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2019

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STATE OF THE CAPITAL REGION IN 2019: HOUSING GROWTH AND AFFORDABILITY

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This report is a collaborative effort from researchers at the Brookings Institution, Fannie Mae, Georgetown University and the George Washington University. We are particularly grateful to the Trachtenberg School of Public Policy and Public Administration and the George Washington Institute for Public Policy for their support in reinvigorating the Center for Washington Area Studies over the past two years. We also thank the Metropolitan Washington Council of Governments Planning Directors and Housing Directors groups, as well as the American Enterprise Institute Housing Collaborative group for giving us early feedback on this report. The views reflected here are our own and do not reflect those of Fannie Mae or the Federal Housing Finance Administration. Any errors in this report are the sole responsibility of the report's authors.

STATE OF THE CAPITAL REGION IN 2019: HOUSING GROWTH AND AFFORDABILITY

Across the Capital Region, there is growing concern about housing affordability. Between 2010 and 2017, the region added almost twice as many people as housing units. This dwindling housing supply relative to population is a substantial concern for the economic vitality of the region.

With the first annual State of the Capital Region report from the George Washington University's Center for Washington Area Studies, we seek to understand the shifting housing landscape in communities throughout the area and, in doing so, improve the lives of people living in the Capital Region. Our inaugural report focuses on housing; in future years we expect to look at other issues, including transportation, zoning and gentrification.

This year's topic stems from our concern for the region's economic vitality. Increasing the number of homes available for sale or to rent is the most straightforward way to limit home price appreciation and increase housing affordability. Thus, we examine the amount and location of new housing in the Capital Region.

This report has two sections. Part I describes changes in supply of housing in the region and shifts in housing affordability. In Chapter 1, we report that roughly half of new housing growth is concentrated in a handful of exurban jurisdictions. These regions are absorbing much of the population growth in the region. In Chapter 2, we explain that most new housing built in the Capital Region consists of single-family homes. This type of housing is more expensive to build per unit than multifamily housing, and therefore contributes to rising home values in the region. In Chapter 3, we show that housing throughout the Capital Region has become more expensive relative to household income since 1980. We point to wide variation across the region in measures of housing affordability.

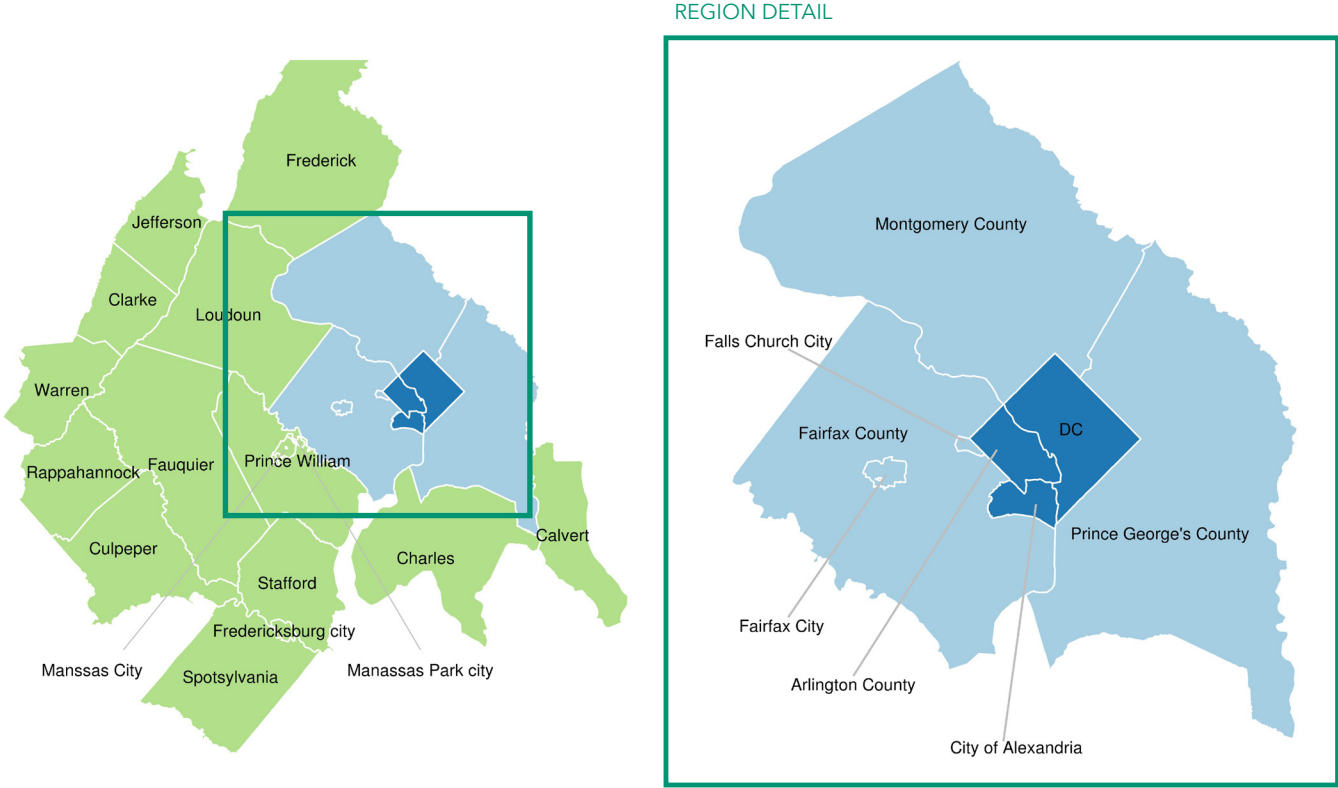
In Part II, we offer a descriptive snapshot of the housing and demographic composition for each jurisdiction in the Capital Region. In coming years, as we expand the scope of the annual report, we expect these analyses to track changes in the supply of housing and composition of the population over time. For now, they offer a point-in-time snapshot of each jurisdiction in the Capital Region.

Rather than focusing exclusively on the District of Columbia, the report analyzes the entire metropolitan area—a region that extends far beyond the District to encompass counties in Virginia, Maryland, and West Virginia. Since the region operates as an integrated labor and housing market, we take stock of housing growth and affordability across all the counties and cities of the Capital Region.

To clarify patterns of growth throughout the region, we distinguish between urban, suburban and exurban locations. In Figure I.1, we present the jurisdictions included in this report. Urban jurisdictions are identified in dark blue, suburban jurisdictions are identified in light blue, and exurban jurisdictions are identified in green.

With this inaugural State of the Capital Region report, we contribute to the ongoing dialogue about housing and the economic vitality of the region. Specifically, how and where will the Capital Region’s growing population live, and how can policy yield housing that is affordable to people of all incomes? This inaugural report offers an opportunity for leaders to take stock of their contribution to housing growth, and to consider new opportunities for building a vibrant economic region.

Figure I.1: Urban, Suburban and Exurban Jurisdictions in the Capital Region



Source: Census Bureau, 2010 jurisdictional boundaries.

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PART I: HOUSING GROWTH AND AFFORDABILITY IN THE CAPITAL REGION

CHAPTER 1: MOST HOUSING GROWTH SINCE 2000 IS EXURBAN

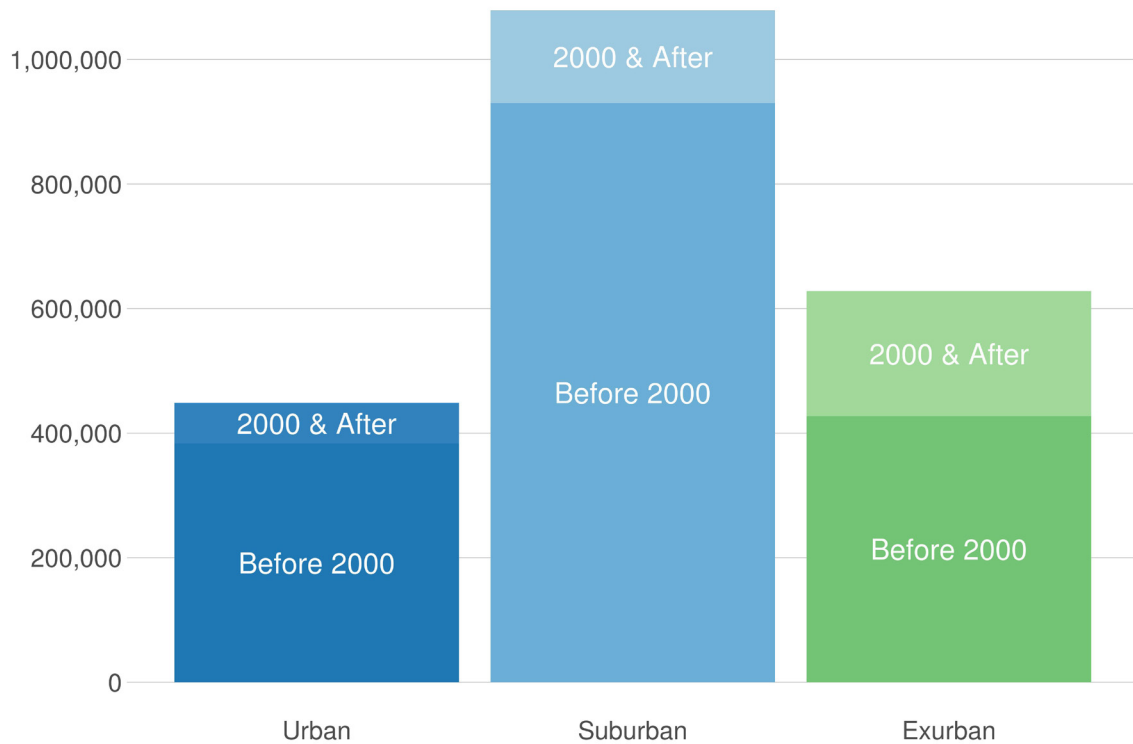
Over the past 20 years, the Capital Region has grown faster than the U.S. as a whole. Between 2000 and 2017 the number of Capital Region housing units grew by 24 percent, equivalent to roughly 415,000 new housing units¹. However, this housing growth has been exceeded by the 26 percent growth in population over the same period.

In addition, housing in the Capital Region has not grown uniformly across jurisdictions. Figure 1.1 shows the number of housing units built before and after 2000 in urban, suburban and exurban locations. Over the last 17 years, exurban locations had about as much housing growth as urban and suburban areas combined.

When expressed in percentage terms, however, the growth in exurban locations is much larger. Exurban locations experienced 45 percent growth in the number of housing units. This is particularly notable in comparison with suburban and urban areas, where housing units grew by about 15 percent.

Figure 1.1: Exurban Areas Built the Most New Housing Since 2000

Number of Housing Units Built Before and After 2000 by Jurisdiction Type



Source: American Community Survey 2013-2017. Data aggregated from county level. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area. Urban core defined as District of Columbia, Arlington County VA, and City of Alexandria, VA. Suburban includes Montgomery and Prince George's Counties, MD, Fairfax County, VA, Falls Church city, VA, and Fairfax city, VA. All other counties and cities are exurban.

¹ Here and throughout the report, housing units refers to occupied housing units.

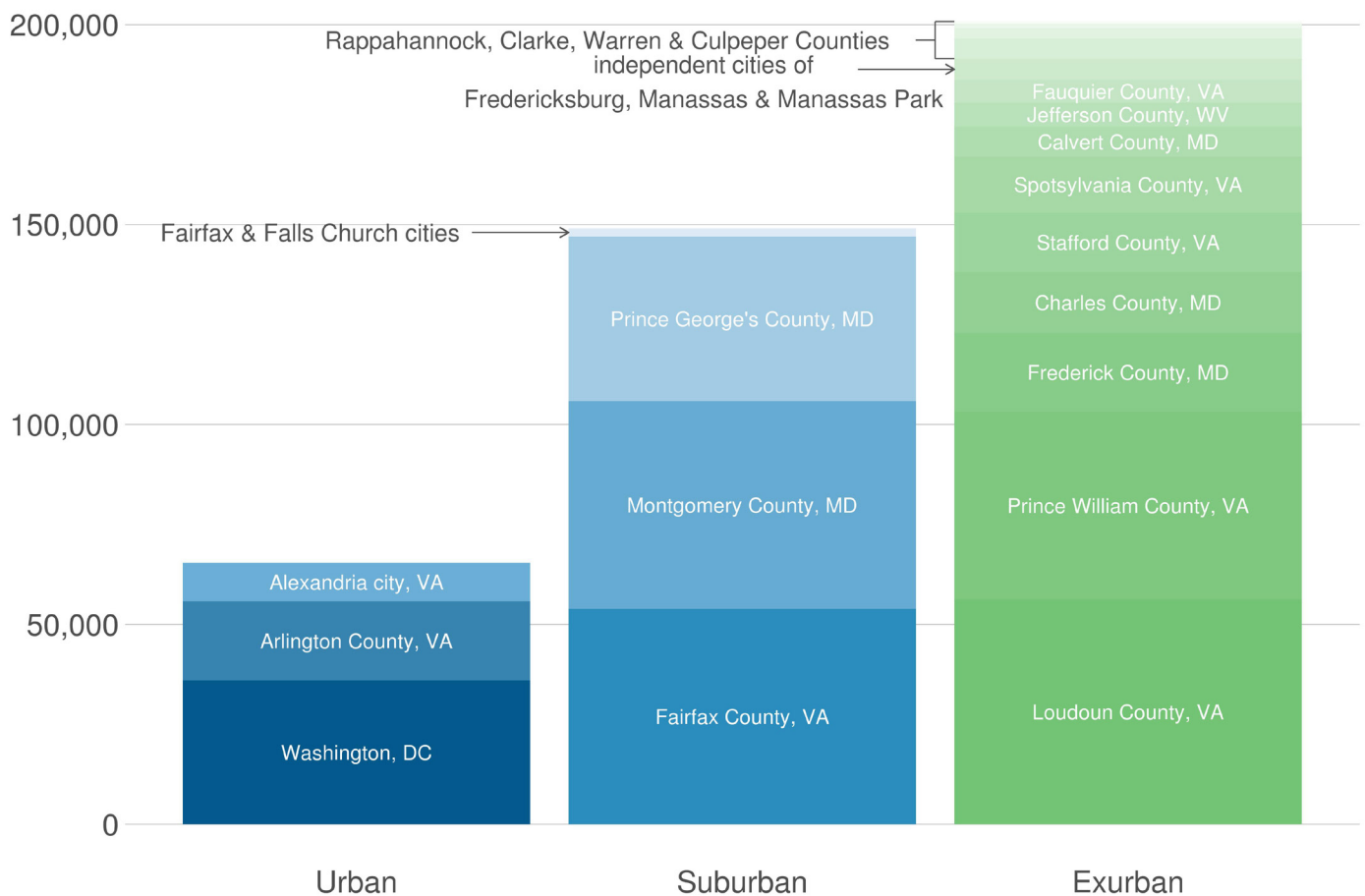
Most of this growth is concentrated in a few jurisdictions. In fact, Figure 1.2 shows that six jurisdictions—the District, Fairfax County, Loudoun County, Montgomery County, Prince George’s County, and Prince William County—accounted for two-thirds of all housing units built after 2000.

Notably, Loudoun added more housing units than any other jurisdiction in the region. With a 2000 population of less than 200,000—less than five percent of the region’s population in 2000—Loudoun accounted for about 15 percent of all housing growth in the Capital Region. It added about as many housing units as the District and Arlington County combined.

The District has been the main driver of new housing in the urban core. More new housing was built in the District than in Arlington and Alexandria combined. The District constructed an additional 36,000 units, equivalent to about 15 percent of the number of housing units as of 2000.

Figure 1.2: Most Housing Growth is Concentrated in a Few Jurisdictions

Housing Units Built After 2000 by Jurisdiction Type and Name



Source: American Community Survey 2013-2017. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area.

Most of the jurisdictions that experienced large increases in the number of housing units since 2000 also had lower median home values as of 2000. Figure 1.3 shows the median value of owner-occupied homes in 2000 (in 2017\$) on the horizontal axis, and the percentage change in the number of housing units in the jurisdiction on the vertical axis.²

The clear outlier in this picture is Loudoun County, which almost doubled its housing stock from 2000 to 2017. This is a much higher growth rate than any other jurisdiction. And while housing prices have risen in Loudoun, they were already above the median in 2000. Box 1 provides a spotlight on Loudoun's exceptionalism.

Box One: Spotlight on Loudoun

Loudoun County, Virginia has been one of the fastest growing areas in the Capital Region over the last 20 years. In 2000, Loudoun had about 170,000 people and a population density less than ten percent that of Fairfax County; however, by 2017, the population in Loudoun County had more than doubled. This growth is not just a pre-Great Recession phenomenon. Between 2012 and 2017, the number of housing units climbed almost 15 percent.

While homeowners often exert pressure on local governments to reduce the number of new housing units, there appears to be widespread support for new construction in Loudoun County. In fact, a recent WTOP report described how the Belmont Country Club Homeowners Association wrote a letter in support of the 100 affordable housing units the county was proposing to build neighboring the club (Augenstein 2018).

Why has Loudoun County bucked national anti-growth trends? What factors have led to this growth in housing construction in the county? While there is no single answer, we offer at least three possible explanations.

1. As of 2000, Loudoun was the closest jurisdiction to the District that still had large tracts of undeveloped land. However, we know that this is not always enough to spur development. Other jurisdictions, such as Fauquier County, avoid additional development through large minimum lot sizes that restrict density and therefore the number of new homes.
2. The expansion of Metro's Silver line, scheduled to open during the next year and a half, runs through Fairfax and Loudoun counties. Loudoun County has more undeveloped land near the metro corridor than Fairfax County. However, metro accessibility does not always predict development because development also requires favorable political consensus.
3. While there is anti-growth sentiment, it does not always win out. This may be because developers are well-organized, well-connected, or are able to offer amenities that make projects palatable. For example, when developer Kincora proposed a mixed use development at the county's edge near Washington Dulles International Airport in 2007, the County Board of Supervisors rejected the application. Three years later, Kincora amended the application to include a ballpark and two bridges linking key arteries, and it passed by a one-vote margin in 2010 (Gibson 2010).

Figure B1.1 Recent Housing in Loudoun



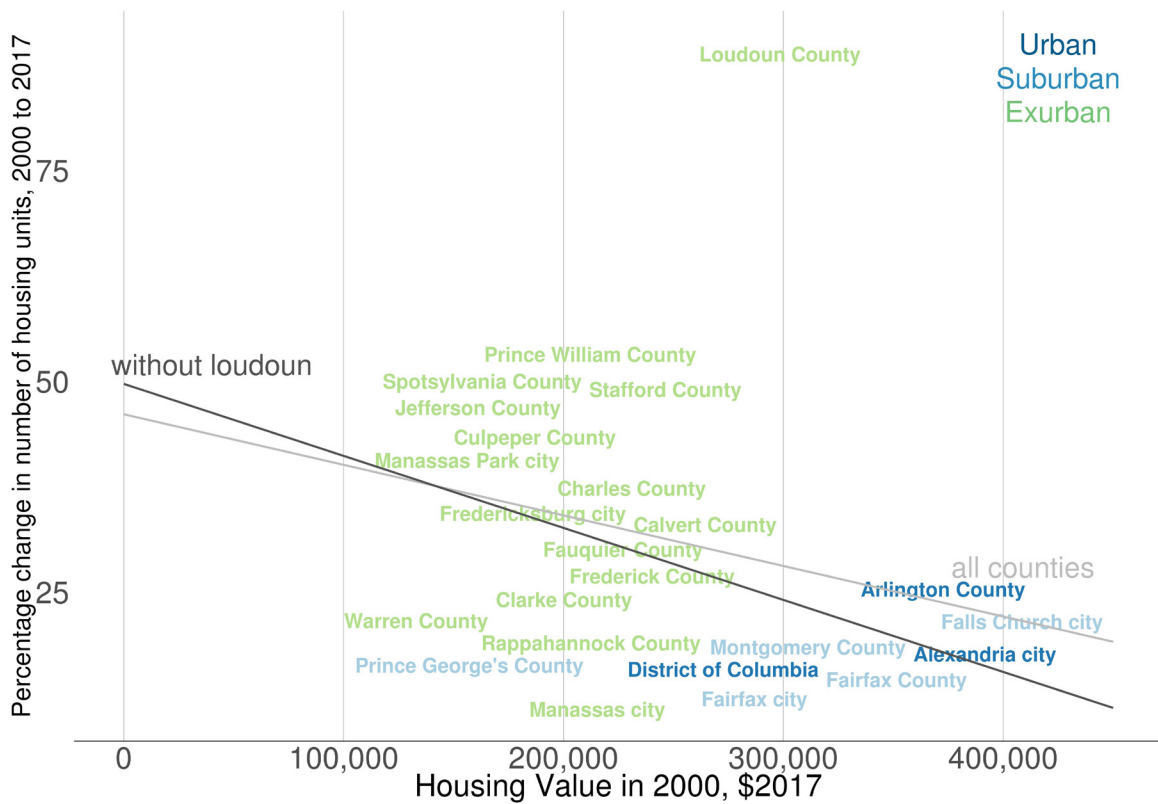
Source: Photo by authors, March 2019.

² Throughout this report, we express all monetary values in constant 2017 dollars.

The more typical growth patterns are in Culpeper, Jefferson, Prince William, Stafford, and Spotsylvania counties. All of these exurban areas were in the bottom two-thirds of regional housing values as of 2000, and experienced a relatively large gain in new housing units in more recent years. Manassas city had the lowest percentage change in housing units during this period, with a growth rate of just above ten percent, and housing values just below the median for the region, at roughly \$224,000.

Figure 1.3: Housing Growth is Lower in Higher-Valued Jurisdictions

County-level percent change in housing units 2000–2017 by median self-reported housing values in 2000 (2017\$). Trend lines with and without Loudoun.



Source: 2000 Decennial Census, American Community Survey 2013–2017. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area. Light colored trend line estimated using all counties. Darker trend line estimated without Loudoun County. Urban jurisdictions are in dark blue font; suburban jurisdictions in light blue, and exurban jurisdictions in green.

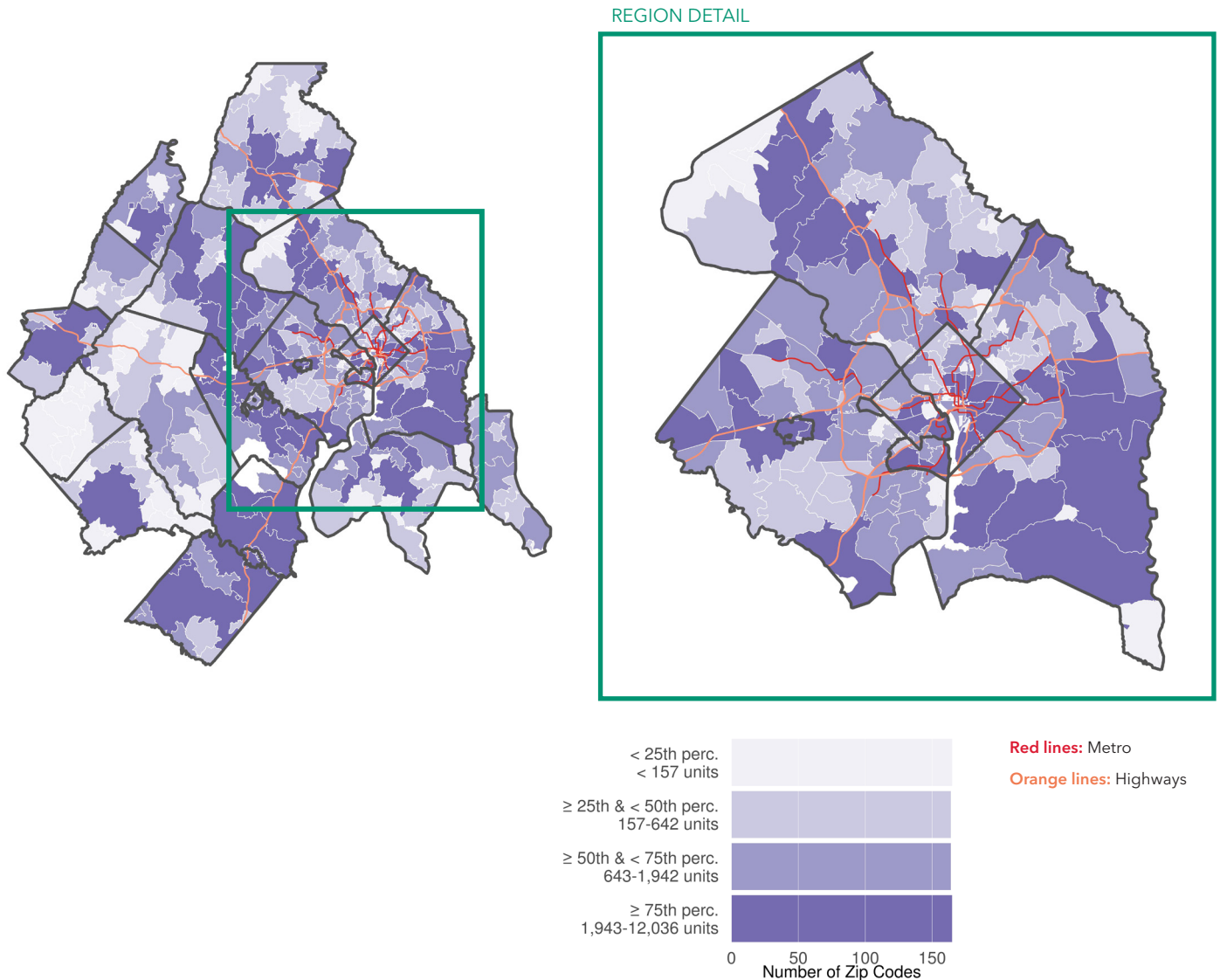
In addition to differences across jurisdictions since 2000, there are also differences in the distribution of new housing within jurisdictions. Figure 1.4 shows the number of new units constructed since 2000 by zip code. The colors distinguish between quartiles of housing units built since 2000, with the lightest color denoting zip codes at or below the 25th percentile of new housing units and the darkest color denoting zip codes in the top quartile³. Spotsylvania and Stafford counties experienced high growth across most neighborhoods. In contrast, most other exurban jurisdictions had both high and low growth neighborhoods within their boundaries.

3 We use “zip code” to refer to the Census Bureau’s zip code tabulation areas, or ZCTAs.

Growth was also unevenly distributed across neighborhoods in the urban and suburban jurisdictions. Prince George’s County stands out with relatively more housing growth near the borders of Charles and Calvert counties.

Figure 1.4: Housing Growth is Unevenly Distributed Across Neighborhoods

Distribution of Housing Units Built 2000 and After by Zip Code, 2017



Source: American Community Survey 2013-2017. Includes all zip codes in the Washington-Arlington-Alexandria metropolitan area; the smaller map highlights zip codes in urban and suburban jurisdictions. Metro lines are in red and interstates are in orange.

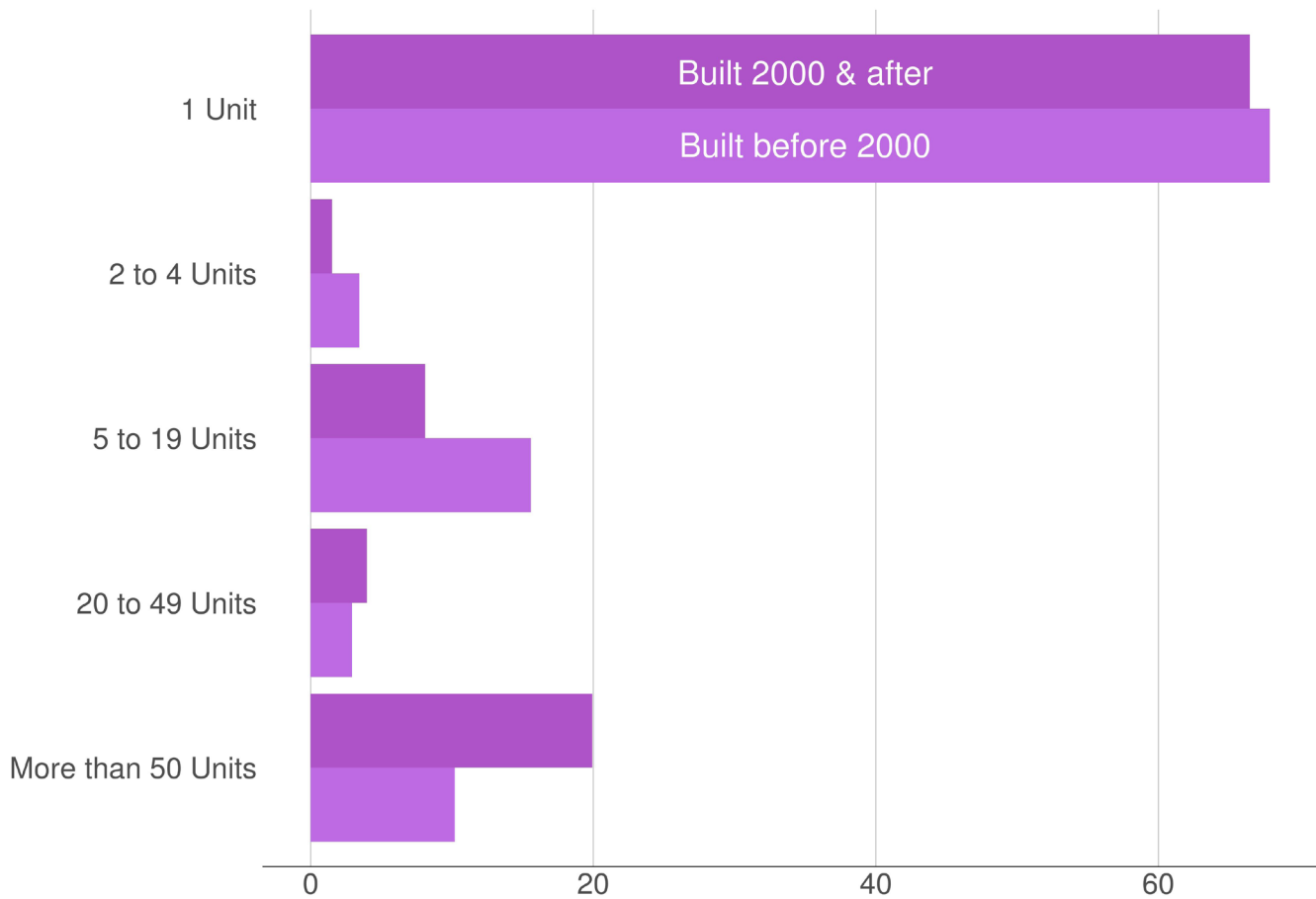
In sum, housing supply in the Capital Region has increased since 2000, but has not kept up with population growth. About one-half of housing units built since 2000 are in exurban locations, with Loudoun leading the way. New housing was also much more likely to be built in initially lower-priced jurisdictions. Among the urban jurisdictions, the District added both the largest number of units and the greatest share.

CHAPTER 2: NEW CONSTRUCTION IS PREDOMINANTLY SINGLE-FAMILY HOMES

Even as the number of housing units in the Capital Region has grown over the past 20 years, most areas have retained their predominantly single-family character⁴. The type of housing unit constructed matters for housing affordability because single-family homes use more land per housing unit and generally cost more to buy or rent than units in multifamily buildings. The composition of new housing therefore has implications both for housing affordability today and for how much housing the region can accommodate in the future.

Figure 2.1 Single-family Homes Continue to Dominate the Housing Stock

Share of housing units by structure type for units built before 2000 and 2000 onward



Source: American Community Survey 2013-2017. Units years reflect age of the existing stock as of 2013-2017. Aggregated from county-level data for Washington-Arlington-Alexandria metropolitan area.

Figure 2.1 compares the type of units constructed before and after 2000 based on unit age as of 2017⁵. Throughout

4 Throughout this report, “single-family” housing includes single-family detached and attached houses. Housing units in 2-4 family buildings are a very small share of both new and existing housing, therefore we refer to non-single-family housing as multifamily.

5 See appendix for full definitions of all variables.

the region, housing built pre- and post-2000 is largely single-family, which includes both detached homes and rowhouses. About two-thirds of housing units built prior to 2000 were single-family, almost exactly the same as the share of single-family housing constructed between 2000 and 2017. Box 2 further discusses the unique role of rowhouses in the Capital Region.

Box Two: What's the Role of Rowhouses?

Nearly 20 percent of the Capital Region's housing units are attached single-family houses, also known as rowhouses or townhouses. As in many older East Coast cities, rowhouses are a key part of the region's architectural language. Figure B2.1 shows the rowhouses for which Georgetown is known.

