James City County
Housing Needs Assessment

Fall 2019

Prepared by Dr. Sarah Stafford, William & Mary

Acknowledgments

This report was prepared by Dr. Sarah Stafford, Professor of Economics, Public Policy and Law, William & Mary. The report was made possible by financial support from the Williamsburg Area Association of REALTORS.

Executive Summary

This Housing Needs Assessment was commissioned by the Williamsburg Area Association of REALTORS to create an unbiased analysis of the housing market in James City County. The goal of this study is to examine the existing housing market to determine the current state of James City County's housing stock and to provide a thorough assessment of the affordability of the existing housing in the county using a range of different measures. This report does not attempt to address how to solve the housing problems facing the county, but is meant to provide a foundation for current and future policy discussions. In future years this study can be replicated to understand trends and the effectiveness of policy decisions and investments.

Some of the key findings of the study include:

- The housing stock in the county has grown over 5 percent since 2000, far outpacing growth in the state of Virginia and the nation as a whole. Over this time period, the percentage of owner-occupied homes has dropped slightly while the percentage of both renter-occupied and vacant homes has increased. Even with these adjustments, the percentage of owner-occupied homes is well above the average for Virginia and the US as a whole.

- Home owners, as opposed to renters, are not distributed equally across all age groups and over time, younger households have become less likely to own their home. Thus the age profile of home owners in the county is increasing with time.

- There is a mismatch in the size of owner-occupied homes and the size of the households in those homes, with homes being much larger than households. There is no comparable mismatch in rental homes. Some of this mismatch could be by choice, with households wishing to own homes with plenty of room for guests. This could also indicate that the existing housing stock and the current population of households is out of sync.

- Home sales have recovered to pre-2008 levels, but housing prices have seen very little change since 2010.

- Rental vacancies hover around 15 percent indicating that currently there are excess units available. However, rental rates have outpaced inflation, suggesting that high rental rates may be adding to the vacancy level.

- Seniors (those 65 or older) represent about a quarter of the residents in the county. Almost two-thirds of senior households are married couples and about twenty percent of senior households are single individuals living independently. Only about two percent of seniors in the county live in nursing homes.

- Almost 30 percent of households in the county are cost-burdened – that is, they spend more than 30 percent of their income on housing. Renters are more likely to be cost-burdened – on average one of every two rental households is cost-burdened while only one in five owners is cost-burdened.

- The supply of affordable homes for first-time buyers is much lower than the demand for such homes. Even finding affordable rental units in the county can be difficult – for example, to afford a two-bedroom unit at "fair market rent" a household must have the equivalent of three full-time minimum wage workers. Households with a single full-time worker earning the average salary in the accommodation or food sector, in the education sector, or in the retail sector can't afford the typical one-bedroom rental unit in the county.

Table of Contents

Page Intentionally Left Blank

Introduction

As the home of the first permanent English settlement in North America, James City County has long been an attractive place for people to live and work. The county has evolved from a primarily rural area to a vibrant community with a diverse economic base. It serves as the home for many individuals who work in the county as well as other parts of the greater Williamsburg area in a range of industries including manufacturing, tourism, education and health care. The community also includes many individuals who commute to jobs in Norfolk and Virginia Beach to the east and New Kent County and Richmond to the west. Additionally, for years the county has been an attractive destination for retirees from around the country.

The county has experienced significant growth since the 1980's. During the 2000 to 2010 period, James City County was the fifth-fastest growing locality in Virginia. Although the growth rate has slowed somewhat over the past couple of years, the area continues to attract newcomers from other parts of Virginia, the United States and the world. Over the years an active housing development sector has arisen to meet the growing demand for housing and has added significantly to the existing housing stock.

Even in such a thriving community, it is important to periodically assess the availability and distribution housing, particularly affordable housing, as the economy and population grow. This Housing Needs Assessment was commissioned by the Williamsburg Area Association of REALTORS to create an unbiased analysis of the housing market in James City County.

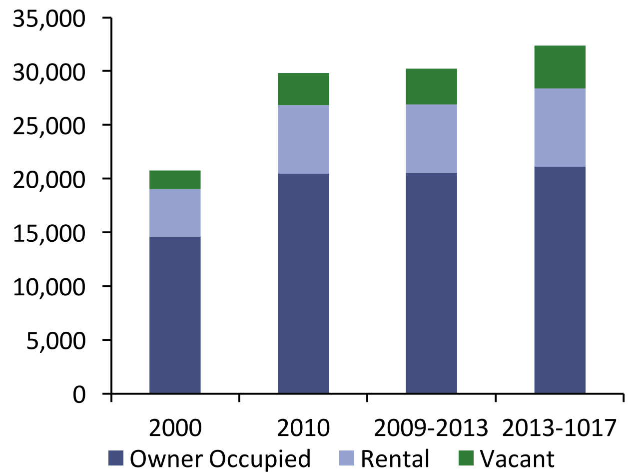
The goal of this study is to examine the existing housing market to determine the current state of James City County's housing stock including both owner-occupied and rental housing, as well as a comparison of the housing stock across different areas of the county. The study also provides a thorough assessment of the affordability of the existing housing in the county using a range of different measures. Lastly, the study compares the housing stock in the county to that of its two closest neighbors, the City of Williamsburg and York County and looks at commuting patterns into and out of the county.

Importantly, this report does not attempt to address how to solve the housing problems facing the county, although it hopefully provides a basis to begin disaggregating the problems the county faces so that solutions can be developed. Rather this survey is meant to serve as a foundation for current and future policy discussions. In future years this study can be replicated to better understand trends and the effectiveness of policy decisions and investments.

Existing Housing Stock

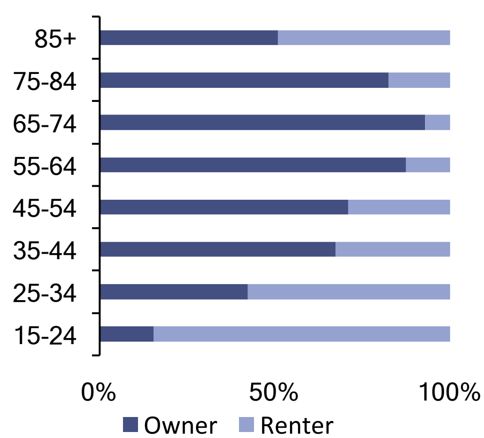
In 2000, the U.S. Census counted a total of 20,772 homes in James City County housing just over 48,000 residents. By 2010, the number of homes had grown by 43 percent to a total of 29,797 units. The 2013-2017 American Community Survey (ACS) estimated a total of 32,357 units in the county housing just over 73,000 residents, which represents a 55 percent growth rate in housing since 2000 and an almost 10 percent growth rate over 2010 levels.[1] This is a relatively high level of growth, as the estimated housing growth in the state of Virginia during this same time period was only 19 percent and nationwide, the housing stock only grew by 17 percent.

The housing stock has grown 55% since 2000...



In the census housing units are classified based on whether they are occupied by their owners or are rented to non-owners. The percentage of rental units in the county has grown slightly since 2000 from 21 percent of the housing stock to about 23 percent. Over that same period, the owner-occupancy rate has dropped from 70 percent in 2000 and to 65 percent currently. However, the absolute number of owner-occupied homes grown from 14,600 to 21,100. Making up the difference, the percentage of vacant units has increased across time, beginning at about 8.5 percent in 2000 and growing to about 12 percent currently. At the national level ownership is less common with 56 percent of units occupied by their owners, 32 percent of units rented, and 12 percent of units vacant.

Younger residents are more likely to rent and older residents to own...

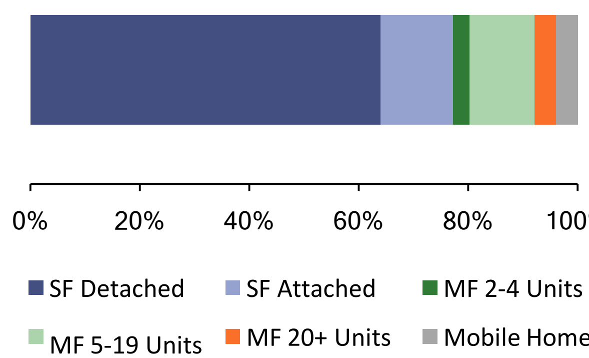


Because the decision to buy a home depends on a wide range of factors including income, future plans, and personal preferences, the percentage of people who own their home rather than rent varies dramatically across age groups. Generally, younger households begin by renting and as they age, more become homeowners. According to the

[1] Appendix B describes the various datasets used in this housing assessment and discusses their limitations and comparability.

2013-2017 ACS, about 84 percent of households in James City County that are headed by a person under the age of 25 are renters. Rental rates then decline and ownership rates increase as the householder ages. Ownership rates are highest for the 65 to 74 age group at about 93 percent owners and 7 percent renters. Ownership rates then begin to drop and once a householder reaches 85, renting and owning are equally likely.[2]

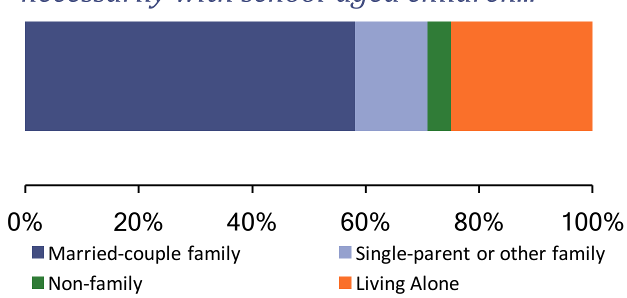
Most housing is in single-family homes...



The ACS also provides details on the characteristics of the housing stock. For the 2013-2017 period, almost 80 percent of the housing units in the county are single-family homes – 64 percent are detached and 13 percent are attached homes. Close to 20 percent of the housing units are in multi-family structures, most commonly in 5 to 19 unit structures. The final 4 percent of units in the county are mobile homes.

Housing units are occupied by what the Census Bureau terms "households." Households range from single-person households, that is an individual living alone, to family households, including extended-family and intergenerational households, to non-family households. For the purposes of collecting information about the occupants in a household, the self-selected "head" of the household is asked to provide more information to the Census Bureau. In most families, the head of the household is one of the older adults in the family, although it is not clear in extended-family households or in non-family households exactly who the head of the household is. There are just over 28,000 households that reside in the county. Just under 60 percent of the households, approximately 16,500, are headed by a married couple. An additional 13 percent of households (3,600) contain multiple family members, but are not headed by a married couple. Of the approximately 20,000 family households in the county, only about 7,500 have children under the age of 18 residing in the home. The 1,200 non-family households – i.e., households with more than one person who are not related to each other – represent about 4 percent of all households. Just under a quarter of households in the county, about 7,000, consist of a single individual. Of these single-person households, half are 65 or older, about two-fifths are between the ages of 35 and 64, and only one-tenth are 35 or younger.

