



Preface to the 2020 Housing Needs Analysis

As part of Housing Arlington, the County is undertaking a review of the Affordable Housing Master Plan (AHMP), an element of the County's Comprehensive Plan. This review primarily consists of three components: 1) an updated housing needs analysis; 2) a review of the County's past performance over the last five years towards fulfilling the Plan's goals, objectives and policies; and 3) a review of the AHMP Implementation Framework to establish future implementation priorities.

The attached Housing Needs Analysis Report updates the needs analysis that was prepared as part of the Affordable Housing Master Plan process. The report was prepared for Arlington County by Jeannette Chapman of the Stephen S. Fuller Institute for Research on the Washington Region's Economic Future at George Mason University. This analysis has three sections that:

- describe the characteristics of Arlington County's population and analyze demographic, economic, and housing market trends;
- examine current housing affordability and housing needs in the County to better understand the current gap between needs and supply; and
- forecast housing demand through 2045 based on the most recent population and employment patterns.

The current COVID-19 pandemic has had an impact on Arlington's rental housing market, resulting in increased vacancy rates and lower asking rents. The County monitors these trends in the rental market through its [Quarterly Rent Report](#). These impacts on the housing market are generally anticipated to be temporary as Arlington's central location within the region, access to jobs, quality schools, transportation and other amenities will continue to make the County an attractive and desirable place to live.

This report notes that "because of the economic recession caused by the pandemic, the forecast of housing demand in 2020 reflects the base demand from job growth through 2019; the jobs losses during the recession did not result in commensurate losses in the demand for housing and are forecasted to be temporary." In other words, the temporary impacts to the housing market are likely to have little effect on the long-term outlook. The forecast assumes an increase of 48,600 jobs during this period based on IHS Markit, this includes a large share of professional & business service jobs and accounts for the impact of Amazon on job growth in the County.

This housing needs analysis is based on the most recent data and the forecast assumes continued job growth post pandemic. The County will continue to periodically reevaluate housing needs for its current and future population based on available data.



The
STEPHEN S. FULLER INSTITUTE
for Research on the Washington Region's Economic Future



Housing A Diverse and Inclusive Community in Arlington County: An Updated Analysis of Current and Future Housing Needs

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Housing A Diverse and Inclusive Community in Arlington County: An Updated Analysis of Current and Future Housing Needs

Executive Summary

In 2015, Arlington County, Virginia adopted its first Affordable Housing Master Plan as an element of the County's Comprehensive Plan. As part of the Master Plan process, the County conducted a Housing Needs Analysis, in order to:

- describe the characteristics of Arlington County's population and to analyze demographic, economic, and housing market trends,
- examine current housing affordability and housing needs in the County, and to better understand the current gap between needs and supply, and
- forecast housing demand based on the most recent population and jobs patterns.

The 2014 report used 2012 as the base year for the description of recent trends and forecasted housing demand for the 2010-2040 period. This analysis updates these trends using data from 2018 and updates the forecast of housing demand for the 2015-2045 period.

Population and Household Trends

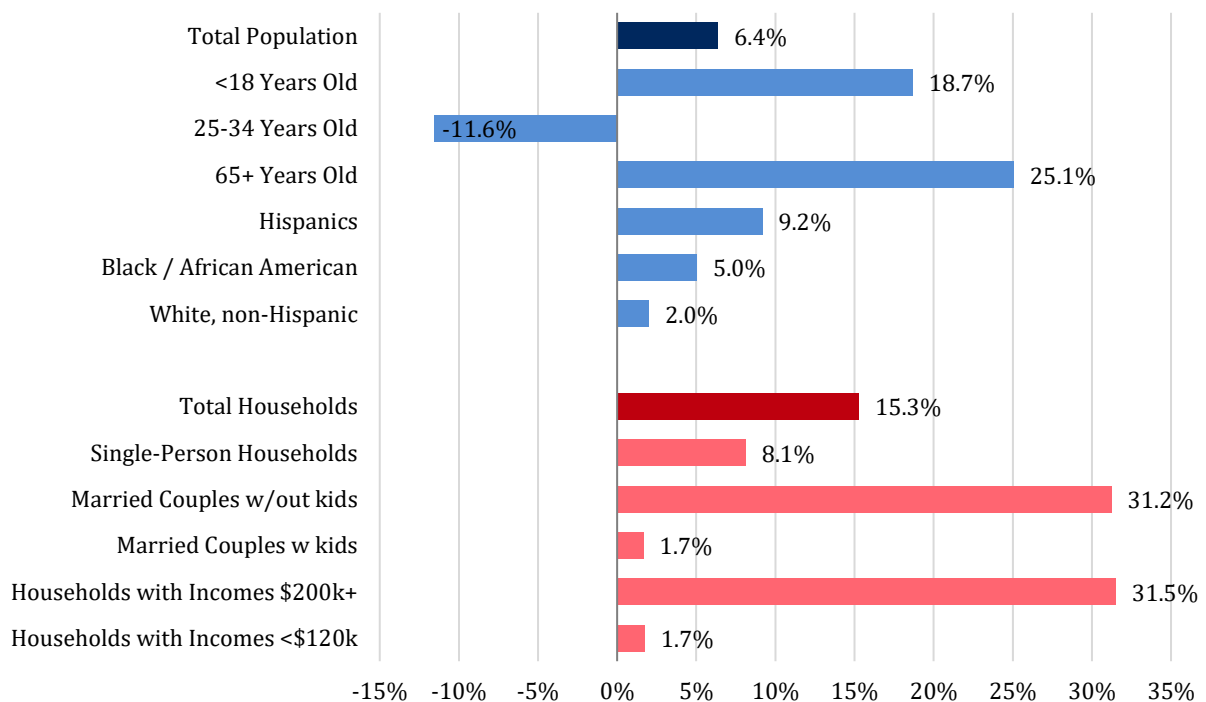
As of 2018, Arlington County, VA had a population of 225,200.¹ Between 2012 and 2018, the County's population increased by 13,500 people (+6.4%). The key changes by select demographic group are below.

- *Fast growth in 65+ year olds:* The number of adults aged 65 and older increased 25.1%, reflecting the aging of the Baby Boomer population.
- *Fast growth in children under 18 years old:* The number of children increased 18.7%, even though the number of families with children was changed little during this period. Instead, this reflects an increase in the number of families with two or more children.
- *Losses in young adults aged 25-34 years old:* The number of young adults, including older Millennials decreased 11.6% and suggests that the County has not attracted or retained this age group at the same rate as in prior years.

¹ Unless otherwise noted, population data are from the U.S. Census's One-Year American Community Survey and reweighted to align with the total published by the Arlington County Planning Division.

- *Fast growth in the Hispanic population:* The number of Hispanic residents in the County increased 9.2% from 2012 and was the most significant source of population growth by race and ethnicity.
- *Relatively fast growth in the Black or African American population:* The number of Black or African American residents in the County increased 5.0% from 2012.
- *Slow growth in the white, non-Hispanic population:* The number of white and not Hispanic residents in the County increased 2.0% and was the slowest growing of all race and ethnic groups.

Population and Household Change in Select Categories, 2012 - 2018



Source: 2012 & 2018 American Community Survey (summary files)

In 2018, Arlington County was home to 109,940 households, 15.3 percent (14,571 households) more than in 2012.² The key changes by select household group are below.

- *Uneven growth in single-person households:* The number of single-person households increased 8.1%, reflecting slower growth in adults younger than 65 living alone (+3.1%) and higher growth rates for adults 65 and older living alone (+34.9%).
- *Fast growth in married couples without children:* These households increased 31.2% between 2012 and 2018 and one-half (49.1%) of these households were headed by

² Unless otherwise noted, household data are from the U.S. Census's One-Year American Community Survey and the Microdata totals for 2018 were reweighted to match the Summary File data.

someone aged 55 years old or older in 2018. The fast growth in this household type primarily reflects the increase of Baby Boomers that became empty nesters during this period.

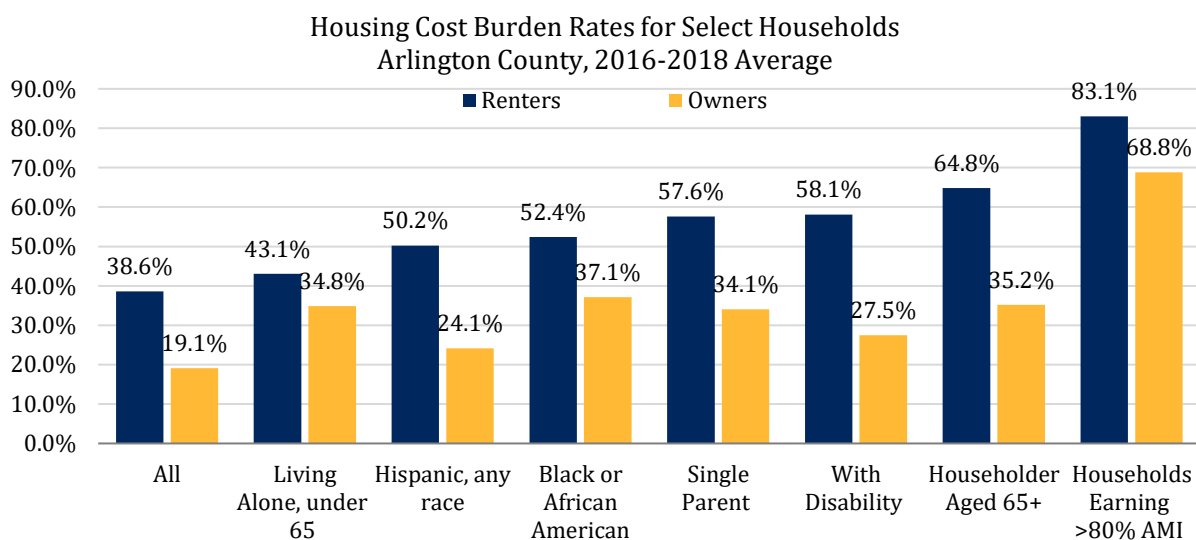
- *Increasing concentration of high-income households:* Households earning more than \$200,000 increased 31.5% since 2012, while those earning less than \$120,000 increased by 1.7%. As a result of the fast growth of high-income households and slow growth in lower-income households, the share of high-income households earning more than \$200,000 increased from 21.5% in 2012 to 24.5% in 2018.

Affordability Trends

As a result of the fast growth in high-income households, the rate of housing cost burden, the share of households paying more than 30 percent of their household income on housing cost (housing cost burdened households), decreased from 32.2 percent in 2012 to 30.0 percent in 2018. However, many household types continued to experience high rates of housing cost burden in 2018.

Nearly two-fifths (38.6%) of all renters paid more than 30 percent of their monthly income on rent and were housing cost burdened, including

- 83.1% of all renter households earning less than 80% of Area Median Income,³
- 74.7% of single-person households aged 65 or older,
- 58.1% of householders with a disability,
- 57.6% of single-parent households,
- 52.4% of Black or African American households, and
- 50.2% Hispanic households.



Source: 2016-2018 American Community Survey (microdata)

³ See pages 12-13 for more information on Area Median Income.

Nearly one-fifth (19.1%) of owner households were housing cost burdened, including:

- 68.8% of all owner households earning less than 80% of Area Median Income,
- 37.1% of Black or African American households,
- 35.2% of single-person households aged 65 or older,
- 34.8% of single-person households younger than 65 or older, and
- 34.1% of single-parent households.

Forecasted Housing Demand

Between 2015 and 2045, the number of households living in Arlington County is projected to increase from 103,760 to 141,840, an increase of 38,080 households (+36.7). The average annual growth rate is projected to be 1.0 percent, with gains modestly stronger during the first decade of the forecast period. Three main factors affect the demand for housing by the end of the forecast period:

- *The Baby Boomer generation will age from being 51-69 years old in 2015 to being older than 81 years old in 2045.* This cohort is a large share of the region's and County's population and the aging of the generation will drive faster growth in retirees, households headed by someone older than 85 years old, and small households consisting of one or two people.
- *The Millennial generation will age from being 16 to 34 years old in 2015 to being 46 to 64 in 2045.* Millennials transition into retirement and become empty nesters towards the end of this forecast period, also contributing to the fast growth in smaller households between 2015 and 2045.
- *The Washington region will continue to have fast growth in low-wage jobs.* Households in Arlington County have jobs throughout the region and the region-wide growth in low-wage jobs will contribute to faster growth in lower-income households

Because of these factors, the demand for housing in the County is projected to be strongest for households earning below the area median income (AMI):

- The number of households earning less than <30% of AMI is projected to increase by 4,340, including an increase of 3,720 renters.
- The number of households earning between 30% and 60% of AMI is projected to increase by 5,790, including 4,960 renters.
- The number households earning between 60% and 80% of AMI is projected to increase by 4,060, including 3,360 renter households.

As a result of the faster increase in lower income households, overall, the share of households earning above 120% of AMI is projected to decline from 52.0 percent in 2015 to 49.1 percent in 2045. However, the ability of these households to live the County will depend on the housing supply, the County's policies, and other market forces.

Forecasts of Household Growth by Selected Characteristics, 2015-2045

Household Type	Households In 2015	Change	Percent Change
All Households	103,760	38,080	36.7%
Household Income			
<30% AMI	10,010	4,340	43.4%
30-60% AMI	11,480	5,790	50.4%
60-80% AMI	8,680	4,060	46.8%
80-100% AMI	8,630	3,840	44.5%
100-120% AMI	11,040	4,320	39.1%
120%+ AMI	53,910	15,730	29.2%
Household Size			
1-person	40,710	17,110	42.0%
2-person	35,050	14,540	41.5%
3-person	11,540	3,920	33.9%
4+-person	16,460	2,520	15.3%
Age of Household Head			
<65	89,080	33,340	37.4%
65-84	12,890	3,290	25.5%
85+	1,800	1,450	80.8%
Disability Status			
With no disabled member	96,150	35,310	36.7%
With a disabled member	7,610	2,770	36.5%
Tenure (Rent/Own)			
Rental units	58,110	29,050	50.0%
Ownership units	45,650	9,040	19.8%

Source: The Stephen S. Fuller Institute at the Schar School, GMU NOTE: May not sum due to rounding

Housing Values

The 2014 Housing Needs Analysis Report detailed four overarching housing values:

- *Diversity*: Housing affordability directly contributes the community's diversity by enabling a wide range of households to live in Arlington, especially households with limited means and special needs.
- *Inclusivity*: Housing inclusivity supports a caring, welcoming community in which discrimination does not occur, housing opportunities are fair, and no one is homeless.
- *Choice*: A range of housing choices should be available throughout our community and affordable to persons of all income levels and needs. Balanced housing choices benefit individuals and the community as a whole.

- *Sustainability*: Housing affordability is vital to the community's sustainability. It impacts the local economy and the natural and built environments. Affordable housing supports diverse jobs and incomes needed to sustain the local economy.⁴

Between 2012 and 2018, the County has had mixed success in furthering these values. By select metrics, the County has become more diverse and inclusive:

- The County has become more racially and ethnically diverse and the share of non-white and not Hispanic residents increased from 36.5% in 2012 to 38.4% in 2018; and
- The County has more diversity of ages and share of children increased from 16.2% to 17.6%, while the share of adults aged 65 and older increased from 8.9% in 2012 to 10.6% in 2018.

