The Greater Washington Region's Future Housing Needs: 2023

by

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Acknowledgements

Enterprise Community Partners is pleased to be the underwriter for this report by the George Mason Center for Regional Analysis (CRA). CRA has been a leader in analyzing data related to the Greater Washington, D.C. regional economy. Enterprise believes it is important to ground funding, policy and systems change conversations in sound data analysis. In light of the housing insecurity issues that impact millions of families across the nation and hundreds of thousands of households in the Greater Washington region, this new report by CRA comes at a critical time. In order to remain competitive as a regional economy, it is important to understand and address the housing needs of individuals and families at all income levels and determine what steps can be taken to meet those needs and reduce the housing insecurity burdens faced by far too many households, especially low income households. In collaboration with the Greater Washington Housing Leaders Group and other stakeholders, we hope this paper will inform public and private sector policy and funding discussions aimed at addressing this critical issue. The Center for Regional Analysis would like to thank Enterprise Community Partners for underwriting this research project.

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Summary of Key Research Findings

Between 2011[1] and 2023, the Greater Washington region[2] is projected to add 410,380 new households for a total of 2,524,410 households, including workers and their families, retirees, students and others necessary for a robust region. In order to determine the future housing needs for these households, this analysis forecasts the Area Median Income (AMI)[3] group of the households, as well as the type (single-family and multi-family) and tenure (owned and rented) of the housing units they occupy.

Key Findings

- Between 2011 and 2023, the region is expected to add **149,000 low income households** earning less than 80% AMI. This growth will be driven by increases in low wage jobs and the retirement of the Baby Boomers.
- The majority of this increase is forecasted to occur in renter households. The region is forecasted to gain **82,130 low income renter households** by 2023 for a total of 476,070 low income renter households.
- The remaining increase in low income households will be owner households. The region is expected to add **66,870 low income owner households** during this time. In 2023, the Greater Washington region is forecasted to be the home for 346,870 low income owner households.
- Of the increase in low income households between 2011 and 2023,
    - **71,190 households** are expected to be **extremely low income households** earning less than 30% AMI (Table 1);
    - **50,980** are forecasted to be **very low income households** earning between 30% and 49.9% AMI; and
    - **26,920** are forecasted to be **low income households** earning between 50% and 79.9% AMI.

Table 1. Households by Area Median Income Group, Greater Washington Region

	Households		2011-2023 Increase	
	2011	2023	Households	Percent
Extremely Low Income: <30% AMI	269,900	341,090	71,190	26.4%
Very Low Income: 30-49.9% AMI	236,220	287,110	50,890	21.5%
Low Income: 50-79.9% AMI	167,820	194,740	26,920	16.0%
Middle Income: 80-119.9% AMI	634,170	737,300	103,130	16.3%
High Income: 120%+ AMI	805,920	964,180	158,260	19.6%
Total	**2,114,030**	**2,524,410**	**410,380**	**19.4%**

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments, and GMU Center for Regional Analysis

[1] The most recent year of complete data is 2011.
[2] The Greater Washington region approximates the Washington Metropolitan Statistical Area (OMB, 2013).
[3] The area median income is the median income for family households.

Table 2. Households by AMI in 2023 and Number of New Units Needed Compared to 2011 Greater Washington Region

	2023							
	<30% AMI	30-49.9% AMI	50-79.9% AMI	Total, Low Income	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**75,250**	**41,330**	**22,980**	**139,550**	**49,880**	**23,450**	**103,130**	**316,020**
Montgomery	43,230	45,940	33,350	122,520	77,770	36,560	170,760	407,610
Prince George's	57,020	55,380	37,830	150,220	79,360	32,440	81,350	343,370
Rest of Suburban Maryland (1)	40,730	31,710	19,980	92,420	56,790	27,230	81,490	257,930
Suburban Maryland	**140,980**	**133,030**	**91,150**	**365,160**	**213,930**	**96,220**	**333,600**	**1,008,910**
Arlington	13,860	7,560	5,790	27,210	20,780	10,310	56,950	115,260
Alexandria city	9,710	8,450	6,310	24,470	16,090	6,940	32,070	79,570
Fairfax (2)	41,070	36,480	24,640	102,190	86,390	42,880	213,590	445,050
Prince William (3)	19,500	22,260	15,360	57,120	43,940	20,080	70,780	191,920
Rest of Northern Virginia (4)	40,730	38,010	28,500	107,240	71,250	35,130	154,060	367,680
Northern Virginia	**124,860**	**112,760**	**80,600**	**318,220**	**238,460**	**115,350**	**527,450**	**1,199,480**
Washington Region	**341,090**	**287,110**	**194,740**	**822,940**	**502,270**	**235,030**	**964,180**	**2,524,410**
	Increase from 2011							
	<30% AMI	30-49.9% AMI	50-79.9% AMI	Total, Low Income	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**12,600**	**4,960**	**1,920**	19,490	**7,450**	**3,030**	**17,380**	**47,340**
Montgomery	5,290	6,550	3,120	14,960	7,400	4,860	20,900	48,110
Prince George's	13,450	11,090	6,990	31,540	5,190	110	4,780	41,620
Rest of Suburban Maryland (1)	14,710	6,740	1,810	23,250	8,890	4,980	14,450	51,580
Suburban Maryland	**33,450**	**24,380**	**11,920**	**69,750**	**21,480**	**9,950**	**40,130**	**141,310**
Arlington	4,740	170	1,910	6,820	4,440	1,510	11,100	23,870
Alexandria city	2,760	2,320	520	5,590	2,740	490	6,030	14,850
Fairfax (2)	2,240	4,760	1,030	8,020	9,750	6,910	15,690	40,380
Prince William (3)	3,610	6,400	2,480	12,490	9,690	4,720	15,720	42,610
Rest of Northern Virginia (4)	11,790	7,910	7,140	26,840	12,190	8,780	52,200	100,010
Northern Virginia	**25,130**	**21,550**	**13,080**	**59,760**	**38,800**	**22,420**	**100,740**	**221,720**
Washington Region	**71,190**	**50,890**	**26,920**	**149,000**	**67,730**	**35,400**	**158,260**	**410,380**

(1) Includes Frederick County, Calvert County, Charles County, and St. Mary's County

(2) Includes the cities of Fairfax and Falls Church

(3) Includes the cities of Manassas and Manassas Park

(4) Includes Clarke County, Culpeper County, Fauquier County, Loudoun County, King George County, Spotsylvania County, Stafford County, Warren County, and Fredericksburg city

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Forecasts of Households by Area Median Income Group and Housing Unit

This research builds upon the "Housing the Region's Future Workforce" reports published in 2011 and in 2013. Similar to the previous reports, the total housing need includes the housing needed to accommodate projected job growth. This need is then combined with the need from replacement workers filling jobs left by retirees. Lastly, the demand for housing from households not filling jobs in the region is forecasted to project the total demand for housing in the region. This total demand is then aligned with supply constraints and a likely scenario of who lives in the region in 2023, along with their housing characteristics and AMI is developed.

An overview of the households in the region in 2023 is presented in Section I. Section II describes the underlying job growth and the households needed to fill these jobs. Section III describes the housing demanded by households without workers.

I. Demand for Housing in the Greater Washington Region in 2023

What are the sources of demand for housing?

For the purpose of these forecasts, a household desires to live in the region either because one or more of its members has a job in the region (worker households) or because of a non-job reason, which is generally related to the household's demographics (non-worker households). Growth in these two types of households is driven by different factors and their housing characteristic profiles differ.

Worker households have at least one member in a payroll job. The incomes in these households will be earned by wages and salaries, which will be determined by the types of jobs they hold. Net new job growth and jobs vacated by retirees will drive the increase in these households.[4] As described in Section II, an estimated 2,199,610 households will be needed to fill the jobs that will exist in the region in 2023. This includes 469,850 worker households filling either jobs that are not currently in the region or jobs vacated by retirees.

Non-worker households include retirees, students, self-employed persons, those looking for a job and all other households in which no member has a payroll job. Non-worker households will not have traditional wage or salary income, but will rely on income from retirement accounts, investments, student aid, self-employment or other transfer payment. Demographic changes will drive the increase in these households. Most notably, Baby Boomers[5] will reach peak retirement age in the next decade, accounting for a large share of this growth. As described in Section III, an estimated 551,180 non-worker households will live in the region 2023.

What types of housing will be demanded?

To determine the household's needs, the **Area Median Income (AMI)** group is forecasted for each household based on the projected income and household characteristics. The Area Median Income is the household income at which half of the families in the region have incomes above and half have incomes below.[6] After accounting for household size, the household income is expressed as a percentage of AMI. The AMI groups are based on those used by the United States Department of Housing and Urban Development and are as follows

- less than 30% AMI; these households are considered to be extremely low income.
- between 30% and 49.9% AMI; these households are considered to be very low income,
- between 50% and 79.9% AMI; these are low income households,
- between 80% and 99.9% AMI,
- between 100% and 119.9% AMI, and
- 120% AMI and above.

[4] Additional vacancies will be generated as workers change jobs. These replacement workers are not included in this analysis.
[5] Baby Boomers were born between 1946 and 1964 and will be between 59 and 77 years old in 2023.
[6] Because not all households are family-households, the forecast of households is not precisely 50% above and 50% below 100% AMI, but reflects ratios consistent with current households.

Household characteristics are also used to project what type of unit will be desired. Both the building type (single-family detached/attached or multi-family) and the tenure (owned or rented) are forecasted.

How many households will live in the Greater Washington Region?

While there is potential demand from 2,750,790 households to live in the region[7] in 2023, these forecasts assume that the housing supply will constrain that growth. Only 2,524,410 housing units are forecasted[8] to exist in the region, 226,380 fewer than the potential units demanded.

To determine which households will ultimately live in the region and which households live outside the region, this research[9] assumes that

1) retirees and other non-worker households follow the same migration patterns as in past years, and
2) job growth, and the households generated by it, will not affect the ability or desire of non-worker households to stay in the region.

Because of these assumptions, not all forecasted worker households filling net new jobs will be able to live in the region. These households will become commuter households, as shown in Table 3. These households are in addition to those who currently commute to jobs from outside the region.

Table 3. Households by Area Median Income Group, 2023
Greater Washington Region

	Households in the Greater Washington Region			New Commuter Households (1)
	Worker Households	Non-Worker Households	Total	
<30% AMI	134,350	206,740	341,090	5,470
30-49.9% AMI	197,710	89,410	287,110	19,810
50-79.9% AMI	149,920	44,810	194,740	13,490
80-99.9% AMI	407,580	94,690	502,270	66,010
100-119.9% AMI	204,790	30,240	235,030	31,490
120%+ AMI	878,890	85,290	964,180	90,120
Total	**1,973,230**	**551,180**	**2,524,410**	**226,380**

(1) The AMI group is approximate and uses the Greater Washington Region's median income.
Numbers may not add due to rounding.
Sources: Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

[7] The Greater Washington region approximates the Washington Metropolitan Statistical Area (OMB, 2013). For a complete list of jurisdictions, see the appendix.
[8] The supply forecasts are based on the Metropolitan Washington Council of Governments, Round 8.3 Cooperative Forecasts.
[9] An alternative scenario that assumes increased rates of out-migration for non-workers is presented in the appendix. Because of the uncertainty around the future behavior of Baby Boomers and their post-retirement patterns, both scenarios may be treated as plausible alternatives.