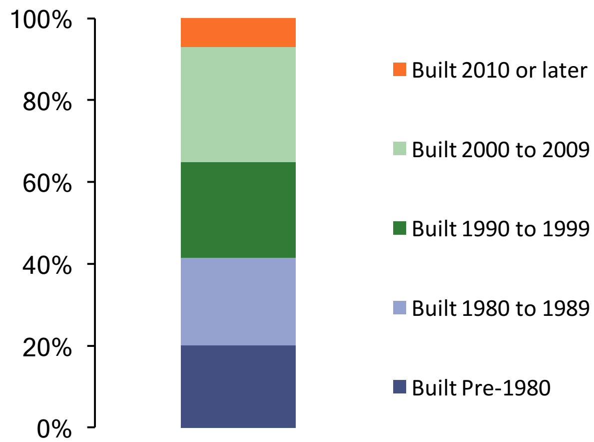
Most households are families, although not necessarily with school-aged children...



[2] Individuals living in nursing homes are not included in these estimates.

In addition to the households discussed above, about 1,000 residents, just over 1 percent of the county's population, is housed in what is known as group quarters. Group quarters are group living arrangements where the housing is owned or managed by an entity that provides both housing and other services for the residents. Such services may include custodial or medical care as well as other types of assistance, and residency is commonly restricted to those receiving these services. Group quarters include such places as residential treatment centers, skilled nursing facilities, and group homes.

The majority of units were built after 1990...

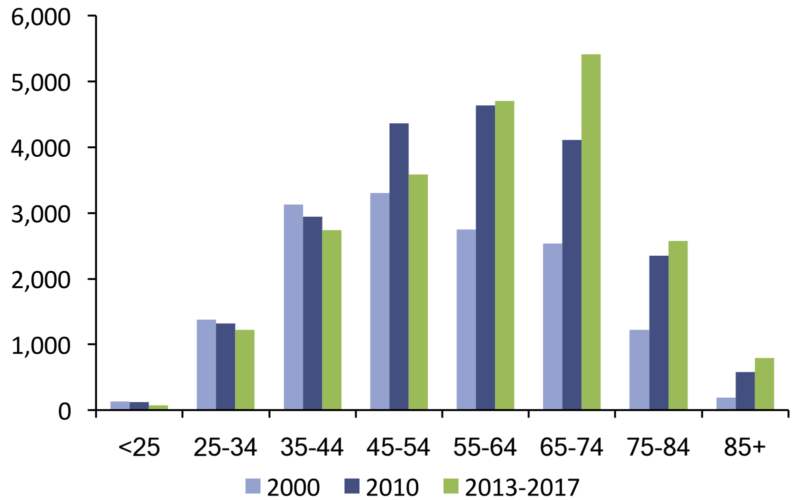


The ACS also tracks the age of the housing stock. According to the 2013-2017 survey, the median vintage of housing units in the county is 1993. Just about a fifth of housing units in the county were built prior to 1980. In each successive decade, an increasing number of units have been built, although the number of new homes since 2010 is estimated to be quite low. To some extent this is due to the fact that the ACS is a moving average of surveys from 2013 to 2017 and thus does not fully reflect the current housing stock. The housing stock in James City County is much newer than the overall U.S. housing stock which has a median vintage of 1977. Nationally only about 18 percent of houses have been built since 2000 compared to over 35 percent in the county.

Owner-Occupied Homes

According to the 2013-2017 ACS there are 21,117 owner-occupied housing units in the county as well as 388 vacant units that are explicitly for sale and an additional 2,259 vacant units that may be for sale for a total of 23,714 units. This represents 73 percent of the current total housing stock. In 2010, the comparable number of units was 21,665 thus the county has experienced almost a 10 percent increase in the stock of owner-occupied housing in less than 10 years.

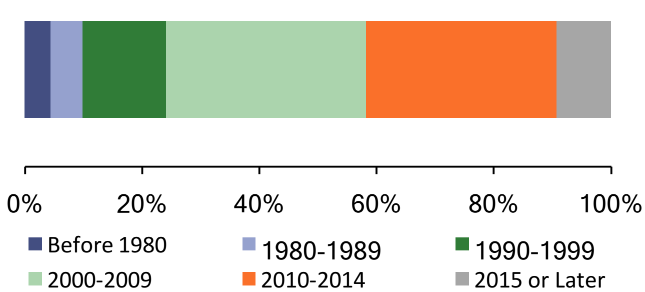
Ownership has decreased among younger households...



However, growth in the number of owner-occupied households in the county has not been distributed equally across all age groups. For the three youngest age groups (those under 45), the number of homeowners actually decreased slightly, even though the overall number of individuals in this age group has grown by almost 20 percent. This is consistent with the national trend that younger adults are less likely to own homes due both to lifestyle choices and to financial conditions. For all of the age groups above 55, the number of homeowners increased between 2000 and to the present, with the 65 to 74 age group showing the largest absolute increase of almost 3,000 homeowners. Of course, between 2000 and to 2013-2017 ACS householders aged 13 to 17 years, so householders who remain in their homes move across the age groups as well.

The 2013-2017 ACS reports that only 10 percent of owner-occupied households, about 2,800 households, moved into their current homes before 1990. About 4,000 households moved into their homes between 1990 and 1999. Most households bought their current home in the 2000's with about a third of all buyers purchasing their homes between 2000 and 2009 and another third purchasing their homes between 2010 and 2014. The final 10 percent purchased their homes in 2015 or later. Note that these

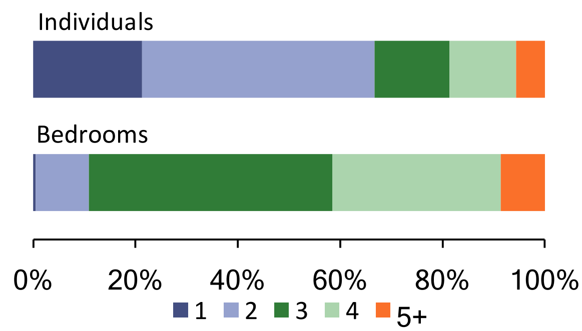
Over 40 percent bought within the last 10 years...



estimates include both newcomers to the area as well as households that moved from other homes within the county.

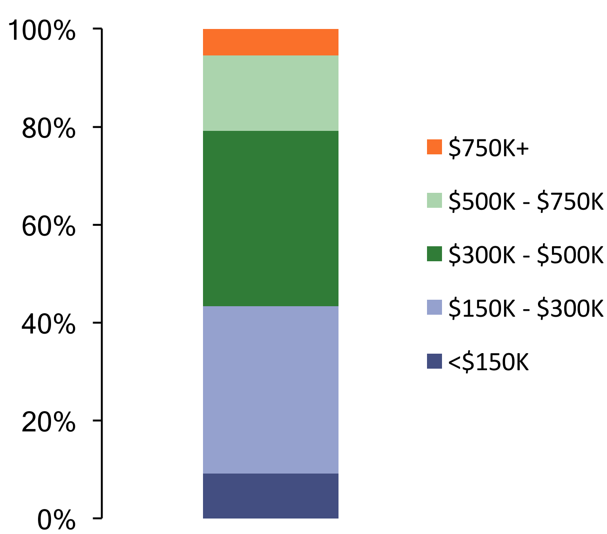
Households vary in size as do houses. According to the 2013-2017 ACS, there are only about 100 owner-occupied houses with only one bedroom even though about 20 percent of households consist of a single individual. In fact, just under two-thirds of all owner-occupied homes have two or fewer occupants even though 10 percent of all owner-occupied houses have two or fewer bedrooms. Overall, the owner-occupied houses are larger than the households in the county. Of course, many households may want additional bedrooms for visitors. In particular, older householders may purchase large homes to accommodate adult children and grandchildren. However, it could also be an indicator that the existing housing stock and the current population of households are somewhat out of sync.[3]

Houses are larger than households...



The 2013-2017 ACS provides estimates of the value of the owner-occupied housing stock. Approximately one-tenth of the homes in the county are valued at less than $150,000. About one-third of the homes are in the $150,000 to $300,000 range and another third are in the $300,000 to $500,000 range. The remaining 20 percent of homes are worth more $500,000 or more. In comparison to both the nation and the state, the owner-occupied housing stock in James City County is significantly more valuable. The 2013-2017 ACS estimates that the median value of owner-occupied homes in the U.S. is $194,000 while the median value in Virginia is $256,000 and the median value in James City County is $329,000. Interestingly, while both the U.S. and the state have a similar percentage of homes in the very highest category as the county, the county has a much higher percentage of homes in the $500,000 to $750,000 category.

Most homes are worth more than $300,000...

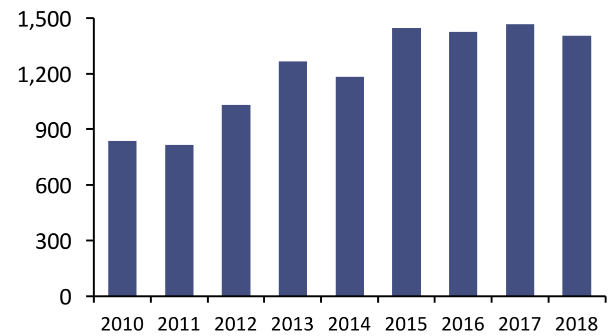


[3] Unfortunately, the ACS does not track the number of bedrooms in a home by the year the structure was built so we cannot determine whether new construction is smaller on average than the existing housing stock.