Figure B2.1: Georgetown Rowhouses



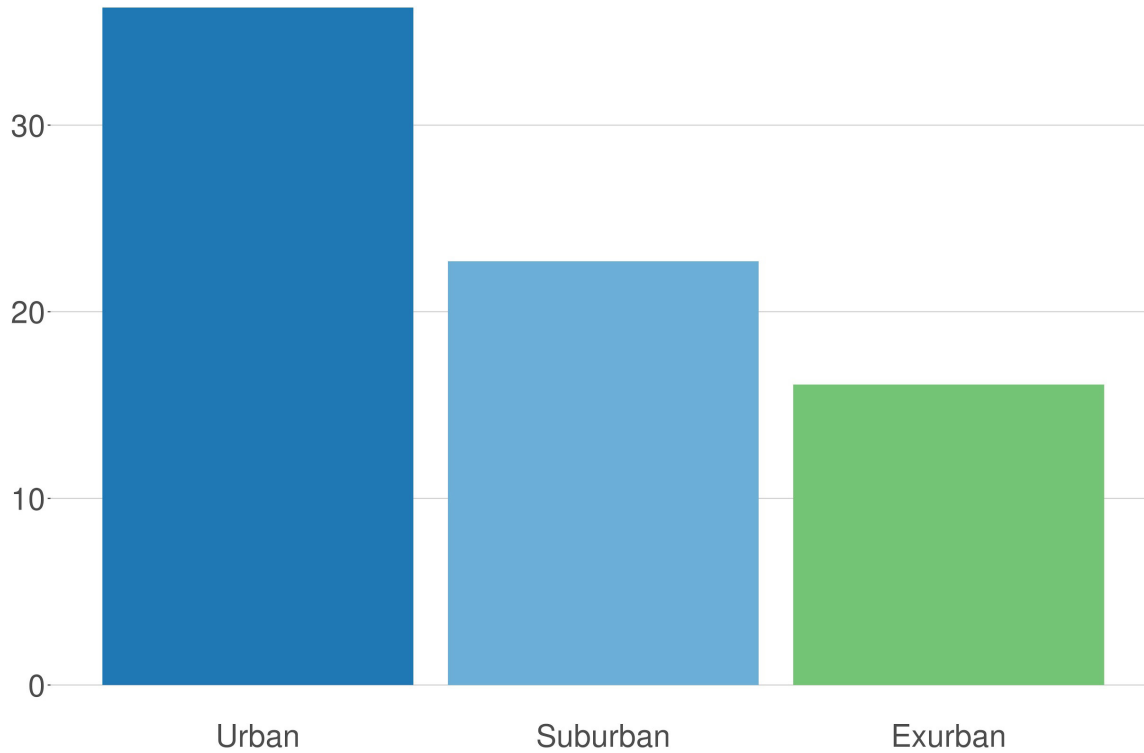
Photo by authors, March 2019.

Rowhouses provide more space and privacy than apartments in multifamily buildings, but relative to single-family detached homes they are generally smaller and on smaller pieces of land. As an in-between housing type, rowhouses fill different niches across locations within the region's housing market.

To illustrate rowhouses' varying importance in the region, Figure B2.2 reports the share of owner occupied homes that are rowhouses by jurisdiction type. In the Capital Region's urban core, rowhouses fill a similar market niche to single-family detached houses. Rowhouses comprise about one-third of all owner-occupied housing in the District, Arlington and Alexandria. Some of the region's most carefully preserved historic neighborhoods, such as Old Town Alexandria, Georgetown, and Capitol Hill, are composed of rowhouse-lined blocks.

Figure B2.2 Rowhouses Are a Greater Share of Owner-Occupied Units in Urban Jurisdictions

Share of owner-occupied housing by jurisdiction type

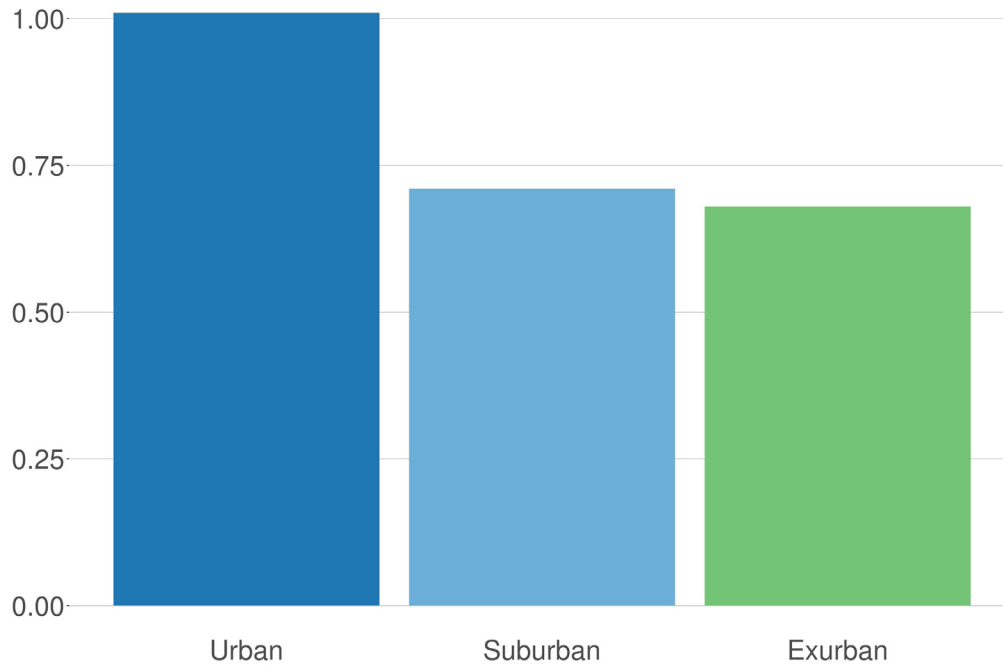


Source: Authors' calculations using 2012-2016 American Community Survey Public Use Microdata Sample. Urban, suburban, and exurban locations defined as elsewhere in report, but exclude Jefferson County WV. The analysis excludes rowhouse structures that have been subdivided into multiple apartments (these are considered multifamily buildings).

In the urban core, homeowners pay a slight premium for rowhouses relative to other owner-occupied structures (particularly condominiums in multifamily buildings). Figure B2.3 illustrates this by reporting the average value of owner-occupied rowhouses divided by the average value of owner-occupied non-rowhouses by jurisdiction type. In the urban core, the average rowhouse has about the same value as the average non-rowhouse owner-occupied home. In some neighborhoods in Alexandria and the District, rowhouses are valued nearly 30 percent more than all other owner-occupied homes.

Figure B2.3: Rowhouses are a More Affordable Homeownership Option in Suburbs and Exurbs

Average value of owner-occupied rowhouses divided by average value of owner-occupied non-rowhouses by jurisdiction type



Source: Authors' calculations using 2012-2016 American Community Survey Public Use Microdata Sample. Urban, suburban, and exurban locations defined as elsewhere in report, but exclude Jefferson County WV. Value ratio is calculated as average value of owner-occupied rowhouses in each Public Use Microdata Area (PUMA) divided by average value of non-rowhouse owner-occupied housing in the same PUMA.

In suburban and exurban parts of the Capital Region, rowhouses are instead a frequent affordable entry point to homeownership. Rowhouses in suburban and exurban neighborhoods are built more recently than most housing in those areas. Figure B2.4 shows townhomes in Loudoun County. While such rowhomes are more likely to be renter-occupied than single-family homes, they do account for a meaningful share of owner-occupied homes.

Rowhouses in the region's suburbs and exurbs are more affordable than the single-family detached homes in the same neighborhoods. In fact, rowhouse values are roughly 30 percent lower than all other owner-occupied homes in suburban and exurban areas.

Figure B2.4 Loudoun County Rowhouses



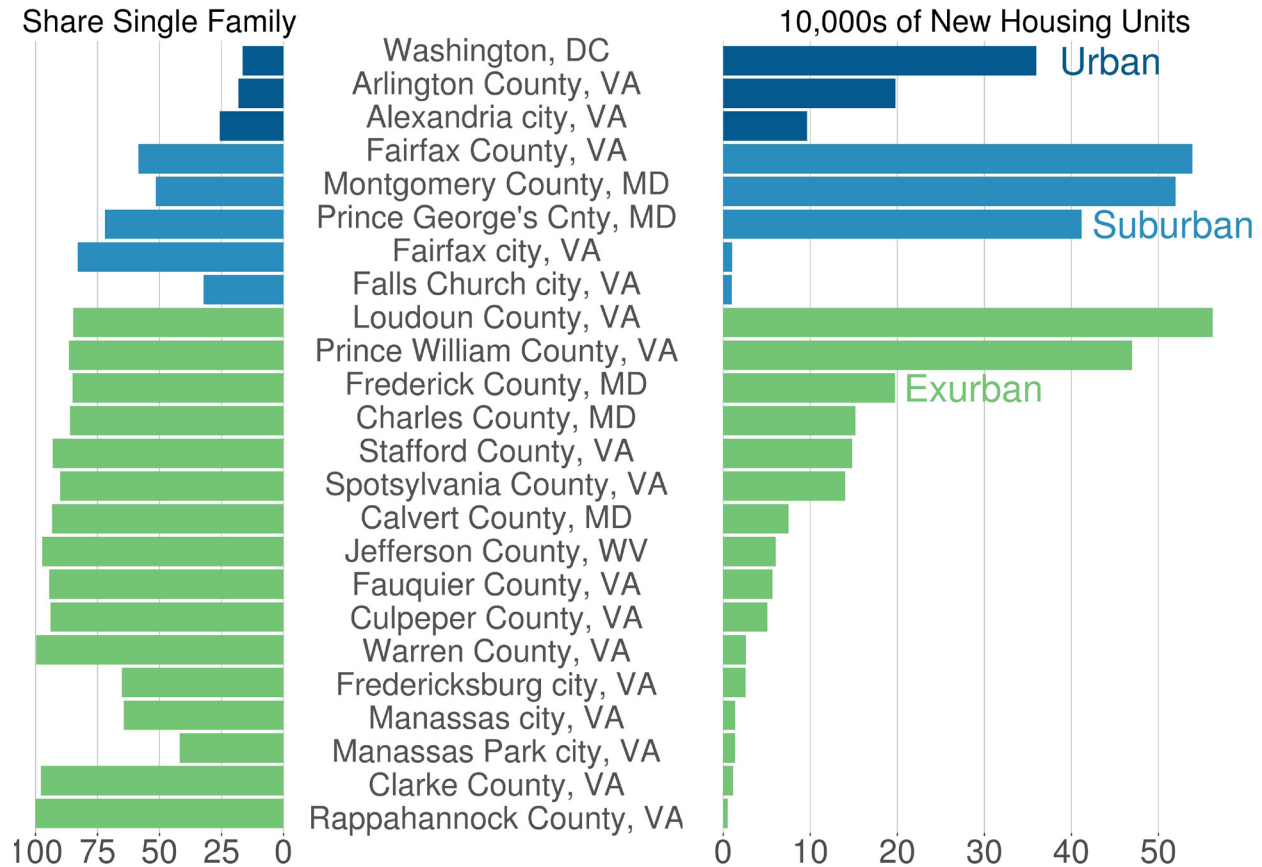
Photo by authors, March 2019.

However, newer construction is more heavily weighted towards apartments in large multifamily buildings. Housing in buildings with 50 or more units comprises only 10 percent of the pre-2000 housing stock, but 20 percent of units built between 2000 and 2017.

The “missing middle”—smaller multifamily buildings, with 2-19 units per building—comprises just under 20 percent of housing built before 2000, but it accounts for less than ten percent of units built 2000 or after. These smaller apartment or condominium buildings comprise a large share of the unsubsidized yet relatively affordable rental stock (Parolek 2014). Preserving the current affordability of these buildings offers one strategy for combating the effects of rising housing costs across the region (Howell 2015).

Figure 2.2 Housing Built Since 2000 is Mostly Single-family, Except in the Urban Core

Share of Housing Built Since 2000 in Single-family Structures (left) and Housing Units Built Since 2000 (right) by Jurisdiction, 2017



Source: American Community Survey 2013-2017. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area.

In Figure 2.2, we examine the single-family share of housing built after 2000 by jurisdiction. This figure classifies jurisdictions by urban (dark blue), suburban (lighter blue) and exurban (green) locations. The left bar shows the share of new units that are single-family, and the right bar shows the total number of new units.

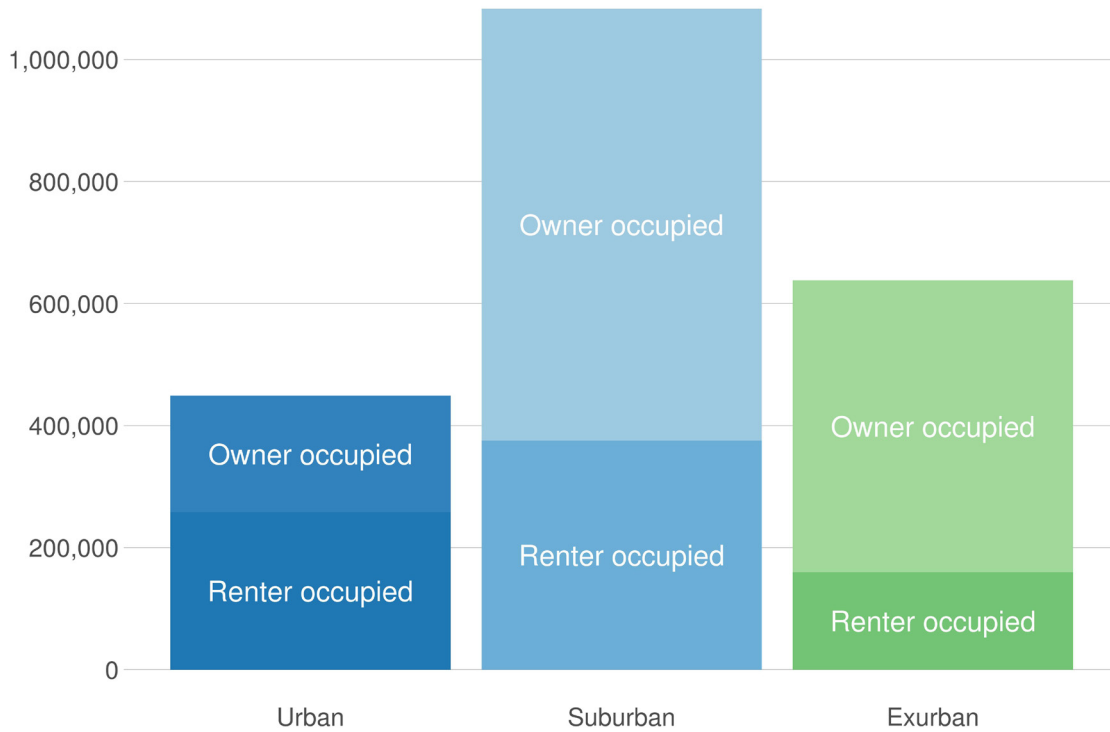
Within the urban core, more than 80 percent of new housing was built in multifamily buildings, mostly in larger buildings (50 or more units). The urban core is a particularly important part of the region’s multifamily market. It made up 15 percent of regional new housing, but close to 40 percent of regional new multifamily housing.

The three large counties that accounted for the most suburban growth differed in their propensity to build single-family housing. Roughly 70 percent of new housing in Prince George’s County was single-family and about 60 percent of new housing in Fairfax was single-family. Montgomery County’s new housing was almost equally split between single-family and multifamily structures.

The exurban housing markets are dominated by Loudoun and Prince William Counties. Together these two counties account for more than half of the housing growth among exurban jurisdictions. Over 85 percent of new housing built in the exurbs is single-family. Only the three independent cities—Fredericksburg, Manassas, and Manassas Park—have built non-trivial shares of multifamily housing, but the total amount of housing built in these cities is small.

Figure 2.3 Suburbs Contribute a Large Share of the Capital Region's Rental Housing Units

Occupied Housing Units by Renter or Owner Status and Intra-regional Location, 2017



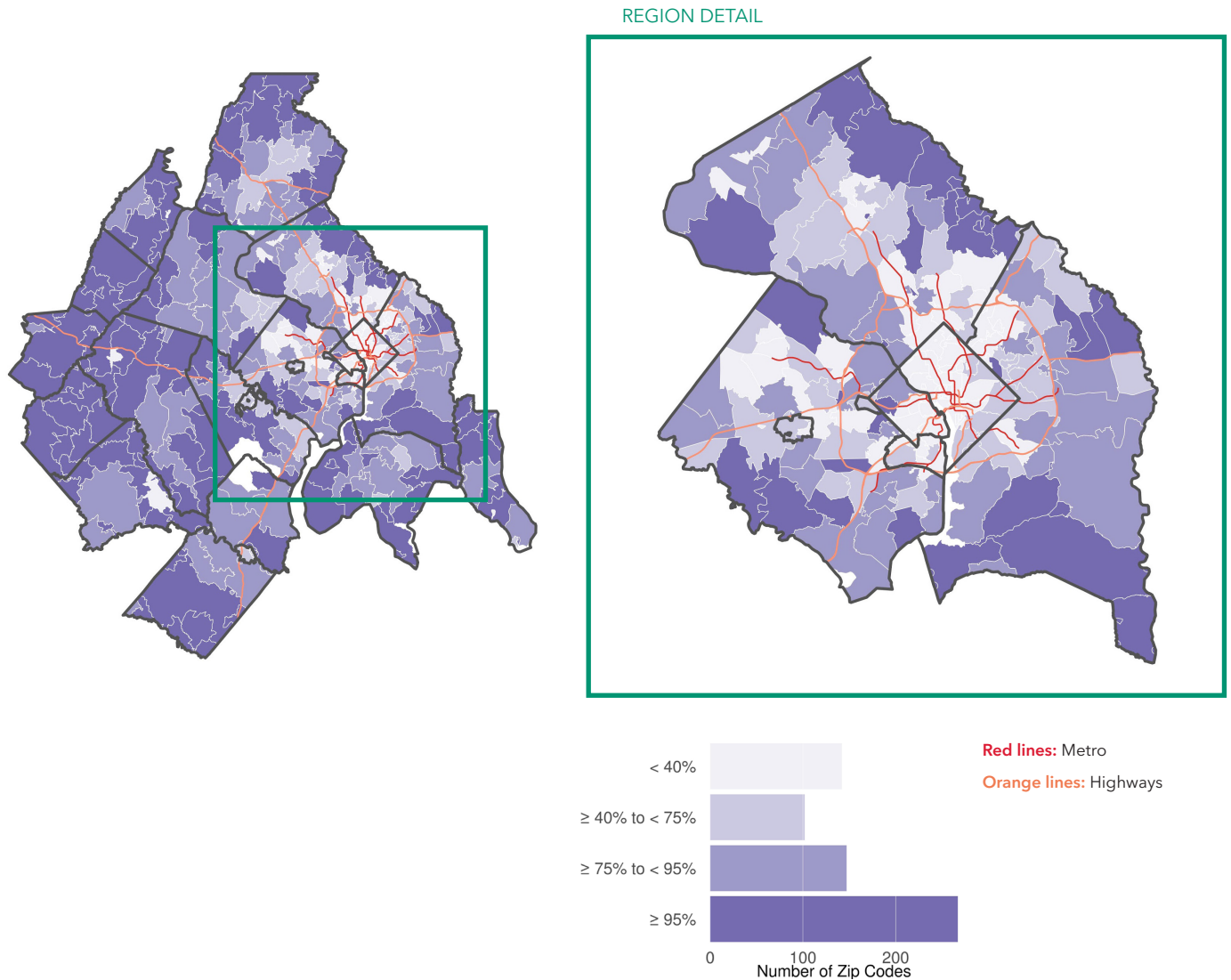
Source: American Community Survey 2013-2017. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area. Urban core defined as District of Columbia, Arlington County VA, and City of Alexandria, VA. Suburban includes Montgomery and Prince George's Counties, MD, Fairfax County, VA, Falls Church city, VA, and Fairfax city, VA. All other counties and cities are exurban.

Across the Capital Region, nearly 65 percent of households own their homes, equivalent to the national homeownership rate. Figure 2.3 breaks down this pattern of owner- and renter-occupied units by urban, suburban and exurban location. Although the rate of homeownership is higher in suburban and exurban jurisdictions, renter-occupied housing exists throughout the region. About 60 percent of households in the urban core are renters, compared to about 35 percent in suburbs and 25 percent in exurbs.

However, because the suburbs host the bulk of regional housing, most renter households—almost 380,000—live in suburban jurisdictions. The exurban rental market includes a large number of single-family detached homes and rowhouses, while renter households in the urban core are more likely to live in multifamily buildings.

Figure 2.4 In Most Neighborhoods, Single-family Units Account for the Majority of Housing Built After 2000

Single-family share of total housing built since 2000 by Zip Code



Source: American Community Survey 2013-2017. Single-family includes both detached and attached structures. Includes all zip codes in the Washington-Arlington-Alexandria metropolitan area; the smaller map highlights zip codes in urban and suburban jurisdictions. Metro lines are in red and interstates are in orange.

Figure 2.4 explores whether the mix of single-family and multifamily housing built after 2000 varies across neighborhoods. We color zip codes by their share of new housing that is single-family. We use four shades of purple to show the single-family share of new housing. The lightest purple areas are zip codes where the single-family share of new housing is below 40 percent. The zip codes in dark purple show zip codes where more than 95 percent of new housing is single-family.

The figure shows that even in the urban core, there are distinct geographic patterns in the structure type of housing built since 2000. In the District, most neighborhoods built more new multifamily than single family housing. Neighborhoods in the far northeast and southeast along the Prince George's County border built a mixture of

multifamily and single-family (single-family share between 40 and 75 percent). The northern half of Arlington County built largely single-family homes, while the southern half built mostly multifamily units.

The pervasiveness of single-family housing varies across suburban neighborhoods as well. Montgomery County built a larger share of multifamily units in several distinct areas: neighborhoods closest to the District, and the corridors along Metro's Red Line. Prince George's County built relatively more multifamily in neighborhoods closest to the District, with mostly single-family along the county's southern edge. Fairfax County shows less clear spatial pattern in the composition of recently built housing. Exurban neighborhoods built almost exclusively single-family homes everywhere.

To conclude, recent residential construction in the Capital Region is predominantly single-family, with the exception of the urban core. Inner suburban jurisdictions, including Fairfax and Montgomery counties and Falls Church, all built at least 30 percent of new units in multifamily structures. However, new construction elsewhere was almost entirely in single-family homes. This pattern of construction helps to explain the "missing middle" of naturally occurring affordable housing.

CHAPTER 3: HOUSING IN THE CAPITAL REGION HAS BECOME MORE EXPENSIVE

Across the Capital Region, housing values have risen faster than income. For long-time homeowners, rising values translate into more wealth and higher property tax payments. For renters, higher home values generally mean higher monthly housing expenditures, but without the upside of home value appreciation.

Whether higher home values pose a barrier to new homebuyers depends in part on the cost and availability of mortgages. In general, when households devote a larger share of their income to rent or mortgages, they have less money to spend on other things, including transportation costs, food and medical expenses. We examine these costs burdens for renters in Box 3.

Box Three: How do Rent-to-Income Ratios Vary by Race?

For most households, housing payments—either on rents or mortgages—make up the largest portion of the monthly budget. High housing costs leave residents with less income to cover other expenses.

The U.S. Department of Housing and Urban Development (HUD) defines households that spend more than 30 percent of their income on housing costs as “cost burdened.” Households that spend more than 50 percent are “severely cost burdened”(HUD n.d.). These thresholds are widely used by housing practitioners and researchers.

According to the Joint Center for Housing Studies at Harvard University, nearly half of American renters pay at least thirty percent of their income on rent (Joint Center for Housing Studies 2017). As rising rents have outpaced stagnant incomes, the share of cost burdened renter households in the United States has risen, especially among the poorest families (Schuetz 2017).

Eighty-three percent of renters with an income below \$15,000—about five out of six households—pay 30 percent or more of their income toward the cost of housing (JCHS 2017).

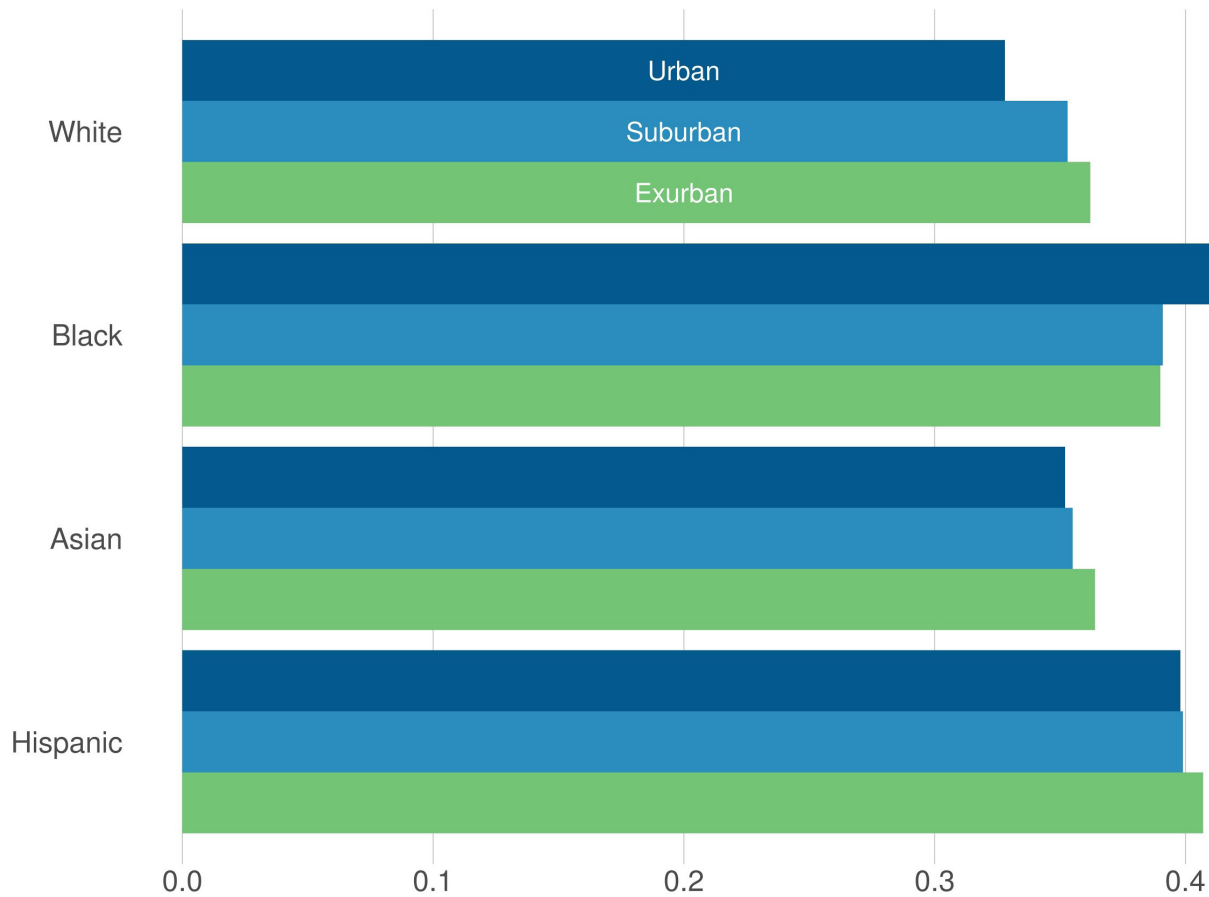
In the Capital Region, there is substantial variation in rental cost burden by race and jurisdiction type. Figure B3.1 reports the ratio of average monthly rent to monthly income across urban, suburban and exurban locations and racial groups. Notably, the rent burden for African-American and Hispanic households is higher than the rent burden for white households regardless of location type.

This discrepancy is particularly stark for African Americans in urban jurisdictions. African-American renters in urban jurisdictions spend on average 43 percent of their income on rent and utilities, and Hispanic renters in urban jurisdictions spend nearly 40 percent of their income on rent and utilities. By contrast, white renters spend on average only 33 percent of their income on rent.

Additionally, among African-American renter households, those in urban areas spend the highest share of their income on rent. For Asian, white and Hispanic renter households this pattern is reversed. For those groups, renters in the exurbs spend the largest share of their income on rent, and those in the urban jurisdictions the smallest.

Figure B3.1: Black and Hispanic Renters Spend More of their Income on Rent than White and Asian Renters.

Mean monthly rent-to-income ratios by race and location type



Source: Authors' calculations using 2012-2016 IPUMS data. Urban, suburban, and exurban locations defined as elsewhere in report, but exclude Jefferson County WV. Gross rent includes estimated utility payments.

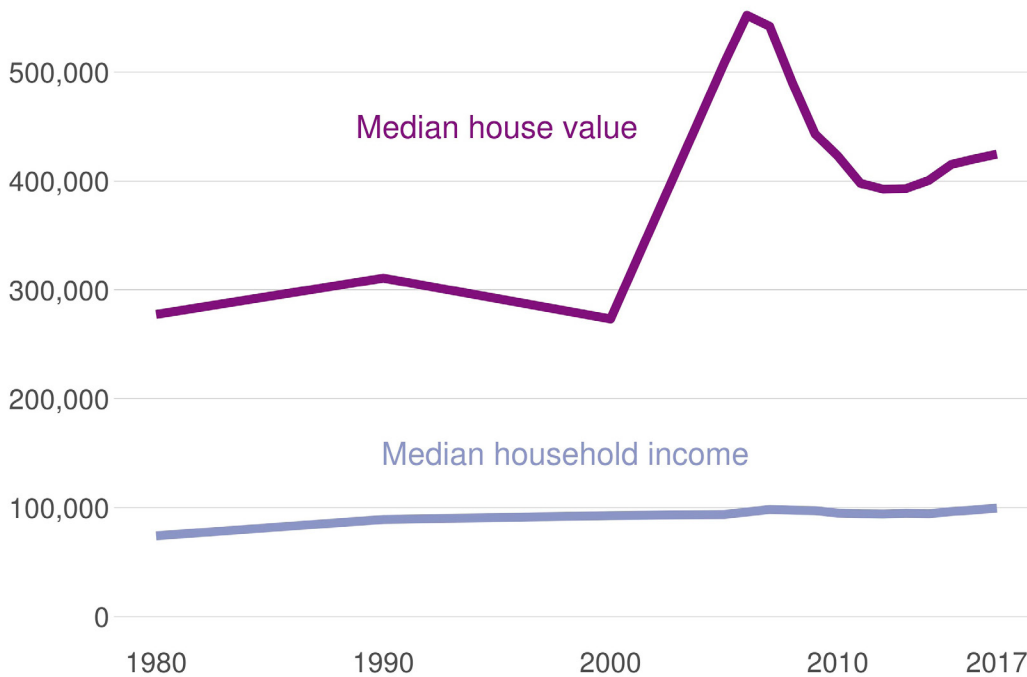
Figure 3.1 illustrates the change in median house value and median household income from 1980 to 2017 in constant 2017 dollars. Since 1980, the growth in housing values has outpaced the growth in household income. In 1980, median income was just above \$70,000 (2017\$) and the median house was valued at about \$275,000 (2017\$). Put differently, in 1980 the median home was valued at 3.7 times the median income. The median home value to income ratio for the U.S. is currently roughly 3.1; this figure is relatively stable over time (Murray and Schuetz 2018). Thus, the Capital Region was already relatively expensive in 1980.

Over the past three decades, housing prices have increased more than income. Between 1980 and 2017, median household income in the Capital Region climbed by 30 percent to almost \$95,000. During the same period, however, the median home value rose by more than 50 percent. In 2017, the median home was valued above \$415,000. This rapid growth in housing value means that the median home in the Capital Region is now valued at nearly 4.5 times the median income.

However, interest rates also fell during this period. As lower interest rates allow new homebuyers to purchase a higher-value home with the same monthly mortgage payments, it is not straightforward to make conclusions about changes in affordability overall.

Figure 3.1: Housing Value has Grown Faster than Household Income

Median Housing Value and Median Household Income, 1980-2017



Source: 1980-2010 Decennial Census, American Community Survey 2005-2017 1-year estimates. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area.

While the median housing value is more than four times the median income across the entire region, this ratio varies starkly across jurisdictions. In general, the ratio of median housing values to median income is higher in urban areas and lower in exurban areas, although there are notable differences across counties.

Figure 3.2 reports the ratio of housing values to income in each of the 24 jurisdictions in the region. The District, Arlington and Alexandria report some of the highest home value to income ratios. In the District, the median home value is nearly seven times the median household income—reflecting both the relatively high cost of housing in the District and the lower incomes of some residents. In Arlington and Alexandria, the median housing value is nearly six times median household income.

The three urban jurisdictions all have homeownership rates below 45 percent, so the median household incomes reflect the fact that renters tend to have lower incomes than homeowners. In suburban and exurban jurisdictions, more than 60 percent of households own their homes.

Several other jurisdictions outside of the urban core, including Falls Church, Rappahannock County and Fredericksburg, also report comparably high ratios of housing values relative to median incomes. Falls Church has the highest median home value of any jurisdiction in the Capital Region, around \$725,000. Fredericksburg and Rappahannock have the lowest median household incomes in the region.

In the two largest suburban counties, Montgomery and Fairfax counties, the median home value is more than 4.5 times the median income. Prince George's, the third largest suburban county, is substantially more affordable with a value-to-income ratio under 3.5.

Notably, the exurban counties exhibit the widest variation in the ratio of housing values to income. Loudoun County has the highest housing value and highest income of the exurban jurisdictions with a moderate house value-to-income ratio of around 3.7.

Jefferson County WV, Charles County, and Spotsylvania County report the lowest ratio of home values relative to income. In these jurisdictions, the median housing value is roughly three times the county's median income.

Overall, high housing costs in the Capital Region contribute to housing instability. In extreme cases, these housing costs can lead to increased risks of homelessness. Box 4 identifies some of the unique challenges of homelessness in the District.

Box Four: Homelessness in Washington, DC

Rising home prices contribute to homelessness. The official, one-night national canvass of homelessness in 2018 counted slightly more than half a million people experiencing homelessness in the U.S.¹ On that night in the District, almost 7,000 individuals were homeless, accounting for one percent of the city's population.

Among major cities in the United States, the District of Columbia ranks fourth in the number of families experiencing homelessness, following New York City, Los Angeles, and Boston. Homeless residents are visible in the clusters of tents found beneath underpasses and near institutions that serve them. (See Figure B4.1)

Since 2007, the rate of homelessness in the District has increased by nearly 30 percent. Slightly more than half of the District homeless population were single and slightly under half were people in families with children.

Of all individuals experiencing homelessness in the District, a staggering 41 percent were "chronically homeless" in 2017. Chronic homelessness—defined as those with a disability that lasts for one year or more, or who experience at least four episodes of homelessness in the last three years, totaling at least 12 months—rose almost 150 percent in the District relative to 2007.