How will households in 2023 differ from households in 2011?

Between 2011[10] and 2023, the number of extremely low income households earning less than 30% AMI is expected to increase significantly. The region is forecasted to add 71,190 extremely low income households during this time, for a total of 341,090 households (Table 4). An additional 287,110 households will be very low income and earn between 30% and 49.9% AMI. This is an increase of 50,890 households from 2011. Low income households earning between 50% AMI and 79.9% AMI are expected to increase by 26,920 households from 2011, for a total of 194,740 households. The total increase in extremely low, very low and low income households accounts for 36.3 percent of all net new households in the region.

The supply of housing will constrain where the new households will live. Net new worker households are assumed to desire to live in their work location. Once the units in the work location is filled, commuting patterns are applied to determine their most likely home location, and whether that home is inside or outside of the region. Future commuting patterns are expected to follow current commuting patterns based on work location and AMI.

The resulting distribution of housing demand by unit type is shown in Tables 5 through 8. The overall demand for multi-family units is expected to grow somewhat faster than the demand for single-family detached and attached units for the region and in nearly every jurisdiction. Demand for single-family detached and attached units is expected to have the highest growth from extremely low and very low income households (earning less than 50% AMI). Demand for multi-family units, however, has equally high growth rates at both ends of the income spectrum. Extremely low income households earning less than 30% AMI in multi-family units are forecasted to increase 26.6 percent. Households earning more than 120% AMI in multi-family units are forecasted to grow 25.7 percent. This two-tailed distribution reflects the demand from young workers and retirees, on one end, and empty-nesters and workers later in their career, on the other.

For the region overall, demand for owned units and rented units is expected to grow similarly. There is considerable variation by jurisdiction, though. Notably, the increase in demand for rental units will outpace the demand for owned units in the majority of Suburban Maryland and the closer-in jurisdictions in Northern Virginia.

[10] 2011 is the most recent year of complete data for comparison.

Table 4. Households by Jurisdiction and Area Median Income Group, 2023
Greater Washington Region

	2023						
	<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**75,250**	**41,330**	**22,980**	**49,880**	**23,450**	**103,130**	**316,020**
Montgomery	43,230	45,940	33,350	77,770	36,560	170,760	407,610
Prince George's	57,020	55,380	37,830	79,360	32,440	81,350	343,370
Rest of Suburban Maryland	40,730	31,710	19,980	56,790	27,230	81,490	257,930
Suburban Maryland	**140,980**	**133,030**	**91,150**	**213,930**	**96,220**	**333,600**	**1,008,910**
Arlington	13,860	7,560	5,790	20,780	10,310	56,950	115,260
Alexandria city	9,710	8,450	6,310	16,090	6,940	32,070	79,570
Fairfax (1)	41,070	36,480	24,640	86,390	42,880	213,590	445,050
Prince William (2)	19,500	22,260	15,360	43,940	20,080	70,780	191,920
Rest of Northern Virginia	40,730	38,010	28,500	71,250	35,130	154,060	367,680
Northern Virginia	**124,860**	**112,760**	**80,600**	**238,460**	**115,350**	**527,450**	**1,199,480**
Washington Region	**341,090**	**287,110**	**194,740**	**502,270**	**235,030**	**964,180**	**2,524,410**
	Increase from 2011						
	<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**12,600**	**4,960**	**1,920**	**7,450**	**3,030**	**17,380**	**47,340**
Montgomery	5,290	6,550	3,120	7,400	4,860	20,900	48,110
Prince George's	13,450	11,090	6,990	5,190	110	4,780	41,620
Rest of Suburban Maryland	14,710	6,740	1,810	8,890	4,980	14,450	51,580
Suburban Maryland	**33,450**	**24,380**	**11,920**	**21,480**	**9,950**	**40,130**	**141,310**
Arlington	4,740	170	1,910	4,440	1,510	11,100	23,870
Alexandria city	2,760	2,320	520	2,740	490	6,030	14,850
Fairfax (1)	2,240	4,760	1,030	9,750	6,910	15,690	40,380
Prince William (2)	3,610	6,400	2,480	9,690	4,720	15,720	42,610
Rest of Northern Virginia	11,790	7,910	7,140	12,190	8,780	52,200	100,010
Northern Virginia	**25,130**	**21,550**	**13,080**	**38,800**	**22,420**	**100,740**	**221,720**
Washington Region	**71,190**	**50,890**	**26,920**	**67,730**	**35,400**	**158,260**	**410,380**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table 5. Households by Area Median Income Group and Select Jurisdiction, 2023
Households in Single-Family Attached and Single-Family Detached Homes
Greater Washington Region

	Total Units	Households in Single-Family Attached & Single-Family Detached Homes						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	**16,840**	**13,010**	**8,060**	**17,770**	**8,700**	**49,590**	**113,960**
Montgomery	407,610	16,760	21,160	17,050	46,360	24,710	138,820	264,860
Prince George's	343,370	27,360	29,640	22,090	55,690	25,260	73,970	234,000
Rest of Suburban Maryland	257,930	25,560	24,100	16,300	49,700	24,940	77,320	217,920
Suburban Maryland	**1,008,910**	**69,680**	**74,900**	**55,440**	**151,750**	**74,910**	**290,110**	**716,780**
Arlington	115,260	2,910	2,390	1,330	5,610	3,380	28,520	44,140
Alexandria city	79,570	2,040	1,710	1,370	4,090	2,360	18,590	30,160
Fairfax (1)	445,050	17,780	20,600	14,030	54,340	30,140	183,230	320,110
Prince William (2)	191,920	10,700	15,220	10,980	35,400	17,700	66,600	156,590
Rest of Northern Virginia	367,680	25,240	27,830	21,880	60,650	32,340	145,050	312,990
Northern Virginia	**1,199,480**	**58,670**	**67,750**	**49,580**	**160,090**	**85,920**	**441,990**	**863,990**
Washington Region	**2,524,410**	**145,190**	**155,650**	**113,080**	**329,610**	**169,520**	**781,690**	**1,694,730**
	Percent Change from 2011							
	Total Units	**Households in Single-Family Attached & Single-Family Detached Homes**						
		<30% AMI	**30-49.9% AMI**	**50-79.9% AMI**	**80-99.9% AMI**	**100-119.9% AMI**	**120%+ AMI**	**Total**
DC	**17.6%**	**11.9%**	**-0.8%**	**-0.3%**	**8.2%**	**3.0%**	**9.9%**	**7.3%**
Montgomery	13.4%	18.1%	5.5%	11.3%	12.3%	6.7%	10.1%	10.3%
Prince George's	13.8%	39.2%	46.4%	21.2%	7.8%	-0.7%	5.0%	13.8%
Rest of Suburban Maryland	25.0%	45.7%	22.5%	2.2%	15.6%	20.9%	22.6%	21.2%
Suburban Maryland	**16.3%**	**35.6%**	**24.9%**	**12.0%**	**11.6%**	**8.2%**	**11.7%**	**14.6%**
Arlington	26.1%	97.7%	77.3%	107.6%	3.7%	-3.1%	20.5%	22.6%
Alexandria city	22.9%	40.4%	-13.4%	62.2%	22.6%	-12.2%	20.1%	17.0%
Fairfax (1)	10.0%	-0.5%	6.6%	6.6%	9.6%	13.0%	8.0%	8.1%
Prince William (2)	28.5%	10.9%	41.7%	19.7%	33.9%	26.2%	27.6%	28.1%
Rest of Northern Virginia	37.4%	38.6%	24.0%	26.3%	20.9%	32.4%	52.5%	37.5%
Northern Virginia	**22.7%**	**20.6%**	**21.4%**	**20.5%**	**18.6%**	**20.5%**	**24.1%**	**22.1%**
Washington Region	**19.4%**	**26.1%**	**20.7%**	**14.6%**	**14.7%**	**13.8%**	**18.3%**	**17.7%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table 6. Households by Area Median Income Group and Select Jurisdiction, 2023
Households in Multi-Family Units
Greater Washington Region

	Total Units	Households in Multi-Family Units						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	**58,400**	**28,320**	**14,920**	**32,110**	**14,760**	**53,540**	**202,050**
Montgomery	407,610	26,470	24,790	16,300	31,410	11,850	31,940	142,750
Prince George's	343,370	29,660	25,740	15,740	23,670	7,180	7,380	109,380
Rest of Suburban Maryland	257,930	15,170	7,610	3,680	7,090	2,290	4,170	40,010
Suburban Maryland	**1,008,910**	**71,300**	**58,140**	**35,720**	**62,180**	**21,320**	**43,490**	**292,130**
Arlington	115,260	10,950	5,170	4,460	15,170	6,940	28,430	71,110
Alexandria city	79,570	7,670	6,740	4,940	12,000	4,580	13,480	49,420
Fairfax (1)	445,050	23,290	15,880	10,610	32,050	12,740	30,360	124,930
Prince William (2)	191,920	8,800	7,040	4,390	8,540	2,380	4,190	35,330
Rest of Northern Virginia	367,680	15,490	10,180	6,620	10,610	2,790	9,010	54,690
Northern Virginia	**1,199,480**	**66,200**	**45,010**	**31,020**	**78,370**	**29,430**	**85,460**	**335,490**
Washington Region	**2,524,410**	**195,900**	**131,460**	**81,660**	**172,660**	**65,500**	**182,490**	**829,680**
	Percent Change from 2011							
	Total Units	**Households in Multi-Family Units**						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**17.6%**	**22.7%**	**21.8%**	**15.0%**	**23.4%**	**23.1%**	**31.8%**	**24.4%**
Montgomery	13.4%	11.5%	28.2%	9.4%	8.0%	38.8%	34.4%	19.6%
Prince George's	13.8%	24.1%	7.1%	24.8%	5.1%	4.1%	20.9%	13.8%
Rest of Suburban Maryland	25.0%	78.9%	43.4%	65.6%	45.0%	40.9%	4.5%	50.9%
Suburban Maryland	**16.3%**	**27.0%**	**19.4%**	**20.1%**	**10.0%**	**24.9%**	**28.5%**	**20.7%**
Arlington	26.1%	43.2%	-14.5%	37.7%	38.7%	30.5%	28.2%	28.4%
Alexandria city	22.9%	39.5%	62.0%	-0.1%	19.8%	21.6%	27.7%	26.9%
Fairfax (1)	10.0%	11.1%	28.2%	1.5%	18.5%	36.9%	7.2%	15.2%
Prince William (2)	28.5%	40.9%	37.5%	18.0%	9.3%	78.9%	46.6%	30.5%
Rest of Northern Virginia	37.4%	44.3%	32.8%	63.9%	19.5%	45.4%	33.4%	36.8%
Northern Virginia	**22.7%**	**29.6%**	**27.2%**	**17.5%**	**21.1%**	**36.0%**	**20.9%**	**24.3%**
Washington Region	**19.4%**	**26.6%**	**22.5%**	**18.2%**	**17.3%**	**29.2%**	**25.7%**	**23.0%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table 7. Households by Area Median Income Group and Select Jurisdiction, 2023
Owner-Households
Greater Washington Region

