010 to 2020.
- Therefore, some conclude that the US underbuilt by 6M units in the 2010s.

At first glance, the following chart looks reasonable.

Construction Activity by Decade



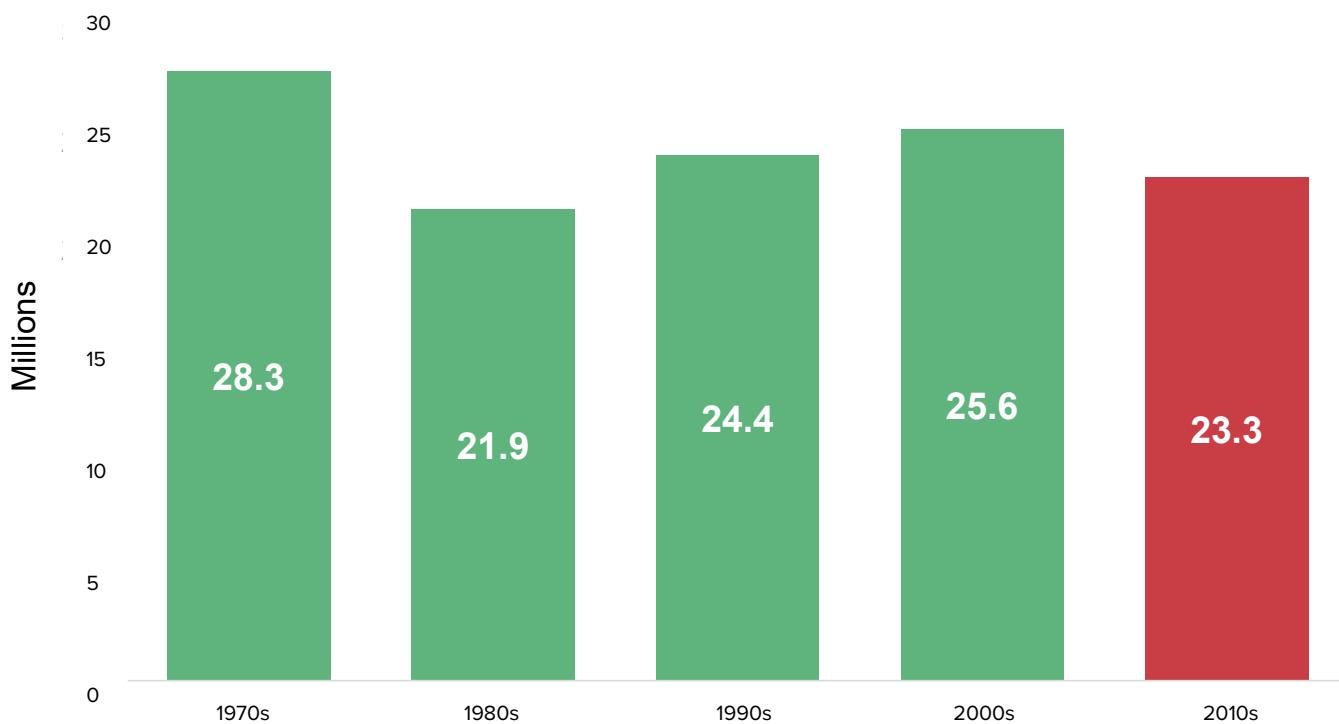
Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data
Adjusted for Decennial Census dates

We believe several recurring themes in this simple calculation will prove to be fatal flaws:

- **Flaw 1: Ignoring our slowing population growth**

- **Reality:** The US adult population grew by 2.3M fewer people from 2010–2020 than in the prior decade and thus needed approximately 1.1M fewer homes built than during the prior decade based on population growth alone. The adult population began growing much more slowly since 2008 for a variety of reasons. The most overlooked reason is the increasing deaths among members of the baby boom that began in the 1940s. We project the adult population to continue to grow at very low levels.

Growth of Population Aged 18+

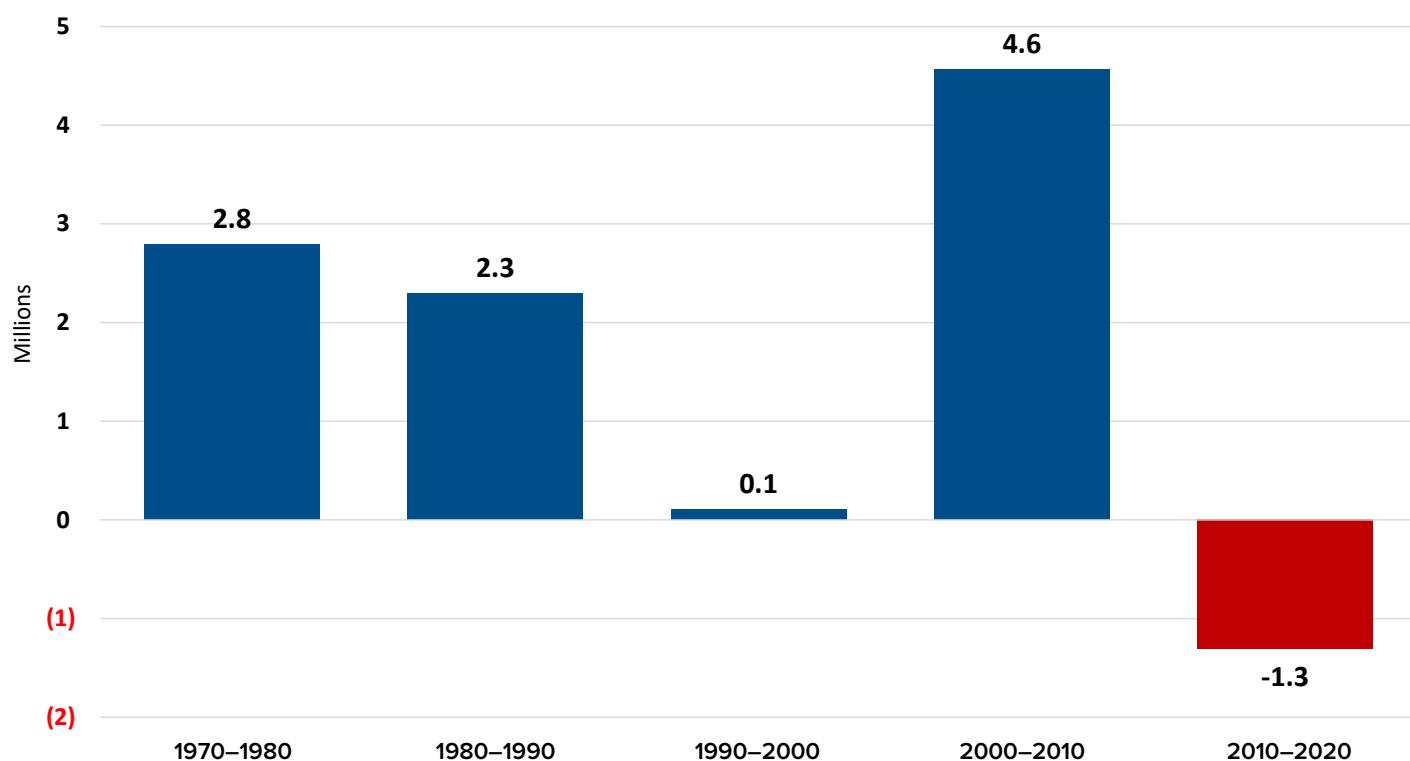


Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

- **Flaw 2: Ignoring the oversupply from the prior decade**

- **Reality:** The US overbuilt by 3.2M homes from 2000–2010 (primarily from 2000–2008, so not due to foreclosures after the Global Financial Crisis), supported by these facts:
 - ◆ The number of vacant homes rose by 4.6M that decade.
 - ◆ Mortgage payments and rents grew less than incomes during that decade.

10-Year Change in Vacant Homes



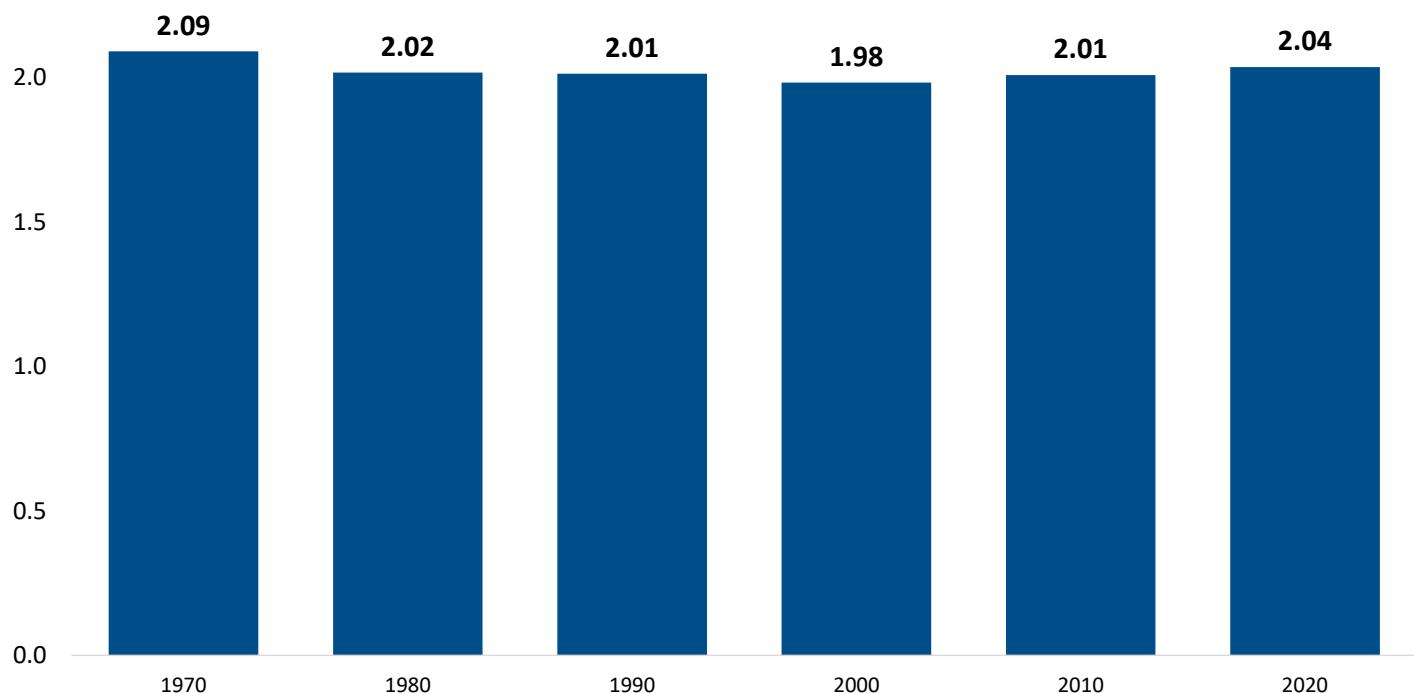
Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data
Adjusted for Decennial Census dates

Note that vacancy surged by 4.6 million homes from 2000 to 2010 and then fell by 1.3 million in the following decade as demand for 1.3 million homes from 2010–2020 was satisfied by supply that had been created the decade prior.

- **Flaw 3:** Ignoring that desirable, expensive areas have very little land left
 - **Reality:** The most desirable and expensive places to live have become even more expensive, in large part because of lack of raw land. The “lack of supply” issues are not a new thing; they have been unsolvable for decades:
 - ◆ **Land constraints:** There is very little raw land.
 - ◆ **Traffic:** Local residents oppose residential construction primarily due to fear of more traffic.
 - ◆ **High construction costs:** High-density construction in urban areas is expensive.
 - ◆ **Regulatory hurdles:** Well-intentioned environmental and construction regulations have increased the cost and time to build in these areas.

If the US had been undersupplying the market by millions of homes, the adult population per household would be rising significantly. In reality, the number of adults per household has not changed significantly since 1980 (and even remains much lower than before the GI Bill, when Americans lived much more multigenerationally).

Adult (18+) Population per Household



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

Big, expensive cities like New York and San Francisco have higher ratios of adults per household due in large part to the high costs of housing relative to incomes. The introduction of additional housing supply at more attainable price points—whether for sale or for rent—could help to reduce this crowding and induce more housing demand, but profitably building in these areas at more attainable price points poses a serious challenge. One cannot conclude from looking at decades of adult population per household stats that America is massively undersupplied. Our estimate of 1.7 million homes undersupplied is 1.2% of the US housing stock.



Household Formations and the COVID-19 Pandemic

Leading up to 2019, housing was not undersupplied nationally, at least for the households that had formed by that point. A housing undersupply would result in three things:

- **Homes would become more crowded.**
 - In reality, the adult population/household has been relatively flat at 2.0+/-adults/household for 40 years.
- **Vacancy rates would decline below historical averages.**
 - In reality, coming off elevated levels spilling over from the housing bust of the late 2000s, the share of homes in the US that were vacant remained higher than the historical average for a normal housing market.
- **Housing would become very unaffordable in relation to history.**
 - Prior to 2020, no matter what start date you pick since 2000, rents had risen at approximately the same rate as incomes, and mortgage payments had risen less than incomes. This fact is widely disbelieved until you study the data and also ask those who bought their first home decades ago what it felt like then. It was expensive, and these locations were often very far from the employment centers at the time.

