U.S. Apartment Demand – A Forward Look

NATIONAL MULTIFAMILY HOUSING COUNCIL

NATIONAL APARTMENT ASSOCIATION

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Estimating the Total U.S. Demand for Rental Housing

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Executive Summary

The housing bubble fallout of 2007-2010 resulted in a paradigm shift in the U.S. among many households. Disillusioned by the bursting of the house price bubble that destroyed equity, many former home owners continue to rent today. Younger households, seeking more mobility and often saddled with student loans, postpone home ownership or choose to have the flexibility of renting. Demographic shifts also affect home ownership and the result has been a declining home ownership rate and corresponding increase in the percentage of households that rent. Some of this shift came about in the same housing units, as owned units became part of the rental inventory and today some one-third of all rental units are single-family units.

Tighter underwriting standards by lenders have resulted in a tighter supply of both multifamily and single-family housing with prices and rents exceeding the growth in income for the past decade. Housing affordability, especially on coastal markets, remains low.

Housing supply is adequate in most markets but there are many exceptions especially along the Northeast and Western U.S. coasts at certain price segments. Affordable market-based housing is only achievable with greater density and smaller sized units, yet land-use policies and political approval processes have moved in the opposite direction adding greater regulation and restrictions. The internet and social media have facilitated quick mobilization for groups that feel threatened by new housing developments that will add traffic and parking congestion in their neighborhood.

Demographic shifts, student debts and tighter underwriting continue to suggest substantial rental demand in the future. Among the major drivers of metro and state level household growth are in-migration policies and trends. As a whole, the U.S. depends on immigration to fuel the labor market. Any declines in immigration rates will severely curtail both the growth of the U.S. economy and future housing demand. In recent years, several metropolitan areas would have had zero or negative population growth were it not for international in-migration. Their natural population increases have been more than offset by domestic out migration and yet international migration has significantly supplemented the population. These metros include[1] Chicago, Detroit, Milwaukee, Philadelphia, St. Louis and New York.

Among the metro markets studied, migration rates are a key telltale sign of the local economy's direction. Those metros with strong economies also have significant population growth rates often derived from in-migration from both domestic and international sources. Examples include Houston, Charlotte, Austin and Tampa-St. Petersburg. Markets such as Washington D.C. and San Diego have strong international in-migration but experience domestic out-migration.

Uncertain in our housing outlook is the longevity of the current rental stock. This study assumes a base rate of economic obsolescence of 0.5% or 720,000 units per year on average through 2030. If the economic life of a housing unit is reduced to 100 years (1.0% per year), on average, then we need 1.4 million housing units per year just to replace the lost housing units. The type of housing needed in the future is also shifting towards units that accommodate older households.

[1] April 2010 to July 2016

Given the maturity of the current economic cycle, the forecast assumes that the U.S. economy could go through two recessions by the end of the forecast period in 2030. Even under this scenario, all 50 states and the 50 metropolitan markets in this study will need new multifamily housing going forward to meet a growing population base. The Southern states driven by economic growth, low costs and diversified demographic growth continue to lead demand forecasts with metropolitan markets in Texas and Florida ranked in 5 of the top 6 places. Phoenix, Atlanta, Raleigh and Las Vegas also rank in the top 10. Slower growth markets are more likely to experience new demand growth in specific neighborhoods. Developers and investors should evaluate these markets carefully for new growth as well as revitalization of existing neighborhoods. These markets are frequently located in the Midwest and Old South and include markets such as Cleveland, Milwaukee, Birmingham, Pittsburgh and New Orleans.

Growth drivers also vary greatly by metro market and will shape the format of new construction going forward. A few markets will continue to attract new renters of all ages, while many will experience an increasing proportion of demand from 35+ aged cohorts. The 65+ aged cohort will account for a large part of demand in some low growth markets, particularly those experiencing net out-migration trends. Income and ethnicity trends also vary significantly by market.

While some markets embrace growth, others are restricted either geographically and / or by policy. Supply-restricted markets tend to have higher rental costs and lower affordability. Markets with both high rental and high for-sale housing costs risk losing population bases to lower cost areas. The middle class, including necessary professions for a healthy economy such as teachers, police and fire-fighters, cannot afford average rents in these markets. States with healthy balance sheets and educated workforces continue to be primed to attract individuals and firms from these markets.

Several 'known unkowns' could occur going forward that would significantly change the forecast. At the national level, 75% of the variance in the U.S. home ownership rate since 1971 can be explained by policy changes such as those that impact capital and banking markets. It is unknown whether policy changes will be put into effect which could impact the applicability of the mortgage tax deductions, particularly for middle income families. Changes in these policies can affect the 'own vs. rent' decision and thus the amount of demand for multifamily properties going forward[2].

The second large 'known unkown' at the national level at the time of writing this report is the impact of policy changes on immigration rates. As the U.S. population ages, growth is slowing and becoming increasingly dependent on immigrants who have a higher tendency to rent. As a base case, population growth is expected to slow from 0.9% per year on average from 2000 to 2010 to 0.7% on average from 2016 through 2030. Under this scenario, immigration begins to outpace natural growth (births minus deaths) by 2023. Without immigration, population growth is expected to slow to 0.4% per year through 2030, less than half the pace of the past decade.

At the local level, some markets could surprise on the upside. For example, large tech campuses continue to expand in Seattle. A growing hub of large tech firms could attract more than expected small tech firms as well as individuals looking to escape the high costs of Silicon Valley. Detroit is at the other end of the growth spectrum but has been increasingly attracting a few investors who are aggregating large tracts of land.

[2] For example, doubling the standard deduction would eliminate the benefits of mortgage interest and property tax deductions for many households and thus, at the margin, provide less incentives to own housing.

U.S. Rental Demand

At the national level, we first estimate total rental demand based upon total population, household size projections, and the portion of the market that desires and can afford ownership given the regulatory environment, interest rates and ease of credit access. The result is the net rental demand in households. We provide some notes on trends worth watching that might affect rental housing demand. We also provide some supply side discussion bringing in the impact of those marginal single-family units that might be rentals or owner occupied.

In brief, the national housing rental demand model is essentially the following:

1. Estimate total population growth considering births, deaths and net immigration.
2. Divide this by household size considering probable recessions and demographic trends
3. Equals total households (with a qualifier on homelessness)
4. Add to this the equilibrium vacant housing from market friction, normal vacancy and second+ home demand
5. Add to this the housing units lost to real depreciation and obsolescence including normal attrition for changes in use, public improvements, etc.
6. Equals total housing unit demand
7. Estimate the owner-occupied portion of this to derive renter demand, considering credit access, housing policies, existing household debt including student loans and credit debt, housing investment appeal and general affordability.
8. Allocate renter demand for new multifamily rentals of 5 units or more per building as defined by the NMHC.

1. Estimating U.S. Population

The U.S. Population is approximately 325 million persons[3] as of the end of 2016, growing at approximately 2,229,000 per year which equates to 4 net new people per minute, 6,107 per day. These estimates are based on the three most important metrics of population: births, deaths and net international migration. Of these three parameters, net immigration is the least predictable but most important for forecasting future population. The reason is that as the U.S. population continues to age our domestic death rates will slowly approach our birth rates. We will continue to add net population at the rate of about 1.35 million for 2017 (births less deaths) but the net immigration figure for 2017 will run 0.88 million. By 2023 and beyond the rate of expected population growth from net migration exceeds that of births less deaths.[4] By 2030, net immigration is expected to run 1.33 million compared to an internal net population increase of 840 thousand.

[3] Official estimates from the U.S. Census.

[4] This is from the U.S. Census as well as Pew Research and others. See for example: "Immigration projected to drive growth in U.S. working-age population through at least 2035" PewResearchCenter.org By Jeffrey S. Passel and D'Vera Cohn, published on: April 17, 2017 http://www.pewhispanic.org/2015/09/28/chapter-2-immigrations-impact-on-past-and-future-u-s-population-change and http://www.calculatedriskblog.com/2017/04/lawler-updated-population-projections.html and http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=23839.

Historically, immigration is highly dependent on the state of the U.S. economy, slowing down during recessions and accelerating during better economic times. For example, while Mexico remains the largest source of persons who obtain lawful permanent resident status in the U.S.[5], net immigration is balanced by persons leaving the U.S. for Mexico. Over time, immigration from Mexico has been one of the largest from any single country bringing 400,000 people per year from 2001-2005. From 2006 through 2010 the number slowed to a trickle, only 200,000 total over 5 years or a tenth the previous rate.[6] Since 2010 the net immigration from Mexico has declined to a very small number, and was negative from 2009-2014. Factors for this slow down include a stricter immigration policy on the U.S. side with increased deportation of undocumented immigrants, less demand for unskilled labor, except for agriculture[7], and positive economic growth in Mexico after the 2009 recession. Asian immigration rates are simultaneously increasing and are now surpassing the combined totals from Mexico and all other Hispanics as the largest single entering ethnic group. Immigrants from Asia tend to be highly educated and have job skills making it easier to integrate into the U.S. economy over a broader range of jobs. For example, 57% of Asian immigrants in 2015 had completed college compared to 13% from Mexico and 28% from Central and South America.[8]

As immigration is approaching half the annual net U.S. population growth rate, it is becoming a critical factor in population forecasts (see Exhibit 1 and Figure 1). What is unknown is whether the U.S. policy towards immigration will be broadly more challenging or more specifically challenging towards single countries or certain group profiles. The Obama administration was characterized by severe, if not extreme, vetting of immigrants. As a base case, we use Census forecasts as shown below, presuming that new immigration policies will sound dramatically more extreme, but should be modest in terms of real impact.[9] The impact of more restricting policies is explored in the Scenario Analyses at the end of this section.

[5] Department of Homeland Security, 2015 Yearbook; Mexico accounted for 157,227 of 1,051,031 total persons who obtained lawful permanent residence in 2015, followed by China (70,977), India (61,380), Philippines (54,307) and Cuba (54,178).

[6] See MPI reports at http://www.migrationpolicy.org/article/mexican-immigrants-united-states.

[7] California is especially dependent on Mexican labor for agriculture and would be devastated if temporary work permits were not facilitated.

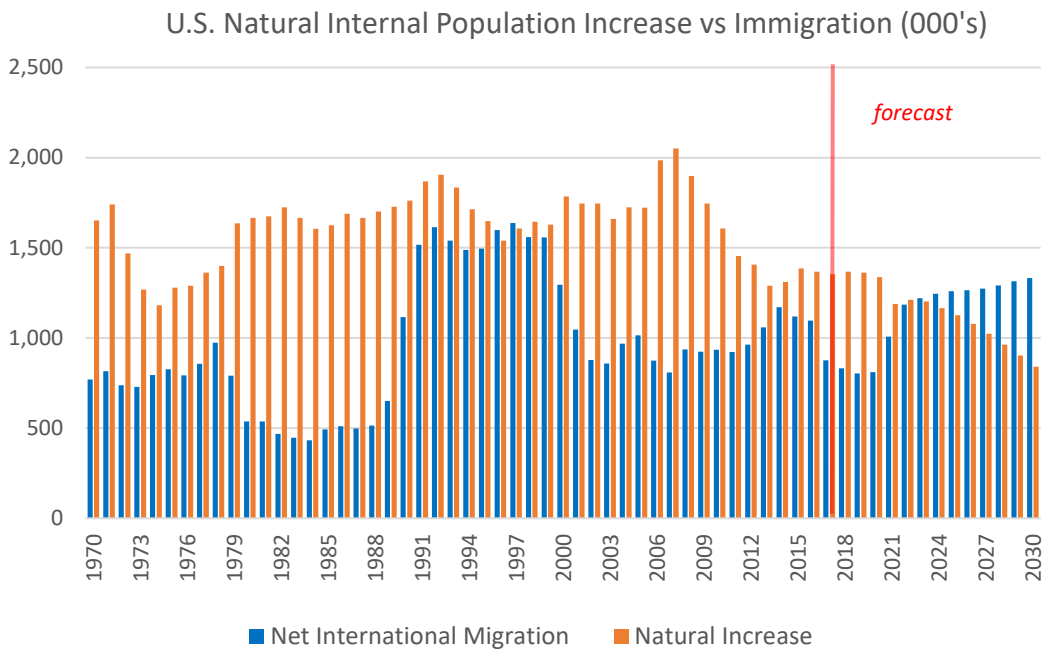
[8] PEW Research Center report on "Future Immigration will change the face of America" 2015.

[9] There are some countries that might be more severely impacted by a Trump administration including Syrian refugees, and those from other Islamic countries but it remains to be seen how new policies will play out.

Exhibit 1: Population Projections

Year	Population	Numeric Change	Percent Change	Natural Increase	Net International Migration
2015	322,632	3,073	0.94%	1,386	1,119
2016	325,107	2,107	0.65%	1,367	1,097
2017	327,336	2,229	0.69%	1,353	876
2018	329,534	2,199	0.67%	1,368	831
2019	331,700	2,166	0.66%	1,362	804
2020	333,849	2,148	0.65%	1,338	810
2021	336,045	2,196	0.66%	1,188	1,008
2022	338,442	2,398	0.71%	1,212	1,185
2023	340,867	2,424	0.72%	1,203	1,221
2024	343,278	2,412	0.71%	1,166	1,246
2025	345,665	2,386	0.70%	1,127	1,259
2026	348,009	2,344	0.68%	1,079	1,265
2027	350,305	2,297	0.66%	1,023	1,274
2028	352,560	2,255	0.64%	963	1,292
2029	354,777	2,217	0.63%	903	1,314
2030	356,949	2,173	0.61%	840	1,333

Figure 1: Population Projections Plot



The impact of immigration on population growth estimates varies widely. While border states first come to mind as areas that could be heavily reliant on immigration for population growth, we find that many of these areas also attract a large U.S. migration making immigration a small part of total growth, e.g. immigration accounted for only 5.0% of population growth in Texas and Arizona in the 2010-2014 period. To the contrary, we find that immigration is more important to slow-growth states, accounting for virtually all population growth from 2010 to 2014 in states such as Maine, Michigan, Rhode Island and West Virginia, and more than 30% of growth in Connecticut, New Jersey, New York, Ohio, Pennsylvania and Vermont. See the state and metropolitan area reviews of this report for further discussion.

2. Estimating U.S. Households

Moving from population estimates to household estimates is simply a function of household size. Household size has declined steadily since 1965, but the rate of decline has flattened in recent years. See Figure 2 below which shows the peak of household size at 3.7 for families and 3.35 for all households in the 1960's. When the population is adjusted for non-households; e.g., those living in group quarters, the average household size is about 2.54 overall and 3.15 for families as of the 2015 Census. If we divide 325 million by 2.54 we get 127.9 million households as of the end of 2016, but this exceeds the benchmark estimates of 118.2 million per the most current U.S. Census survey. Thus, we used the most complete and current surveys of population and households from different Census surveys[10] and other sources to estimate household size and total households. Figures used in this survey are shown in Figure 7.

Several factors are causing a decrease in household size. Single persons living alone doubled from 13% of households in 1960 to nearly 27% in 2010 (Figure 3). This is a result of influences on both ends of the population spectrum. The median age at first marriage increased from 23.5 for men and 21.1 for women in 1975 to 29.5 and 27.4 respectively in 2016.[11]

[10] U.S. Census B25127 2015 ACS (1-year) table, Moody's Analytics and Hoyt Advisory Services.

[11] U.S. Census Bureau, Families and Living Arrangements, Table MS-2.