	Total Units	Owner-Households						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	13,270	12,640	7,610	21,080	10,500	66,270	131,380
Montgomery	407,610	17,480	19,870	18,130	46,450	25,780	143,420	271,130
Prince George's	343,370	19,950	24,530	19,340	51,860	23,660	71,210	210,550
Rest of Suburban Maryland	257,930	18,960	19,140	13,340	43,620	22,440	73,500	190,990
Suburban Maryland	**1,008,910**	56,390	63,540	50,810	141,920	71,890	288,130	672,680
Arlington	115,260	2,510	2,110	1,590	7,500	3,920	34,230	51,860
Alexandria city	79,570	1,660	1,680	1,910	5,660	2,730	20,670	34,300
Fairfax (1)	445,050	15,040	17,300	12,880	50,050	29,250	177,500	302,030
Prince William (2)	191,920	7,650	11,440	8,030	28,530	15,360	63,370	134,390
Rest of Northern Virginia	367,680	20,150	20,780	17,880	54,540	29,220	140,220	282,790
Northern Virginia	**1,199,480**	47,010	53,310	42,290	146,290	80,490	435,980	805,360
Washington Region	**2,524,410**	116,670	129,490	100,710	309,290	162,880	790,380	1,609,420
	Percent Change from 2011							
	Total Units	**Owner-Households**						
		<30% AMI	**30-49.9% AMI**	**50-79.9% AMI**	**80-99.9% AMI**	**100-119.9% AMI**	**120%+ AMI**	**Total**
DC	**17.6%**	**32.8%**	**10.9%**	**20.3%**	**24.3%**	**10.1%**	**17.8%**	**18.9%**
Montgomery	13.4%	16.9%	5.9%	9.8%	16.7%	10.0%	13.4%	13.0%
Prince George's	13.8%	41.0%	41.7%	17.6%	6.8%	-5.0%	2.9%	10.5%
Rest of Suburban Maryland	25.0%	56.4%	29.0%	5.6%	17.6%	22.7%	22.2%	23.1%
Suburban Maryland	**16.3%**	**36.8%**	**24.8%**	**11.4%**	**13.1%**	**7.9%**	**12.6%**	**14.9%**
Arlington	26.1%	102.3%	74.9%	118.4%	16.8%	6.5%	18.1%	22.7%
Alexandria city	22.9%	42.4%	14.1%	6.5%	33.0%	-2.7%	23.1%	21.3%
Fairfax (1)	10.0%	18.2%	9.6%	5.2%	12.4%	16.3%	7.2%	9.4%
Prince William (2)	28.5%	28.4%	44.0%	27.6%	29.5%	29.2%	26.4%	28.9%
Rest of Northern Virginia	37.4%	27.2%	30.8%	25.3%	33.2%	35.7%	50.8%	40.4%
Northern Virginia	**22.7%**	**27.3%**	**26.0%**	**19.7%**	**23.8%**	**23.7%**	**23.0%**	**23.5%**
Washington Region	**19.4%**	**32.3%**	**23.8%**	**15.4%**	**18.7%**	**15.3%**	**18.6%**	**19.4%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table 8. Households by Area Median Income Group and Select Jurisdiction, 2023
Renter-Households
Greater Washington Region

	Total Units	Renter-Households						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	**61,970**	**28,690**	**15,370**	**28,800**	**12,950**	**36,860**	**184,640**
Montgomery	407,610	25,750	26,070	15,220	31,330	10,770	27,330	136,480
Prince George's	343,370	37,070	30,840	18,490	27,500	8,780	10,140	132,820
Rest of Suburban Maryland	257,930	21,770	12,580	6,630	13,180	4,790	7,990	66,930
Suburban Maryland	**1,008,910**	**84,590**	**69,490**	**40,340**	**72,010**	**24,330**	**45,460**	**336,230**
Arlington	115,260	11,350	5,450	4,200	13,280	6,390	22,720	63,400
Alexandria city	79,570	8,050	6,770	4,400	10,430	4,210	11,410	45,270
Fairfax (1)	445,050	26,030	19,180	11,760	36,340	13,630	36,090	143,020
Prince William (2)	191,920	11,850	10,820	7,330	15,410	4,720	7,410	57,540
Rest of Northern Virginia	367,680	20,570	17,230	10,620	16,720	5,900	13,840	84,890
Northern Virginia	**1,199,480**	**77,850**	**59,450**	**38,310**	**92,180**	**34,860**	**91,470**	**394,120**
Washington Region	**2,524,410**	**224,420**	**157,630**	**94,020**	**192,980**	**72,140**	**173,790**	**914,990**
	Percent Change from 2011							
	Total Units	**Renter-Households**						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**17.6%**	**17.7%**	**14.9%**	**4.3%**	**13.0%**	**19.0%**	**25.1%**	**16.7%**
Montgomery	13.4%	12.0%	26.4%	11.0%	2.5%	30.5%	16.9%	14.2%
Prince George's	13.8%	26.0%	14.3%	28.4%	7.3%	18.2%	37.5%	19.4%
Rest of Suburban Maryland	25.0%	56.6%	24.0%	19.9%	21.8%	20.7%	15.9%	30.6%
Suburban Maryland	**16.3%**	**27.6%**	**20.3%**	**19.9%**	**7.4%**	**23.9%**	**20.7%**	**19.2%**
Arlington	26.1%	44.0%	-11.9%	33.3%	33.8%	25.0%	34.8%	29.1%
Alexandria city	22.9%	39.1%	45.2%	10.1%	14.6%	15.5%	23.2%	24.2%
Fairfax (1)	10.0%	-0.3%	20.4%	3.4%	13.1%	26.0%	11.6%	11.2%
Prince William (2)	28.5%	19.3%	36.7%	11.2%	26.0%	35.8%	50.5%	27.7%
Rest of Northern Virginia	37.4%	57.1%	21.2%	49.8%	-7.8%	22.5%	56.4%	28.2%
Northern Virginia	**22.7%**	**24.0%**	**21.5%**	**19.0%**	**13.1%**	**25.1%**	**26.7%**	**21.1%**
Washington Region	**19.4%**	**23.5%**	**19.8%**	**16.7%**	**10.9%**	**23.5%**	**24.7%**	**19.5%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

II. Economic Growth and Housing Demand in the Greater Washington Region: Housing Demand from Worker Households

The Greater Washington region has over 3.2 million jobs and is expected to add 380,700 net new jobs by 2023. In order for the economy to grow, new workers will come to the region to fill these new positions, or commute to these jobs from outside the region. Not all sectors of the economy are expected to grow (Table 9). Manufacturing employment will decline modestly and Federal employment will return to pre-Recession levels.

In addition to the growth from net new jobs, the retirement of Baby Boomers will leave an even larger number of vacant positions. As of 2011, over 560,000 jobs in this region were filled by someone who was at least 55 years old. These workers have begun to retire and will continue to do so in upcoming years. These vacancies will be greatest in the larger employment sectors: the Federal Government and Professional and Business Services sector will each need over 70,000 new workers if current levels of employment are to be maintained in 2023. Because the Professional and Business Services sector will have more total jobs in 2023 compared to today, the workers needed to fill positions vacated by retirees are in addition to the net new jobs in this sector. But because total Federal Government employment is expected to decline, many of these vacated positions will not be replaced.

Table 9. Job Growth by Sector, 2013-2023
Greater Washington Region
Ranked by New Jobs

	Net New Jobs	Jobs Vacated by Retirees	Total	
			New Jobs	Share of New Jobs
Professional & Business Services	208,390	70,000	278,390	35.8%
State & Local Government	46,200	51,170	97,380	12.5%
Construction	63,070	16,340	79,410	10.2%
Education & Health Services	43,150	53,900	97,050	12.5%
Transportation, Trade & Utilities	15,440	44,370	59,810	7.7%
Leisure & Hospitality	22,640	17,230	39,870	5.1%
Information	15,570	9,140	24,710	3.2%
Financial Activities	3,190	22,600	25,780	3.3%
Other Services	1,350	25,620	26,970	3.5%
Military (1)	5,020	780	5,800	0.7%
Manufacturing	(1,910)	11,780	9,870	1.3%
Federal Government	(41,390)	73,960	32,560	4.2%
Total	**380,700**	**396,900**	**777,600**	**100.0%**

Numbers may not add due to rounding.
(1) Retirees only include those in private housing and over 55 years old.
Sources: IHS Economics, Bureau of Labor Statistics (Current Population Survey), American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Where will these jobs be located?

Nearly half (45.7 percent) of the new jobs, both net new and vacated jobs, coming to the region by 2023 will be in Northern Virginia (Table 10). Fairfax County, Fairfax City and Falls Church City, combined, will account for a third of the new jobs in Northern Virginia as the Silver Line and other developments are completed. Suburban Maryland will have 258,930 new jobs by 2023, including 121,460 in Montgomery County and 77,580 in Prince George's County. The District will have the largest share of new jobs of any jurisdiction and 21.0 percent of all new jobs will be located in the District. The location of these jobs will influence where these new workers choose to live and the resulting commuting patterns.

Table 10. Job Growth by Place, 2013-2023
Greater Washington Region

	Net New Jobs	Jobs Vacated by Retirees	Total	
			New Jobs	Share of New Jobs
DC	**58,600**	**104,680**	**163,280**	**21.0%**
Calvert	10,420	9,260	19,680	2.5%
Charles & St. Mary's	9,740	5,510	15,250	2.0%
Frederick	13,850	11,100	24,950	3.2%
Montgomery	52,770	68,700	121,460	15.6%
Prince George's	37,770	39,810	77,580	10.0%
Suburban Maryland	**124,550**	**134,380**	**258,930**	**33.3%**
Alexandria city	7,480	12,840	20,320	2.6%
Arlington	14,340	23,180	37,520	4.8%
Clarke	180	390	570	0.1%
Culpeper	5,840	1,960	7,800	1.0%
Fairfax (1)	43,850	75,880	119,730	15.4%
Fauquier	2,310	2,200	4,510	0.6%
Loudoun	57,250	14,770	72,020	9.3%
Prince William (2)	35,950	14,320	50,270	6.5%
Spotsylvania (3)	13,840	6,040	19,880	2.6%
Stafford & King George	15,060	5,040	20,100	2.6%
Warren	1,440	1,220	2,660	0.3%
Northern Virginia	**197,550**	**157,840**	**355,390**	**45.7%**
Region	**380,700**	**396,900**	**777,600**	**100.0%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

(3) Includes Fredericksburg City

Numbers may not add due to rounding.