Yet compared to other cities, the vast majority—over 90 percent—of the District's homeless population were sheltered. The District, along with three other states, requires that none of the people experiencing homelessness in families with children are unsheltered. The District is among the few jurisdictions in the country that legally guarantees a "right to shelter" on freezing nights.

Mayor Muriel Bowser has presented a plan to end homelessness by embracing a "Housing First" strategy. The underlying goal of this strategy is to provide permanent housing for all residents. So far, the city has connected 3,900 single adults to permanent housing, including 1,700 veterans.

While the initial plan aspired to build a shelter in each ward, only Ward 4 has completed its shelter. Wards 7 and 8 are not far behind. Opposition groups in Ward 3, the District's most affluent, filed unsuccessful lawsuits that delayed construction. Citizens in Ward 5 have also organized against a new planned shelter there, arguing that the ward already houses a concentration of public facilities.

Figure B4.1: Homeless Encampments in the District of Columbia

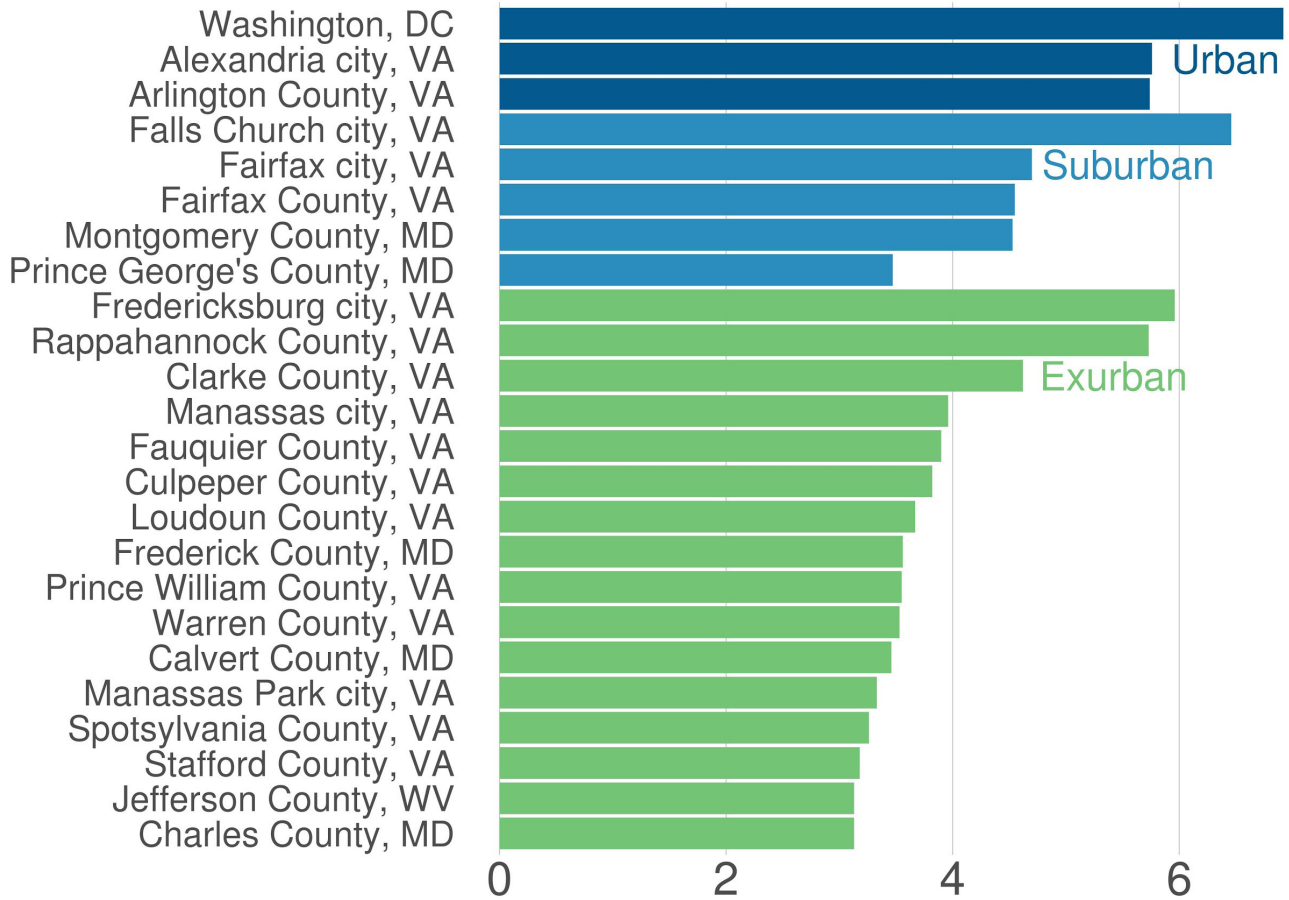


Source: Photo by authors, March 2019.

¹ All the homelessness figures in this section are taken from HUD (2017) and HUD (2018).

Figure 3.2: Housing Values are Highest Relative to Incomes in the Urban Core

Median Housing Value Divided by Median Household Income, by Jurisdiction, 2017



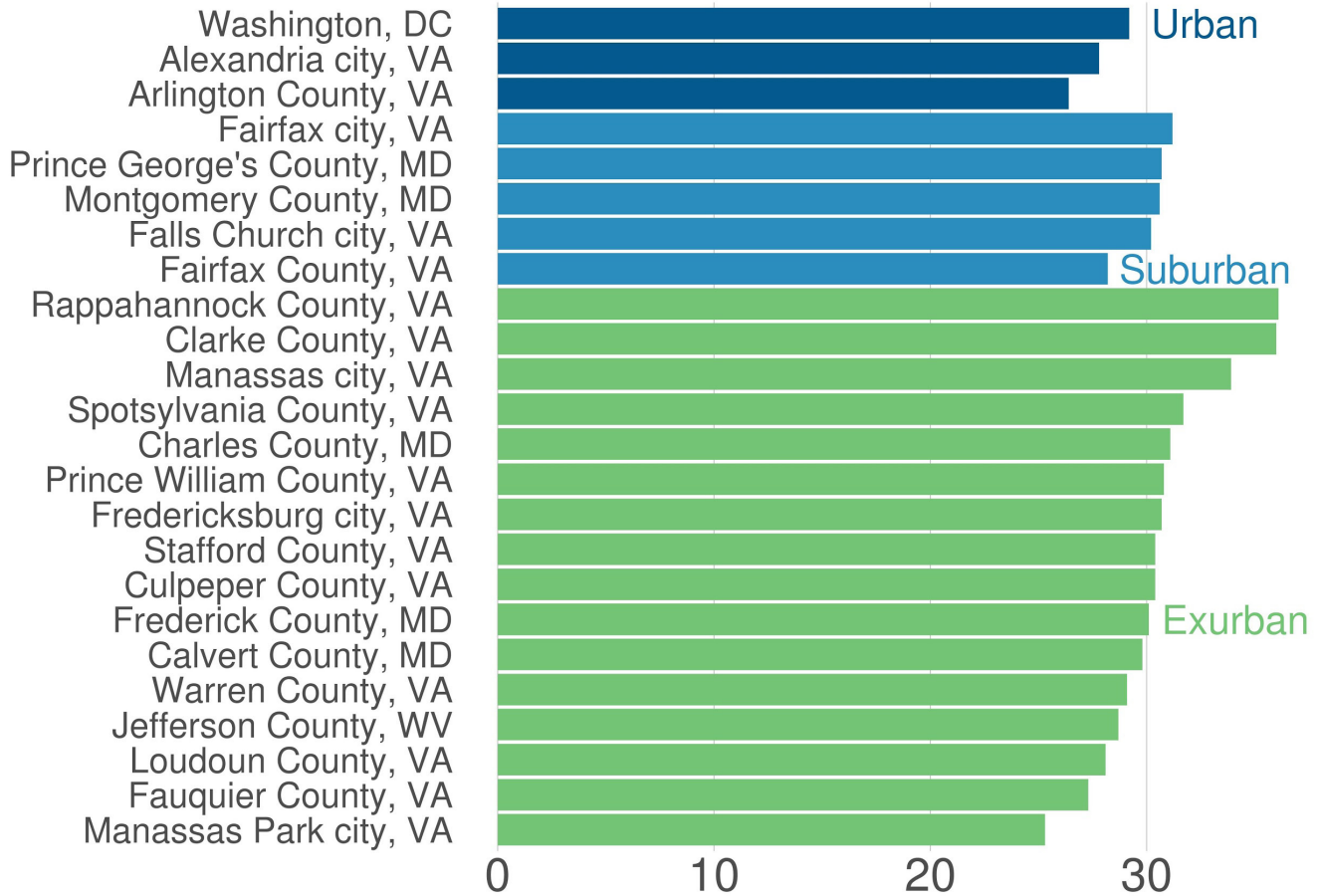
Source: American Community Survey 2013-2017. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area.

The cost to income ratio for renters varies across the Capital Region, as well, although the patterns are notably different. Figure 3.3 reports annual rent⁶ as a share of renters' annual household income. Again, we order jurisdictions by urban, suburban, and exurban and then rank by the ratio of rent to income.

⁶ Here and throughout, "rent" refers to gross rent. See appendix for further details.

Figure 3.3: Annual Rent Relative to Renters' Income is Lowest in Urban Jurisdictions

Median Annual Rent Divided by Annual Income for Renters by Jurisdiction, 2017



Source: American Community Survey 2013-2017. Includes all counties and independent cities in the Washington-Arlington-Alexandria metropolitan area. Median gross rent includes estimated utility payments. Income only for renter households.

Rent to income ratios vary less across jurisdictions than housing value to income ratios, and there are fewer clear spatial patterns. In most jurisdictions, the median renter household pays less than one-third of income on rent, within the Department of Housing and Urban Development's recommendation.

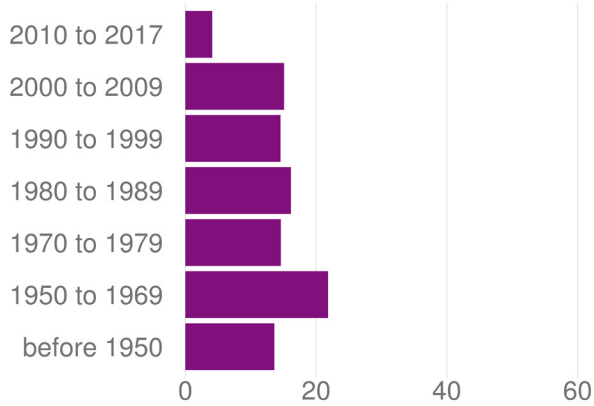
Interestingly, and opposite of the pattern in Figure 3.2, households pay more of their income to rent in some exurban jurisdictions, although the differences are quite small in magnitude. The median rent to income ratio is the lowest in the urban areas, although the rent to income ratios vary substantially by race and ethnicity, as we note in Box 3.

In sum, the Capital Region has long had high housing costs, and housing has become more expensive in the last 30 years.

PART II: HOUSING AND DEMOGRAPHIC INDICATORS THROUGHOUT THE CAPITAL REGION

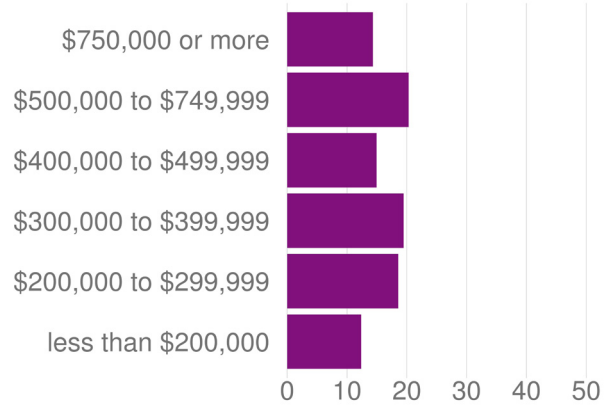
CAPITAL REGION

Share of Residential Housing Units by Year Built



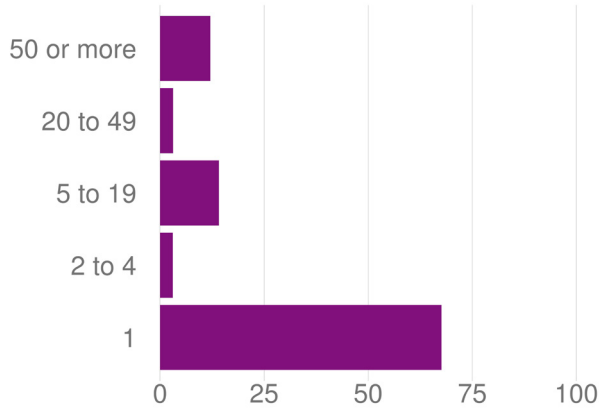
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



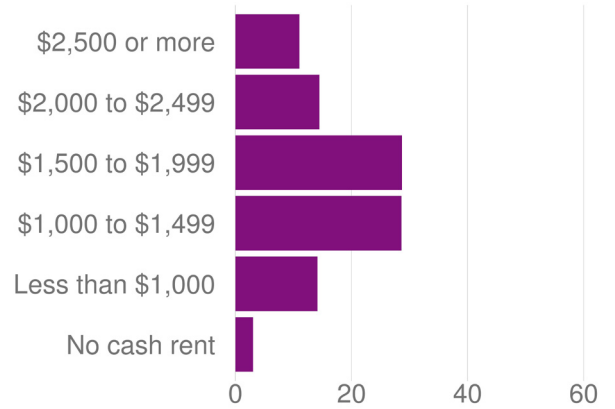
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

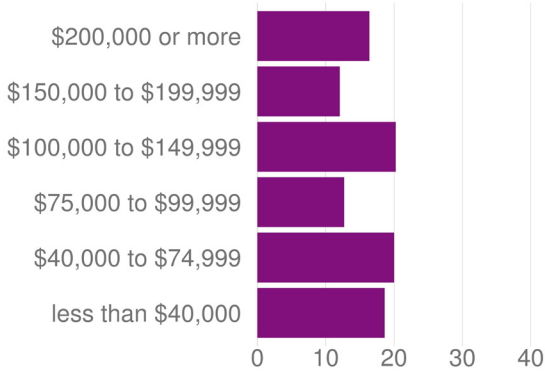
Share of Renter occupied Units by Gross Rent



Source: American Community Survey, 2013-2017.

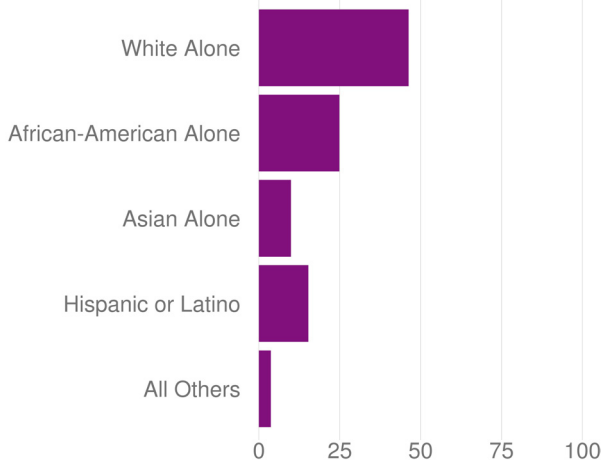
CAPITAL REGION

Share of Households, by Household Income



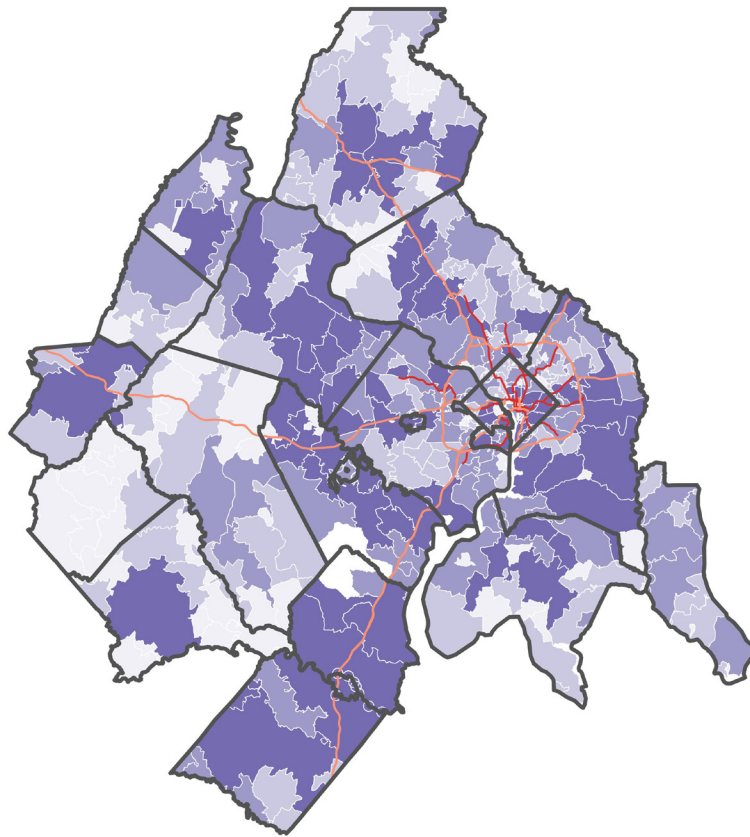
Source: American Community Survey, 2013-2017.

Share of Population by Race and Ethnicity

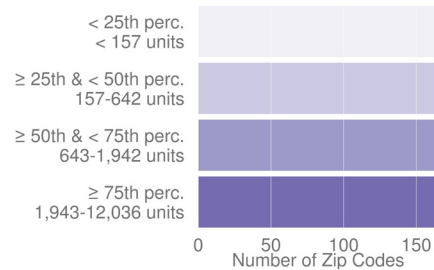


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Red lines: Metro
Orange lines: Highways

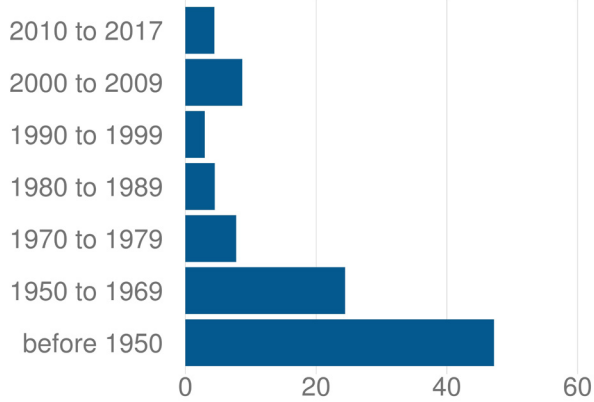


Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



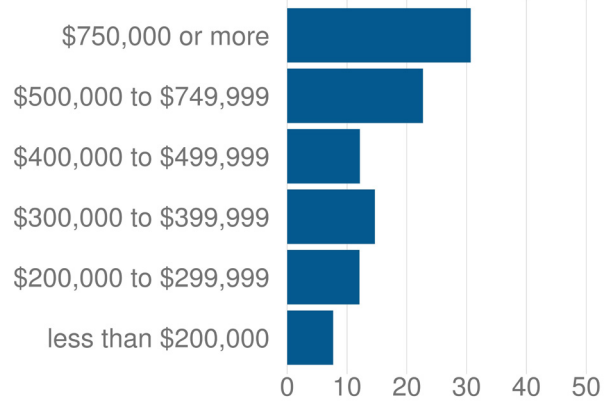
DISTRICT OF COLUMBIA

Share of Residential Housing Units by Year Built



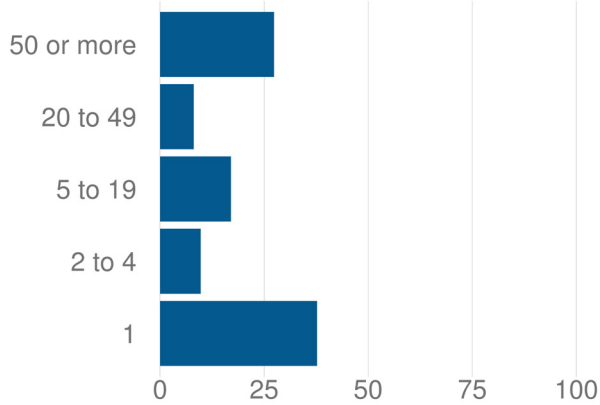
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



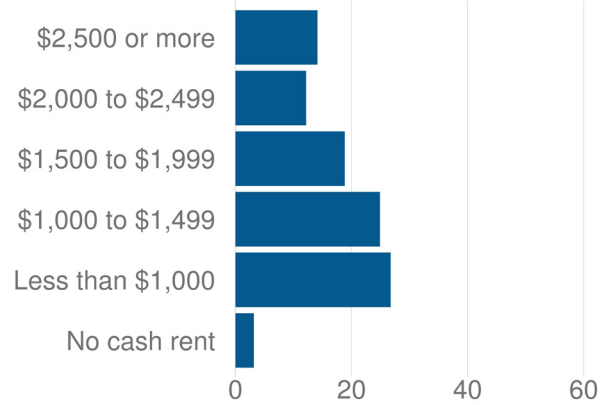
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

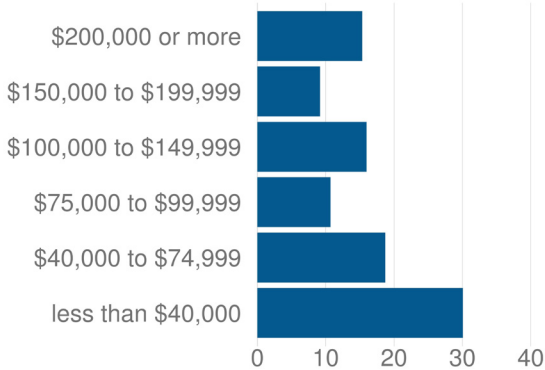


Source: American Community Survey, 2013-2017.



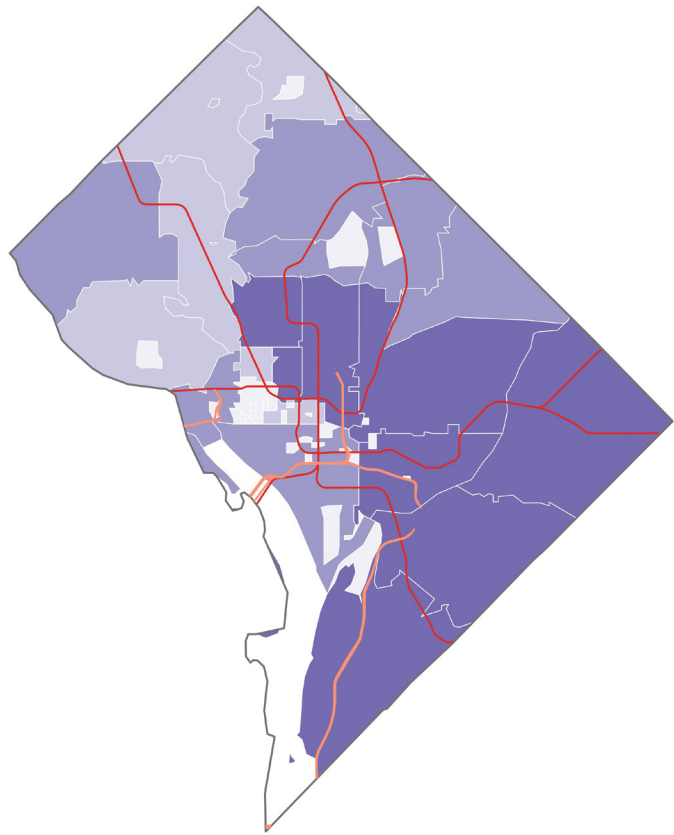
DISTRICT OF COLUMBIA

Share of Households, by Household Income

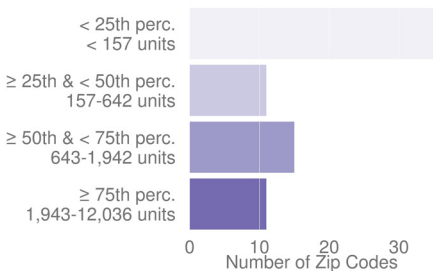


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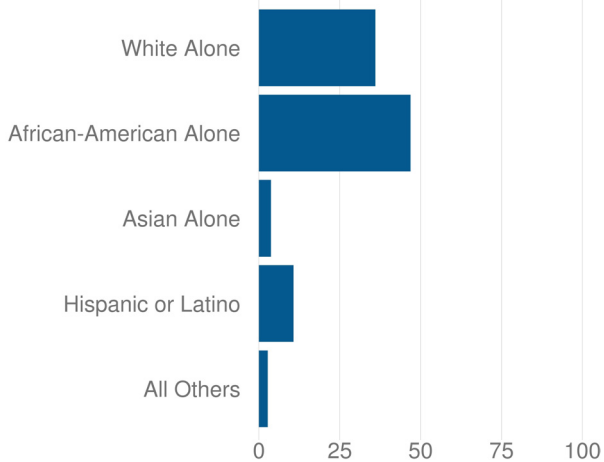
Number Housing Units Built 2000 and After by Zip Code



Red lines: Metro
Orange lines: Highways



Share of Population by Race and Ethnicity



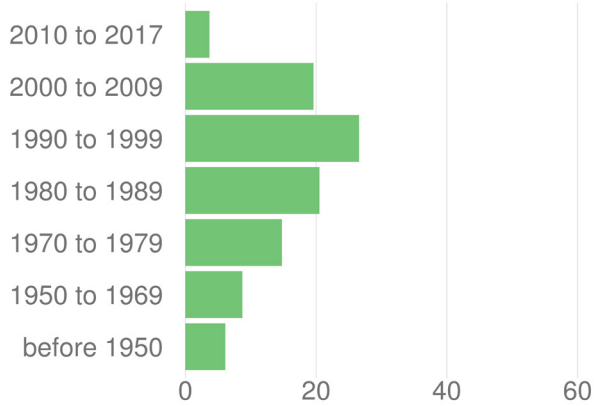
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



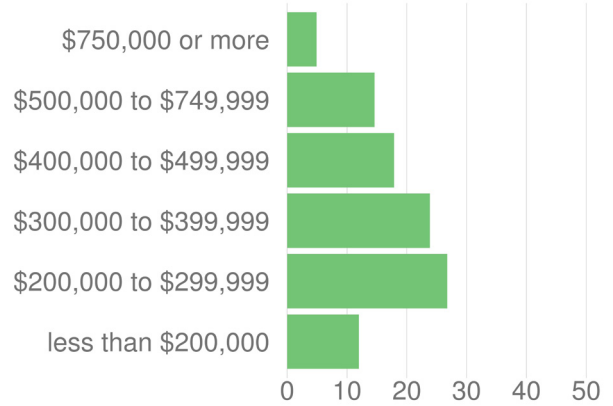
CALVERT COUNTY, MD

Share of Residential Housing Units by Year Built



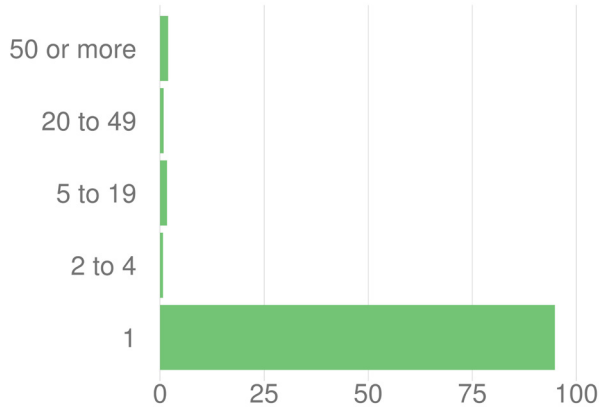
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



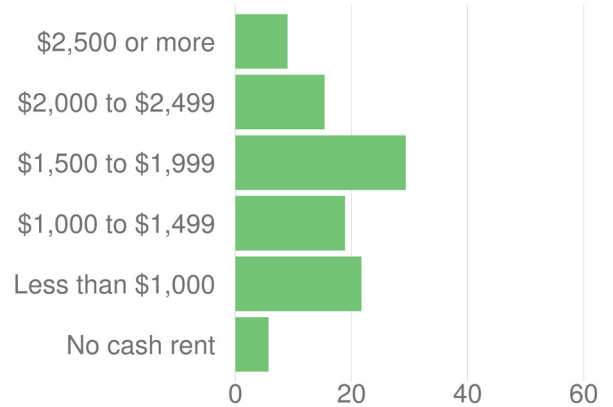
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

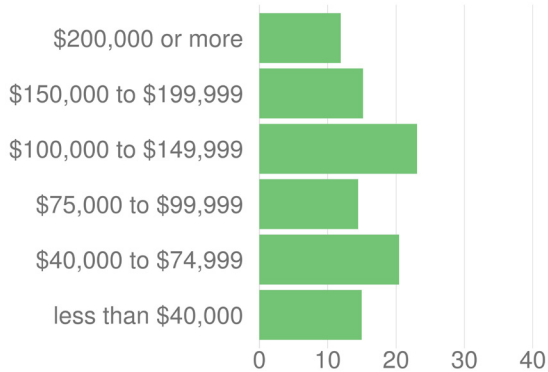


Source: American Community Survey, 2013-2017.



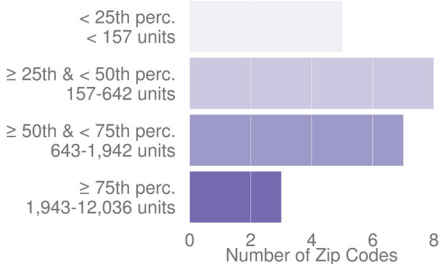
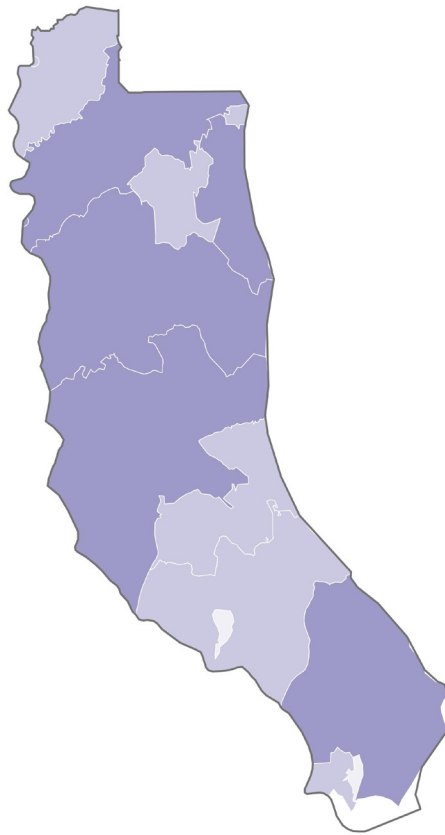
CALVERT COUNTY, MD

Share of Households, by Household Income

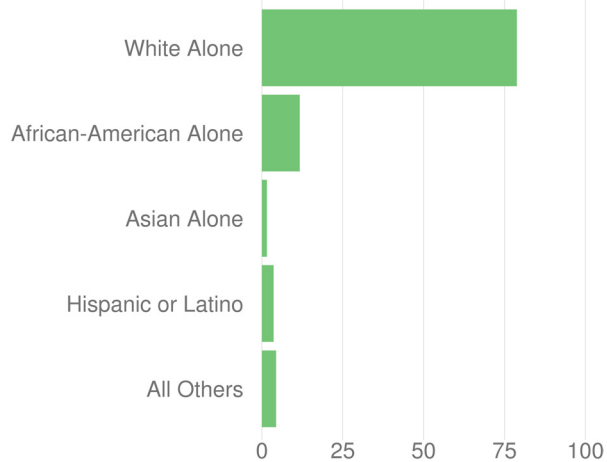


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



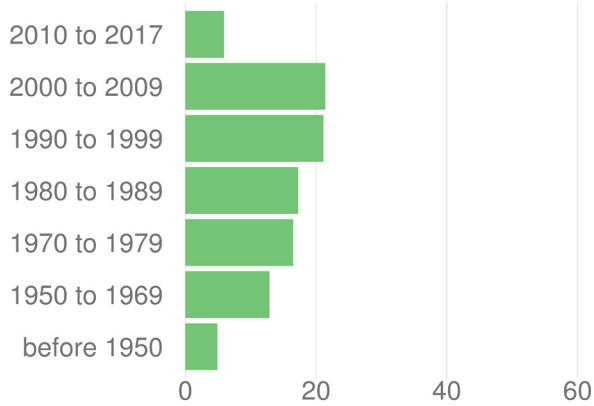
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



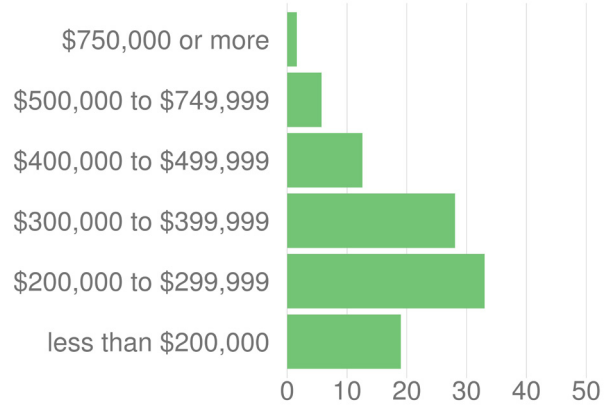
CHARLES COUNTY, MD

Share of Residential Housing Units by Year Built



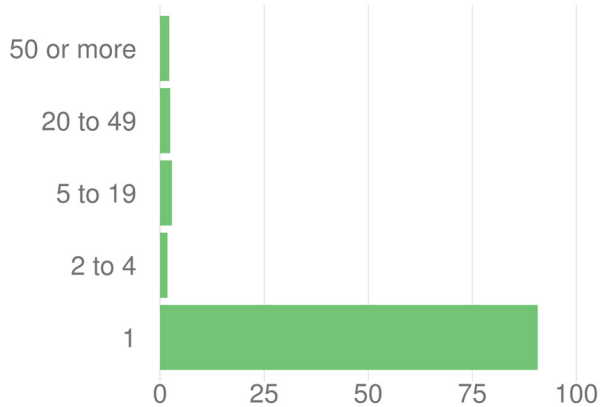
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



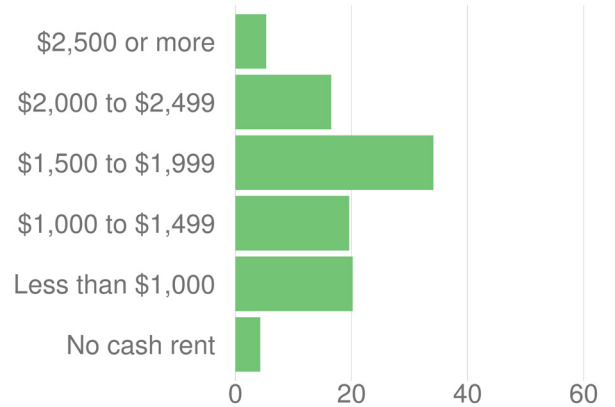
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

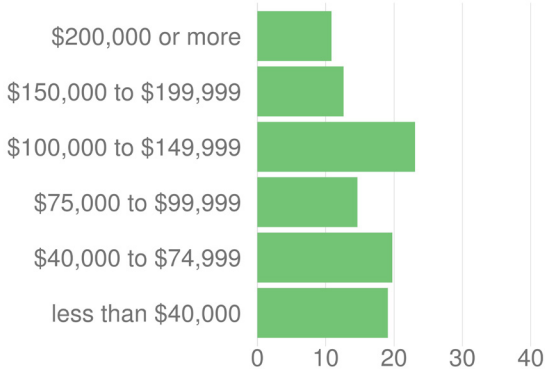


Source: American Community Survey, 2013-2017.