Figure 2: Household Size Over Time

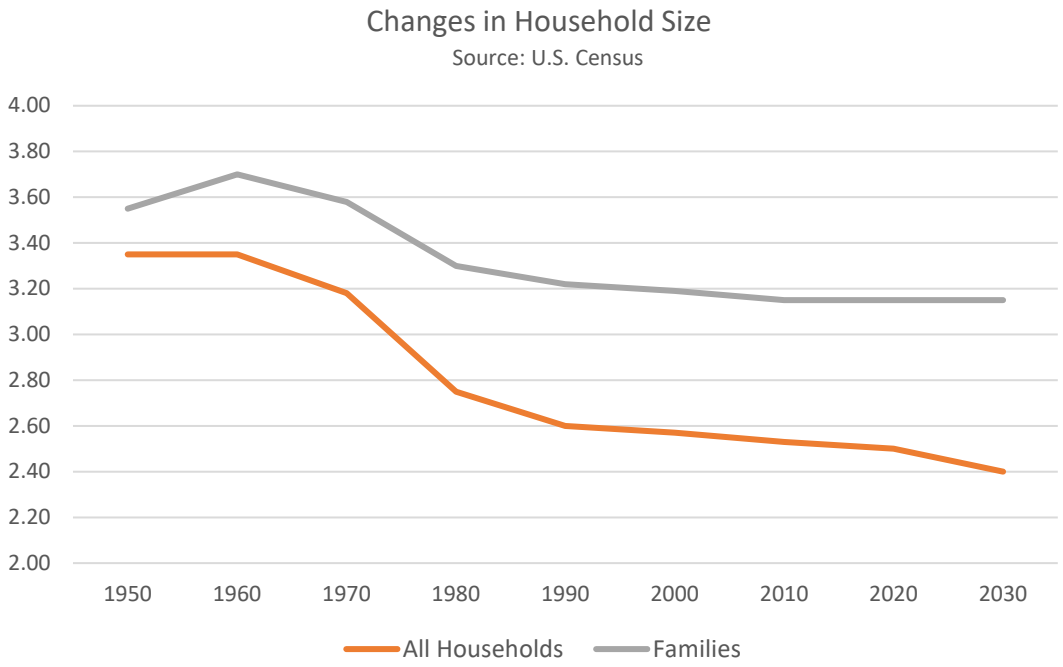
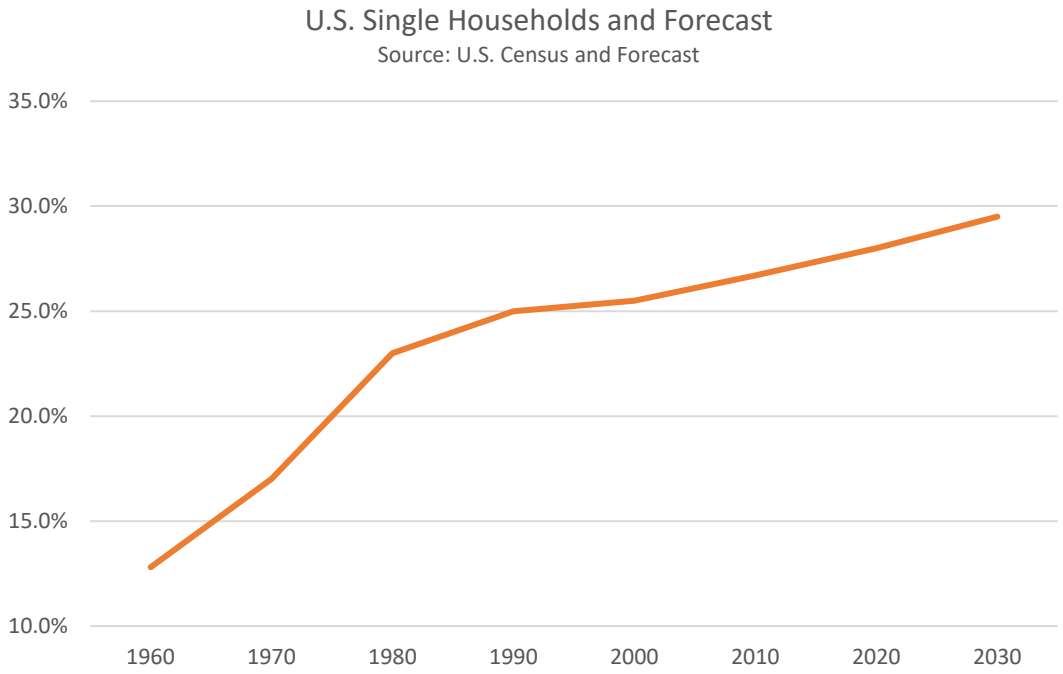
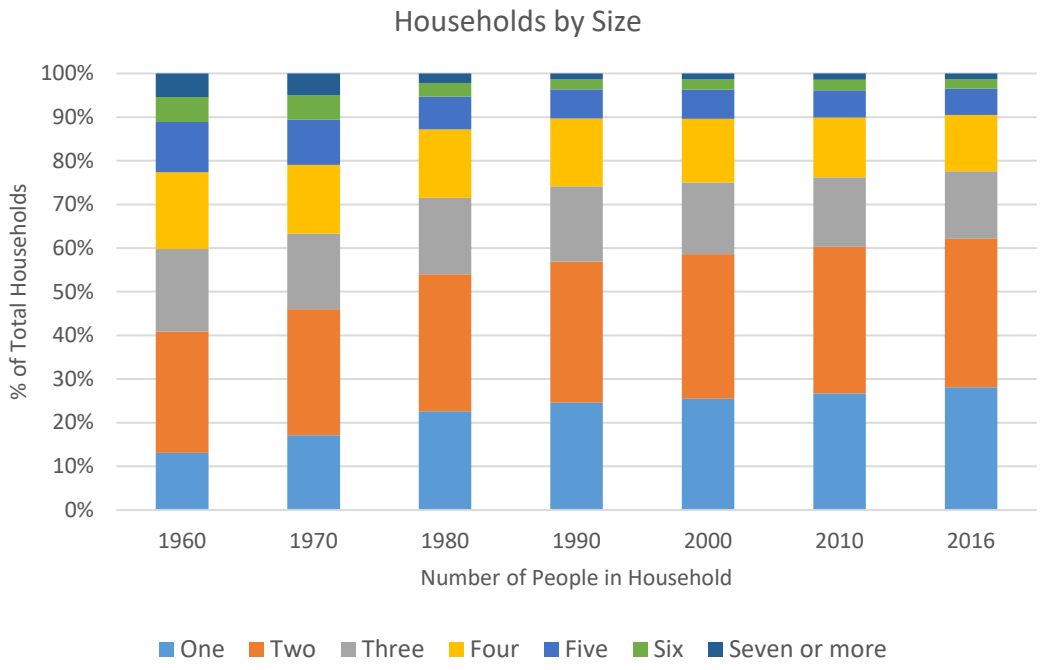


Figure 3: The Rise of the Single Person Household



Not only are the single households rising as a percent of the population but the size of households overall continues to decline as shown in Figure 4. Households of three or more people declined from 59% of households in 1960 to 43% in 1990 and 38% in 2016[12].

Figure 4: Large Households a Declining Share of Total



Household size by age of householder increases on average until age 40 as young people form families and then begins to decline after age 40[13]. See Figure 5 below. Average household size is three people or larger for households where the head of household is aged 30 to 49. Conversely, household size drops precipitously to slightly over 1.6 people when the head of household is 75+ years. As the U.S. population ages, older (and smaller) households are becoming a larger share of the market. See Figure 6 below. Notably, we estimate that the 45-54 aged household segment will decline from 21% of households in 2010 to 16% in 2030 while the Baby Boomers, born circa 1946 to 1964, are entering traditional retirement age. The 65-74 aged segment is projected to increase from 11% of households in 2010 to 17% in 2030 while the 75+ aged segment increases from 10% to 15% of households during the same time period.

[12] Source: U.S. Census Bureau, Families and Living Arrangements.

[13] Source: U.S. Census Bureau, Current Population Survey 2015.

Figure 5: Household Sizes Are Smaller for Older Households

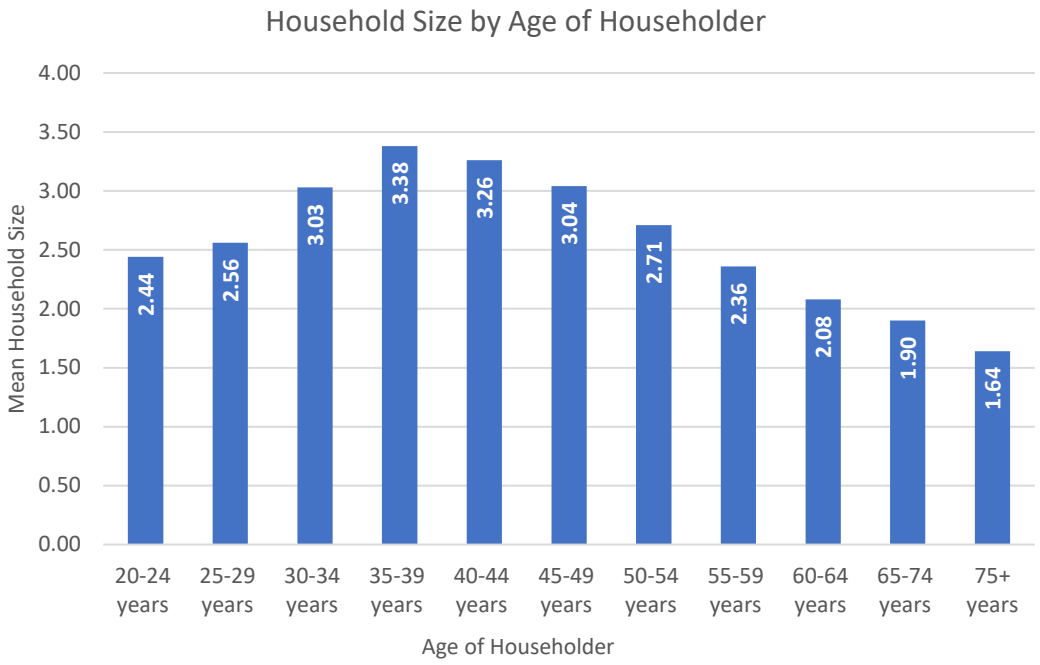
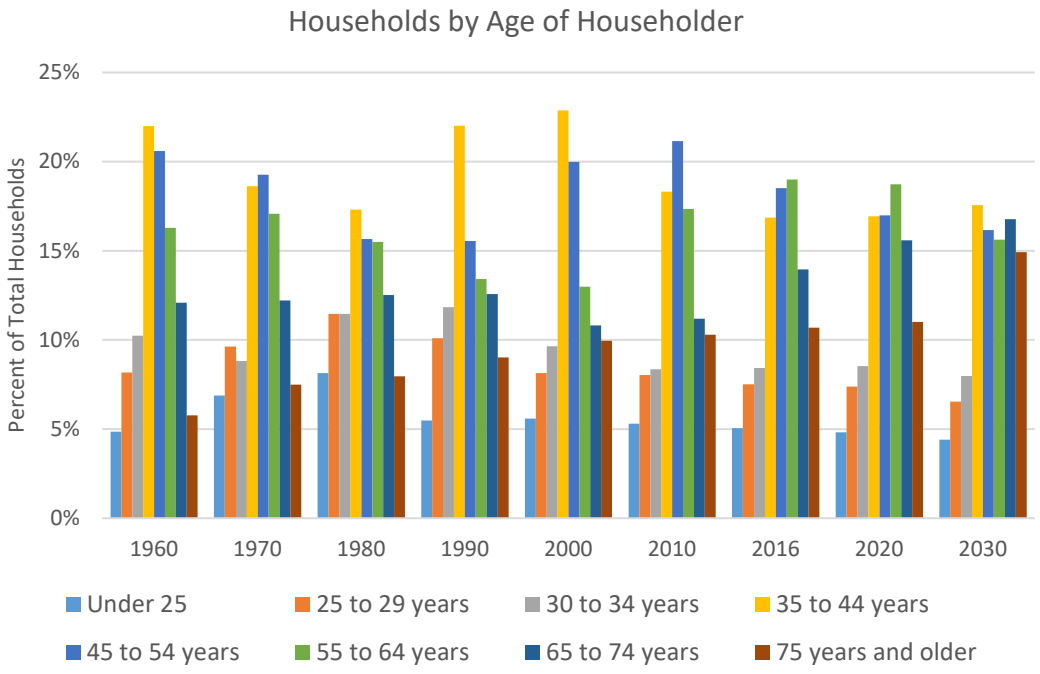


Figure 6: Older Households an Increasing Share of Total Households



Another significant trend impacting household size is the increasing share of population growth attributed to international in-migration to the U.S. See Figure 1 above. Notably, households of Hispanic origin[14]accounted for an estimated 20% of U.S. population growth in 2015 and 43% of net in-migration. By 2030, the U.S. Census Bureau estimates that people of Hispanic origin will account for 24% of U.S. population growth and 41% of net in-migration. This is significant to household size estimates because households of Hispanic origin are significantly larger, averaging 3.25 people per household as compared to 2.42 people per household for non-Hispanics.[15] However, similar to overall U.S. household size data, Hispanic households are also declining in size, down from 3.56 people per household in 2001.

The implications of the household size and population trends are projected below in Figure 7. The U.S. is expected to have approximately 141 million households by 2030. From the end of 2016 through the end of 2030 the population should grow in total by 9.8% but the household growth rate over than same period is 12.8%, as the household size declines. This is an annual compounded growth rate, in our base case, of 0.7% in population increase and 0.9% in household increases. Note that this is a slower pace than recent historical trends when population increased by 1.2% annually on average from 1990 to 2000 and by 0.9% from 2000 to 2010. Without any net in-migration from other countries, the U.S. population is expected to grow by only 0.4% annually through 2030. Household growth stayed a little more stable over time as household size shrank, averaging 1.2% per year in both 1990-2000 and 2000-2010 and dropping slightly to 1.1% since 2010.

While the timing and severity of economic recessions are difficult to predict, the U.S. has experienced a recession every four to ten years during the past fifty years. Thus, we broadly estimate two recessions slowing down household formation rates in the forecast horizon, the first estimated around 2019 lingering until 2020 and the second and larger recession in 2030, possibly starting in 2029 and lingering through 2031. The first recession is forecast to be mild and is based upon the normal economic cycle.[16] A second mild recession could occur in 2026 but will depend more on a global economy and is not factored into any of our models. The third recession is estimated to be quite severe and is based upon entitlements (Social Security and Medicare) running out of funding resulting in the need for massive tax increases and some budget cuts.[17] The population growth rate in the graph below is shown in lighter gray with the darker column showing households. Normally the household growth rate exceeds that of the overall population, but here we note the effects of the slower household growth rates during projected recession years which is further impeded by lower than historic population growth. The number of households actually shrinks slightly in 2030 as more people double or triple up during a significant recession.

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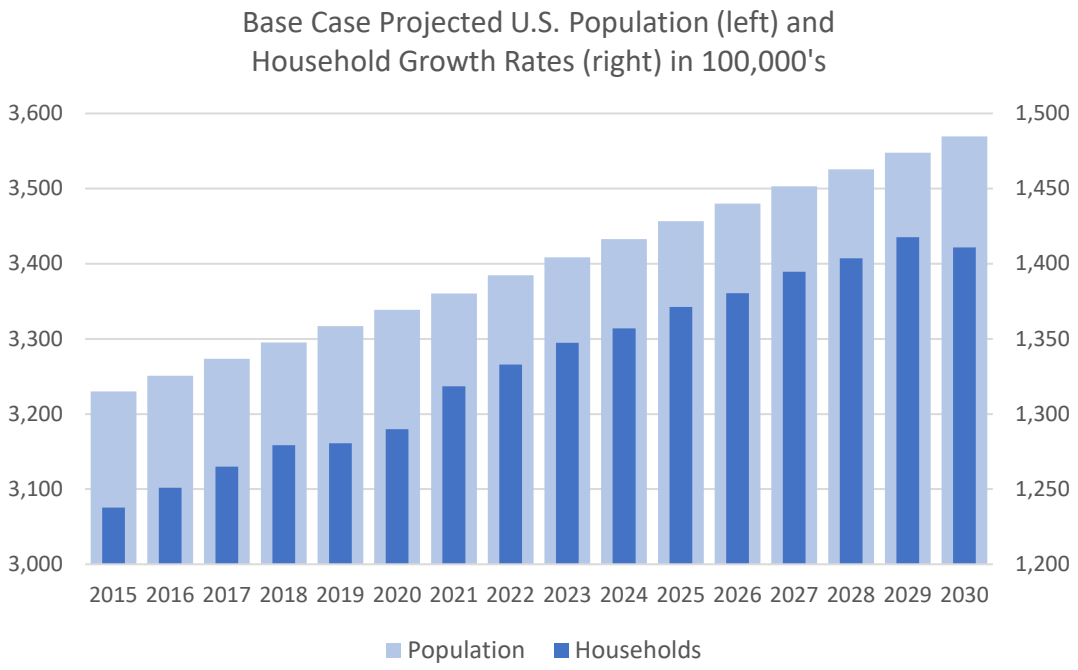
[14] Note that origin is separate from race, and thus Hispanic households may be of any race in U.S. Census data.

[15] Source: U.S. Census Bureau, Current Population Survey 2016.

[16] A variety of sources were used to suggest a recession in late 2019 and during part of 2020. The most convincing of these came from Intensity, an economic forecasting firm headed by Dr. Alan Timmermann. See http://intensity.com/forecasts. Another economist consulted for longer term economic crisis is Dr. Alan Beaulieu. https://www.itreconomics.com/content/alan-beaulieu.

[17] See the very convincing analysis of Alan Beaulieu, http://www.financialsense.com/contributors/dr-alan-beaulieu/us-recession-2019-depression-2030 where he makes the case that the U.S. politicians kick the can down the road until it reaches a crisis point, that being the inability to fund Social Security, Medicaid and other entitlements, along with a maxed out Federal debt creating unsustainable borrowing capacity. The timing estimate here is very much driven by the aging Baby Boomers who will no longer be working and demanding vast increases of medical care in the last years of life.

Figure 7: Base Case of the U.S. Household Growth Rate



U.S. Projected Base Case Households by Year as Used in Figure 4 in 000's

Year	Population	Household Size[18]	Households
2015	323,000	2.53	123,778
2016	325,107	2.52	125,094
2017	327,336	2.51	126,501
2018	329,534	2.50	127,915
2019	331,700	2.51	128,043
2020	333,849	2.51	128,979
2021	336,045	2.47	131,848
2022	338,442	2.46	133,295
2023	340,867	2.45	134,746
2024	343,278	2.45	135,688
2025	345,665	2.45	137,131
2026	348,009	2.45	138,048
2027	350,305	2.44	139,474
2028	352,560	2.44	140,363
2029	354,777	2.43	141,768
2030	356,949	2.45	141,092

[18] Assumes 3.0% of population is in group quarters.

3. Total Housing Demand

While total housing demand parallels the number of households as projected above, the actual housing stock demanded will also be affected by the following factors:

- the number of homeless households,
- the number of excess or vacant units available to fill new demand, if located in areas where demand exists,
- the demand for second and third homes, and last,
- the atrophy of physical housing units which will leave the housing market.

Later, we will divide the housing demand into owner and renter shares, and when doing so, noting the impact of units that might be part of either stock.

a. Homeless Population and Households

Homelessness exists in the U.S. at the rate of about 17 to 18 persons per 100,000 population, about half of whom are considered chronic. Thus, on a single night in 2015, more than 560,000 people were without housing and sleeping outside, in an emergency shelter or a transitional housing program.[19] The highest rate in any metropolitan market is Washington D.C. at 111 per 100,000 population.[20] More expensive large cities tend to have higher homeless rates. Single persons make up about half the homeless household count. From an analysis of long term trends, economic cycles affect homelessness but there is no relative trend based on household income dispersion. During 2016 for example, homeless rates were lower in about two-thirds of the U.S. States and higher in the other third.

For 2016 the impact of homeless households requires an adjustment from 125,094,000 down to 124,820,000 households, a reduction of 2/10ths of 1.0%. At the national level this is not very significant, but in some metro markets such as Washington D.C., it requires a modeling adjustment for household demand.

b. Normally Vacant Units

The U.S. Census Bureau surveyed nearly 134.8 million housing units in 2015, some 118.2 million occupied and 16.6 million of them as vacant representing 12.3% of the stock.[21] HAS adjustments that correlate the decennial Census with their current ACS survey provide for 134.7 million housing units in 2015, 120.4 million occupied and 14.3 million vacancies or 10.6%.[22] The real question is what is the total demand and growth rate, but part of the demand is a function of normally vacant units. We can break the vacant housing statistic into three parts:

There is the normal equilibrium vacancy rate in each market where rents tend to go up when the vacancy rate is below a certain level.[23] Residential rentals have the lowest average natural vacancy

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[19] See http://www.endhomelessness.org/library/entry/SOH2016 "End Homelessness in America" 2016.

[20] See http://www.endhomelessness.org.

[21] U.S. Census American Community Survey (ACS) 1-year estimates.

[22] HAS and associates adjustments are based on Census metrics only.

[23] Source: "REVISITING THE DERIVATION OF AN EQUILIBRIUM VACANCY RATE" by Richard Parli and Norm Miller, Journal of Real Estate Portfolio Management, Vol. 20, Issue 3, 2014.

rate compared to office, industrial and retail property. At the national level, we estimate this at about 5.0% to 6.0%, although in some local supply constrained markets it normally runs even lower and in some elastic supply markets, it runs higher. As of the end of 2015 the rental vacancy rate for all residential was 6.8%. Note that 6.8% of the rental stock would represent about 2.6% of the total housing stock.