However, housing choice remains limited, which continues to affect the types of households that can live in the County and has reduced the diversity of the community by other metrics:

- The rising cost of housing has likely contributed to a loss of income diversity among households in the County and the share of households earning more than 120% of the area median income increased from 50.5% in 2012 to 54.5% in 2018; and
- The smaller rate of growth in ownership units may have been a factor in the decrease in 25-34 year olds living in the County, as the older Millennials may not be able to find their preferred housing stock as they age into their next phase of life.

Overall, the inability of the County to house prime working age adults (aged 24-64) and households earning less than 120% of the area median income at the same rates as in prior years poses a threat to its long-term community and economic sustainability.

Based on forecasts of housing demand through 2045, demand is projected to be strongest from households earning below the median income and demand from younger adults is projected to return after 2025. The County has an opportunity to reverse the trend of decreasing economic diversity as well as bolster its share of working-age adults, provided that the County retains its retirees and low-wage worker-households. The ability of these households to live the County is tied to the supply and the level of protection provided by the County's policies.

⁴ These bullets are from "Housing a Diverse and Inclusive Community in Arlington County: An Analysis of Current and Future Housing Needs" (September 2014), page 42.

Introduction

Arlington County is updating the 2014 Housing Needs Analysis Report as part of the five-year review of the Affordable Housing Master Plan in connection with the County's Comprehensive Plan. The 2015 Affordable Housing Master Plan detailed how housing was integral to the County's vision to support residents, to improve neighborhoods and to strengthen the economy. The Plan set forth three main goals: to increase supply, to ensure access, and to contribute to a sustainable community.

In order to achieve these goals, period updates on the fundamental factors affecting the demand and supply of housing are undertaken. As part of this process, this report is a quantitative update of the prior 2014 Housing Need Analysis Report. This analysis is based on data from Arlington County, the U.S. Census Bureau and other public sources. Unlike the prior report, attitudinal data on housing was not collected; the 2014 report synthesized qualitative information obtained through a customized poll and survey and a series of focus groups and targeted interviews with key stakeholder groups in Arlington.

Like in the prior report, the main goals of this analysis are

- To describe the characteristics of Arlington County's population and to analyze demographic, economic, and housing market trends, focusing on the trends between 2012, the base year of the prior report, and 2018, the most current data available;
- To examine current housing affordability and housing needs in the County, and to better understand the current gap between needs and supply; and
- To forecast housing demand to 2045 based on the most recent population and jobs patterns.

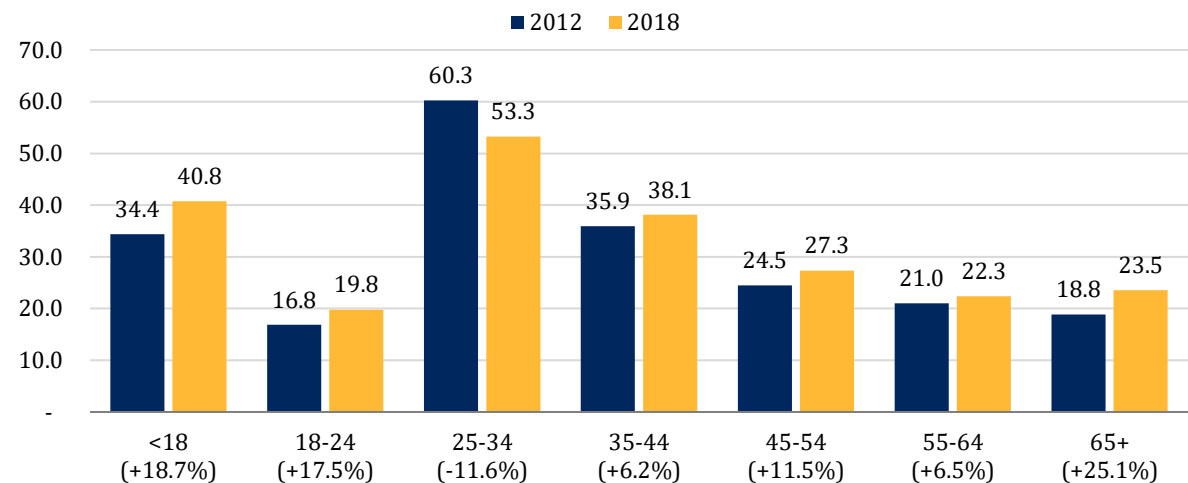
Profile of the Arlington Community

Population

As of 2018, Arlington County, VA had a population of 225,200.⁵ Between 2012 and 2018, the County's population increased by 13,500 people (+6.4%). The County continued to have a large share of young adults but the share decreased from 2012 because of an absolute decline in this population and faster growth in older adults. The majority of the County's residents were white and not Hispanic, although the County has become more racially and ethnically diverse since 2012.⁶

Between 2012 and 2018, the number of adults aged 65 or older in the County increased by 25.1 percent (+4,720 people) and had the fastest rate of growth. This age cohort accounted for 10.6 percent of the County's population in 2018; a share that is larger than in 2012 (8.9%), but smaller than that in other major jurisdictions in the Washington region.⁷ The large growth rate of this age group reflects the aging of the Baby Boomers, who were between 54 and 72 years old in 2018, and advances in health care and technology that have allowed older adults to live independently for longer.

Figure 1. Population by Age Group, 2012 & 2018 (thousands)



Source: 2012 & 2018 American Community Survey (summary files) and Arlington County Planning Division
Percent changes are shown in parenthesis

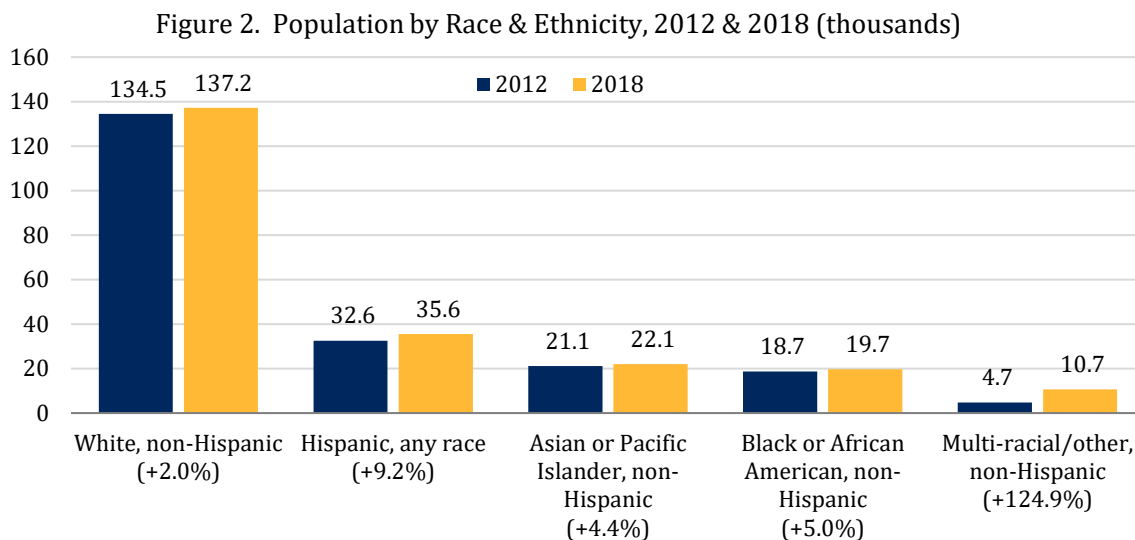
⁵ Unless otherwise noted, population data are from the U.S. Census's One-Year American Community Survey and reweighted to align with the total published by the Arlington County Planning Division. All data on households are from the U.S. Census's American Community Survey.

⁶ The age, race and ethnicity data in the American Community Survey are controlled to match the totals estimated by the U.S. Census's Population Estimates. These estimates are partially based on administrative data and are partially modeled and use the Decennial Census as their base. After the 2020 Decennial Census, these estimates will likely be revised to better conform to the 2020 results.

⁷ The jurisdictions analyzed in this report include the District of Columbia, Montgomery County, MD, Alexandria City, VA, and Fairfax County, VA (inclusive of the cities of Falls Church and Fairfax when the ACS microdata is used).

The number of 25 to 34 year olds in the County accounted for one-quarter (24.9%) of the County's population and this share is larger than that in other major jurisdictions in the Washington region, including the District of Columbia. However, the number of 25 to 35 year olds decreased 11.6 percent (-6,975 people) between 2012 and 2018 and was the only age group to decline. Nationally, this age group increased 8.0 percent, a rate that was nearly double the overall population growth of 4.2 percent.⁸ The national growth in this age reflects the large size of the Millennial generation, who were between 18 and 37 in 2018. The decrease in Arlington County indicates that the County did not attract or retain this population at the same rates in prior years. Fairfax County, VA, Montgomery County, MD and the City of Alexandria, VA also had fewer 25-34 year olds in 2018 than in 2012 and gains in this age group were relatively small for the Washington region, overall (+2.2%).

The majority of the population in Arlington County identified as white and non-Hispanic in 2018; this race and ethnic group accounted for 60.9 percent of the population. Compared to other major jurisdiction in the region, white non-Hispanics represented a larger share of the population. However, compared to 2012, Arlington County became more diverse and the share of white non-Hispanic residents decreased from 63.5 percent. This decline was the result of faster growth in every other major race and ethnic group. The white and non-Hispanic population increased 2.0 percent between 2012 and 2018.



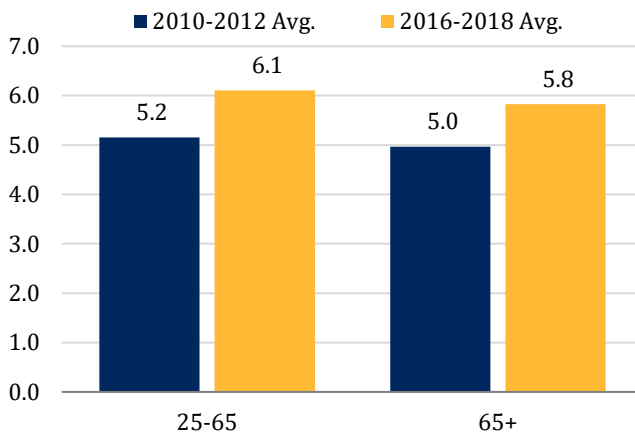
Source: 2012 & 2018 American Community Survey (summary files) and Arlington County Planning Division
Percent change shown in parenthesis

Between 2012 and 2018, the number of County residents identifying as not Hispanic and either more than one race or a race other than white, Black/African American, Asian or Pacific Islander increased 124.9 percent (+5,920 people) and had the fastest growth. In part, this reflects fast rate of growth in the number of multi-racial children, both in the County and nationally. The number of multi-racial, non-Hispanic people under the age of 20 increased

⁸ U.S. Census, vintage 2018 Population Estimates

by 23.3 percent in County between 2012 and 2018. The number of Hispanic residents in the County had the second fastest growth rate, increasing 9.2 percent (+2,990 residents). The non-Hispanic, Black or African America population in the County increased 5.0 percent (+940 residents), while the non-Hispanic and Asian and Pacific Islander population increased 4.4 percent (+930 residents).

Figure 3. Population by Disability Status & Age Group (thousands)



Source: 2010-2012 & 2016-2018 American Community Survey (microdata) and Arlington County Planning Division

Of residents older than 25 years, 7.2 percent had a disability. This share increased from that in 2012 (6.3%) as a result of the faster growth in older adults. Adults older than 65 years old are more likely to have a disability and nearly one-quarter (24.6%) did according to the 2016-2018 American Community Survey estimate. Fewer than five percent (4.3%) of residents between 25 and 64 years old had a disability during this period. For both age groups, ambulatory difficulties were the most common disability, affecting 14.1 percent of older adults and 1.6 percent of adults between 25 and 64 years old.⁹

Households

In 2018, Arlington County was home to 109,940 households, 15.3 percent (14,571 households) more than in 2012.¹⁰ Single-person households were the most common household type in 2018 and 30.7 percent of all households were single adults under the age of 65 and 7.5 percent were single adults aged 65 and older. Compared to 2012, the number of adults aged 65 and older that were living alone increased 34.9 percent and was the second fastest growing household type, behind families that did not consist of married couples or single parents¹¹ (other family).

The second most common household type was married couples without children, which accounted for 21.7 percent of all households in 2018. Nearly one-half (49.1%) of these households were headed by someone aged 55 years old or older and it is likely that many of these households once had children and were empty nesters by 2018. Compared to 2012, the number of married couples without children increased 31.2 percent, the third largest percentage increase.

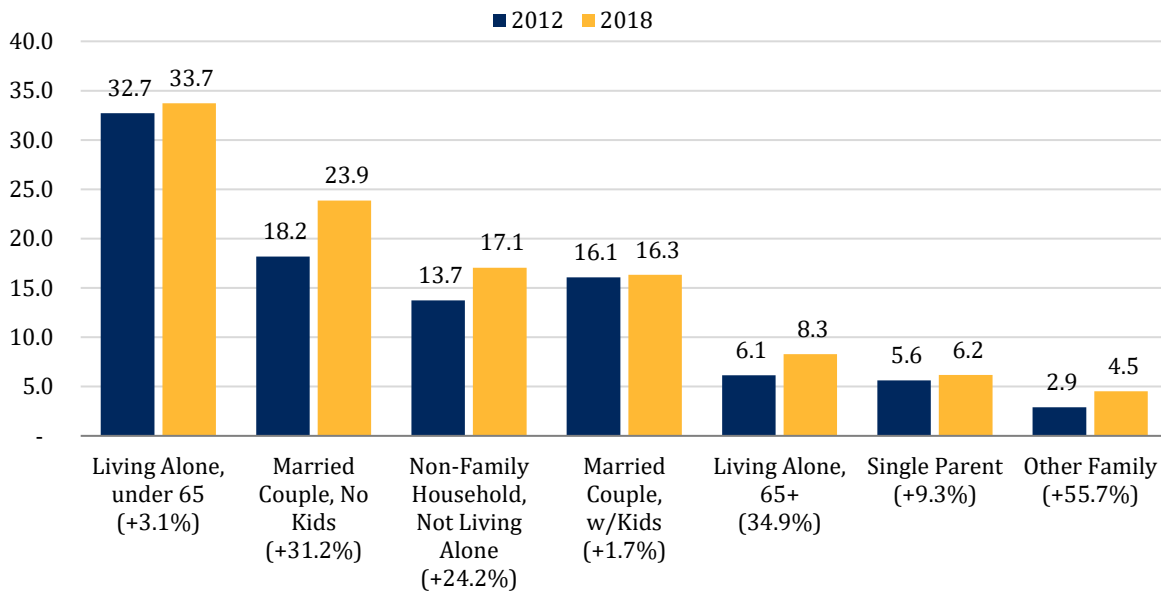
⁹ From the U.S. Census's 2016-2018 American Community Survey, microdata. Six disabilities are included in this survey: hearing difficulty, vision difficulty, ambulatory difficulty, cognitive difficulty, self-care difficulty and independent living difficulty. Respondents may have more than one disability.

¹⁰ Unless otherwise noted, household data are from the U.S. Census's One-Year American Community Survey and the Microdata totals for 2018 were reweighted to match the Summary File data.

¹¹ Single parent households includes all single adults with children, including those living with a grandparent or other guardian.