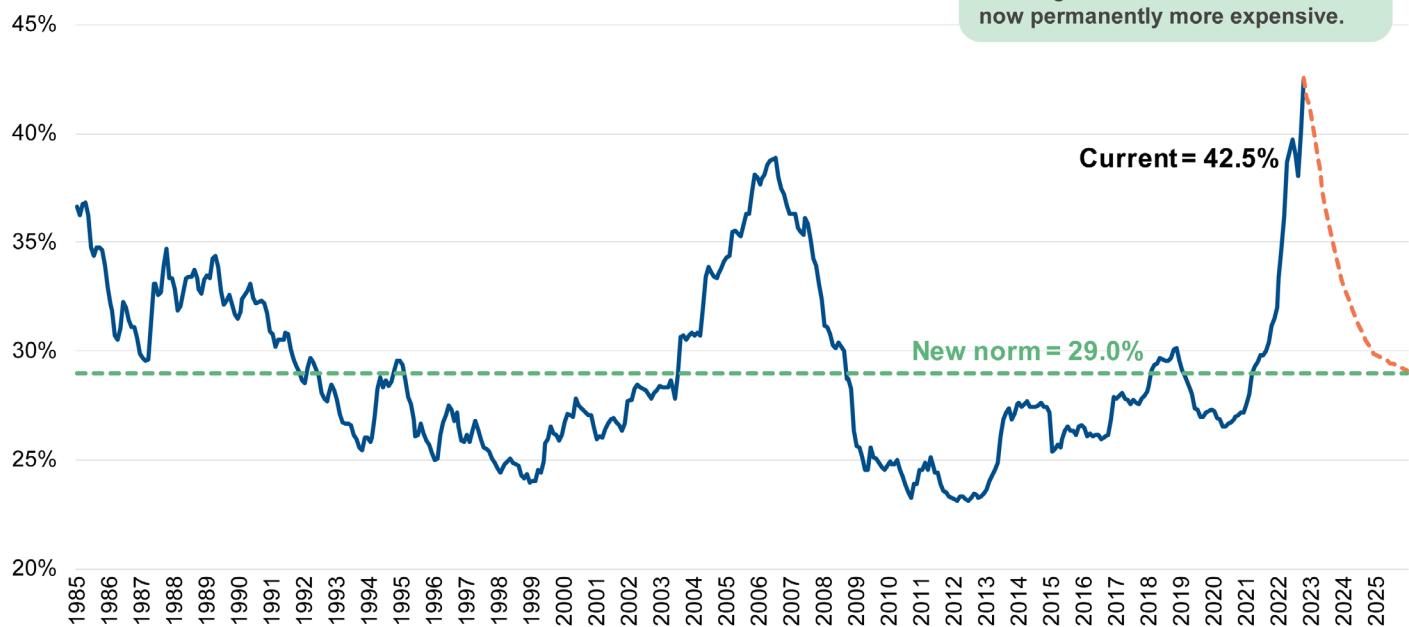
Our CEO, John Burns, likes to tell the story of his grandfather, who purchased a home in Marin County, north of San Francisco, on his post office salary. While the home was sold for a huge gain many decades later, it is important to remember that his grandfather took the ferry to San Francisco until the Golden Gate Bridge was built.

- By 2019, our Burns Affordability Index, which measures the housing-cost-to-income ratio for for-sale housing in each market, had only returned to approximately the long-term intrinsic value—both nationally and for most markets by 2019, well below the peaks of the mid-2000s.*

Burns Affordability Index

Housing-cost-to-income ratio

Our New Norm Intrinsic HC/I ratio reflects fundamental shifts in the housing market, which we believe is now permanently more expensive.



Source: John Burns Real Estate Consulting, LLC, (Data: Oct-22; Pub: Nov-22)

*To arrive at the housing-cost-to-income ratio, we divide the median monthly housing cost by 125% of the median income. Housing cost assumes the purchase of a home equal to the median-priced existing home with a 10% down payment and a 30-year, fixed-rate mortgage. Payment includes PITI (principal, interest, taxes, and insurance) plus mortgage insurance. We compare against an intrinsic ratio, using a long-term trend of the housing-cost-to-income ratio, with an emphasis on recent history and our forecasts. We calculate an intrinsic adjuster—the spread between the intrinsic housing-cost-to-income ratio and the historical median ratio—which is representative of fundamental shifts in several markets we feel are now permanently more/less expensive due to increased/decreased demand or limited supply.

Housing affordability discussions have occurred for decades. Time Magazine's cover story on September 12, 1977, was "Sky-High Housing: Building Up, Prices Up." This article appeared when mortgage rates were 9% and then rose significantly the next several years.



The COVID-19 pandemic unleashed strong renter and owner household formation that we believe pulled forward demand from future years.

From 2007 to 2013, household formations collapsed while the Global Financial Crisis unfurled, as young adults either remained in or moved back into their parents' homes, and more "doubling up" occurred as people took on roommates amid a rough economy. This is typical behavior during a declining economy.

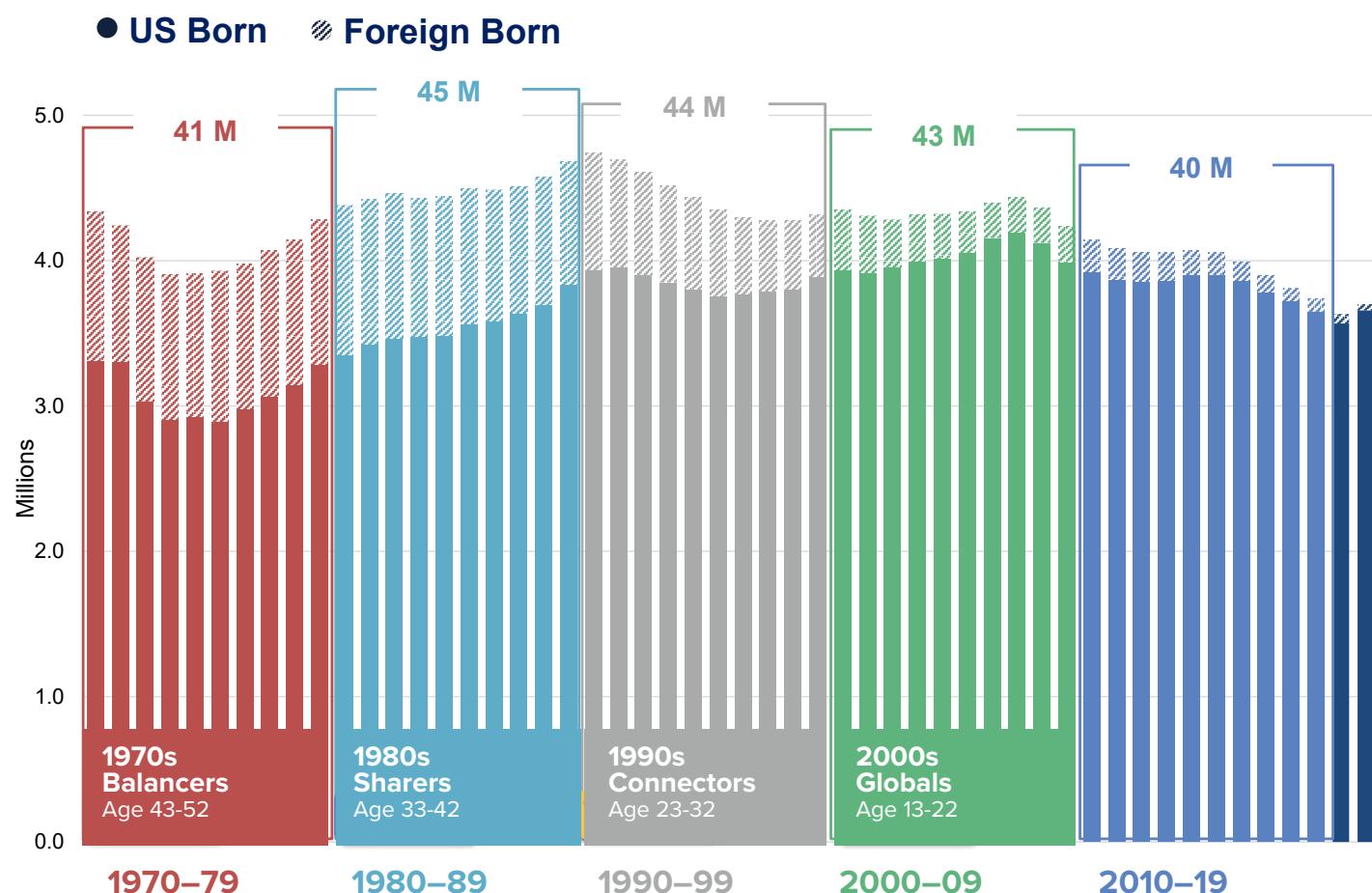
Household formations began to improve gradually over the next several years as the economy improved, job growth returned, and some of the pent-up demand from younger adults began to unleash. By 2019, we estimate that annual net household growth had returned to approximately 1.3 million from levels that hovered around 0.5–0.6 million from 2008–2011.

As the COVID pandemic sent the economy into a whirlwind in early 2020, household formation initially appeared to compress, with doubling up occurring as people weathered the loss of jobs and stay-at-home policies. However, as the pandemic progressed and the role of the home took on more importance, household formation looked stronger than might be expected for an era of such massive job losses, due to a number of factors, primarily:

1. **Young adult population surge:** A temporary surge in millennial household formation and home buying was driven by:
 - The population surge of those born in the early 1990s (now in their late 20s to early 30s), many of whom were forming households later than their parents did
 - A strong economy and record-low mortgage rates. The ability to lock in a record-low rate—even if prices were high—represented the buying opportunity of a lifetime for some, and a fear of missing out certainly fueled some of the household formation.
 - Stimulus checks and forced reductions in spending, which helped accelerate housing demand as well

2021 US Population by Year Born

Millions



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

2. Living-at-home mandates: The COVID crisis forced people into their houses, where they didn't have enough space and privacy to satisfy their needs. Work-from-home initiatives provided more of them the incentive to move to areas where they could afford their own household, rather than living with others. This has changed the locations of home demand permanently.

A tremendous surge in nearly all categories of housing demand created a surge in household formations during 2020 and 2021. Look at the evidence:

- Months of resale housing supply—typically 4 to 5 months of supply in a normal housing market—fell to less than 1 month of supply in most major MSAs.
- Unsold standing new home inventory—typically 1.5 to 2 homes per community in a normal housing market—fell as low as 0.25, based on our monthly survey of home builders. That means one unsold, completed home for every 4 new home communities!
- Home prices skyrocketed, with strong double-digit gains across the country.

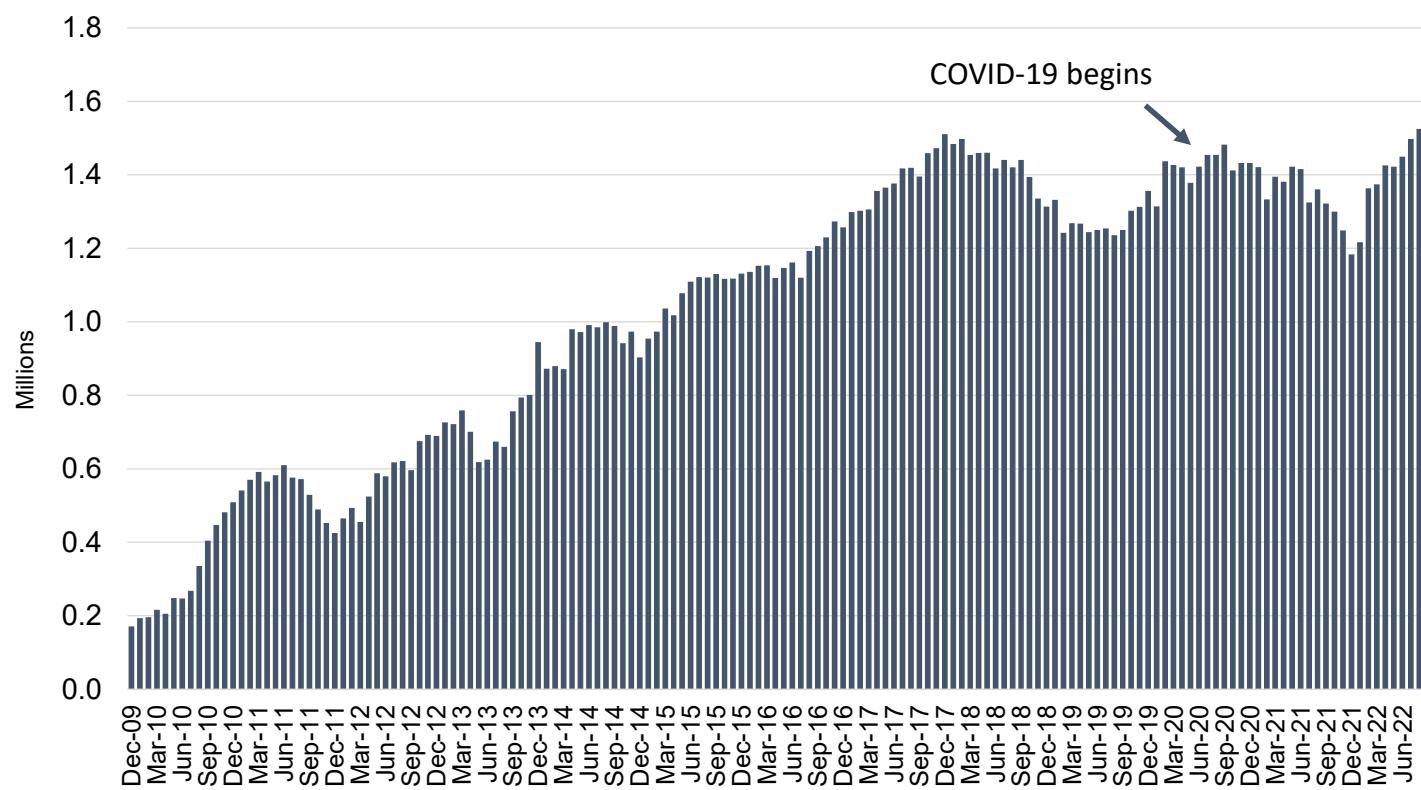
- Apartment occupancy rates rose to an all-time high, and single-family rental home occupancy rates rose to their highest levels since the mid-1990s.
- The demand for apartments massively outstripped the amount of new supply, and volume-wise the annual increase in leased apartments was significantly higher in 2021 than in any of the prior 20 years, according to RealPage.
- Altruistic policies like forbearance and eviction moratoriums provided some relief for households that might otherwise have had to double up due to the financial stress and job loss during the pandemic. Without those policies in place, the US would likely have seen a greater drag on net household formations.

We also point to the growth in residential utilities customers, which was very strong in 2017 and 2018, softened in 2019, and then strengthened in 2020 and 2021. The utilities customer data includes second homes as well, so it may have received a boost as a result of increased second-home demand. But the fact that growth remains solid also suggests strong household growth.

Additionally, roommates splitting up for better work-from-home environments likely also contributed to household formations. Publicly traded multifamily REIT AvalonBay Communities reported in its earnings report on its observed “de-densification” trend, watching the number of adults per unit decline 10% from the historical pre-pandemic average of 1.8 to 1.6 in Q1 2022 across 50,000 apartments. Publicly traded multifamily RETI UDR echoed that experience, with adults per apartment falling from 2.1 to 1.8.