Sources: IHS Economics, Bureau of Labor Statistics (Current Population Survey), American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

How many new households will be needed to accommodate this growth?

These jobs will be filled by 470,220 net new households. However, just over half (51.9 percent) of these households are forecasted to live region. This is primarily due to supply constraints but preferences will also play a role in this decision. As shown in Table 11, net new worker households who are forecasted to live in the region are more likely to be in multi-family units than those who live outside of the region and commute to a job in the region. Net new worker households living in the region are also somewhat less likely to own their homes than those forecasted to live outside of the region.

Table 11. Net New Worker Households by Housing Type, 2013-2023
Greater Washington Region

	Total	Live in Region		Live Outside Region	
	Households	Households	Percent of Total	Households	Percent of Total
Single-Family Detached/ Attached, Owner	258,110	125,930	48.8%	132,180	51.2%
Single-Family Detached/ Attached, Renter	54,820	27,580	50.3%	27,240	49.7%
Multi-Family, Owner	29,490	16,310	55.3%	13,180	44.7%
Multi-Family, Renter	127,810	74,020	57.9%	53,790	42.1%
Total	**470,220**	**243,840**	**51.9%**	**226,380**	**48.1%**

Numbers may not add due to rounding. Represents the total demand from new jobs in the region.
Sources: IHS Economics, Bureau of Labor Statistics (Current Population Survey), American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

What will these new households earn?

The AMI distribution of the net new worker households is shown in Table 12. For households living outside of the region, the Greater Washington region area median income is used for comparison and will not reflect the AMI groups based on their home location, which will be in a different metro area. In general, new worker households who would have been middle-income households (between 80% AMI and 119.9% AMI) in the region are more likely to become commuter households.

Table 12. Net New Worker Households by AMI Group, 2013-2023
Greater Washington Region

	Total	Live in Region		Live Outside Region (1)	
	Households	Households	Percent of Total	Households	Percent of Total
<30% AMI	29,630	18,700	63.1%	10,940	36.9%
30-49.9% AMI	48,340	28,520	59.0%	19,820	41.0%
50-79.9% AMI	34,110	18,410	54.0%	15,700	46.0%
80-99.9% AMI	102,510	45,370	44.3%	57,140	55.7%
100-119.9% AMI	56,420	25,100	44.5%	31,320	55.5%
120%+ AMI	199,220	107,750	54.1%	91,470	45.9%
Total	**470,220**	**243,840**	**51.9%**	**226,380**	**48.1%**

(1) Represents the AMI group if the households lived in the Greater Washington region. Does not reflect the AMI group of these households in the region in which they live.

Numbers may not add due to rounding. Represents the total demand from new jobs in the region.

Sources: IHS Economics, Bureau of Labor Statistics (Current Population Survey), American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

A note on housing for existing workers

There are about 3.1 million jobs that are filled by workers who are not expected to retire. While many of these workers will change jobs, overall, any job or housing churn in these households is assumed not to have any impact on the total housing demand. The characteristics, in aggregate, of the 1.7 million households currently filling these jobs is not expected to change.

III. Demographic Trends and Housing Demand in the Greater Washington Region:
Housing Demand from Non-Worker Households

How many non-worker households will live in the region in 2023?

The two largest generational cohorts, Baby Boomers and Millennials,[11] will continue to make their presence felt in the region over the next decade. In 2023, Millennials will be between 24 years old and 43 years old and in the early to middle stages of their careers and family lives. Millennials will primarily be in the region for work and will play a large role in filling the region's jobs and their demand for housing is captured by the forecasts for worker households. But some will be students or here for reasons other than work. Because this region is currently home to a large share of young people, Millennials and the oldest population of Generation Z[12] will not significantly alter the number of non-working households.

Baby Boomers will have a large impact on the number of non-working households in the region (Table 13). In 2023, Baby Boomers will be between 59 years old and 77 years old and either in retirement, or very near to it. Assuming this generation follows the same migration patterns as previous generations, there will be 168,470 non-worker households with a householder[13] between 65 to 74 years old. This is an increase of 63.1 percent from 2011 and accounts for 41.0 percent of the total increase in these households.

Table 13. Non-Worker Households by Age of Head of Household, 2023
Greater Washington Region

	Non-Worker Households		Change	
	2011	2023	Households	Percent
15 to 34	31,330	32,820	1,490	4.7%
35 to 54	69,180	71,590	2,410	3.5%
55 to 64	68,520	81,230	12,710	18.5%
65 to 74	103,300	168,470	65,170	63.1%
75+	119,890	197,070	77,190	64.4%
Total	**392,230**	**551,180**	**158,960**	**40.5%**

Numbers may not add due to rounding.
Sources: 2011 American Community Survey microdata and GMU Center for Regional Analysis

The increase in non-worker households that results from retiring Baby Boomers is exceeded only by the increase driven by householders older than 75 years. The workers in these households are currently 65 or older, but have not yet retired. Of the region's 358,000 households headed by someone over 65 years

[11] Millennials were born between 1980 and 1999.
[12] Generation Z were born after 2000.
[13] The terms householder and head of household are used interchangeably in this report.

old, 134,600 households, or 38 percent, have a worker.[14] Over the next decade, the majority of the workers in these households will have retired. After applying historic migration patterns for this age cohort, there will be 197,070 non-worker households with a householder over 75 years old in 2023. This represents an increase of 64.4 percent from 2011 and accounts for 48.6 percent of the total increase in non-worker households.

What will these households earn?

While retirees constitute a large share of these future non-worker households, the householders in many non-worker households will be younger than 55 years old. Some of these households will be self-employed or have other established income streams (real estate income, investment income etc.), which is reflected in the AMI distribution in Table 14. Also reflected in this distribution is that many retirees in this region have incomes not unlike their working counterparts because of investments, savings and pensions. The diversity of household income is expected to continue in the future.

Table 14. Non-Worker Households by Area Median Income Group, 2011 and 2023 Greater Washington Region

	2011		2023		2011-2023 Change	
	Households	Share	Households	Share	Households	Percent
<30% AMI	159,530	40.7%	206,740	37.5%	47,210	29.6%
30-49.9% AMI	63,740	16.3%	89,410	16.2%	25,670	40.3%
50-79.9% AMI	34,290	8.7%	44,810	8.1%	10,530	30.7%
80-99.9% AMI	59,050	15.1%	94,690	17.2%	35,640	60.4%
100-119.9% AMI	22,020	5.6%	30,240	5.5%	8,220	37.3%
120%+ AMI	53,600	13.7%	85,290	15.5%	31,690	59.1%
Total	**392,230**	**100.0%**	**551,180**	**100.0%**	**158,960**	**40.5%**

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata and GMU Center for Regional Analysis

What types of housing will these households need?

The age of the householder and the household's AMI are key factors in determining the housing type the non-worker households will occupy. In general, younger households are more likely to be renters and older households are more likely to be owners. Households in higher AMI groups are also more likely to be owners. Similarly, older households are more likely to live in single-family detached or single-family attached homes, as are those within higher AMI groups. But, as a group, non-worker households are more likely than their worker counterparts to be renters.

Because growth in these households will be driven by older households, the majority are forecasted to live in single-family detached or attached homes and to be homeowners (Table 15). But 199,150 non-worker households will rent their homes, with most of these renter-households (125,000 households) earning less than 30% AMI.

[14] 2011 data

Table 15. Non-Worker Households by Unit Type and AMI Group, 2023
Greater Washington Region

	<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
Single-Family Detached/Attached, Owner	67,650	50,300	29,030	67,640	22,880	64,380	301,870
Single-Family Detached/Attached, Renter	25,220	7,140	2,370	4,460	980	1,860	42,030
Multi-Family, Owner	14,090	7,740	4,670	10,000	2,460	11,200	50,160
Multi-Family, Renter	99,770	24,230	8,740	12,590	3,930	7,850	157,120
Total	**206,740**	**89,410**	**44,810**	**94,690**	**30,240**	**85,290**	**551,180**
	As a Percent of Total						
	<30% AMI	**30-49.9% AMI**	**50-79.9% AMI**	**80-99.9% AMI**	**100-119.9% AMI**	**120%+ AMI**	**Total**
Single-Family Detached/Attached, Owner	33%	56%	65%	71%	76%	75%	55%
Single-Family Detached/Attached, Renter	12%	8%	5%	5%	3%	2%	8%
Multi-Family, Owner	7%	9%	10%	11%	8%	13%	9%
Multi-Family, Renter	48%	27%	20%	13%	13%	9%	29%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Numbers may not add due to rounding.

Sources: 2011 American Community Survey microdata and GMU Center for Regional Analysis

Appendix

Methodology

The forecasts of Area Median Income (AMI) by housing type for the Washington DC metro area are derived from three main components: housing demand from non-worker households, housing demand from workers filling net new jobs, and housing demand from workers replacing jobs vacated by retirees. This process relies on jurisdiction-level employment forecasts, population growth estimates and analysis of American Community Survey data.

Geography: In the Greater Washington region forecasts, we generate forecasts for the metro's area and for seven combinations of jurisdictions.[15]

Timeframe: The forecasts are for the 2011-2023 period.

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

Housing Types: Within each AMI group, we forecast the demand for single-family owner, single-family renters, multi-family owner, and multi-family renter. Townhouses and single-family attached are considered single-family.

This methodology is divided into three sections:
I. Housing needs for net new workers and replacement workers for retirees
II. Housing needs for non-working households
III. Regional housing characteristics and scenarios

[15] See the Appendix for more geographical detail.

A Note on Area Median Income Thresholds

The AMI limits in this forecast use U.S. Department of Housing and Urban Development (HUD) limits and methods when forecasting.

Household Size Adjustment:
AMI thresholds are dependent on household size. The 100 percent AMI threshold for a 4-person household is equal to the region's AMI and all other households are calculated using a 4-person household as the base as shown in Table A1. AMI limits for households smaller than four people are 100 percent of the 4-person limit *minus* ten percent for each fewer person. AMI limits for households larger than four people are 100 percent of the 4-person limit *plus* eight percent for each additional person.

Table A1. FY 2013 AMI Limits, Washington Metro Area

	1-Person	2-Person	3-Person	4-Person	5-Person	6-Person	7-Person	8-Person
	70% of 4-person HH	80% of 4-person HH	90% of 4-person HH	100%	108% of 4-person HH	116% of 4-person HH	124% of 4-person HH	132% of 4-person HH
Extremely Low Income Limits (30% AMI)	22,550	25,800	29,000	32,200	34,800	37,400	39,950	42,550
Very Low Income Limits (50% AMI)	37,600	42,950	48,300	53,650	57,950	62,250	66,550	70,850
Low Income Limits (80% AMI)	46,750	53,400	60,100	66,750	72,100	77,450	82,800	88,150
100% AMI	75,150	85,850	96,600	107,300	115,900	124,500	133,100	141,650
120% AMI	90,150	103,000	115,900	128,750	139,050	149,350	159,650	169,950

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

Income Limit Adjustments:
After establishing the 100 percent AMI limits for each household size, the extremely low[16], very low and 120 percent AMI limits are calculated. The 100 percent AMI limits for each household size are multiplied by 30 percent, 50 percent, and 120 percent, respectively. Each limit is rounded up to the nearest $50. This method was used when forecasting these AMI limits. The forecasts assume that other adjustments considered by HUD for these AMI groups, including ceilings or floors, are not applicable.