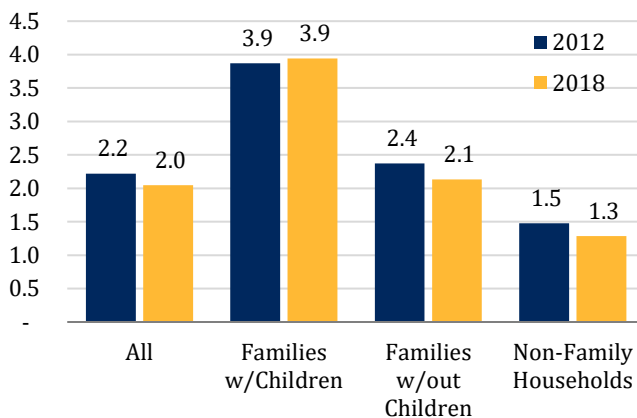
Between 2012 and 2017, the slowest growing household type was married couples with children (+1.7%). Despite the relatively small increase in families with children, both married couples and single parents, the average number of children in these families increased from 1.6 in 2012 to 1.8 in 2018 and the increase in children under the age of 18 was larger than the average growth for residents of all ages. This most likely reflects the aging of the Millennial cohort, the oldest of whom were 37 in 2018.

Figure 4. Households by Type, 2012 & 2018 (thousands)



Source: 2012 & 2018 American Community Survey (microdata); Percent change shown in parenthesis

Figure 5. Average Household Size, 2012 & 2018



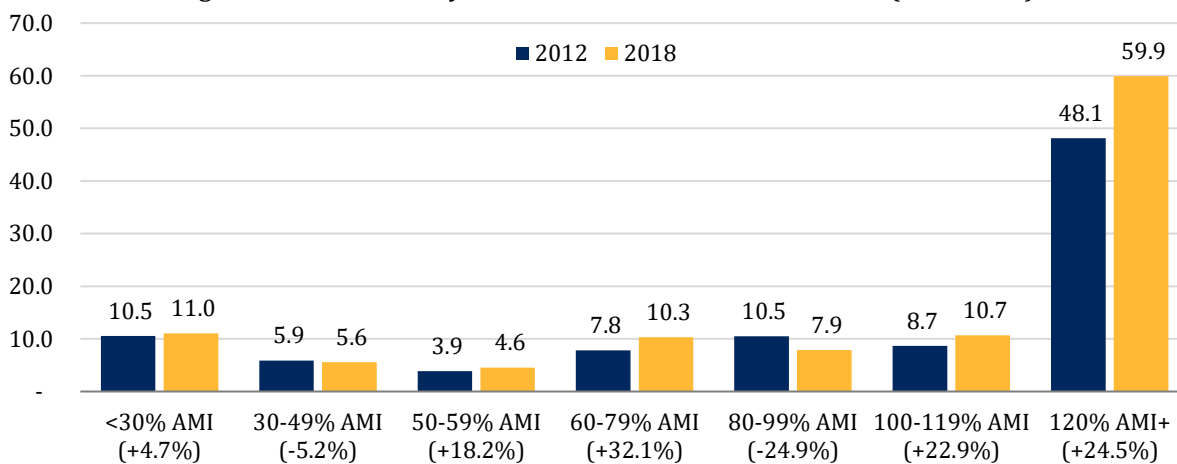
Source: 2012 & 2018 American Community Survey (microdata)

The average household size decreased from 2.2 in 2012 to 2.0 in 2018, primarily because of a decline in the average size of non-family households, which decreased from 1.5 to 1.3. The average household size for families without children aged 18 or younger also decreased from 2.4 to 2.1, likely reflecting the loss of college-aged adults or young adults as they formed their own households. Conversely, the average household size for families with children increased slightly from 3.87 to 3.94; the average number of children in these families increased from 1.6 to 1.8 and the average number of adults decreased slightly.

The Area Median Income measures the income level of a household relative to both its household size and other households in the region and is used primarily to determine housing needs. The median household for the purposes of AMI is a family of four earning \$117,200 in 2018 for the Washington region. The median income of a single-person household, as estimated using AMI, was \$82,040 for the Washington region in 2018.¹² Households earning less than 30% of AMI based on their income and household size are considered to be extremely low income. Households earning between 30% and 60% of AMI are considered very low to low income households, while those earning between 60% and 80% of AMI are moderate income. Lastly, households earning between 80% and 120% of AMI are considered middle income. In Arlington, most households earning more than 60% of AMI generally had at least one worker, while those earning less typically included a large share of older adults that were not (or no longer) working. See Table 1 on page 13 for more details on AMI in Arlington County.

The majority (54.5%) of households in the County had incomes greater than 120% of regional Area Median Income (AMI) in 2018; in 2012, 50.5 percent did. The share of households earning less than 50% of AMI decreased to 15.1% in 2018 from 17.2% in 2012. Regionally, 21.9 percent of all households earned less than 50% of AMI in 2018 and this income group continued to be the most underrepresented household group. About 17 percent (16.8%) of households in the County were middle income households, earning between 80 and 120% of AMI, and the County had a smaller share of these households compared to both the region in 2018 (20.0%) and the County in 2012 (20.1%). Overall, the County had a smaller share of all AMI groups below 120% AMI compared to the region in 2018.

Figure 6. Households by Area Median Income, 2012 & 2018 (thousands)



Source: 2012 & 2018 American Community Survey (microdata)

NOTE: The smaller categories have larger margins of error; Percent change shown in parenthesis

¹² These levels are partially modeled and forecasted and do not equal the median (50th percentile) incomes for each household size as measured by the American Community Survey.

Table 1. Area Median Income Limits and Examples, 2018

Income (FY2018)	Most Common Type of Household In Arlington	Maximum Affordable Housing Cost
<i>Extremely Low Income:</i> 0-30% AMI <\$35,650: Family of Four <\$24,650: Single Person	Older Adult Living Alone Households with One Worker in Health Care, Accommodations or Retail industry	<\$890: Family of Four <\$615: Single Person
<i>Very Low to Low Income:</i> 30-60% AMI \$35,650 - \$70,320: Family of Four \$24,650 - \$49,225: Single Person	Older Adult Living Alone Households with 1-2 Workers in Professional Service, Personal Care, or Accommodations industry	\$890-\$1,760: Family of Four \$615-\$1,230: Single Person
<i>Moderate Income:</i> 60-80% AMI \$70,320 - \$93,760: Family of Four \$49,225 - \$65,630: Single Person	Young Adult Working in Professional Service industry, State/Local or Federal Government	\$1,760-\$2,345: Family of Four \$1,230-\$1,640: Single Person
<i>Middle Income:*</i> 80-120% AMI \$93,760 - \$140,640: Family of Four \$65,630 - \$98,450: Single Person	Adult working in Professional Services industry, Federal Government, or Association	\$2,345-\$3,515: Family of Four \$1,640-\$2,460: Single Person

Source: U.S. Department of Housing and Urban Development NOTE: The thresholds are not capped using the HUD formulas and the dollar amounts.

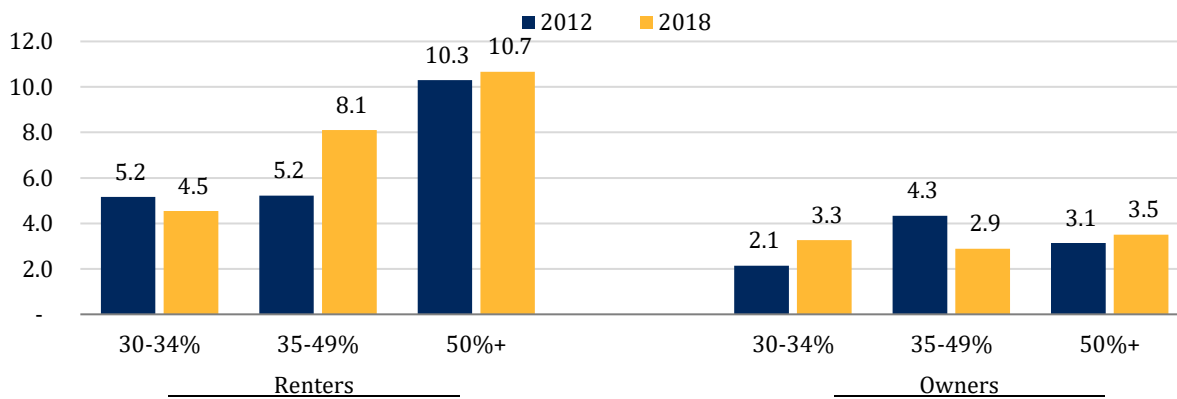
Current Housing Affordability

All Households

Housing costs are considered affordable when they account for less than 30 percent of a household's income. Households spending more than this are considered housing cost burdened.¹³ In 2018, 30.0 percent of all households in the County spent more than 30 percent of their household income on housing costs and were considered housing cost burdened, including 36.9 percent of all renters and 20.7 percent of all owners. As a result of the fast growth in high-income households, a smaller share of households in the County were housing cost burdened in 2018 compared to 2012; the County also had a smaller share of housing cost burdened households in both years compared to the region after adjusting for home ownership rates.

¹³ See "Who Can Afford To Live in a Home?: A look at data from the 2006 American Community Survey" by Mary Schwartz and Ellen Wilson available at <https://www.census.gov/housing/census/publications/who-can-afford.pdf> for a discussion of why 30 percent of income is a standard for housing affordability.

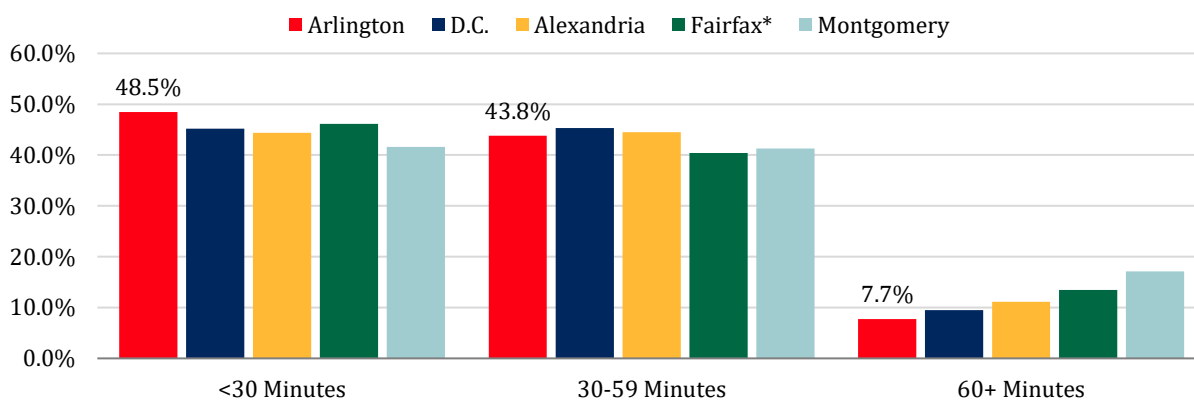
Figure 7. Households by Share of Income Spent on Housing
2012 & 2018 (thousands)



Source: 2012 & 2018 American Community Survey (microdata)

Even though a smaller share of households were housing cost burdened in 2018 compared to 2012, the total number of burdened renters increased 12.6 percent (+2,600 households) and the total number of burdened owners increased 1.3 percent (+130 households). The most significant increases were in the number of renters spending between 40 and 49.9 percent of household income on rent (+70.2%, +1,965 households) and in owners spending between 30 and 34.9 percent of household income on owner costs (+53.8%, +1,150 households). The increase in renters spending 40-49.9 percent of their income on rent was predominantly driven by younger renters earning \$30,000-\$59,999; the increase in owners spending 30-34.9 percent of their income on housing costs was also driven primarily by younger owners with varying incomes, suggesting that these households may be newer owners. The number of severely housing cost burdened households, those spending more than 50 percent of their household income on rent also increased modestly in absolute terms, rising from 13,435 households in 2012 to 14,190 households in 2018.

Figure 8. Share of Workers By Commute Time in Select Jurisdictions
By Place of Work, 2016-2018 Average



Source: 2016-2018 American Community Survey (microdata) *Includes the cities of Fairfax and Falls Church

Alternate measures of housing cost affordability include the differences in transportation costs associated with different home locations. Modeled data are available for hypothetical households; however, household-level estimates are not.¹⁴ Instead, commute time is used in this analysis to illustrate the general access to jobs, especially those in the two largest employment hubs in the region, D.C. and Fairfax, and the time savings associated with living in the County. Arlington commuters typically had shorter commutes than commuters living in other jurisdictions in the region, with nearly one-half (48.5%) commuting for fewer than 30 minutes and just 7.7 percent commuting for more than an hour each way. This suggests that some households can afford to spend more on housing because they are spending less on transportation.

Disproportionately Burdened Households

Several key household types were more likely to be housing cost burdened, including lower income households, older adults and younger home owners, single parent households and single-person households, minority households, and households where the householder has a disability.¹⁵

Low income households, both renter and owner, were more likely to be housing cost burdened in 2018. Renters earning less than \$80,000 had higher rates of burden than the average renter household and owners earning less than \$120,000 had higher rates of burden than the average owner household. Home owners earning more than \$80,000 were also more likely than renters to be housing cost burdened.

The housing cost burden rates change somewhat when both income and household size are taken into account. The Area Median Income is a measure of household income that is adjusted for the household's size and regional income levels and scaled so that each of these households in the same AMI band have a similar quality of life relative to the household's overall costs.¹⁶ The housing cost burden rates by AMI show that renters earning less than 80% of AMI have higher rates of burden than the average renter household in the County. Owners earning less than 120% of AMI are more likely to be burdened than all owners and all households, overall.

These trends shown by the cost burden by AMI broadly align with those as measured by household incomes with two key differences. Firstly, renters were more likely to find homes that were affordable to them if they earned more than 80% of AMI; the average household size for renters was 1.9 people so this occurs at about \$75,000 in the income-based measure. Secondly, owners are more likely to be burdened than renters for the high-income levels, but less likely than renters to be burdened for all AMI groups below the median. The average household size for owners was 2.4 and a larger share of owners have large households

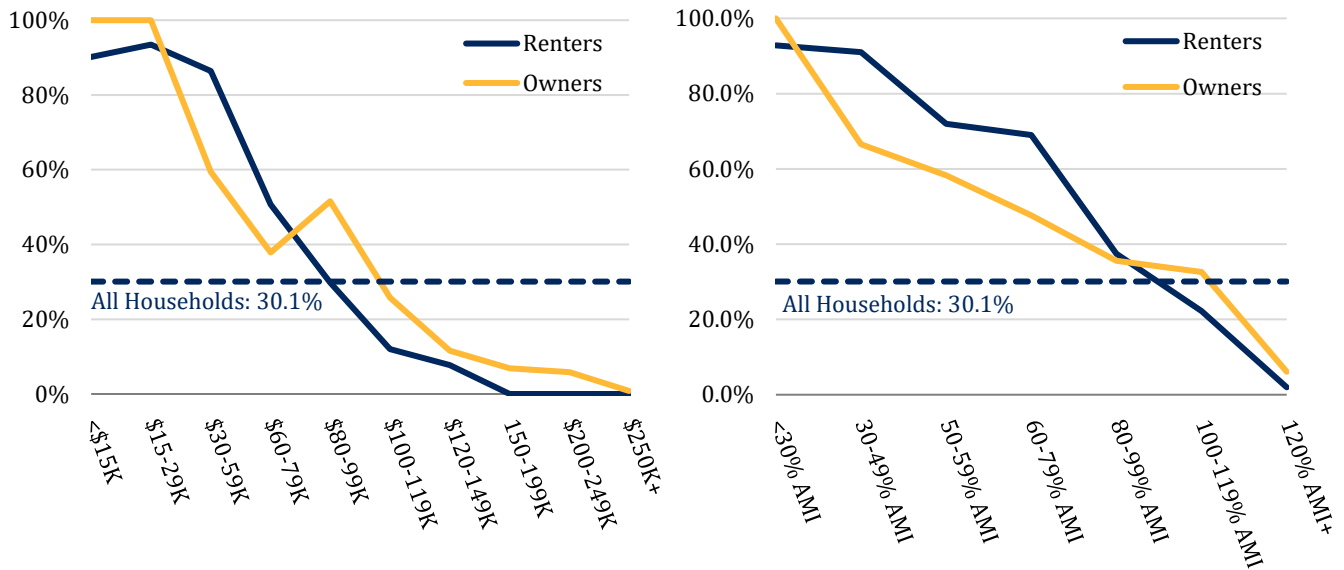
¹⁴ See <https://htaindex.cnt.org/about/> for more.