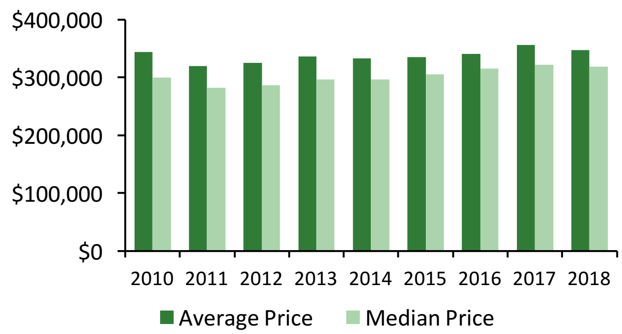
Home Sales and Prices

The number of home sales in James City County has been growing steadily since 2010. According to the Williamsburg Multiple Listing Service (MLS), 836 homes were sold through the service in 2010 while 1,405 homes were sold in 2018, almost an 80 percent increase. By 2015, home sales had recovered to their pre-2008 peak of 1,253 and have continued to grow since then. While sales numbers have seen a dramatic increase since 2010, home prices have not followed the same pattern. The average home sales price through the Williamsburg MLS was $344,000 in 2010 and $348,000 in 2018, about a 1 percent increase. However, these prices are well below the pre-2008 peak of $387,000 in 2006. The median price has risen by slightly more from $300,000 in 2010 to $319,000 in 2018.

Sales have recovered from the 2008 crash...



But prices have seen very little change.

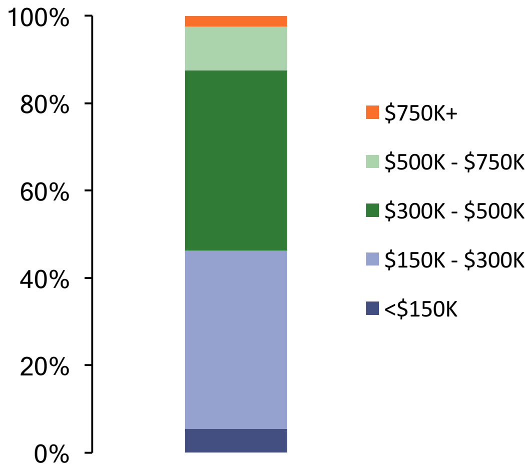


Attached and detached units sell equally well...

Home Type	Homes Sold	Median Price	Median Price/ Sq. Ft.	Median Days on Market
Single-Family Detached	1328	$355,000	$145	35
Single-Family Attached	619	$235,000	$134	23

In 2018, the majority of homes sold in the county – almost 70 percent – were single-family detached homes. The detached homes are significantly more expensive than single-family attached homes both overall and per square foot and spend more time on the market than attached homes. However, the time on the market– which is a good measure of the state of the market – for both types is significantly shorter than it was at the beginning of the decade when the median days on the market was 88 for detached homes and 110 for attached homes. Interestingly, the percentage of attached homes sales (just over 30 percent) is almost twice as large as the percentage of owner-occupied attached homes in the existing housing stock (13 percent).

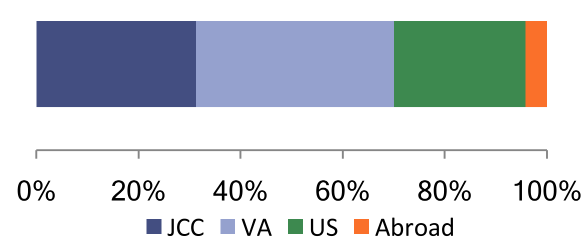
Most sales are in the $150-$500K range...



In 2018, home sales prices ranged from a low of $30,000 to a high of $2.4 million. The median price for single-family homes was approximately $312,000 while the average was around $340,000. According to the 2013-2017 ACS, the median home value for the existing stock of housing is higher at around $329,000. There are a higher percentage of sales in the $150,000 to $500,000 range than in the existing stock and a lower percentage of sales in the $500,000 and up range. In both the under $150,000 range and the $300,000 to $500,000 range, the percentages are roughly similar.

Given such a wide range of prices for home sales, it is not surprising that the square footage of the homes sold ranges from 500 to 25,865. The average square footage is 2,337 and the median square footage is 2,169. In terms of the number of bedrooms, the average is 3.3 and the median is 3. Less than one percent of homes sold had only one bedroom or 6 or more bedrooms.

Two-thirds of buyers are realtively local...



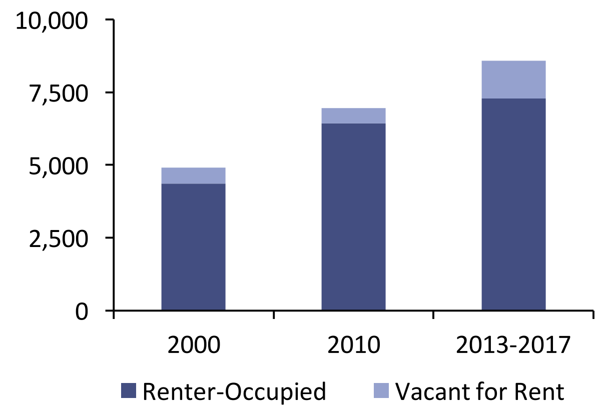
From the 2013-2017 ACS we can get some sense of the population that has been buying homes in James City County in the recent past. Around 30 percent of the people that moved in the 2013-2017 period moved from one home in the county to a different home.[4] An additional 40 percent moved from outside the county but within the state. Just over a quarter of the people that moved into the county moved from U.S. states other than Virginia and around 5 percent moved from another country.

[4] The ACS counts the number of people moving, not the number of households.

Rental Homes

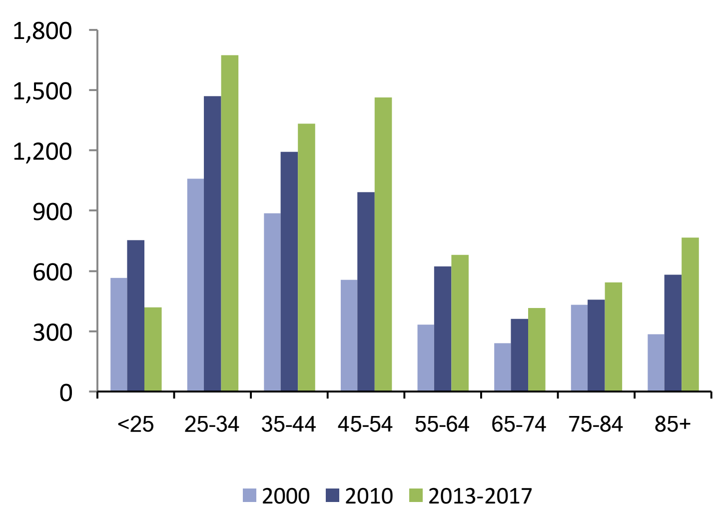
According to the 2013-2017 ACS there are 7,293 rental units in the county as well as 1,300 vacant units that are explicitly for rent for a total of 8,593 units. This represents 27 percent of the current total housing stock. In 2010, the comparable number of units was 6,964. Thus the county has experienced a 24 percent increase in the stock of rental housing in less than 10 years and a 75 percent increase since 2000. While the percentage increase in rental units is more than twice the rate of increase in the stock of owner-occupied housing, the absolute number of additional units is about the same across the two types of housing. The percentage of households that rent has increased slightly since 2000 and 2010 when it was just under a quarter of all households, which is consistent with national trends. However, on an absolute level the county a significantly lower percentage of rentals than both Virginia and in the U.S. overall, where rental percentages are between 32 and 34 percent.

Rental stock has grown 75% since 2000...



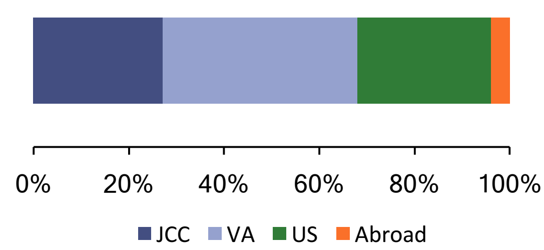
In 2000, the vacancy rate for rental units was approximately 11 percent. Vacancies dropped to about 8 percent in the 2010 census, but were estimated at around 15 percent in the 2013-2017 ACS. A vacancy rate of 5 percent is generally thought to be the “natural” vacancy rate for rentals, i.e., the vacancy rate that indicates a balance between housing supply and demand. Vacancy rates higher than 5 percent indicate that the available rental housing is sufficient to satisfy existing demand.

There are more renters across almost all age groups...



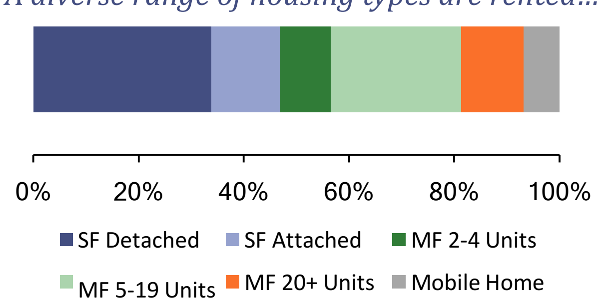
Both the percentage and the absolute number of households that rent has risen in every age category except those under 25. Higher rental rates in the younger age groups could be an indicator of the difficulty in making a first-time home purchase. On the other hand, increasing rental rates among older groups are likely due to different circumstances. Some may have been priced out of the sales market while others may be downsizing and perceive an advantage to renting. For elderly households the move to rental housing may be due to accessibility issues or the need to decrease the amount of home maintenance. Unfortunately for those in the upper age brackets, the move to the rental market may represent an increased cost burden, particularly for those on fixed incomes who were under pressure to change housing in a short time period.

Two-thirds of renters are from Virginia...



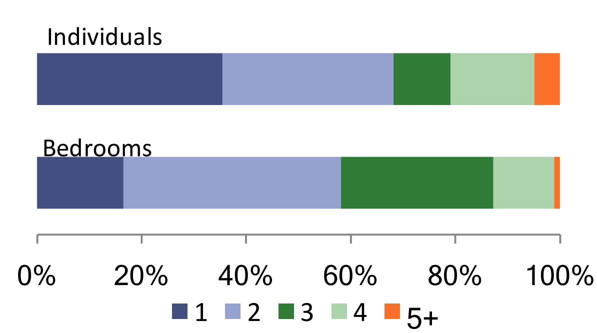
According to the 2013-2017 ACS, less than 10 percent of rental households have been in their units since 2000 or earlier. Just under 20 percent of rental households moved into their units between 2000 and 2009. The remaining 75 percent of householders moved into their units in 2010 or later. In terms of the rental population (rather than rental households), the 2009-2013 ACS reports that 75 percent of renters were in the same unit for at least a year and 25 percent moved into their unit within the last year. Of the renters that moved within the last year, 30 percent moved within the county and almost 45 percent moved within Virginia. Most of the remaining movers came from within the U.S. with only a small percentage (just over five percent) from abroad.

A diverse range of housing types are rented...