There are also vacant homes within the owner-occupied market simply because of imperfect timing, or time needed to repair homes prior to occupancy, or from units vacated after buying a new home. This tends to add 1.5% to 2.0% vacancy to the entire stock of housing.

c. Demand for Second and Third Homes

The third source of vacant homes is from second and third, and in some cases fourth-plus homes, owned but rarely occupied by wealthier households. These are particularly important in tourist markets, but even at the national level the counts are significant. Nationally this surplus housing figure runs about 6.0% to 8.0% of the housing stock, and it has been growing slowly on a long-term basis.[24]

Add together vacant rental units at 2.6% of the total housing stock, plus 1.75% for unoccupied owner units, plus 7.0% for unoccupied surplus homes and we get a total vacant estimate of 11.35%, which is in the range of the Census-based HAS adjusted estimates above.

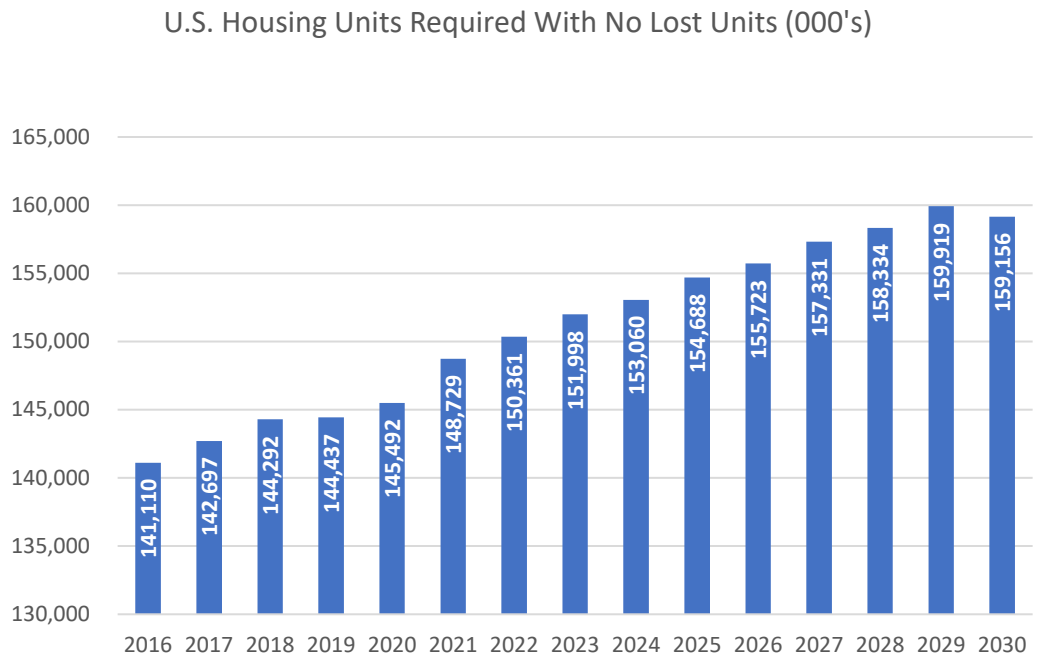
For 2016 this suggests a total housing demand of approximately 125.1[25] million households times (1-.1135) equals 141.1 million housing units. This is similar, but slightly higher than our HAS adjusted estimates above.[26] See Figure 8 below where we project total housing units required through 2030. Note this does not equal total housing demand, nor can it be used to derive net units demanded per year until we make further adjustments. We must consider the obsolescence, real deterioration and demolition of existing housing stock based on a variety of causes and also include housing units lost to the process of eminent domain for public improvements, schools, roads, and infrastructure. Fires, tornadoes, and hurricanes also take their toll, yet we seldom see eliminated housing units brought into forecast models of demand. This will be considered next.

[24] Some of these units may be rented but unreported. Others might be reported as rentals but generally left vacant, so solid and reliable statistics on second homes is a challenge.

[25] The U.S. Census Bureau publishes at least five different estimates of the number of households. Each source yields a somewhat different figure. Most of the differences can be explained because of differing methodologies, dates, and whether undercount adjustments have been applied to the series. This study uses a base household estimate as provided by Moody's Analytics which is based on Decennial Census, Current Population Survey basic monthly files, and annual Census Population Estimates.

[26] There is also some possibility that U.S. households or individuals are living outside the U.S., including those in the military, and yet at the same time foreigners are living in the U.S. No adjustments are made for such ex-pat type housing demand.

Figure 8: U.S. Housing Units Projected Through 2030 Prior to Adjustment for Lost Units



d. Annual Loss of Physical Housing Units

The rate of loss of existing housing stock varies according to age and location. A recent study by Bokhari and Geltner suggested depreciation rates on new multi-family dwellings of 4.0% per year.[27] The depreciation tended to slow down as properties aged until they approached the end of their economic life. They found an average real depreciation rates of about 1.44% per year over the entire economic life. Quantifying the impact of real depreciation and units lost to natural causes (fires, tornadoes, hurricanes) and demolished for re-purposed property or moved or changed in use is the discussion provided in CINCH reports by HUD. CINCH stands for Components of Inventory Change.[28] CINCH data is not consistent nor annual and the last major report covered 2011-2013. During that time 1.567 million units of housing were lost to various causes, or 522,333 per year. This represented about 0.4%[29] of the housing stock per year. However, if we used 0.4% of the housing stock each year, that would suggest an economic life of 250 years, well beyond anything statistically supportable. This seems extreme, especially considering the average age of all U.S. housing is currently around 39 years in age, and few homes are over 200 years in age in the U.S. Figure 9 shows the age of the U.S. housing stock broken down by owned vs. rented and year the units were built[30], including a category for all mobile homes and

[27] See "Characteristics of Depreciation in Commercial and Multi-Family Property: An Investment Perspective" https://mitcre.mit.edu/wp-content/uploads/2014/03/Characteristics-of-Depreciation-in-Commercial-and-Multi-Family-Property_0317.pdf.

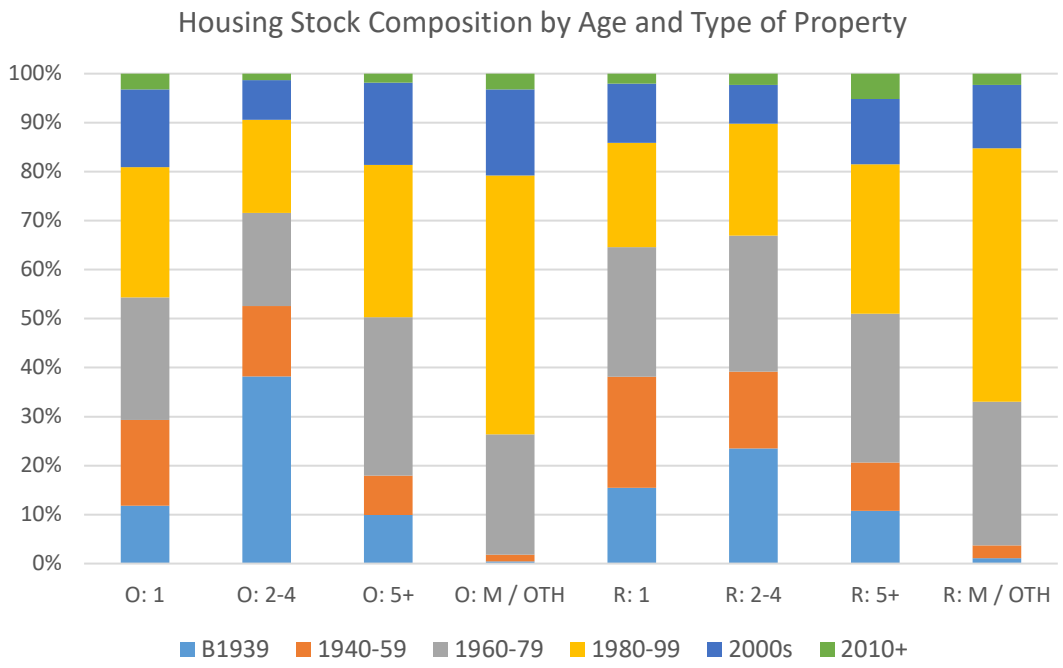
[28] See https://www.huduser.gov/portal/datasets/cinch.html. See also https://www.huduser.gov/portal/datasets/cinch/cinch13/Rental-Dynamics-Report.pdf.

[29] Note that loss rates vary by property, tenure and occupier characteristics with renter occupied properties experience loss rates that are about 52% higher than this figure.

[30] Source: U.S. Census, American Community Survey, 2015.

other property types. Note that there are significant differences in age of housing stock by property type. For example, 30%-40% of single units, either owned (O:1 in the graph below) or rented (R:1 in the graph below) were built before 1960. Conversely, almost none of the mobile home stock was built before 1960, with a large part of the current inventory built between 1980 and 1999. Rental properties that are 5 units or larger (R:5+), a segment frequently tracked by institutional owners, is more evenly distributed with 21% built before 1960, 61% built between 1960 and 1999 and 13% built in the 2000's. Note that this segment has the largest percent of inventory built since 2010, at 5.1%.

Figure 9: Age of U.S. Housing Stock



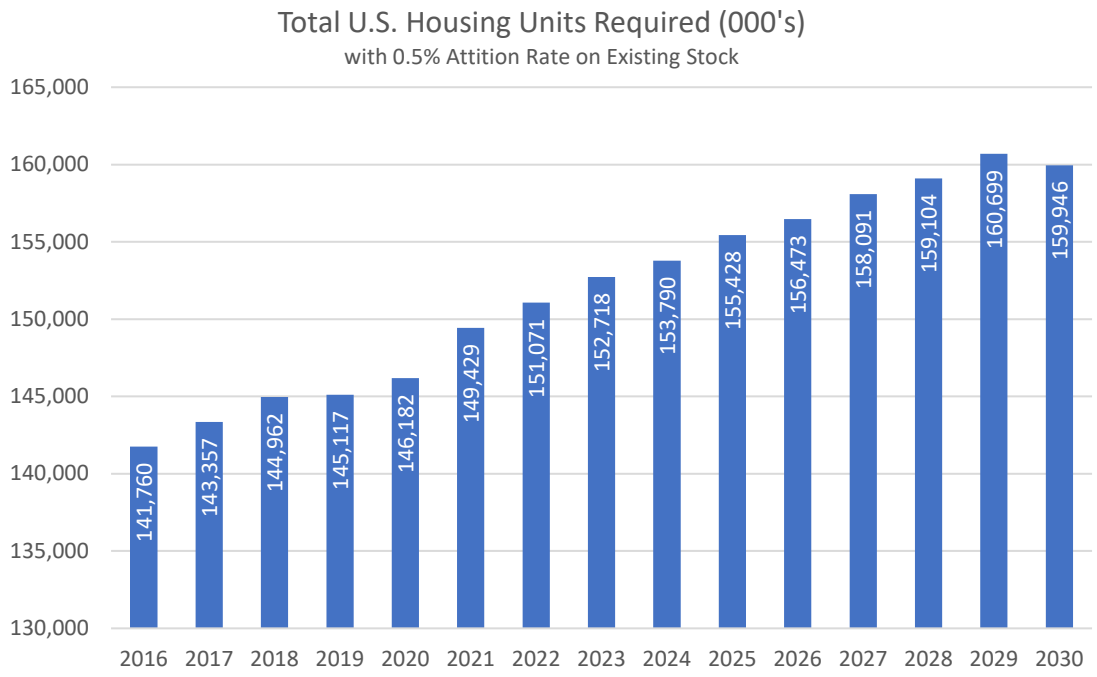
Using the general number of 1.44% based on the average of Bokhari and Geltner estimates results in an economic life of about 70 years for multifamily properties, which seems very reasonable, assuming owners keep them maintained.

One lesson of the Bokhari and Geltner study is that major capital improvements are required to periodically update multifamily properties, or for that matter any building, and without such capital expenditures the wear and tear and loss of real value (gross depreciation) would be much higher. We should also note that the type of buildings we observe which are 250 years-old and still standing have two attributes. They are built of very strong materials, stone or brick and very long lasting roofs. They are also continuously occupied in strong demand areas and well maintained. Today, we tend to use materials that are much less durable.

A recent study by Jiro Yoshida found that the depreciation rate for single family residences was about 1% per year but the rate varies considerably by location and other property characteristics.[31] This study used a rather limited sample of properties. To be conservative for the best case, we will use a 200-year life and a 0.5% loss rate, noting that at least two thirds of this loss will be due to natural causes. Even this very conservative estimate suggests we need at least 650,000 units of housing production in 2016 and growing with the stock rate simply to maintain what we have. We should not assume that housing, once built never disappears. We will add this 650,000 plus figure to the total U.S. required housing stock, growing in proportion to the total. Please note how sensitive this assumption is to our required housing stock. We are assuming that the existing stock will be here for a while since the average age is only 39 years and that is why a conservative replacement assumption makes sense for the next few decades.

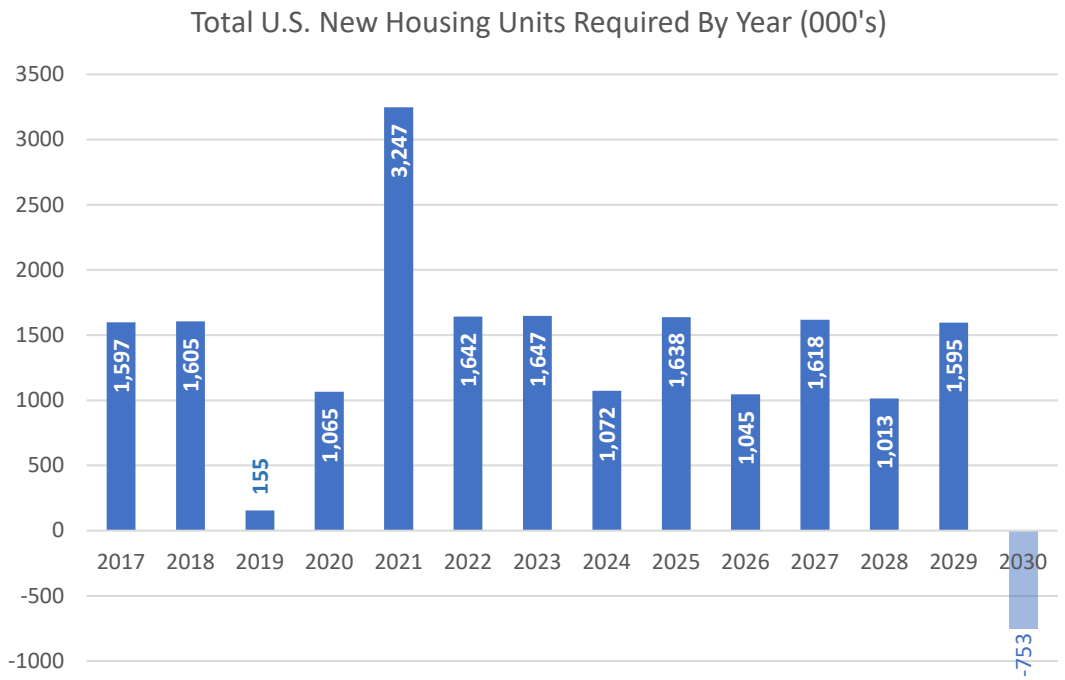
In Figure 10 below, we add in the estimate of lost units to derive the total U.S. housing stock required and in Figure 11 we show the net new housing required each year. The average over the entire period is 1.3 million new housing units each year. Some of the variation in required units is based on a slowdown in economic growth with probable modest economic recessions occurring around 2019-2020 and more severely in 2029-2030.

Figure 10: Total U.S. Housing Units Required



[31] "Economic Depreciation in Property Value: Cross-Sectional Variations and Their Implications on Investments" by Jiro Yoshida, Real Estate Research Institute Working Paper, April 1, 2017. Working papers can be found at http://www.reri.org/research/working.cfm.

Figure 11: Total U.S. Housing Units Required by Year



4. Home Ownership Rates and Renter Portion of Housing Demand

The characteristics of homeowners vary from those of renters. For example, 35% of renters are less than 35 years old with another 20% less than 44 years old. Only 36% of homeowners are less than 44 years old. Renters are more ethnically diverse with significantly more people of Hispanic origin and Black by race, and have a lower proportion of college-educated persons. Interestingly, tenants in rental properties are somewhat sticky with 59% of renters moving into their units in 2010 to 2014 with only 15% moving in 2015. See Appendix 2 for further details.

Globally, home ownership rates vary widely from less than 50% of households to more than 95%[32]. According to data compiled by the European Mortgage Federation from Eurostat, supplemented by more recent data from Eurostat, the majority of European countries, the 28 countries in the European Union, have home ownership rates that exceed the U.S.[33] While international comparisons are difficult to measure, countries with extremely high home ownership rates seem to have several factors in common. Many are former socialist countries which gave existing tenants the housing they occupied.[34] Ever since the dissolution of the USSR and the transition to privatization, the high home ownership rates have been receding. Culture, the momentum of tax laws and other policies that

[32] See http://www.pewresearch.org/fact-tank/2013/08/06/around-the-world-governments-promote-home-ownership.

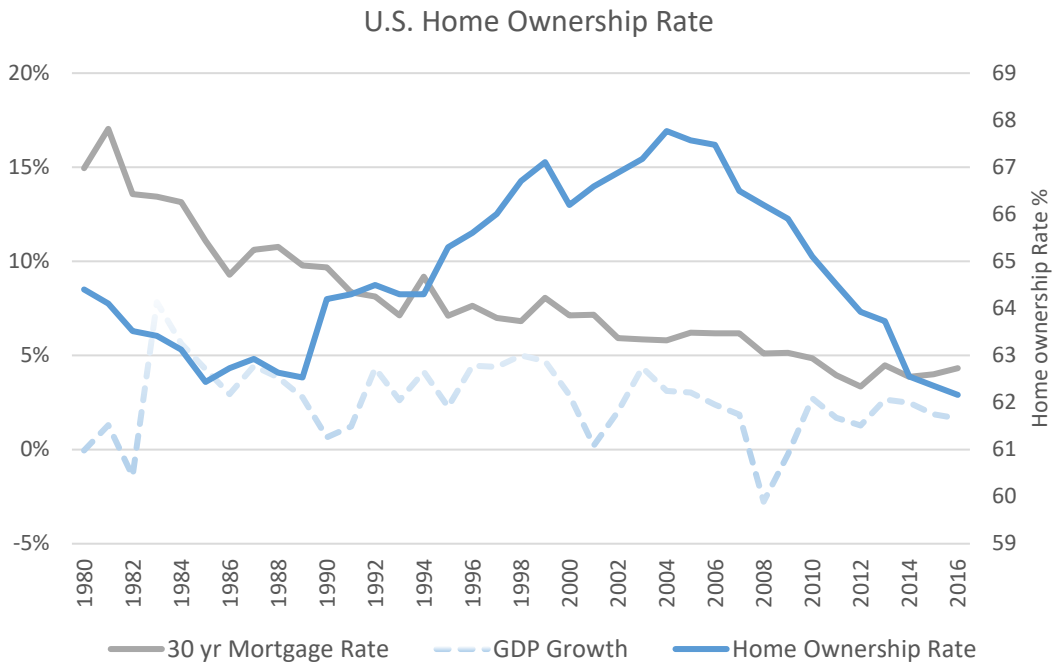
[33] See http://eyeonhousing.org/2015/06/a-cross-country-comparison-of-homeownership-rates.