Increase in Residential Electric Customers

YOY, rolling 12 months



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data



The Household Shortfall Conundrum

Despite the pickup in household formation during the pandemic, the number of households in the US today remains approximately 5 million below where historical trends suggest it could be.

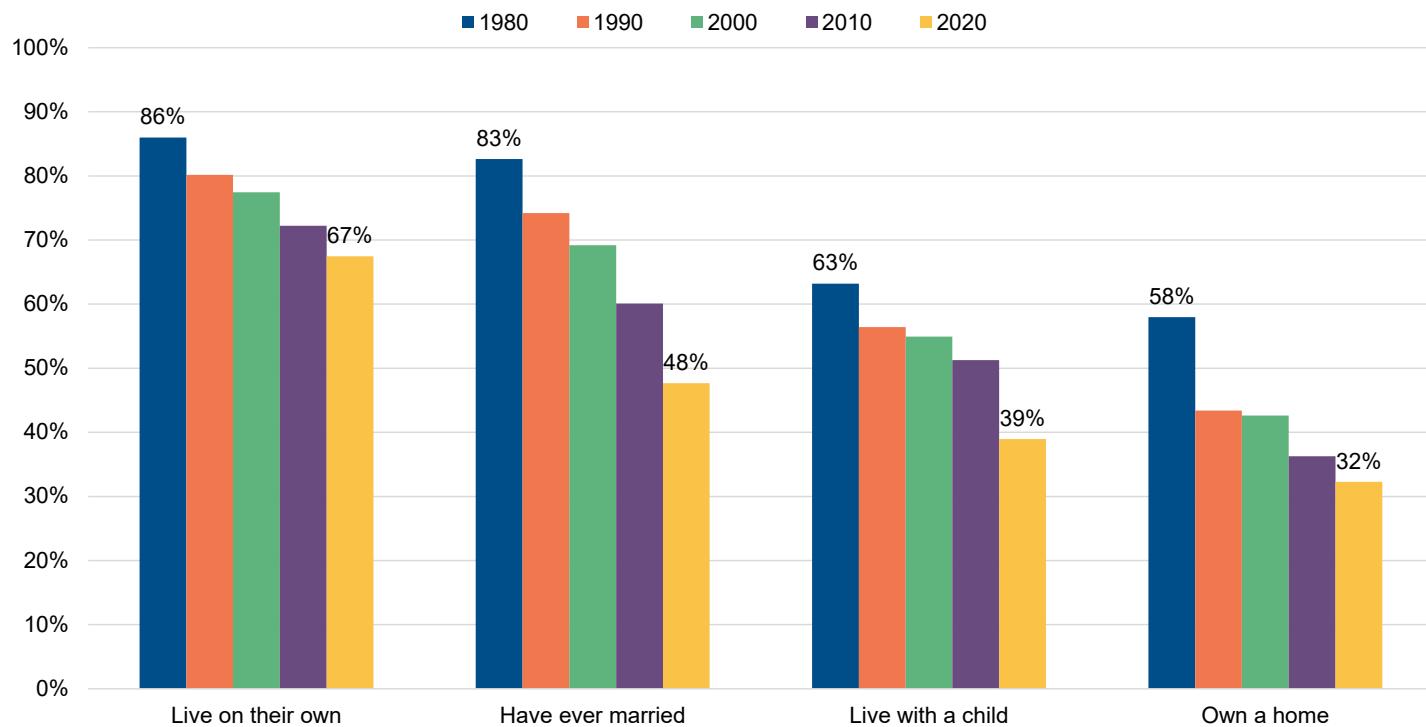
Much of the analysis on the housing shortage in the US—particularly those with undersupply estimates of 4 million or more—have included in those estimates the number of households that seemingly should have formed based on the size and age of the adult population measured against historical rates of household formation by age.

While not the explicit focus of this analysis, we did want to address it, given that much attention has been drawn to these higher numbers. A multitude of reasons can explain why household formations—mostly for younger adults—have not maintained the same relative level as in the past, including:

- More investment of time into higher education has delayed household formation, and the accompanying student loan debt has certainly contributed to this delay as well.
- Societal shifts that have made living in someone else's household—roommates, young adults living with parents later in life—more common. Getting married and having children, both of which are correlated with household formation, are happening later as well.
- Housing affordability has contributed to the shortfall of household formation as well. As housing costs have become a larger share of incomes, it is hard for younger adults to make the leap from living with others to living on their own.

The societal shifts noted above are not a new phenomenon. The graph below shows that the shifts in traditional milestones of adulthood—moving out, getting married, having children, owning a home—have increasingly been delayed for decades. While these shifts were magnified in the press for the millennial generation, who was coming of age at the time of the Global Financial Crisis, in reality these are much longer-standing trends. (It is worth noting that, even though these milestones may be reached later in life compared to prior generations, they are still largely being reached eventually—just delayed.)

Percentage of 30-Year-Olds Hitting 'Adult' Milestones

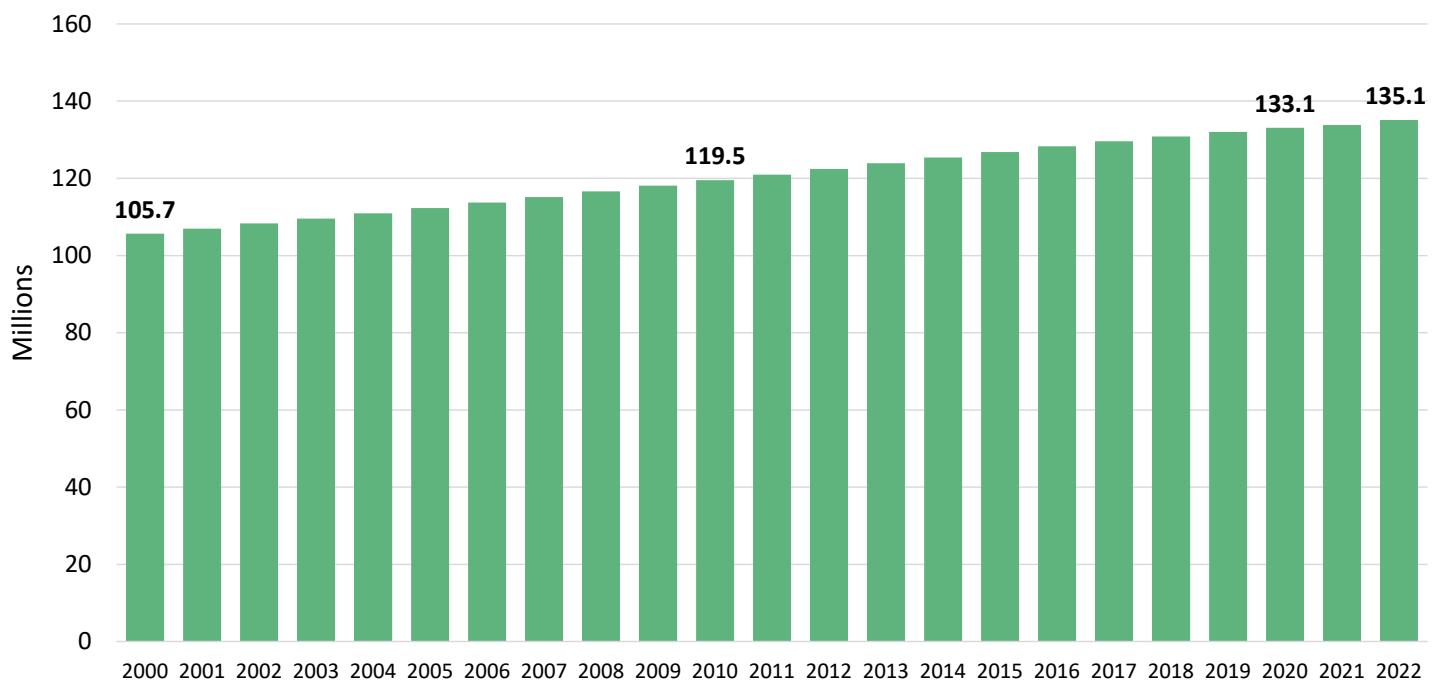


Sources: U.S. Census Bureau; John Burns Real Estate Consulting, LLC, (Data: 2020)

We estimate that there are approximately 5 million fewer households today than should have formed, based on demographic assumptions from the year 2000. While the shortage can vary depending on which year's assumptions are used as the basis of comparison, the totals are in the millions, and some common themes emerge:

- The majority of the shortfall in household formation occurs within the young adult population.
- The shortfall of young adult households is somewhat offset by older households, who are living longer and are more likely to live independently later in life, maintaining their own household.

Total Number of Households Formed if the Headship Rate by Age Had Remained Consistent since 2000



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

This shortfall of household formation relative to history is a tailwind for housing's future.

The top 50 largest metropolitan areas/divisions in the US account for approximately 2.8 million of the shortfall of 5 million households. We estimated the shortfall in households by applying metro-level headship rates—the share of the population that heads a household—from 10-year age cohorts in the 2000 Decennial Census to the population by age in 2022. In actuality, a number of metro areas in the US—including several in the top 50—have more households than might be expected based on these historical assumptions, but the net number across the US implies an overall shortfall.

The metro areas where households fell short the most on a percentage basis are topped by California markets, where the high cost of living is a significant factor in peoples' ability to form a household—particularly young adults. Generally speaking, markets with a relatively lower cost of living, including a number of Midwest markets, tend to have household counts more in line with expectations. Two notable exceptions where relatively expensive markets have household counts relatively in line with expectations: the New York and San Francisco metro divisions.

A list of the 50 largest housing markets by household shortfall is available on pages 48–49 in the Appendix.



Housing Undersupply/Oversupply by Metro Area

Another measure of the housing under/oversupply is the vacancy approach—comparing current rates of housing vacancy rates by market with historical norms. We estimate that as of July 2022 there are 1.7 million fewer vacant housing units nationally than normal relative to the number of current households.

While important to put the national picture into perspective, what really matters are the local dynamics: if housing is very undersupplied in the markets where people are moving to and significantly oversupplied in markets people are leaving, then a net national number holds little value.

Estimating the level of undersupply/oversupply in a market is challenging, given a lack of consistent, real-time information at the metro level on household formations and vacancies. (See *Data Challenges* in the Appendix.)¹

Housing needs a certain level of vacancy for markets to be efficient, as there needs to be a certain level of homes available for sale or for rent to give consumers options and keep affordability in check. A market with a high rate of net household formation relative to new supply added reduces the vacancy rate, driving up prices at an accelerated pace.

The best measure of vacancy at the metro level is from the Census Bureau's Decennial Census data, filling in the interim years through a combination of total housing unit estimates (based on Census Bureau estimates) and household formation estimates.² Vacancy rates can vary significantly by market, so we looked at each market's own history, rather than assuming a single rate of vacancy for all markets.

For most markets, vacancy rates came down from excess levels measured by the 2010 Decennial Census to the 2020 Decennial Census, as the economy improved over those 10 years, household formations recovered, and housing construction gradually ramped up.

¹These are our best estimates using the best data we can find from the Census Bureau. We do not believe the data is 100% accurate; that would be almost impossible for a huge number of reasons, including that people are moving all the time and that the most recent Decennial Census was taken on April 1, 2020, during the initial stages of the COVID-19 pandemic shutdown, making it very difficult to know who was living where, when.

²At the local level, the Census Bureau does not provide annual household estimates consistent with the methodology used in the Decennial Census, so we have had to estimate household formations. At the time of publication, the Census Bureau had not released detailed information on the types of housing vacancy at the local level. This data is tentatively scheduled for release in May 2023.

A surge in household formations in the last several years—driven by a large wave of aging millennials, mortgage rates being at all-time lows, rising incomes and savings, and a greater emphasis placed on the home—has driven down vacancy rates even further since that 2020 measurement, particularly in markets that benefited from “The Great American Move.” The reshuffling of geographies, enabled by more flexibility in working remotely and “The Great Resignation,” meant vacancy rates fell further in the in-migration markets, even as new construction rose.

To estimate the level of undersupply/oversupply in each market, we estimated the average vacancy rate by metro from 1980–2006, the latter years on the cusp of the run-up in vacancies that accompanied the housing crash of the late 2000s.

2022 Undersupply / Oversupply based on Historical Vacancy Rates

Rank	Metro Area / Division	2022 Estimated Undersupply / Oversupply***	Undersupply/ Oversupply Share of Housing Units***
1	Riverside-San Bernardino-Ontario, CA	-102,900	-6.4%
2	West Palm Beach-Boca Raton-Delray Beach, FL*	-41,000	-5.7%
3	Tampa-St. Petersburg-Clearwater, FL	-63,800	-4.2%
4	Phoenix-Mesa-Scottsdale, AZ	-83,400	-4.0%
5	Fort Worth-Arlington, TX*	-39,700	-3.8%
6	Dallas-Plano-Irving, TX*	-63,700	-3.1%
7	Houston-The Woodlands-Sugar Land, TX	-85,200	-2.9%
8	Las Vegas-Henderson-Paradise, NV	-27,000	-2.8%
9	Austin-Round Rock, TX	-29,500	-2.8%
10	Fort Lauderdale-Pompano Beach-Deerfield Beach, FL*	-24,400	-2.8%

*Metro division

A list of the 50 largest housing markets by Undersupply / Oversupply is available on pages 46–47 in the Appendix.

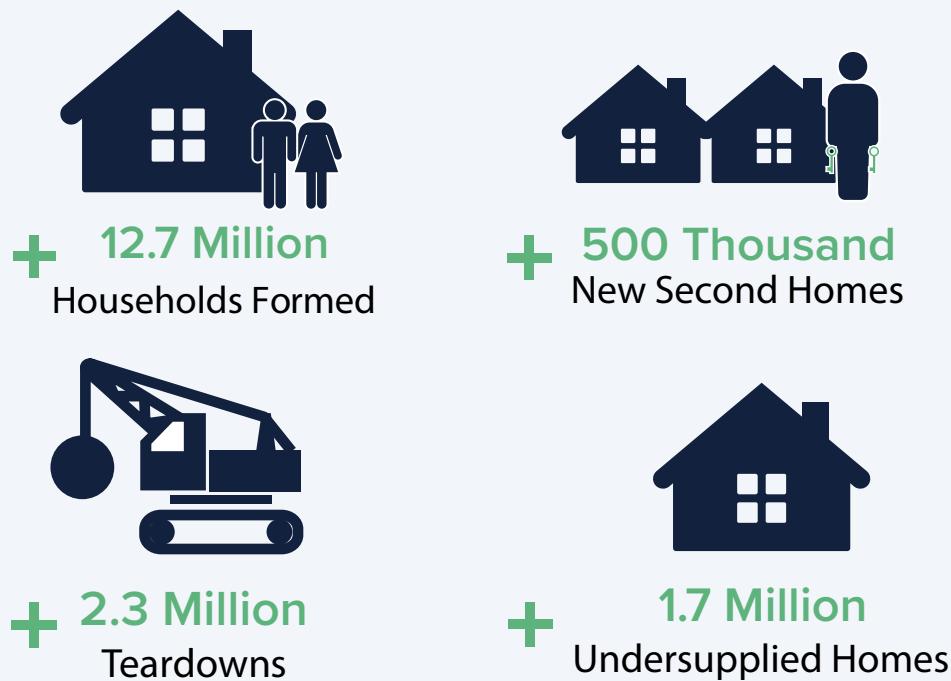


Estimating Future Housing Demand

We estimate 17.1M units of construction (for sale and for rent) will be needed between 2020 and 2030, satisfying the demand from demographics, second homes, teardowns, and a return to more balanced levels of demand and supply.