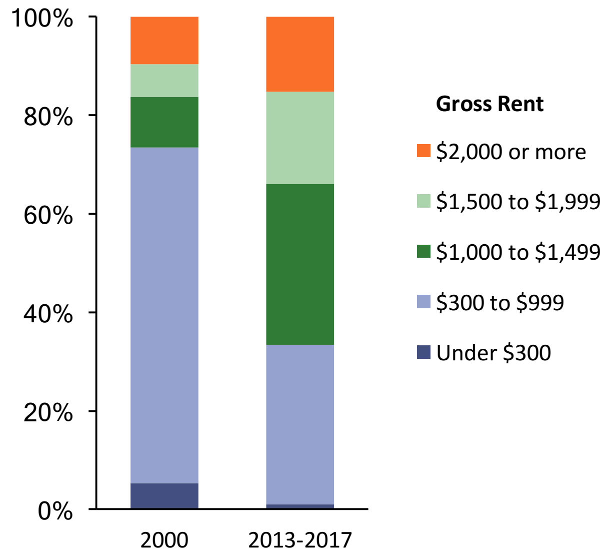
Every type of housing unit is available for rent in the county. The 2013-2017 ACS reports that over a third of the rental units are single-family detached houses and an additional 13 percent are single-family attached homes. Just under 10 percent of rental units are in small-multifamily structures. The most common type of multi-family rental are rentals in medium-sized structures, i.e., those with between 5 and 19 units which captures 25 percent of the rental population. About 12 percent of rentals are in large multi-family structures with 20 or more units. Finally, almost 7 percent of rentals are mobile homes.

Households and rental units are well-matched...



Comparing rental household sizes to the size of rental units as reported in the 2013-2017 ACS, we can see that they are better matched than owner-occupied units. About 18 percent of the rental units have one bedroom. While almost 40 percent of rental households have only one member, the ratio of single homeowners to one bedroom houses is about 20 to one rather than two to one. Just over 40 percent of units have two bedrooms, the most common size for rental units. At the other end of the spectrum, almost none of the rental units have five or more bedrooms, while about 5 percent of households have five or members. Of course, more than one person can share a bedroom.

Rents have outpaced inflation since 2000...

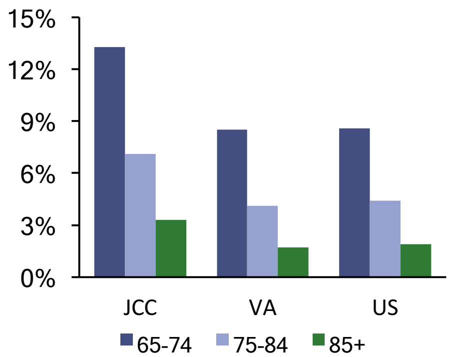


According to the 2000 Census, the median gross rent (which includes monthly utilities) for James City County was $703. In the 2013-2017 ACS, the median estimated gross rent is $1,202, which well exceeded the rate of inflation. If median gross rent had increased exactly at the rate of inflation, in 2017 it would have been only $1,011. The median rent may have increased by more than inflation rate because of a change in the types of rental housing available such as more luxury or upscale units. Alternatively, it could also indicate an increase in demand relative to supply for certain types of rental units in the county. However, the fact that the overall rental vacancy rate is well above the 5 percent "natural" vacancy rate shows that there is no overall imbalance between rental demand and supply. Of particular concern is that there is likely excess demand for units at the lower end of the scale. Even though the overall number of rental units has increased by 75% since 2000, the absolute number of units renting for less than $1,000 decreased by 750.

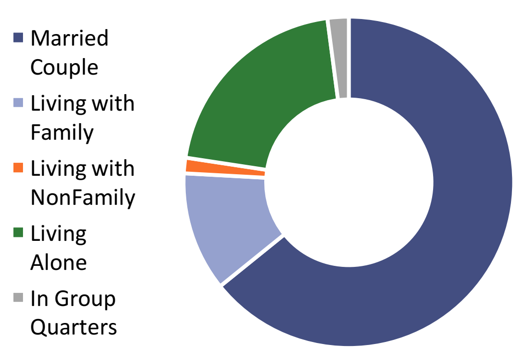
Senior Housing

Given the preponderance of seniors in the county, we wanted to examine the housing situation for seniors in detail. According to the 2013-2017 ACS, 17,264 of the people in the county were 65 years or older. Seniors thus represent almost one-quarter of the total population in the county. Across the U.S. overall, seniors are estimated to make up about 15 percent of the population, and only 14 percent of Virginians are 65 or older. Looking at specific age groups, about 13 percent of the county's population is between 65 and 74 compared to around 8 percent of the Virginia and U.S. populations. About 7 percent of the county's population is in the 75 to 84 age group and just over 3 percent are over 85. Both Virginia and the U.S. overall have smaller percentages – about 4 percent of the population in both are in the 75 to 84 age group and under 2 percent are in the 85 plus age group.

James City County is popular with seniors of all ages...



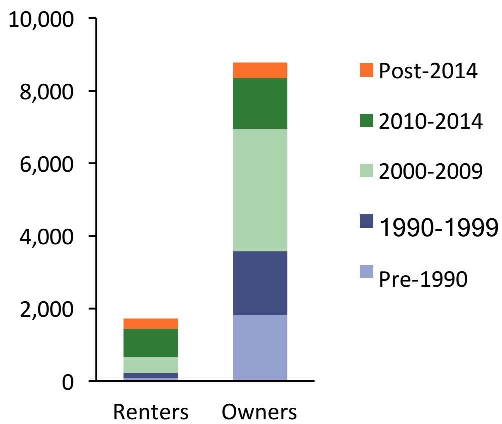
Most seniors share a home with a spouse...



The ACS also provides a breakdown of the senior population into household types. About 65 percent of seniors live with a spouse and another 12 percent live with at least one family member. A small number of seniors, about two percent, live in a household with non-family members. A little over 20 percent of seniors live alone, and more than three times as many women live alone compared to men. A small number of seniors – about 2 percent or 572 individuals – live in group quarters such as nursing homes. Just under 30 percent of seniors live with some form of disability.

While over 50 percent of the seniors in James City County would are classified as "upper income" with annual household income above $75,000, almost 15 percent have household incomes that are below almost are below $25,000. However, only a small percentage of seniors – about 2 percent – are estimated to be living below the poverty line. Looking at the impact of housing costs on seniors, of the 10,507 households 65 or older, about twenty-five percent of them are cost-burdened – that is, pay more than 30 percent of their income for housing. This is about the same as the percentage of households overall that are cost-burdened, as discussed in more detail in the following section, but there is a significant difference between owners and renters. Only 20 percent of the 8,783 senior households that own their homes are cost-burdened, while almost 60 percent of the 1,724 senior households that rent their homes are cost-burdened.

Seniors households include long-term residents and newcomers...



The 2013-2017 ACS also reports when senior households moved into their present home. Of the 10,507 total households, just about two-thirds are estimated to have moved into their home in 2000 or later. Of these, about 5,200 homes are owner-occupied and 1,500 and rentals. Of those that moved into their current homes before 2000, almost all of those households are owner-occupied, although about 230 households did move into their current rentals before 2000. Of the almost 1,500 seniors that reported moving to a new home within the last year, over one-third moved from another home within James City County. About 350 moved from another part of Virginia and over 500 moved from another state. Only around 50 reported moving from another country.

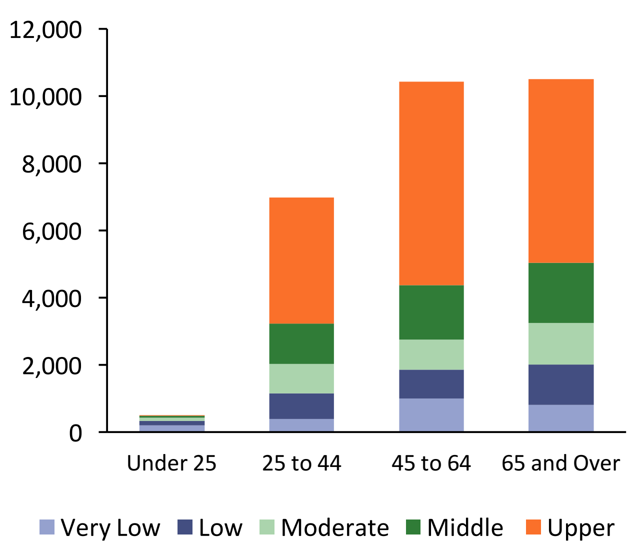
Housing Affordability Analysis

A housing affordability analysis compares what it costs to live in a certain area with the income of both current and potential new residents to determine whether the existing housing in the area is affordable. Affordability analyses typically focus on whether particular income groups can afford housing in a community.

Income Category	HUD Income Range	HUD Income Band	Analysis Income Band
Very low	< 30% MFI	Less than $25,100	Less than $20,000
Low	30% - 50% MFI	$25,100 - $37,500	$20,000 - $35,000
Moderate	50% - 70% MFI	$37,500 - $52,500	$35,000 - $50,000
Middle	70% - 100% MFI	$52,500 - $75,000	$50,000 - $75,000
Upper	> 100% MFI	More than $75,000	More than $75,000

Many affordability analyses use the income groups from the Department of Housing and Urban Development (HUD). The HUD income groups are defined relative to the Median Family Income (MFI) for an area. Very-low-income households have incomes that are less than 30 percent of the MFI while low-income groups have incomes between 30 and 50 percent of the MFI for a family of four. In 2018, the MFI for James City County was $75,000. Within the county, the HUD very-low-income group includes households with a total annual income of less than $25,100 and the low-income group has an income between $25,100 and $37,500. Unfortunately, the data we have on household incomes from the ACS do not allow us to determine how many households have incomes less than $25,100 or $37,500. Therefore, for this analysis we define a very-low-income household to be one with an annual income of less than $20,000 and a low-income household to be one with an income of $20,000 to $35,000. For our analysis, moderate-income households are those with income between $35,000 and $50,000, middle are those with income between $50,000 and $75,000, and upper are those with incomes greater than $75,000.

Low-income households exist in all age groups...