[34] For example, Romania, Czechoslovakia, and many others.

encourage home ownership and economic stability certainly play a role.[35] Developed countries like Germany and the U.K. have had relatively stable economies and inflationary environments and do not fear runaway inflation, thus the demand for real assets and inflation hedges are somewhat mitigated. Housing affordability across countries is additionally impacted by a number of factors including differences in tax burdens, housing stock characteristics and income equality[36]. In the U.S., age is positively correlated with home ownership and the highest home ownership rates exist for those aged 65-74, as shown in Figure 13. We also observe a conversion to renting as people reach 75+, especially for those 80+. The Baby Boomers will be crossing these thresholds in significant numbers by 2025, which could affect overall home ownership rates. While it seems that there is no universal equilibrium home ownership rate, we have modeled home ownership rates over time as noted below.

In the U.S., a high rate of housing ownership has been an overall economic policy goal, particularly during the past 50 years, after full employment and keeping inflation under control, but this goal seems to have been punctured by the last housing bust. As shown in Figure 12 below, U.S. home ownership rates have historically had little to do with capital market or economic trends.

Figure 12: Home Ownership Rate



National policies affecting credit availability, banking regulation and lending trends have a significant impact on home ownership rates. Changes in political environments and policies are difficult to forecast going forward, but have had a significant impact on home ownership in the past. In fact, we

[35] Capital gains tax laws and exclusions for single and married households help to maintain the momentum of sticking with home ownership after an initial purchase, if significant appreciation has occurred.

[36] See http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/international_rental_housing_carliner_marya.pdf.

were able to model home ownership rates from 1971 to 2016 with a high degree of certainty[37] using three demographic and economic factors and five policy factors. The policy impacts alone explain approximately 75% of the variance in U.S. home ownership rates since 1971. Examples of significant policy changes include the 1977 Community Reinvestment Act which intended to encourage lenders to address the needs of all borrower segments of their communities including low and moderate-income neighborhoods, i.e. it intended to reduce discriminatory credit practices against low income neighborhoods, otherwise known as redlining. In 1992, The Housing and Community Development Act passed, requiring that 30% or more of Fannie's and Freddie's loan purchases be related to "affordable housing" (borrowers who were below normal lending standards). However, HUD was given the power to set future requirements, and HUD soon increased the mandates. The Gramm-Leach-Bliley Act also known as the Financial Services Modernization Act was passed in 1999. It repealed portions of Glass Steagall act, allowing depository and investment banks to merge. Critics often cite it as a cause of the subprime crisis, allowing mergers to create 'too big to fail banks' that did not have enough regulation regarding risk and reserve requirements. The Commodities Futures Modernization Act of 2000 further limited the regulation of financial derivatives. As a response to the subprime crisis, The Housing and Economic Recovery Act was passed in 2008 in an effort to assist homeowners and restore stability and confidence in Fannie Mae and Freddie Mac.

Home ownership peaked in the U.S. in June of 2004. While 10-year Census data routinely reports lower home ownership rates than annual estimates, home ownership rates are estimated to have peaked near 68% in the first quarter of 2005 as a function of easy credit, subprime mortgage brokers peddling high loan to value mortgage options, reasonably low interest rates, appraisals that merely justified prices paid, and rising price expectations by buyers.[38] Since the crash which followed in 2008 and beyond, credit standards have tightened significantly and underwriting remains tighter than prior to the crash.[39] While many subprime mortgage lenders are no longer in business, most lenders still sell qualified mortgages to Fannie Mae and Freddie Mac and find appraisers who will justify the value, with little skin in the game. History may repeat itself with respect to a new housing bubble, but for now we observe that as of the end of 2016, nearly 10% of the mortgaged households remained underwater. The forecast model does not assume any policy changes going forward, although significant modifications to the tax code were under consideration as of the time this report was being written. Modifications for example that offset or impact the applicability of mortgage interest deductions in the tax code should be watched going forward for potential impacts on home ownership rates.

The appetite and investment luster of housing is certainly much less than before 2008. Home ownership rates are notably lower for younger buyers as shown in Figure 13. This segment of the population has also shown the largest change in home ownership trends since the 2009 peak. While home ownership rates for the 65+ segment of the population fell by only 210 bp since the 2004 peak, rates for the under 35 and 35 to 44 segments fell by 840 bp and 1100 bp respectively. The challenge now is to figure out how much of this change is cyclical and how much is secular. Many of those who

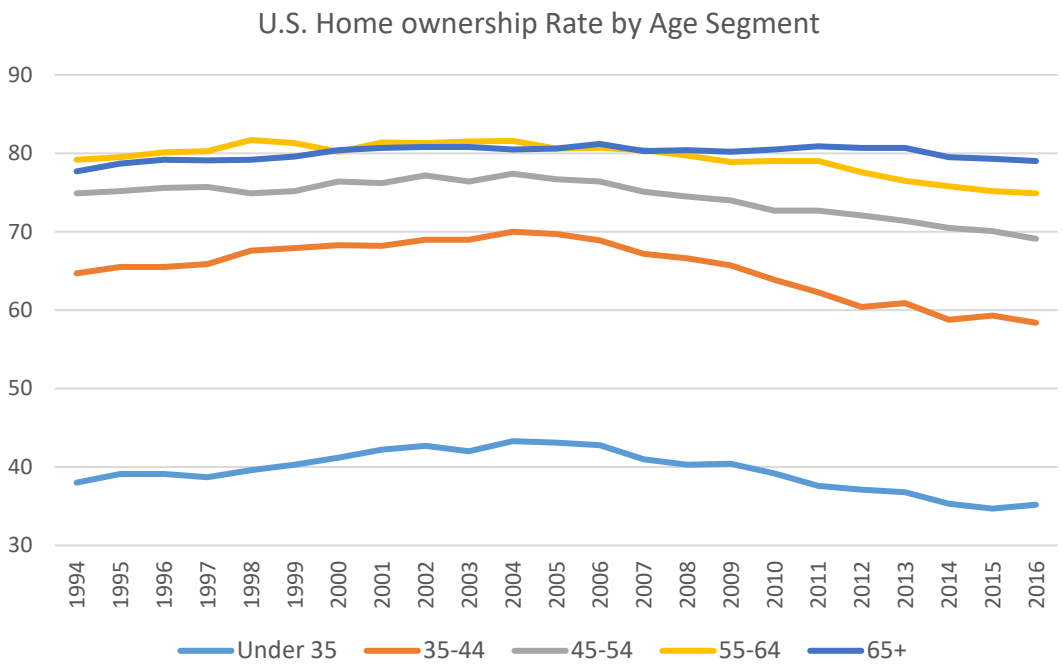
[37] Adjusted R square on the model of 0.847.

[38] See https://www.bloomberg.com/news/articles/2016-07-28/homeownership-rate-in-the-u-s-tumbles-to-the-lowest-since-1965.

[39] See https://www.bloomberg.com/news/articles/2016-07-28/homeownership-rate-in-the-u-s-tumbles-to-the-lowest-since-1965 with a note that minorities now find it harder to qualify for mortgage loans compared to pre-crisis.

bought near price peaks or had their credit affected are hesitant to jump back into housing ownership.[40] Surveys of Millennials suggest that owning a home has less importance than to the prior generation. Others suggest that this reticence to jump into home ownership will change as the younger generation has children.[41]

Figure 13: Home Ownership Rate by Age



Unemployment after the 2008 recession hit the younger population harder. Unemployment for 20-24 year-olds peaked at 17.2% in April of 2010, 10% higher than the average for people aged 35 or over, and double the typical difference between the two age groups. The span between the 20-24 year-old unemployment and the 35+ year-old unemployment did not come back in line until early 2016. Similarly, the 24-35 year-old unemployment peaked at 10.6% in May 2010, significantly higher than the average for the 35+ group.

Young adults living at home in both the 18 to 24 year and 25 to 34 year groups increased by about 5.0% in the past decade to unprecedented levels since the data began in 1960 and remain at elevated levels through 2016 with more than half of 18-24 year-olds living with parents and about 15% of 25-34 year-olds living with parents. Additionally, household size increased from 2000 to 2010, particularly in very young households (less than 20 years old) and in the 50-59 aged group, reflecting adult children living at home. The good news for housing demand is that household size trends began to

[40] See http://jchs.harvard.edu/sites/jchs.harvard.edu/files/hbtl-06.pdf a Harvard study on housing as a means to build wealth, 2013.

[41] See http://rismedia.com/2016/07/25/home-ownership-still-desirable-for-millennials suggesting Millennials would like to own homes but are hampered by student debt and mobility concerns.

reverse slightly in 2016, particularly for younger households that were again beginning to reduce in size, possibly indicating a reversal of the housing doubling up after the recession. In addition to getting married at an older age, young people are having their first child at an older age. In 2000, the mean age of a woman when she first gave birth was 24.9 years old. In 2014, that age had risen to 26.3[42]. These trends are significant because the median age of first-time homebuyers is 32[43] – indicating pressure on young people to stay as renters longer. In fact, first-time homebuyers typically account for approximately 40% of home sales, although this figure dropped to a low of 32% as of 2015 (but rose to 35% of survey respondents in 2016).

College admissions continued to grow through 2010, and with rising unemployment in the younger population, student debt became an increasing burden. Aside from the tighter credit standards and lower investment appeal of housing, we consider student debt a considerable factor in the home ownership rate over the next several years. As of late 2016 student debt in the U.S., incurred by 44 million borrowers, exceeded 1.3 trillion dollars. Student debt has grown by 500% since 2004. The delinquency rate stood at 11.1% and the average monthly payment was $351.[44] Some 70% of the student debt borrowers owe more than $10,000 dollars. The average is now just over $30,000.[45] Converting a payment of $351 a month into a mortgage at 4.5% with a 30-year term has the impact of borrowing nearly $70,000 less; or conversely, it is like adding a second mortgage to any home purchase decision. With an 80% loan to value mortgage, this means the average affordable home is constrained by $87,000 dollars. Another way to look at this is if we use 28% of income towards a home purchase, this equates to reducing income by $15,000 per year.

The New York Fed has studied the issue of student debt and has provided the following statistic: in 2005 student debt stood at just over 310 billion dollars and the under 30 adult home ownership rate was about 34%. In 2015 the student debt reached $1.2 trillion and the under 30 home ownership rate declined to under 28%.[46] The point is that the propensity and capability of buying is being significantly curtailed by student debt. John Burns Real Estate Consulting estimated the reduction in home buying as a result of student debt to be 103,000 homes per year, a reduction of 7.6%.[47]

Some economists have suggested that students who borrow student debt and graduate will get a positive net present value, but this depends very much on the quality of the selected program. Some students will see substantially increased earning power, such as those attending medical schools or business schools, but many of these 44 million borrowers will be negatively constrained and affected by the debt. This will affect the marginal propensity to buy versus rent. We expect the proportion of college graduates seeking to rent instead of buy for the next several years will be somewhere near 55% as they age and start families, and yet this figure could be high. The U.S. Census figure for home ownership by those aged 35 and below slumped from 34.7% as of December 2016 to 34.3% at the end of March, 2017.

[42] Source: NCHS Data Brief, No. 232, January 2016.

[43] National Association of Realtors, Profile of Homebuyers and Sellers Survey, November 11, 2016.

[44] See https://studentloanhero.com/student-loan-debt-statistics.

[45] See http://ticas.org/posd/map-state-data for state by state data.

[46] See http://financeography.com/millennial-home-ownership-shrinks-as-student-debt-grows.

[47] See "Student Debt's Drag on Home ownership", John Burns, April, 2017.

Household wealth also plays an important part in home ownership rates. Wealth is impacted by a number of factors including job growth, income levels, savings behavior and capital market trends. Home prices are a large contributor to wealth, and in turn support spending behavior and purchases of other goods in rising price environments.[48] Home ownership rates also tend to rise in high inflationary environments in our model.

The last major factor that will lower home ownership rates from 2016 through the next decade are demographics. One parent households, headed by fathers, are nine times as common today as in 1960 and four times as common for single mothers[49]. The model also adjusts for factors such as age (previously discussed) and race/origin[50]. For example, Hispanics represent a growing segment of our population. "According to the American Community Survey, only 45 percent of Hispanic households owned their homes in 2013 compared with 71 percent of White Only households. If one were to hold those rates constant as Hispanics become an increasing percentage of the pool of homebuyers, the home ownership rate would drop."[51] The home ownership rate of Hispanics is rising with each successive generation that integrates into American society, but the impact of a changing population mix and a lower percentage seeking home ownership must be addressed in any realistic model on the home ownership rate. Additionally, household size varies significantly by race.

5. U.S. Rental Housing Demand

Based primarily on the lower appeal of for-sale housing for those households burned by the last housing bubble, the impact of student loans and the changing demographics, we expect a decline in the home ownership rate as shown in Figure 14. In the base case, interest rates are expected to continue to increase at a moderate rate, but higher or faster than expected interest rate increases could cause actual home ownership rates to be lower than those shown below.[52]

Figure 15 shows the total rental stock required to meet rental household demand, and Figure 16 shows the result by year. Note that while Figure 15 reveals a perfect and instant market response to anticipated demand, we do not expect the actual pattern to be so erratic. Rather, the time required to anticipate and get development approvals will require significant planning on the part of developers with no assurances of approvals in a timely manner. The actual number of rental units required, from all sources, averages 586,000 units per year from now until 2030. See Figure 16. In 2015 the U.S. added only 306,000 rental units, the most since 1989. At this rate, we are falling short by an average deficit of over 200,000 rental units.

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[48] See "How do house prices affect consumption? Evidence from micro data" by John Y. Campbella, João F. Coccob, Journal of Monetary Economics, Volume 54, Issue 3, April 2007, Pages 591–621 at https://doi.org/10.1016/j.jmoneco.2005.10.016.

[49] U.S. Census Bureau

[50] Wachter and Megbolugbe (1992) estimated that about 80 percent of the gap between White households and Black and Hispanic households can be explained by differences in endowment (including differences in income, education, age, gender, and family type). See https://www.huduser.gov/portal/periodicals/cityscpe/vol18num1/ch9.pdf.

[51] See http://www.urban.org/urban-wire/why-low-hispanic-home-ownership-rate-matters.

[52] Note that ten-year bond yields increased by over 70 basis points from early in November 2016 to December 2016.