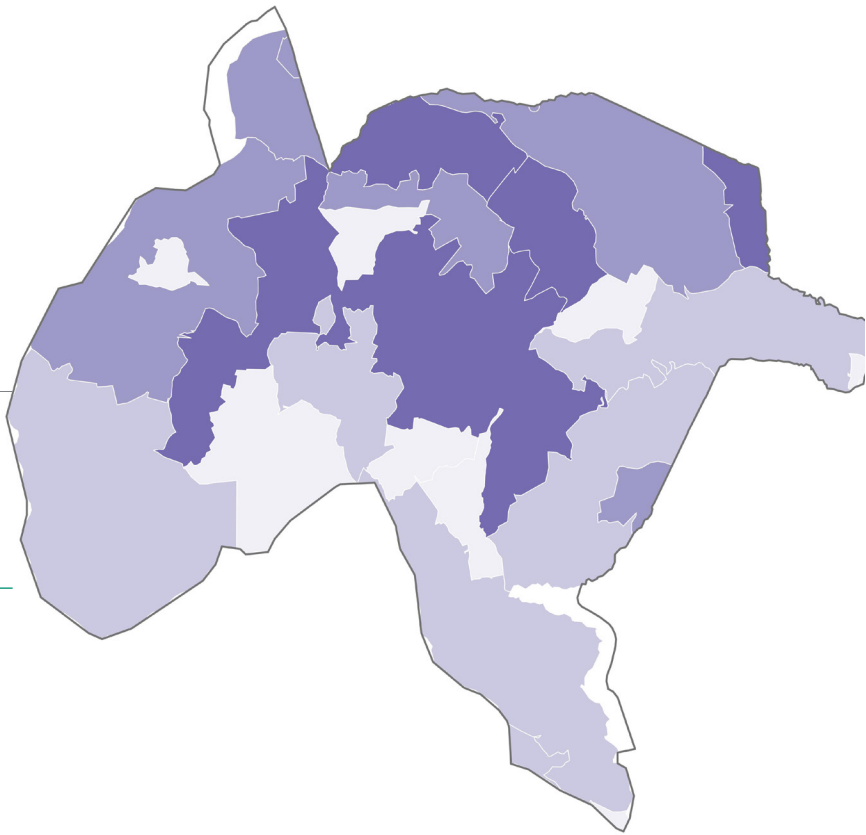
CHARLES COUNTY, MD

Share of Households, by Household Income

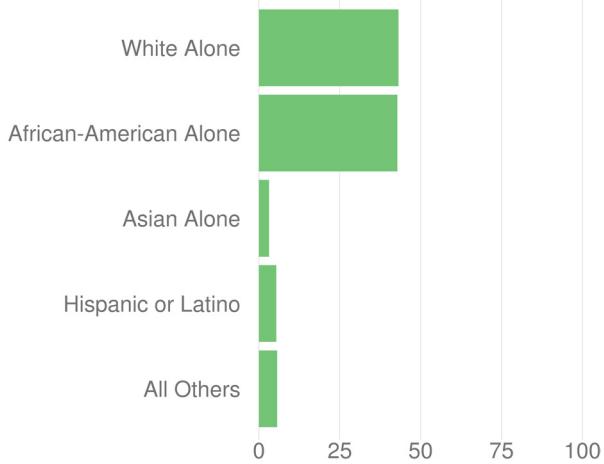


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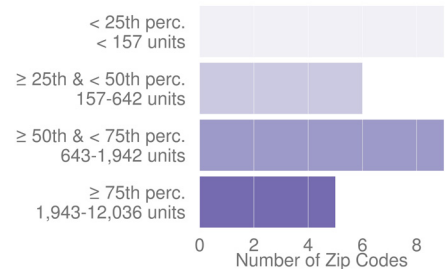
Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



Source: American Community Survey, 2013-2017.



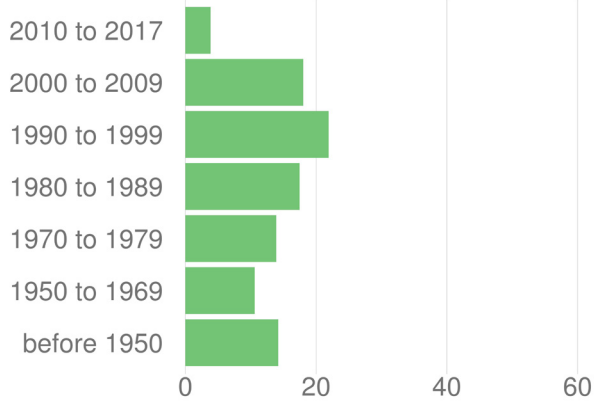
Source: American Community Survey, 2013-2017.

Figure includes all zip codes in this county, including those with very little county land area



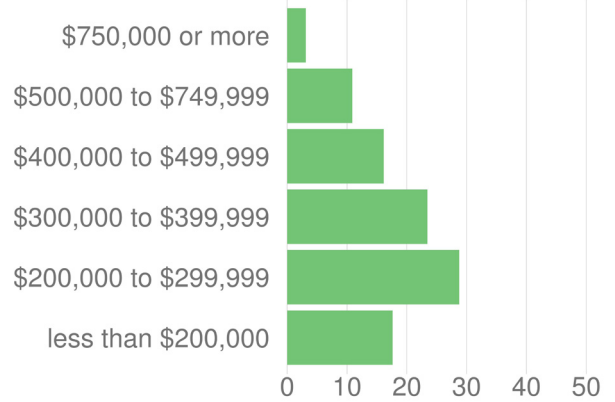
FREDERICK COUNTY, MD

Share of Residential Housing Units by Year Built



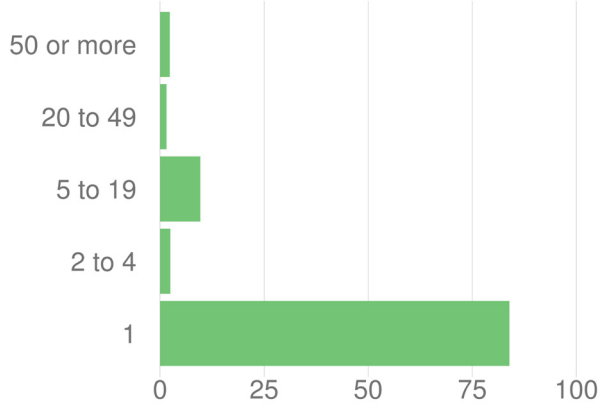
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



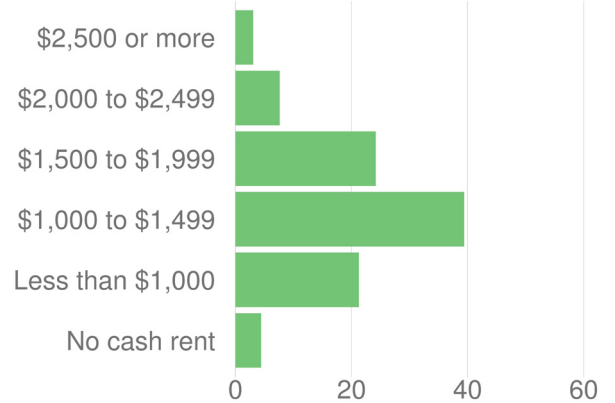
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

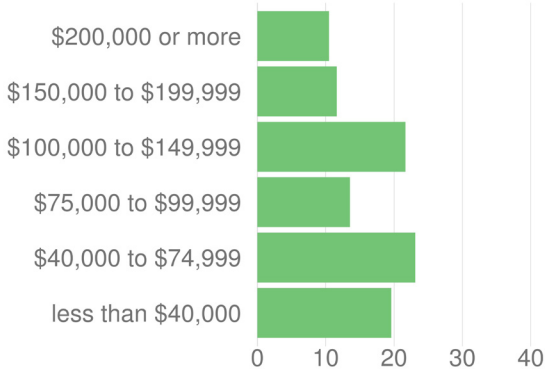


Source: American Community Survey, 2013-2017.



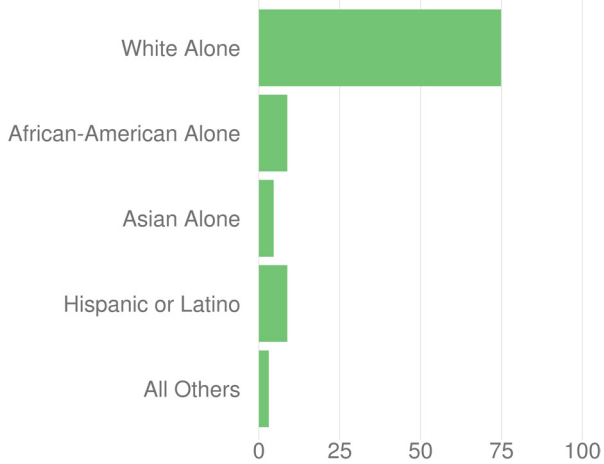
FREDERICK COUNTY, MD

Share of Households, by Household Income



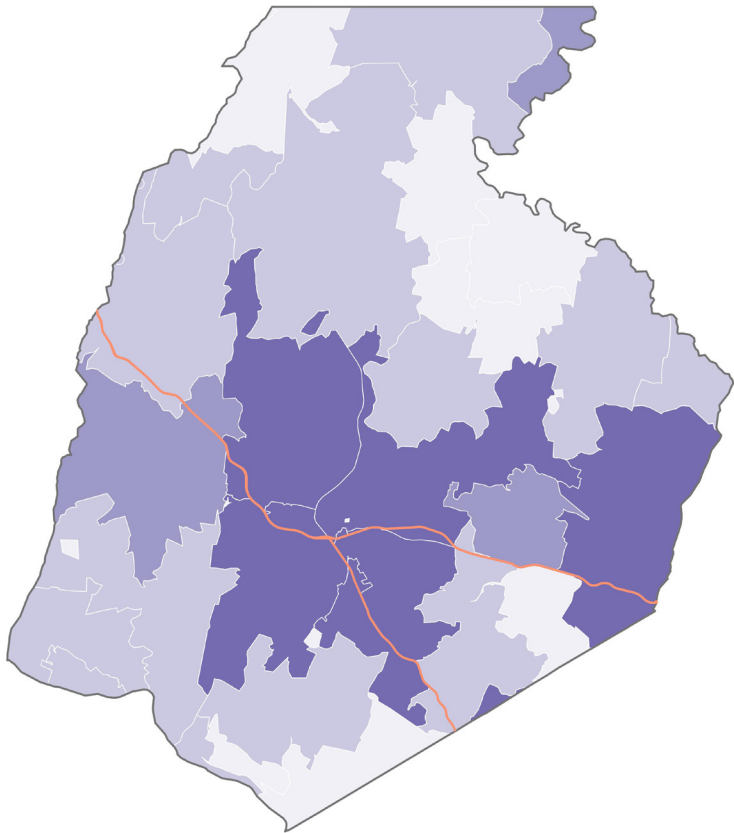
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Share of Population by Race and Ethnicity

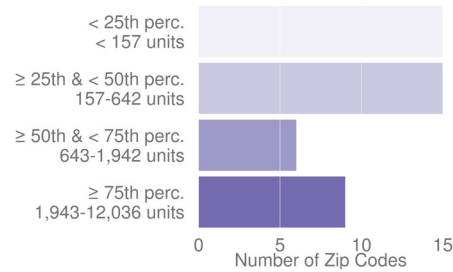


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code

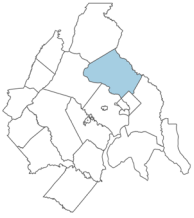


Orange lines: Highways



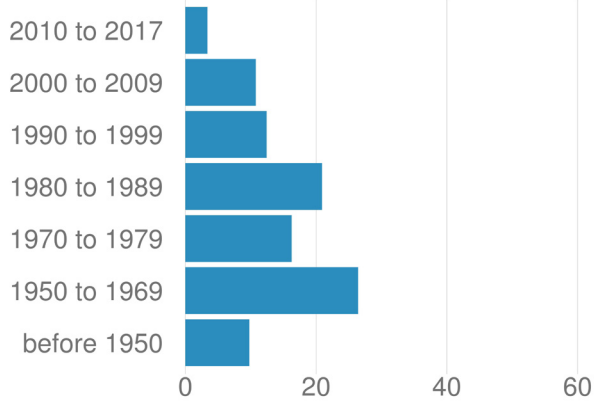
Source: American Community Survey, 2013-2017.

Figure includes all zip codes in this county, including those with very little county land area



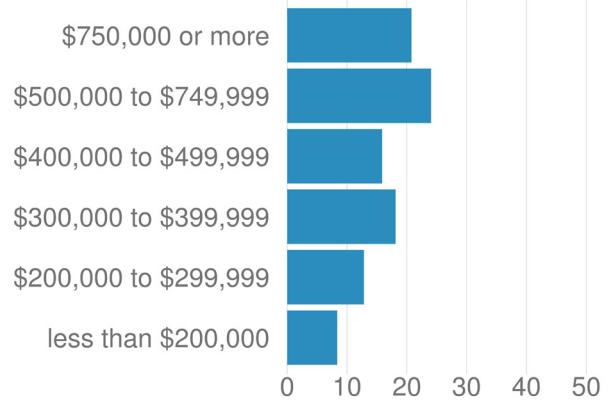
MONTGOMERY COUNTY, MD

Share of Residential Housing Units by Year Built



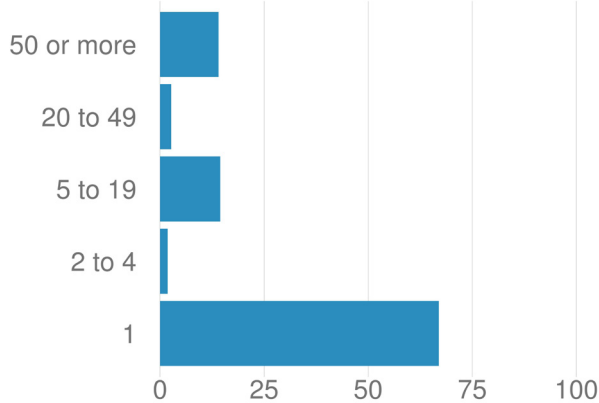
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



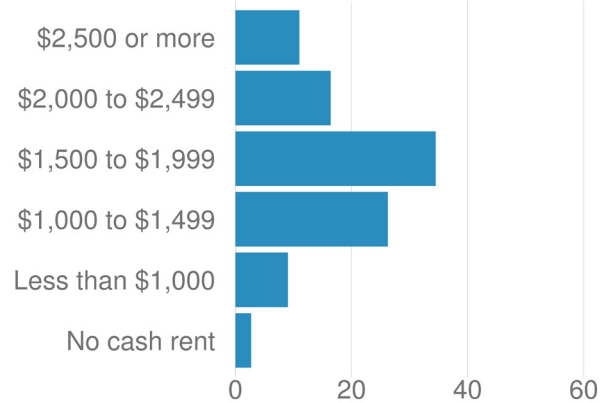
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

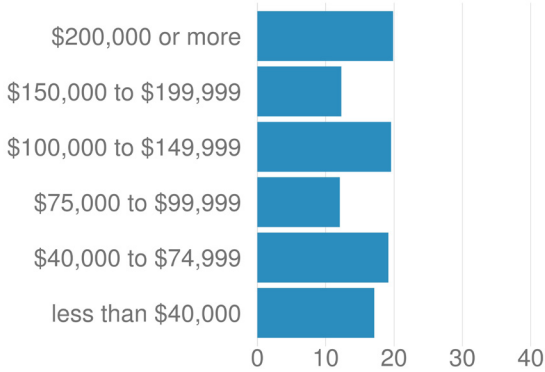


Source: American Community Survey, 2013-2017.



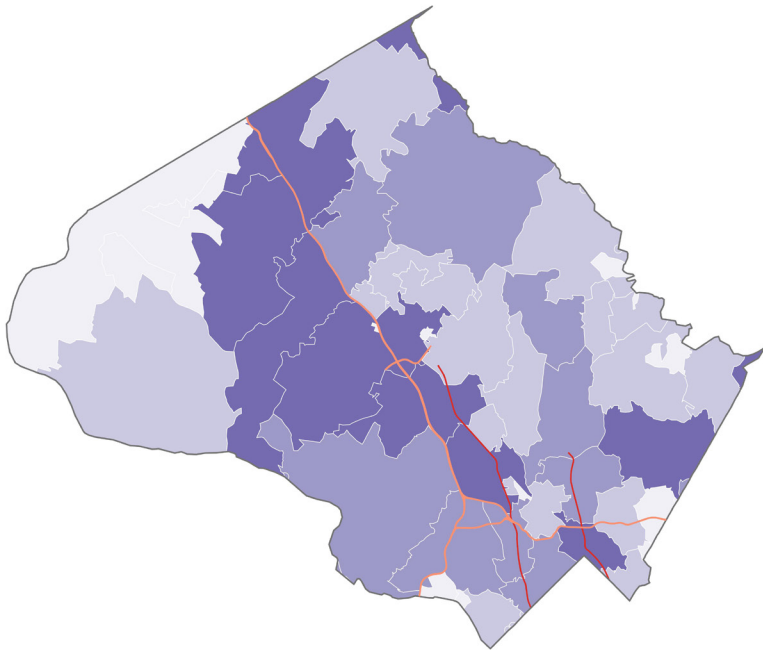
MONTGOMERY COUNTY, MD

Share of Households, by Household Income

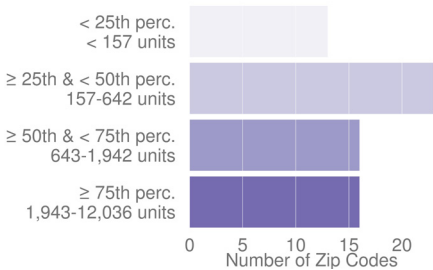


Source: American Community Survey, 2013-2017.

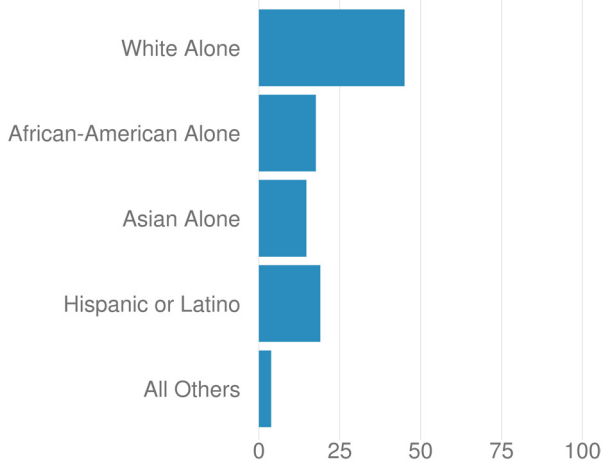
Number Housing Units Built 2000 and After by Zip Code



Red lines: Metro
Orange lines: Highways



Share of Population by Race and Ethnicity



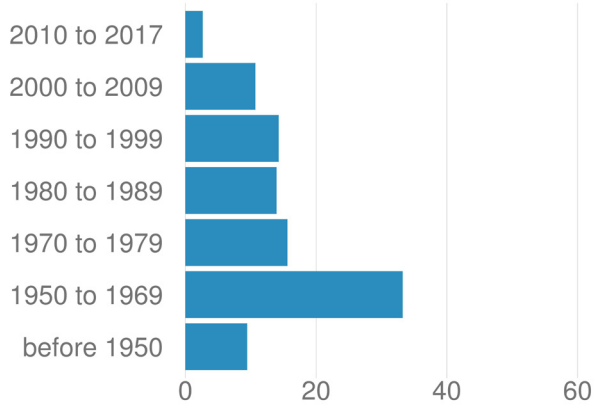
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



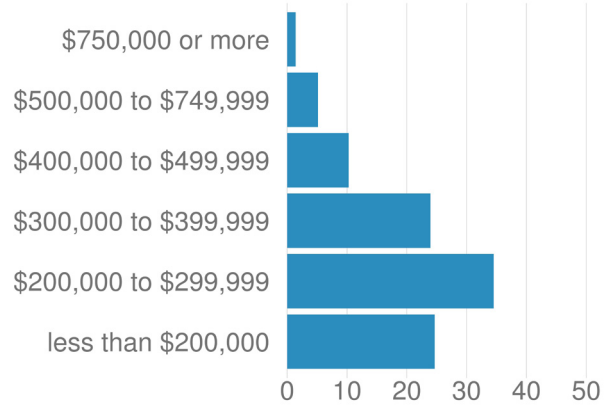
PRINCE GEORGE'S COUNTY, MD

Share of Residential Housing Units by Year Built



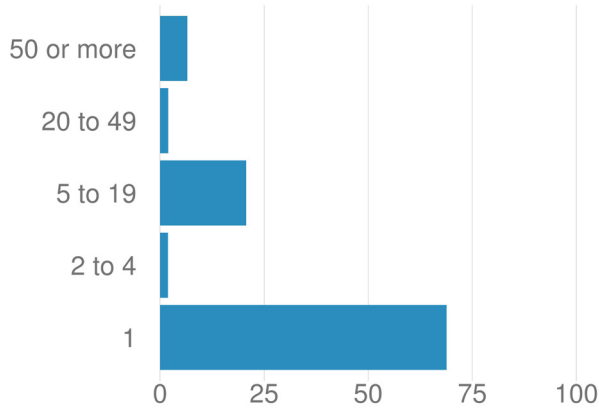
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



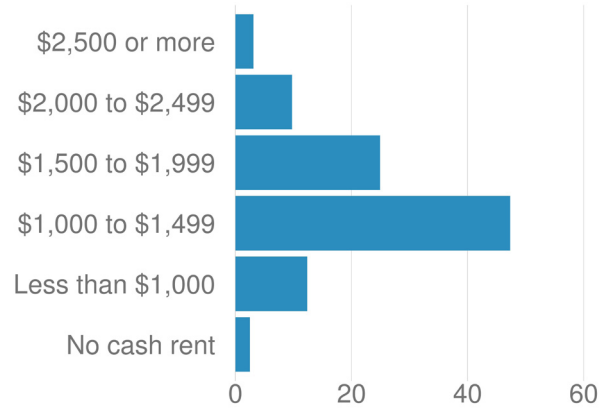
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

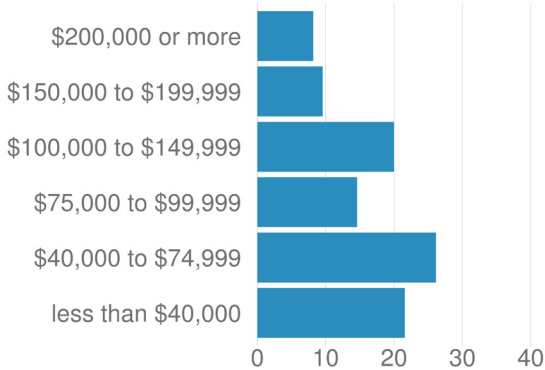


Source: American Community Survey, 2013-2017.



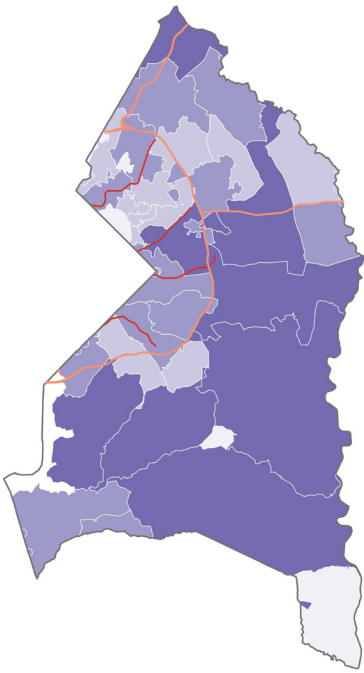
PRINCE GEORGE'S COUNTY, MD

Share of Households, by Household Income

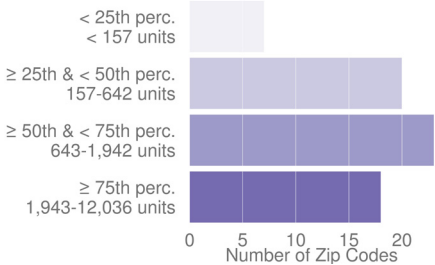


Source: American Community Survey, 2013-2017.

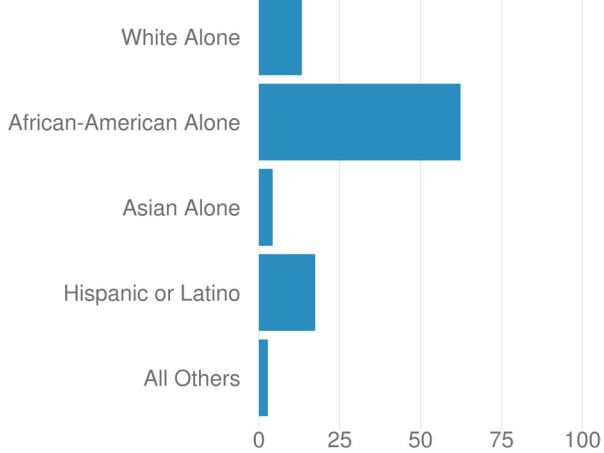
Number Housing Units Built 2000 and After by Zip Code



Red lines: Metro
Orange lines: Highways



Share of Population by Race and Ethnicity



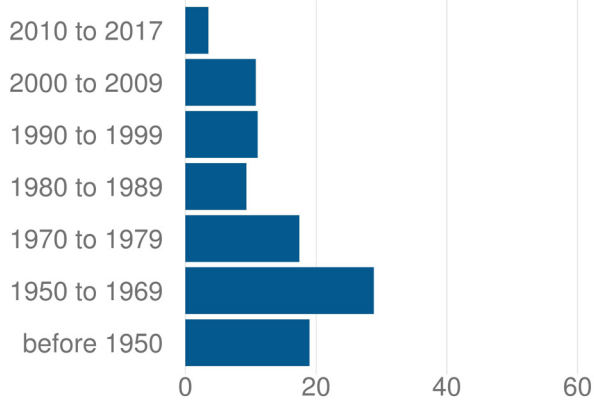
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



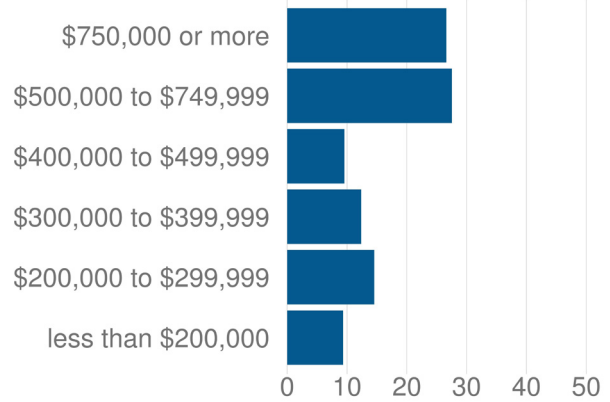
CITY OF ALEXANDRIA, VA

Share of Residential Housing Units by Year Built



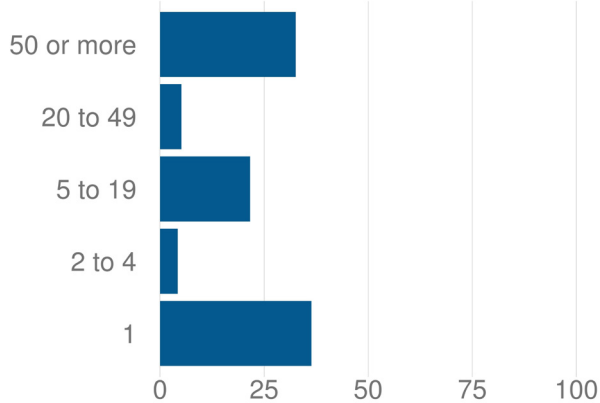
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



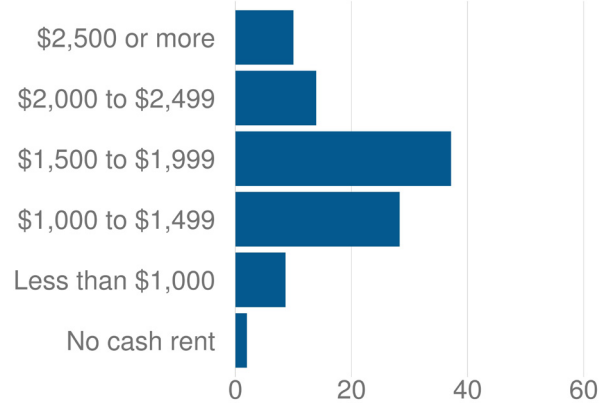
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

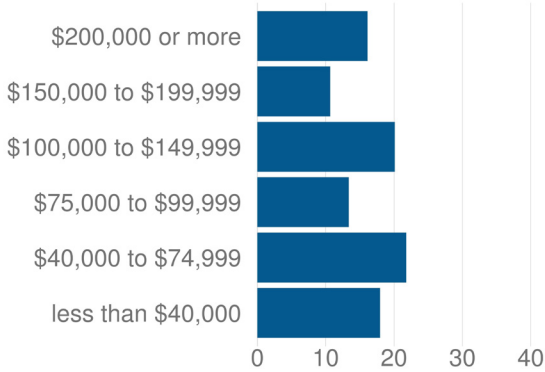


Source: American Community Survey, 2013-2017.



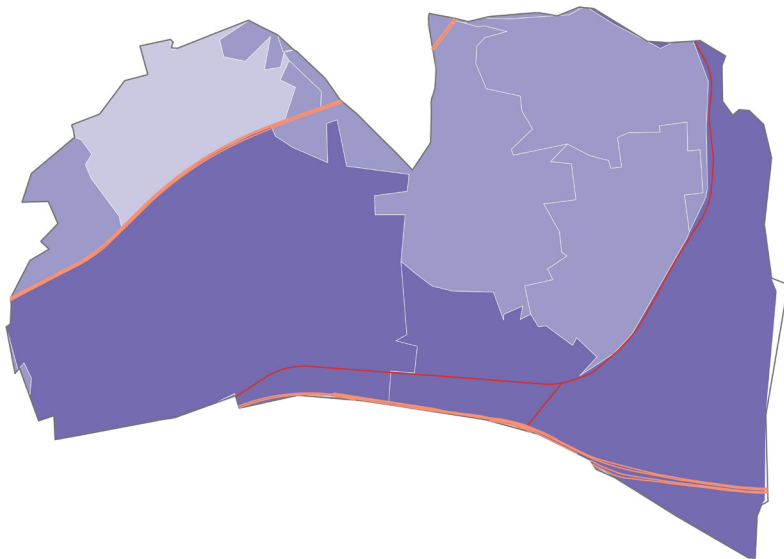
CITY OF ALEXANDRIA, VA

Share of Households, by Household Income

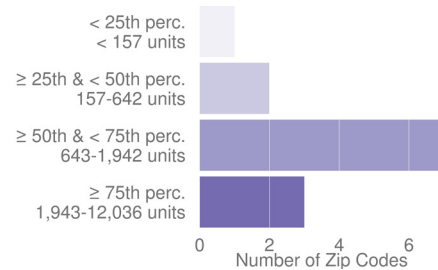


Source: American Community Survey, 2013-2017.