Projected Housing Demand

July 1, 2020, to July 1, 2030



A detailed analysis of our forecast reasoning follows.

Demand for Housing

Demand for housing is made up of four components, which we explore in depth in this section:

- **Adult population growth:** A base case that estimates the number of households that *should* form, based on the size of the population aged 18+ and the likelihood at each age that a person heads a household
- **Societal shifts:** Any number of factors (marriage, divorce, education, children, etc.) that impact the rate at which people form a household at a given age
- **Second homes:** Non-primary homes that are used seasonally, for recreational purposes or occasional use, or short-term rentals (like Airbnb)
- **Replacement housing:** An existing home that is torn down and replaced with a new housing unit (no net gain to the housing stock volume but necessitates a housing start)

Adult Population Growth

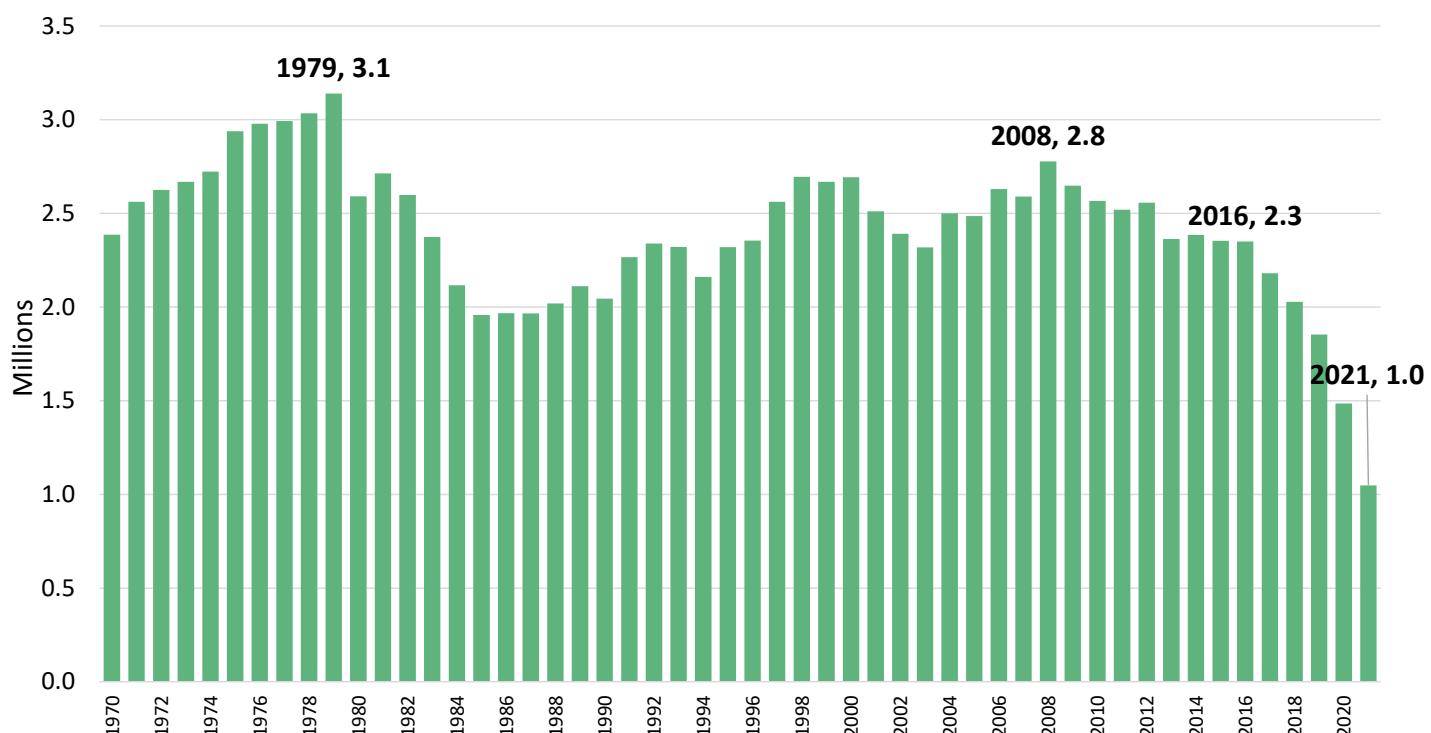
The growth in the adult population (defined here as 18+) peaked in 1979 and has been trending down sharply since 2008.

Adult population growth:

- Surged during the 1960s and 1970s due to the baby boomer generation coming of age
- Rose in the 1990s and 2000s due to baby boomer births plus strong immigration
- Slowed beginning in the 2010s due to slower immigration and rising deaths

Annual Growth of Population Aged 18+

Millions (1980–2008 average: 2.4 million)



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau population estimates; Decennial Census data

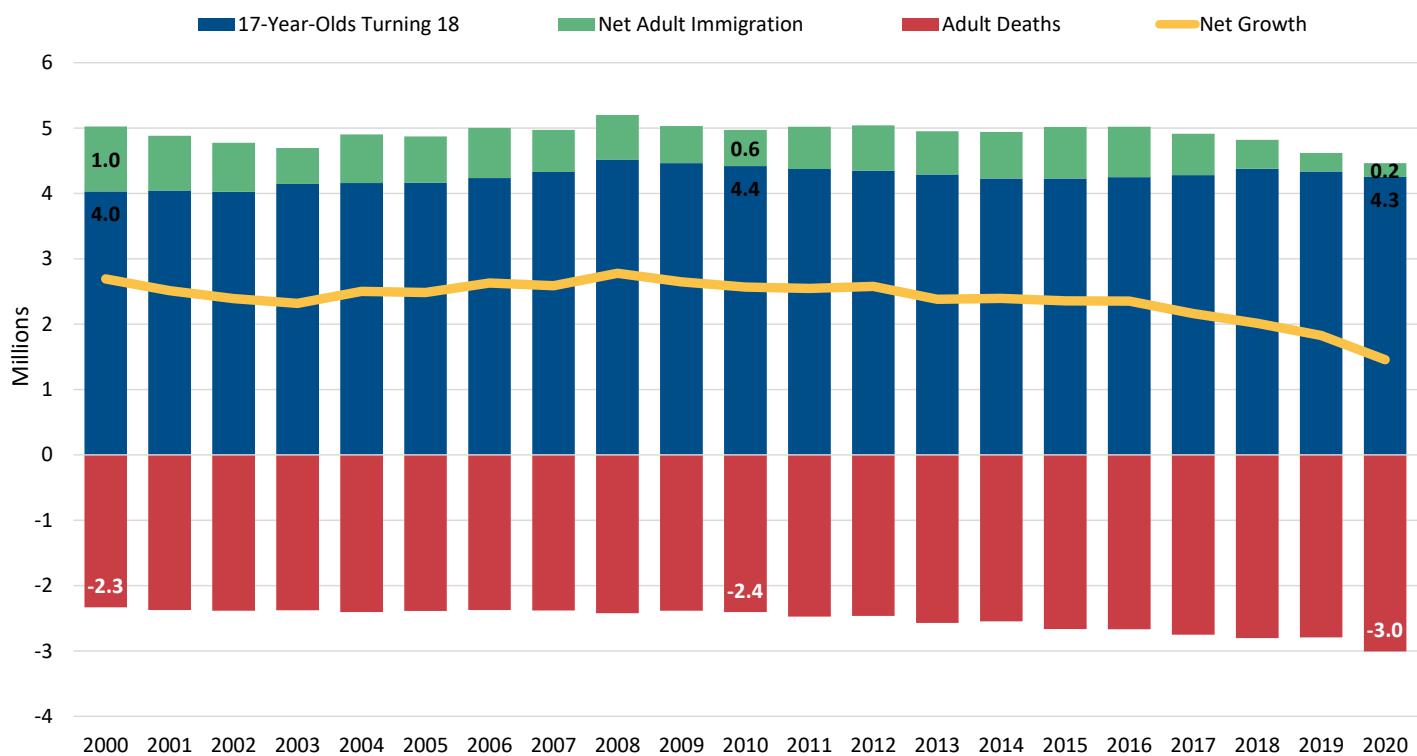
From mid-2020 to mid-2021, the first year of the pandemic, this growth fell to extremely low levels due to the increased number of deaths and a near standstill in immigration. We expect adult population growth will pick up from today's very low levels as these two factors moderate, with the long-term prognosis of a generally slower rate than in the past several decades.

The adult population changes each year by:

- 17-year-olds turning 18, which increases the adult population
- Adult deaths, which decreases the adult population
- Net adult immigration

Components of Adult Population Growth

2000–2020



Sources: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau population estimates (17-year-olds, immigration) and Centers for Disease Control and Prevention (deaths)

Minors aging into the adult population is a fairly predictable trend, based on the number of births in the US, aged forward 17 years.

- 1989–2002: Average of 4.0M births per year, turning 18 from 1997–2020
- 2003–2009: Average of 4.2M births per year, turning 18 from 2021–2027
- 2010–2021: Births fell below 4.0M per year, steadily trending down below 3.7M in 2020 and 2021; this represents the newly forming adult population in 2028+.

The foreign-born population among minors is relatively low. People tend to move to the US in their 20s and 30s. Still, the number of 17-year-olds turning 18 in the US who were born in another country has averaged 300,000 to 350,000 per year recently.

Conclusion: Adult population growth from US births alone will begin to slow.

(Note that only a small percentage of 18-year-olds form a household but is still used in the basis for the adult population math. Our calculations for societal shifts adjust for this low rate of heading a household.)

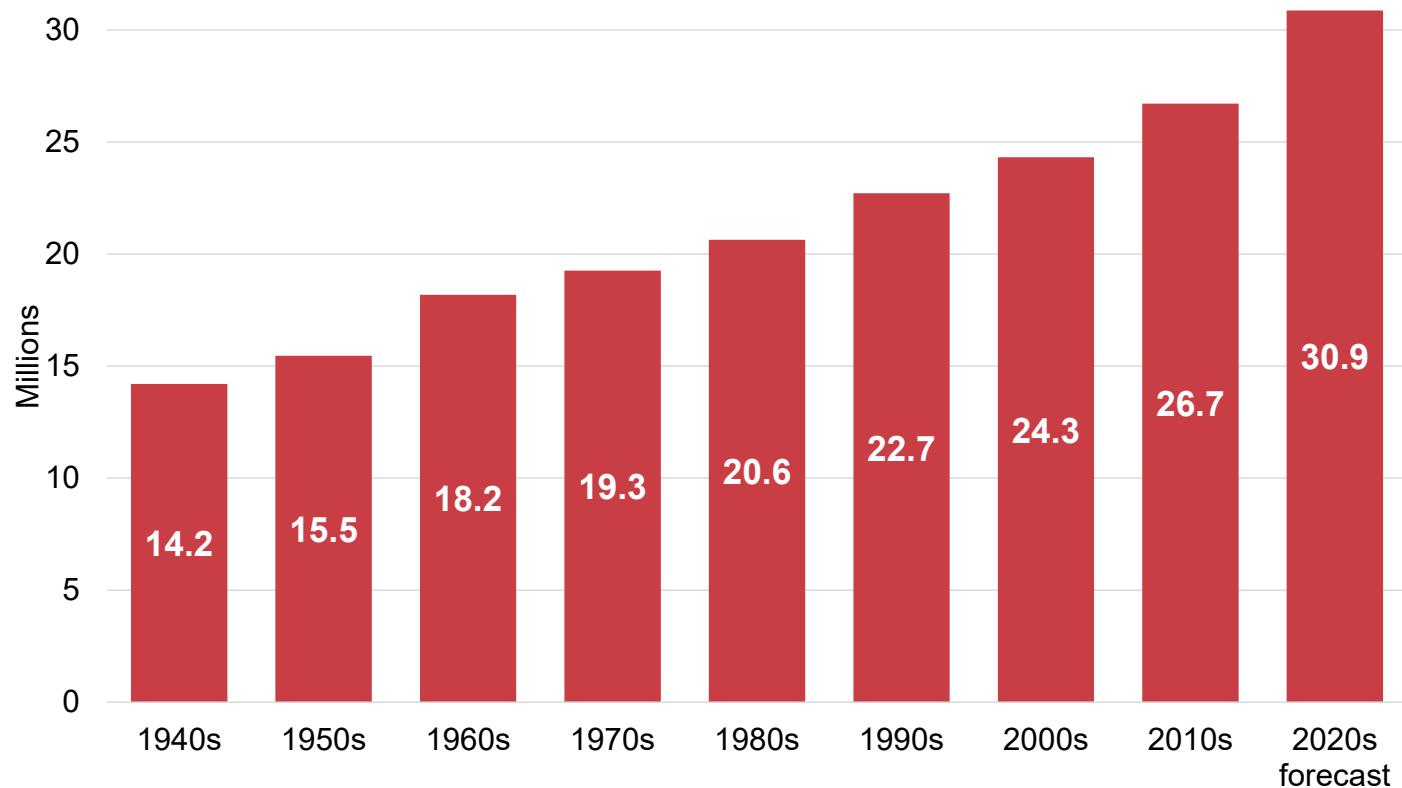
Deaths have been steadily rising in the US, creating a bigger drag on adult population growth. Just under 27M people passed away in the 2010s, a number that is projected to rise to nearly 31 million in the 2020s as the baby boomers begin to pass away in larger numbers.