[16] The HUD methodology changed in FY 2014 (see http://www.huduser.org/portal/datasets/il/il2014/2014summary.odn). This updated methodology is not incorporated in these forecasts.

To determine the low income limits, the 100-percent AMI limit is multiplied by 80 percent. However, the resulting income limit may not exceed the U.S. median family income level except when justified by high housing costs. When forecasting the AMI thresholds in this analysis, the 80 percent AMI limits were adjusted downwards using current adjustment ratios. Each limit is then rounded up to the nearest $50.

I. Housing needs for new worker households

I.a. Determine job growth by industry:

In this analysis, future job growth has two components: net new job growth and jobs vacated by retirees.

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

Jobs vacated by retirees: The Bureau of Labor Statistics 2013 Current Population Survey (CPS) was used to calculate the share of retirees in each 5-year age group for the population over 55 years old in the Washington Metropolitan Area. This survey was used because it includes more detailed questions and information on retirement status. Retirees younger than 55 years old are excluded because they may be more likely to re-enter the workforce. Next, the 2009-2011 and 2011-2013 American Community Surveys were used to determine the number of workers who were likely to retire in the next decade and the industry of these workers.

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

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

The first step in moving from new jobs to housing demand is to estimate the age distribution of the new workers. In other words, for each jurisdiction, we assigned some share of new workers in each sector to one of three age groups: under 30, 30-44 or 45-64. We assumed no new workers were aged 65 or older. For replacement workers, it is assumed that for more senior positions, the majority of the workers directly filling the job are already in the region and in the same industry. So, as workers in senior positions retire, their jobs will be filled by another worker in the region, leaving a more junior position vacant, which will be filled by a younger worker.

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

We analyzed data from the 2009-2011 and 2011-2013 American Community Surveys (3-year microdata sample) to estimate the age distribution of current workers for each industry sector. We then adjusted the age distribution to account for the fact that new workers would be younger by analyzing 2009-2011 ACS data on the age distribution of workers who had recently moved to the Washington DC region. Through this analysis, we found that recent movers were about 97% more likely to be 18-29 than existing residents. Recent movers were 7% more likely to be 30-44 than exiting residents. Recent movers were 52% less likely to be 45-64 and 75% less likely to be ages 65 and older.

We applied these ratios to the age distribution of existing workers who had earned a wage in each jurisdiction to create an age distribution for new workers. The recent mover ratio was applied to those under 30 and those between 30 and 44. The remaining workers were assumed to be between 45 and 64. We assumed that no new workers were age 65 and older. If a sector only had current workers in one of the age groups, all new workers were allocated to that group. If the share of new workers under 30 and workers between 30 and 44 totaled more than 100%, the difference to 100% was equally subtracted from those age groups. When there were job losses in a sector, we used the same age distributions as we used for job gains, which may not be appropriate.

Thus, for each sector in each jurisdiction, we estimated the percent of new jobs held by workers under age 30, between 30 and 44, and between 45 and 64.

I.c. Assign new workers to an AMI group and household type:

The AMI group and the household type are interdependent, so it is assumed that the age of the worker and the worker's industry determines both. Then, the number of new households is found by using the average number of workers in each household type, AMI group and place.

i) Age is a determinant of both AMI group and housing type both because younger workers are more likely to have lower wage-based incomes than older workers, and they are also more likely to live alone or be in young families. For example, new workers under age 30 are more likely to live in one-person households or two adult-no children households and workers age 30 to 44 are more likely to live in households with children. Industry is also a determinant of AMI and household type because the size of the household directly changes the AMI limits. And number of workers in a household will change the income received in a household.

For this step of the analysis, we used the 2009-2011 and 2011-2013 American Community Surveys to assign both an AMI group and one of 11 household types to current workers. Because this forecast is for workers only, only households with a worker are included in this step. The 11 household types are listed in Table A2.

Table A2. Household Types

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

These workers were then grouped by age and industry, so that the likelihood of each AMI group and household type could be determined based on the age and industry. Thus, for each jurisdiction, we assessed what percent of workers under 30 years old earned less than 30% of AMI and lived in 1 adult households, what percent earned between 30% and 49.9% and lived in 1 adult households and so on.

i) Next, we determined the number of households formed by these workers. The average number of workers in each of the 11 household types by AMI group is used to convert workers into households. The average number of workers in each household type, AMI group and available jurisdiction was calculated using the 2009-2011 and 2011-2013 American Community Surveys. This step assumes that workers who live in the same household also work in the same jurisdiction.

I.d. Assign each new household a unit type

We now have a count of the number of household formed by each household type and AMI group based on the number of new jobs coming to the region. Household type and household AMI are both associated with the type of housing demand. Therefore, we use these counts to estimate the need for four different types of housing units by the AMI group. The four housing unit types are: single-family (included single-family detached and single-family attached/townhome) owner and renter, and multi-family owner and renter.

We used the 2009-2011 ACS 3-year microdata file to run crosstabulations of housing type (i.e. four types) by household composition (i.e. 11 household types) for each of the six AMI groups. The results of this analysis show the current distribution of housing types for different household types and household incomes.

We ran this analysis for the following jurisdictions: Washington DC, for Arlington and Alexandria combined, for Fairfax and Montgomery combined, and for all other jurisdictions combined. We did not run the analysis for individual jurisdictions because the sample sizes were too small.We then applied these distributions to the projected households for each jurisdiction to estimate the need for housing by unit type and rent/price.

II. Housing needs for non-working households

To be considered a non-working household, no members of the household have a payroll job. This includes households consisting of retirees, students, workers looking for a job and many self-employed workers and does not preclude the household from having higher-levels of income. The forecasted age group, sex and home location of the householder is used to determine the likelihood of the household being a non-worker household. To determine the age group and sex of the householder, the population by age group and sex was first forecasted.

II.a. Population Forecasts by Age:

To forecast the population by age group and sex, we first started by using cohort change ratios.[17] The population in 1990, 2000 and 2010 was grouped by 5-year age group by sex. Between 1990 and 2000, a cohort change ratio was calculated by dividing the 2000 population in each age and sex group by the 1990 population in each age and sex group, but for the age group 10 years younger. The cohort change ratio captures both the "aging up" and net migration by age group and sex. The same was done for the 2000 and 2010 populations. An average[18] of the 1990-2000 and 2000-2010 cohort change ratios was applied to the 2013 population to determine the forecasted age and sex of residents over 10 years old in 2023 and 2033. To determine the future number of children under ten years old, a ratio of number of children under ten to the number of women between 20 and 44 years old was calculated for 1990, 2000 and 2010. The average of this ratio was applied to the forecasted number of women between 20 and 44 years old to estimate the number of children. Overall population forecasts from the Round 8.3 Cooperative Forecast from Metropolitan Washington Council of Governments (MWCOG) were used to control each forecast.

Using cohort change ratios alone for small area forecasts may lead to large percentage changes based on small absolute changes. For that reason, we then stabilized the changes by taking into account national growth forecasts. To do so, we calculated the share of the population in each age group by sex for both the individual jurisdictions and the nation in 1990, 2000, 2010 and 2013. We then calculated the ratio of each age group by sex in each jurisdiction relative to the nation's share (for example, the percentage of the Arlington population that is 25-29 year old and male in 2013 divided by the percentage of the U.S. population that is 25-29 year old and male in the U.S. in 2013). This relative ratio was averaged across the four periods. The average was then applied to the forecasted national share to determine share of each jurisdiction's population by age group and sex. These shares were then applied to the overall population forecasts from MWCOG. An average of the two population estimates was used to take into account both historic migration and growth patterns and national trends.

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

We analyzed data from the 2009-2011 and 2011-2013 American Community Survey (3-year microdata sample) to estimate the percentage of each age group by sex who is a head of household (a headship

[17] a.k.a the Hamilton-Perry Method
[18] The 2000-2010 cohort change ratio was used for the District of Columbia.

rate). This analysis was done separately for each jurisdiction or combination of jurisdictions if the county/city was too small.[19] This headship rate was applied to the forecasted population by age and sex group to determine the number of households headed by each age group. The total households were controlled to match the forecasted number of households from MWCOG.

II.c. Non-worker Household Forecasts:

Again using the 2009-2011 and 2011-2013 American Community Surveys, the current percentage of non-worker households by the householder's age group and sex was calculated. This percentage was applied to the forecasted households by the householder's age group and sex.

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

The age and sex of the future non-working householder is assumed to drive the household's AMI and housing unit characteristics. From the 2009-2011 and 2011-2013 American Community Surveys, the share of current non-working households in each AMI group and unit type was calculated for each the age group by sex. These shares were then applied to the forecasted households by householder age group and sex to distribute all non-working households by AMI and unit type.

[19] The ACS data can be analyzed at the PUMA-level (PUMA = public use microdata area). Each PUMA contains at least 100,000 people. The 2009-2011 geography is based on the 2000 Census. In the 2011-2013 microdata, the geography for respondents in 2012 and 2013 is based on 2010 Census which is not comparable to all 2011 geographies. See the Geography section for more information.

III. Combined housing needs and scenarios

III.a. Determine which households "stay" in the WMSA region:

The total forecasted demand exceeds the forecasted supply, so two scenarios were developed to determine which households live in the region.

Primary Scenario: The base for each scenario is the number of worker households who are currently filling jobs in the region. In aggregate, the worker households filling jobs that exist today are expected to have the same housing characteristics in 2023 as they do today. Then, this scenario assumes that all forecasted non-worker households stay in the region. The non-worker household forecasts account for previous migration patterns and this scenario assumes that future migration patterns do not change.

The remaining units are then filled by worker households. Commuting patterns are applied first to determine which of the remaining workers do not live in the region. Both the location of the job and the AMI group of the household is used to determine who lives in the region and who lives outside the region. 2009-2011 American Community Survey data was used to get the current share of workers by AMI group and workplace location who commute. These were then applied to future worker households. Then, the intra-jurisdiction patterns were applied so that the total number of households living in a jurisdiction or group of jurisdictions did not exceed the forecasted supply.

Alternative Scenario (results shown on page 35): The base for each scenario is the number of worker households who are currently filling jobs in the region. In aggregate, the worker households filling jobs that exist today are expected to have the same housing characteristics in 2023 as they do today.

This scenario assumes that about 19 percent of non-worker households leave the region. This is equal to one third of the increase in non-worker households between 2011 and 2023. The non-worker households are assumed to be equally likely to leave the region. So, the "leavers" are removed proportionally, by jurisdiction, AMI group and unit type.