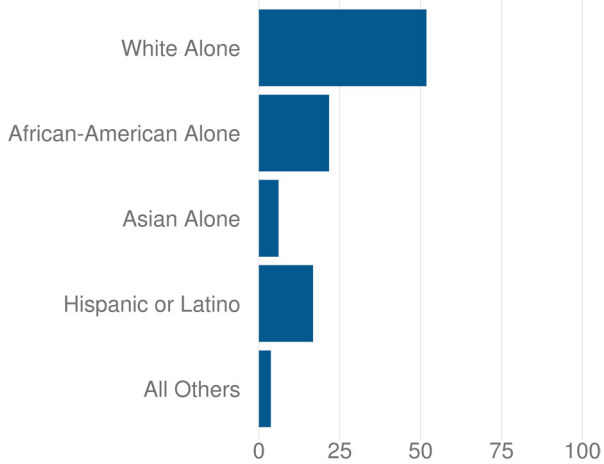
Number Housing Units Built 2000 and After by Zip Code



Red lines: Metro
Orange lines: Highways



Share of Population by Race and Ethnicity



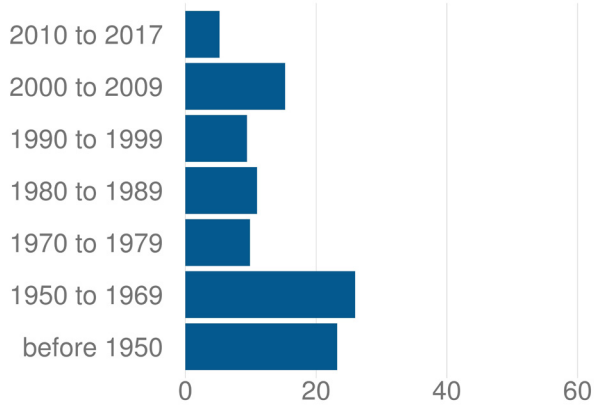
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



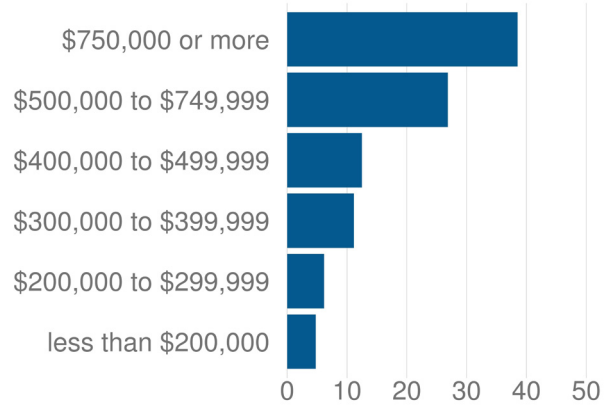
ARLINGTON COUNTY, VA

Share of Residential Housing Units by Year Built



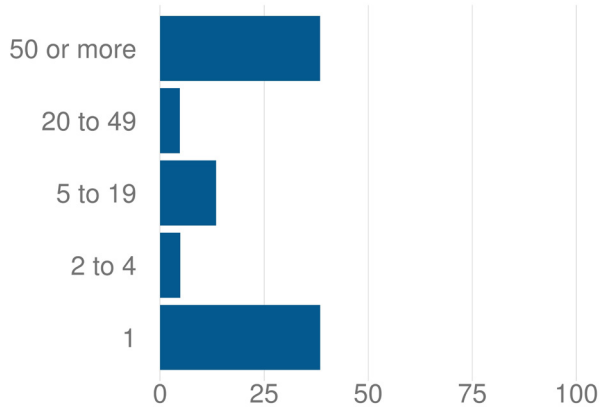
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



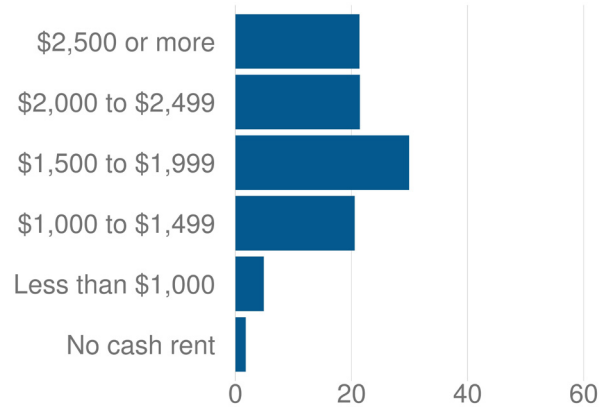
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

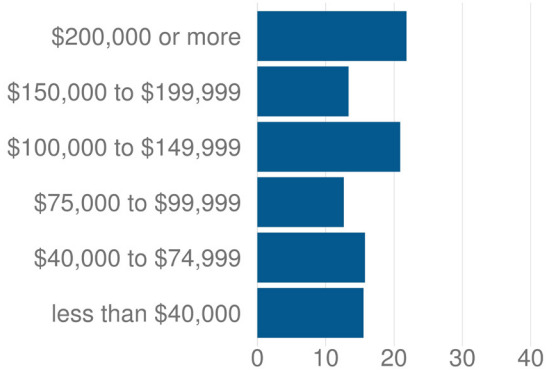


Source: American Community Survey, 2013-2017.



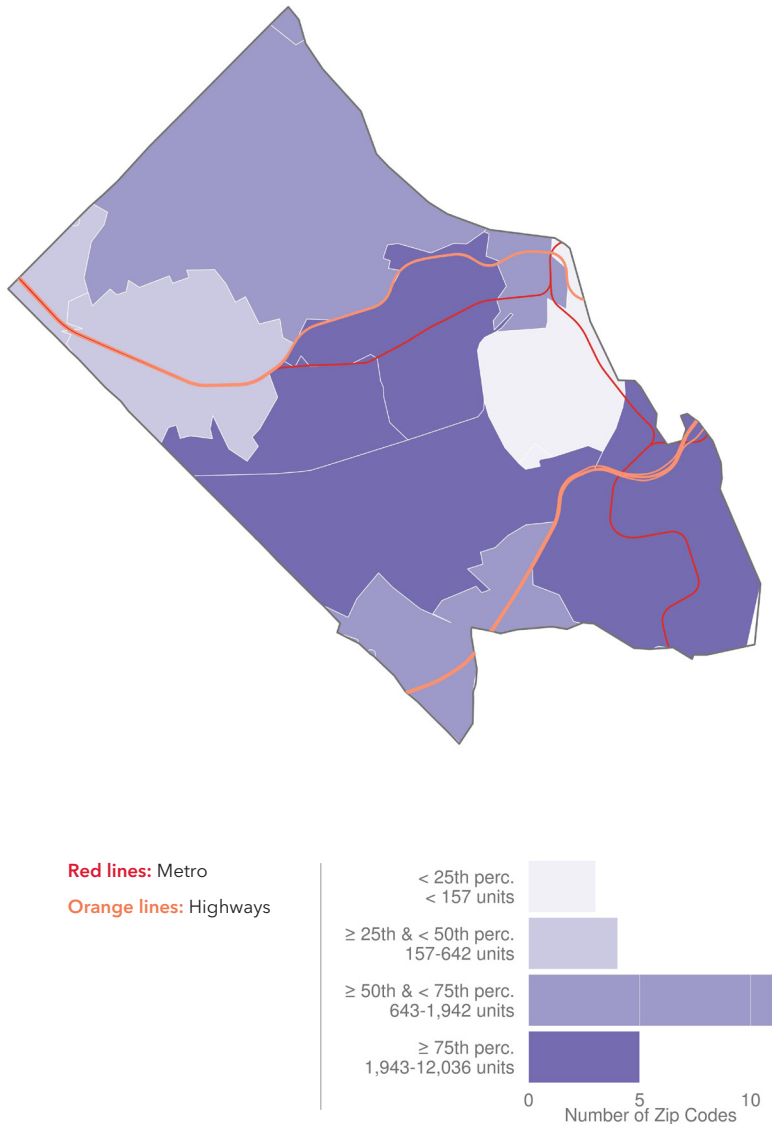
ARLINGTON COUNTY, VA

Share of Households, by Household Income



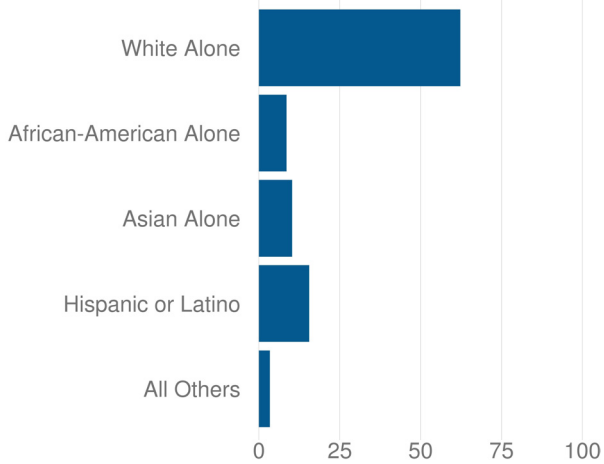
Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area

Share of Population by Race and Ethnicity

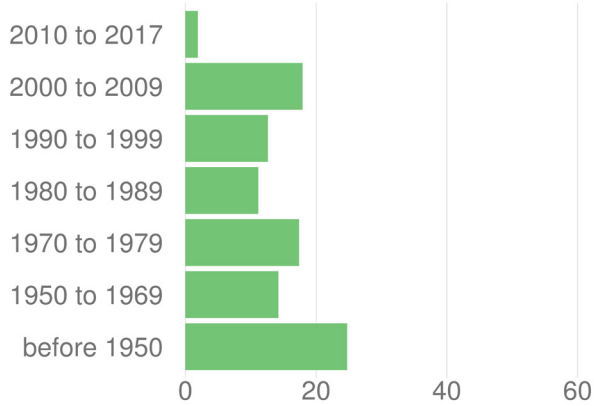


Source: American Community Survey, 2013-2017.



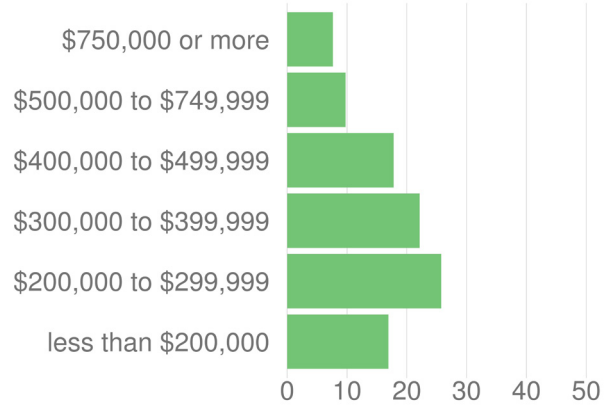
CLARKE COUNTY, VA

Share of Residential Housing Units by Year Built



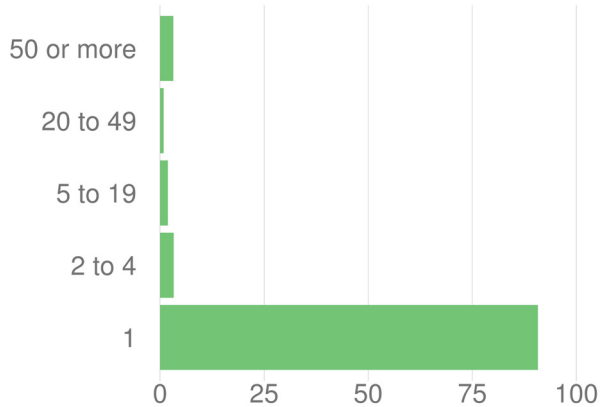
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



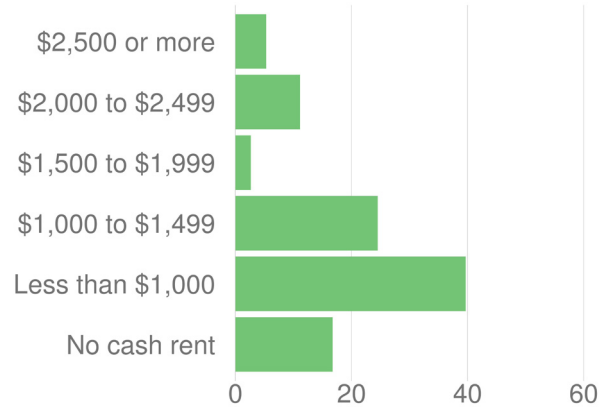
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

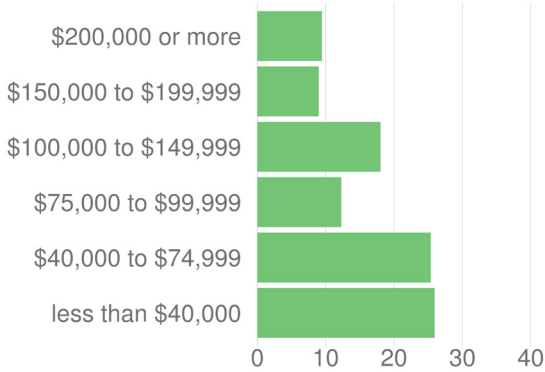


Source: American Community Survey, 2013-2017.



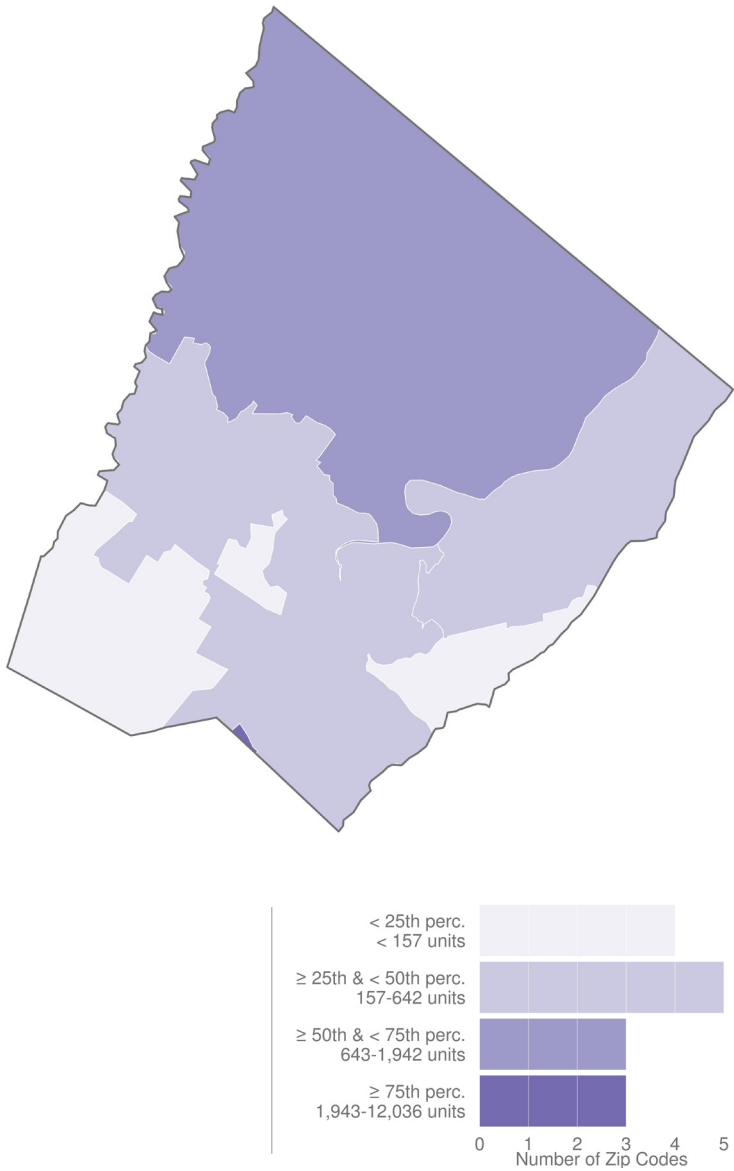
CLARKE COUNTY, VA

Share of Households, by Household Income

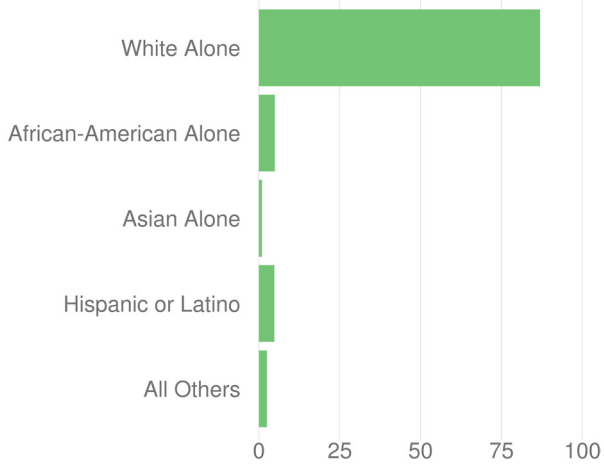


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



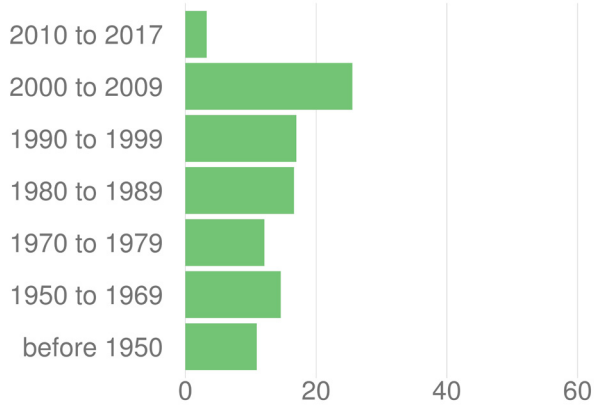
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



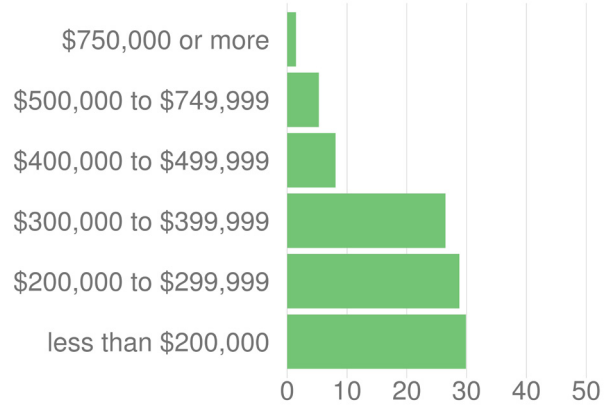
CULPEPER COUNTY, VA

Share of Residential Housing Units by Year Built



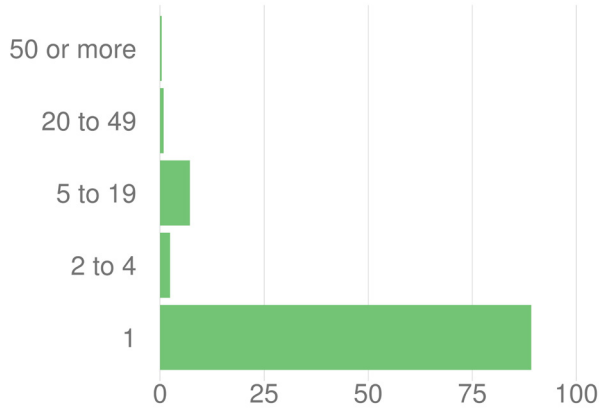
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



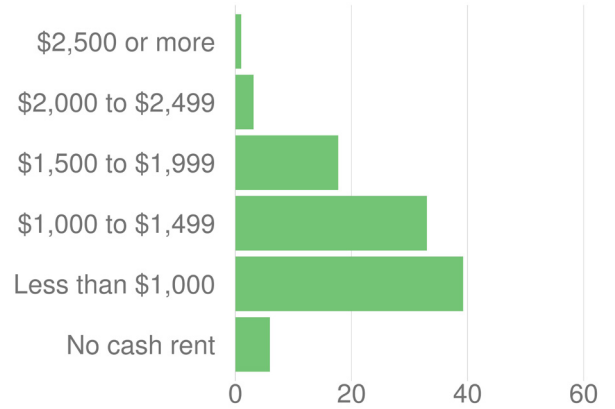
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

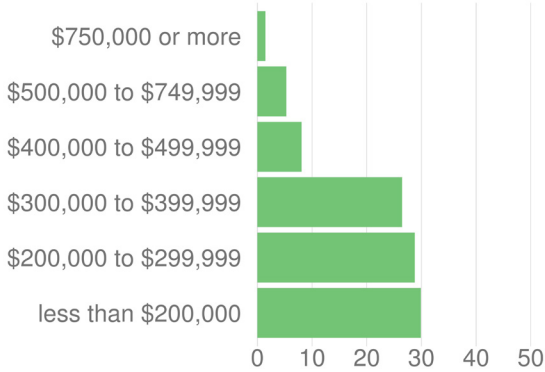


Source: American Community Survey, 2013-2017.



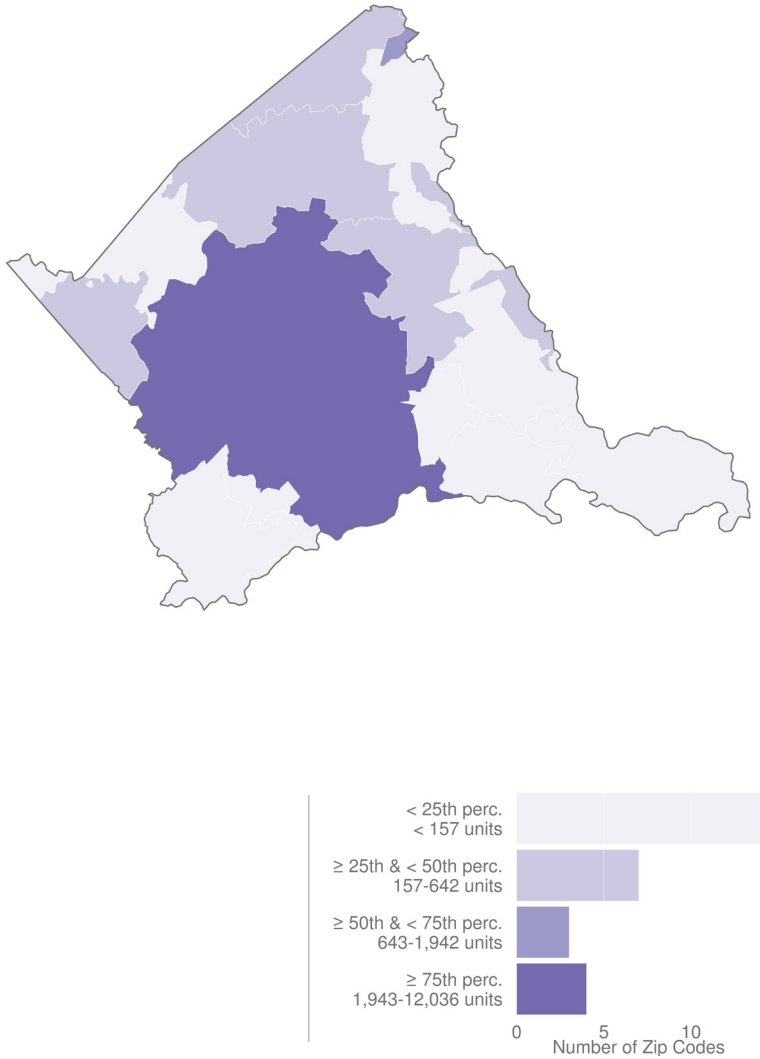
CULPEPER COUNTY, VA

Share of Households, by Household Income

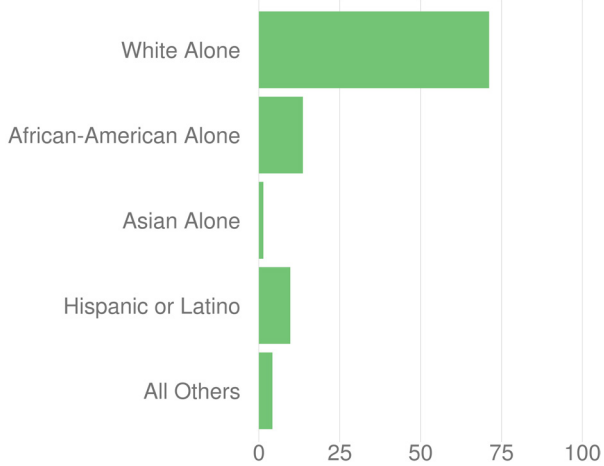


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



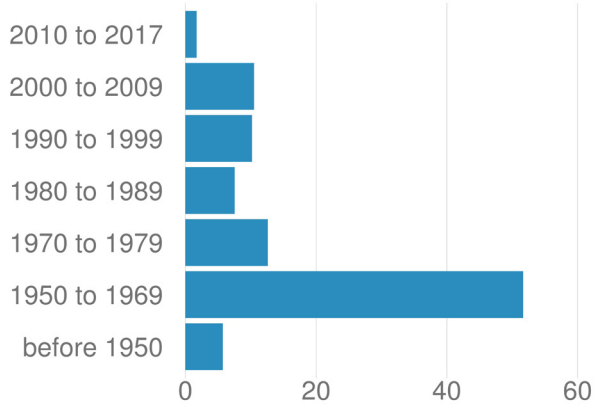
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



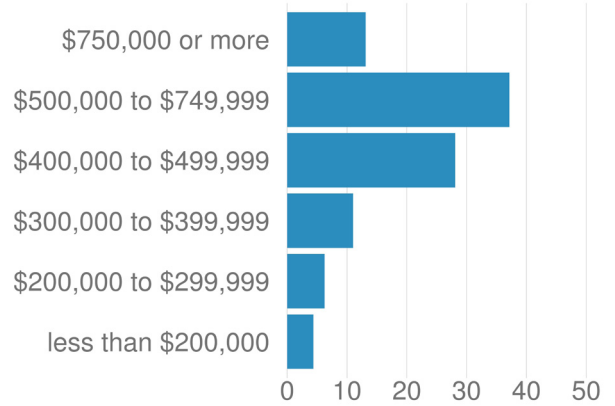
FAIRFAX CITY, VA

Share of Residential Housing Units by Year Built



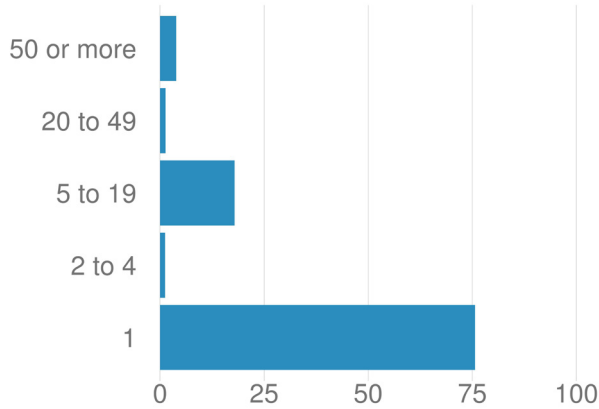
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



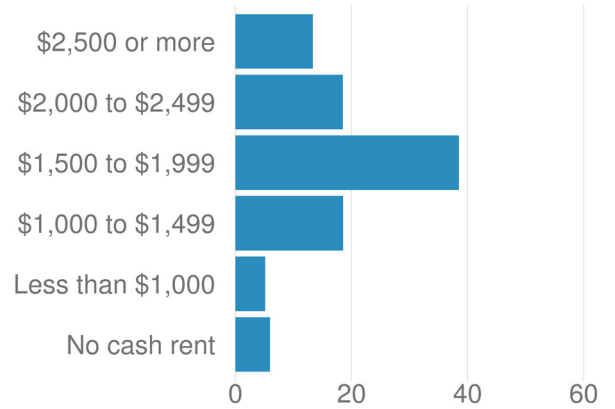
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

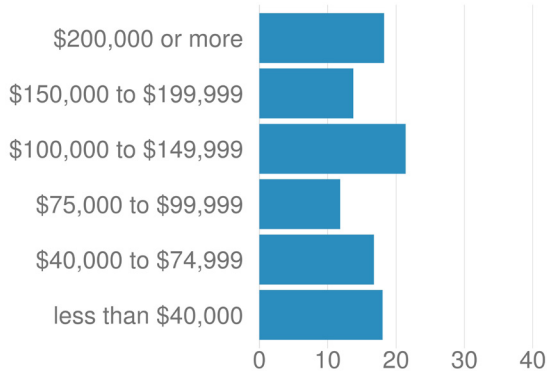


Source: American Community Survey, 2013-2017.



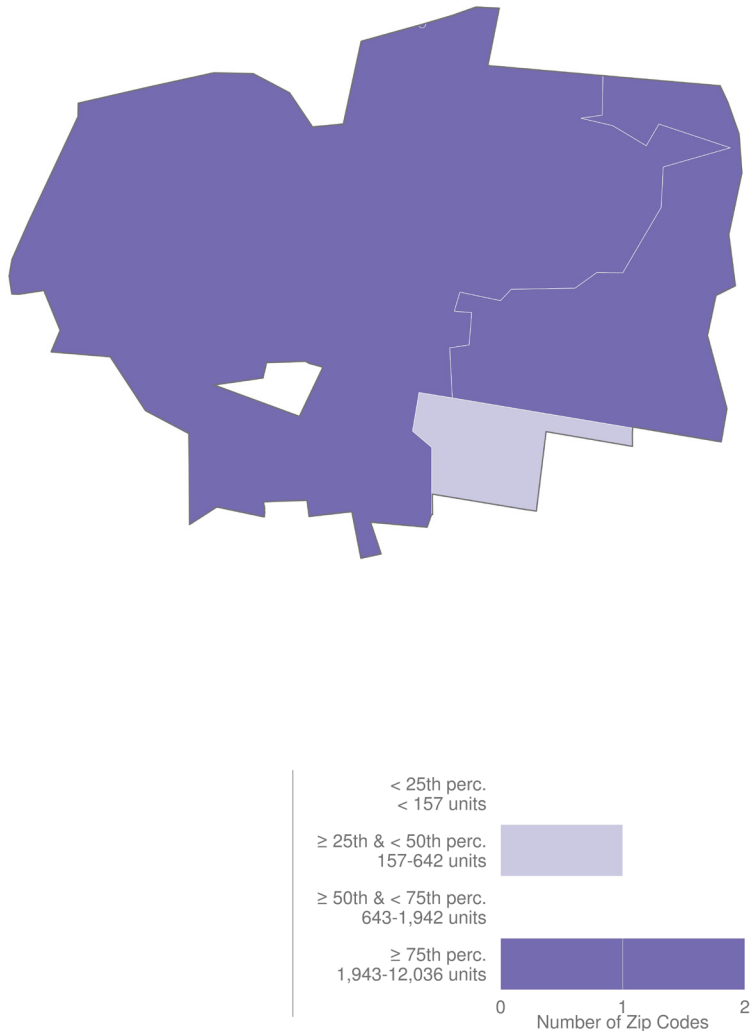
FAIRFAX CITY, VA

Share of Households, by Household Income

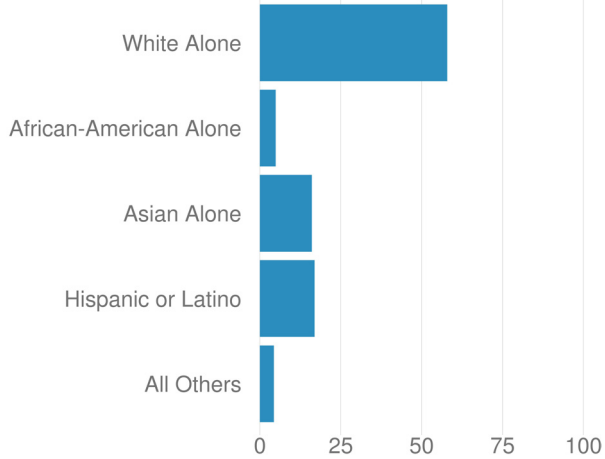


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



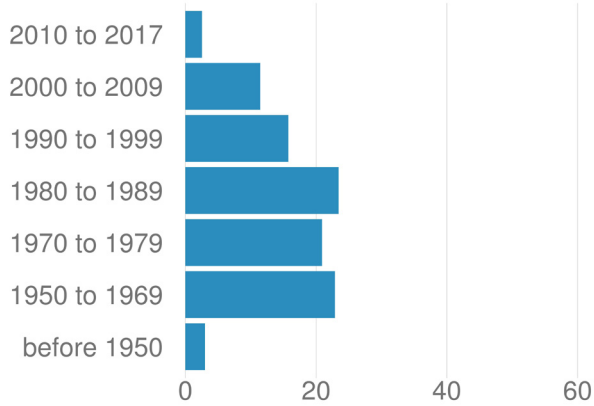
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



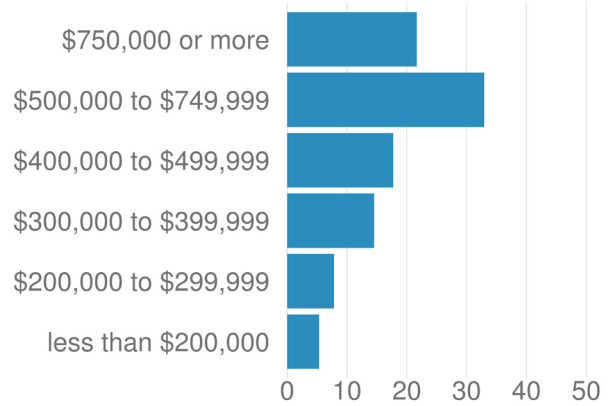
FAIRFAX COUNTY, VA

Share of Residential Housing Units by Year Built



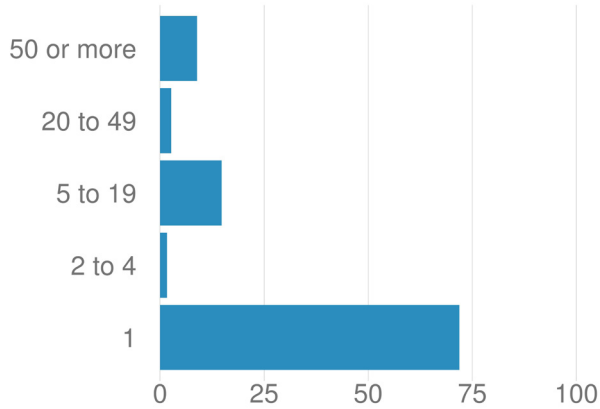
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



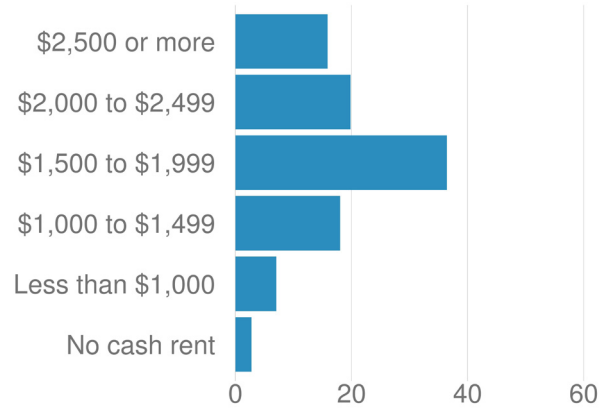
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

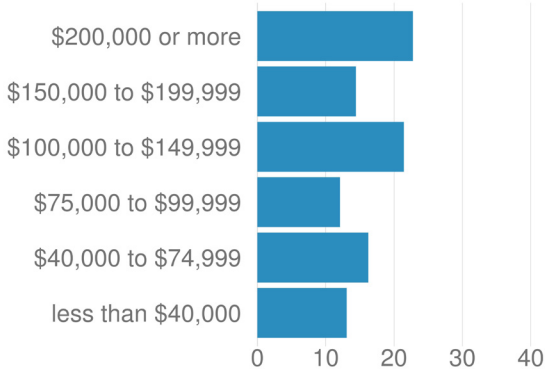


Source: American Community Survey, 2013-2017.