(Our assumptions for deaths in the 2020s assume a low-immigration scenario and include the 1,000,000+ excess deaths due to COVID to date.)

Conclusion: A rising number of deaths will be a drag on adult population growth.

US Deaths

Millions



Sources: Department of Health and Human Services, National Center for Health Statistics; John Burns Real Estate Consulting, LLC (forecasts)

Immigration has a significant impact on population growth in the US. For the last several decades, approximately 1/3 of the net population growth in the US has come through immigration. As we wrote about in our 2016 book *Big Shifts Ahead: Demographic Clarity for Businesses*, the wave of immigration in recent decades has helped to level out some of the ebbs and flows in the US-born population.

Immigration steadily rose to approximately 1M net people per year by 2015 and 2016. Slowing growth in the following years fell to a near standstill in 2021, with approximately just 250,000 people entering the US in the first year of the pandemic. The US is seen as a desirable place to live, and certainly the demand is there for more immigration. Government policy plays a significant role here.

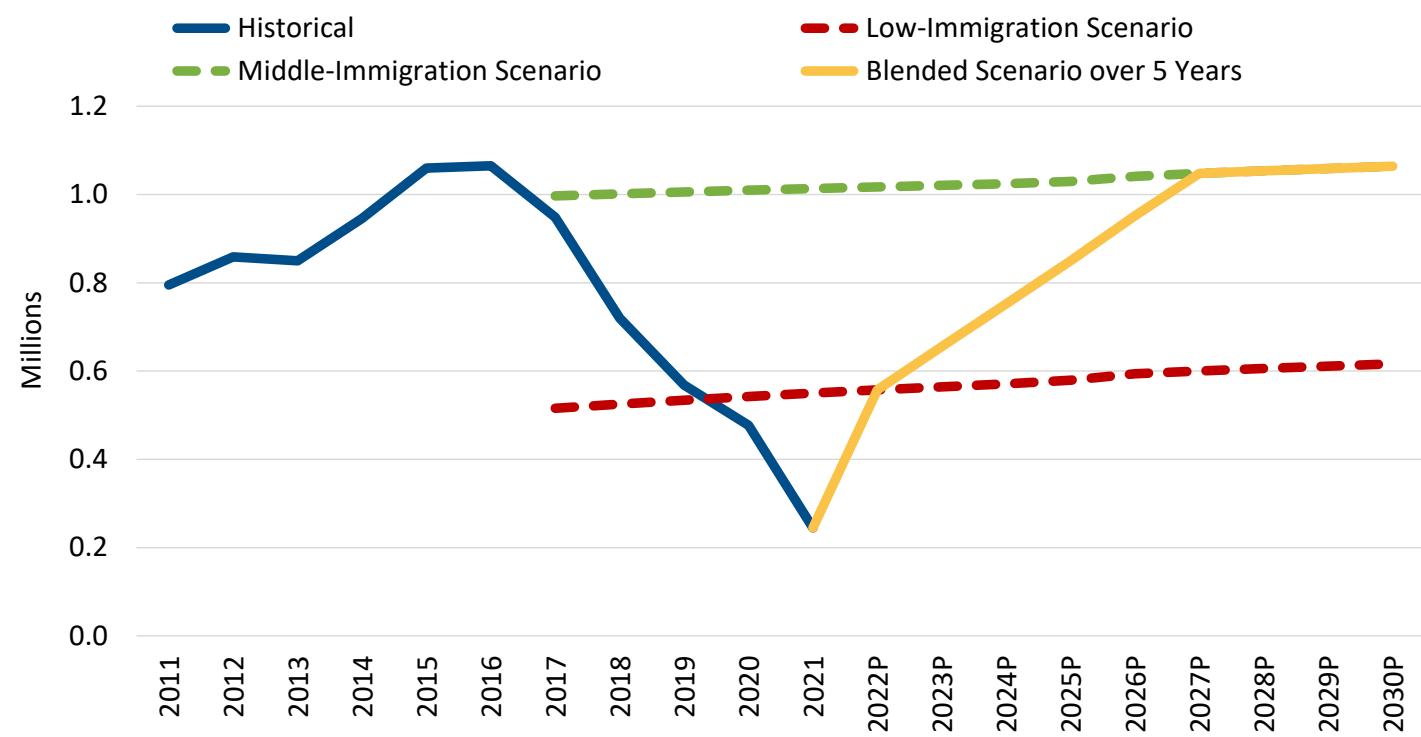
Currently, immigration levels (legal and illegal) are well below even low-immigration scenarios forecasted by the Census Bureau. High arrests at the border, plus anti-immigrant rhetoric, leads many to believe that immigration is high. We tend to believe it is not, just as reported by the Census Bureau and also by huge labor shortages that are well documented. A low-immigration scenario would average approximately 700,000 net adult immigrants per year from 2020–2030. The difference of 3.4

million fewer adults between this scenario and a middle-immigration scenario of 1.04 million adults per year (which seems very high right now) translates to 1.6M fewer households due to immigration over 10 years.

Conclusion: Growth in the adult population in the 2020s depends heavily on immigration trends. We forecast that, given the desirability of the US, immigration will gradually return to more normal levels over time and have assumed that net immigration rebounds from extremely low levels in 2021 to more normal levels around 1M per year by 2025.

Net International Immigration Assumption, July 1–July 1

Millions



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau population estimates, 2017 Immigration Scenarios

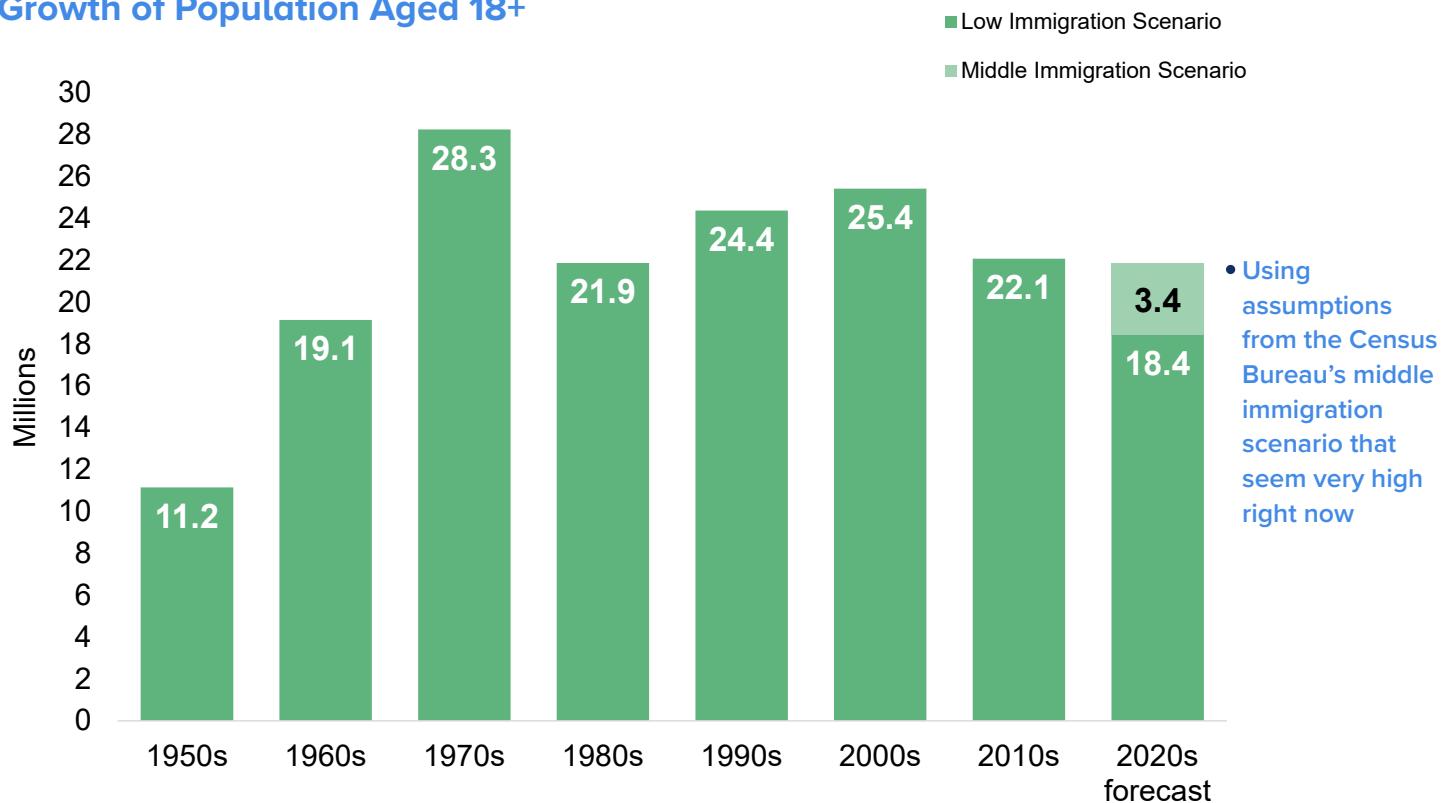
Conclusion:

Taken together, we conclude that **the adult population in the US will continue to grow more slowly** than in prior decades, regardless of immigration scenario, resulting in less demand for new construction than in prior decades.

- The adult population grew by 3.3M fewer people in the 2010s than in the 2000s and thus needed approximately 1.6M fewer additional homes, assuming the long-term trend of 2.0 adults per household.
- An uptick from extremely low recent levels of adult population growth due to fewer

COVID-related deaths and an expected gradual pickup in immigration seems likely, but overall adult population growth will be even slower in the 2020s than in the 2010s.

Growth of Population Aged 18+



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

Household Growth Resulting from Adult Population Growth

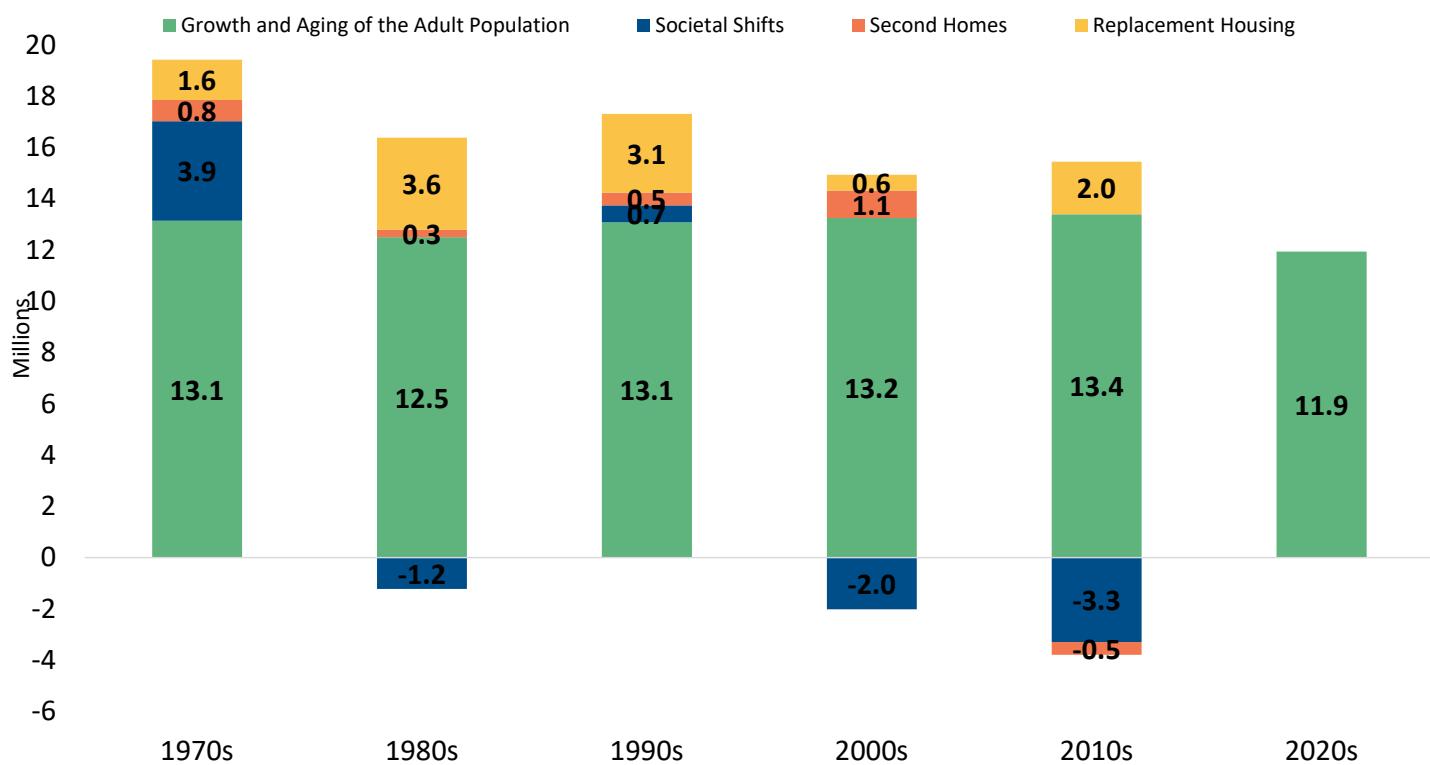
While the overall change in adult population matters, what is particularly important is the ages at which that growth or decline occurs and the rate at which adults are likely to head a household at each age. That ultimately determines the amount of housing demanded each year.

The rate at which people form households by age varies over time—covered in the *Societal Shifts* section below—but we needed to establish a base level at which households should have formed. For this, we turned to the 1970 Decennial Census—just before the boomers (born 1946 to 1964) started their massive wave of household formation in the 1970s, which was unprecedented.

11.9 million households should be formed in the 2020s based on the growth of the adult population. Net growth could be as low as 10.6 million households under a low-immigration scenario and as high as 12.2 million under a middle-immigration scenario. We believe reality will be between those two scenarios.

To reiterate: this 11.9 million estimate is based on 1970s headship rates held steady over time. It is the fundamentals-based demand, which is lower than any of the prior five decades. However, we estimate the actual net household growth will be 12.7 million over 10 years, boosted by the societal shifts explained in the next section.

Housing Demand Growth Due to:



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

Societal Shifts

In our book, we highlighted *Societal Shifts* as one of the Four Big Influencers on demographic shifts. The attitudes, values, and principles that impact these societal shifts prove difficult to quantify, partly because they can shift so quickly. However, societal influence has concrete demographic consequences that deeply affect Americans' decisions.