¹⁵ All data on detailed rates of cost burden are an average of the 2016, 2017, and 2018 American Community Survey unless otherwise noted.

¹⁶ AMI is not a normative measure of income, but a descriptive one. It does not account for any variation in household types (disability status, number of workers or number of children). These levels are also partially modeled and forecasted and do not equal the median (50th percentile) incomes for each household size as measured by the American Community Survey. See Table 1 on page 13 for more detail.

compared to renters, meaning that the same income level would not result in a similar quality of life for the average renter household and the average owner household. After adjusting for household size using the AMI, owners had lower housing cost burdens than renters for all AMI groups below the median.

Figures 9 and 10. Housing Cost Burden by Income (2018\$s) and Area Median Income
Arlington County, 2016-2018 Average



Source: 2016-2018 American Community Survey (microdata)

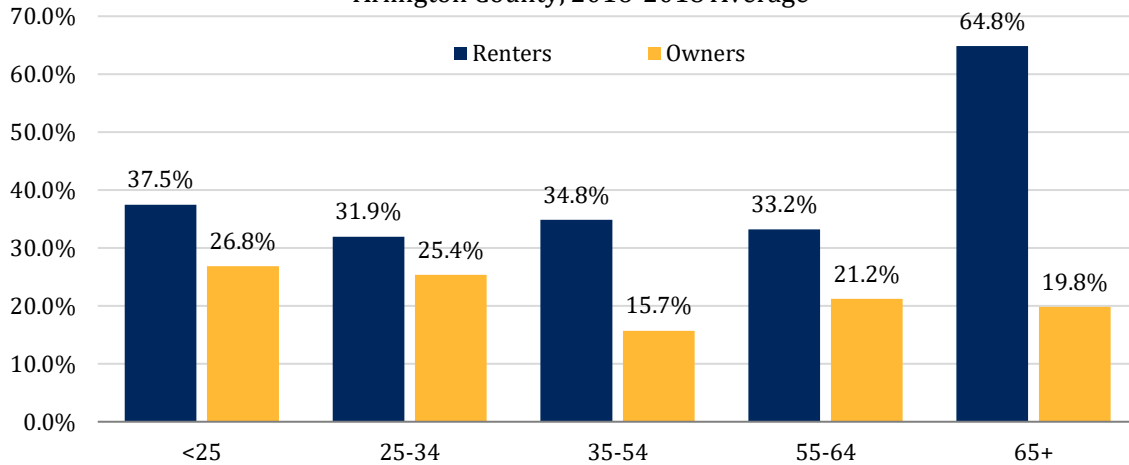
Housing cost burden rates varied significantly by the age of the householder. For renters, the most burdened age group was adults aged 65 and older, 64.8 percent of whom were burdened. The second most burdened age group for renters was younger adults aged younger than 25 years old. Housing cost burden rates for working-aged adults were more consistent, with adults between 35 and 64 years old experiencing somewhat elevated rates of burden compared to those aged 25-34 years old. For owners, the highest rates of burden were younger adults (<25 years old), 26.8 percent of whom were burdened. The rates of burden declined on average until the householder was about 54 years old and then were similar for the households that were most likely to have retirees (55+ years old)

Similar to the burden rates by age, these rates vary by household type, with the largest rates of burden occurring for adults aged 65 and older that live alone; 75.7 percent of older renters and 35.2 percent of older owners were paying more than 30 percent of their household income on housing costs. Single parent households¹⁷ also had higher than average rates of burden, with 57.6 percent of single parent renters and 34.1 percent of single parent owners paying more than recommended on housing costs. Married couples without children and households consisting of unrelated roommates had the lowest rates of burden, both for renters and owners.

¹⁷ Includes all single adults with children, including those living with a grandparent or other guardian.

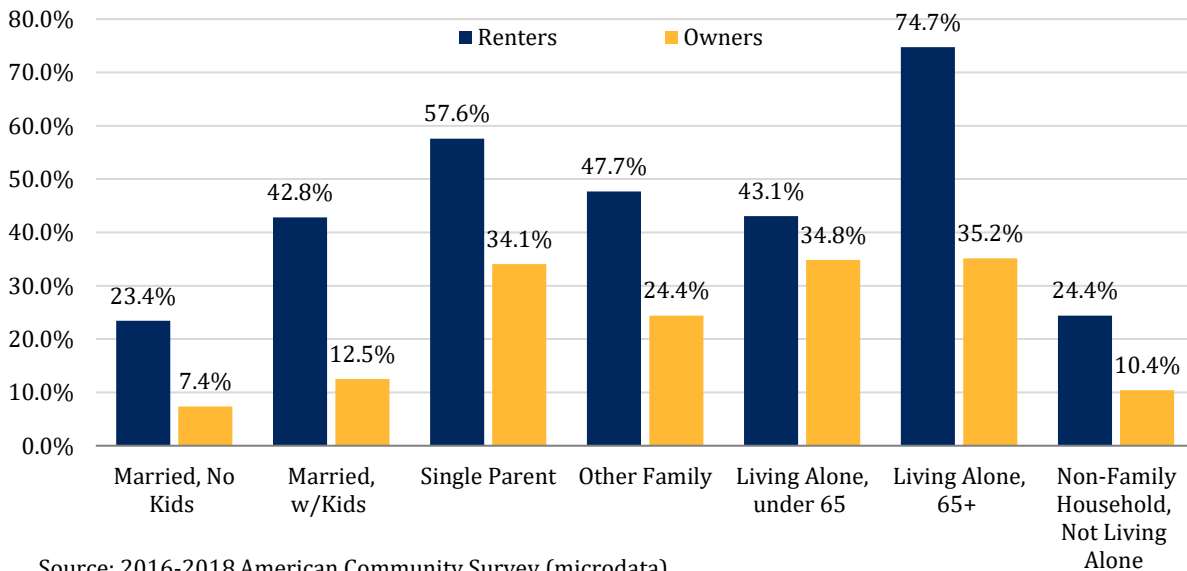
The vast majority (89.7%) of households with roommates had one bedroom or fewer per person, while other households were more likely to have a spare bedroom; 29.4 percent of single adults under 65 years old lived in units with two or more bedrooms. The decision to have roommates, especially for young renters, may reflect a combination of preferences, assumptions about future increases in wages, and supply constraints.

Figure 11. Housing Cost Burden Rates by Age Group
Arlington County, 2016-2018 Average



Source: 2016-2018 American Community Survey (microdata)

Figure 12. Housing Cost Burden Rates by Household Type
Arlington County, 2016-2018 Average

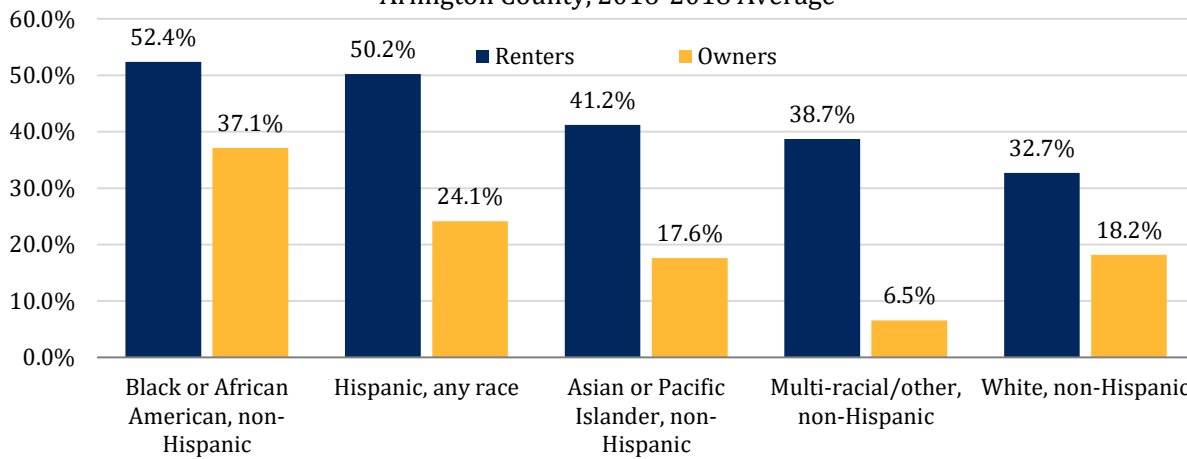


Source: 2016-2018 American Community Survey (microdata)

Black or African American and non-Hispanic householders had the highest housing cost burden rates for all major race and ethnic groups. More than one-half (52.4%) of Black or African American, non-Hispanic renter households and 37.1 percent of owners paid more

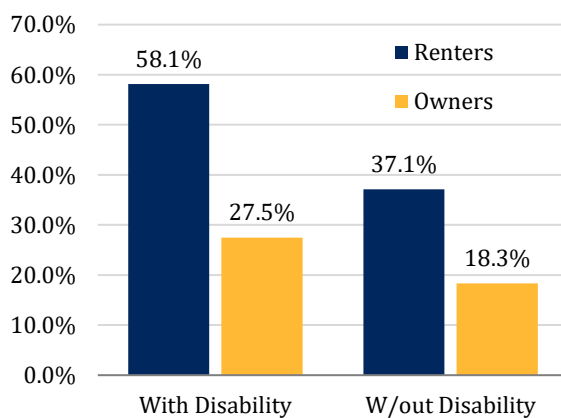
than 30 percent of their income on rent or owner costs, respectively. Hispanic householders of any race had the second largest rates of burden, with 50.2 percent of renters and 24.1 percent of owners spending more than 30 percent of their household income on housing costs. White, non-Hispanic householders were the least likely renters to be housing cost burdened, while non-Hispanic Asian or Pacific Islander households had the smallest share of cost burdened owners; the number of owners that were multi-racial or of another race was small and the estimates of housing cost burden are subject to a larger margin of error.

Figure 13. Housing Cost Burden Rates by Race & Ethnicity
Arlington County, 2016-2018 Average



Source: 2016-2018 American Community Survey (microdata)

Figure 14. Housing Cost Burden Rates by Disability Status, Arlington County
2016-2018 Average



Source: 2016-2018 American Community Survey (microdata)

Households where the householder had a disability were also more likely to pay more than 30 percent of their incomes on housing costs and 58.1% of renters and 27.5 percent of owners with a disabled householder did so. These households were more likely to be older, live in a single-family detached home, and receive social security or public assistance than households headed by someone without a disability. For owners, households headed by someone with a disability were more than twice as likely to own their home free and clear as those without a disability, suggesting that a combination of lower income levels or higher maintenance, taxes or other costs were contributing to the higher rates of cost burden rates for owners instead of mortgage costs.

Housing Market Trends

Residential Construction Trends

Between 2012 and 2018, the number of housing units in Arlington County increased by 7,200, an annual average increase of 1,200 units or 1.1 percent annual growth.¹⁸ Nearly all of this increase was from units in multi-family buildings with more than three units. The number of units in multi-family buildings increased by 6,900 (+10.1%) and these units accounted for 65.4 percent of all the housing in the County in 2018, up from 63.3 percent in 2012.

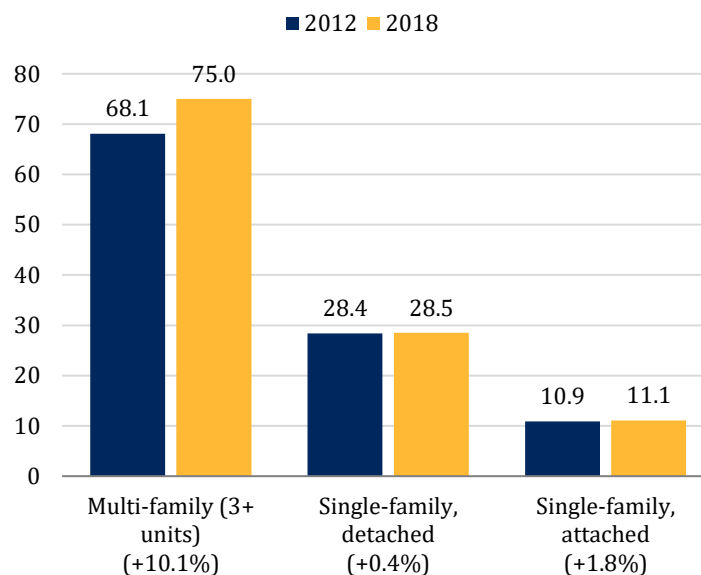
The number of single-family attached units (e.g. townhomes) increased by 200 (+1.8%) but remained the least common housing type, accounting for 9.7 percent of the County's housing stock in 2018. The number of

single-family detached homes increased by 100 units (+0.4%) between 2012 and 2018 and had the smallest gain. As a result of the below-average growth, the share of units that were single-family detached decreased from 26.4 percent in 2012 to 24.8 percent in 2018.

Compared to the Washington region, Arlington households were far more likely to live in units built prior to 1950.¹⁹ Nearly one-quarter (24.2%) of Arlington households lived in a unit dating to pre-1950 and 13.3 percent lived in a unit built in the 1950s; regionally, these shares were 12.8 percent and 9.3 percent, respectively. Households in Arlington were less likely to live in a unit built between 1960 and 2009 compared to the region and 54.2 percent did so in Arlington County while 71.1 percent did so in the region. Households in Arlington were slightly more likely to live a unit built since 2010 and 8.3 percent did so compared to 6.8 percent in the region.