Figure 14: Forecast of U.S. Home Ownership Rate

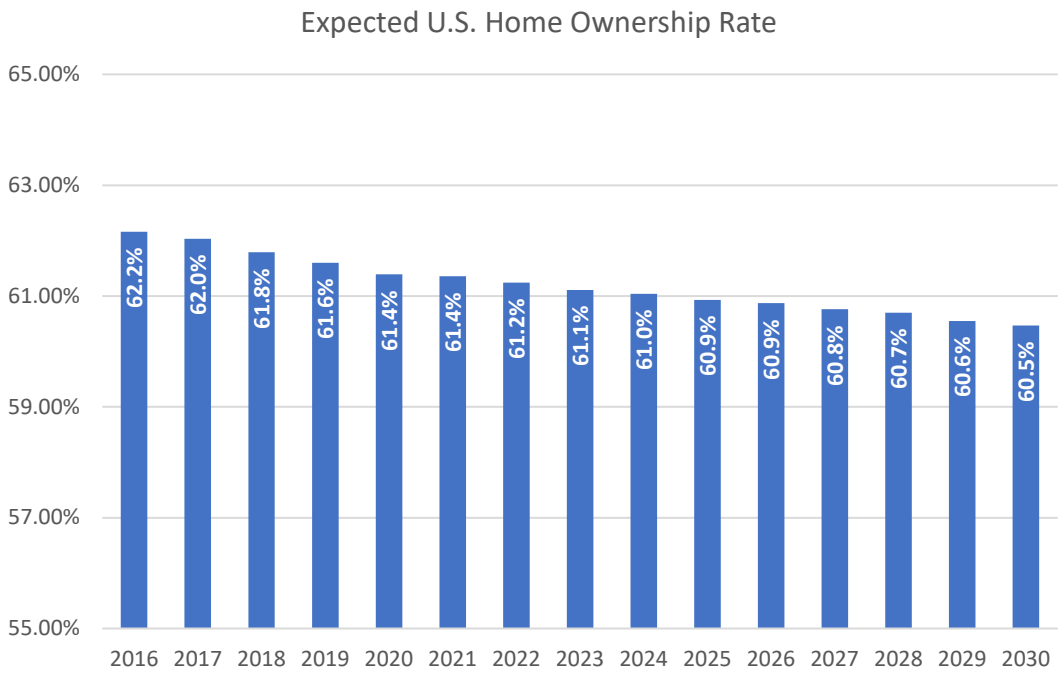


Figure 15: Total Rental Stock Required by Year

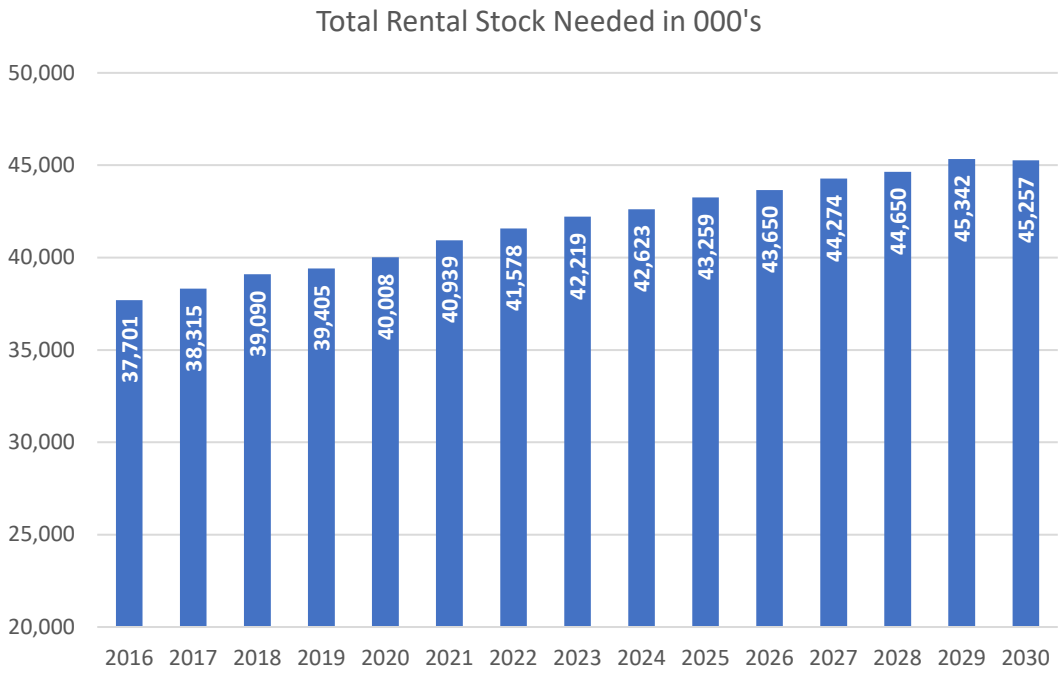
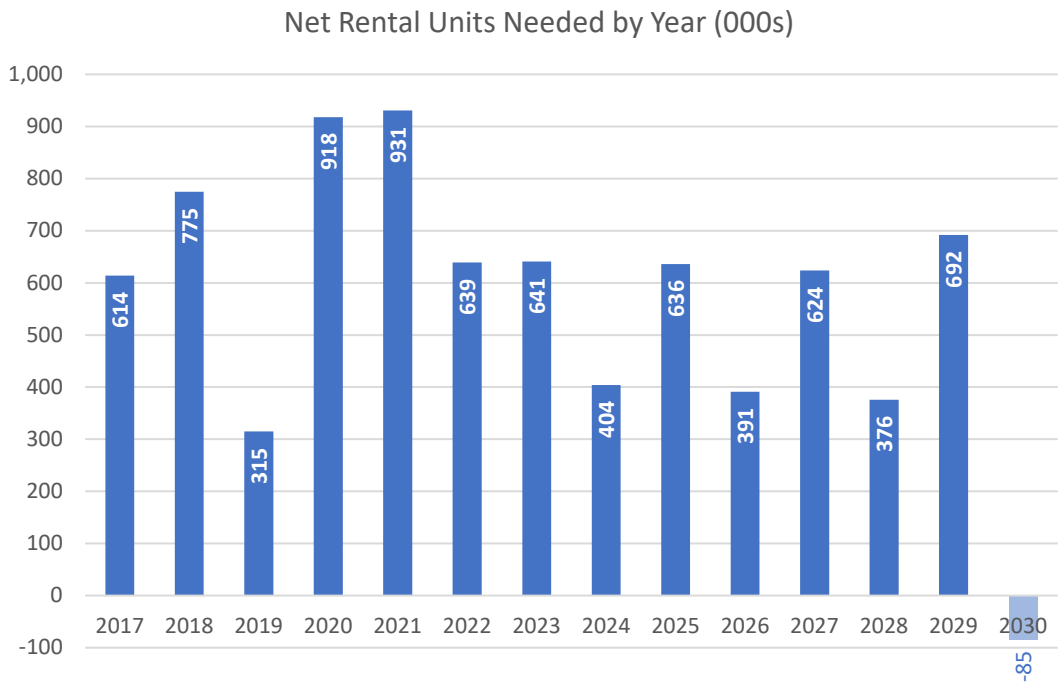


Figure 16: Rental Stock Required Per Year Based on Demand



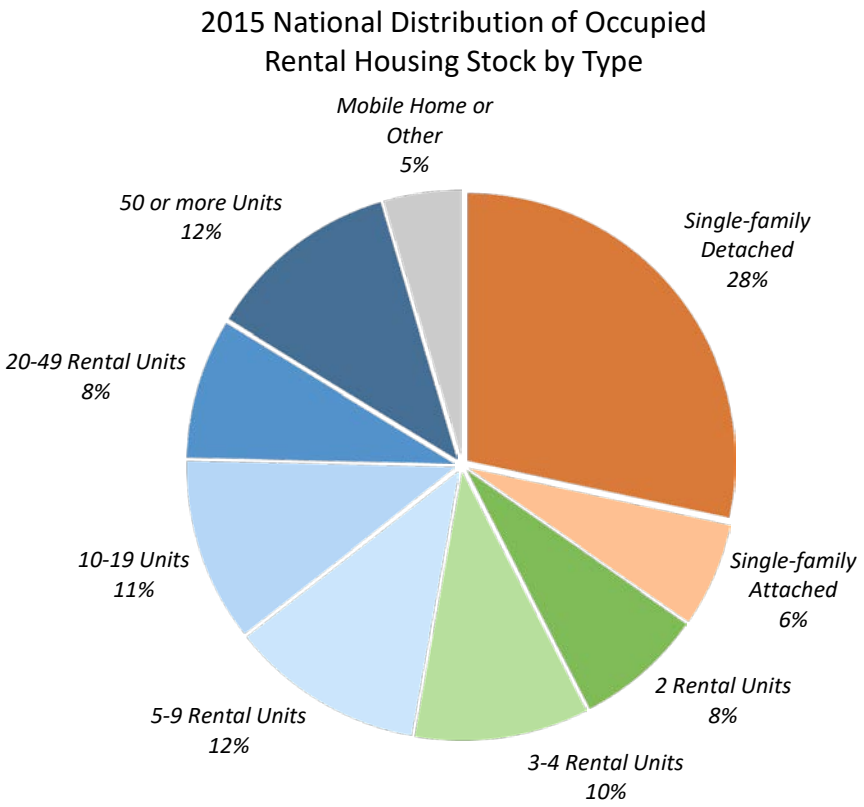
6. Rental Demand for Institutional Investment

We focused next on properties with 5 or more units which are generally of the investment size and quality needed for institutional investors and have provided a large proportion of the needed stock, some 43% or 16.2 million units as of 2016. See Figure 17 below. *The 5+ unit segment of the rental market is the focus of the remainder of the report.*

The 5+ segment was further disaggregated to the state and metropolitan market level for all states and 50 select markets throughout the U.S. by a bottoms-up approach of collecting similar data at the state and metropolitan market level. This data aggregated both Census data and where available, data from private data providers such as CoStar® and CBRE® Econometrics. In some markets, particularly those that are characterized by significant institutional investment, the private data providers had significantly more robust data than the Census surveys. In other markets, the Census data was more robust. Thus, a combination of data sources was used to estimate total stock at the metro market and state level. This data was then summed at the state level to an estimate for the U.S. and was significantly larger than the Census sample, equal to 22.95 million units as of 2016.

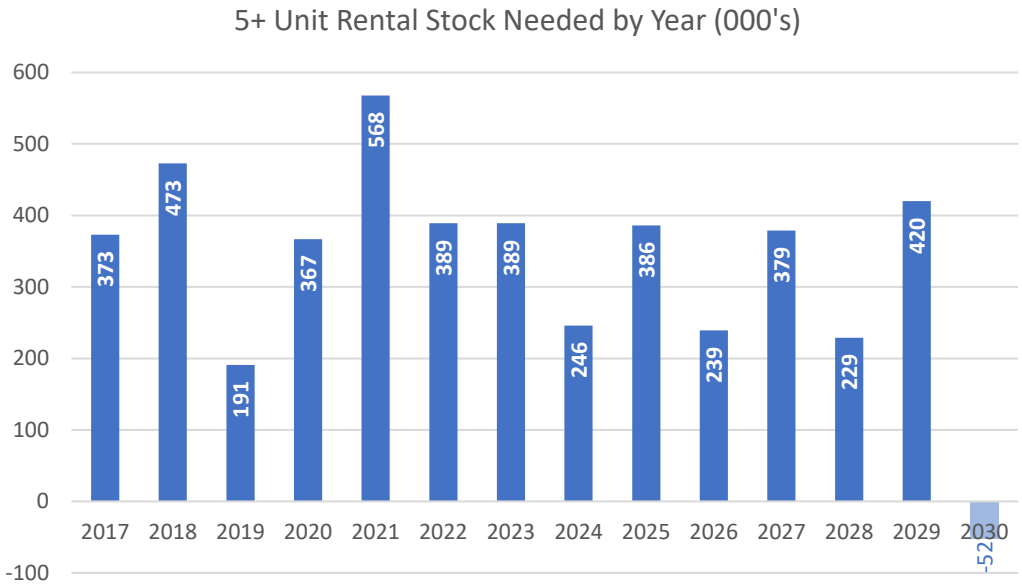
Even with the advent of a new and more permanent single house rental stock, discussed below, we will still need about 328,000 units of rental housing per year provided by larger properties through 2030. Note that as in the base scenario above, the model continues to assume a recession in 2029-2030 that will require no new 5+ rental housing units in 2030. See Figure 18.

Figure 17: Detailed Breakdown of the Rental Housing Stock



Source: U. S. Census Bureau, 2015 American Community Survey 5-year Estimate

Figure 18: Rental Units of 5+ Units Per Year



7. Other Rental Property Types

Single-family Housing and Detached Units as a Source of Rental Supply

After the housing crisis of 2008, many formerly owner occupied units became part of the rental stock. In fact, several investment funds were created to own and operate single-family housing units as part of the rental stock. The term for this trend is the "Institutionalization of Single-Family Rentals (SFR)". Nearly 200,000 single-family homes are now owned as rental units by institutions. A list of the largest is included in Appendix 1, with the largest as of 2016 listed below:

Institution	SFR Units
Blackstone (Invitation Homes)	47,342
American Homes 4 Rent	46,131
Colony Starwood Homes	32,272
Progress Residential	16,345

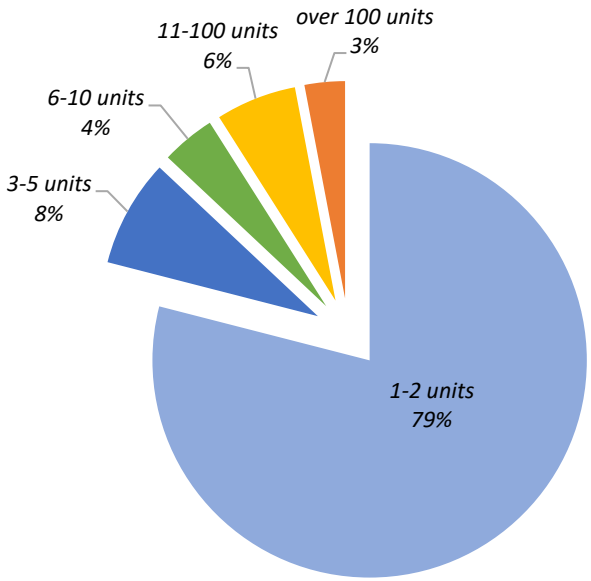
This SFR asset class would not have existed were it not for the low investment basis possible via a wave of distressed real estate sales with potential rents high enough to carry the units using modest leverage. Another key factor in the establishment of SFR as an asset class has been the ability to reach minimum concentration scale thresholds for the efficient management of units. Because of the need for scale, much of this asset class is clustered in markets hit hard by the housing crisis, where rents relative to acquisition cost were attractive.[53]

Despite institutional interest in SFR, the bulk, some 99%, of all rental SFR units are owned by individuals and private partnerships. In total, some 17 million single-family rentals compete today with the 2 to 4 unit and 5 or more unit rentals.

As a percentage of the total rental stock, SFR units surged from 2010 through 2014 and now represent about a third of all rental stock. The result has been a surge in the distribution of small scale landlords as shown in Figure 19 below:

[53] The largest concentrations of SFR units are in Dallas, Denver, San Antonio, Orlando, Nashville, Tampa, Atlanta, Charlotte, Phoenix, Miami, Riverside, Salt Lake City, Las Vegas, Indianapolis, Jacksonville, Cincinnati, Raleigh-Durham, Columbus (OH), and Chicago. See http://roofstock.com.

Figure 19: Small Scale Ownership of Rental Units



While market share of small scale ownership has increased significantly, we have every reason to expect it to decline as market forces prompt a conversion back to the single-family owner occupant in select markets. [54]

We expect that SFR will continue to be a viable rental stock alternative, especially for families choosing to rent and requiring a larger number of bedrooms, something lacking in the typical larger property multifamily stock. Over time, more 3 and 4 bedroom choices could be added to meet this demand, and new units will be added to the inventory. At the same time, some of the existing SFR units will be converted back to owner occupied housing as prices for the owner market rise relative to the rental market and landlords decide to cash out. Additionally, more rental demand is coming from smaller households. For this reason, we do not expect the SFR units to increase as a percentage of the rental stock and in fact, are more likely to decrease over the long run, until the next wave of distressed sales.

[54] See Attom Realty's report called LANDLORD LAND: A real estate dance party is being led by a new breed of rental property investors, March, 2017. http://www.attomdata.com/landlord-land/#.

Scenarios Analysis

At the national level, sensitivity analysis is probably less important in that it is easy to imagine a scenario where some parts of the country are growing more than expected while others are growing less than expected. In such a case, we might conclude that no change in the projected demand for new housing units is needed at the national level if the more positive growth areas exactly balance the less positive (or negative) growth areas. Nevertheless, we have laid out a few national level scenarios that might impact the aggregate rental demand.

Lower Rentership Scenario: Here we assume that home ownership rates increase by nearly 170 bp by 2030, but remain about 400 bp lower than the previous peak, assuming that the subprime market was a contributor to home ownership rates reaching levels near 2004-05 that are in excess of long-term stabilized levels. See the below table for home ownership rates used in the various scenarios. We also assume a long-term slow-down in net immigration with more restrictive immigration policies keeping immigration to just over half the base case scenario. Household growth is slower, resulting in 1.7% fewer households by 2030 than in the base case.

Higher Rentership Scenario: Here we maintain immigration at current rates in the near-term, rising to 1.6 million people per year by 2023 (29% higher than the base case), while we allow home ownership rates to continue to decline based on higher immigration rates, the aging population and continued delay in family formations by younger persons. The resulting total and annual rental unit demand is show in the following graphs.

In the downside rental demand scenario, we require 153,000 units of new rental housing per year on average from here through 2029. If we include 2030 we require only 139,000 units on average per year, with a projected deep recession hitting around 2030. In the upside scenario, we require 525,000 rental units on average per year through 2029 and 517,000 on average through 2030. Of course, during recessions units will not be withdrawn from the market, so the averages through 2029 are relevant figures.

Home ownership Rates Used in Scenario Analyses

Year	Base	Low Rentals	High Rentals
2016	62.2%	62.2%	62.2%
2017	62.0%	62.2%	61.8%
2018	61.8%	62.2%	61.4%
2019	61.6%	62.4%	61.2%
2020	61.4%	62.8%	61.1%
2021	61.4%	63.2%	60.8%
2022	61.2%	63.4%	60.6%
2023	61.1%	63.5%	60.4%
2024	61.0%	63.5%	60.3%
2025	60.9%	63.5%	60.2%
2026	60.9%	63.5%	59.9%
2027	60.8%	63.6%	59.8%
2028	60.7%	63.6%	59.6%
2029	60.6%	63.7%	59.5%
2030	60.5%	63.8%	59.2%

Figure 20: Total Multifamily Rental Stock Required by Year in Scenarios

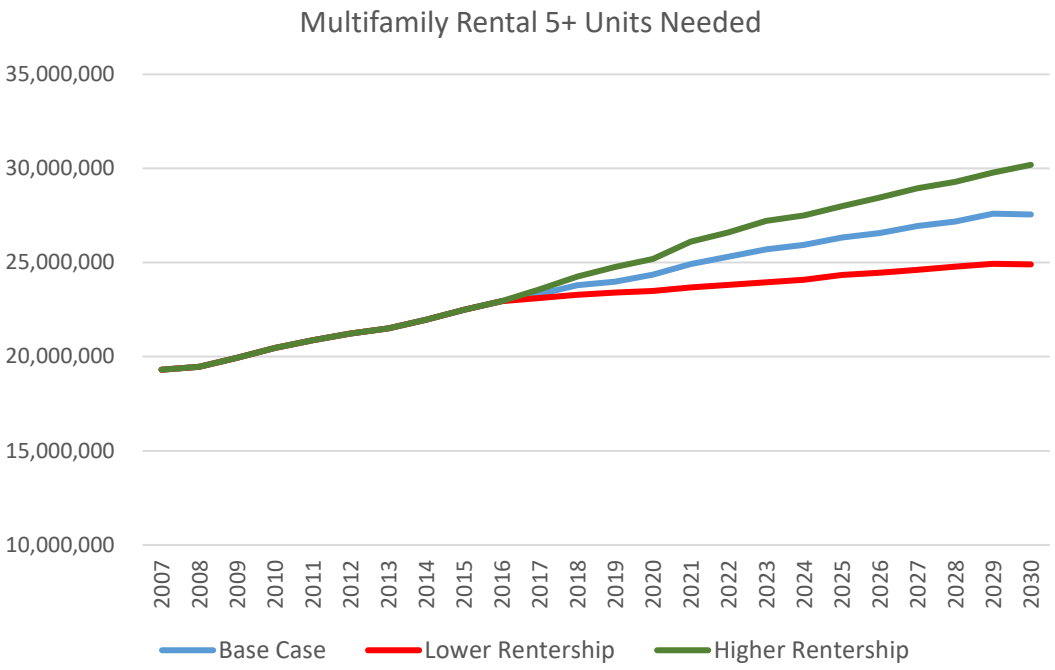
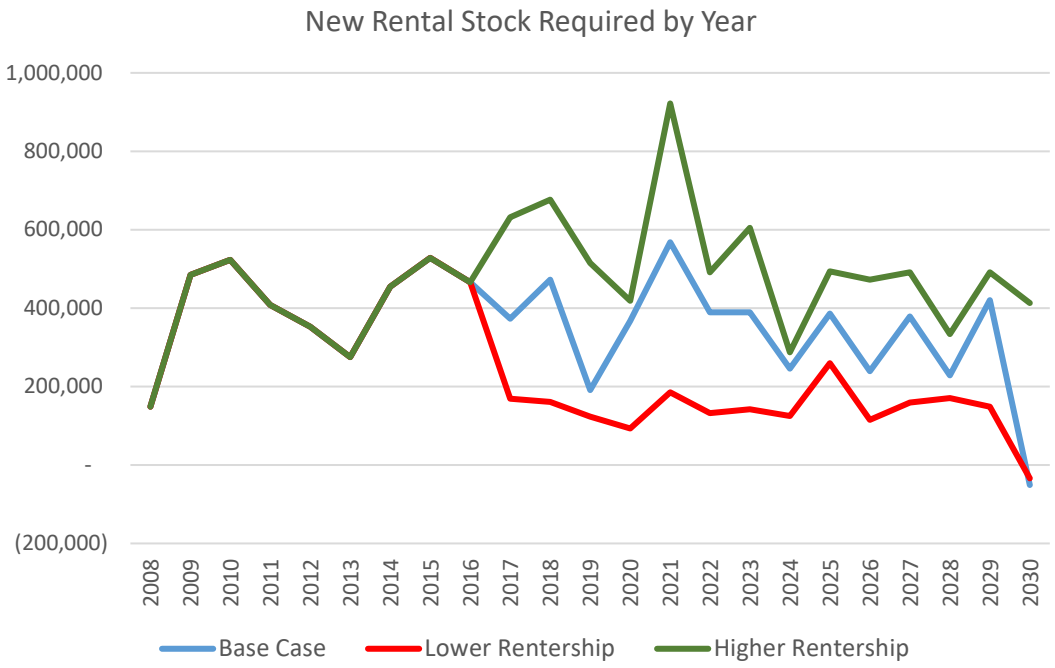


Figure 21: Annual New Rental Stock Required by Year in Scenarios



National Trends Worth Watching

While the total units of housing required overall will not deviate with a number of other market trends, we feel it worth mentioning some observations influencing the types of units which will be demanded in the next decade or two. These include an upscale shift in rental households, changes in unit sizes, the impact of an aging population, the impact of demographics, better data sources, the impact of an increasingly privatized student housing market, the conversion of affordable units and uncertain future subsidies to housing, and the impact of short term rentals and reactionary regulations at the building level to neighbors to cities. Each will be discussed in turn.