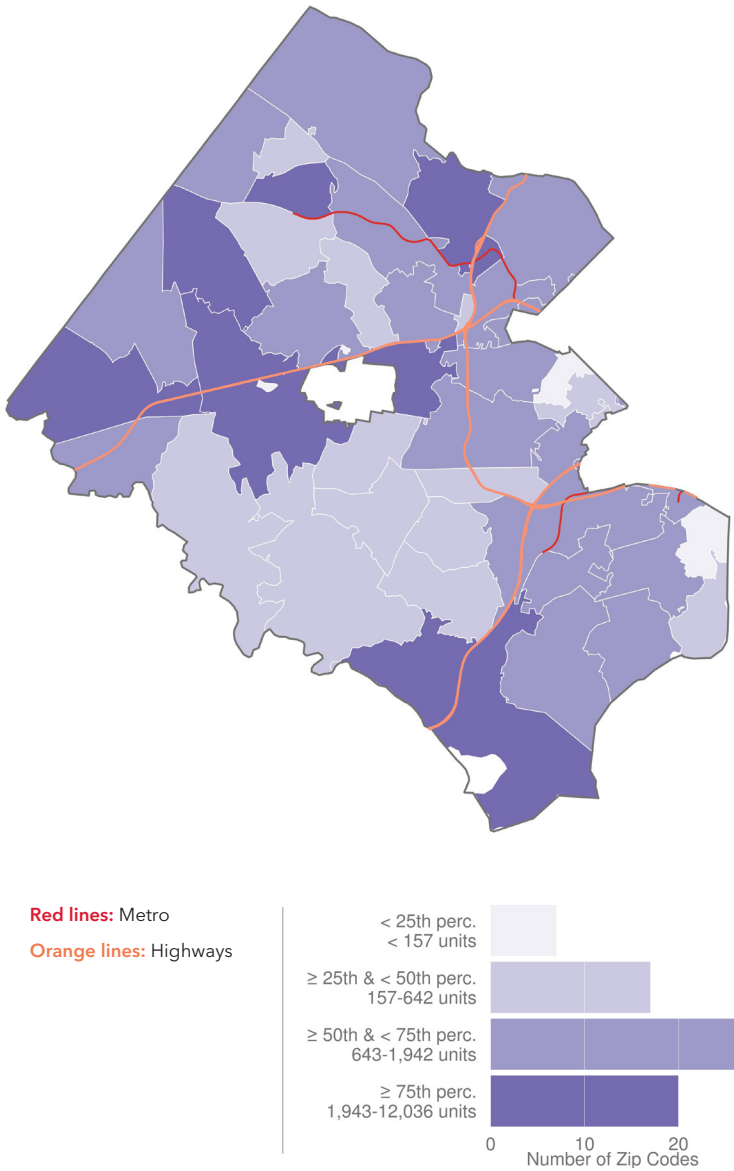
FAIRFAX COUNTY, VA

Share of Households, by Household Income



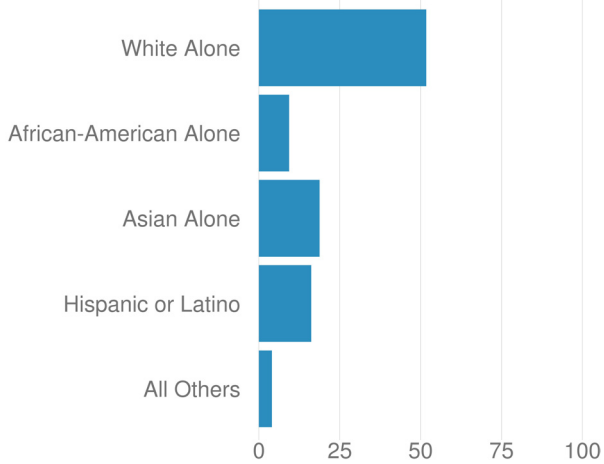
Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area

Share of Population by Race and Ethnicity

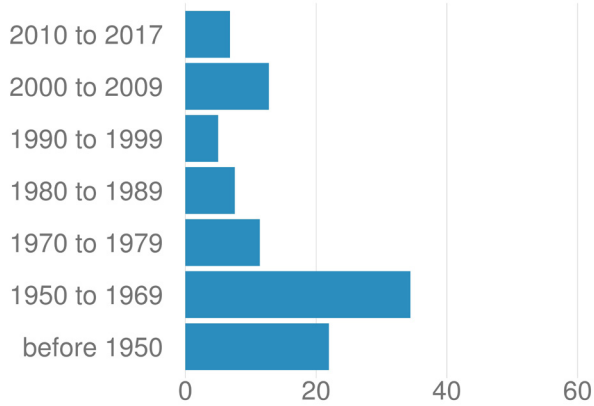


Source: American Community Survey, 2013-2017.



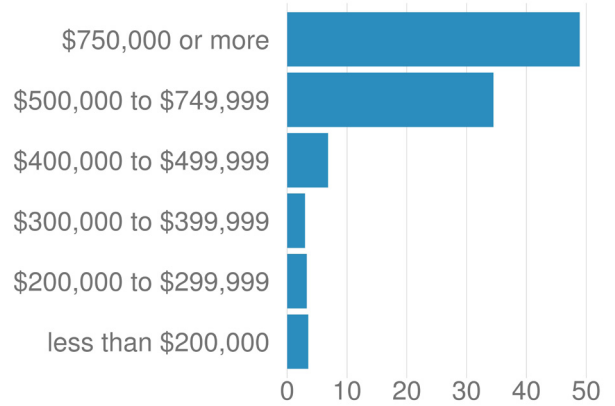
FALLS CHURCH CITY, VA

Share of Residential Housing Units by Year Built



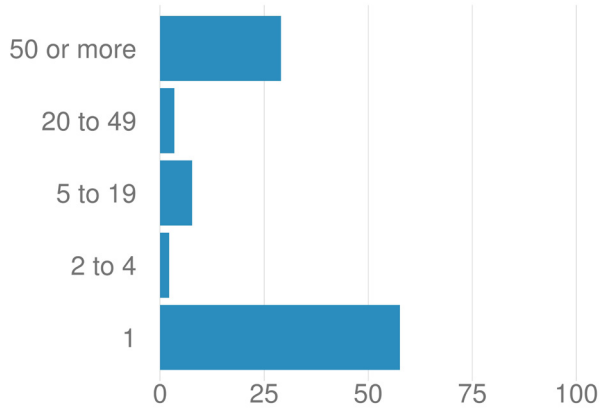
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



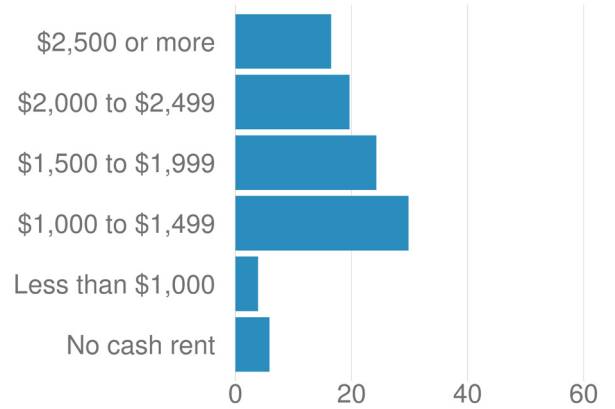
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

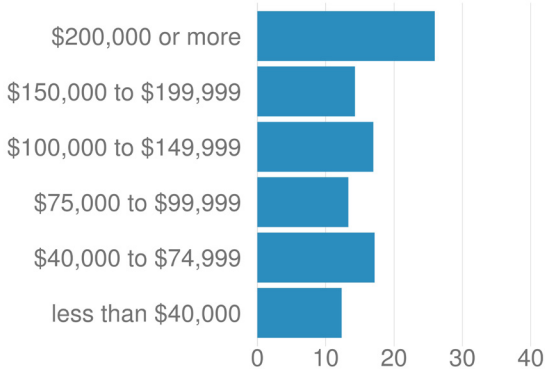


Source: American Community Survey, 2013-2017.



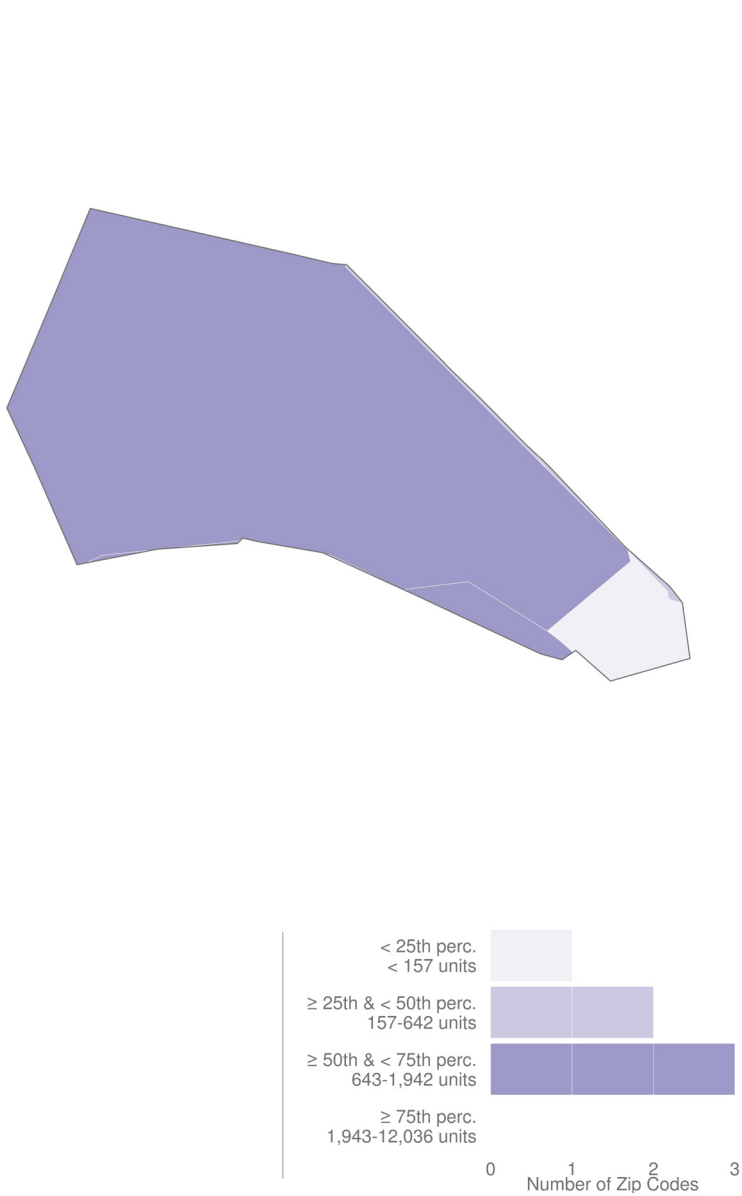
FALLS CHURCH CITY, VA

Share of Households, by Household Income

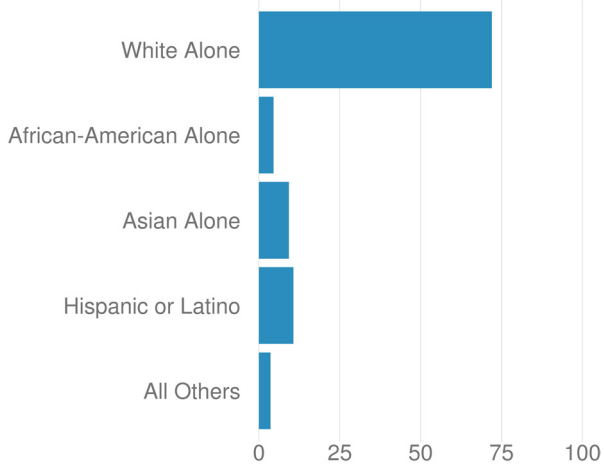


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



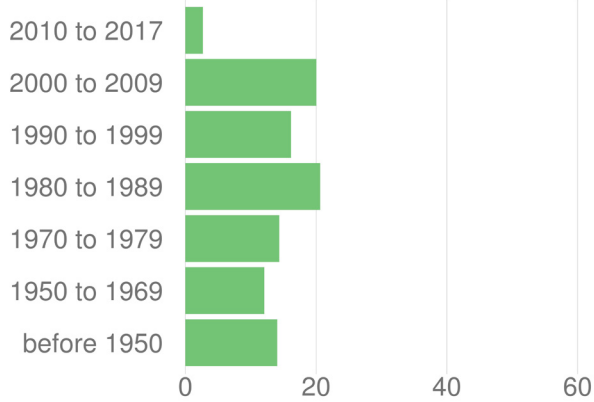
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



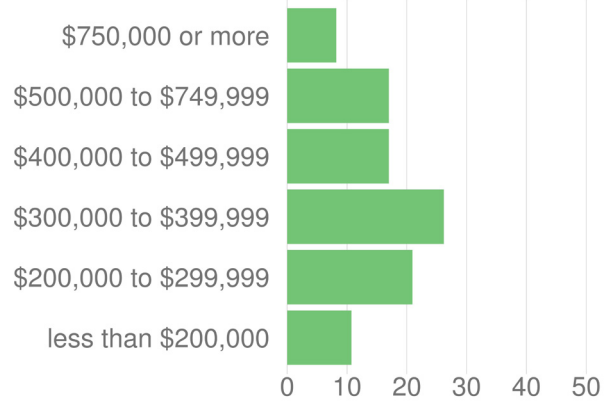
FAUQUIER COUNTY, VA

Share of Residential Housing Units by Year Built



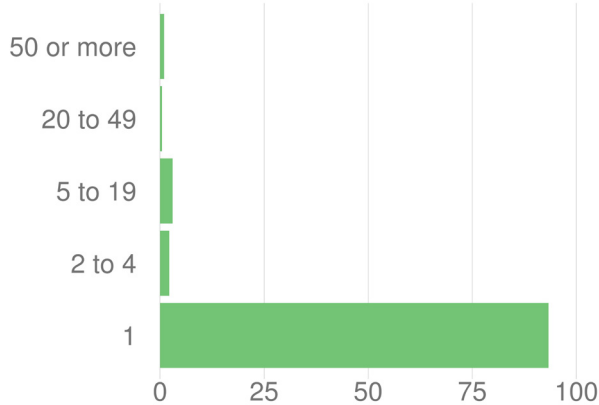
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



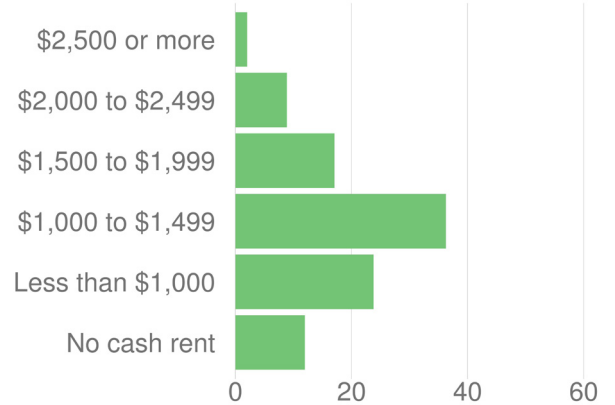
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

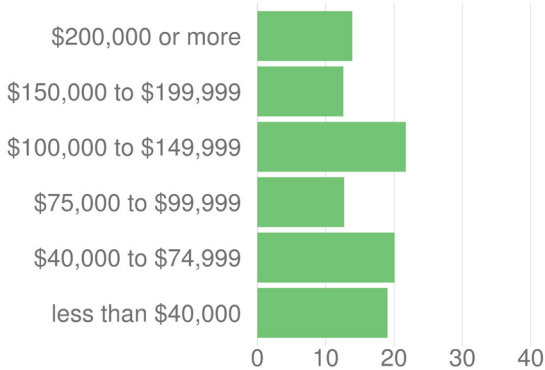


Source: American Community Survey, 2013-2017.



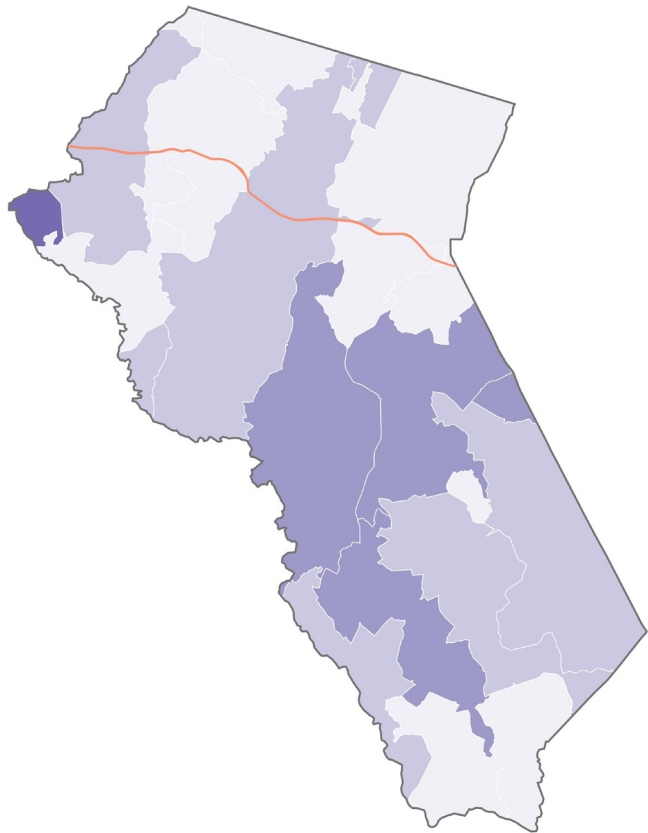
FAUQUIER COUNTY, VA

Share of Households, by Household Income

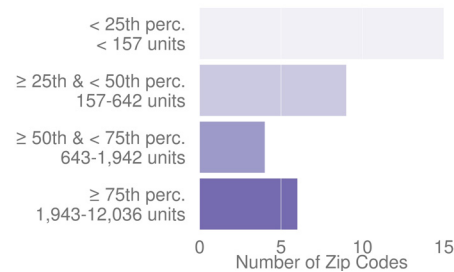


Source: American Community Survey, 2013-2017.

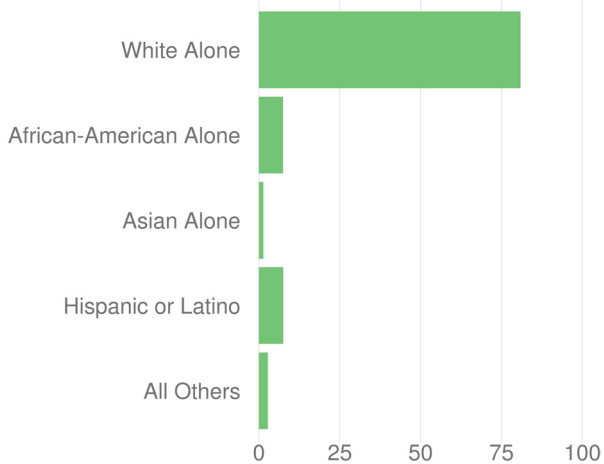
Number Housing Units Built 2000 and After by Zip Code



Orange lines: Highways



Share of Population by Race and Ethnicity



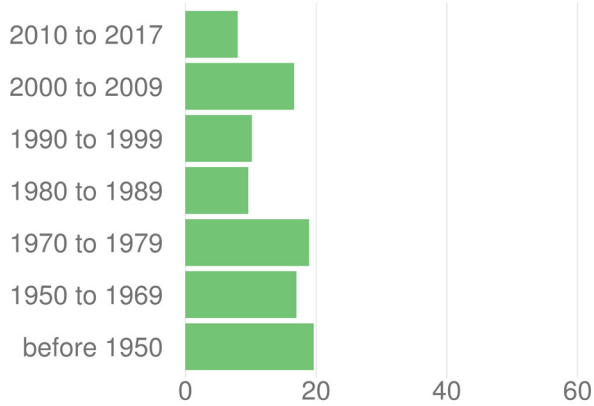
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



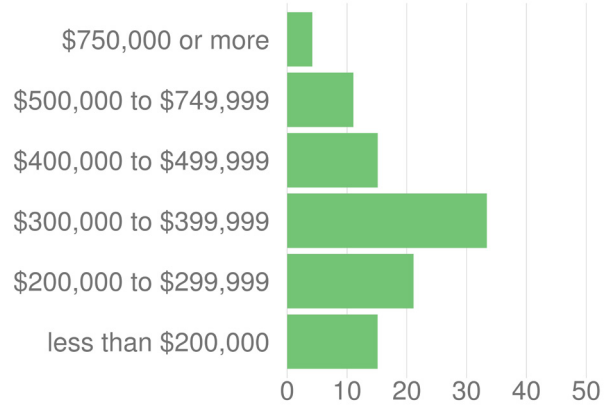
FREDERICKSBURG CITY, VA

Share of Residential Housing Units by Year Built



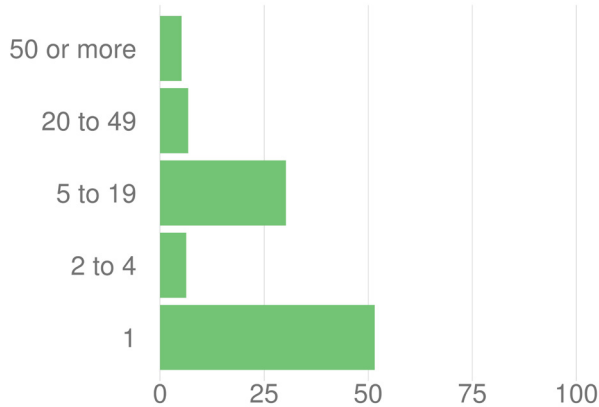
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



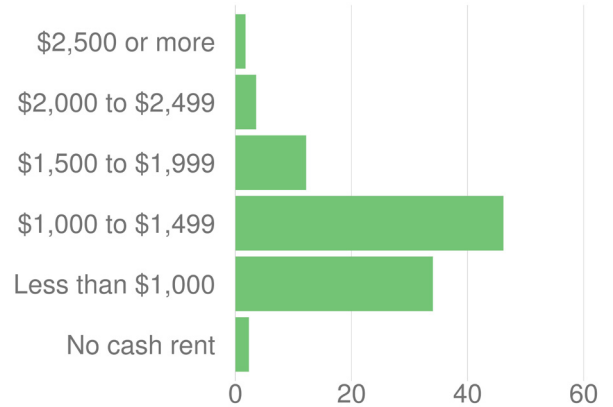
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

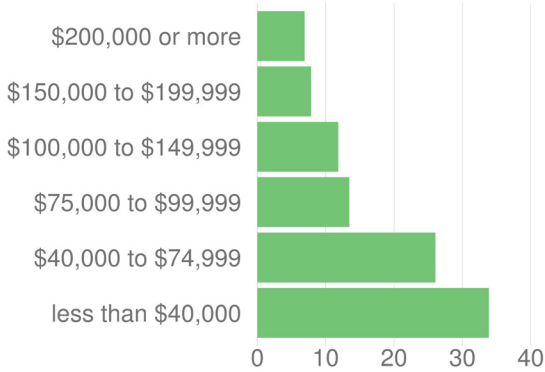


Source: American Community Survey, 2013-2017.



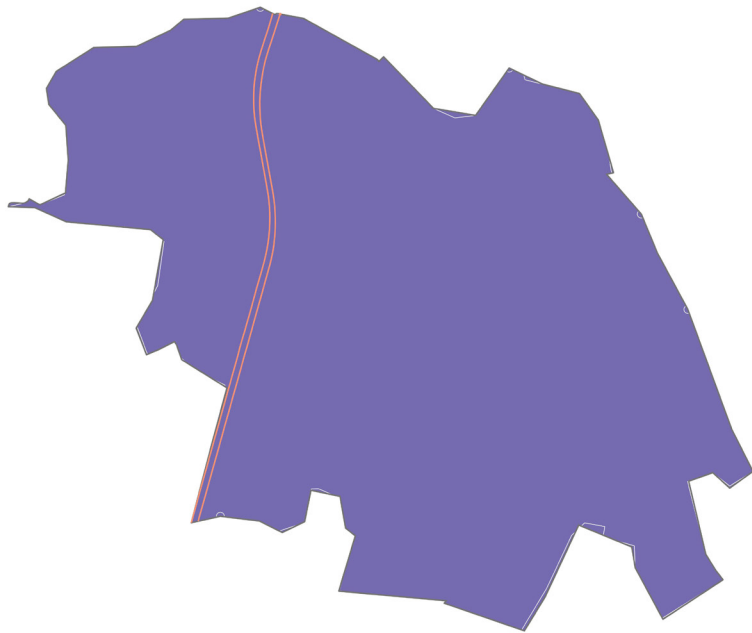
FREDERICKSBURG CITY, VA

Share of Households, by Household Income

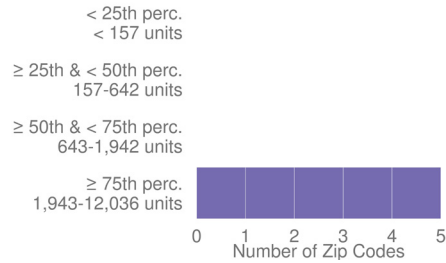


Source: American Community Survey, 2013-2017.

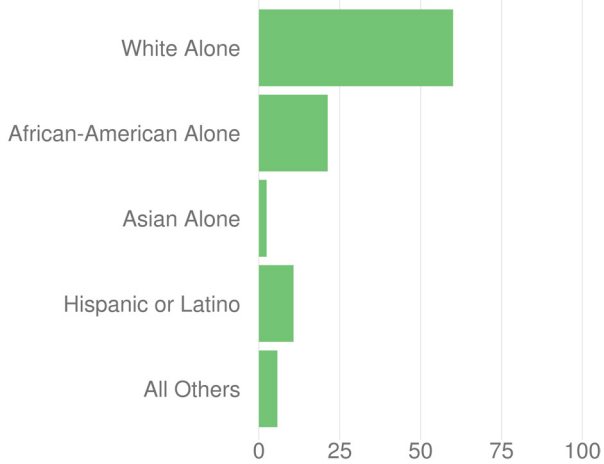
Number Housing Units Built 2000 and After by Zip Code



Orange lines: Highways



Share of Population by Race and Ethnicity



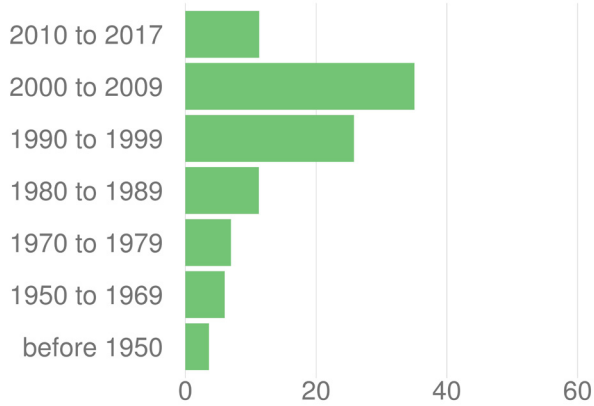
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



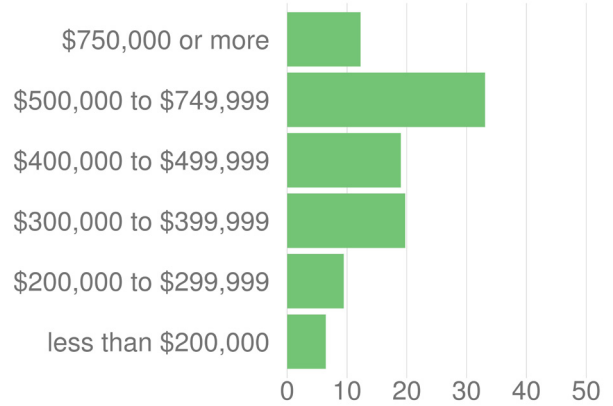
LOUDOUN COUNTY, VA

Share of Residential Housing Units by Year Built



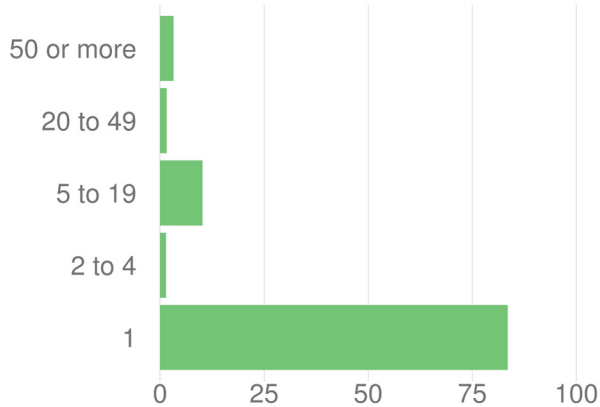
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



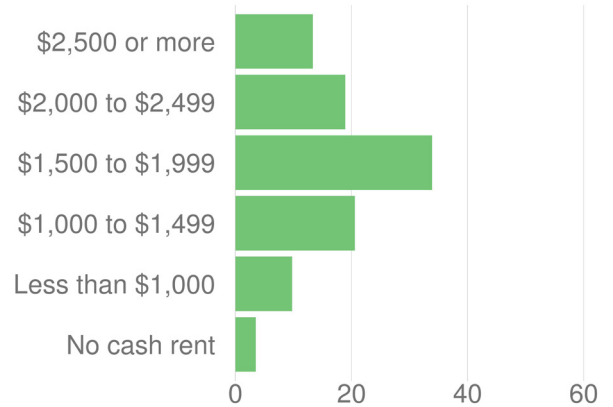
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure

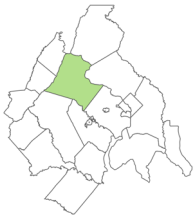


Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

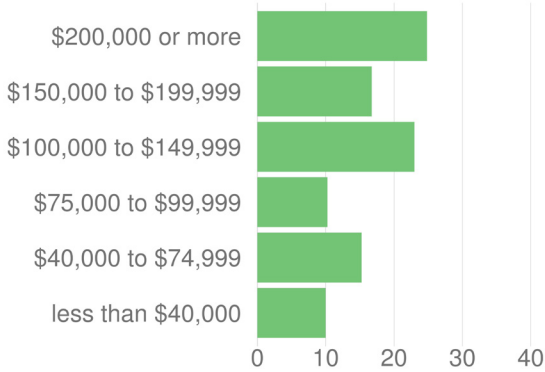


Source: American Community Survey, 2013-2017.