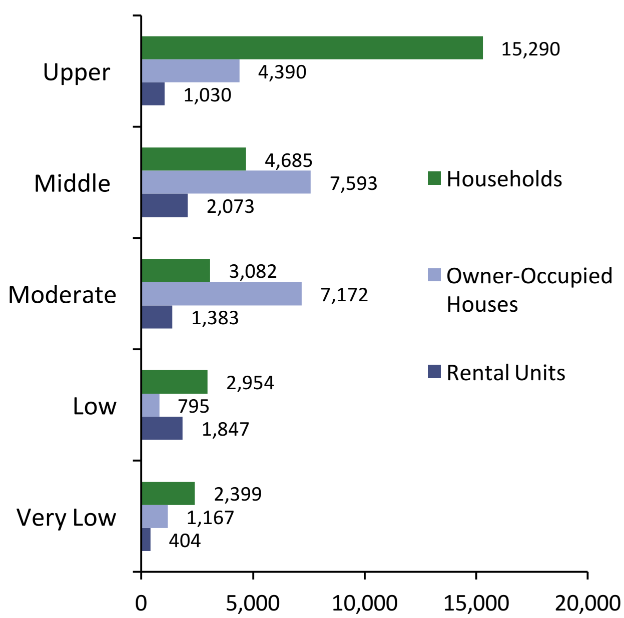


As one might expect, the under-25 age group the highest percentage of very-low-income and low-income households although such households occur in all age groups. Across all age groups in the county there are almost 2,400 very-low-income households which is just under 10 percent of all households and there are almost 3,000 low-income households representing just over 10 percent of households. Across all ages, about 11 percent of households are moderate income and 16 percent are middle income. By definition, almost 50 percent of all households are in the upper income group. Many of the very-low-income households are likely to be living in poverty as the federal poverty threshold for a family of four in 2018 was $25,100. However, the poverty level depends on the number of people in a household while the income groups do not. Thus, there could be some very-low-income households with a small number of family members that are not below the poverty level and some low-income households with large numbers of family members that might be.

Income Category	Maximum Rent [5]	Maximum House Value[7]
Very low	$600	$100,000
Low	$1000	$150,000
Moderate	$1,250	$300,000
Middle	$2,000	$500,000
Upper	> $2,000	>$500,000

Housing affordability is typically measured by computing the fraction of a household's income that must be expended to provide the household with housing. Housing is deemed to be affordable if the household spends 30 percent or less of their income on housing costs. Housing costs depend on whether the household owns or rents their home. For renters, housing costs include rent and utilities and we can look at gross monthly rent to determine whether a rental unit is affordable. For those in the very low income groups gross rent must be less than $600 per month to be affordable and, depending on what a particular household's income is, the maximum affordable housing might be significantly less. For homeowners, housing costs include mortgage principal and interest, taxes, insurance and utilities. For each income group we can determine the maximum affordable price for a home under certain assumptions.[6] For example, for those in the very low income group, only homes that are worth less than $100,000 are affordable. To determine whether the existing housing stock in James City County is affordable for residents in the different income groups, we compare the number of households in each income group to the number of owner-occupied houses and rental units in the county that are below the maximum house value and gross

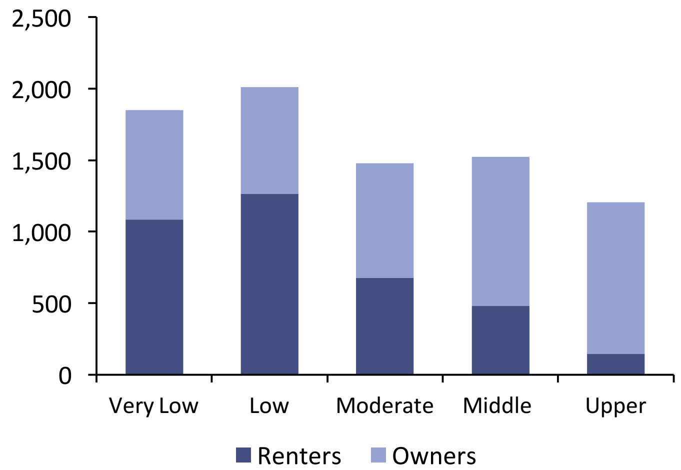
Demand for affordable units exceeds supply...



[5] In setting the maximum rent and maximum house price for each income group, we were limited by the way that gross rent data and house values are reported in the Census and ACS. Appendix A explains how we arrived at these values.

[6] We assume a 30-year fixed rate loan at a 3.75% interest rate with a 10% down payment, homeowner's insurance at 0.031% of the home's value and property taxes at 0.9%.

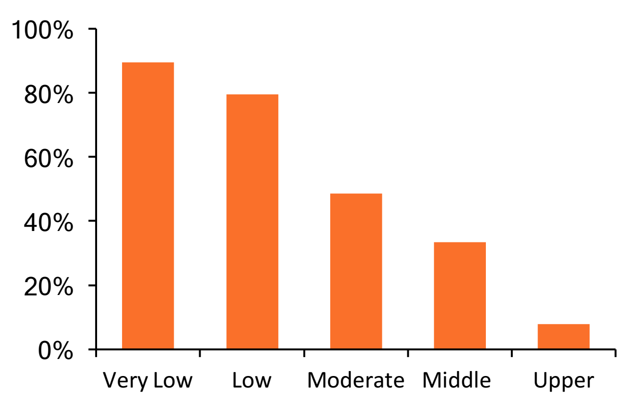
Households are cost-burdened at all income levels...



rents for that income group. For the very-low income group, the number of affordable rental and owner-occupied housing units is significantly less than the number of households. Thus almost half of the households in this group are likely to be "cost-burdened" as they will have to spend more than 30 percent of their income on housing. The situation is only slightly better for those households in the low-income group, i.e., those making between $20,000 and $35,000. There are over 2,600 housing units that are considered affordable for this income group while there are about 2,900 households in this group. However, since the total demand for housing for households making less than $35,000 is about 5,400 units and the supply is only about 4,200 units, overall a significant proportion of households in these two groups will be cost-burdened. For both the moderate and middle income groups, the stock of affordable housing is greater than the demand. While the stock of "affordable" housing for the upper income group may at first look to be insufficient, the total number of housing units is greater than the total number of households, so there is sufficient housing stock for households in this income group.

When one examines the 2013-2017 ACS data on the share of income that households report spending on housing, it appears that the cost burden is spread more widely than one might expect at first. Overall, just under thirty percent of households in the county, 8,068, are cost-burdened. In every income group a significant number of households are cost-burdened. Renters are more likely to be cost-burdened, with just over half of all renters reporting that they are cost-burdened. Just over twenty percent of owners report being cost-burdened. As one might expect, at the lower end of the income scale there are more cost-burdened renters but as income increases, the cost-burdened are more likely own their home. When one examines the percentage of households in each income group that are cost burdened, the percentage decreases as incomes rise. In the very-low-income group, almost 90 percent of all households are cost burdened and in the low-income group almost 80 percent are. These estimates include all households in the county, even those receiving housing assistance. While

But the cost burden falls hardest on the poor...

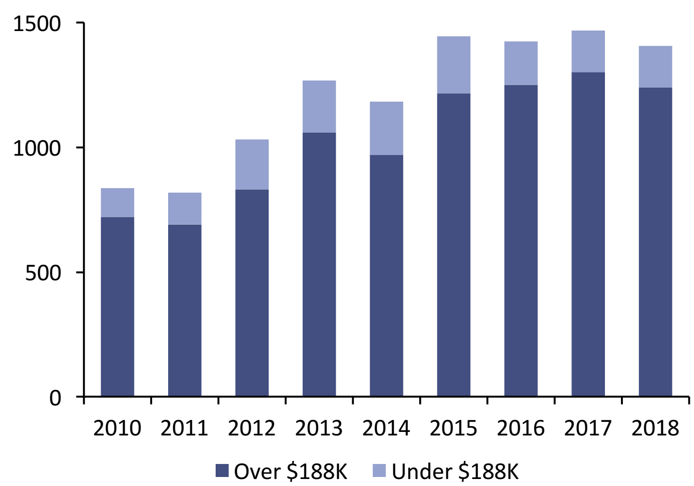


housing assistance does relieve the some of the cost burden for households that receive them, there is not enough housing assistance available to meet needs in the county and therefore a significant number of low-income households in the county are still struggling to pay for housing.

Interestingly, even in the moderate-income group almost 50 percent of households are cost-burdened and a third of those in the middle-income group are. For some households, it could be the case that they made their housing decision under different financial circumstances and some change, such as the loss of a job, has left them cost-burdened. Alternatively, some of these households may be voluntarily cost-burdened – that is, the household deliberately made a choice to spend more than 30 percent of their income on housing to obtain a higher standard of housing. Additionally, when considering these results it is important to remember that the definition of cost-burden compares income to monthly housing costs. Thus, a household that has high wealth might appear to be cost-burdened even if it is not having trouble covering the cost of housing. For example, a household that has recently retired may have a relatively modest annual income but have money in savings that is used to pay housing costs.

In addition to considering the reported cost-burden, another way to look at affordability is to analyze whether a typical first-time buyer can afford most to buy a home in the county. According to the 2013-2017 ACS, the median income of a rental household in the county was $43,678. Assuming that the renter is a first-time homebuyer and can pay no more than 30 percent of that income on housing, this translates into a monthly housing budget of $1,092 a month including principal, interest, taxes, and insurance (PITI). This means that a renter with the median income could afford to purchase a home selling for around than $188,000.[7] Since there are approximately 7,300 rental households in the county, this means that there are around 3,650 rental households in the county that have incomes below $43,678 and can only afford houses that cost less than $188,000. According to the 2009-2013 ACS, there are less than 2,000 owner-occupied homes that are worth less than $150,000.[8]

Most homes for sale aren't affordable to renters...



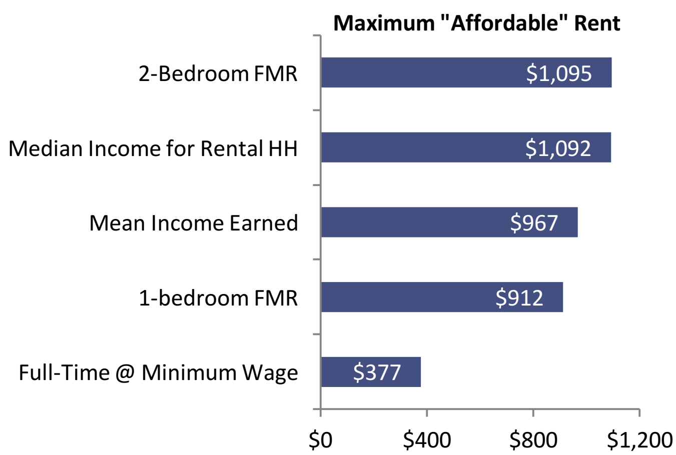
[7]Assuming a 30-year fixed rate loan at a 3.75% interest rate with a 10% down payment, including homeowner's insurance at 0.3% of the home's value and property taxes at 1%.