1. Upscale Shift in Rental Households

The housing downturn and recent surge in multifamily development have revealed a shift in rental households toward upscale tastes, greater buying power and corresponding demand for new rental product. National field studies using market segmentation modeling[55] have seen this rising share of renters to be 30%-45% of all rental households in most metro market sectors, a much greater share in the high-demand metros of San Francisco, Los Angeles and New York. Upscale renters will devote more gross monthly income to rent, expect a wider array of unit choice and amenities, and have found a 12-, even 24-month lease aligned with their mobility and career horizon.

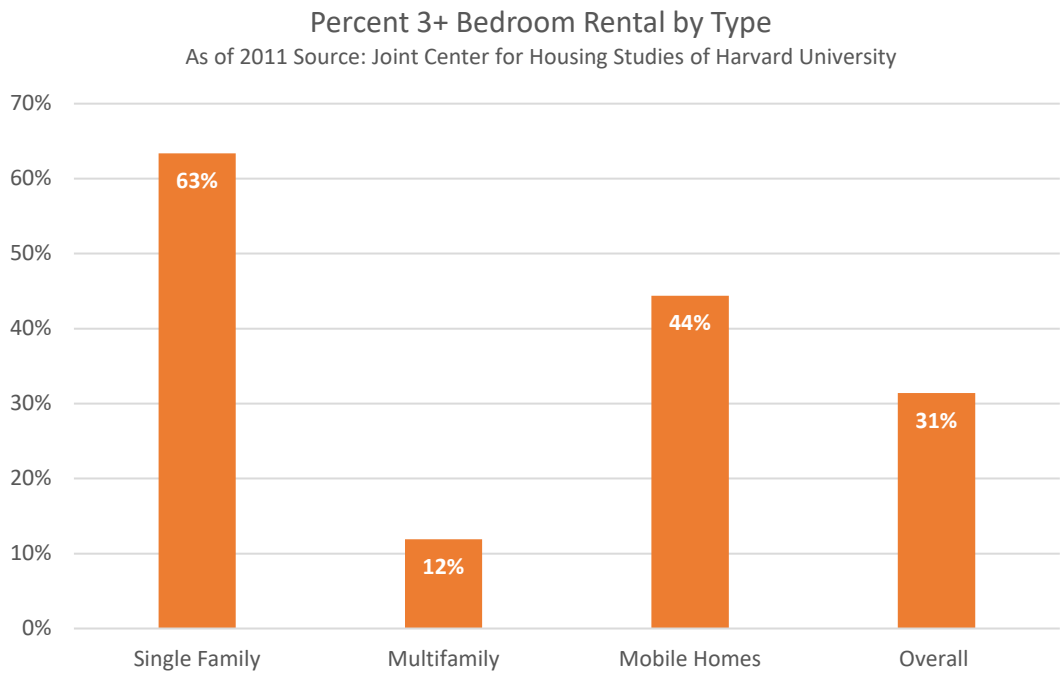
2. Unit Types: Expansion at both ends of the size spectrum

Family units: The housing crisis of 2008-2010 drove many foreclosed home owners to rental stock. This created a surge in demand for 3 and 4 bedroom units. Some households went into single-family units, as discussed above. Others went into larger rentals within traditional apartment complexes. See Figure 22 below. Here we can see that the proportion of 3+ bedroom units runs about 12% for multifamily properties and 63% for single-family units including detached and attached, creating a better fit for those moving from owned single-family housing, and thus fueling the surge in newly institutionalized single-family rental market after the 2008 downturn. The mobile home proportion of 3+ bedrooms is 44%. The vacancy rate on these 3+ bedroom units is lower than average and the turnover is much lower, suggesting such units add stability to rental streams, although household size for renters is generally smaller and thus a balance of unit size that reflects local demographics must be in place at each property.[56]

[55] For example, Tapestry Segmentation by ESRI®.

[56] Daryl Carter, founder and CEO of Avanath Capital Management suggested that family sized rental units were not a well-served market, yet they typically had half the turnover rates and lower vacancy rates than any other sized units. See http://www.avanath.com/about_management-team_daryl.php and Institutional Real Estate Investor interview where he suggested these units do not need amenities as much as space.

Figure 22: Proportion of Rental Housing with 3+ Bedrooms by Type[57]



Micro-housing units: At the other end of the spectrum, what some households in the older housing of Russia or China would consider typical sized units, we call micro-units. We define micro-units as units which are typically 650 square feet or less, although in New York City a micro-unit might be 250 square feet and in Dallas it will be 500 square feet.[58] The reason for increased demand of micro-units is twofold. First, to keep costs down to affordable levels in high cost markets, the units must be very small. Second, location tends to dominate the criteria for apartment selection and not size. Combine the two criteria and we see a large demand for urban well located micro-units. It is unlikely that too much of this type of housing can be supplied in that it is an affordable choice for typically single occupied households who want to live close to work and social amenities. The development of micro-units has been particularly strong in several markets where they have also been permitted.[59]

Unlike SRO, single room occupant housing where bathrooms and kitchens and common areas are generally shared, micro-units typically include modest kitchens and private bathrooms.[60] Some cities have minimum size requirements. For example, the District of Columbia requires units of at least 220 square feet. Seattle and Portland have no minimum sizes and are more likely to see a variety of

[57] See: http://www.jchs.harvard.edu/americas-rental-housing.

[58] See the ULI report at http://uli.org/wp-content/uploads/ULI-Documents/MicroUnit_full_rev_2015.pdf.

[59] See http://www.curbed.com/maps/microhousing-micro-dwelling-small-space-living-apartment.

[60] See https://www.hudexchange.info/resources/documents/Understanding-SRO.pdf. Many micro-units under 350 square feet feature built-in storage units and flexible furniture systems (e.g., Murphy beds, hideaway kitchen modules, convertible tables, and so on) to make these smaller spaces work. To put the size of a micro unit into perspective, a 300-square-foot micro-unit studio apartment is slightly larger than a one-car garage but considerably smaller than a two-car garage.

combinations of SROs and micro-units with various common amenities.[61] We expect to see substantial excess demand for micro-units that provide affordable housing without subsidies. The limits on this form of housing will likely be regulations and neighbors against smaller unit housing, claiming that it will drive up traffic congestion and parking problems.[62] Should autonomous cars become prevalent they may negate the arguments about parking and reduce urban apartment construction costs by placing dedicated parking structures in less desirable areas. For example, close to noisy rail yards, airports and generally on the boundaries of urban areas. Parking requirements for most multifamily developments are a significant cost factor adding to the required rents and making units less affordable.[63]

3. Aging Households: propensity to own tails off when and if we live long enough

In the United States, tax laws have been favorable to ownership for those in higher tax brackets, as property taxes and mortgage interest are deductible expenses and capital gains are generally excluded from taxation.[64] These laws tend to add significant momentum to the ownership or rental decision. That is, once a household buys a home, they tend to remain as owners for most of the balance of their lives.[65] Ownership tends to start to drop off around age 75. See Figure 23 below. For those above 80 years in age the drop off accelerates. This suggests that as Baby Boomers reach 75 years of age and beyond around the year 2025 we should expect some potential drop off in the home ownership rates, assuming our tax laws remain status quo. A lowering of capital gains tax rates could lower the propensity to continue to own after initial purchase, just as price declines pushed many households away from home ownership, now wary of counting on future home appreciation as a reason to buy.

[61] ULI report http://uli.org/wp-content/uploads/ULI-Documents/MicroUnit_full_rev_2015.pdf.

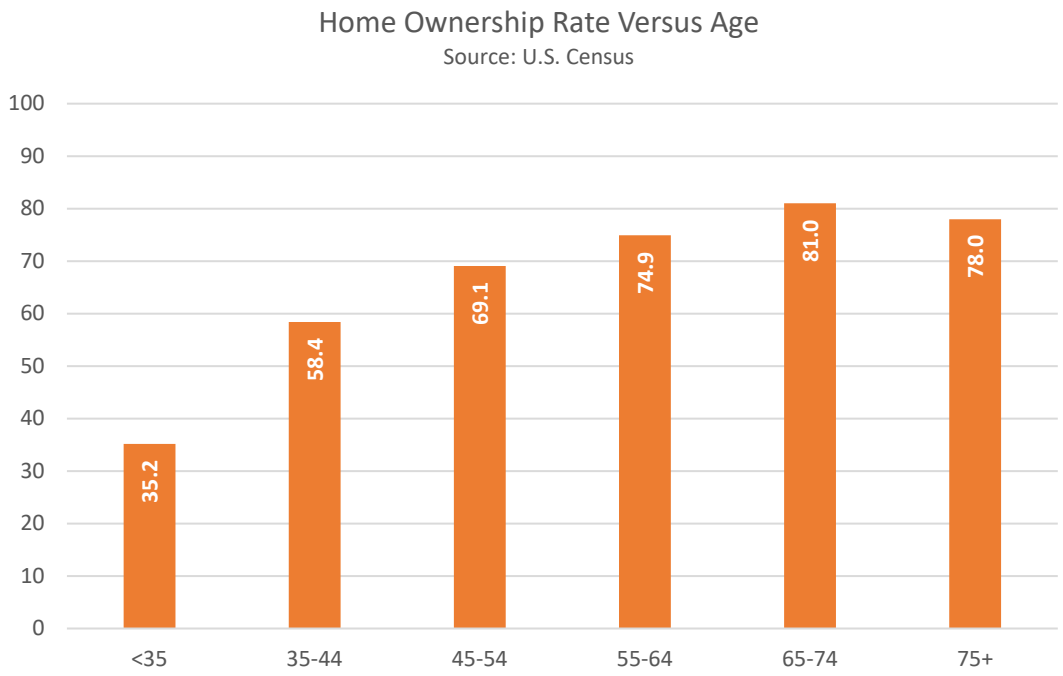
[62] These claims are fairly universal in fights against any new development.

[63] See http://www.vtpi.org/park-hou.pdf. "Parking Requirement Impacts on Housing Affordability" August 24, 2016. Todd Litman, Victoria Transport Policy Institute. The abstract of this research is as follows: Most zoning codes and development practices require generous parking supply, forcing people who purchase or rent housing to pay for parking regardless of their demands. Generous parking requirements reduce housing affordability and impose various economic and environmental costs. Based on typical affordable housing development costs, one parking space per unit increases costs approximately 12.5%, and two parking spaces can increase costs by up to 25%. Since parking costs increase as a percentage of rent for lower priced housing, and low income households tend to own fewer vehicles, minimum parking requirements are regressive.

[64] This is $250,000 for an individual and $500,000 for a couple as of 2016 as long as a new home is purchased within the required time period. See https://www.irs.gov/taxtopics/tc701.html. For those over 55 years in age, there is also a once in a lifetime exclusion of $125,000 single or $250,000 jointly on home gains.

[65] See U.S. Census reports on housing at http://www.census.gov/housing/hvs/files/currenthvspress.pdf.

Figure 23: Age Versus Home Ownership



4. Demographic Trends

Aside from the aging trend mentioned above, the changing mix of major ethnic groups will affect both household size and the propensity to own. Most relevant here and factored into our analysis are the increasing proportion of Hispanic households.[66] In 2015 the Hispanic home ownership rate was 45.6% much lower than for whites, but still an increase from prior years. Over half of all new homeowners were Hispanic in 2012, and most analysts expect the home ownership rate for Hispanics to continue to rise. Still the propensity to own remains lower than for non-Hispanics and this may reduce the overall home ownership rate and thereby increase the demand for rental housing. In particular, the single housing rental units and larger apartment units will observe the most demand pressures from this demographic trend. With lower than average income, rental unit affordability stress suggests that low amenity larger units will be in very high demand for some time.

5. Better Data Sources

Base Census data and estimates do not track rising renter circulation well, especially the previous upscale renters concentrated in revitalized urban cores. Alternative housing surveys such as the Social Compact Initiative have demonstrated over 12% urban household undercounts in even the more sedate Midwestern markets[67]. Developer-provided rent rolls of new scaled developments consistently reflect more tenant buying power and younger professionals in growth employment

[66] See http://www.housingwire.com/articles/36524-hispanic-home-ownership-on-the-rise.

[67] Social Compact Initiative Cincinnati Neighborhood Market DrillDown June 2007. See https://www.uc.edu/cdc/urban_database/citywide_regional/cinti_drilldown_report.pdf.

sectors. On the supply side, several private data sources collect and categorize multifamily housing stock with greater depth, often including rentals from duplex, condominium and detached housing. Along with base Census data, two such sources were referenced for the HAS estimates throughout this review.[68]

6. Student Housing: Increasingly Privatized

Student housing supply tends to be measured in beds, not units. This market has become increasingly privatized with universities providing less and less dormitory units. According to Axiometrics, nearly 220,000 beds were delivered in the four-year span of 2013-2016.[69] Student housing units in the private market will have more amenities, especially fast Wi-Fi and common study rooms and social areas, and will not be that different from some of the larger apartment complexes located adjacent to campuses. Affinity for such private sector housing varies by campus. Florida and Texas universities are among the most dependent on such housing.[70]

7. Housing Affordability

Employment growth is increasingly occurring in large urban centers. For example, more than 14% of jobs that were created in 2009 to 2016 were created in three metropolitan areas: New York, Los Angeles and San Francisco. With this has come significant housing affordability issues. Going forward, job growth is expected to continue in urban centers. Historically, rent control programs have proved to be ineffective in creating affordable housing for the overall market and in fact in some instances have done just the opposite.[71] Thus, creating housing will be of utmost importance in growing markets.

8. Affordable Units Converting to Market

Section 8 rental subsidies and low income tax credit housing programs have provided nearly 1.4 million units of U.S. rental housing. This is a significant percentage of the rental stock and there is a great deal of speculation that affordable low income tax credit housing units will be converted to the private sector over the next several years. Per rental agreements with 15 year minimums and some 30 year restrictions on such conversions to private market rents, we will observe significant units eligible to convert to the private market. The first wave of such units will hit around 2022 although most industry analysts suggest that these properties will need substantial capital improvements to be able to compete with other private sector market properties.[72] What is more likely over the next Presidential term in

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[68] CoStar® and CBRE Econometrics®, with permission.

[69] See http://pinecrestus.com/wp-content/uploads/2016/07/Q1-2016-Student-Housing-Market-Update-for-website.pdf.

[70] See http://www.fanniemae.com/resources/file/research/emma/pdf/MF_Market_Commentary_062315.pdf.

[71] Rent control encourages wasteful use of space. It discriminates in favor of those who already occupy houses or apartments in a particular city or region at the expense of those who find themselves on the outside. Permitting rents to rise to the market level allows all tenants or would-be tenants equal opportunity to bid for space. See Miller and Geltner, Real Estate Principles for the New Economy, 2005.

[72] See https://www.huduser.gov/publications/pdf/what_happens_lihtc_v2.pdf and https://www.huduser.gov/portal/periodicals/em/summer13/highlight1.html.

2017-2020 is a cut back on public housing subsidies putting more pressure on communities to approve affordable market rate housing. The only way to do this is to approve more units with greater densities.[73]

9. Short Term Rentals

The advent of the shared economy brought with it firms like AIRBnB, VRBO and Homeaway.com that matched home owners with empty rooms or houses or condos. As a percentage of the hotel industry the AIRBnB room count provides up to 20% of the short-term rentals in expensive markets like New York City and 12.5% in San Francisco but only 3.4% overall.[74] In many communities a backlash against short term rentals of less than 30 days suggests that these types of operators are more likely to affect the hotel industry and not likely to have a significant impact on the longer-term rental housing market.

[73] The challenge remains one of overcoming NIMBY's that suggest traffic and parking will hurt their neighborhood, yet pushing housing further away simply adds to traffic congestion and air pollution. In California, some legislators have proposed a carbon tax on communities unwilling to approve more affordable private sector housing in their backyards. At the Federal level, see I-732's proposal at https://www.wired.com/2016/11/washington-state-pass-nations-first-carbon-tax.

[74] See https://skift.com/2016/02/03/measuring-airbnbs-real-threat-to-u-s-hotels-using-industry-metrics.

Conclusions on U.S. Rental Housing Demand

There are a few very sensitive assumptions in our models that will affect future demand for housing of all types in the U.S. Among these are 1) the net immigration rate and future government policies that may affect an important source of long term household growth in the U.S., and 2) the longevity of the rental housing stock. Given the relatively young age of the U.S. housing stock, just around 40 years in age as of 2017, it is difficult to suggest that atrophy and replacement of existing units will be a major demand driver in the next few years. But, even at 0.5% of the stock per year, we are talking about 720,000 units per year on average through 2030 for all housing types. Changing this to 1.0% for a 100-year economic life doubles the 720,000 to 1.4 million per year. Eventually capital improvements will be required at much higher levels than today or else greater production will be required.