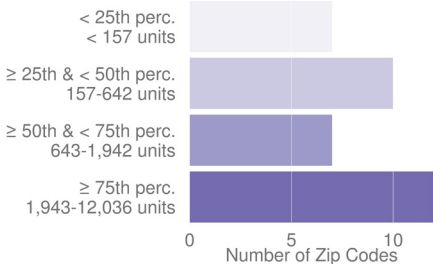
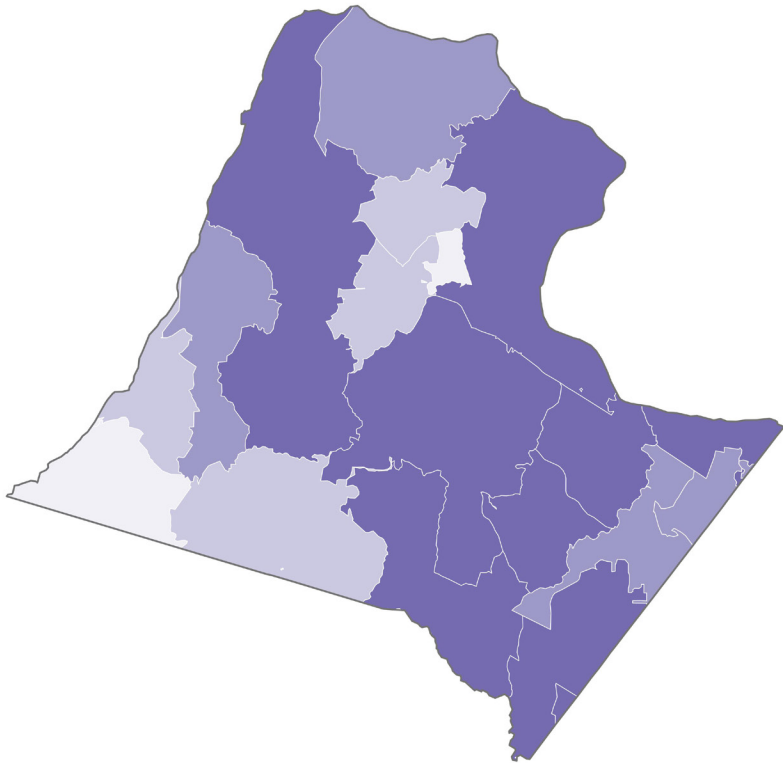
LOUDOUN COUNTY, VA

Share of Households, by Household Income

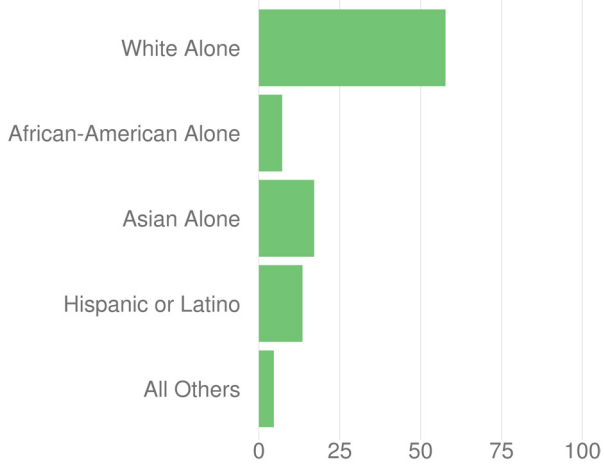


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



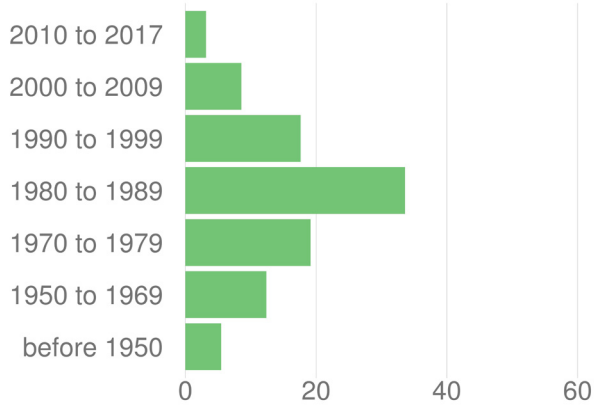
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



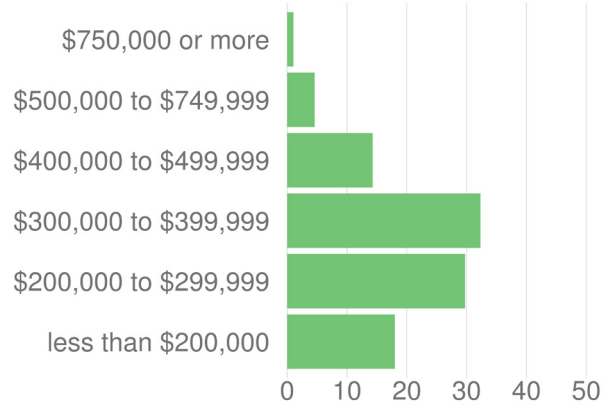
MANASSAS CITY, VA

Share of Residential Housing Units by Year Built



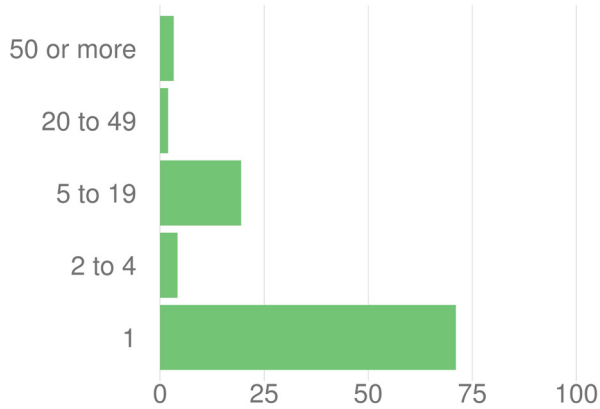
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



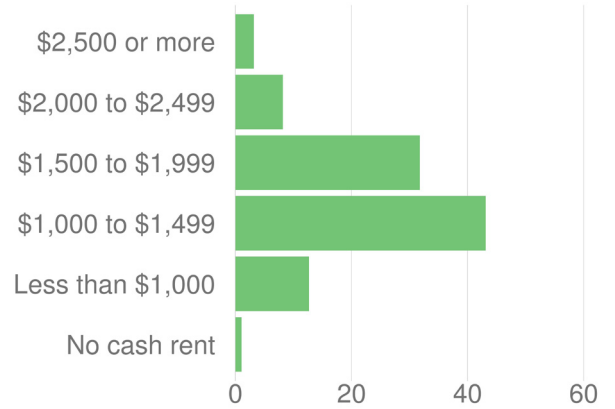
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

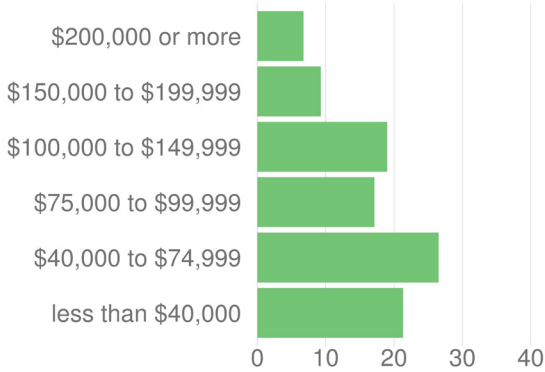


Source: American Community Survey, 2013-2017.



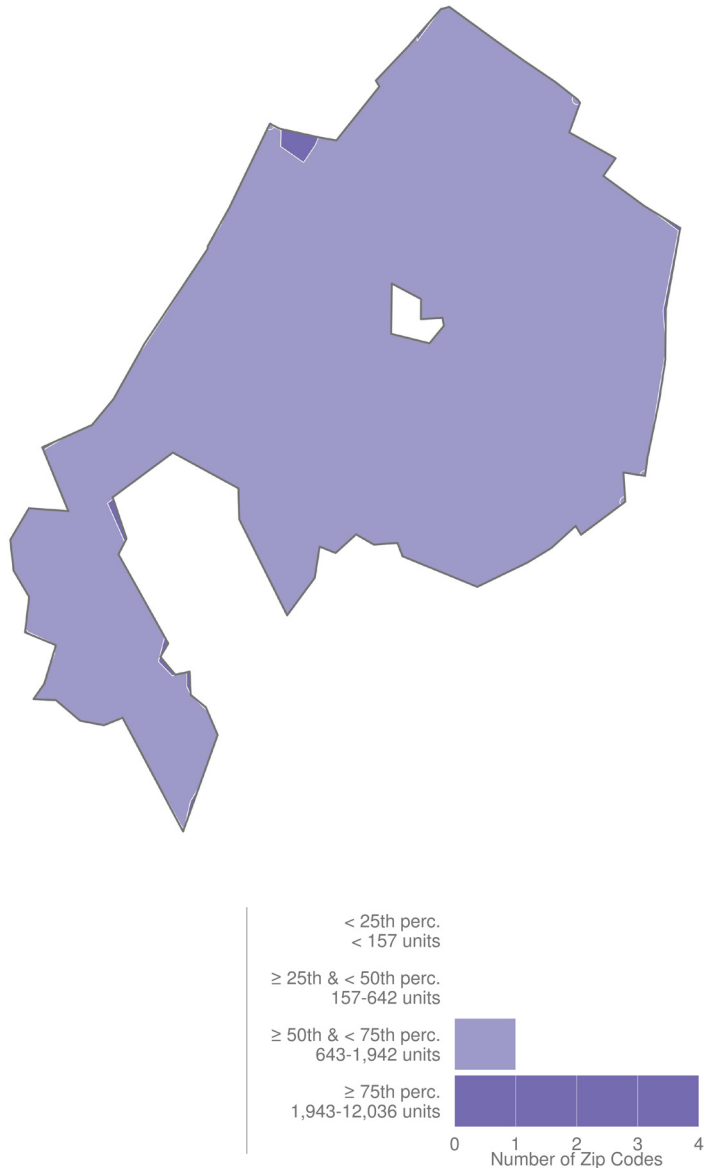
MANASSAS CITY, VA

Share of Households, by Household Income

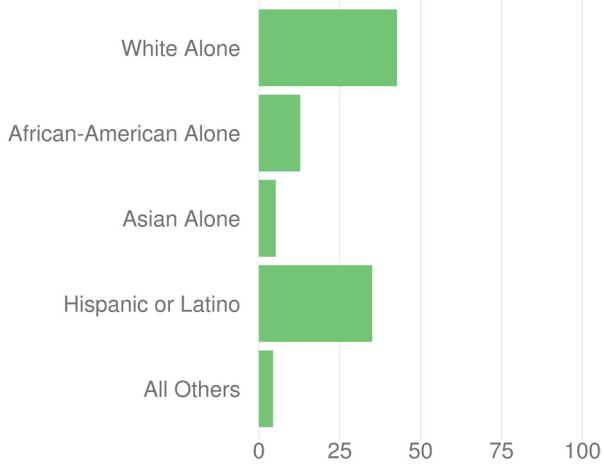


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



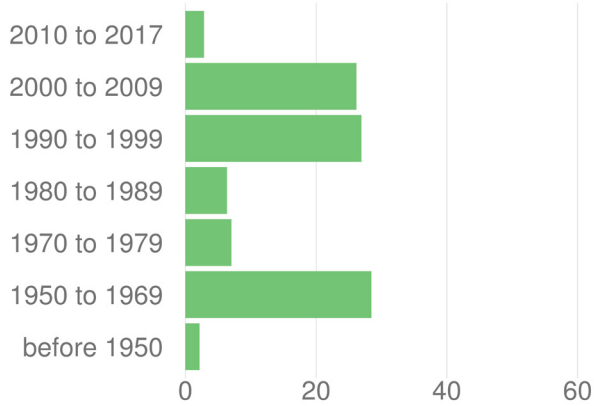
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



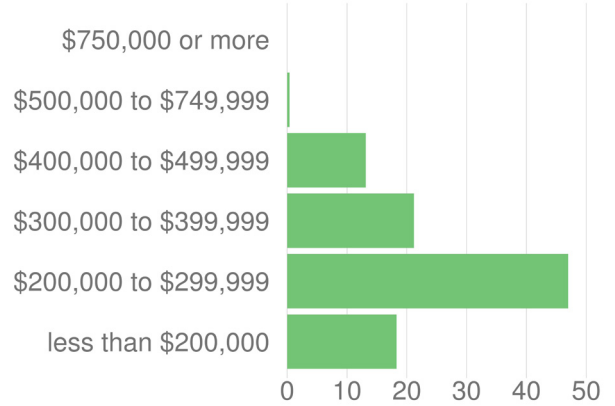
MANASSAS PARK CITY, VA

Share of Residential Housing Units by Year Built



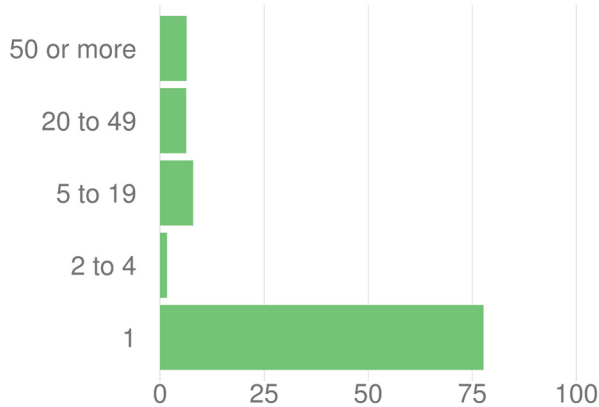
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



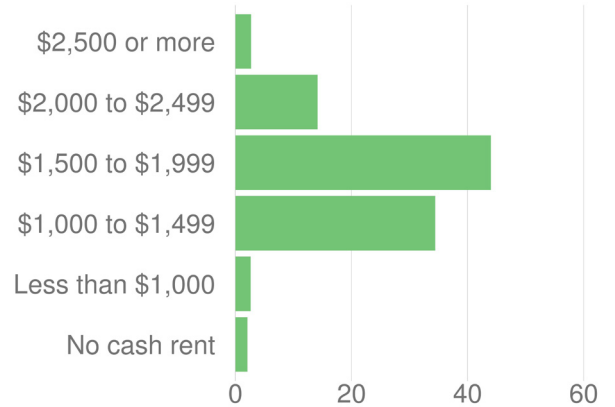
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

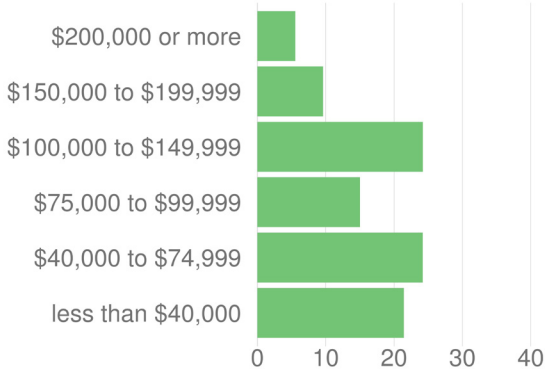


Source: American Community Survey, 2013-2017.



MANASSAS PARK CITY, VA

Share of Households, by Household Income

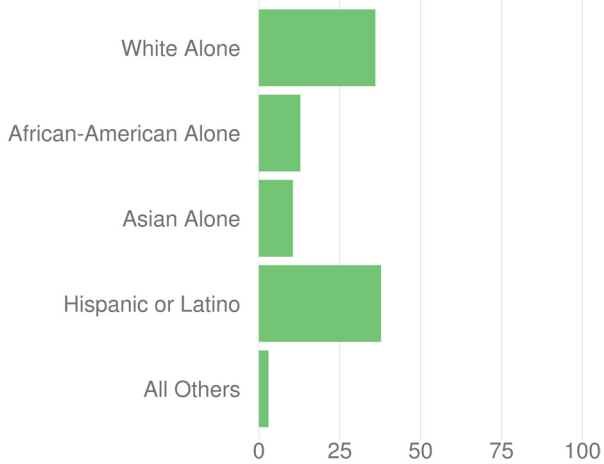


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



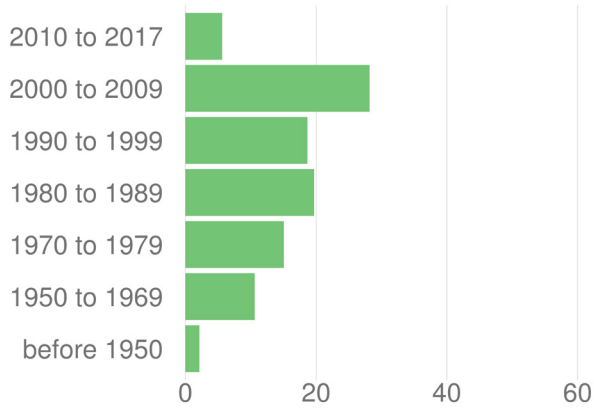
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



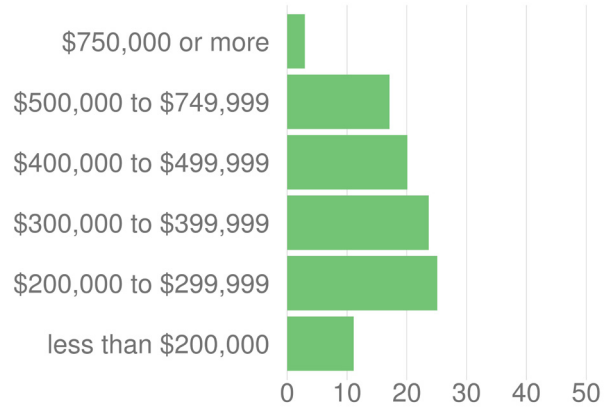
PRINCE WILLIAM COUNTY, VA

Share of Residential Housing Units by Year Built



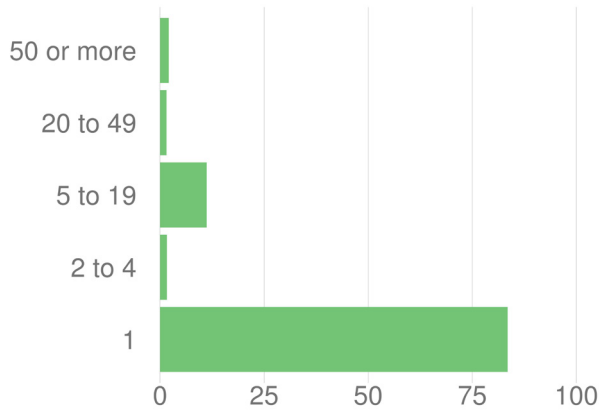
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



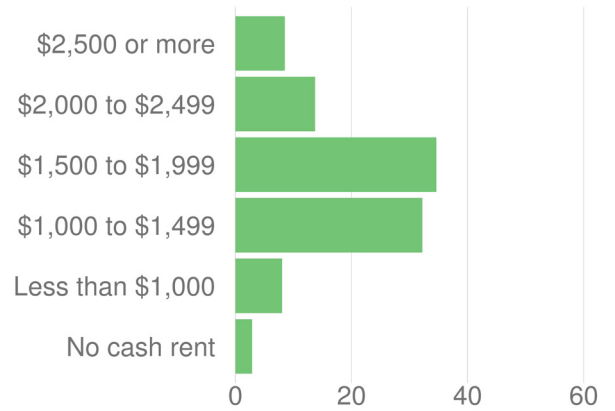
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

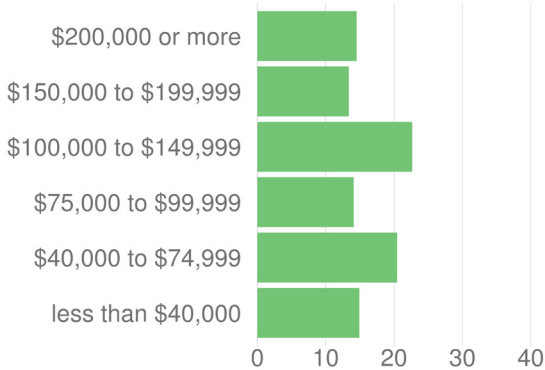


Source: American Community Survey, 2013-2017.



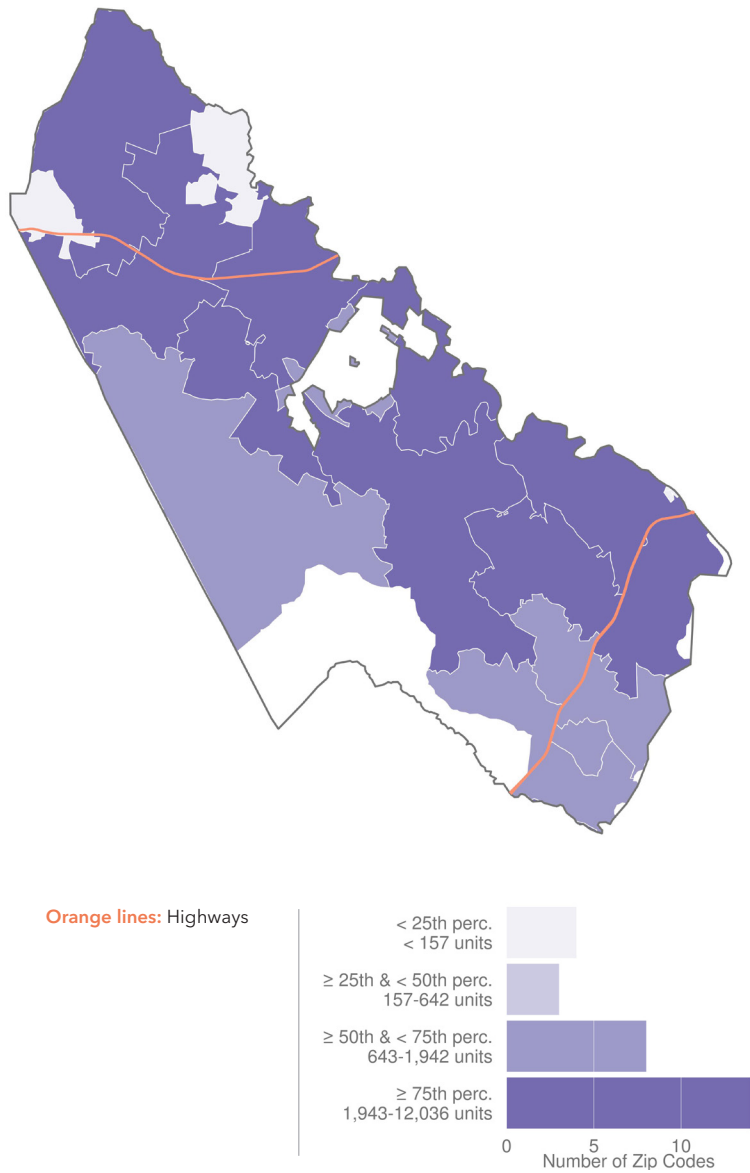
PRINCE WILLIAM COUNTY, VA

Share of Households, by Household Income



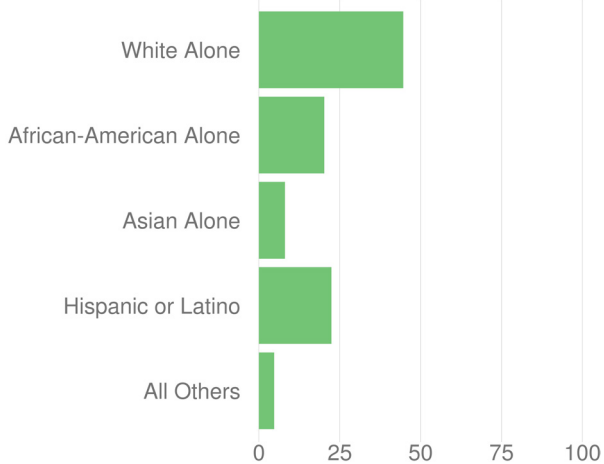
Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area

Share of Population by Race and Ethnicity

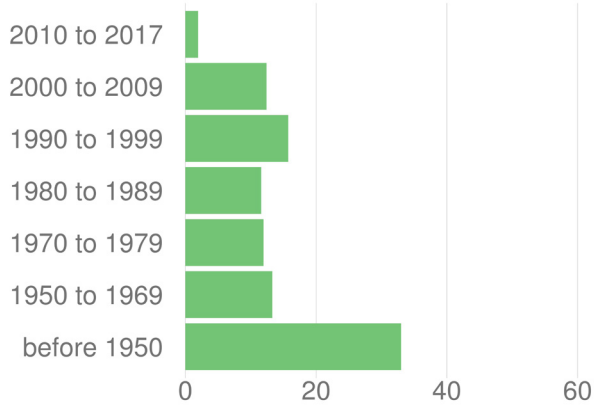


Source: American Community Survey, 2013-2017.



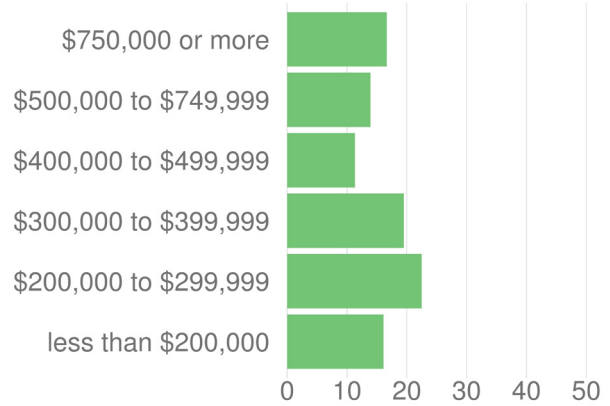
RAPPAHANNOCK COUNTY, VA

Share of Residential Housing Units by Year Built



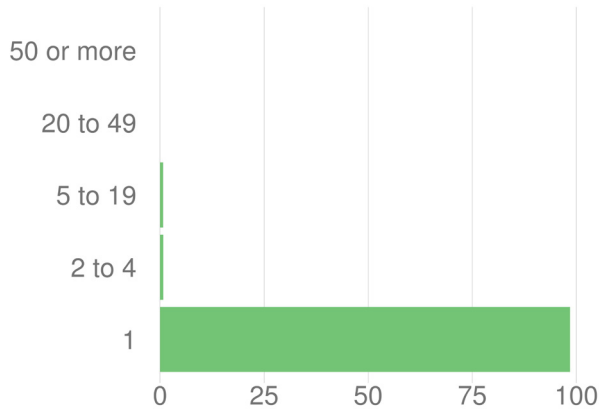
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



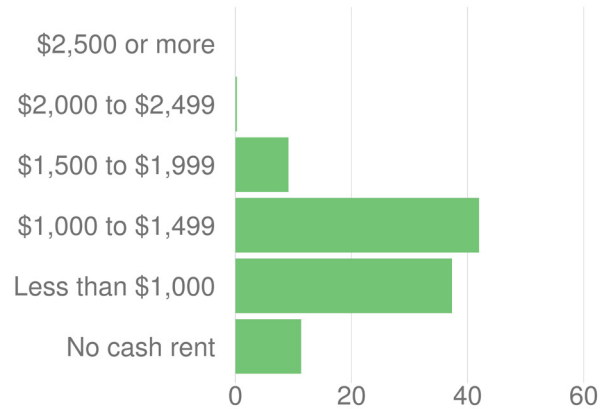
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

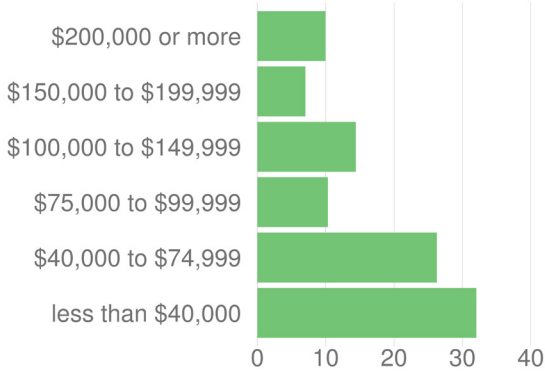


Source: American Community Survey, 2013-2017.



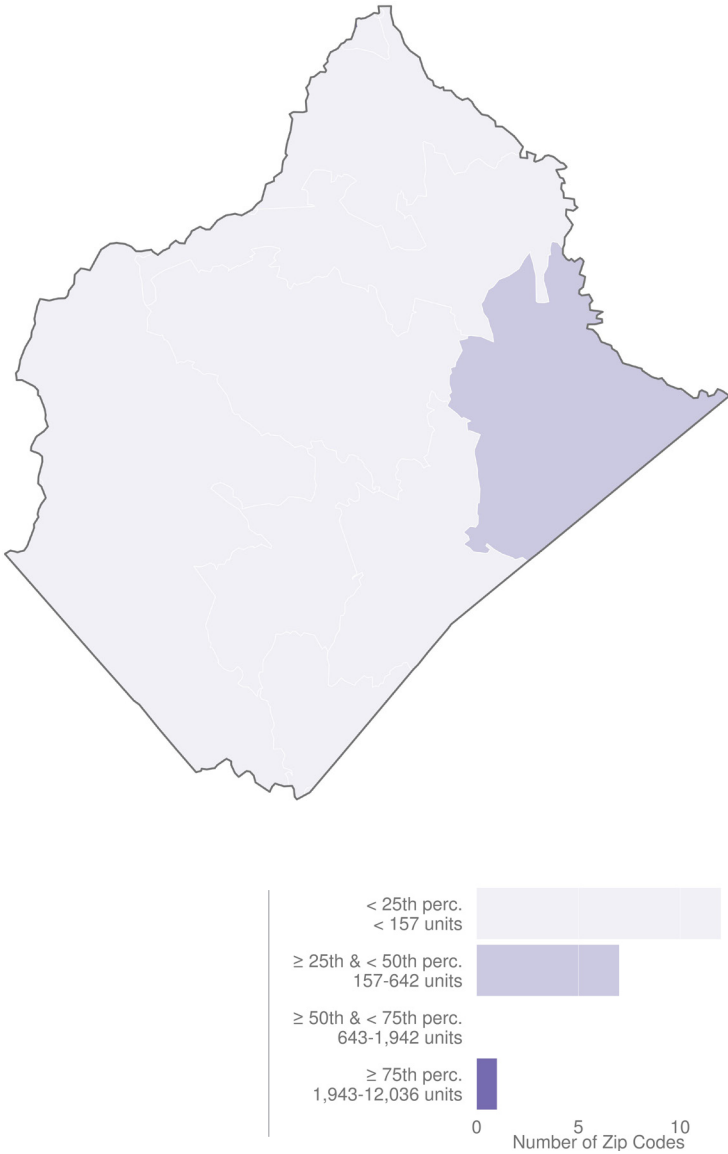
RAPPAHANNOCK COUNTY, VA

Share of Households, by Household Income

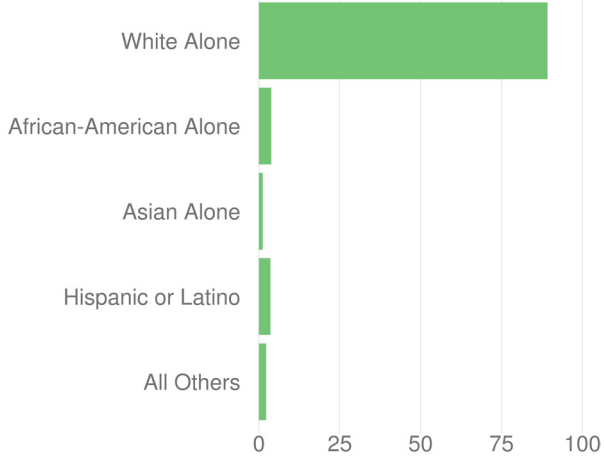


Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Share of Population by Race and Ethnicity



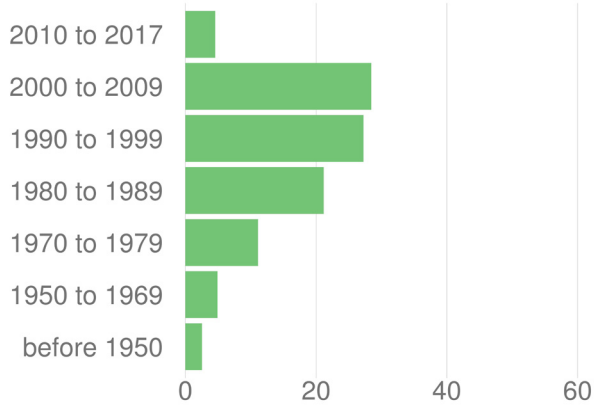
Source: American Community Survey, 2013-2017.

Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



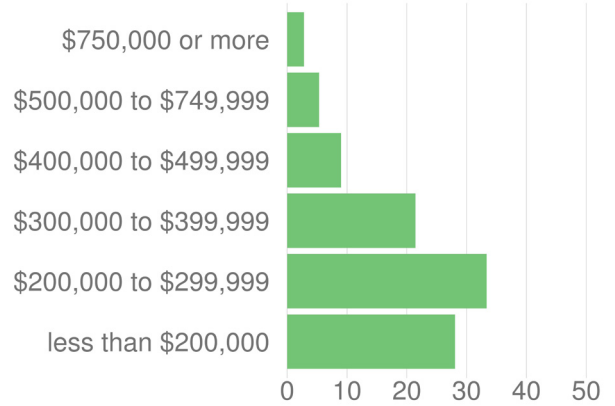
SPOTSYLVANIA COUNTY, VA

Share of Residential Housing Units by Year Built



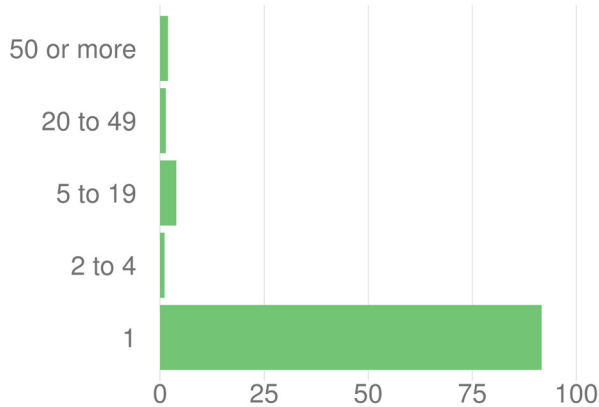
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



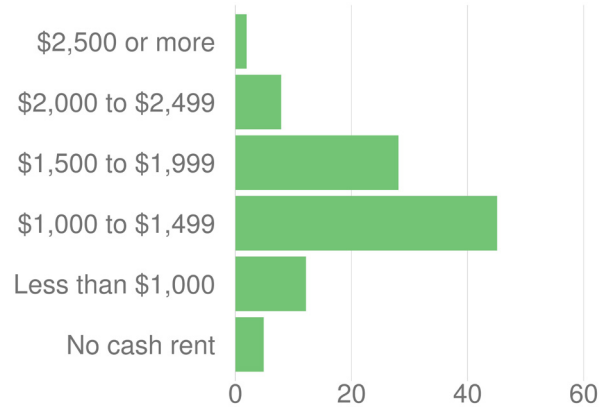
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

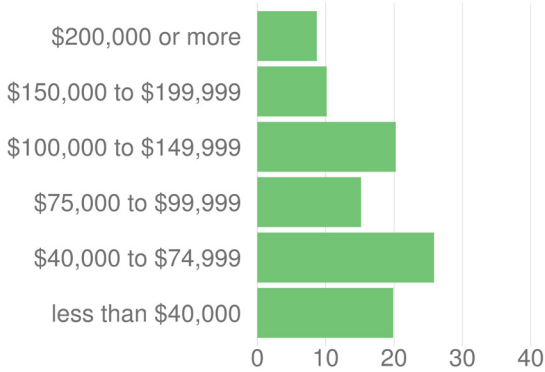


Source: American Community Survey, 2013-2017.