The remaining units are then filled by worker households. Commuting patterns are applied first to determine which of the remaining workers do not live in the region. Like in the first scenario, both the location of the job and the AMI group of the household is used to determine who lives in the region and who lives outside the region. 2009-2011 American Community Survey data was used to get the current share of workers by AMI group and workplace location who commute. These were then applied to future worker households. Then, the intra-jurisdiction patterns were applied so that the total number of households living in a jurisdiction or group of jurisdictions did not exceed the forecasted supply.

III.b. Adjust the Median Household Income to reflect the scenarios:

The area median income is the level at which half of families in the region have incomes that are higher and half have incomes that are lower. Because not all households are families and geographic limitations, in 2011 about 52.4 percent of all households in the study area had income lower than the AMI, and 47.6 percent had incomes that were higher. After each scenario, the median income was re-calculated, and each component re-run so that these shares were unchanged. The HUD methodology

was used to adjust the AMI group limits. The AMI adjustments were trial and error until the splits were achieved.

III.c. Adjust the Forecasts:

Because of land constraints in DC, Alexandria and Arlington, the number of new single-family detached and attached units was capped. The 2000-2014 average annual permits for single-family detached and attached units was used as the annual limit. This is likely high because some permits are for replacements/tear-downs of existing homes. A similar method was looked at for Montgomery County and Fairfax County, Fairfax City and Falls Church City, combined. But the demand for single-family attached and detached homes in these jurisdictions did not surpass their forecasted cap.

Geography

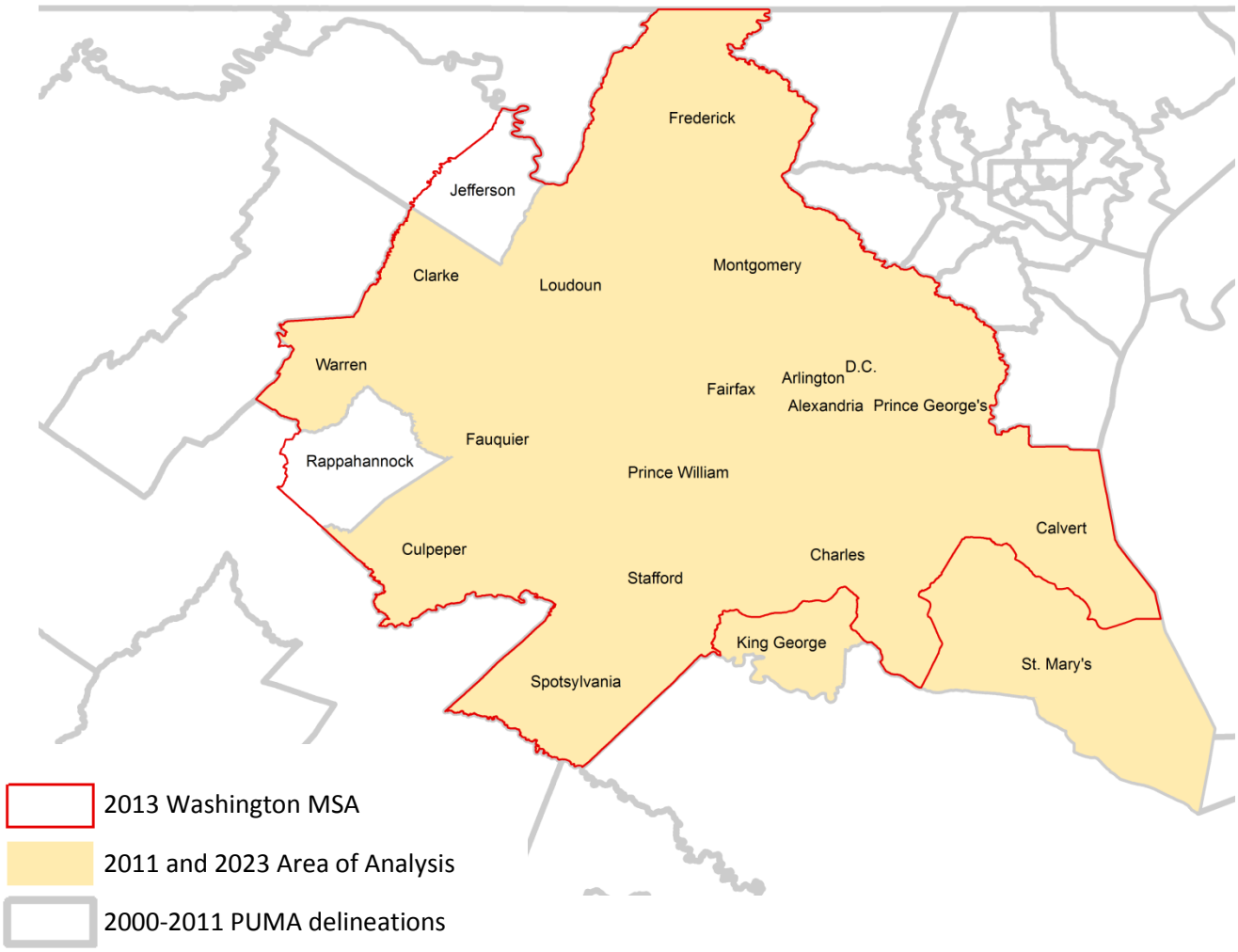
These forecasts use approximate the Washington Metropolitan Area (MSA) as defined by the Office of Management and Budget in 2013 and include the following jurisdictions

- District of Columbia;
- Frederick County, Maryland;
- Montgomery County, Maryland;
- Calvert County, Maryland;
- Charles County, Maryland;
- Prince George's County, Maryland;
- St. Mary's County, Maryland;
- Arlington County, Virginia;
- Clarke County, Virginia;
- Culpeper County, Virginia;
- Fairfax County, Virginia;
- Fauquier County, Virginia;
- Loudoun County, Virginia;
- King George County, Virginia;
- Prince William County, Virginia;
- Spotsylvania County, Virginia;
- Stafford County, Virginia;
- Warren County, Virginia;
- Alexandria city, Virginia;
- Fairfax city, Virginia;
- Falls Church city, Virginia;
- Fredericksburg city, Virginia;
- Manassas city, Virginia; and
- Manassas Park city, Virginia.

These jurisdictions differ from the official MSA because this analysis relies on Public Use Microdata Sample data. This data allows for additional analysis beyond the files that are published by the U.S. Census through FactFinder and other formats. But this data is only by public use microdata area (PUMA)., which can include multiple jurisdictions. These geographies contain at least 100,000 people and do not necessarily align with the metropolitan statistical area definitions. The PUMAs were changed in 2012.

The PUMA used through 2011 are in Figure A1, with the 2013 Washington Metropolitan Statistical Area (MSA) shown in red. The PUMAs closely align with the MSA, and the area in yellow is the geography used both for the 2011 estimates and the 2023 forecasts.

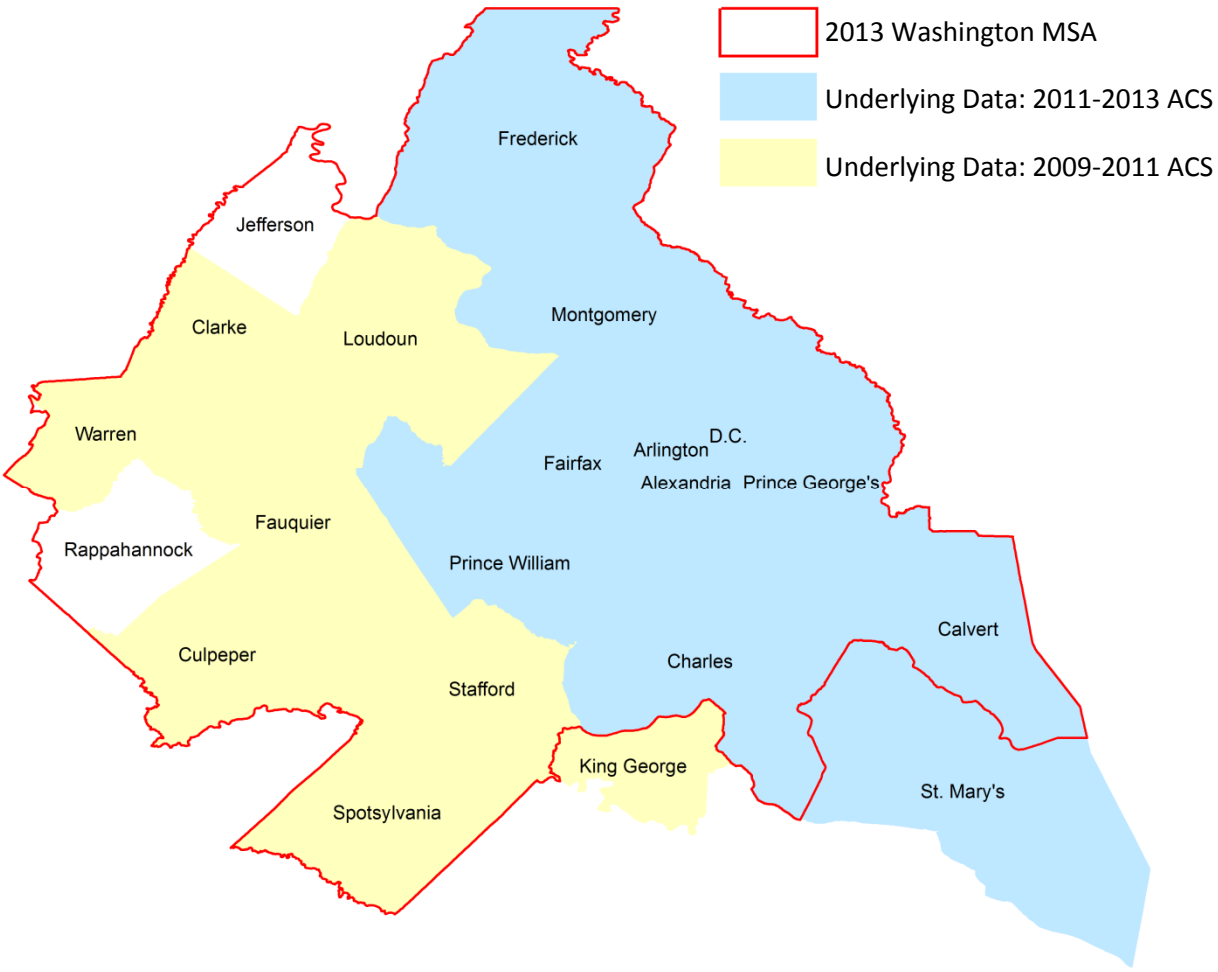
Figure A1. Area of Analysis and PUMA Delineations Used Through 2011



Source: U.S. Census Bureau

For the underlying assumptions, three-year datasets are used because of the sample sizes of both the ACS and the microdata, which is an anonymized sample of the ACS. However, the changes to the PUMAs in 2012 resulted in two different geographies in the 2011-2013 ACS data. For many jurisdictions in Northern Virginia, the changes mean that 2011 data cannot be compared with 2012 and 2013 data. Only Suburban Maryland, DC, and parts of Northern Virginia (shown in blue in Figure A2) are comparable. The underlying assumptions for these jurisdictions use the 2011-2013 data. For the areas in yellow, the 2009-2011 data was used.