The diversity of the housing stock partially reflects when the housing was built in the County. In Arlington County, the majority of the surviving housing built prior to 1960 was single-family detached. Units built prior to 1950 also included a larger share of single-family attached units and housing in buildings with 2-19 units (garden and low-rise). Housing built in the 1960s and 1970s that was occupied in 2018 was more likely to be in buildings with 2-

Figure 15. Housing Units by Type, 2012 & 2018*

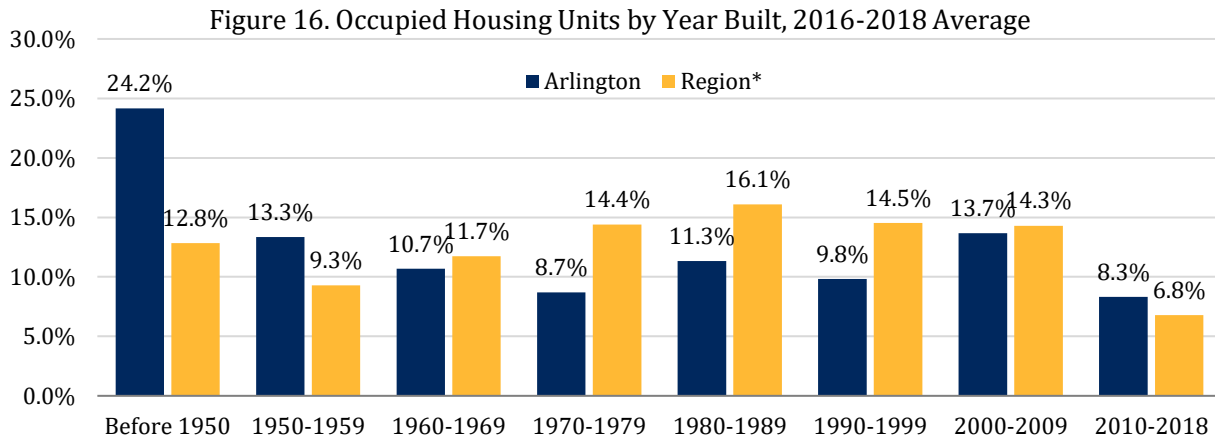


Source: Arlington County Planning Division
*Excludes 100 units of other types for both years
Percent change shown in parenthesis

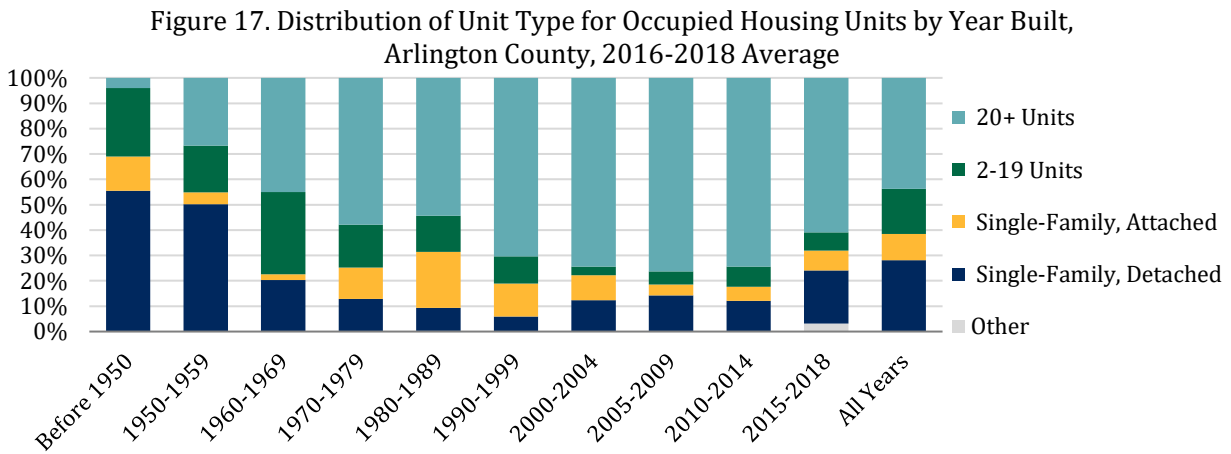
¹⁸ Estimate from the Arlington County Planning Division

¹⁹ Year built data are from the U.S. Census's 2016-2018 American Community Survey, microdata.

19 units, while housing built between 1980 and 1999 was more likely to be single-family attached. Since 1990, the majority of units have been in buildings with more than 50 units and there was less variety in the housing type of homes built since 2000 compared to in prior periods.



Source: 2016-2018 American Community Survey (microdata) *See Appendix for list of jurisdictions



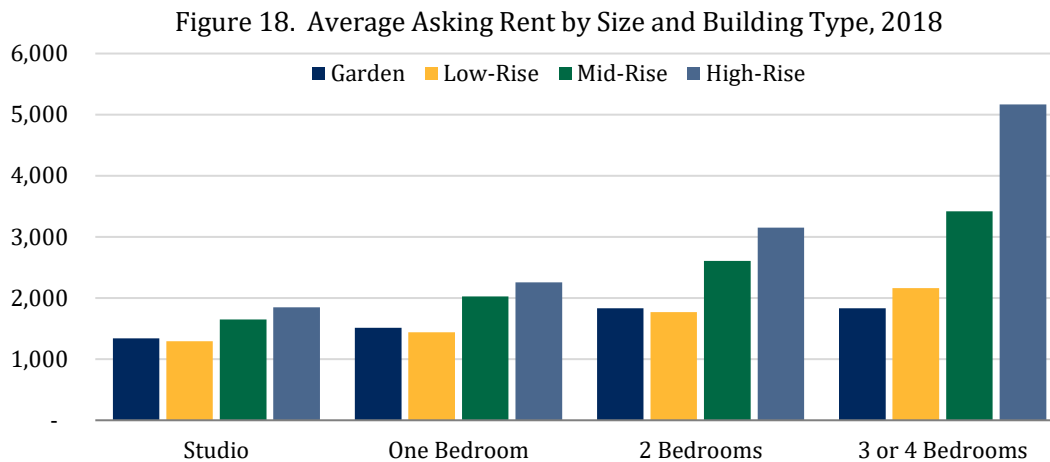
Source: 2016-2018 American Community Survey (microdata) NOTE: Teardowns and replacement units are shown based on the year of construction and this chart does not show net change by unit type.

Rental Housing Costs

The asking rent for a unit in a multi-family building in Arlington County varied by the number of bedrooms and unit type in 2018.²⁰ Garden buildings and low-rise buildings were the most affordable and also had smaller variation in rents by unit size. These buildings are typically older and have fewer on-site amenities than mid- and high-rise buildings. The average asking rent for a one-bedroom in a garden unit was \$1,515 and rent in a low-rise building was \$1,440; these building types had few studios and these rents were similar to those for one bedroom. The average asking rent for a three- or four-bedroom unit was \$1,835 in a garden

²⁰ Data on asking rents is from CoStar via the Arlington County Planning Division

building, 21.2 percent more than that for a one bedroom. For a three- or four-bedroom unit in a low-rise building, the asking rent was \$2,160 and 50.3 percent more than that for a one-bedroom unit.



Source: CoStar; Arlington County Planning Division

Mid- and high-rise buildings had higher asking rents and a larger difference between the asking rent of a small unit and a larger unit. Studio units were also more common for mid- and high-rise buildings. The average asking rent of a studio was \$1,650 in a mid-rise building and \$1,846 in a high-rise building. One-bedroom units had an average asking rent that was about 20 percent more in both unit types, but the price premium for each additional bedroom was larger in mid- and high-rise buildings compared that for garden and low-rise buildings. The average asking rent for a three- or four-bedroom unit in a mid-rise building was \$3,420, more than double (+107.4%) that of a studio. For a high-rise building, rent in a three- or four-bedroom unit was \$5,170 and 180.0 percent more than the asking rent for a studio. This wider distribution of asking rents suggests that either demand for large units in high-rise buildings is stronger than for other unit types or that the cost premium of building larger units (either directly associated with the unit or an indirect cost like a parking ratio) is higher for high-rise buildings than for other building types.

Table 2. Distribution of Monthly Rent
Arlington County, 2016-2018 Average

	Gross Rent
10th Percentile	\$1,229
25th Percentile	\$1,570
Median (50th Percentile)	\$1,967
75th Percentile	\$2,432
90th Percentile	\$3,032
Average Cost	\$2,031

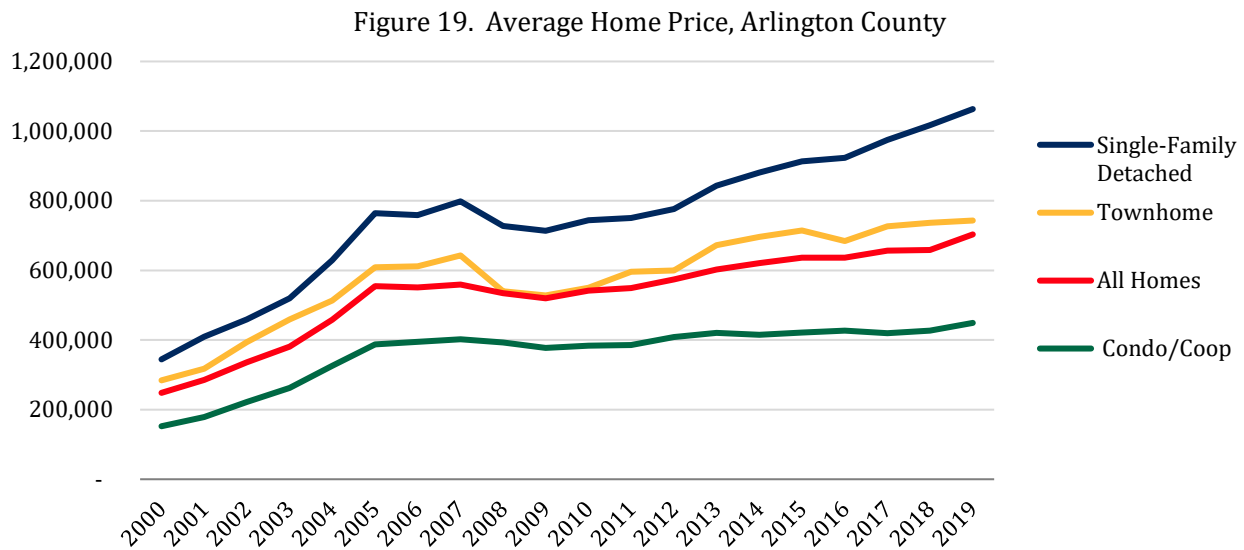
Source: 2016-2018 American Community Survey (microdata)

The distribution of rents that were paid by households in Arlington County is similar to the distribution of asking rents.²¹ Ten (10.0) percent of renters paid less than \$1,229 for rent and one-quarter (25%) paid less than \$1,570. These units were typically either smaller or older. The median rent was \$1,967; one-half of renters paid less than this amount. One-quarter (25.0) percent of renters paid \$2,432 or more for rent, including 10.0 percent that paid \$3,032 or more.

²¹ Rent distribution data are from the U.S. Census's 2016-2018 American Community Survey, microdata.

Owned Housing Costs

The average price for homes sold in Arlington County increased 14.7 percent between 2012 and 2018, or an average of 2.3 percent per year.²² Since 2000, average home prices have increased 165.5 percent and by an average of 5.6 percent annually. The average annual price increase between 2012 and 2018 for a single-family detached home was the largest of the home types, rising an average of 4.6 percent annually. The annual price increase for a townhome was 3.5 percent, while the average gain for a condo was 0.7 percent. Compared to the long-term average growth rates, all unit types had smaller price increases in recent years.



Source: MarketStats by ShowingTime NOTE: Not adjusted for inflation

The overall housing cost for owned housing depends on the household's mortgage rate, property taxes, home owner or condominium association fees, insurance and other costs that vary considerably. In Arlington County, more than one-quarter (25.9%) of owners did not have a mortgage payment; their costs were about 70 percent smaller than the owner costs for households with a mortgage.²³ Still, ninety (90.0) percent of owners without a mortgage paid \$642 or more each month on taxes, fees, insurance and select utility costs, requiring at least \$25,700 in household income to be considered affordable.

Fifty (50.0) percent of owners without a mortgage paid less than \$994 in monthly owner costs, requiring a household income of \$39,765 to be affordable. Ten (10.0) percent of households paid more than \$1,507 in non-mortgage owner costs, requiring an income of \$60,270 or more.

²² The average price of a home is from MarketStats by ShowingTime.

²³ Data on ownership costs are from the U.S. Census's 2016-2018 American Community Survey, microdata

Table 3. Distribution of Monthly Owner Costs,
Arlington County, 2016-2018 Average

	W/ Mortgage	No Mortgage
10th Percentile	\$1,667	\$642
25th Percentile	\$2,265	\$781
Median (50th Percentile)	\$3,001	\$994
75th Percentile	\$4,002	\$1,245
90th Percentile	\$5,200	\$1,507
Average Cost	\$3,268	\$1,047
Source: 2016-2018 American Community Survey (microdata)		

There was greater variation in costs for owners with a mortgage. Ten (10.0) percent of owners with a mortgage paid less than \$1,667 for owner costs and one-quarter (25%) paid less than \$2,265. These costs were 35.6 percent and 44.3 percent more than the 10th and 25th percentile cost for renters, reflecting the price premium associated with the entry into home ownership. The median owner cost was \$3,001 and one-half of owners

with a mortgage paid less than this amount, which is affordable for households earning more than \$120,045. One-quarter (25.0) percent of owners with a mortgage paid \$4,002 or more on owner costs, including 10.0 percent that paid \$5,200 or more.

Current Demand and Supply

Housing cost burdened rates describe which households are paying housing costs that are considered affordable and are one measure of need at the household-level. This section examines the housing units (supply) that are available to each Area Median Income group, based on the unit size and monthly cost, and compares it to the number of households in each AMI group and household size in order to better describe the potential gaps in Arlington County's housing supply. In other words, this section measures the degree of mismatch between existing housing units and exiting households in aggregate.

For renters, there were more lower income households than units priced at levels affordable to them, regardless of household size. There were 3,800 more single-person renters earning less than 30% of AMI than there were studios or one-bedroom units priced at levels that would be affordable to them (<\$615). The number of households exceeded the supply for two-person, two-bedroom units in this AMI band by 1,152 and the number of three or more person households exceeded the number of larger rental units by 1,540. These households rented units at higher price levels and were housing cost burdened.

Table 4. Maximum Monthly Housing Cost Affordable to Renters in Arlington County, 2018 \$
Assumes Households Spend Less than 30% of Income on Housing Costs

	1 Person / 0-1 Bedroom	2 People/ Bedrooms	3 People/ Bedrooms	4 People/ Bedrooms
<30% AMI	615	703	791	879
30-49% AMI	1,026	1,172	1,319	1,465
50-59% AMI	1,231	1,406	1,582	1,758
60-79% AMI	1,641	1,875	2,110	2,344
80-99% AMI	2,051	2,344	2,637	2,930
100-119% AMI	2,461	2,813	3,164	3,516
120% AMI+	2,461+	2,812+	3,164+	3,516+

Source: U.S. Department of Housing and Urban Development

Conversely, there were more high-income renter households earning more than 120% of AMI than there were units priced at this AMI band (above \$2,460 for single-person households) for every household size. There were 4,973 single-person households, 8,170 two-person households and 2,483 household with three or more people renting housing units at lower price levels. This could indicate that these households 1) may prefer spending money on non-housing costs or savings, or 2) would prefer to buy but cannot find a unit available to them at their preferred price and size.²⁴

Table 5. Rental Units by Size and Area Median Income, Households by Size and Area Median Income, and Housing Unit Gap, 2016-2018 Average, Arlington County

	Rental Units By Affordability Level				
	0/1 Bedrooms	2 Bedroom	3 Bedrooms	4+ Bedrooms	Total
<30% AMI	672	817	78	18	1,585
30-49% AMI	702	723	517	255	2,197
50-59% AMI	2,107	1,253	237	-	3,597
60-79% AMI	8,795	3,840	825	195	13,655
80-99% AMI	10,698	4,760	795	222	16,475
100-119% AMI	6,983	4,248	1,052	308	12,592
120% AMI+	2,745	3,593	2,108	542	8,988
	Renter Households				
	1 Person	2 People	3 People	4+ People	Total
<30% AMI	4,472	1,968	737	900	8,077
30-49% AMI	1,903	1,580	533	1,193	5,210
50-59% AMI	1,518	650	677	487	3,332
60-79% AMI	3,497	1,502	453	623	6,075
80-99% AMI	3,017	1,430	535	458	5,440
100-119% AMI	3,282	1,918	535	605	6,340
120% AMI+	7,718	11,763	3,270	1,863	24,615
	Households Minus Supply				
	1 Person	2 People	3 People	4+ People	Total
<30% AMI	3,800	1,152	658	882	6,492
30-49% AMI	1,202	857	17	938	3,013
50-59% AMI	(588)	(603)	440	487	(265)
60-79% AMI	(5,298)	(2,338)	(372)	428	(7,580)
80-99% AMI	(7,682)	(3,330)	(260)	237	(11,035)
100-119% AMI	(3,702)	(2,330)	(517)	297	(6,252)
120% AMI+	4,973	8,170	1,162	1,322	15,627

Source: 2016-2018 American Community Survey (microdata) NOTES: Assumes one person per bedroom when determining the AMI for housing units; Assumes owners can afford a unit that is four times their annual household income

Large renter households also had fewer units available to them for all rent levels. For households with more than three people, overall, there were 5,718 more households than

²⁴ It is also possible that these households cannot find the rental supply that suites their needs at the time they move. This is less likely given the amount of supply and the likely turnover of these units.

there were units with more than three bedrooms, suggesting that these households shared bedrooms and were more likely to include couples or children that did so.