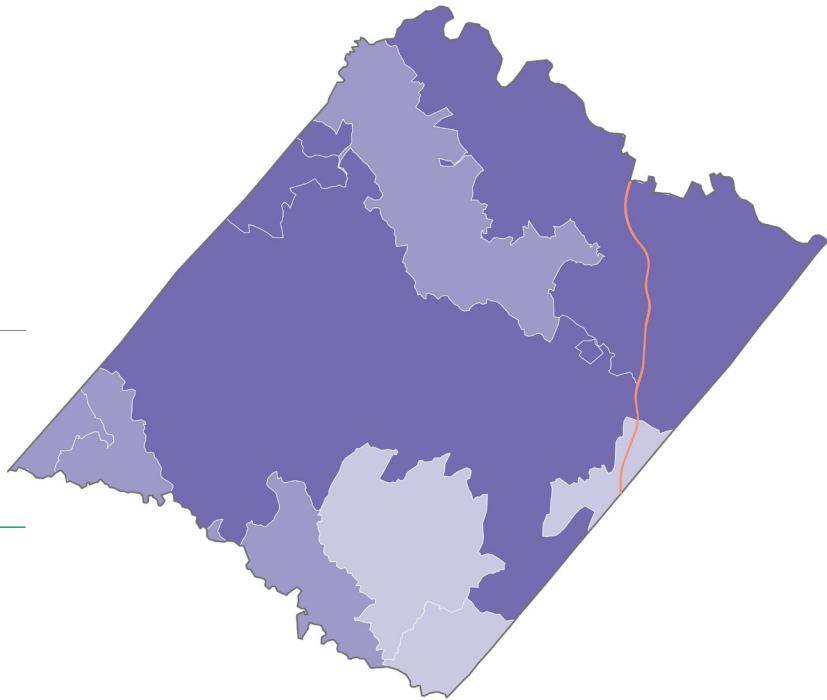
SPOTSYLVANIA COUNTY, VA

Share of Households, by Household Income

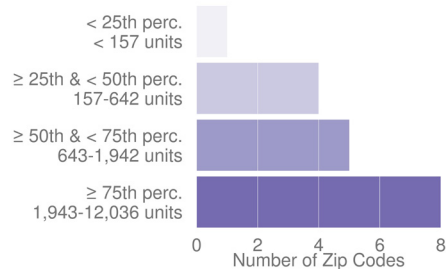


Source: American Community Survey, 2013-2017.

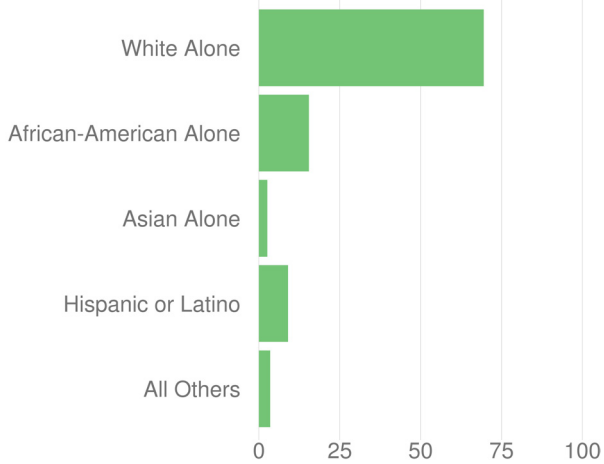
Number Housing Units Built 2000 and After by Zip Code



Orange lines: Highways



Share of Population by Race and Ethnicity



Source: American Community Survey, 2013-2017.

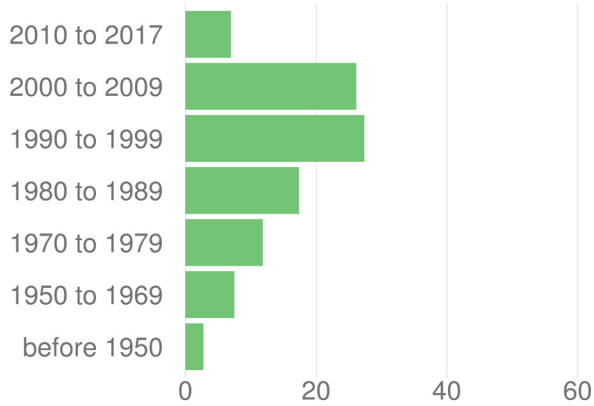
Source: American Community Survey, 2013-2017.

Figure includes all zip codes in this county, including those with very little county land area



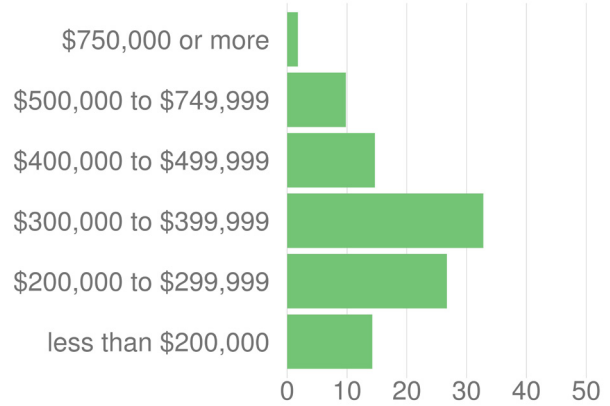
STAFFORD COUNTY, VA

Share of Residential Housing Units by Year Built



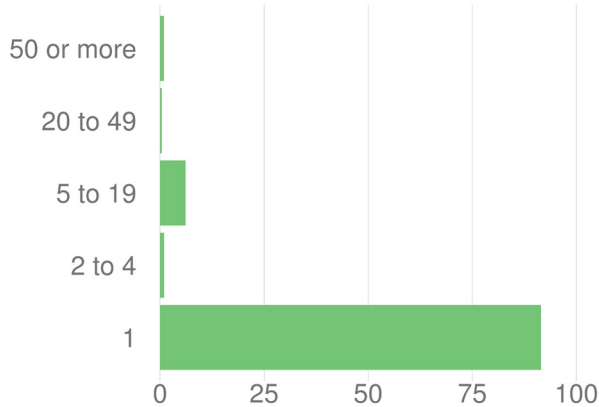
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



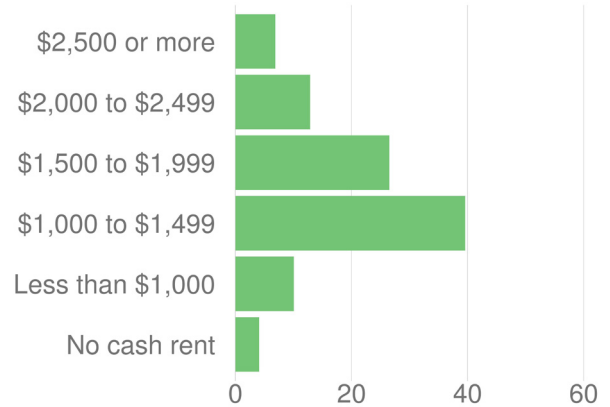
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

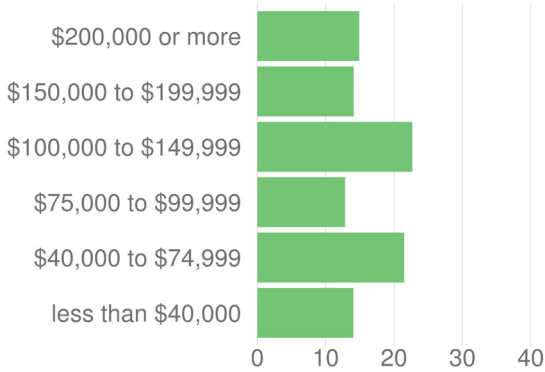


Source: American Community Survey, 2013-2017.



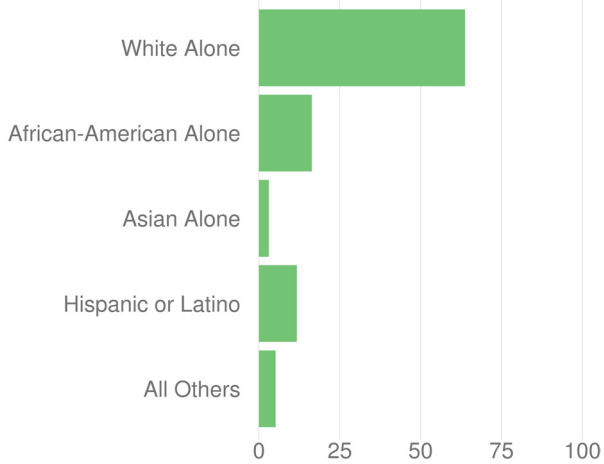
STAFFORD COUNTY, VA

Share of Households, by Household Income



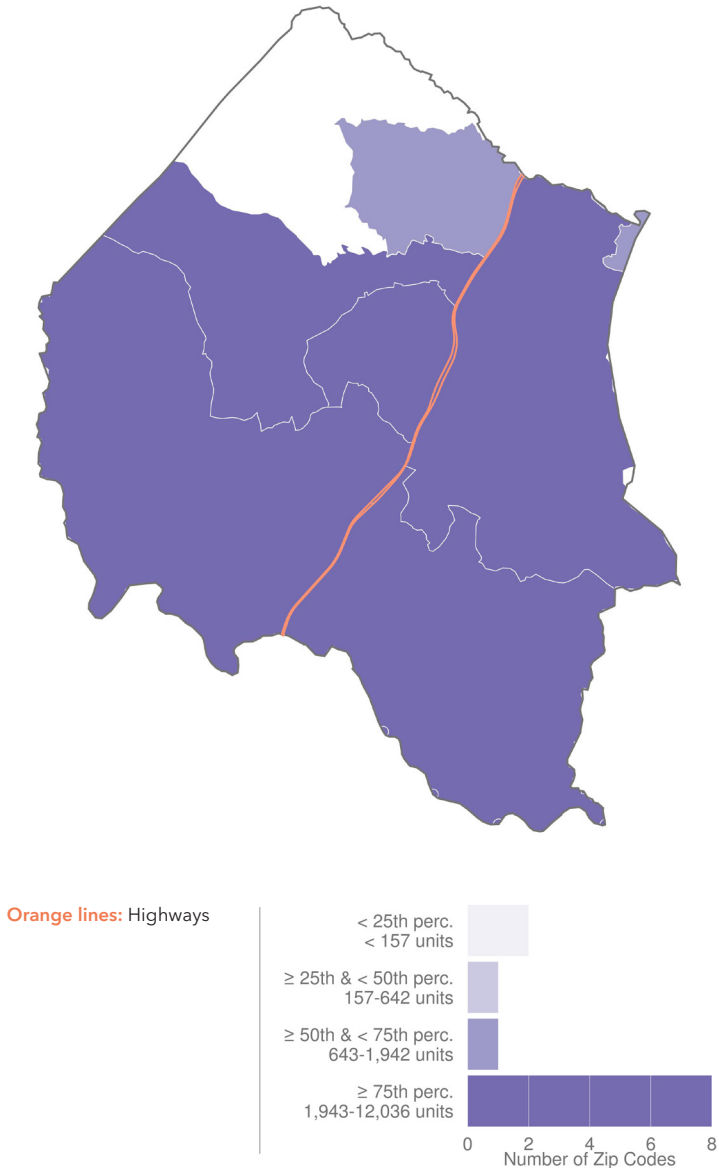
Source: American Community Survey, 2013-2017.

Share of Population by Race and Ethnicity



Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code

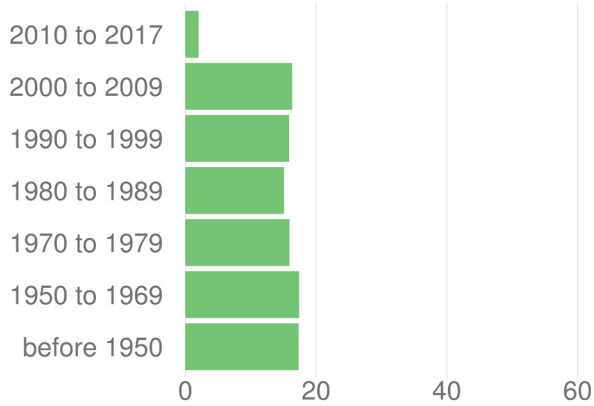


Source: American Community Survey, 2013-2017.
Figure includes all zip codes in this county, including those with very little county land area



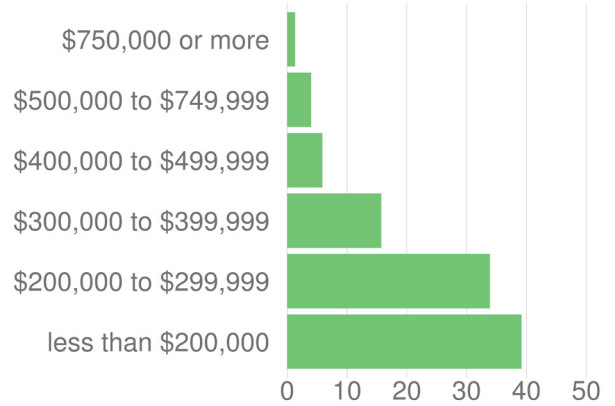
WARREN COUNTY, VA

Share of Residential Housing Units by Year Built



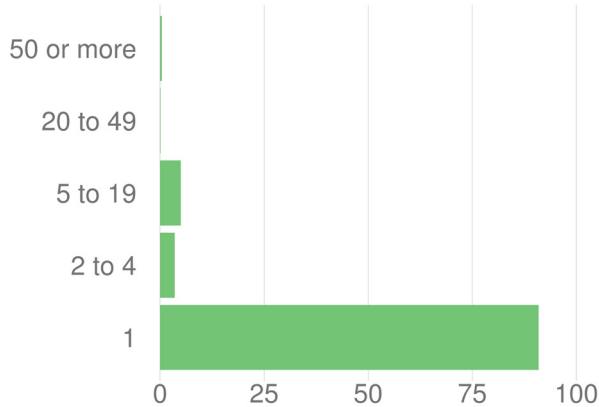
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



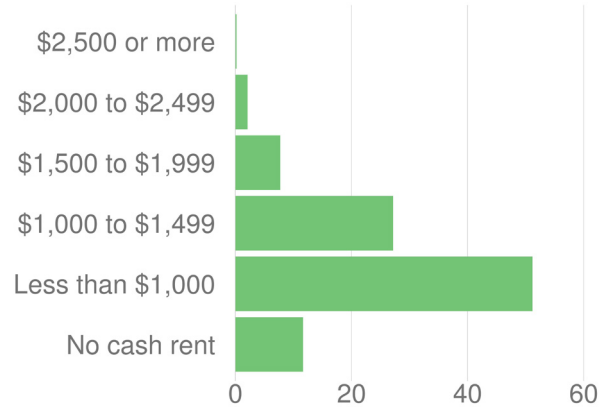
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

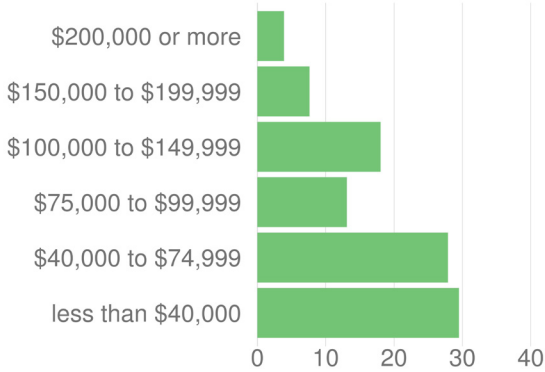


Source: American Community Survey, 2013-2017.



WARREN COUNTY, VA

Share of Households, by Household Income

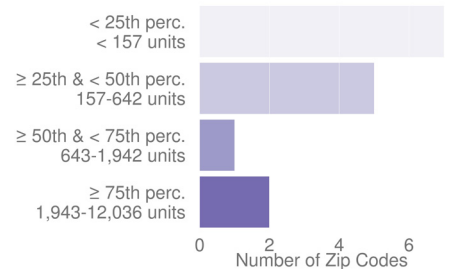


Source: American Community Survey, 2013-2017.

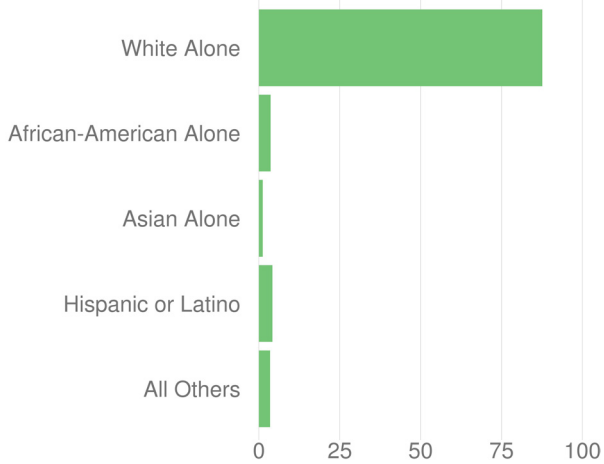
Number Housing Units Built 2000 and After by Zip Code



Orange lines: Highways



Share of Population by Race and Ethnicity



Source: American Community Survey, 2013-2017.

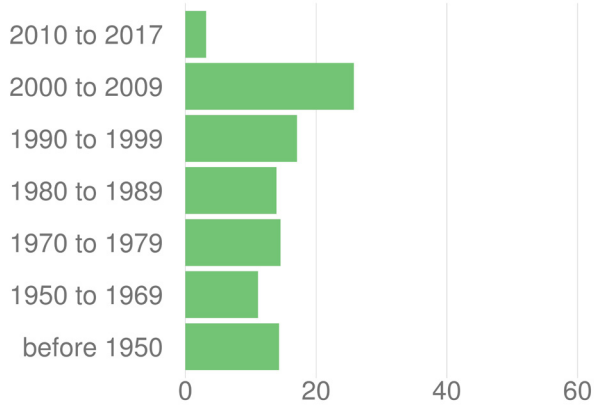
Source: American Community Survey, 2013-2017.

Figure includes all zip codes in this county, including those with very little county land area



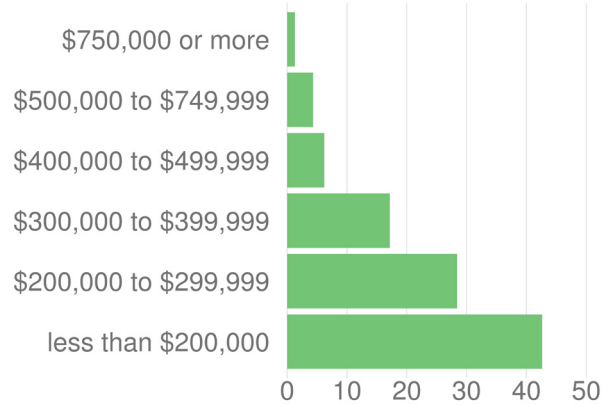
JEFFERSON COUNTY, WV

Share of Residential Housing Units by Year Built



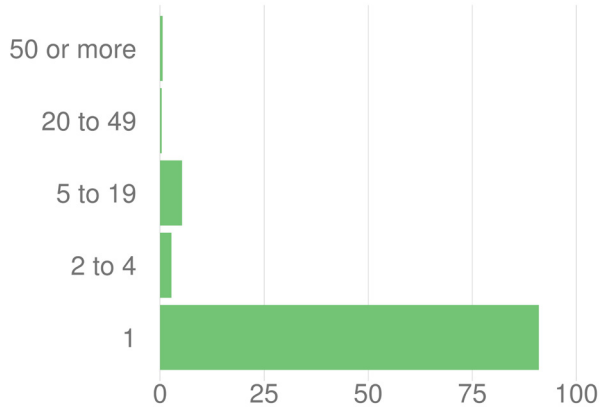
Source: American Community Survey, 2013-2017.

Share of Owner-occupied Housing Units by Value



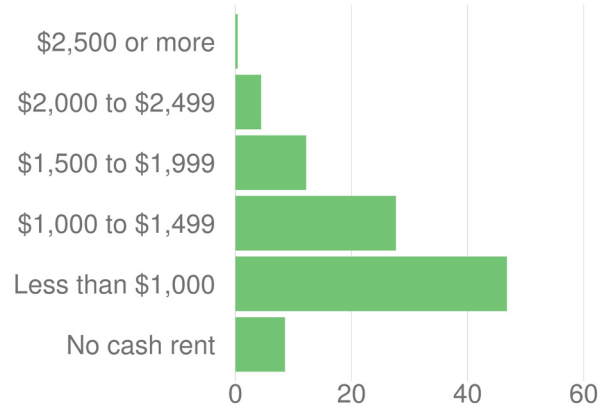
Source: American Community Survey, 2013-2017.

Share of Residential Housing Units by Number of Units in Structure



Source: American Community Survey, 2013-2017.

Share of Renter occupied Units by Gross Rent

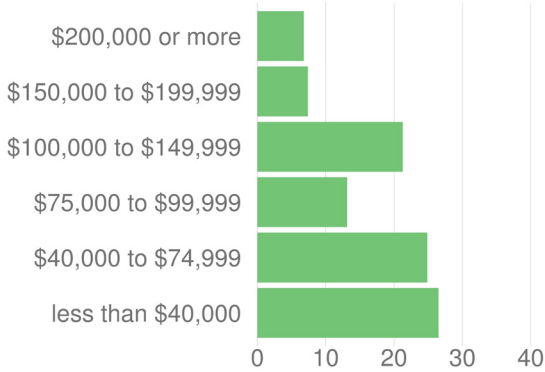


Source: American Community Survey, 2013-2017.



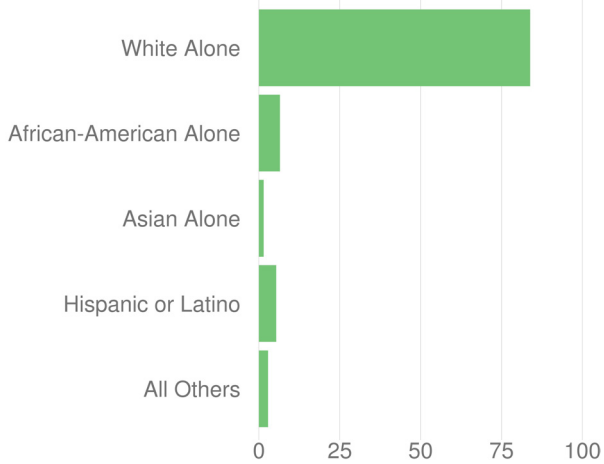
JEFFERSON COUNTY, WV

Share of Households, by Household Income



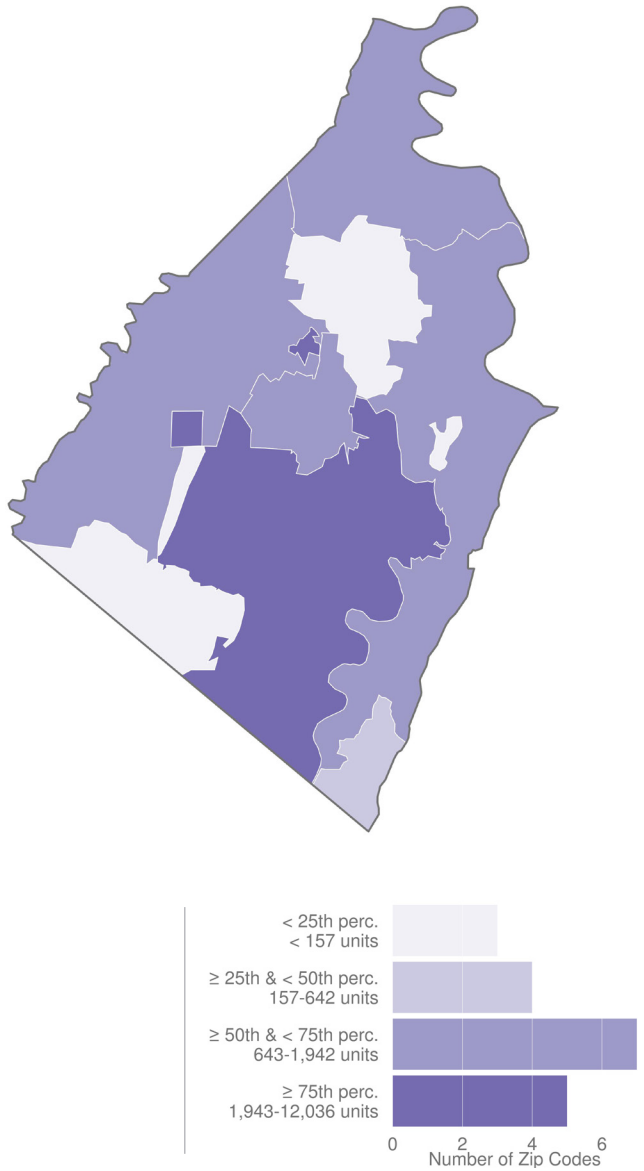
Source: American Community Survey, 2013-2017.

Share of Population by Race and Ethnicity



Source: American Community Survey, 2013-2017.

Number Housing Units Built 2000 and After by Zip Code



Source: American Community Survey, 2013-2017.

Figure includes all zip codes in this county, including those with very little county land area

PART III: SOURCES AND METHODS

APPENDIX

American Community Survey 5-year estimates.

The report mainly relies on 5-year pooled estimates from the 2013-2017 5-year American Community Survey (ACS). The ACS is a Census product that provides ongoing estimates of population and housing. This survey relies on smaller samples than the decennial Census, and therefore pools information collected across 5-year periods for smaller geographies, such as zip codes and jurisdictions with populations of less than 20,000. ACS zip code estimates began in 2011 for the 2007-2011 period. For more information, see: <https://www.census.gov/programs-surveys/acs>.

Counties and county equivalents.

The Census provides data for counties and, in some states, county equivalents. In Virginia, independent cities have their own local governments entirely distinct from any county (e.g., maintain their own finances and legal authority). In our sample, the Census Bureau classifies Alexandria, Falls Church, Fairfax city, Fredericksburg, Manassas, and Manassas Park as county equivalents. The District of Columbia is also a county equivalent. All the Maryland jurisdictions in our study are counties.

Housing Unit Counts.

Unit counts are based on occupied housing units as of the 2013-2017 5-year ACS for each jurisdiction or zip code. Occupied housing units exclude vacant, seasonal, recreational, or occasional-use units. The occupied stock data also reflects the age and mix of the housing stock as of the 2013-2017 period, rather than offering a comparison with the housing stock in 2000. This provides a view of the housing stock as of the current time period and does not capture units that were redeveloped or lost from the housing stock after 2000.

Rent.

The report defines "rent" as gross rent, which includes the estimated cost of utilities, such as gas, electricity, water, and sewer. Because some leases require renters to pay these costs separately while other leases incorporate utilities in the base rent paid by tenants to landlords, gross rent provides a more consistent estimate of total monthly housing costs.

APPENDIX

Appendix Table 1: Population in Capital Region by Jurisdiction

	Population		
	2017	2010	2000
District of Columbia	672,391	601,723	572,059
Maryland			
Calvert County	90,824	88,737	74,563
Charles County	156,021	146,551	120,546
Frederick County	246,105	233,385	195,277
Montgomery County	1,039,198	971,777	873,341
Prince George's County	905,161	863,420	801,515
Virginia			
Alexandria city	154,710	139,966	128,283
Arlington County	229,534	207,627	189,453
Clarke County	14,331	14,034	12,652
Culpeper County	49,795	46,689	34,262
Fairfax city	23,580	22,565	21,498
Fairfax County	1,142,004	1,081,726	969,749
Falls Church city	13,843	12,332	10,377
Fauquier County	68,406	65,203	55,139
Fredericksburg city	28,135	24,286	19,279
Loudoun County	374,558	312,311	169,599
Manassas city	41,379	37,821	35,135
Manassas Park city	16,117	14,273	10,290
Prince William County	450,763	402,002	280,813
Rappahannock County	7,359	7,373	6,983
Spotsylvania County	130,159	122,397	90,395
Stafford County	141,159	128,961	92,446
Warren County	38,991	37,575	31,584
West Virginia			
Jefferson County	55,673	53,498	42,190

Appendix Table 2: Housing Units in Capital Region by Jurisdiction

	Housing Units		
	2017	2010	2000
District of Columbia	308,161	296,719	274,845
Maryland			
Calvert County	34,785	33,780	27,576
Charles County	58,883	54,963	43,903
Frederick County	94,688	90,136	73,017
Montgomery County	386,587	375,905	334,632
Prince George's County	330,326	328,182	302,378
Virginia			
Alexandria city	75,489	72,376	64,251
Arlington County	111,646	105,404	90,426
Clarke County	6,286	6,235	5,388
Culpeper County	18,307	17,657	12,871
Fairfax city	8,843	8,680	8,204
Fairfax County	411,223	407,998	359,411
Falls Church city	5,805	5,489	4,725
Fauquier County	26,413	25,600	21,046
Fredericksburg city	11,545	10,467	8,888
Loudoun County	126,162	109,442	62,160
Manassas city	13,451	13,123	12,114
Manassas Park city	4,895	4,904	3,365
Prince William County	145,961	137,115	98,052
Rappahannock County	3,945	3,839	3,303
Spotsylvania County	46,594	45,185	33,329
Stafford County	47,345	43,978	31,405
Warren County	16,188	16,034	13,299
West Virginia			
Jefferson County	22,813	22,037	17,623

Appendix Table 3: Capital Region Housing Characteristics by Jurisdiction, 2017

	Share Single Family	Share Owner-Occupied	Median Home Value
District of Columbia	37.7	37.6	537,400
Maryland			
Calvert County	94.8	75.4	347,200
Charles County	90.7	72.2	294,000
Frederick County	83.9	71.1	315,400
Montgomery County	67	62.7	467,500
Prince George's County	68.8	57.4	272,900
Virginia			
Alexandria city	36.4	39.2	537,900
Arlington County	38.5	40.8	643,300
Clarke County	90.8	66.4	333,100
Culpeper County	89.2	67	266,400
Fairfax city	75.7	67.3	501,900
Fairfax County	71.9	64.9	534,800
Falls Church city	57.6	54.7	742,000
Fauquier County	93.3	71.2	370,000
Fredericksburg city	51.6	32.4	341,200
Loudoun County	83.5	74.9	475,500
Manassas city	71.1	59.3	307,000
Manassas Park city	77.7	65.9	263,300
Prince William County	83.5	69.2	358,300
Rappahannock County	98.5	59.7	358,600
Spotsylvania County	91.6	71.9	265,600
Stafford County	91.5	72.6	327,600
Warren County	90.9	67.3	231,000
West Virginia			
Jefferson County	91	67.6	227,300

Source: American Community Survey 2013-2017. Share single family is from variable B25127. Share owner-occupied is from B25003 and is based on all occupied housing units. Median home value is variable B25077 and is reported for owner-occupied houses only.

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DATA

A. MAP FILES

County boundaries

US Census Bureau, 2014. 2010 Census county boundaries. Downloaded cb_2017_us_county_500k.zip 2/28/2014 from https://www.census.gov/geo/maps-data/data/cbf/cbf_counties.html

Zip code boundaries

US Census Bureau, 2019. 2017 American Community Survey zip code tabulation areas. Downloaded cb_2017_us_zcta510_500k.zip from https://www.census.gov/geo/maps-data/data/cbf/cbf_counties.html

Metro map

Copyright 2017. National Capital Region Transportation Planning Board Downloaded Metro__Lines.zip from http://rtdc-mwcog.opendata.arcgis.com/datasets/0d90d7b18c644657ba7646149b72e2d1_1

Highway map

US Census Bureau, 2017 TIGER/Line® Shapefiles: Roads Downloaded tl_2017_us_primaryroads.zip from <https://www.census.gov/cgi-bin/geo/shapefiles/index.php?year=2017&layergroup=Roads>

B. DATA FILES

2000 Census

United States. Bureau of the Census. Census of Population and Housing, 2000 [United States]: Summary File 3, All states . Ann Arbor, MI: [distributor], 2006-01-12. <https://doi.org/10.3886/ICPSR13342.v1>

2010 Census

2010 Census Summary File 1 United States, prepared by the U.S. Census Bureau, 2011.

American Community Survey, 2013-2017, 5-year estimates

United States Census Bureau. "Summary File." 2013 - 2017 American Community Survey. U.S. Census Bureau's American Community Survey Office, 2018. Web. 1 January 2018 <<http://ftp2.census.gov/>>.

American Community Survey, 2005-2017, 1-year estimates.

United States Census Bureau. "Summary File." 2005-2017 American Community Survey. U.S. Census Bureau's American Community Survey Office, 2018. Web. 1 January 2018 <<http://ftp2.census.gov/>>.

Integrated Public Use Microdata Extract, 2012-2016

Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek. IPUMS USA: Version 8.0 [dataset]. Minneapolis, MN: IPUMS, 2018. <https://doi.org/10.18128/D010.V8.0>

the authors are aware of, no other studies have examined the effects of the combination of these two factors on the response of a group of young people.

It is interesting to note that the effects of the combination of the two factors were not significant in the current study. This may be due to the relatively small sample size. The current study was a pilot study and the sample size was small (20 subjects). It is possible that a larger sample size would have revealed a significant interaction between the two factors. However, the current study was a pilot study and the sample size was small (20 subjects). It is possible that a larger sample size would have revealed a significant interaction between the two factors. However, the current study was a pilot study and the sample size was small (20 subjects). It is possible that a larger sample size would have revealed a significant interaction between the two factors.

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