Annual household formations in the U.S. will require net new housing increases of about 1.3 million units per year for the next 14 years. The figures would be higher were it not for two expected recessions where households will double and triple up, estimated first in late 2019 and 2020 and then again in 2029-2030. Of the net new housing demand, some 40% or so are expected to be renters despite the momentum of senior citizen owners to keep a home until reaching ages of 75+. In fact, the surge in much older citizens starting in 2025 will contribute to a slight reduction in household size and the home ownership rate. Housing starts are running close to the net new demand, as of late 2016, but there is a mismatch in that units added by price type and supply may not geographically match up with where it is most needed. That is, there is no national and fungible housing market. There are only local markets and segmented markets by size and price points. Thus, some markets will fall well short of housing demand, even though top line average vacancy rates may waver, often reflecting trends in new supply which tends to be oriented towards the highest price points in the market.

The propensity to choose renting over buying could dramatically affect the rental demand suggested here. Our numbers are conservatively low on the dimension of choosing renting. To the extent that owned housing is considered a life style choice with less freedom and mobility, significant investment risks and often provided in a size larger than desired or in distant locations from the urban core, rental demand could be even higher than our base case shown here.

Single-family rentals have helped to satisfy some of the rental unit demand but we do not expect that market share to continue to increase. Based on 43% of the total rental demand being satisfied with traditional 5+ multifamily units, we will need an average of 328,000 units per year from now through 2030 and cumulatively 4.6 million units of 5+ unit housing. New supply will also need to match requirements for all income levels, not just the top tier of the market. Anything short of this will simply drive up rents faster, far exceeding expected household income growth and requiring more doubling up and house sharing.

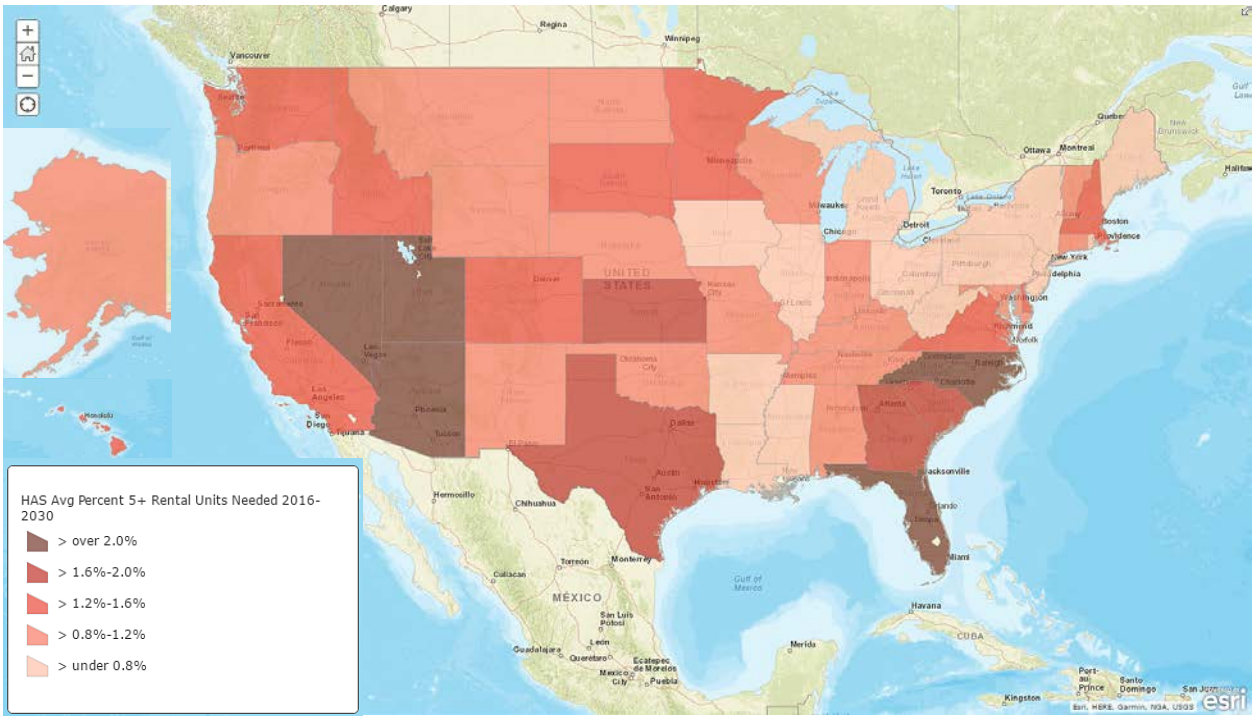
State Key Issues:

- More than 100,000 new rental units will be needed by 2030 in states such as California, Georgia, Arizona, Florida, North Carolina, New York, Texas and Washington.
- Less than 35% of the rental stock was built after 1980 in much of the Northeast indicating significant need for rehabilitation of existing stock. These markets have also tended to be less volatile over the past 20 years.
- The Western U.S., as well as Texas, Florida and North Carolina are expected to have the greatest need for new rental housing through 2030, although all states will need more housing. The fastest economic and household growth will continue in low-cost, business friendly states, primarily in the southeast and mountain west.
- The 65+ age cohort will account for a large part of population growth going forward across all states, especially Florida, Maine, W. Virginia, Vermont, Pennsylvania, Montana, Delaware and Hawaii. Longer term, Arizona and Nevada will also add more senior citizens than average.
- International immigration is assumed to account for 51% of all new U.S. population growth over the period through 2030, declining over the 2017-2020 period and then accelerating again. Most affected by policy changes and international fears that the welcome mat might be curtailed in the future are slow-growth states in the Northeast where natural population increases are the slowest.
- Renters are becoming increasingly diverse with larger families becoming a more permanent part of the rental demand. Hispanics account for more than 30% of renters in 11 states and their lower propensity to own has helped drive down the expected home ownership rate.
- The propensity to rent is and has always been higher in high-growth and high cost states where housing affordability constrains ownership demand, e.g. California exemplifies this trend.
- Generally, the home ownership rate increases with age but this trend reverses for those living long enough. The national forecast assumes slower household growth going forward because of the aging population, although this trend varies by state.
- Renters over 35 years old are a significant component of rental demand, particularly in the Northeast where renters aged 55+ account for more than 30% of rental households.
- In fact, the 55+ age cohort of renters is greater than the 15-34 year-old segment in Connecticut, Maine, Massachusetts, New Jersey, New York, Pennsylvania and Rhode Island.
- The institutional segment (5+ units) of the apartment market is a larger part of the market in higher income states and less affordable housing states.
- Affordability issues are exacerbated by high land costs which is the result of natural supply limits or severe political restrictions. Rents as a percent of income are over 44% in California, New Jersey and New York where housing supplies are limited.
- Affordable housing is needed in both high cost states as well as in lower income states. Renters with household income below the poverty level account for more than 24% of renters in parts of the Midwest and South. 31% of all renters earn less than $20,000. This figure increases to over 30% in parts of the South and Midwest. Florida and Louisiana have lower housing costs but severe income constraints affecting affordability.

State Trends

Similar methodology was applied at the state level to estimate rental demand through 2030 for each of the 50 states. See Appendix 3 for rankings and Appendix 5 for methodology. Not surprisingly, as shown in the map below, the fastest growth through 2030 is expected in many of the southern and mountain west states, including Florida, North Carolina, Arizona, Nevada and Colorado, followed by Texas, Georgia, South Carolina and Kansas.

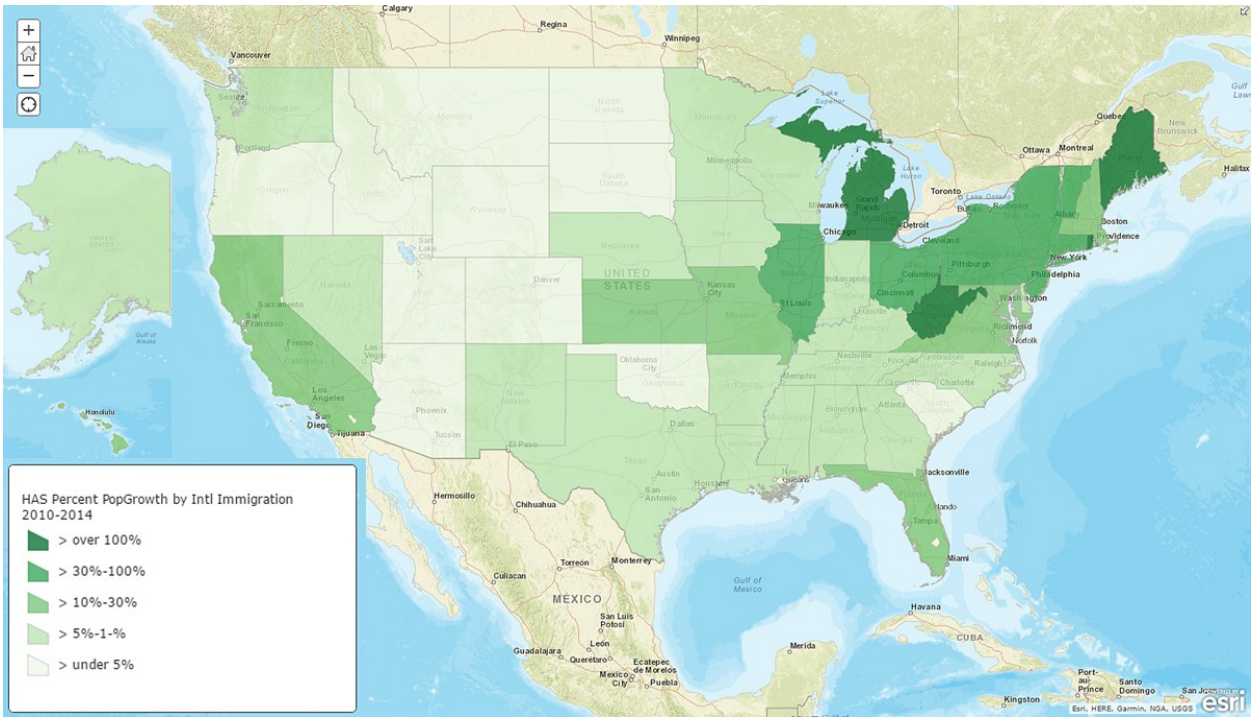
Forecast Growth Per Year in Multifamily 5+ Units.



Some of the more interesting trends appear when looking at the underlying details. One of the policy risks identified in the model is the amount of international immigration that will occur during the next decade. As discussed earlier in this report, due to the aging U.S. population base, immigration is expected to exceed natural population growth within the next ten years. These trends will be more amplified within some states and metro areas. While border states have proximity to other countries, many of those states also have low business and housing costs, as well as young and growing population bases. Thus, states most at risk to U.S. immigration policies are those states that have slow growth, older population bases, and exposure to international trade and immigration (see below map). These states are predominately located in the Northeast as well as parts of the Midwest, with less exposure in border states such as California and Florida. Our expectation is that there are wider margins of error in the forecasts for these states because of the potential volatility in U.S. immigration policies going forward. See the Metro Market Overview section of this report for further information about demographics, in-migration and growth in the major markets in these states.

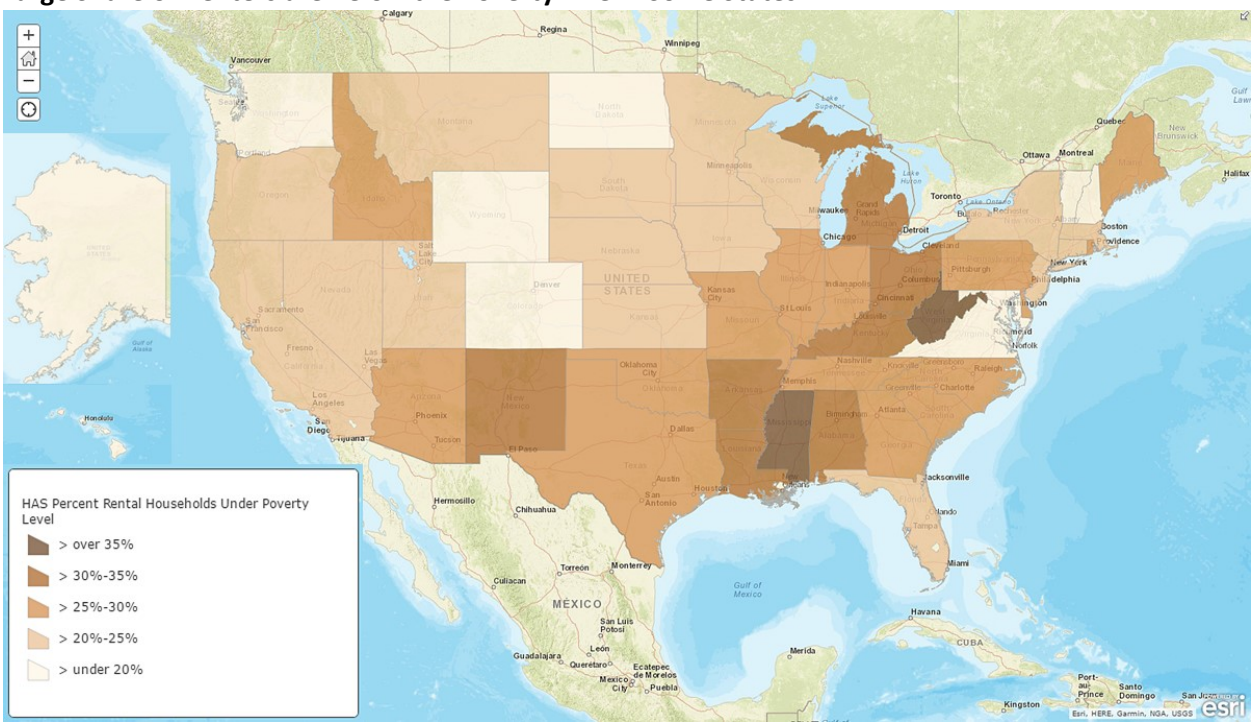
Interestingly, the major markets do not always exemplify the state trends. For example, while international immigration accounts for a large part of population growth in Michigan, Detroit benefits mostly from natural growth (births minus deaths) and experiences net out-migration including international and domestic migration to other locations.

Percent of Population Growth Created by International Immigration slow growth states.



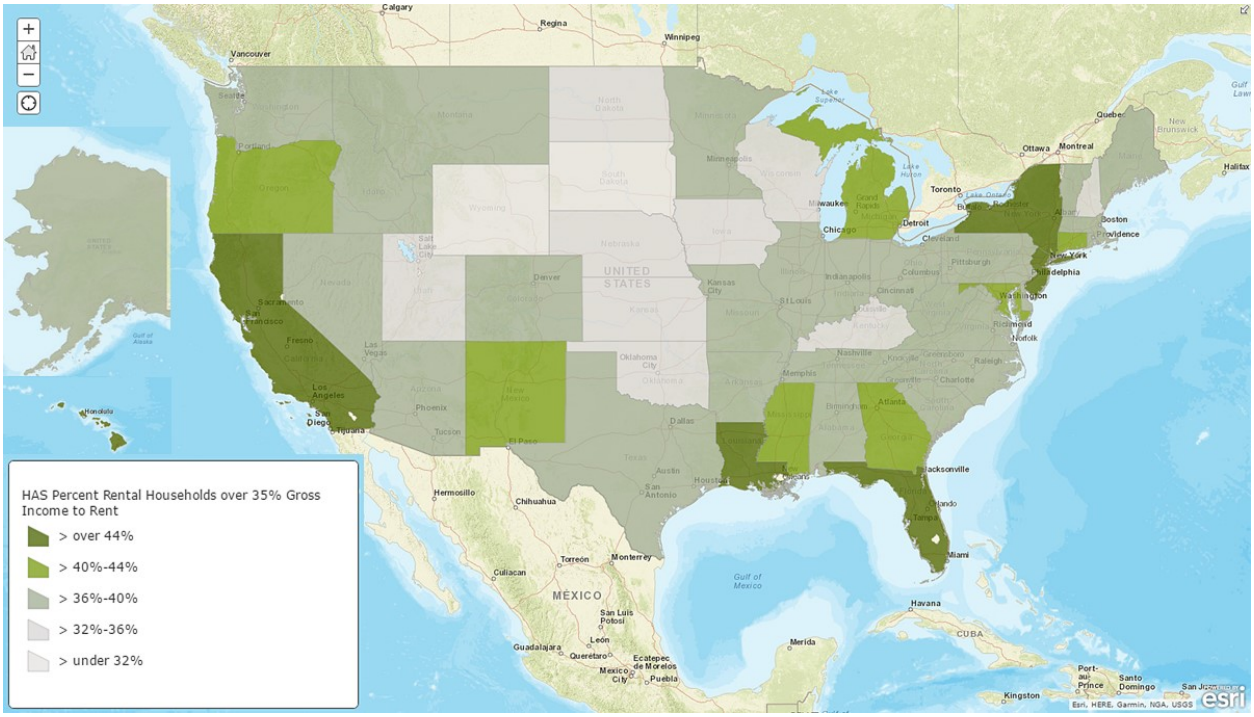
Rental affordability is also a significant issue in the U.S. Affordability can be affected either because of low incomes or because of high housing costs. Exposure to these factors varies significantly by state. For example, 31% of U.S. renters earn less than $20,000 per year. As seen in the map below, renters below the poverty level account for more than 35% of renters in states such as Mississippi and West Virginia, signaling a significant need for affordable housing in these markets.

Large Share of Renters are Below the Poverty Line in Some States.



In other areas, renters have significant incomes, but the high cost of housing creates affordability problems. In markets such as California, Hawaii, New York and New Jersey, more than 44% of renters are spending over 35% of their gross income on rent due to high housing costs. States such as Florida and Louisiana face a similar mismatch in incomes to rental costs, even though they have lower housing costs. We explore this topic in more detail in the Metro Market Overview appendix of this report. At the metro area level, many of these markets have either geographical and/or political restrictions on new supply that can cause housing costs to soar.

Renters in some areas spend a significant share of income on rent.