Figure A2. Underlying Data Used for Assumptions



Source: U.S. Census Bureau

Study Limitations

The demand for housing depends on many factors. Modeling this housing demand necessarily involves making simplifying assumptions. Some of the complexity of housing need will be excluded from the analysis and some of the limitations of the research are described briefly in this section.

The housing demand forecasts exclude the housing needed to accommodate replacement workers who are not filling jobs left by retirees. This analysis excludes the housing needs for replacement workers for existing positions except in the case of retirement. Many replacement workers are already in the region, and as they change jobs, they may also change housing units. However, this analysis assumes, as a group, replacement workers will occupy the housing units already existing

It is assumed that there are no major shifts in the housing unit preferences of future cohorts or in the direction of Federal policies related to homeownership. These forecasts are based on data on the housing characteristics of current residents by age group, household composition and household income in order to make estimates of future housing needs. This method assumes that there are no major changes in the housing unit preferences of future cohorts.

In addition, this research makes no assumptions about the direction of Federal policies related to homeownership which might make owning relatively less attractive or feasible over time. If there are major changes to the federal mortgage interest deduction or to regulation related to down payment and other requirements for securing a home mortgage, then homeownership may be less desirable or less achievable for future workers. Thus, there could be a shift to a need for even more rental housing in the region.

Alternative Scenario

The potential demand for housing is forecasted to exceed the supply, but this demand is largely contingent upon how many Baby Boomers will stay in the region after retirement. Several competing factors will play a role in their decision to stay or move. The large majority of Baby Boomers own their homes and many anticipate staying in their homes as long as feasible. But rising home prices and increasing demand from new workers may entice them to sell. However, not all of these owners will have paid off their mortgages, which may keep them in their homes for longer. Retirees may also move or stay to be close to their friends and family. Lastly, the Recession may have impacted the retirement savings Baby Boomers, potentially making them more sensitive to costs. Some renters and owners may prefer to move to a lower cost region, but moves can be expensive and potential options may be limited.

The scenario presented in the body of this report assumes that Baby Boomers and all other non-working households will follow the same migration patterns as previous generations. An alternative scenario was also developed that assumes that

1) non-worker households will have increased rates of out-migration and
2) job growth, and the resulting households, will fill the units left by this out-migration.

The alternative scenario assumes that only one-third of the net new non-worker households forecasted to live in the region, based on historic migration patterns, will do so. Because of the constrained supply, the alternative scenario also results in net new commuter households. These households will become commuter households, as shown in Table A3. These households are in addition to those who currently commute to jobs from outside the region.

Table A3. Households by Area Median Income Group, 2023
Alternative Scenario
Washington Region

	Households In Washington Region			Additional Housing Demand Generated by the Region But Living Elsewhere	
	Worker Households	Non-Worker Households	Total	New Commuter Households	Increase in Out-Migration
<30% AMI	139,470	169,980	309,460	8,240	40,910
30-49.9% AMI	214,670	73,370	288,030	10,480	17,660
50-79.9% AMI	160,400	35,810	196,210	6,200	8,620
80-99.9% AMI	455,960	75,810	531,780	32,640	18,250
100-119.9% AMI	226,080	23,740	249,830	11,580	5,710
120%+ AMI	883,550	65,550	949,100	49,960	15,770
Total	**2,080,150**	**444,260**	**2,524,410**	**119,090**	**106,920**

Numbers may not add due to rounding

Sources: Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Consistent with the primary scenario, the area median income is re-calculated so that half of families have incomes above 100% AMI and half have incomes below.[20] This scenario also shows significant growth in extremely low income households earning less than 30% AMI, but the increase is smaller than in the primary scenario. The region is forecasted to add 39,560 extremely low income households between 2011 and 2023 for a total of 309,460 households (Table A4). An additional 288,030 households will be very low income and earn between 30% and 49.9% AMI, or an increase of 51,810 households from 2011. Low income households earning between 50% AMI and 79.9% AMI are expected to increase by 28,400 households from 2011, for a total of 196,210 households. The total increase in extremely low, very low and low income households accounts for 29.2 percent of all net new households in the region, instead of 36.3 percent shown in the primary scenario.

As in the primary scenario, the supply of housing will constrain where the new households will live. In this scenario, not all non-worker households remain in the region and all non-worker households are assumed to be equally as likely to leave. Therefore, a proportional number of all non-working households in each jurisdiction are assumed to live outside of the region. Then, as in the first scenario, worker households are assumed to live in their work location until the forecasted supply of units is filled. Commuting patterns are then applied to the remaining worker households to determine their most likely home location.

The resulting distribution of housing demand by unit type is shown in Tables A5 through A8. The overall demand for multi-family units is expected to grow somewhat faster than the demand for single-family detached and attached units for the region as a whole and in nearly every jurisdiction. Demand for single-family detached and attached units is expected to have the highest growth rate for middle-income households earning between 80 and 119.9% AMI. Overall, the growth by AMI group for single-family detached and attached units is relatively evenly distributed in this scenario. Demand for multi-family units in the region is expected to have the highest growth in the 100-119.9% AMI group. But there is significant growth in the majority of AMI groups, reflecting the range of jobs and the younger workforce that is expected to be in the region.

The primary scenario and the alternative scenario show similar patterns of rental and owner demand. The overall demand for owned units and rented units is expected to grow similarly. For rental units, there is somewhat faster growth from households earning 120% or more. The demand varies by jurisdiction, with larger increases for rental units in Suburban Maryland and the closer-in jurisdictions in Northern Virginia.

[20] Because not all households are family-households, the forecast of households is not precisely 50% above and 50% below 100% AMI, but reflects ratios consistent with current households.

Table A4. Households by Jurisdiction and Area Median Income Group, 2023
Alternative Scenario
Greater Washington Region

	2023						
	<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**67,740**	**41,180**	**23,870**	**52,390**	**25,460**	**105,380**	**316,020**
Montgomery	41,180	45,860	32,380	80,470	38,630	169,090	407,610
Prince George's	50,970	53,930	35,870	85,530	34,820	82,240	343,370
Rest of Suburban Maryland	32,970	31,310	20,280	60,010	28,600	84,760	257,930
Suburban Maryland	**125,120**	**131,100**	**88,540**	**226,010**	**102,050**	**336,090**	**1,008,910**
Arlington	12,710	7,450	6,530	20,880	10,980	56,710	115,260
Alexandria city	9,070	8,790	6,060	16,740	6,850	32,080	79,570
Fairfax (1)	38,950	35,790	25,470	89,260	43,130	212,450	445,050
Prince William (2)	18,610	23,070	15,630	45,940	20,130	68,540	191,920
Rest of Northern Virginia	37,250	40,650	30,120	80,560	41,220	137,870	367,680
Northern Virginia	**116,600**	**115,760**	**83,810**	**253,380**	**122,310**	**507,630**	**1,199,480**
Washington Region	**309,460**	**288,030**	**196,210**	**531,780**	**249,830**	**949,100**	**2,524,410**
	Increase from 2011						
	<30% AMI	**30-49.9% AMI**	**50-79.9% AMI**	**80-99.9% AMI**	**100-119.9% AMI**	**120%+ AMI**	**Total**
DC	**5,100**	**4,810**	**2,810**	**9,950**	**5,040**	**19,630**	**47,340**
Montgomery	3,240	6,460	2,160	10,090	6,930	19,230	48,110
Prince George's	7,410	9,650	5,040	11,360	2,500	5,670	41,620
Rest of Suburban Maryland	6,940	6,340	2,110	12,110	6,350	17,730	51,580
Suburban Maryland	**17,590**	**22,450**	**9,310**	**33,560**	**15,780**	**42,620**	**141,310**
Arlington	3,580	50	2,650	4,530	2,180	10,870	23,870
Alexandria city	2,120	2,650	270	3,380	390	6,040	14,850
Fairfax (1)	130	4,070	1,850	12,620	7,160	14,540	40,380
Prince William (2)	2,720	7,220	2,740	11,680	4,770	13,480	42,610
Rest of Northern Virginia	8,310	10,560	8,760	21,500	14,880	36,000	100,010
Northern Virginia	**16,860**	**24,550**	**16,280**	**53,720**	**29,380**	**80,930**	**221,720**
Washington Region	**39,560**	**51,810**	**28,400**	**97,230**	**50,200**	**143,180**	**410,380**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table A5. Households by Area Median Income Group and Select Jurisdiction, 2023 Alternative Scenario
Households in Single-Family Attached and Single-Family Detached Homes
Greater Washington Region

	Total Units	Households in Single-Family Attached & Single-Family Detached Homes						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	**15,010**	**12,720**	**8,120**	**18,140**	**9,580**	**50,380**	**113,960**
Montgomery	407,610	15,970	21,220	16,230	47,870	26,120	137,450	264,860
Prince George's	343,370	24,160	28,490	21,110	60,330	28,140	75,130	237,370
Rest of Suburban Maryland	257,930	21,400	23,490	16,520	52,540	25,830	80,690	220,470
Suburban Maryland	**1,008,910**	**61,530**	**73,190**	**53,860**	**160,740**	**80,090**	**293,270**	**722,690**
Arlington	115,260	2,640	2,260	1,280	5,630	3,530	28,800	44,140
Alexandria city	79,570	1,830	1,880	1,120	4,100	2,410	18,730	30,060
Fairfax (1)	445,050	16,650	20,330	14,070	56,360	30,760	182,740	320,900
Prince William (2)	191,920	10,330	15,730	11,270	36,940	17,810	64,830	156,920
Rest of Northern Virginia	367,680	22,800	29,150	23,180	68,100	37,640	129,940	310,810
Northern Virginia	**1,199,480**	**54,240**	**69,350**	**50,930**	**171,140**	**92,140**	**425,050**	**862,840**
Washington Region	**2,524,410**	**130,780**	**155,270**	**112,910**	**350,020**	**181,810**	**768,700**	**1,699,490**
	Percent Change from 2011							
	Total Units	**Households in Single-Family Attached & Single-Family Detached Homes**						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**17.6%**	**-0.3%**	**-3.0%**	**0.5%**	**10.5%**	**13.6%**	**11.6%**	**7.3%**
Montgomery	13.4%	12.5%	5.8%	5.9%	16.0%	12.8%	9.0%	10.3%
Prince George's	13.8%	22.9%	40.7%	15.8%	16.8%	10.7%	6.6%	15.4%
Rest of Suburban Maryland	25.0%	21.9%	19.4%	3.6%	22.2%	25.2%	28.0%	22.6%
Suburban Maryland	**16.3%**	**19.7%**	**22.0%**	**8.8%**	**18.2%**	**15.7%**	**13.0%**	**15.5%**
Arlington	26.1%	79.1%	67.4%	100.7%	4.1%	1.2%	21.7%	22.6%
Alexandria city	22.9%	25.6%	-4.8%	33.3%	22.8%	-10.5%	21.0%	16.6%
Fairfax (1)	10.0%	-6.8%	5.2%	6.9%	13.7%	15.3%	7.8%	8.3%
Prince William (2)	28.5%	7.1%	46.6%	22.9%	39.7%	26.9%	24.2%	28.4%
Rest of Northern Virginia	37.4%	25.2%	29.9%	33.8%	35.7%	54.1%	36.6%	36.5%
Northern Virginia	**22.7%**	**11.5%**	**24.2%**	**23.8%**	**26.8%**	**29.2%**	**19.4%**	**21.9%**
Washington Region	**19.4%**	**13.6%**	**20.4%**	**14.4%**	**21.8%**	**22.1%**	**16.3%**	**18.0%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table A6. Households by Area Median Income Group and Select Jurisdiction, 2023
Alternative Scenario
Households in Multi-Family Units
Greater Washington Region