[8] Unfortunately, the ACS reports the number of homes below $150,00 and those in the $150,000-$300,000 range, so we cannot determine the number of homes worth $200,000 or less.

Of course, those homes already have owners. Looking at the MLS sales data for 2018, only 165 homes were sold for $188,000 or less – just under 12 percent of the total sales in 2018. Looking at all home sales from 2010 to 2018, the numbers are slightly better with just over 14 percent of homes sales for prices under $188,000 representing just under 1,700 houses. These figures indicate that the supply of affordable homes for first-time buyers is much lower than the potential demand for such homes.

If one is concerned primarily about the affordability of rental housing, one key factor to examine is whether a typical rental household can afford to rent a two-bedroom home without spending more than 30 percent of the household's income on housing costs. Alternatively, one can calculate the hourly wage an individual must earn to afford the estimated "Fair Market Rent" (FMR) while spending no more than 30 percent of income on housing. The FMR is defined by HUD as the 40th percentile of gross rents for typical, non-substandard rental units in the area. FMRs are determined by HUD on an annual basis, and the 2018 FMR for James City County for a two-bedroom unit was $1,095 and $912 for a one-bedroom unit. The median rental household in James City County can just afford the two-bedroom FMR as their maximum affordable monthly housing cost is $1,092. However, a household with only one worker who earns the average income paid in James City County of $38,679 can only afford $967 per month without being cost-burdened.[9] Thus such a worker would just barely be able to afford a one-bedroom unit at FMR. For a worker with a full-time minimum-wage worker who only earns $15,080 a year, even a one bedroom units is unaffordable. In fact, for a household to be able to afford a two-bedroom unit at FMR there would have to be the equivalent of 3 full-time minimum-wage workers in the household and for a one-bedroom unit there would have to be 2.5 full-time minimum wage workers. If there was only one earner in the household working full-time, that person would have to earn $21.06 an hour to afford a two-bedroom unit and $17.54 to afford a one-bedroom unit.

Minimum-wage workers can't afford most rentals...



[9] Bureau of Labor Statistics, Quarterly Census of Employment and Wages average annual income paid for James City County in 2018.

Industry	Average Annual Salary	Maximum Monthly Rent	Maximum Home Price
Accommodations and Food Service	$20,200	$505	$88,000
Retail Trade	$21,400	$535	$90,000
Education	$25,000	$625	$93,000
Health Care and Social Assistance	$43,100	$1,080	$162,000
Construction	$52,400	$1,310	$217,000

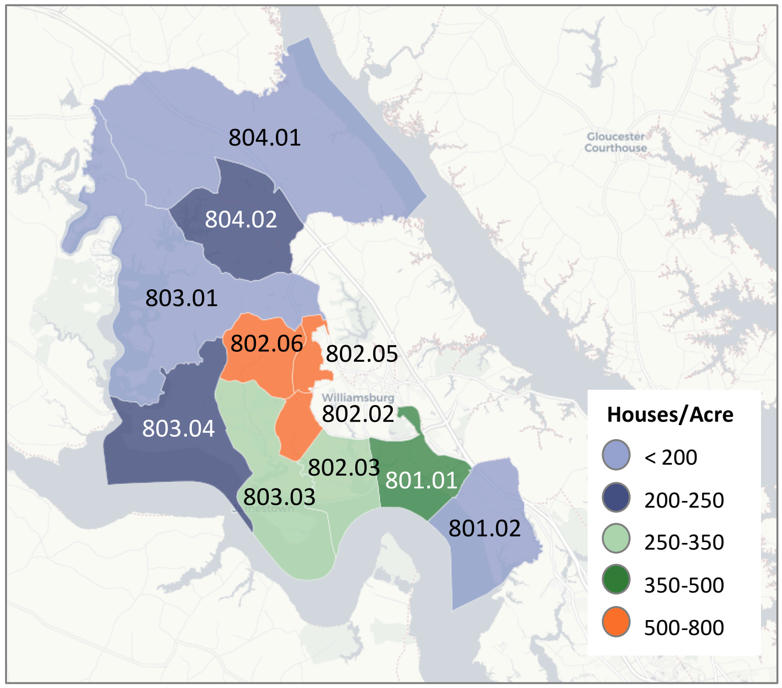
Many affordability analyses also compare the average salary for different types of jobs in an area to housing costs in that area to determine whether the area is affordable for the individuals engaged in those occupations. According to the Virginia Employment Commission, in 2018 the average wage for worker in the Accommodations and Food Service sector in the county was $20,200. This worker could afford a maximum monthly rent of $505 and could buy a home worth no more than $88,000.[10] Thus, a household with a single earner working in the Accommodations and Food Service sector could not afford the FMR for a one-bedroom apartment and would have a difficult time finding a house that he could afford to buy. A worker in the Retail Trade or Education sectors (which includes teachers as well as other staff members at public and private schools) would be in a similar situation. The average workers in the Health Care and Social Assistance or the Construction industries would be able to afford a two-bedroom apartment at fair market rent, although they will have a difficult time finding an affordable home to buy since less than 25 percent of homes on the market in the county are sold for less than $200,000.

[10] Assuming a 30-year fixed rate loan at a 3.75% interest rate with a 10% down payment, including homeowner's insurance at 0.03% of the home's value and property taxes at 1%.

Intra-County Comparison

The housing stock is not equally distributed across James City County. In terms of housing density, the number of housing units per acre according to the 2013-2017 ACS ranges from a high of 789 units per acre in census tract 802.05 to a low of 71 units per acre in tract 804.01. Overall, the housing density in the county is about 230 units per acre. The densest tracts are those closest to the City of Williamsburg while the least dense tracts are those in the northwest section of the county as well as the tract is the southeastern part of the county. Housing density depends on a number of factors including the amount of land that is zoned for residential use, the size of lots and the existence of multi-family housing in addition to demand for housing in a particular area.

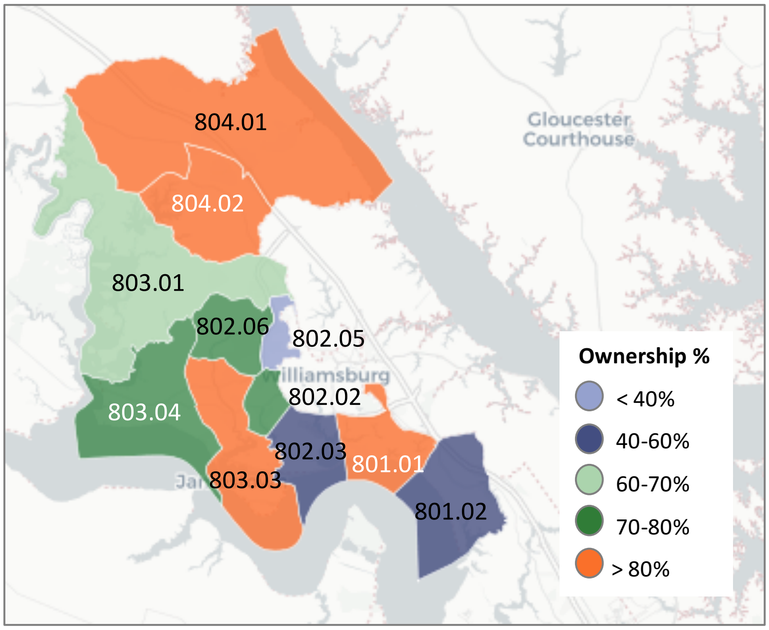
The densest tracts are closest to the City of Williamsburg…



Census Tract	Housing Units in 2013-17	Housing Units in 2010	Percent Growth
801.01	3,118	3,095	1%
801.02	1,537	1,409	9%
802.02	2,284	2,275	0%
802.03	1,785	1,746	2%
802.05	1,988	1,450	37%
802.06	5,402	4,947	9%
803.01	3,585	3,683	-3%
803.03	3,825	3,214	19%
803.04	2,409	2,416	-1%
804.01	2,988	2,669	12%
804.02	3,436	2,893	19%

In absolute numbers of housing units, the tracts vary significantly as well with a current estimate of 5,402 total units in census tract 802.05 and only 1537 units in tracts 801.02. In analyzing the growth in housing between 2010 and today, the fastest growing census tracts in terms of the percentage increase in housing in 802.05 which grew by 37 percent. However, this is a relatively small tract. Thus, while tract 803.03 only had a 19 percent increase in the number of housing units, the absolute increase was over 600 homes compared to about 530 homes in 802.05. Tract 804.02 also had an increase in about 550 units during this time period. Note that two tracts are actually estimated to have decreased the number of available units, 803.01 and 803.04.

Ownership rates are high across most of the county…



The county has a very high ownership rate compared to the rest of Virginia and the US overall. In 2013-2017 ACS, census tract 804.01 had the highest owner-occupancy rate at 90 percent, followed closely by tract 803.03 which has an owner-occupancy rate of 85 percent.[11] The real outlier is tract 802.05 – the tract that contains New Town – which has an owner-occupancy rate of about 36 percent and thus a rental rate of around 64 percent. In this tract, almost 40 percent of units are in complexes with 10 or more units and another 10 percent are in other multi-family complexes. The next lowest owner-occupancy rate is in tract 802.03 which has an ownership rate of just over 60 percent. This is the census tract that includes the apartment complexes at the intersection of 199 and Jamestown Road and overall this tract has just over a third of its housing stock in multi-unit housing structures. Almost all of the other census tracts in the county have between 75 and 90 percent single-family units, not including mobile homes. The one remaining exception is census tract 801.02, the southernmost tract, where 46 percent of the housing units are mobile homes and the owner occupancy rate is only about 60 percent.

Vacancy rates (for both owner-occupied and rental units) vary across the census tracts as well. Census tracts 801.01 and 802.06 both have vacancy rates much higher than the county's overall rate of 12 percent as both of these tracts have a vacancy rate of almost 20 percent. These are extremely high vacancy rates, particularly since both of these tracts are over 75 percent owner-occupied, with more than one out of every six houses vacant. Tract 801.01 contains the Kingsmill neighborhood while tract 802.06 includes the Ford's Colony golf courses and surrounding homes. While the "natural" vacancy rate for rentals is around 5 percent, owner-occupied vacancy rates tend to be below 5 percent. Interestingly, these tracts have the relatively high value homes which could be contributing to the high vacancy rates for these areas. Tracts 802.02 and 803.04 both have the lowest vacancy rates – less 5 percent – which is less half that of the county's overall rate. The remaining tracts all have vacancy rates between 8 and 15 percent. Thus overall

[11] These estimates only consider occupied housing – thus the owner occupancy rate is calculated as the total number of owner-occupied houses divided by the total number of occupied houses.

the county appears to have a slight excess supply of housing relative to the demand for housing, although of course for certain price points or types of housing there could be excess demand.