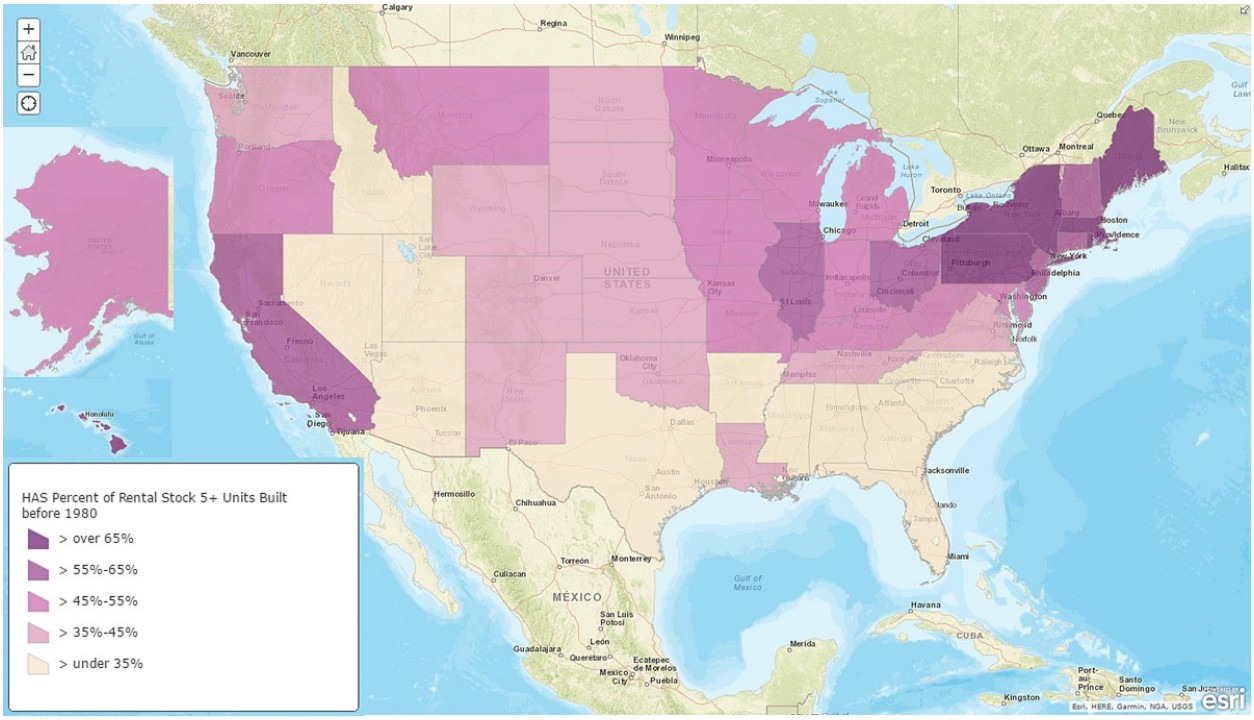


For example, a Redfin study found that only 17% of California homes for sale were affordable to an average teacher in 2016, down from 30% in 2012. Affordability is worse in major metro areas. With average incomes of just over $71,000 in the San Francisco Bay Area, teachers can afford rents that are 48% of average rents in San Francisco and about 67% of average rents in the East Bay.

Percent Teacher Salary Needed for Average Rent	
San Francisco	48%
Alameda	67%
Contra Costa	69%

For investors looking to rehabilitate and improve older properties, the proportion of buildings built before 1980 varies significantly by geographic area. As shown in the map below, in the northern states and California, more than 65% of the multifamily housing stock in properties with five or more units was built before 1980. In contrast, less than 35% of the southern markets are in older buildings. While it is unknown how many of these properties have already been improved or renovated, they create a significant market size. In total, 11.7 million units were built before 1980 in the U.S. These units may also serve mid to lower income households which are a significant proportion of the population base.

Renovation Opportunities? Markets with a High Proportion of Older Stock



Second Tier Affordable Rentals (STAR)

Another product type is of significant size and generally left out of the institutional rental market, although they are a critical and ongoing multifamily supply component. We call these units Second Tier Affordable Rentals or STAR units. STAR units are characterized as older and lower quality units. Using CoStar® ratings of 1 to 5 for sites of five units or more, STAR units are those with lower CoStar® ratings of 1 to 2. Costar® ratings are based on a number of criteria including building structure and systems, amenities, site and landscaping, and certifications such as LEED and Green Globes. Properties rated 2 have functional architectural design and systems, below average finishes and one to no additional amenities. They have minimal to no landscaping and exterior spaces, and are unlikely to hold green or energy efficient certifications. Properties rated 1 may require significant renovation and are possibly functionally obsolete. STAR facilities are likely to serve lower income populations which are a significant part of the population base in some metro areas, and may represent, in some areas, potential investment targets for upgrading to higher quality properties. States such as California, New York, Michigan and Ohio have a high proportion of STAR units. At the metro market level, the percent of multifamily rental properties with 5+ units characterized as STAR units for metro markets in this study ranges from 61% (Los Angeles) to 17% (Austin) with a metro market average of 36%.

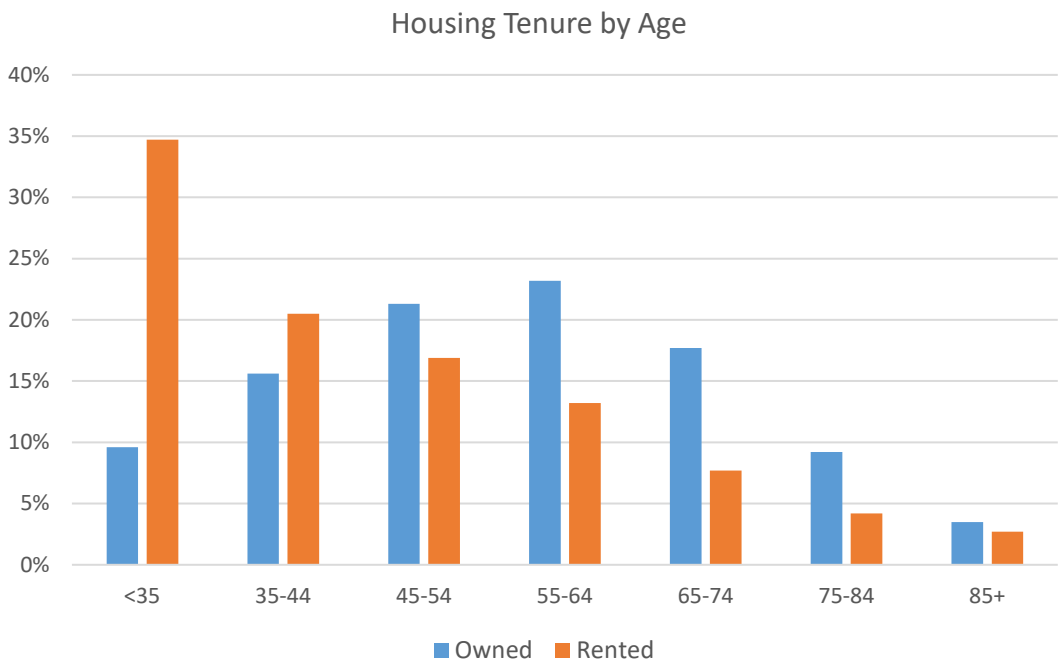
Appendix 1: Institutional Ownership of Single Family Rentals

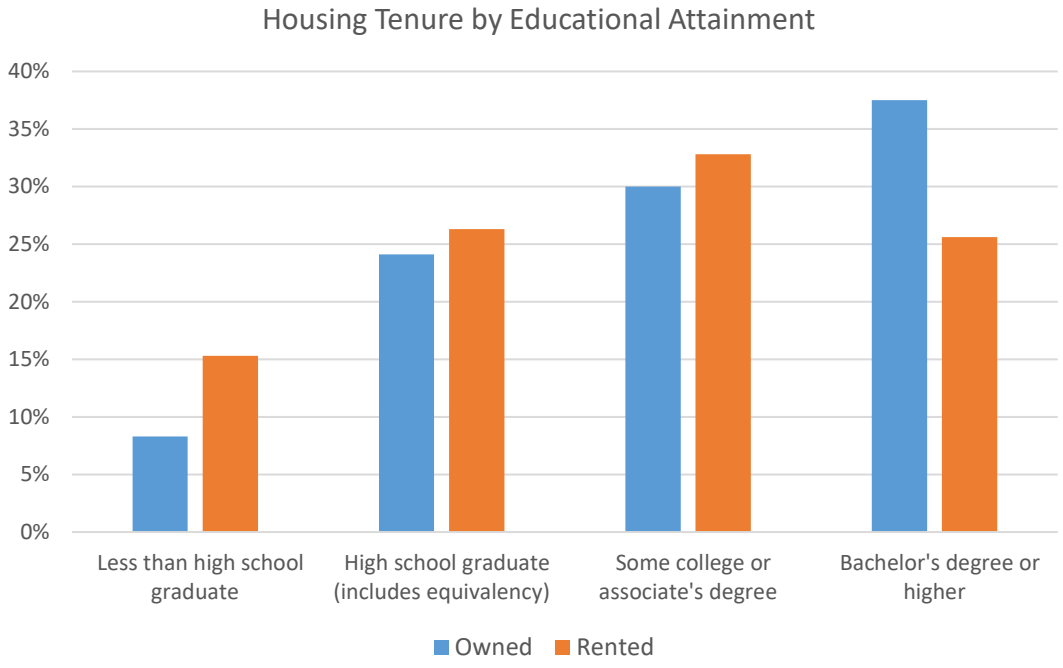
Estimated institutional holdings - single-family rental (SFR) properties

Source: Amherst Insight Labs estimates based on CoreLogic County Record and Transaction Data as of Q1 2016

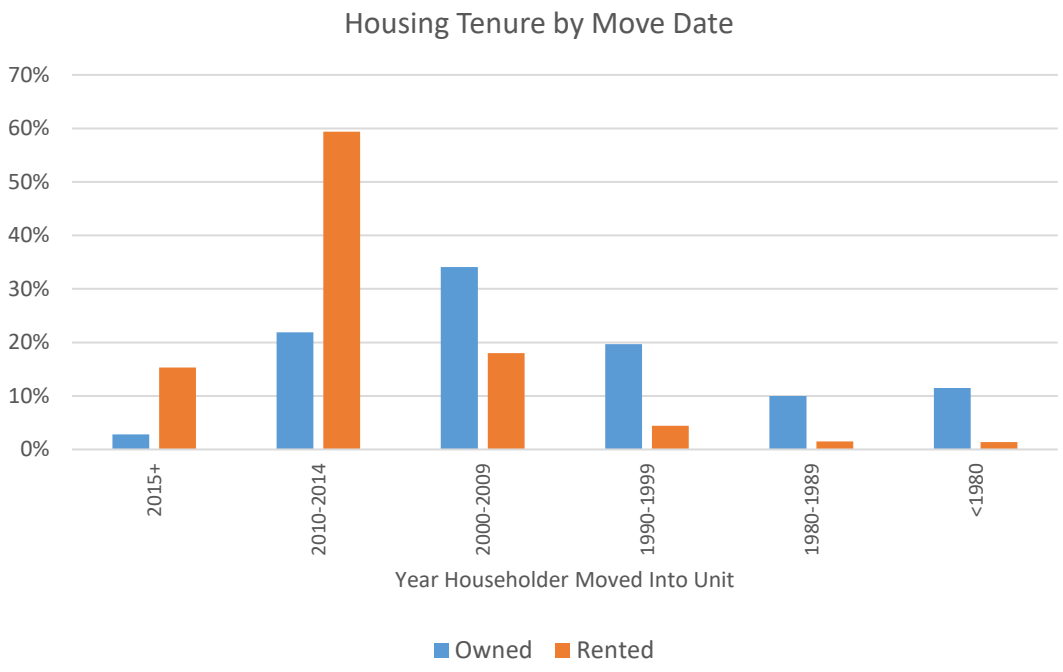
Institution	Units Owned	Total Managed Count
Blackstone (Invitation Homes)	44,386	47,342
American Homes 4 Rent	39,043	46,131
Colony Starwood Homes	27,193	32,272
Progress Residential	14,321	16,345
Silver Bay Realty Trust	6,928	8,798
Main Street Renewal	5,694	6,754
Tricon American Homes	5,103	6,743
Cerberus Capital Management	3,428	5,912
Havenbrook Homes	3,917	4,061
Connorex-Lucinda	2,704	2,994
Altisource Residential	1,522	2,912
Golden Tree Insite Partners (GTIS)	2,182	2,911
Vinebrook Homes	998	1,973
Gorelick Brothers Capital	1,460	1,784
Camillo Properties	13	1,314
Haven Homes	1,253	1,294
Lafayette Real Estate	994	1,271
Transcendent Investment Mgmt	598	628
Reven Housing Reit	216	500
Broadtree Home Rentals	432	468
Prager Property Management	119	277
Pintar Investment Company	151	164
TOTAL		**162,655**

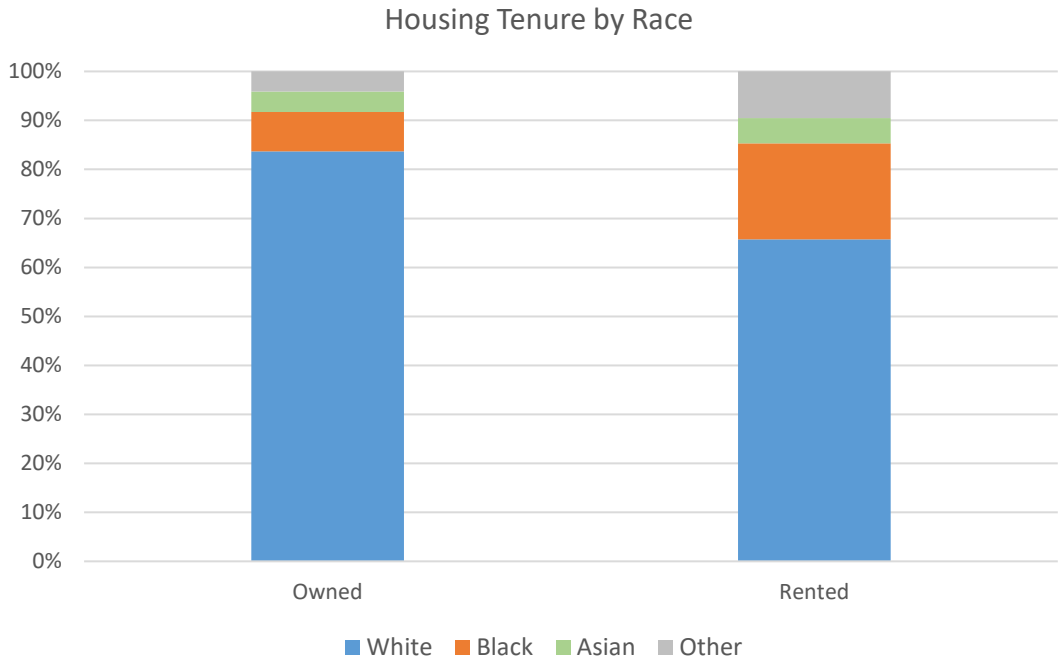
Appendix 2: Renter vs. Owner Demographics





Appendix 2: Renter vs. Owner Demographics, continued.





COMING SOON:

Metro Area Analysis and Report Methodology

Sources

Demographic data was drawn from several U.S. Census Bureau surveys, including the 2015 American Community Survey (ACS) which was the most recent ACS survey at the time of this report. Economic and demographic trend and forecast data was drawn from Moody's Analytics® supplemented by other sources including U.S. Census Bureau, Federal Reserve and other forecast surveys such as the Wall Street Journal Economic Forecasting Survey and the Federal Reserve Bank of Philadelphia Survey of Professional Forecasters. Property market data was derived from several sources including the U.S. Census Bureau, CoStar® Realty Information, CBRE® Econometrics and ESRI®.

* *

This report was prepared for the National Multifamily Housing Council and the National Apartment Association by Hoyt Advisory Services, Dinn Focused Marketing, Inc. and Whitegate Real Estate Advisors, LLC.

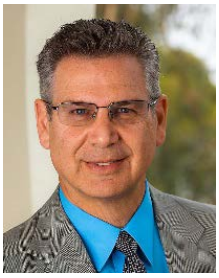
Hoyt Advisory Services (HAS) is subsidiary of the Homer Hoyt Institute (HHI), an independent, non-profit research and educational foundation established in 1967 to improve the quality of public and private real estate decisions by expanding and disseminating the real estate body of knowledge, stimulating innovation in the discipline of real estate and land economics, building bridges among academia, industry, and government, and developing innovative approaches to the solution of real estate problems.

Research supported by HHI must meet the highest standards of scholarship, and it must further the improvement of decision making in the real estate industry. That is, it must combine rigor with relevance. HAS is able to engage PhDs from leading universities along with practitioners with proven, appropriate real estate expertise for the project, in this case partnering with Dinn Focused Marketing, Inc. and Whitegate Real Estate Advisors.

Dinn Focused Marketing, Inc. provides clients a detailed and directional picture of the underlying market place trends now and going forward for any national housing or mix-use real estate development challenge. Clientele are a select cadre of land developers, homebuilders, lending institutions, portfolio managers, municipal leadership and national housing organizations.

Whitegate Real Estate Advisors, LLC provides real estate consulting services in the areas of investment analysis, portfolio structuring, capital formation strategies, market analysis, econometric modeling and forecasting, reporting and asset management.

Authors for this paper each have more than 25 years of experience in the real estate industry, and are frequent speakers and publishers in both academic and practitioner journals and meetings:



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Michael J. Dinn, CRE®

Michael Dinn leads Dinn Focused Marketing, Inc. (DFM) Throughout his career, Michael has taken a market-centric stance in land acquisition, land brokerage, residential development, residential design and marketing campaigns. For over 16 years leading DFM, he has combined these experiences into a skill set that provides clients a detailed and directional picture of the underlying market place trends now and going forward for any national housing or mix-use real estate development challenge. His Clientele are a select cadre of land developers, homebuilders, lending institutions, portfolio managers, municipal leadership and national housing organizations, each with a unique market position, access or capacity to affect their residential market. The mix is public and private, lender and sponsor, landowner and sales management. His work provides scaled assessments of metro housing markets amid great change, targeting a mix of housing assets from failing master planned communities to select multifamily apartment portfolios.

Paige Mueller, CRE®

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Reasonable efforts have been made to ensure that the data contained in this study reflect accurate and reliable information and are based on information that to our knowledge was current as of the date of this report. This study is based on estimates, assumptions, and other information developed from independent research efforts, models and general industry knowledge. No responsibility is assumed for inaccuracies in reporting by any data source used in preparing or presenting this study. This report represents a view of reasonable expectations as of the time the report was written, but such information, estimates, or opinions are not offered as predictions or assurances that particular results or events will occur. Actual results may vary from those described in this report, and the variations may be material. Therefore, no warranty or representation is made that any of the data, projected forecasts or results contained in this study will be achieved.