For owners, determining the home value that is affordable to that household is more difficult and depends on the household's ability to save for a down payment, the household's mortgage rate and the non-mortgage owner costs of the unit. As in the last report, this analysis uses a ratio of income to home price of four; that is, households are assumed to be able to afford a home valued at up to four times their annual income. While this may not be the correct level for every household, it does correspond to the average buyer patterns in the Washington region.²⁵

Table 6. Owner Units by Size and Area Median Income, Households by Size and Area Median Income, and Housing Unit Gap, 2016-2018 Average, Arlington County

	Owned Units					
	0/1 Bedrooms	2 Bedroom	3 Bedrooms	4 Bedrooms	5+ Bedrooms	Total
<30% AMI	170	80	142	22	22	435
30-49% AMI	295	297	133	-	-	725
50-59% AMI	195	265	37	23	-	520
60-79% AMI	820	1,097	218	65	38	2,238
80-99% AMI	955	1,195	863	185	292	3,490
100-119% AMI	1,428	2,667	1,043	288	55	5,482
120% AMI+	1,947	5,860	11,988	8,385	5,358	33,538
	Owner Households					
	1 Person	2 People	3 People	4 People	5+ People	Total
<30% AMI	1,475	232	20	18	235	1,980
30-49% AMI	655	270	40	110	155	1,230
50-59% AMI	645	262	183	115	38	1,243
60-79% AMI	1,247	442	113	268	93	2,163
80-99% AMI	1,063	872	347	275	137	2,693
100-119% AMI	1,433	1,272	697	407	340	4,148
120% AMI+	7,718	12,093	5,082	5,590	2,487	32,970
	Households Minus Supply					
	1 Person	2 People	3 People	4 People	5+ People	Total
<30% AMI	1,305	152	(122)	(3)	213	1,545
30-49% AMI	360	(27)	(93)	110	155	505
50-59% AMI	450	(3)	147	92	38	723
60-79% AMI	427	(655)	(105)	203	55	(75)
80-99% AMI	108	(323)	(517)	90	(155)	(797)
100-119% AMI	5	(1,395)	(347)	118	285	(1,333)
120% AMI+	5,772	6,233	(6,907)	(2,795)	(2,872)	(568)

Source: 2016-2018 American Community Survey (microdata) NOTES: Assumes one person per bedroom when determining the AMI for housing units; Assumes owners can afford a unit that is four times their annual household income

²⁵ Data reported by the Home Mortgage Disclosure Act in 2017 and 2018 show that the average buyer in the Washington region purchased a home valued at 3.9 times their annual income.

For owner households, the household-unit gap was less likely to correspond to income groups and more likely to relate to household sizes. The most commonly underrepresented unit size was studios and one bedrooms and there were 8,427 more one-person households than units. While this may reflect a true supply gap, it likely also reflects the fact that homes are lived in for multiple years and are often either intentionally purchased with extra bedrooms, especially for families that anticipate growing, or have extra bedrooms as the result of children leaving the home as they age into adulthood.

Larger households, however, did not have ownership supply available to them at price points they could afford, especially those earning less than 80% of AMI. There were 1,033 households earning less than 80% of AMI with four or more people and 700 units affordable to them with three or more bedrooms, including just 170 units with four or more bedrooms. Even assuming that two family members share a bedroom in each household, just one-third (32.3%) of these households were living in unit with values that they could afford. Similar to renters, larger owner households appear to be disproportionately limited by the stock that is available to them for those with earnings below the median income.

Future Housing Needs

The above sections focus on the housing needs and trends affecting existing residents in Arlington County; however, communities are dynamic, while the housing stock is less so. In order to determine both the short-term and long-term changes to the household base, this analysis includes a forecast of housing demand between 2015 and 2045 based on demographic and economic trends. These forecasts were then compared with the Round 9.1a Cooperative Forecasts produced by the Metropolitan Washington Council of Governments (MWCOCG) and adjusted to incorporate these forecasts, which include supply-based assumptions pertaining to the pipeline, the availability of land and zoning. The forecasts produced herein are referred to as a demand-based forecast, while those produced by MWCOCG are referred to as supply-based forecasts. This describes the main driver of the forecasts and both at least partially reflect both supply and demand, as there is a continuous feedback loop between the two.

Approach²⁶

This forecast follows uses the same methodology as the forecasts produced in 2014. The base year has been updated from 2010 to 2015, the underlying assumptions on housing preferences have been updated from those during the 2012-2014 period to the 2016-2018 period, and the jobs forecasts have been updated from those produced in 2014 to those produced in 2020.

The demand for housing in Arlington County is assumed to come from one of two sources: 1) households with a payroll job either in the County or elsewhere in the Washington region

²⁶ This section includes text adapted from the 2017 “Loudoun County Housing Study” produced by Lisa Sturtevant and Jeannette Chapman, which also uses the same forecast method.

(employment-driven demand) or 2) households that are in the County generally for non-employment reasons, primarily retirees (demographic-driven demand).

The employment-driven demand includes households where there is at least one worker who has a payroll job, or a position with a regular wage or salary, in Arlington County or somewhere else in the Washington region. Thus, demand for housing in the County results both from local job growth as well as job growth in the region, overall, especially in the District of Columbia and Fairfax County. Employment forecasts from IHS Markit are used to estimate the number of net new jobs coming to the region between 2015 and 2045. Because of the economic recession caused by the pandemic, the forecast of housing demand in 2020 reflects the base demand from job growth through 2019; the jobs losses during the recession did not result in commensurate losses in the demand for housing and are forecasted to be temporary.

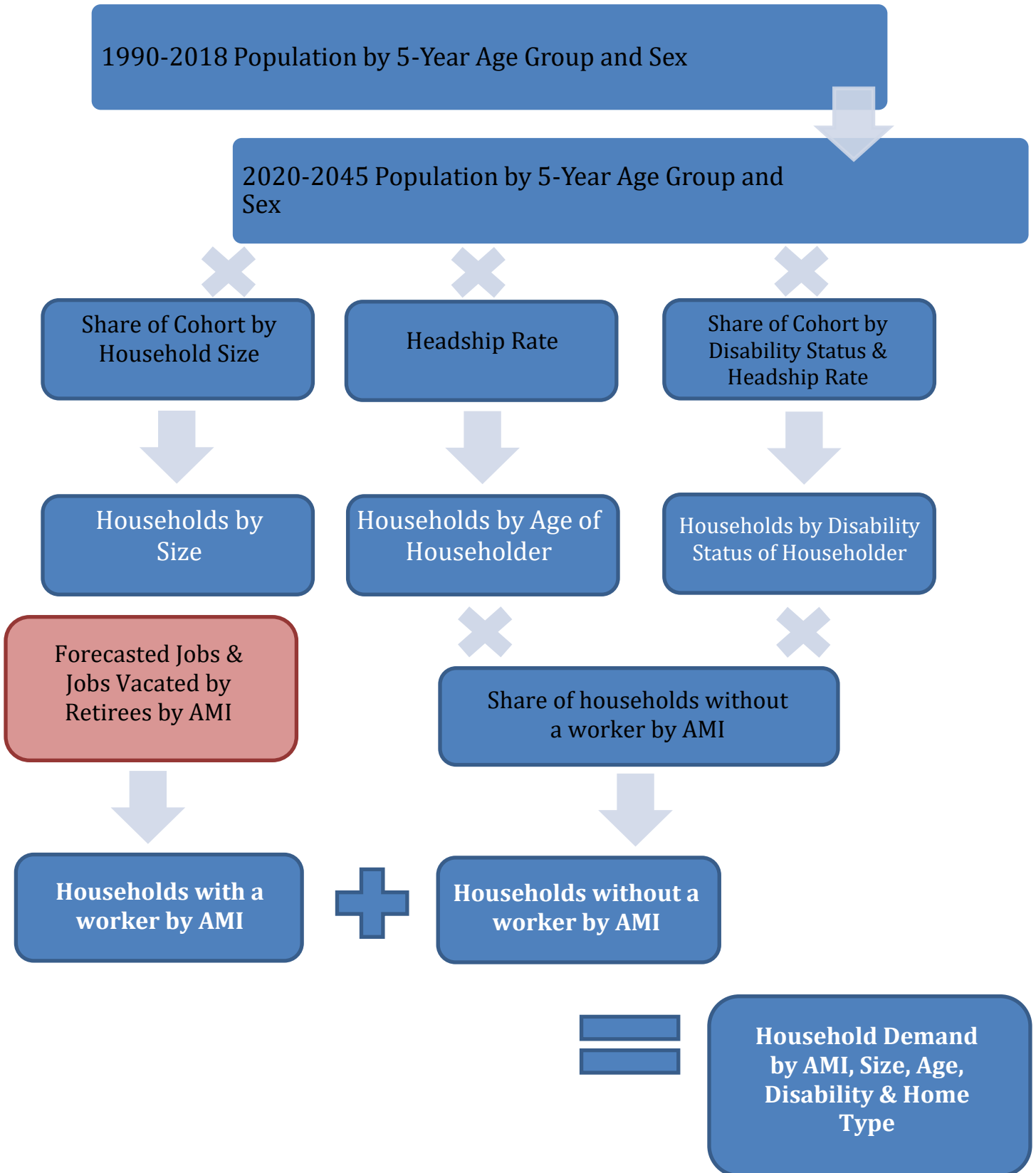
In addition to new payroll jobs expected over the forecast period, these employment-driven housing demand forecasts also takes into account the turn-over in jobs related to retirement. The increase in the number of net new jobs and projected retirement is combined to determine how many new workers will be in the Washington region over the forecast period. Household characteristics and housing unit preferences of future workers are estimated based on patterns of observed characteristics of current workers of the same age and industry analyzed using data from the U.S. Census Bureau. The share of working households that will demand housing in Arlington County are based on current regional commuting patterns and modified base on the supply-based forecast from Metropolitan Washington Council of Governments (MWCOC).²⁷

The demographic-driven demand for housing in Arlington County includes all other households without a payroll job. This includes a broad array of households, such as retirees, students, people with disabilities, and some types of self-employed residents. A separate forecasting process based on projected age and sex of the current population, using the County's historic migration and birth/death rates, and the national forecasts that incorporate international migration and national birth/death rates are used to determine how many households will be expected to live in the County by 2045. Similar to the employment-driven forecasts, the household characteristics and housing unit preferences of households without a payroll worker are based on patterns observed among existing households in the County.

It is important to emphasize that these forecasts of housing demand do not make any assumptions about major changes in housing preferences over time. Controlling for age, household composition and household income, housing preferences have been generally consistent over time with any shift occurring for a small minority of the population.

²⁷ If demand forecasted exceeds the supply-based forecast from MWCOC, this forecast assumes that net new worker households will live elsewhere, while non-worker households, which are primarily retirees that have lived in the County prior to retirement, will be able to remain in the County. This is partly aspirational and renter retirees, in particular, may not be able to do so if there are too few units and worker-households are willing and able to pay more. This forecast is designed to measure the housing needs and prevent displacement of residents after incorporating historic out-migration rates for these cohorts.

Figure 20. Methodology for Forecasting Housing Demand



Forecasts of Housing Demand

Between 2015 and 2040, the number of households living in Arlington County is projected to increase from 103,760 to 141,840, an increase of 38,080 households (+36.7). The average annual growth rate is 1.0 percent, with gains modestly stronger during the first decade of the forecast period. These forecast totals are constrained to account for the supply-based forecast produced by MWCOC and the characteristics of demand are derived from the demand- and employment-based forecasts.

Two major demographic shifts happen during this forecast period. Firstly, Baby Boomers age from being 51-69 years old in 2015 to being older than 81 years old in 2045. This cohort is a large share of the region's and County's population and, even assuming the same out-migration rates as in the past, this generation will drive faster growth in households headed by someone older than 85 years old and small households consisting of one or two people.

Table 7. Forecasts of Household Growth by Selected Characteristics, 2015-2045

Household Type	Households In 2015	Change	Percent Change
All Households	103,760	38,080	36.7%
Household Income			
<30% AMI	10,010	4,340	43.4%
30-60% AMI	11,480	5,790	50.4%
60-80% AMI	8,680	4,060	46.8%
80-100% AMI	8,630	3,840	44.5%
100-120% AMI	11,040	4,320	39.1%
120%+ AMI	53,910	15,730	29.2%
Household Size			
1-person	40,710	17,110	42.0%
2-person	35,050	14,540	41.5%
3-person	11,540	3,920	33.9%
4+-person	16,460	2,520	15.3%
Age of Household Head			
<65	89,080	33,340	37.4%
65-84	12,890	3,290	25.5%
85+	1,800	1,450	80.8%
Disability Status			
With no disabled member	96,150	35,310	36.7%
With a disabled member	7,610	2,770	36.5%
Tenure (Rent/Own)			
Rental units	58,110	29,050	50.0%
Ownership units	45,650	9,040	19.8%

Source: The Stephen S. Fuller Institute at the Schar School, GMU NOTE: May not sum due to rounding

Table 8. Housing Forecast by Main Attribute, 2015-2045

	Households				Change: Households			Change: Percent		
	2015	2025	2035	2045	2015-2025	2025-2035	2035-2045	2015-2025	2025-2035	2035-2045
Total Households	103,760	117,870	129,770	141,840	14,110	11,900	12,070	13.6%	10.1%	9.3%
Area Median Income										
<30% AMI	10,010	11,670	13,030	14,350	1,660	1,360	1,320	16.6%	11.6%	10.1%
30-59% AMI	11,480	13,300	15,230	17,270	1,820	1,920	2,040	15.9%	14.5%	13.4%
60-79% AMI	8,680	10,190	11,440	12,750	1,510	1,240	1,310	17.4%	12.2%	11.4%
80-99% AMI	8,630	10,120	11,310	12,480	1,490	1,190	1,170	17.2%	11.7%	10.3%
100-119% AMI	11,040	12,690	14,020	15,360	1,650	1,330	1,340	14.9%	10.5%	9.5%
120%+ AMI	53,910	59,890	64,750	69,640	5,970	4,860	4,890	11.1%	8.1%	7.6%
Household Size										
1-Person	40,710	47,490	52,770	57,820	6,770	5,280	5,050	16.6%	11.1%	9.6%
2 People	35,050	40,730	45,100	49,590	5,680	4,370	4,490	16.2%	10.7%	10.0%
3 People	11,540	12,690	14,000	15,450	1,150	1,310	1,450	10.0%	10.3%	10.4%
4+ People	16,460	16,960	17,890	18,980	500	930	1,080	3.1%	5.5%	6.1%
Age Group										
<65	89,080	100,270	111,030	122,420	11,190	10,760	11,390	12.6%	10.7%	10.3%
65-84	12,890	15,610	16,120	16,170	2,730	510	50	21.2%	3.3%	0.3%
85+	1,800	1,980	2,620	3,250	190	630	630	10.4%	31.8%	24.2%
Disability Status										
Multiple	3,130	3,690	4,100	4,350	560	410	260	17.9%	11.1%	6.2%
Physical	3,680	4,270	4,640	4,960	590	370	320	16.0%	8.6%	6.9%
Cognitive	380	450	500	560	70	50	60	18.3%	10.3%	12.3%
Ind. Living / Self-Care	410	470	490	510	60	20	10	14.3%	4.5%	2.3%
None	96,150	108,980	120,030	131,460	12,830	11,060	11,420	13.3%	10.1%	9.5%
Tenure										
Renter	58,110	68,260	77,570	87,160	10,150	9,320	9,580	17.5%	13.7%	12.4%
Owner	45,650	49,610	52,190	54,690	3,960	2,580	2,490	8.7%	5.2%	4.8%