Here, we use the concept to represent how actuality departs from the base case, or factors that impact people's ability or decision to form a household at a certain age.

Headship—the percent of the adult population that represents a unique household—follows a general trend:

- Increasing rapidly for people in their 20s, as they move out of their parents' homes to form a household
- More moderate growth in their 30s, as people live with a spouse or partner instead of alone
- Continued moderate growth for people in their 40s and 50s, increasing due to divorces
- Continued growth for people in their 60s and 70s, as they begin to outlive a spouse
- Slowing headship in their 80s, as they move into assisted living or move in with family and no longer head a household

When one heads a household has varied over time, influenced by these societal shifts:

- **1910s–1920s:** Immigrants lived in boarding homes, rooms in a home owned by someone.
- **1930s–1940s:** Recessions and wars delayed household formation.
- **1950s–1960s:** The Silent Generation, born in the 1930s and earlier, lived with their parents until they got married, usually in their early 20s.
- **1970s–1980s:** Few early baby boomers lived with their parents as young adults, forming households very early. There also was a huge increase in divorce rates, creating more households.
- **1990s–2000s:** A surge in immigrants from Asia and south of the border formed fewer households per adult because, culturally, multiple generations tend to live together.
- **2000s–2010s:** Millennials got married and had kids ~ 5 years later than their parents, delaying household formation.

The resulting balance of the age of householders has shifted over time from 1970. Today, we have:

- More households headed by older adults, due to increasing longevity and more independent living
- Fewer young adult households, as a result of living with other adults (parents, roommates, etc.)

Because of these shifts, the US had 1.5 million fewer households by mid-2022 than would be indicated if headship rates remained unchanged since 1970.

131.6 million expected based on 1970s headship rates

– 130.1 million in actuality, based on our estimates

1.5 million fewer households than expected

As noted earlier, the base year of headship rate comparison matters; the shortfall is closer to 5 million if compared to headship rates from the year 2000.

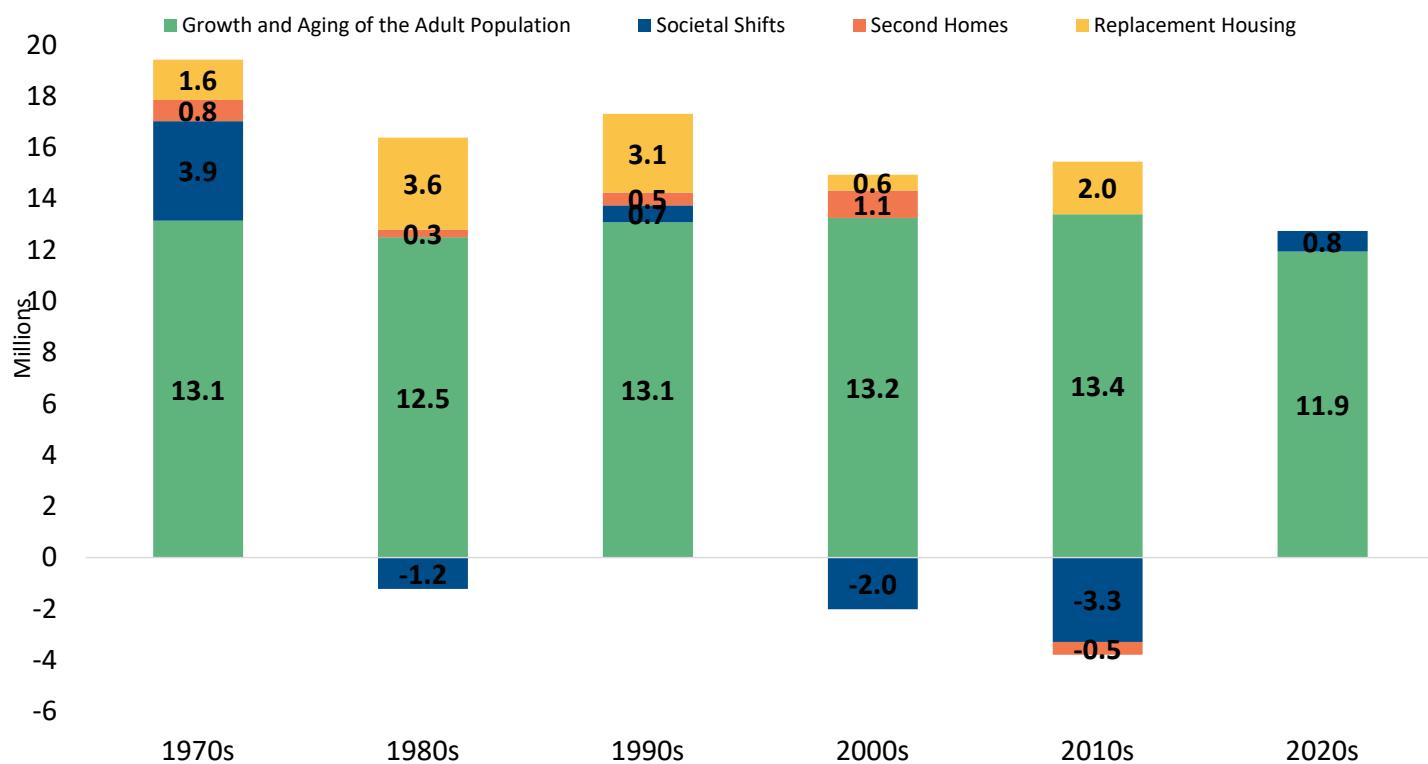
This shortage in household formation could be based on a wide variety of reasons, including (but not limited to):

- Housing affordability
- Societal shifts such as delayed household formations due to marrying later
- Population shifts such as more immigrant households who tend to live together
- Timing shifts, including:
 - A recession
 - Mortgage tightening/loosening
 - Global health crisis

Trying to calculate the impact of each of these factors is imprecise, as these reasons are not mutually exclusive.

Affordability certainly plays a role in societal shifts. If the housing industry could profitably build more attainable homes in places that people want to live, that would surely induce household formation, and thus housing demand.

Housing Demand Growth Due to:



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

Additional Housing Demand

In addition to the new construction needed to meet the demand from household formations, there are three other categories of housing demand:

- Second homes
- Teardowns
- Vacancies



Second Homes

Second homes also generally add to housing demand, as they are housing units in excess of primary residences (households).

Second homes are actually a subset of that vacant housing stock, as they are the not the primary occupied home that makes up the household count. Somewhat challenging to measure, we look at second home demand as the change in seasonal, recreational, or occasional-use homes as defined by the Census Bureau.

We say second homes *generally* add to housing demand, though based on Decennial Census data, we believe these fell in the 2010s from particularly high growth in the boom of the 2000s.

We forecast 10-year growth of 500,000 units in second-home demand during the 2020s, consistent with long-term averages and likely heightened as a result of increased demand during the pandemic, as more people were given the freedom to work from anywhere. That said, signs point to a recent slowing in second-home demand.

Teardowns

The replacement of an existing home usually requires a housing start but does not result in a net change in housing units.

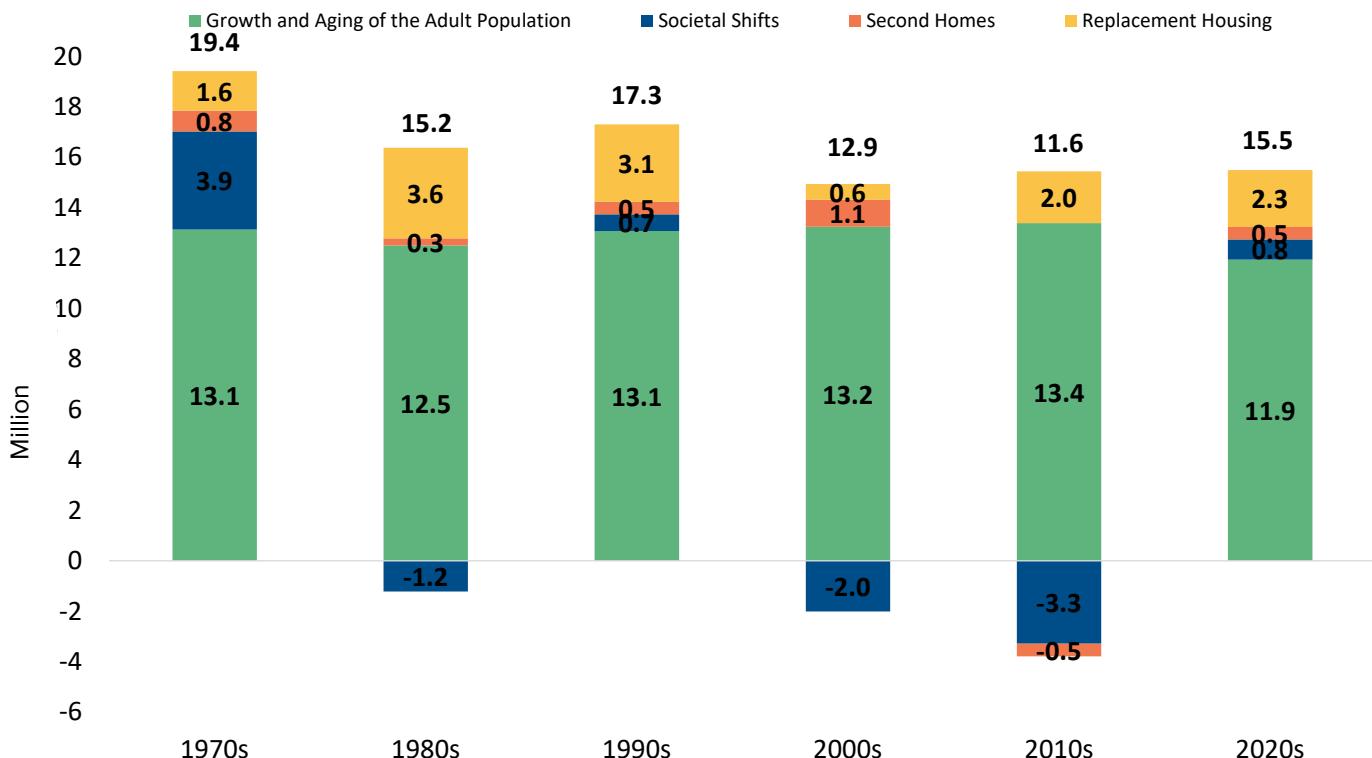
Teardowns are a complicated number to calculate, but for simplicity's sake, we view replacement housing as the difference between residential construction activity (single-family completions, multifamily completions, and manufactured housing shipments) and Census tallies of housing unit growth.

Over the last 20 years, we estimate that 92% of housing construction results in a new net housing unit, with 8% replacing an existing home. Overall, this replacement housing is a very small percentage of the overall housing stock but is a surprisingly large share of annual construction. The construction is most evident in markets with declining population, like Buffalo.

Historically, replacing existing units adds 0.6 to 3.6 million units of demand per decade. During the 2000s, when replacement housing netted to just 0.6M units, we suspect that a larger number of teardowns were not replaced, or existing housing units were converted to non-residential use for businesses such as professional offices, retail, and services.

We assume that this replacement housing will account for 2.3M units of construction over 10 years, averaging just over 200,000 per year. We believe this should trend up over time due to the aging of the housing stock.

Housing Demand Growth Due to:



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data



Vacancies

Housing always needs some level of vacancy to keep the market relatively in balance. Vacancy is comprised of second homes, homes that are available for sale or for rent, and homes that are unoccupied for a variety of other reasons, including personal/family reasons, obsolescence, foreclosure, being repaired, storage, extended absence, legal proceedings, preparing to rent/sell, possibly abandoned / to be demolished / condemned, and specific-use housing.

While vacancies should naturally rise over time, economic cycles and over/under building cause vacancy to deviate from the long-term trend.

Vacancy trends from 2000 to current show the overbuilding in the 2000s and the catchup that ended in 2019.

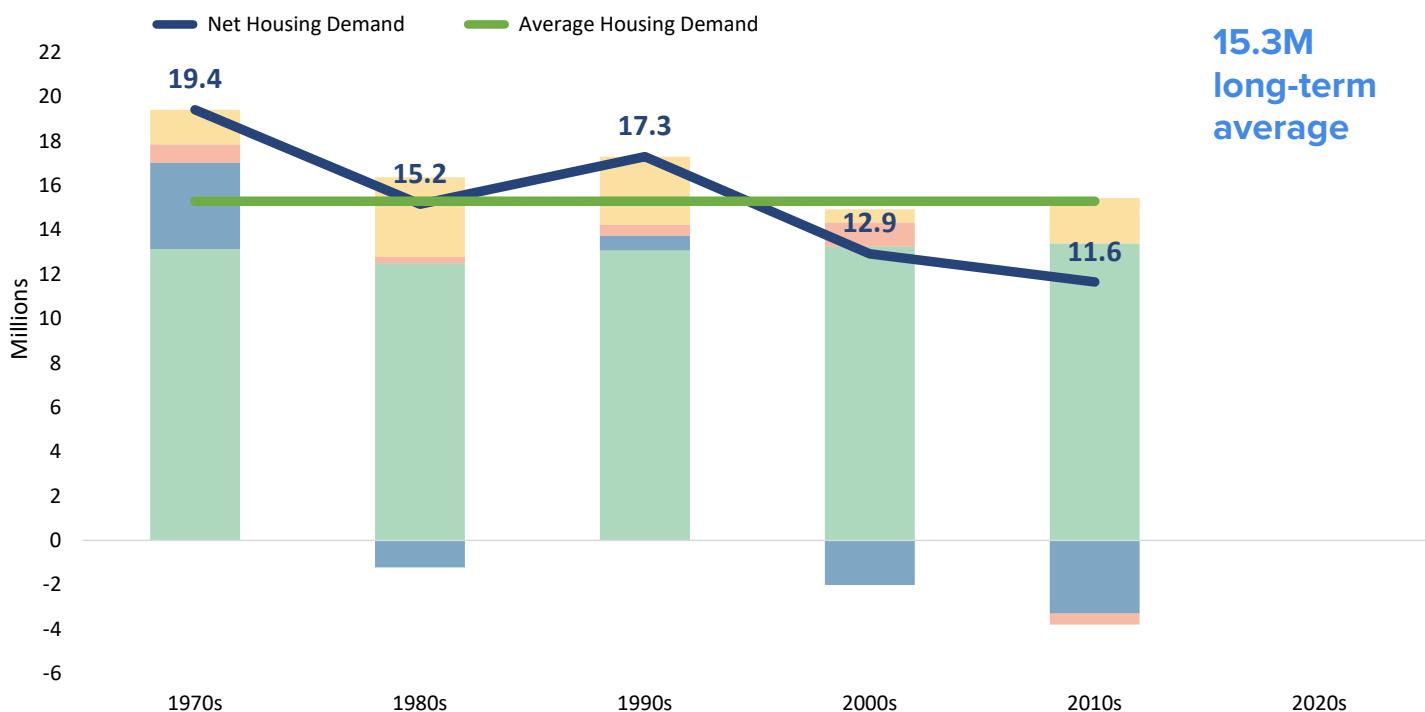
When we conducted our demand/supply analysis in 2015, vacancy was still high, but the US had worked off 1.9 million of the 3.2 million units of overbuilding in the 2000s. It is possible that more of the excess vacancy might have become occupied if those homes were where the economy was growing and where people prefer to live.