Owner-Occupied Houses

As one would expect, housing values also vary across census tract. The median owner-

	801.01	801.02	802.02	802.03	802.05	802.06	803.01	803.03	803.04	804.01	804.02
Median Value	$496K	$111K	$282K	$333K	$205K	$441K	$268K	$327K	$458K	$337K	$276K
<$100K	3%	48%	7%	2%	8%	5%	7%	1%	3%	2%	4%
$100K-150K	0%	14%	9%	6%	10%	1%	6%	3%	0%	3%	4%
$150K-300K	14%	37%	39%	32%	66%	21%	54%	38%	13%	37%	48%
$300K-500K	34%	1%	40%	46%	13%	37%	30%	44%	39%	37%	41%
<$500K	49%	0%	6%	14%	4%	36%	4%	14%	47%	22%	3%

occupied house value varies from a low of $111,000 in tract 801.02 to a high of $496,000 in tract 801.01. Recall that in tract 801.02, 46 percent of the housing units are mobile homes, explaining the low median value. The housing affordability analysis found that the maximum house price that a household with a very low income could afford is $100,000, $150,000 for a household with a low income, $300,000 for a household with a moderate income, and $500,000 for a household with a middle income. Tract 801.02 is the census tract that is most likely to house very low income households as 47 percent of the homes in this tract are worth less than $100,000. Even low income households are likely to live in only four tracts – 801.02, 802.02, 802.05, and 803.01. In tracts 801.01, 802.06 and 803.04, the majority of households are likely to be in the upper income group since less than 25 percent of their owner-occupied houses are worth $300,000 or less and thus affordable to anyone other than those in the upper income group.

The 2018 MLS sales data also provide insight into the relative value of homes in each tract. Not surprisingly, the lowest average sales price is in tract 801.02. There are also very few MLS sales per owner-occupied house in this tract. The highest average price is in tract 803.04 which also has a relatively low number of sales per house. The most active tract is 804.02 with 7.5 percent of the owner-occupied houses sold in 2018. This tract added over 550 new homes since 2010, which explains the high percentage of sales. Note also

Census Tract	Sales in 2018	MLS Sales/ Houses	Average Price	Avg. Days on Market
801.01	141	4.5%	$441,046	82
801.02	17	1.1%	$176,331	243
802.02	158	6.9%	$252,762	34
802.03	42	2.4%	$329,763	58
802.05	65	3.3%	$273,344	91
802.06	193	3.6%	$445,835	77
803.01	116	3.2%	$285,918	50
803.03	185	4.8%	$310,746	66
803.04	85	3.5%	$534,404	86
804.01	86	2.9%	$360,312	74
804.02	256	7.5%	$315,162	44

that the average sales price in this tract is at the lower end of the range for the county and the days on the market is also relatively low. Tract 801.02 has the highest average days on the market, an indicator that houses in this tract are not selling well. Recall that this tract also has the highest percent of vacancies in the county – almost 20 percent – which is a further indicator that the houses in this area not in high demand.

<u>Rental Units</u>

Census Tract	Housing Units	Units for Rent	Percent for Rent	Rental Vacancies	Median Rent
801.01	3,118	750	24%	40%	$1,209
801.02	1,537	557	36%	4%	$955
802.02	2,284	497	22%	3%	$1,175
802.03	1,785	792	44%	18%	$1,161
802.05	1,988	1,297	65%	12%	$1,365
802.06	5,402	1,388	26%	16%	$1,204
803.01	3,585	1,152	32%	5%	$1,230
803.03	3,825	627	16%	22%	$1,227
803.04	2,409	468	19%	0%	$1,705
804.01	2,988	434	15%	30%	$1,809
804.02	3,436	631	18%	17%	$798

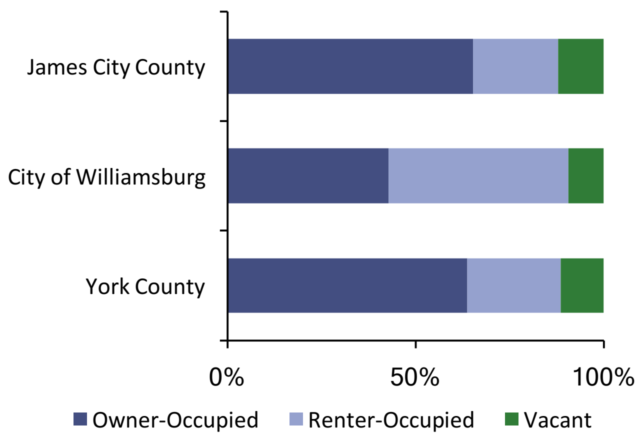
The stock of rental housing also differs significantly across the county both in terms of availability and price. As discussed earlier, tract 802.05 has the highest percentage of rental units (both occupied and vacant) in the county, although tract 802.06 – the tract that contains a number of rental complexes off of Longhill Road – has the highest number of rental units. Tract 804.01 has the lowest number of units and percent for rent.[12] Several tracts have a very low rental vacancy – i.e., vacancy rates below below the "natural" vacancy rate of 5 percent. Other tracts have very high rental vacancies above 30% in both tract 804.01 and 801.01. There are also significant differences in the median rental rate across tracts. Some of the variation in both rents and vacancy rates is due to the type of rentals in each tract. In both 804.01 and 801.01, at least 60 of occupied rental units are single-family houses. The two tracts with the lowest median rental rates, 801.02 and 804.02, also have the highest percentage of rentals in complexes with 50 or more units.

[12] The "Percent for Rent" is the number of units current occupied by renters plus the vacant units for rent divided by the total number of units.

Inter-County Comparison

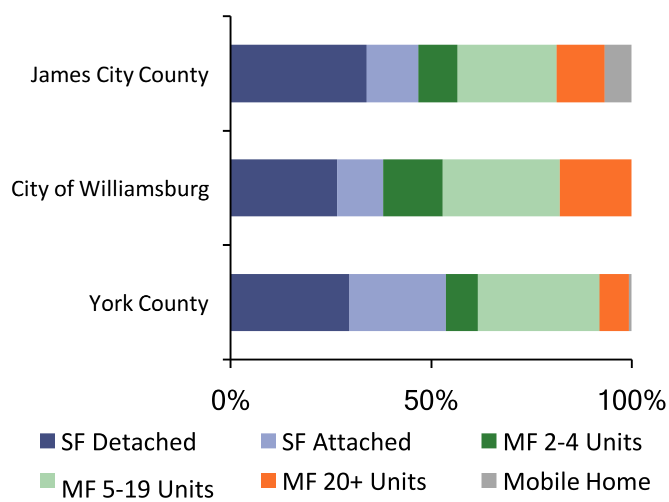
Greater Williamsburg consists of three different jurisdictions – James City County, the City of Williamsburg and the upper portion of York County. Individuals who looking to reside in the greater Williamsburg area are likely to look at homes in all three locations. Thus, it makes sense to compare the housing markets of these three areas. All three areas have experienced significant growth over the last three decades, although the City Williamsburg, with its lack of significant undeveloped land, has seen the lowest growth of about 30% compared to 80% in York County and 120% in James City County. The City of Williamsburg has just over 5,100 housing units compared to 27,500 in York and 32,400 in James City. All three localities have similar rates of housing vacancies – between 9 and 12 percent, but the two counties both have a significantly higher percentage of owner-occupied housing than the City of Williamsburg, where less than half of all units are occupied by their owners.

The counties look similar to each other, but the city stands out with many more renters...



There are also important differences in the types of housing available in the three jurisdictions. Only James City County has a significant number of mobile homes – 7 percent – while York has less than one percent and the City has none. Williamsburg has a much higher percentage of very large multi-family units, almost twenty percent, compared to 12 and 8 percent in James City County and York, respectively. York has the highest percentage of single family homes – 55 percent – although about half of its single-family homes are attached compared to about thirty percent for the City and James City County. Given these differences in the types of housing units, as one might expect there are also difference in the house prices and rents. James City County has the highest median value for owner-occupied houses at $329,000 according to the 2013-2017 ACS, followed by

Available housing varies across jurisdictions...



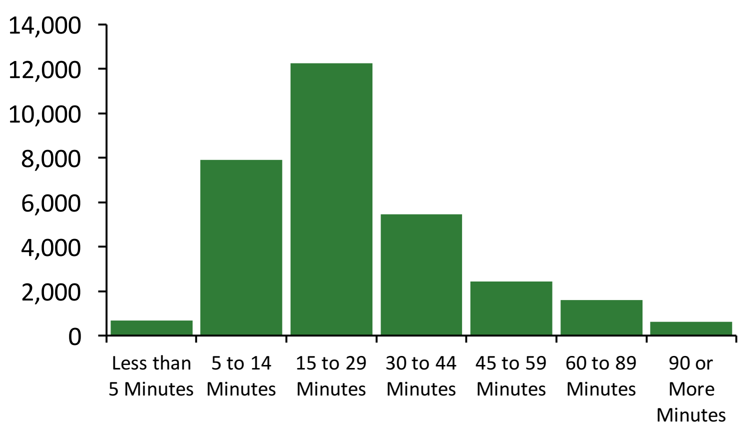
York County at $315,000 and the City at $307,000. However, York has the highest median rent at $1,460 followed by James City at $1,200 and the City at $1,000.

Jurisdiction	Williamsburg MLS Sales	Average Price	Avg. Days on Market
James City County	1,405	$347,832	64
City of Williamsburg	154	$311,333	73
York County	390	$322,607	46

With respect to house sales, the Williamsburg MLS contains data on sales from all three jurisdictions, although it does not have a complete records of sales in York county as a separate multiple listing service, the Real Estate Information Network (REIN) covers the lower part of Hampton Roads. The Williamsburg MLS primarily covers sales in the upper part of York county, particularly parts of the county with a Williamsburg mailing address. According the Williamsburg MLS, there are about ten times as many house sales in James City County as there are in Williamsburg and homes in James City County sell faster and for more than homes in Williamsburg. Compared to upper York County, homes in James City take longer to sell, but they also sell for a higher average price.