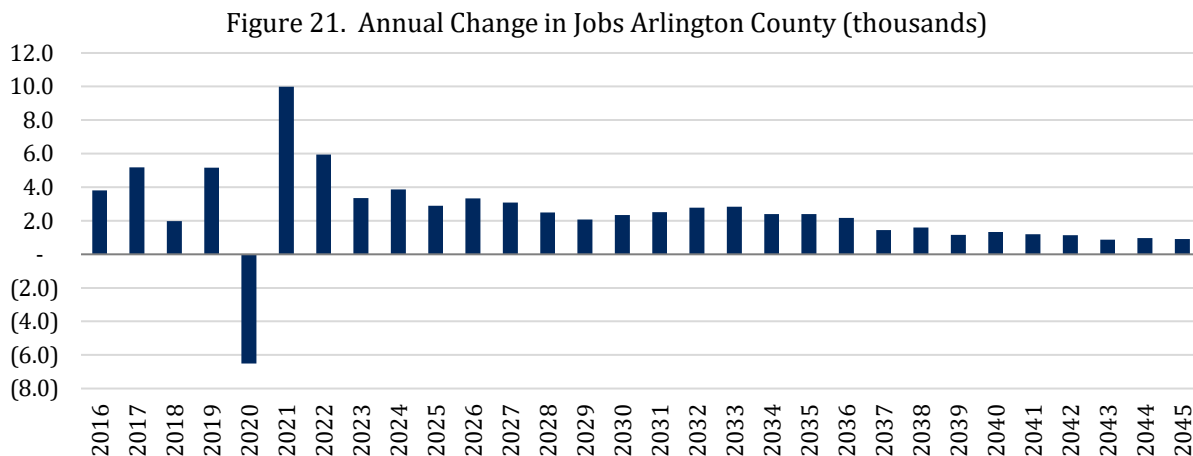
Source: MWCOC Forecast Round 9.1a; The Stephen S. Fuller Institute at the Schar School, GMU NOTE: May not sum due to rounding

Secondly, the Millennial generation will age from being 16 to 34 years old in 2015 to being 46 to 64 in 2045. While the Baby Boomer generation was transitioning into retirement and becoming empty nesters during the 2010-2018 period, the Millennials will do so towards the end of this forecast period, also contributing to the fast growth in smaller households.

As a result of the fast growth in retirees and the relatively high share of low-wage jobs and positions vacated by retirement forecasted for the Washington region, Arlington County is forecasted to have the fastest rates of growth for households earning below the median income. The number of households earning less than 30% of AMI is projected to increase by 4,340, including an increase of 3,720 renters. The number of households earning between 30% and 60% of AMI is projected to increase by 5,790, including 4,960 renters. The number of households earning between 60% and 80% of AMI is projected to increase by 4,060, including 3,360 renter households. As a result of the faster increase in lower income households, overall, the share of households earning above 120% of AMI is projected to decline from 52.0 percent in 2015 to 49.1 percent in 2045.

Detailed Components of Demand

The largest source of demand for housing in Arlington County is from regional job growth and the turn-over of existing jobs in the region. The turn-over of jobs is based primarily on demographic trends and retirement, while new job growth includes business cycle effects and other location-specific trends. The near-term forecast of jobs, both regionally and in the County, reflects the pandemic-induced recession in 2020. According to the forecasts from IHS Markit, the County is forecasted to lose an average of 6,500 jobs (-3.4%) in 2020 because of this recession, while the region is forecasted to lose 134,600 jobs (-4.0%). These jobs are projected to be fully recovered in 2021, with the County adding 10,000 jobs (+5.3%) and the region adding 149,600 jobs (+4.6%) during the year. The job losses from the pandemic are temporary and are excluded from the 2020 forecast for housing demand.

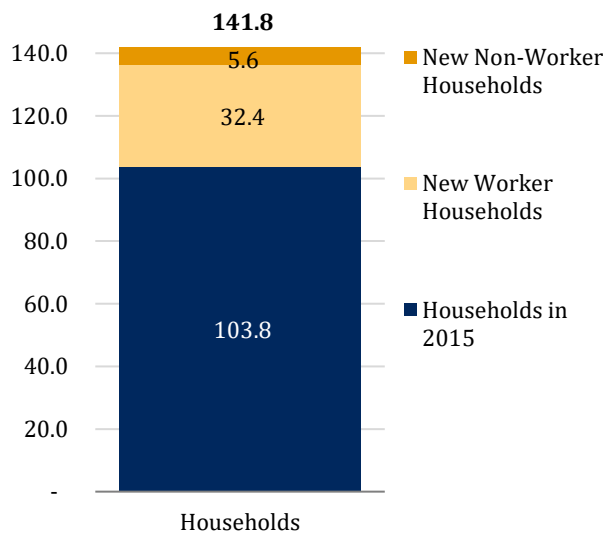


Source: IHS Markit as of June 2020

The arrival of Amazon's second headquarters in Arlington County is a second factor affecting job growth in upcoming years. Amazon is projected to bring up to 37,850 jobs to the County between 2019 and 2034. IHS Markit forecasts an increase of 48,600 jobs during this period

and includes a large share of Professional & Business Service jobs, accounting for the impact of Amazon on job growth in the County. Similarly, the rate of job growth in the County is projected to be larger than that for the region until 2036, also reflecting the Amazon impact. Even with the arrival of Amazon, the regional rates of jobs growth are projected to slow over the forecast period, partially reflecting the lack of growth in Federal jobs and the slowdown of gains in the Leisure & Hospitality and Education sectors.

Figure 22. Households by Source of Demand, 2045



Source: MWCOG 9.1a; The Stephen S. Fuller Institute

Even with this slowdown in regional job growth, the continued retirement of the Baby Boomers in upcoming years and the retirement of Millennials in the outyears of this forecast result in a significant number of positions vacated by retirees that will need to be filled; it is assumed that an older, existing worker will fill the job left by the retiree and that a new worker will be needed at a lower level position as workers cycle up.

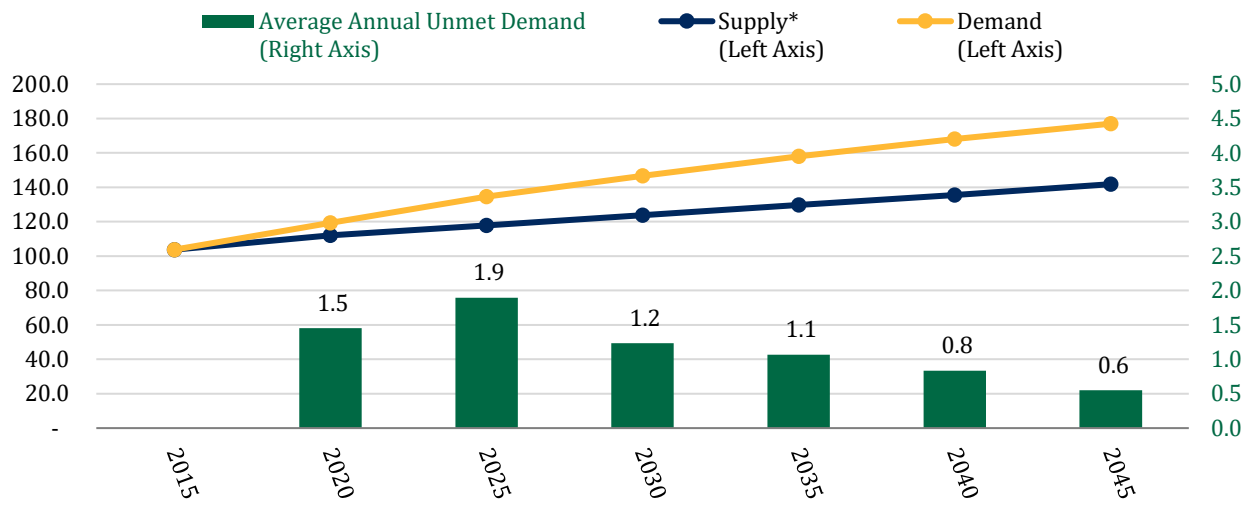
As a result of both the net new job growth and positions vacated by retirees, Arlington County is projected to have 32,400 more worker-households in 2045 than in 2015, with these households continuing to constitute the largest source of demand for housing in the County.

Unconstrained Demand

As part of this analysis, forecasts that were unconstrained by any projected increases to supply were produced. These forecasts suggest that the demand for housing in Arlington County will exceed the increase in supply as projected by the MWCOG forecasts. Between 2015 and 2035, the County is projected to have demand that exceeds the supply by 1,400 units on average each year. While the annual increase in this gap is smaller in the outyears of the forecast, the total measure of unmet demand is cumulative in this assessment as a way to illustrate the added pressure on housing costs; it is likely that some of the households that locate outside of the County in spite of their preference to live in Arlington change their preferences over time to reflect their attachment to the community that they move to.

This level of unmet demand on an annual basis is likely similar to the gap in past years, although this particular gap is hypothetical and the final measure of housing demand is constrained by the number of housing units in the County.

Figure 23. Housing Demand and Supply*, Arlington County (thousands)



Source: MWCOC Forecast Round 9.1a; The Stephen S. Fuller Institute at the Schar School, GMU

*The MWCOC forecast is used as a proxy for supply; supply responds to changes in demand but is constrained the pipeline in the short term and the availability of land (including zoning) in the long term

Conclusion

The 2014 Housing Needs Analysis Report detailed four overarching housing values:

- *Diversity*: Housing affordability directly contributes the community's diversity by enabling a wide range of households to live in Arlington, especially households with limited means and special needs.
- *Inclusivity*: Housing inclusivity supports a caring, welcoming community in which discrimination does not occur, housing opportunities are fair, and no one is homeless.
- *Choice*: A range of housing choices should be available throughout our community and affordable to persons of all income levels and needs. Balanced housing choices benefit individuals and the community as a whole.
- *Sustainability*: Housing affordability is vital to the community's sustainability. It impacts the local economy and the natural and built environments. Affordable housing supports diverse jobs and incomes needed to sustain the local economy.²⁸

Between 2012 and 2018, the County has had mixed success in furthering these values. By select metrics, the County has become more diverse and inclusive:

²⁸ These bullets are from "Housing a Diverse and Inclusive Community in Arlington County: An Analysis of Current and Future Housing Needs" (September 2014), page 42.

- The County has become more racially and ethnically diverse and the share of non-white and not Hispanic residents increased from 36.5% in 2012 to 38.4% in 2018; and
- The County has more diversity of ages and share of children increased from 16.2% to 17.6%, while the share of adults aged 65 and older increased from 8.9% in 2012 to 10.6% in 2018.

However, housing choice remains limited, which continues to affect the types of households that can live in the County and has reduced the diversity of the community by other metrics:

- The rising cost of housing has likely contributed to a loss of income diversity among households in the County and the share of households earning more than 120% of the area median income increased from 50.5% in 2012 to 54.5% in 2018; and
- The smaller rate of growth in ownership units may have been a factor in the decrease in 25-34 year olds living in the County, as the older Millennials may not be able to find their preferred housing stock as they age into their next phase of life.

Overall, the inability of the County to house prime working age adults (aged 24-64) and households earning less than 120% of the area median income at the same rates as in prior years poses a threat to its long-term community and economic sustainability.

Based on forecasts of housing demand through 2045, demand is projected to be strongest from households earning below the median income and demand from younger adults is projected to return after 2025. The County has an opportunity to reverse the trend of decreasing economic diversity as well as bolster its share of working-age adults, provided that the County retains its retirees and low-wage worker-households. However, the ability of these households to live the County will depend on the housing supply, the County's policies, and other market forces.

Appendix

Table A1. Forecast of Renter Households by Select Characteristic

	Renter Households (Count)							Percent Change					
	2015	2020	2025	2030	2035	2040	2045	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
Total	58,109	64,087	68,256	72,899	77,573	82,196	87,156	10.3%	6.5%	6.8%	6.4%	6.0%	6.0%
Area Median Income													
<30% AMI	7,803	8,567	9,129	9,717	10,344	10,911	11,526	9.8%	6.6%	6.4%	6.4%	5.5%	5.6%
30-59% AMI	8,685	9,537	10,154	10,952	11,819	12,671	13,648	9.8%	6.5%	7.9%	7.9%	7.2%	7.7%
60-79% AMI	5,993	6,755	7,153	7,657	8,207	8,749	9,355	12.7%	5.9%	7.1%	7.2%	6.6%	6.9%
80-99% AMI	5,872	6,508	6,909	7,400	7,881	8,367	8,896	10.8%	6.2%	7.1%	6.5%	6.2%	6.3%
100-119% AMI	7,330	8,045	8,585	9,124	9,655	10,185	10,741	9.8%	6.7%	6.3%	5.8%	5.5%	5.5%
120%+ AMI	22,425	24,674	26,327	28,048	29,667	31,313	32,991	10.0%	6.7%	6.5%	5.8%	5.5%	5.4%
Household Size													
1-Person	26,199	28,859	30,688	32,647	34,554	36,397	38,320	10.2%	6.3%	6.4%	5.8%	5.3%	5.3%
2 People	19,995	22,444	24,095	25,903	27,681	29,483	31,443	12.2%	7.4%	7.5%	6.9%	6.5%	6.6%
3 People	5,776	6,308	6,708	7,227	7,789	8,344	8,967	9.2%	6.3%	7.7%	7.8%	7.1%	7.5%
4+ People	6,138	6,475	6,765	7,122	7,550	7,972	8,427	5.5%	4.5%	5.3%	6.0%	5.6%	5.7%
Age Group													
<65	54,361	59,859	63,720	68,106	72,566	76,986	81,667	10.1%	6.5%	6.9%	6.5%	6.1%	6.1%
65-84	3,017	3,428	3,727	3,882	3,949	4,022	4,182	13.6%	8.7%	4.1%	1.7%	1.8%	4.0%
85+	731	800	808	911	1,058	1,188	1,307	9.4%	1.1%	12.7%	16.1%	12.2%	10.0%
Disability Status													
Multiple	1,827	2,014	2,137	2,261	2,373	2,461	2,543	10.2%	6.1%	5.8%	4.9%	3.7%	3.3%
Physical	1,684	1,834	1,929	2,025	2,119	2,213	2,316	8.9%	5.2%	5.0%	4.7%	4.4%	4.7%
Cognitive	269	305	328	344	366	391	419	13.2%	7.7%	4.8%	6.4%	7.0%	7.1%
Ind. Living / Self-Care	253	282	295	302	308	316	326	11.6%	4.8%	2.2%	2.0%	2.7%	3.0%
None	54,077	59,652	63,566	67,968	72,408	76,815	81,552	10.3%	6.6%	6.9%	6.5%	6.1%	6.2%