	Total Units	Households in Multi-Family Units						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	**52,730**	**28,450**	**15,750**	**34,240**	**15,880**	**55,000**	**202,050**
Montgomery	407,610	25,210	24,640	16,150	32,600	12,510	31,640	142,750
Prince George's	343,370	26,810	25,440	14,760	25,200	6,680	7,110	106,010
Rest of Suburban Maryland	257,930	11,570	7,830	3,760	7,470	2,770	4,070	37,460
Suburban Maryland	**1,008,910**	**63,590**	**57,910**	**34,680**	**65,270**	**21,960**	**42,820**	**286,220**
Arlington	115,260	10,070	5,190	5,250	15,240	7,450	27,910	71,110
Alexandria city	79,570	7,240	6,910	4,930	12,640	4,450	13,340	49,510
Fairfax (1)	445,050	22,310	15,460	11,400	32,900	12,370	29,710	124,150
Prince William (2)	191,920	8,280	7,340	4,360	9,000	2,310	3,700	35,000
Rest of Northern Virginia	367,680	14,450	11,500	6,940	12,460	3,590	7,930	56,870
Northern Virginia	**1,199,480**	**62,360**	**46,400**	**32,870**	**82,240**	**30,170**	**82,590**	**336,640**
Washington Region	**2,524,410**	**178,670**	**132,760**	**83,300**	**181,760**	**68,020**	**180,400**	**824,920**

	Percent Change from 2011							
	Total Units	Households in Multi-Family Units						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**17.6%**	**10.8%**	**22.4%**	**21.4%**	**31.6%**	**32.5%**	**35.4%**	**24.4%**
Montgomery	13.4%	6.1%	27.4%	8.3%	12.0%	46.5%	33.2%	19.6%
Prince George's	13.8%	12.2%	5.8%	17.1%	11.9%	-3.2%	16.5%	10.3%
Rest of Suburban Maryland	25.0%	36.5%	47.5%	69.4%	52.8%	70.6%	1.9%	41.3%
Suburban Maryland	**16.3%**	**13.3%**	**18.9%**	**16.6%**	**15.5%**	**28.7%**	**26.5%**	**18.3%**
Arlington	26.1%	31.6%	-14.2%	62.1%	39.4%	40.2%	25.8%	28.4%
Alexandria city	22.9%	31.8%	66.0%	-0.3%	26.1%	18.0%	26.4%	27.1%
Fairfax (1)	10.0%	6.4%	24.8%	9.0%	21.6%	33.0%	4.9%	14.4%
Prince William (2)	28.5%	32.7%	43.3%	17.2%	15.1%	74.2%	29.7%	29.2%
Rest of Northern Virginia	37.4%	34.6%	50.2%	71.8%	40.3%	86.7%	17.4%	42.2%
Northern Virginia	**22.7%**	**22.1%**	**31.2%**	**24.6%**	**27.1%**	**39.5%**	**16.9%**	**24.7%**
Washington Region	**19.4%**	**15.4%**	**23.7%**	**20.5%**	**23.4%**	**34.2%**	**24.3%**	**22.3%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table A7. Households by Area Median Income Group and Select Jurisdiction, 2023
Alternative Scenario
Owner-Households
Greater Washington Region

	Total Units	Owner-Households						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	**11,830**	**11,880**	**7,560**	**22,130**	**11,110**	**67,600**	**132,100**
Montgomery	407,610	16,030	20,230	16,910	47,640	27,240	142,800	270,850
Prince George's	343,370	17,710	23,180	18,420	55,780	26,240	72,340	213,670
Rest of Suburban Maryland	257,930	15,820	18,490	13,300	45,730	23,460	76,890	193,690
Suburban Maryland	**1,008,910**	**49,560**	**61,910**	**48,630**	**149,150**	**76,940**	**292,030**	**678,210**
Arlington	115,260	2,280	1,890	1,880	7,100	4,170	34,130	51,450
Alexandria city	79,570	1,480	1,790	1,880	5,380	2,880	20,640	34,050
Fairfax (1)	445,050	13,900	16,980	12,500	51,490	29,230	177,210	301,300
Prince William (2)	191,920	7,040	11,480	8,270	30,040	15,730	61,600	134,160
Rest of Northern Virginia	367,680	17,930	21,720	18,670	60,340	34,150	125,730	278,530
Northern Virginia	**1,199,480**	**42,630**	**53,860**	**43,190**	**154,350**	**86,160**	**419,300**	**799,500**
Washington Region	**2,524,410**	**104,020**	**127,640**	**99,380**	**325,630**	**174,210**	**778,930**	**1,609,810**
	Percent Change from 2011							
	Total Units	**Owner-Households**						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**17.6%**	**18.4%**	**4.2%**	**19.5%**	**30.5%**	**16.5%**	**20.1%**	**19.6%**
Montgomery	13.4%	7.2%	7.8%	2.4%	19.7%	16.2%	12.9%	12.9%
Prince George's	13.8%	25.2%	33.9%	12.0%	14.9%	5.4%	4.5%	12.1%
Rest of Suburban Maryland	25.0%	30.6%	24.7%	5.2%	23.3%	28.3%	27.9%	24.9%
Suburban Maryland	**16.3%**	**20.2%**	**21.6%**	**6.6%**	**18.9%**	**15.5%**	**14.2%**	**15.8%**
Arlington	26.1%	83.9%	57.0%	158.3%	10.6%	13.2%	17.7%	21.7%
Alexandria city	22.9%	27.3%	21.1%	5.1%	26.5%	2.6%	23.0%	20.4%
Fairfax (1)	10.0%	9.2%	7.5%	2.1%	15.7%	16.2%	7.0%	9.2%
Prince William (2)	28.5%	18.2%	44.6%	31.4%	36.3%	32.3%	22.9%	28.7%
Rest of Northern Virginia	37.4%	13.1%	36.7%	30.8%	47.4%	58.6%	35.2%	38.2%
Northern Virginia	**22.7%**	**15.4%**	**27.3%**	**22.3%**	**30.6%**	**32.4%**	**18.3%**	**22.6%**
Washington Region	**19.4%**	**18.0%**	**22.0%**	**13.9%**	**25.0%**	**23.4%**	**16.9%**	**19.4%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis

Table A8. Households by Area Median Income Group and Select Jurisdiction, 2023
Alternative Scenario
Renter-Households
Greater Washington Region

	Total Units	Renter-Households						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**316,020**	**55,910**	**29,300**	**16,310**	**30,260**	**14,350**	**37,780**	**183,910**
Montgomery	407,610	25,150	25,620	15,470	32,830	11,390	26,290	136,760
Prince George's	343,370	33,260	30,750	17,460	29,760	8,590	9,900	129,710
Rest of Suburban Maryland	257,930	17,140	12,820	6,980	14,280	5,140	7,870	64,230
Suburban Maryland	**1,008,910**	**75,560**	**69,190**	**39,910**	**76,870**	**25,120**	**44,060**	**330,700**
Arlington	115,260	10,430	5,560	4,660	13,780	6,810	22,580	63,810
Alexandria city	79,570	7,590	7,000	4,170	11,350	3,970	11,440	45,520
Fairfax (1)	445,050	25,050	18,810	12,970	37,770	13,900	35,240	143,750
Prince William (2)	191,920	11,570	11,590	7,360	15,910	4,400	6,930	57,760
Rest of Northern Virginia	367,680	19,330	18,940	11,450	20,220	7,070	12,140	89,140
Northern Virginia	**1,199,480**	**73,960**	**61,900**	**40,610**	**99,030**	**36,150**	**88,330**	**399,980**
Washington Region	**2,524,410**	**205,440**	**160,390**	**96,830**	**206,150**	**75,620**	**170,170**	**914,600**
	Percent Change from 2011							
	Total Units	**Renter-Households**						
		<30% AMI	30-49.9% AMI	50-79.9% AMI	80-99.9% AMI	100-119.9% AMI	120%+ AMI	Total
DC	**17.6%**	**6.2%**	**17.4%**	**10.7%**	**18.8%**	**31.8%**	**28.2%**	**16.3%**
Montgomery	13.4%	9.4%	24.2%	12.9%	7.4%	38.0%	12.4%	14.4%
Prince George's	13.8%	13.1%	14.0%	21.3%	16.1%	15.6%	34.2%	16.6%
Rest of Suburban Maryland	25.0%	23.3%	26.4%	26.2%	32.0%	29.7%	14.1%	25.3%
Suburban Maryland	**16.3%**	**14.0%**	**19.8%**	**18.7%**	**14.7%**	**27.9%**	**17.0%**	**17.3%**
Arlington	26.1%	32.3%	-10.2%	47.8%	38.8%	33.1%	34.0%	29.9%
Alexandria city	22.9%	31.1%	50.2%	4.4%	24.8%	8.8%	23.6%	24.9%
Fairfax (1)	10.0%	-4.0%	18.1%	14.1%	17.6%	28.5%	9.0%	11.7%
Prince William (2)	28.5%	16.5%	46.4%	11.7%	30.1%	26.7%	40.7%	28.2%
Rest of Northern Virginia	37.4%	47.6%	33.2%	61.4%	11.6%	46.7%	37.2%	34.7%
Northern Virginia	**22.7%**	**17.8%**	**26.5%**	**26.1%**	**21.5%**	**29.7%**	**22.3%**	**22.9%**
Washington Region	**19.4%**	**13.0%**	**21.9%**	**20.2%**	**18.5%**	**29.5%**	**22.1%**	**19.5%**

(1) Includes the cities of Fairfax and Falls Church

(2) Includes the cities of Manassas and Manassas Park

Numbers may not add due to rounding

Sources: 2011 American Community Survey microdata, Metropolitan Washington Council of Governments and GMU Center for Regional Analysis