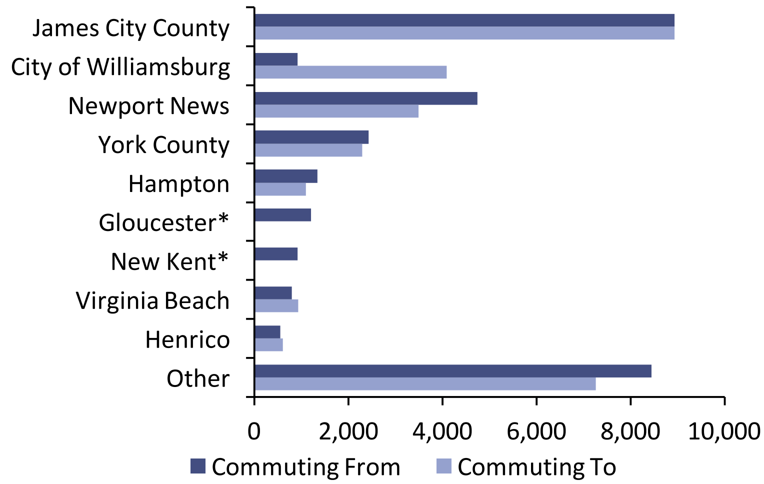
Another important factor that influences an individual's housing location decision is their ability to commute to other locations. According to the 2013-2017 ACS, about 6 percent of the working adults in the JCC worked from home – the remaining all commute to work. While the average commute time is 25 minutes, commute times vary significantly from under 5 minutes to over 90 minutes. Amost all of these commuters use a personal vehicle to get to work, with almost 90 percent of commuters driving alone and an additional 8 percent carpooling in a personal vehicle. Just about one percent of commuters use some form of public transportation to get to work and just over one percent walk to work.

Most JCC Residents have commutes under 30 minutes...



The Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) dataset also provides information on commuting patterns in the area. In 2017, approximately 9,000 residents (around 30 percent of workers) of James City County both lived and worked in the county with the remaining 20,000 working residents commuting to other jurisdictions. Additionally, about 21,000 individuals commute into the county from elsewhere to work. Thus, the inflow and outflow of workers in the county is about equal. However, more workers commute to the city of Williamsburg than commute from Williamsburg to James City County, with a net outflow of almost 3,000. The reverse is true of Newport News, York County and Hampton, all of which show a net inflow of workers. Newport News

JCC receives a net outflow of commuters to Williamsburg and a net inflow from Newport News, York, and Hampton...

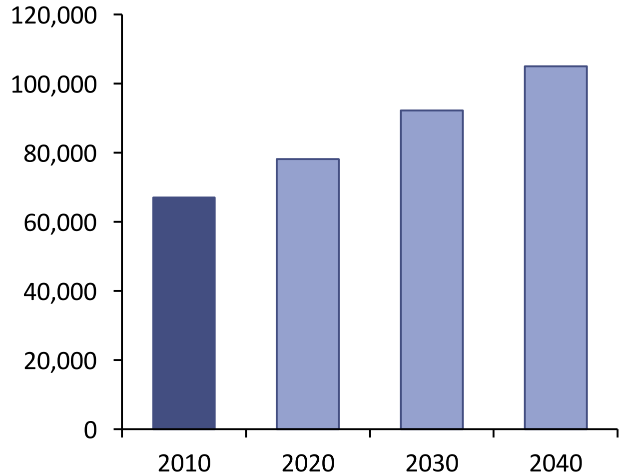


has the highest net inflow of about 1,200 workers into the county as well as the largest absolute number of incoming commuters. Gloucester and New Kent counties are both significant sources of workers in the county with 1,200 and 900 commuters respectively. The number James City residents working in those two areas is less than 500, and thus is not calculated direcrly in the LEHD, but rather included in the “Other” group in the graph to the right. Both Virginia Beach and Henrico have more workers commuting into the county that commute out to those two locations. Virginia Beach has a net inflow of commuters of about 150 workers, while Henrico’s inflow is about 50.

Future Housing Needs

The Weldon Cooper Center for Public Service produces population projections for all Virginia localities. According to their most recent estimates, the population in Williamsburg will grow to 78,016 by 2020, to 92,210 by 2030, and to 104,915 by 2040. These figures are consistent with the 2013-2017 ACS population estimate of 73,028 which shows about a 6,000 person increase over the 2010 Census count of 67,009. Thus, over the next decade, the population of the county is likely to grow by well over 10,000 individuals. Given an estimated average household size of 2.5 people, this suggests the need for more than 7,500 additional housing units by 2030. The 2013-2017 ACS estimates a total just under 4,000 vacant housing units currently leaving a deficit of over 3,500 units that will be needed within the next decade to meet the increased demand for housing.

The county's population is projected to grow by well over ten thousand in the next decade...



Appendix A: Affordability Analysis Income Groups

Income Category	HUD Income Range	HUD Income Band	Analysis Income Band
Very low	< 30% MFI	Less than $25,100	Less than $20,000
Low	30% - 50% MFI	$25,100 - $37,500	$20,000 - $35,000
Moderate	50% - 70% MFI	$37,500 - $52,500	$35,000 - $50,000
Middle	70% - 100% MFI	$52,500 - $75,000	$50,000 - $75,000
Upper	> 100% MFI	More than $75,000	More than $75,000

The standard income groups used in housing affordability analyses are those created by the Department of Housing and Urban Development (HUD). The income groups are defined relative to the Median Family Income (MFI) for an area, assuming a household of four people. As shown in the table above, very low income households have incomes that are less than 30 percent of the MFI while low income groups have incomes between 30 and 50 percent of the MFI, etc. In 2018, the MFI for James City County was $75,000. Thus, within the county, the HUD very low income group includes households with a total annual income that is less than $25,100 and the low-income group has an income between $25,100 and $37,500. However, the data available on household incomes from the Census and ACS do not break income out into fine enough categories to allow us to determine how many households have incomes less than $25,100 or $37,500. Therefore, for this analysis we used income ranges that correspond as closely as possible to the HUD income ranges while being consistent with the data provided by the Census and ACS. This for this analysis we define a very-low-income household to be one with an annual income of less than $20,000 and a low-income household to be one with an income of $20,000 to $35,000. For our analysis, moderate-income households are those with income between $35,000 and $50,000, middle are those with income between $50,000 and $75,000, and upper are those with incomes greater than $75,000.

Similarly, when analyzing the number of housing units – both owner-occupied and rental – that would be affordable for each income group, we were limited by the way in which the ACS reports home values and gross rents. The table below shows the actual maximum gross rent and house price that each income group could afford as well as the proxy values we used in our analysis based on the way data are reported in the ACS. Thus while the maximum rent that is affordable for a low-income household (using our analysis income bands) is $875, for our analysis we considered any rents below $1000 to be affordable. Similarly, while the maximum house price someone in this income group could afford is $152,500 we only considered houses less than $150,000 to be affordable.

Income Category	HUD Income Band	Analysis Income Band	Maximum Rent	Maximum Rent Proxy	Maximum House Price	Maximum House Proxy
Very low	Less than $25,100	Less than $20,000	$500	$600	$102,000	$100,000
Low	$25,100 - $37,500	$20,000 - $35,000	$875	$1000	$180,000	$150,000
Moderate	$37,500 - $52,500	$35,000 - $50,000	$1,250	$1,250	$255,000	$300,000
Middle	$52,500 - $75,000	$50,000 - $75,000	$1,875	$2,000	$385,000	$500,000
Upper	More than $75,000	More than $75,000	> $1,875	> $2,000	>$385,000	>$500,000

Appendix B: Data Sets Used in the Assessment

One of the mainstays of demographic analysis is the decennial Census administered by the Census Bureau. One of the strengths of the census is that it attempts to record data on all individuals living in the country, rather than using a sample of individuals to estimate demographic characteristics for particular locations. However the questions that are asked of all individuals are generally pretty limited. Each household is asked to record the age, gender, and race of all individuals living in the household. With respect to housing information, the only information collected is the number of units in a structure, whether units are occupied or vacant, and whether they are owner-occupied or rented. More detailed demographic data is collected through a survey. Prior to 2010, the survey was part of the decennial Census and was called the "long form." Approximately 1 in 6 households received the long form which asked additional individual data (level of education, employment status and type, disability status, income levels, etc.) as well as additional data on housing (gross rent, number of bedrooms, mortgage status, etc.).

Beginning in 2005 the American Community Survey (ACS), which is also conducted by the Census Bureau, replaced the Census long form. The ACS is conducted monthly, rather than every 10 years and collects much the same information that was collected on the Census long form. The ACS is also a sample but has a much lower sampling rate – only 1 in 40 households is sampled every year. Because the sample is lower the estimates from the ACS are noisier. Thus for smaller geographies (census tracts, block groups, areas with less than 60,000 in population) estimates are only provided based on a 5-year moving average. For larger geographies, estimates are available based on a 3-year or 1-year average. Because the estimates are based on a sample, they are subject to error. The short time periods use fewer surveys to calculate the estimates and thus have larger errors.

Comparing data across the ACS and the Census should be done with care. For example, the 2013-2017 ACS includes data from collected each month between the beginning of 2013 and the end of 2017 and thus represent an average over those 5 years while data from the 2010 Census provides a picture of what was happening in 2010 alone.

An important source for information about housing investment patterns and housing affordability in James City County is the Williamsburg Multiple Listing Service (MLS) data on home sales in James City County. The Williamsburg MLS data contains information on all home sales that are listed by brokers that participate in the MLS service in the area. Sales that are made by private parties, such as sales by owners, are usually not listed in the MLS. Estimates of the percentage of total sales listed on the MLS range from 70 percent to 90 percent of all sales and depend on both the area and the market conditions. Additionally, some realtors may belong to the Hampton Roads MLS and thus their listings would not be included in these data. In particular, some listings on the southeast side of the county, i.e., in tract 801.02 may not be included in this data. For this analysis we looked at a cross-section of Williamsburg MLS sales for James City County in 2018 as well as a panel dataset of WMLS sales in the county from 2010 to 2018. The important thing to remember when using this data set is that not all sales are represented and in particular one might expect that very low priced houses would be less likely to be sold using a real estate agent both because the sellers may not be willing to pay an agent a commission and because agents may not be interested in selling houses that will result in only low commissions.

For information on commuting patterns, we used the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) dataset to find data on the origin and destination of commuters. These data are estimates based on tabulated and modeled administrative data, not counts from a census. For information on population projections, we used data developed by the Demographics Research Group at the University of Virginia's Weldon Cooper Center. These data are estimates calculated using data from the 2010 Census and a variety of different growth and extrapolation methods.