Total Demand for Housing

Adding all of these components, over 50 years net housing demand has averaged 15.3 million units per decade and has been less lately. Net housing demand ranges from 19 million in the 1970s to 11–13 million in the 2000s and 2010s.

Housing Demand and Supply



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

In summary, we think the demand for housing will be higher in the 2020s than the 2010s due to:

- **Households formations:** Slower overall adult population growth, but growth in the right age categories and a recent societal shift that has placed more emphasis on the home and household formation
- **Second homes:** Likely higher now due to work from anywhere
- **Teardowns:** Challenging to calculate but trending up due to aging housing stock
- **Vacancies:** A need to bring housing from an undersupplied situation to more balance



Supply

The other part of the equation is the supply of housing. Additions to the housing stock mainly arrive through new construction but also come from the conversion of non-residential spaces to residential. New construction can be measured by single-family and multifamily permits, starts, or completions, though only the permits data is available from the Census Bureau at the county/metro level.

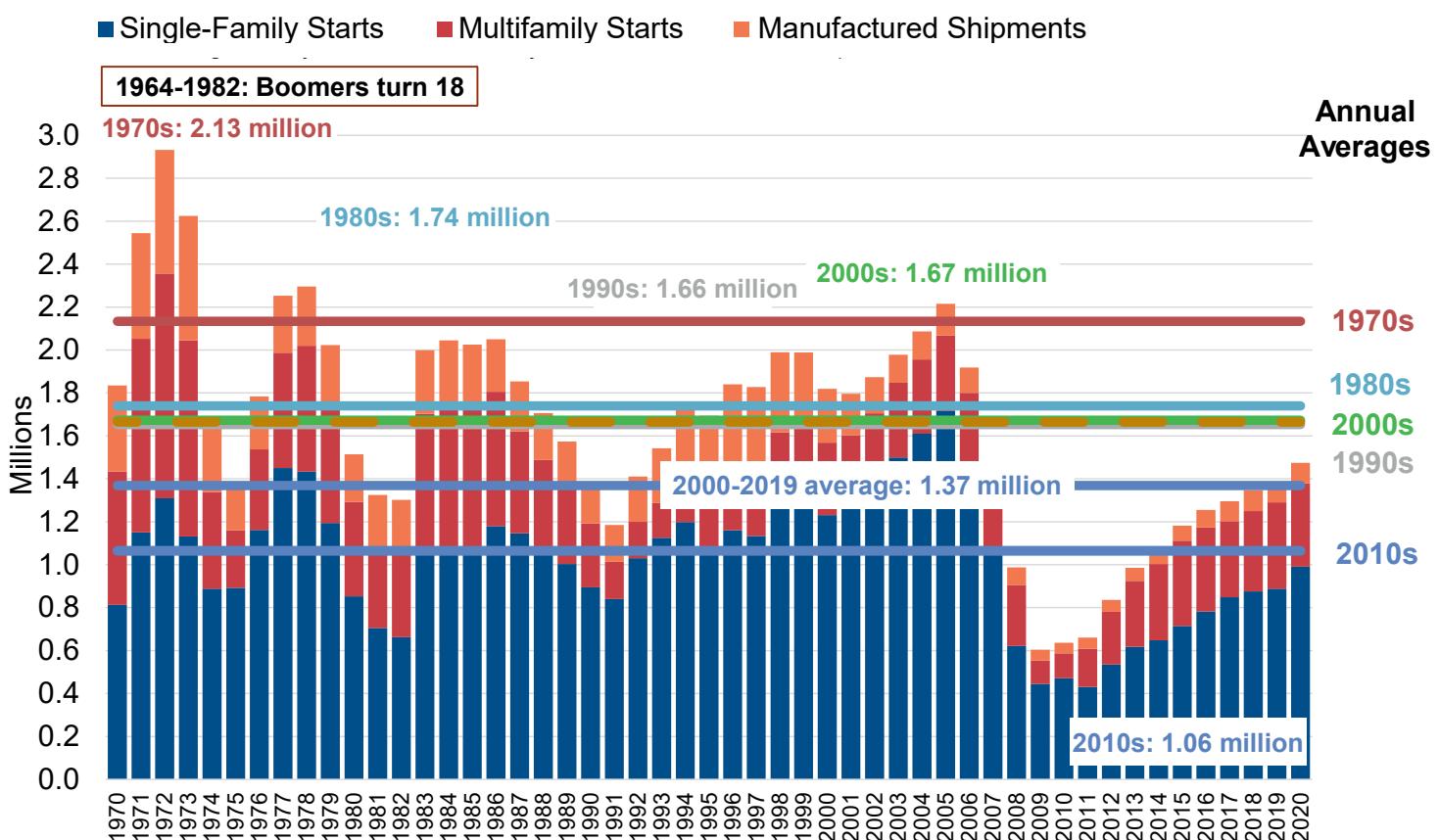
Another significant—but sometimes ignored—part of the supply calculation is manufactured housing shipments, which more recently have added 100,000 units to the housing stock per year. Regulation, often related to building codes, has led to ebbs and flows in manufactured housing over the years, ranging from more than 600,000 units per year in 1972 and 1973 to just 50,000 units per year in the wake of the Global Financial Crisis.

The US has averaged 1.65 million units of construction per year since 1970, generally trending down over the decades:

- 21.3M starts/shipments in the 1970s
- 17.4M in the 1980s
- 16.7M in the 1990s
- 16.4M in the 2000s
- 10.9M in the 2010s

US National Housing Starts

Millions

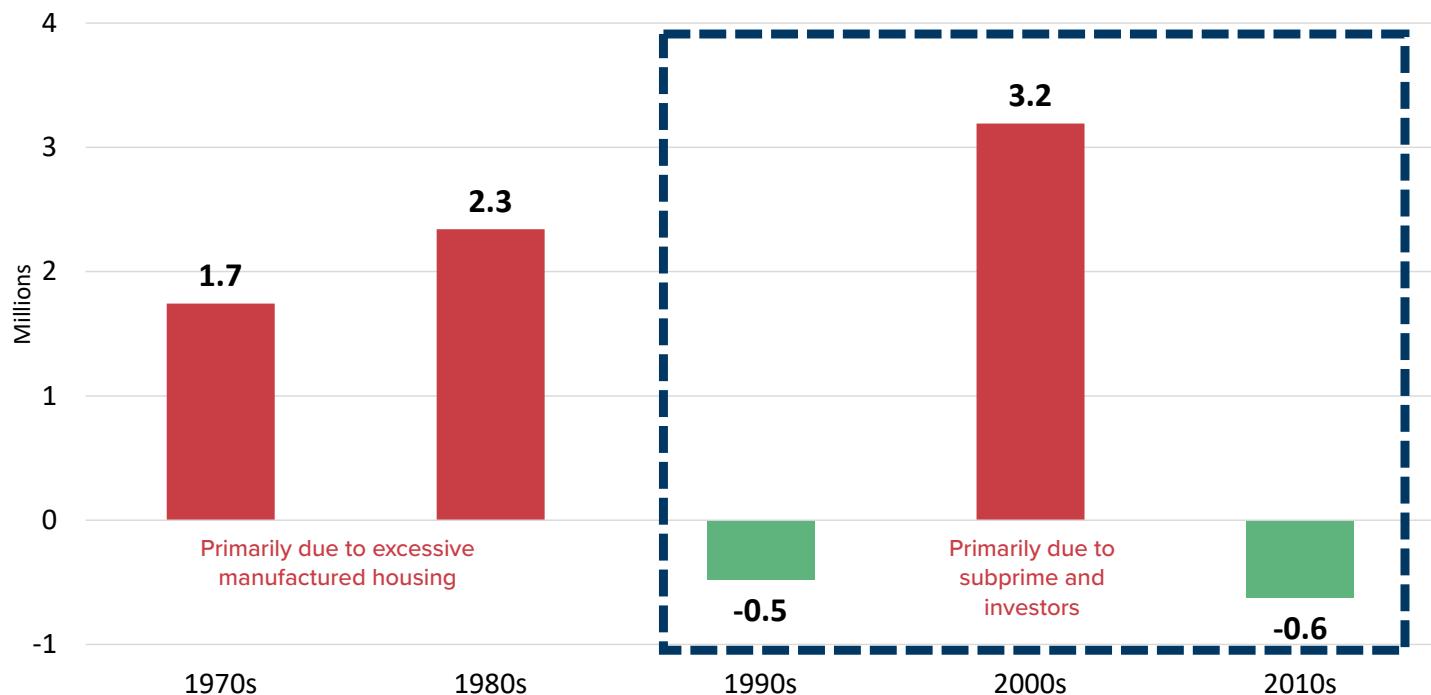


Source: U.S. Census Bureau; John Burns Real Estate Consulting (projections)

Relative to the housing demand analysis in the prior section, housing was:

- Overbuilt in the 1970s and 1980s, due in part to excessive manufactured housing
- Relatively balanced in the 1990s
- Overbuilt in the 2000s
- Underbuilt in the 2010s

Housing Unit Oversupply/Undersupply



Source: John Burns Real Estate Consulting, LLC, tabulations of U.S. Census Bureau data

The cumulative oversupply/undersupply math heavily depends on which year is used as the starting point. We picked 1970 as the baseline, but picking a different year may have yielded different results. We did adjust for societal shifts such as marrying later.

Putting it all together, there was less housing demand in the 2010s than during the 2000s:

- 10.1 million households formed during the 2010s, including 1.3 million that occupied previously vacant homes.
- 2.0 million units of replacement housing were added to the housing stock.
- 0.5 million fewer second homes were required than at the end of the prior decade (which was overbuilt).
- Net demand of 11.6M units was lower than the prior decade, continuing a generally declining trend since 1970.

Just over 11M units of new housing units added means that housing was underbuilt by -0.6M in the 2010s, following an oversupply of 3.2M during the 2000s.

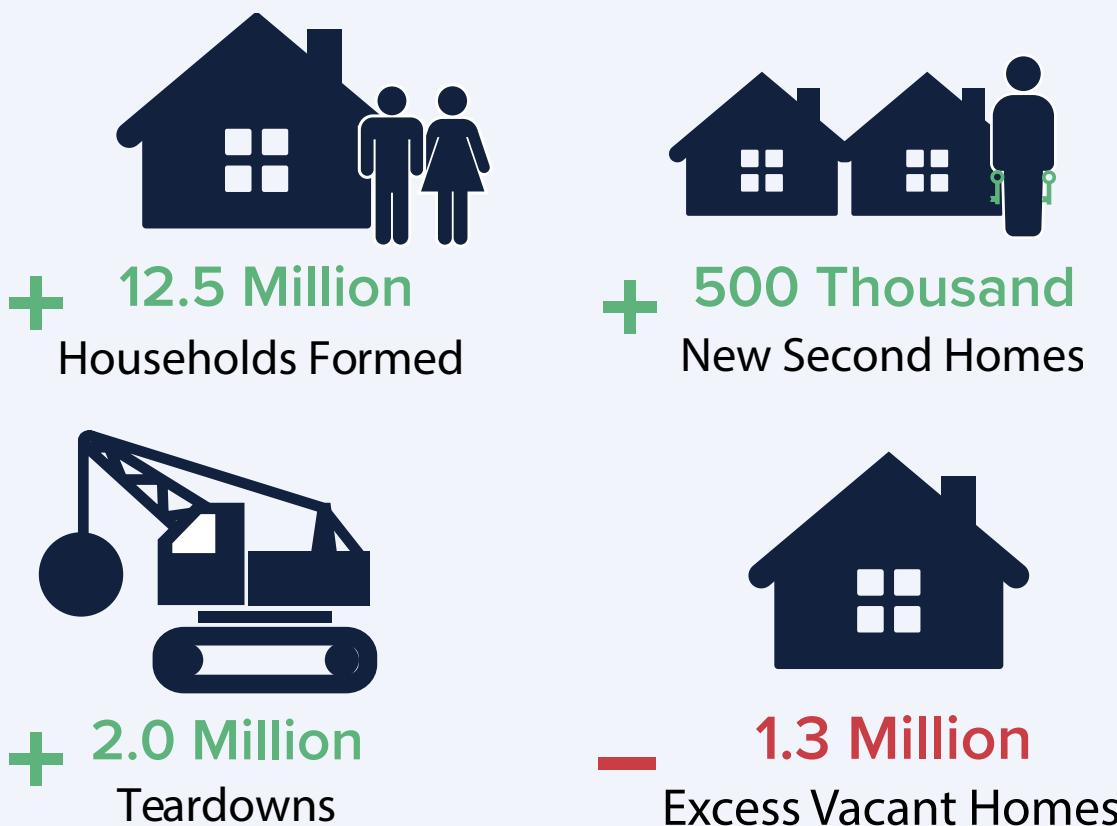


Implications for the Future: Housing through 2030

We concluded in our book published in 2016 the need for 13.7 million homes built between 2015 and 2025, or 1.37 million per year. Construction the first five years averaged 1.35 million per year, justifying our conclusions. Construction has been higher than that recently, but we expect that to change.