Source: MWCOC Forecast Round 9.1a; The Stephen S. Fuller Institute at the Schar School, GMU NOTE: May not sum due to rounding

Table A2. Forecast of Owner Households by Select Characteristic

	Owner Households (Count)							Percent Change					
	2015	2020	2025	2030	2035	2040	2045	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
Total	45,652	47,959	49,610	50,958	52,195	53,403	54,687	5.1%	3.4%	2.7%	2.4%	2.3%	2.4%
Area Median Income													
<30% AMI	2,204	2,425	2,543	2,620	2,683	2,745	2,823	10.1%	4.9%	3.0%	2.4%	2.3%	2.9%
30-59% AMI	2,796	3,009	3,150	3,281	3,408	3,512	3,622	7.6%	4.7%	4.2%	3.9%	3.1%	3.1%
60-79% AMI	2,690	2,892	3,042	3,148	3,231	3,310	3,393	7.5%	5.2%	3.5%	2.7%	2.4%	2.5%
80-99% AMI	2,763	3,048	3,212	3,330	3,427	3,500	3,581	10.3%	5.4%	3.7%	2.9%	2.1%	2.3%
100-119% AMI	3,710	3,944	4,104	4,242	4,363	4,482	4,616	6.3%	4.1%	3.4%	2.8%	2.7%	3.0%
120%+ AMI	31,489	32,641	33,560	34,337	35,082	35,854	36,653	3.7%	2.8%	2.3%	2.2%	2.2%	2.2%
Household Size													
1-Person	14,515	15,872	16,798	17,562	18,216	18,839	19,502	9.3%	5.8%	4.5%	3.7%	3.4%	3.5%
2 People	15,052	16,014	16,632	17,063	17,421	17,763	18,147	6.4%	3.9%	2.6%	2.1%	2.0%	2.2%
3 People	5,763	5,871	5,982	6,085	6,214	6,352	6,487	1.9%	1.9%	1.7%	2.1%	2.2%	2.1%
4+ People	10,322	10,203	10,198	10,247	10,344	10,449	10,551	-1.2%	0.0%	0.5%	0.9%	1.0%	1.0%
Age Group													
<65	34,718	35,757	36,550	37,446	38,467	39,593	40,754	3.0%	2.2%	2.5%	2.7%	2.9%	2.9%
65-84	9,869	11,039	11,885	12,180	12,170	12,053	11,991	11.9%	7.7%	2.5%	-0.1%	-1.0%	-0.5%
85+	1,066	1,164	1,175	1,332	1,557	1,757	1,942	9.2%	1.0%	13.3%	16.9%	12.9%	10.5%
Disability Status													
Multiple	1,303	1,449	1,553	1,641	1,726	1,776	1,811	11.2%	7.2%	5.7%	5.2%	2.9%	2.0%
Physical	2,000	2,206	2,344	2,440	2,524	2,585	2,649	10.3%	6.3%	4.1%	3.4%	2.4%	2.5%
Cognitive	113	120	124	128	133	136	141	6.0%	3.5%	3.7%	3.3%	2.9%	3.1%
Ind. Living / Self-Care	162	169	178	184	187	185	180	4.8%	5.1%	3.1%	1.7%	-0.9%	-2.6%
None	42,075	44,015	45,411	46,564	47,626	48,721	49,907	4.6%	3.2%	2.5%	2.3%	2.3%	2.4%

Source: MWCOC Forecast Round 9.1a; The Stephen S. Fuller Institute at the Schar School, GMU NOTE: May not sum due to rounding

Housing Forecast Methodology

The forecasts of Area Median Income (AMI) by housing type for Arlington County are derived from three detailed components: housing demand from non-worker households, housing demand from workers filling net new jobs, and housing demand from workers replacing jobs vacated by retirees. This process relies on regional employment forecasts, jurisdictional-level population estimates and analysis of American Community Survey data.

Geography: The forecasts reported in this report focus exclusively on Arlington County. However, in order to derive the likely source of demand from net new worker households, the job growth within the greater Washington region was examined.

Timeframe: The forecasts are for the 2015-2045 period.

Area Median Income Groups: Forecast for eight AMI groups are included. AMI is commonly used as a basis for grouping households among affordable housing policymakers, planners and advocates. The AMI limits are published annually by HUD for all U.S. metropolitan areas and correspond to the median family income.

Housing Types: Six housing types were forecasted including single-family detached owner, single-family detached renter, single-family attached owner, single-family attached renter, multi-family owner, and multi-family renter.

Age: Three age groups are forecasted" <65, 65-84 and 85+.

Household Type: Eleven household types were forecasted as shown in Table A2. These household types correspond to one-, two-, three- and four+-person households.

Disability Status: Five main disability status types were forecasted: none, multiple, physical (alone), cognitive (alone), or independent living and or self-care difficulties.

Each of these variables are forecasted for all households.

This methodology is divided into three sections:

- I. Housing needs for households without a payroll job
- II. Housing needs for net new workers and replacement workers for retirees
- III. Regional housing characteristics and scenarios

I. Housing needs for households without a payroll job

Households without a payroll job include retirees, students and many self-employed workers, the majority of whom are living in Arlington County for a reason not tied to the traditional employment market. Demographic changes are assumed to drive their future growth. The forecasted age group and sex of the householder is used to determine the likelihood that a household would not have a payroll job. A forecast of the population by age group and sex was first forecasted and then used to estimate the number of households by the householder's age and sex.

I.a. Population Forecasts by Age:

To forecast the population by age group and sex, cohort change ratios are used.²⁹ The population in 1990, 2000 and 2010 was grouped by 5-year age group by sex. Between 1990 and 2000, a cohort change ratio was calculated by dividing the 2000 population in each age and sex group by the 1990 population in each age and sex group, but for the age group 10 years younger. The cohort change ratio captures both the “aging up” and net migration by age group and sex. The same was done for the 2000 and 2010 populations and the 2005 and 2015 populations. An average of the 1990-2000, 2000-2010 and 2005-2015 cohort change ratios was applied to the 2015 population to determine the forecasted age and sex of residents over 10 years old in 2025, 2035 and 2040. The recent period was more heavily weighted through the use of the 2005-2015 period. This was done to better capture recent trends that may be missed by equally weighting the 1990-2000 trends. To determine the future number of children under ten years old, a ratio of number of children under ten to the number of women between 20 and 44 years old was calculated for 1990, 2000, 2005, 2010 and 2015. The average of this ratio was applied to the forecasted number of women between 20 and 44 years old to estimate the number of children. Overall population forecasts from the Round 9.1a Cooperative Forecast from Metropolitan Washington Council of Governments (MWCOCG) were used to control each forecast.

Using cohort change ratios alone for small area forecasts may lead to large percentage changes based on small absolute changes. For that reason, the changes are stabilized by taking into account national growth forecasts. To do so, the share of the population in each age group by sex for both the individual jurisdictions and the nation in 1990, 2000, 2005, 2010, 2015, 2008 and 2018 is calculated. Then, the ratio of each age group by sex in each jurisdiction relative to the nation's share (for example, the percentage of the Loudoun's population that is 25-29 year old and male in 2015 divided by the percentage of the U.S. population that is 25-29 year old and male in the U.S. in 2015) is calculated. This relative ratio was averaged across the four periods. The average was then applied to the forecasted national share to determine share of each jurisdiction's population by age group and sex. These shares were then applied to the overall population forecasts from MWCOCG. An average of the two population estimates was used to take into account both historic migration and growth patterns and national trends.

I.b. Households Forecasts by Householder Age and Sex:

²⁹ a.k.a the Hamilton-Perry Method

Data from the 2016-2018 American Community Survey (an average of the one year microdata samples) are used to estimate the percentage of each age group by sex who is a householder (i.e. the head of household) (a headship rate). This headship rate was applied to the forecasted population by age and sex group to determine the number of households headed by each age group. The total households were controlled to match the forecasted number of households from MWCOG.

I.c. Non-worker Household Forecasts:

Again using the 2016-2018 American Community Surveys, the current percentage of non-worker households by the householder's age group and sex was calculated. This percentage was applied to the forecasted households by the householder's age group and sex.

I.d. Non-worker Household Forecasts AMI and Unit Type:

The age and sex of the future non-working householder is assumed to drive the household's AMI, housing unit and other characteristics. From the 2016-2018 American Community Surveys, the share of current non-working households in each AMI group and unit type was calculated for each age group by sex. These shares were then applied to the forecasted households by householder age group and sex to distribute all non-working households by AMI, unit type and other characteristics.

II. Housing needs for new worker households

II.a. Determine job growth by industry:

In this analysis, future job growth has two components: net new job growth and jobs vacated by retirees. Retirement is included in this analysis because it is assumed that a new worker will be needed somewhere within the industry, typically at a lower level, as current workers "cycle up" to fill the position vacated by the retirement.

Net new job growth: IHS Economics provides job forecasts for 12 main industry sectors: construction, natural resources, and mining; manufacturing; transportation, trade and utilities; information; financial activities; professional and business services; education and health services; leisure and hospitality; other services; federal government; state and local government; and military. Forecasts were adjusted if they differed significantly from those produced by MWCOG.

Jobs vacated by retirees: The 2016-2018 American Community Survey microdata was used to calculate the labor force participation rate for each 5-year age group for the population over 55 years old in the Washington Metropolitan Area. Retirees younger than 55 years old are excluded because they may be more likely to re-enter the workforce. Next, the 2016-2018 American Community Survey microdata was used to determine the number of workers who were likely to retire in the next decade and the industry of these workers.

These needs were then combined to determine the total need by industry.

II.b. Assign new jobs to workers by age category:

The first step in moving from new jobs to housing demand is to estimate the age distribution of the new workers. In other words, for each jurisdiction, a share of new workers in each sector is assigned to one of five age groups: under 35, 35-44, 45-54, 55-64 or 65+. No new workers are assumed to be aged 65 or older. For replacement workers, it is assumed that for more senior positions, the majority of the workers directly filling the job are already in the region and in the same industry. So, as workers in senior positions retire, their jobs will be filled by another worker in the region, leaving a more junior position vacant, which will be filled by a younger worker.

The demand for different types of housing is associated with individuals' ages and new workers will be somewhat younger than the existing workforce. The age distribution is also important for estimating the AMI, as the age of the worker is instrumental in determining his or her wage and household type.

Data from the 2016-2018 American Community Survey microdata are used to estimate the age distribution of current workers for each industry sector. Then, ages are adjusted to account for the fact that new workers would be younger by analyzing 2016-2018 ACS data on the age distribution of workers who had recently moved to the region.

These ratios are applied to the age distribution of existing workers who had earned a wage in each jurisdiction to create an age distribution for new workers. The recent mover ratio

was applied to those under 34 first. In some cases, 100% of new workers were allocated to this age group. The workers in groups that had workers leftover were distributed among the remaining age groups proportionally, based on the mover rates. No new workers were aged 65 and older. If a sector only had current workers in one of the age groups, all new workers were allocated to that group. When there were job losses in a sector, same age distributions as the job gains was used, which may not be appropriate.

Thus, for each sector in each jurisdiction, the percent of new jobs held by workers in each age group was estimated.

II.c. Assign new workers to a household type:

Age is a determinant of both AMI group and household type both because younger workers are more likely to have lower wage-based incomes than older workers, and they are also more likely to live alone or be in young families. For example, new workers under age 34 are more likely to live in one-person households or two adult-no children households and workers age 35 to 44 are more likely to live in households with children.

For this step of the analysis, the 2016-2018 American Community Surveys was used to assign both an AMI group and one of 11 household types to current workers. Because this forecast is for workers only, only households with a worker are included in this step. The 11 household types are listed in Table A2.

Table A3. Household Types

Household Size	Household Composition
1-person households	1 adult
2-person households	1 adult, 1 child
	2 adults
3-person households	1 adult, 2 child
	2 adults, 1 child
	3 adults
4+ person households	1 adult, 3+ children
	2 adults, 2+ children
	3 adults, 1+ children
	4+ adults / 1+ children
	4+ adults

These workers were then grouped by age and industry. Thus, for each jurisdiction, the percent of workers under 35 years old lived in 1 adult households, by industry was estimated, the percent that lived in 2 adult households was estimated and so on.

II.d. Assign new workers to an AMI group and determine the number of households

Next, the household type and industry of each worker was used to determine the distribution of each household by AMI using ten percent intervals between 0 and 200 percent of AMI and an additional AMI group for all households earning more than 200 percent AMI. The AMI is dependent upon both the household size and the industry of each worker, so both are used to estimate the number of workers by AMI group and household type.

i) Using the 2016-2018 American Community Survey, the distribution of the AMI groups of current workers by both industry and household was calculated. If a quarter of construction workers in 1 adult households earn between 30 and 39 percent of AMI, then 30% will do so in the future.³⁰

ii) Next, the number of households formed by these workers was estimated. The average number of workers in each of the 11 household types by AMI group is used to convert workers into households. The average number of workers in each household type, AMI group and available jurisdiction was calculated using the 2016-2018 American Community Surveys.

II.e. Assign each new household a unit type

The final count of the number of households formed by each household type and AMI group based on the number of new jobs coming to the region was based on the above steps. Household type and household AMI are both associated with the type of housing demand. Therefore, these counts were used to estimate the need for six different types of housing units by the AMI group.

The 2016-2018 ACS microdata files were used to run crosstabulations of housing type (i.e. four types) by household composition (i.e. 11 household types) for each of the eight AMI groups. The results of this analysis show the current distribution of housing types for different household types and household incomes.

III. Determining the Demand for Homes in Arlington County

Commuting patterns base on the workplace location and all the household variables were used to estimate which households were most likely to demand housing in Arlington County. The total number of housing units in the County was capped at the MWCOG 9.1a forecasts. Only 1,000 net new households living in single-family detached units were assumed to be able live in the County during the 30-year period; an average of 50 new units are assumed to be added annually through 2025, and 25 new units are assumed to be added per year between 2025 and 2045. When determining which households would be able to live in the County, priority was given to non-worker households and then net new worker-households were “kicked-out” proportionally after adjusting for the cap on single-family detached housing.

A Note on the Regional Geography

For all microdata analysis and the forecast, the below jurisdictions were included as the Washington region.

- District of Columbia
- Calvert County, MD
- Charles County, MD
- Frederick County, MD

³⁰ However, the future median income is adjusted so that approximately half the households in the region earn below it and half earn above it. Any shifts in the future distribution are used to update the area median income groups.

- Montgomery County, MD
- Prince George's County, MD
- St. Mary's, MD
- Arlington County, VA
- Caroline County, VA
- Culpeper County, VA
- Fauquier County, VA
- King George County, VA
- Loudoun County
- Madison County, VA
- Orange County, VA
- Rappahannock County, VA
- Stafford County, VA
- Alexandria city, VA
- Fairfax County, VA
- Fairfax city, VA
- Falls Church city, VA
- Prince William County, VA
- Manassas city, VA
- Manassas Park city, VA
- Spotsylvania County, VA
- Fredericksburg County, VA