 **13.7 Million Homes Will Be Needed to Meet Housing Demand**

FIGURE 8.15 Projected Housing Demand, 2016–2025



Updating our 10-year outlook for 2020–2030, a few assumptions have changed:

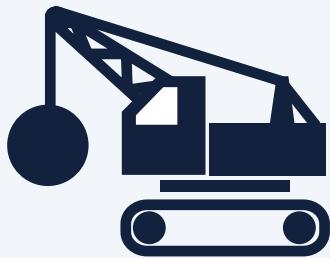
- While adult population growth will be slower through 2030 than in the prior 10 years, updated data on the age of the population, combined with rising headship during the pandemic, suggests the net household formation will be stronger.
- Housing has gone from being oversupplied (excess vacancy) to undersupplied (below optimal vacancy). To bring better balance to the equation, we will need more construction to bring vacancies back to more normal levels.



+ **12.7 Million**
Households Formed



+ **500 Thousand**
New Second Homes



+ **2.3 Million**
Tear downs



+ **1.7 Million**
Undersupplied Homes

15.5 million housing units over 10 years will be necessary to meet the demand from demographics, second homes, and replacement housing and is on par with the long-term average demand over the last five decades. The slower rate of household formation that has been occurring for years provides a tailwind for housing's future—some of which was realized in 2020 and 2021. An additional 1.7M units will be needed to bring today's undersupply conditions back to more balanced levels.



Forward-Thinking Conclusions

We forecast a mild recession in 2023–2024 that will likely result in the slowing of household formations from the accelerated levels the US has experienced since 2020. Already to date in 2022, signs are pointing to this slowing, which will only hasten should the economy slow. This deceleration in demand, combined with the significant supply of homes under construction or in the pipeline, should help to bring the supply and demand dynamics back toward more balanced levels nationally, though market-level imbalances may vary widely, with more markets potentially headed toward an oversupply scenario, depending on the severity of the pullback in the economy.

The outlook for demand for housing construction nationally is solid, averaging 1.7 million units per year between 2020 and 2030—slightly above the long-term average. The year-to-year can vary depending on the stage of the housing cycle and the state of the economy, but we believe the long-term fundamentals for this level of demand exist. We stress the importance of examining demand and supply metrics at the local level and continue to look for ways to better understand these dynamics.



Appendix

Data Challenges

Perhaps one reason for limited analysis on the undersupply at the local level is due to a lack of consistent and real-time housing stock data. There is a void at the national level: different Census Surveys don't agree on the size of the housing universe and even have different methodologies on what constitutes a household—and the data is even sparser at more granular geographies.

We have pieced together our own estimates and forecasts based on the best data available from multiple sources, recognizing that each source has its own benefits and limitations. Our methodology uses the Decennial Census as the base level.

- The **Decennial Census** data is the gold standard for information on households, housing units, and vacancies, as well as the characteristics of each. On the plus side, it is a full enumeration—the Census attempts to count every person in the country. Unfortunately, this data comes out only every 10 years, and the reporting of the data can lag.
 - The 2020 Decennial Census collection process was disrupted due to the COVID-19 pandemic. Post-enumeration surveys, which measure the undercount/overcount in the Decennial Census, found a higher margin of error in 2020 than in the 2010 Census. Detailed data on the characteristics of population, households, and vacancies has been delayed to May 2023.
 - Also, the data is measured as of April 1, 2020, which was early on in the pandemic, and many households were beginning to relocate—either temporarily or permanently—if they had not already done so.
- The Census Bureau's **American Community Survey** (ACS), an annual sample-based survey that overlaps the Decennial Census, provides more frequent data, though still with a lag.
 - The 2020 American Community Survey collection process was likewise disrupted by the COVID-19 pandemic, and the Census Bureau has issued caution about using the data, including comparisons to prior years.

- The Census Bureau's **Housing Vacancies and Homeownership Survey** (HVS), from which the headline homeownership rate is calculated, releases quarterly findings on households and vacant units. While helpful for directional indicators at the national and regional levels, the data does have its challenges, including dislocations in the time series.
 - Based on differences in methodologies, the HVS tends to undercount households relative to the Decennial Census, which means it overstates vacancies. We also know that the HVS has not adjusted its total housing unit calculations to the latest housing controls and is likely further underestimating the total housing stock and total households.
 - The HVS does report annual housing vacancy rates for the top 75 MSAs. However, we have found that the data does not adjust for changes in MSA definitions over time, and the magnitude of some of the YOY changes in vacancy rates often do not make sense mathematically.
 - The Census Bureau's **American Housing Survey** (AHS) is a biannual survey focused solely on housing, with extensive detail on housing characteristics not provided in the other surveys. The AHS is largely national in scope, with more granular coverage limited to a select number of states and metro areas.

2022 Undersupply / Oversupply for 50 Largest Housing Markets in the US based on Historical Vacancy Rates

Rank	Metro Area / Division	2022 Estimated Undersupply / Oversupply***	Undersupply/ Oversupply Share of Housing Units***	Burns Under/ Overpriced Market Index: For-Sale****	Burns Single-Family Rental Under/ Overpriced Market Index: For-Rent****
1	Riverside-San Bernardino-Ontario, CA	-102,900	-6.4%	51%	6%
2	West Palm Beach-Boca Raton-Delray Beach, FL*	-41,000	-5.7%	61%	6%
3	Tampa-St. Petersburg-Clearwater, FL	-63,800	-4.2%	66%	11%
4	Phoenix-Mesa-Scottsdale, AZ	-83,400	-4.0%	60%	12%
5	Fort Worth-Arlington, TX*	-39,700	-3.8%	62%	6%
6	Dallas-Plano-Irving, TX*	-63,700	-3.1%	55%	5%
7	Houston-The Woodlands-Sugar Land, TX	-85,200	-2.9%	47%	4%
8	Las Vegas-Henderson-Paradise, NV	-27,000	-2.8%	65%	17%
9	Austin-Round Rock, TX	-29,500	-2.8%	51%	4%
10	Fort Lauderdale-Pompano Beach-Deerfield Beach, FL*	-24,400	-2.8%	54%	4%
11	Sacramento--Roseville--Arden-Arcade, CA	-25,600	-2.7%	42%	4%
12	Orlando-Kissimmee-Sanford, FL	-30,100	-2.6%	59%	7%
13	Atlanta-Sandy Springs-Roswell, GA	-55,000	-2.2%	68%	14%
14	Denver-Aurora-Lakewood, CO	-24,300	-1.9%	51%	1%
15	Jacksonville, FL	-12,600	-1.7%	62%	8%
16	Oklahoma City, OK	-10,600	-1.7%	48%	3%
17	Indianapolis-Carmel-Anderson, IN	-11,400	-1.2%	62%	3%
18	Raleigh-Durham-Chapel Hill, NC**	-9,400	-1.1%	65%	6%
19	Charlotte-Concord-Gastonia, NC-SC	-12,000	-1.0%	71%	9%
20	Columbus, OH	-7,800	-0.8%	56%	1%
21	Seattle-Bellevue-Everett, WA*	-11,000	-0.8%	43%	-2%
22	Portland-Vancouver-Hillsboro, OR-WA	-8,300	-0.8%	41%	2%
23	San Antonio-New Braunfels, TX	-8,200	-0.8%	53%	5%
24	Kansas City, MO-KS	-7,400	-0.8%	52%	2%
25	Nashville-Davidson--Murfreesboro--Franklin, TN	-6,300	-0.7%	70%	7%
26	Oakland-Hayward-Berkeley, CA*	-7,000	-0.7%	33%	-4%
27	Miami-Miami Beach-Kendall, FL*	-7,100	-0.6%	57%	0%
28	Minneapolis-St. Paul-Bloomington, MN-WI	-10,100	-0.6%	40%	-0%
29	San Diego-Carlsbad, CA	-7,400	-0.6%	43%	3%
30	Providence-Warwick, RI-MA	-4,100	-0.6%	N/A	N/A
31	Washington-Arlington-Alexandria, DC-VA-MD-WV	-12,500	-0.5%	36%	-6%

32	Newark, NJ-PA	-4,700	-0.4%	37%	-1%
33	Cincinnati, OH-KY-IN	-2,500	-0.3%	52%	-4%
34	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	-6,700	-0.3%	44%	-1%
35	Boston-Cambridge-Newton, MA-NH	-5,300	-0.3%	40%	-2%
36	Warren-Troy-Farmington Hills, MI*	-1,600	-0.1%	39%	-0%
37	Virginia Beach-Norfolk-Newport News, VA-NC	-300	-0.0%	42%	-2%
38	Los Angeles-Long Beach-Glendale, CA*	2,300	0.1%	35%	-0%
39	St. Louis, MO-IL	4,300	0.3%	44%	-1%
40	Nassau County-Suffolk County, NY*	4,200	0.4%	34%	-1%
41	Baltimore-Columbia-Towson, MD	6,300	0.5%	29%	-3%
42	New York-Jersey City-White Plains, NY-NJ	32,800	0.5%	27%	-5%
43	Chicago-Naperville-Elgin, IL-IN-WI**	19,400	0.6%	33%	-1%
44	Anaheim-Santa Ana-Irvine, CA*	7,100	0.6%	42%	0%
45	Milwaukee-Waukesha-West Allis, WI	5,700	0.8%	40%	-5%
46	San Jose-Sunnyvale-Santa Clara, CA	9,100	1.3%	25%	-10%
47	Cleveland-Elyria, OH	12,900	1.3%	48%	1%
48	Pittsburgh, PA	16,300	1.4%	N/A	-3%
49	Detroit-Dearborn-Livonia, MI*	13,500	1.7%	36%	9%
50	San Francisco-Redwood City-San Rafael, CA**	16,700	2.0%	15%	-12%
	Other	-981,000	-1.3%		

*Metro Division **Combination of Metro Divisions, except Raleigh-Durham, which is a combination of MSAs

*** Positive number implies 2022 estimated vacancy rate is higher than long-term average from 1980-2006.

**** Our Burns Under/Overpriced Market Index, measured as of October 2022 (for-rent) / November 2022 (for-sale), analyzes how much a market is underpriced or overpriced compared to the market's own long-term housing-cost-to-income ratio for for-sale homes (assuming a 6.6% 30-year fixed mortgage rate as of end of November 2022) and compared to the market's own long-term single-family rent-to-income ratio for rental homes.

2022 Shortfall of Households for 50 Largest Housing Markets in the US by % Shortfall

Based on year 2000 headship by age assumptions

Estimate of 2022 household shortfall based on year 2000 headship rates by age
 (Among MSAs with at least 600,000 total housing units)

Rank	Metro Area / Division	% Shortfall	Shortfall
1	Riverside-San Bernardino-Ontario, CA	-12.6%	-210,500
2	Sacramento--Roseville--Arden-Arcade, CA	-8.9%	-87,700
3	Oakland-Hayward-Berkeley, CA*	-8.8%	-97,100
4	Anaheim-Santa Ana-Irvine, CA*	-8.2%	-96,100
5	San Diego-Carlsbad, CA	-7.4%	-93,900
6	Los Angeles-Long Beach-Glendale, CA*	-6.8%	-249,900
7	Portland-Vancouver-Hillsboro, OR-WA	-6.1%	-65,400
8	Orlando-Kissimmee-Sanford, FL	-5.9%	-64,700
9	Fort Worth-Arlington, TX*	-5.8%	-59,700
10	Nassau County-Suffolk County, NY*	-5.8%	-60,100
11	Fort Lauderdale-Pompano Beach-Deerfield Beach, FL*	-5.7%	-46,800
12	Phoenix-Mesa-Scottsdale, AZ	-5.7%	-113,700
13	Dallas-Plano-Irving, TX*	-5.5%	-114,900
14	Denver-Aurora-Lakewood, CO	-5.2%	-66,200
15	Washington-Arlington-Alexandria, DC-VA-MD-WV	-4.9%	-124,600
16	Atlanta-Sandy Springs-Roswell, GA	-4.8%	-117,900
17	Jacksonville, FL	-4.6%	-32,200
18	Columbus, OH	-4.6%	-41,700
19	Tampa-St. Petersburg-Clearwater, FL	-4.4%	-62,900
20	Las Vegas-Henderson-Paradise, NV	-4.4%	-40,300
21	Raleigh-Durham-Chapel Hill, NC**	-4.3%	-37,500
22	West Palm Beach-Boca Raton-Delray Beach, FL*	-4.3%	-28,200
23	Seattle-Bellevue-Everett, WA*	-4.2%	-55,300
24	Newark, NJ-PA	-4.1%	-41,100
25	Cincinnati, OH-KY-IN	-4.0%	-37,200
26	Oklahoma City, OK	-4.0%	-23,800
27	Houston-The Woodlands-Sugar Land, TX	-3.6%	-99,200
28	Providence-Warwick, RI-MA	-3.6%	-25,200
29	Minneapolis-St. Paul-Bloomington, MN-WI	-3.6%	-55,000
30	Baltimore-Columbia-Towson, MD	-3.4%	-38,800
31	Indianapolis-Carmel-Anderson, IN	-3.3%	-28,700

32	Warren-Troy-Farmington Hills, MI*	-3.3%	-35,900
33	San Jose-Sunnyvale-Santa Clara, CA	-3.1%	-21,900
34	Kansas City, MO-KS	-3.0%	-27,900
35	Boston-Cambridge-Newton, MA-NH	-3.0%	-59,200
36	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	-2.8%	-70,900
37	Austin-Round Rock, TX	-2.7%	-26,600
38	San Antonio-New Braunfels, TX	-2.6%	-25,600
39	Miami-Miami Beach-Kendall, FL*	-2.6%	-25,900
40	Charlotte-Concord-Gastonia, NC-SC	-2.2%	-24,200
41	St. Louis, MO-IL	-2.1%	-25,000
42	Nashville-Davidson-Murfreesboro-Franklin, TN	-2.1%	-17,700
43	Detroit-Dearborn-Livonia, MI*	-1.9%	-13,800
44	New York-Jersey City-White Plains, NY-NJ*	-1.9%	-106,500
45	Virginia Beach-Norfolk-Newport News, VA-NC	-1.8%	-13,100
46	Chicago-Naperville-Elgin, IL-IN-WI**	-1.1%	-33,800
47	Cleveland-Elyria, OH	0.1%	1,100
48	Milwaukee-Waukesha-West Allis, WI	0.4%	2,400
49	Pittsburgh, PA	1.8%	18,700
50	San Francisco-Redwood City-San Rafael, CA**	2.1%	15,700

*Metro Division **Combination of Metro Divisions, except Raleigh-Durham, which is a combination of MSAs

Positive number implies 2022 households are higher than expected, based on year 2000 headship assumptions.

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Prepared exclusively for JBREC: Rob Flint