

***Linking Job Growth and Housing:
Forecasts of the Demand for Workforce
Housing in Fairfax County***

prepared for

Fairfax County Department of Housing
and Community Development

by

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Purpose of the Study

The Fairfax County Redevelopment and Housing Authority (FCRHA) and the Fairfax County Department of Community Development (HDC) contracted with the George Mason University Center for Regional Analysis to prepare an analysis of the County's affordable/workforce housing need.

This report forecasts the demand for workforce housing in the County in 2010, 2015, 2020 and 2025.

A primary objective of this report is to detail the link between job growth and housing in Fairfax County. Results from this analysis will help Fairfax County officials develop housing plans and policies that will support the County's future economic growth.

This report forecasts Fairfax County's workforce housing demand in 2010, 2015, 2020, and 2025. This analysis of unmet housing demand explicitly links the availability of affordable housing to the continued economic prosperity of the County. If Fairfax County is not able to meet the future demand for affordable housing for its workforce, its economic vitality will be undermined and it will lose its economic leadership position in the region.

This report builds on the November 2006 report prepared by George Mason University titled *Need for Affordable/Workforce Housing in Fairfax County*. That report documented the overall mismatch between historical and forecast job growth and housing supply in the County and made projections of the demand for housing units to 2010 and 2025 using simple assumptions on the relationship between costs of housing, incomes, and wages by major economic categories. In this report, more detailed analysis is done on future job growth by sector and income. In addition, this analysis considers other factors that are part of the future workforce housing situation in the County, including commuting and migration patterns and economic versus lifestyle residential location choices.

This report estimates the need for housing for future working households, assuming that 65 percent of future workers will be housed in the County. This analysis does not address the housing needs of the non-working population, particularly the elderly and disabled, nor does it forecast the demand for housing by Fairfax County residents that work outside the County. Thus, projections of unmet housing demand presented in this report are just a portion of the total future housing demand that will be generated by the entire County population.

The following are key findings from the analysis:

- With approximately 674,000 jobs in 2007, Fairfax County rivals the District of Columbia as the region's major business district. In the future, the County likely surpass the central business district in terms of the total number of jobs. The continued growth and diversity of Fairfax County's economy is highly dependent on the availability of housing that is affordable to workers from the full spectrum of the economy. The consequences of a lack of affordable housing could include the out-migration of businesses, reduced availability

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of personal and business services, and a decline in the County's "livability."

- Between 2007 and 2025, Fairfax County is projected to add nearly 200,000 jobs, increasing its employment base by 29 percent. The fastest growing job sectors are projected to be the Professional and Technical Services, Management, Health Care and Social Assistance, and Education Services Sectors. However, without sufficient affordable housing, it is unlikely that this anticipated growth will occur.
- Given the forecasts of job growth and the assumptions documented in detail in the body of the report, it is anticipated that there will be a demand by new workers for 92,625 new housing units in Fairfax County over the 2007 through 2025 period. (This figure is lower than the forecast in GMU's previous report because it assumes only 65 percent of new workers will live in the County, rather than 100 percent.) About 22 percent of these units will need to be affordable to households earning less than 50 percent of County median income; another 22 percent should be affordable at 50 to 80 percent of County median income, 14 percent should be affordable at 80 to 100 percent of County median income, and 11 percent should be affordable at 100 to 120 percent of County median income.
- This future housing demand will include a need for 36,619 rental units and 56,006 ownership units over the 2007 through 2025 period. Based on discussions with housing specialists, it is assumed that few or limited workers with incomes below 50 percent of the County median will be able to own a home in Fairfax County. (This reflects a change from GMU's November 2006 report.)
- In the short term (2007-2010) new workers in the County will demand 24,082 new units, which corresponds to roughly 8,000 new residential units per year for the next three years. This need will include a demand for 9,521 rental units and 14,562 ownership units.
- In the longer term (2010-2025), there will be a demand for 68,542 new units in the County to accommodate the new workers. Of this total, there will be a demand for 27,098 rental units and 41,445 ownership units.
- Workers in certain sectors are going to find it most difficult to find affordable housing in the County in both the short term and longer term, given current trends. Workers in the Accommodation and Food Services, Administrative Support and Waste Management, Health and Social Assistance Services, and Education Services Sectors all provide vital services to the County's residents, businesses and tourists, and will have the most difficulty finding affordable housing.

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Forecasts of the Need for Workforce Housing Units by Income Group and Tenure 2007 - 2025

Income as a Pct. of County Median Income	Total Units	Rental Units	Ownership Units
<50%	20,413	20,413	0
50-60%	6,775	3,387	3,387
60-70%	5,499	2,068	3,431
70-80%	7,651	2,241	5,410
80-90%	6,237	1,622	4,615
90-100%	6,757	1,653	5,104
100-110%	4,648	1,070	3,578
110-120%	5,680	1,155	4,525
120%+	28,965	3,009	25,955
Totals	92,625	36,619	56,006

Introduction

Fairfax County has been an economic engine of the greater Washington DC area economy over the past 15 years. Strong job growth in the County has resulted in improved quality of life and greater opportunities for residents, but has also led to increased traffic congestion and escalating housing costs. In recent years, firms have re-located or expanded outside of Fairfax County and households, particularly families with children, have moved elsewhere in response to the high cost of housing. If Fairfax County is not able to meet the demand for affordable housing for its workforce, its economic vitality will be undermined and it will lose its economic leadership position in the region.

This report forecasts workforce housing demand for Fairfax County in 2010, 2015, 2020, and 2025. The findings in this report refine forecasts made by the George Mason University Center for Regional Analysis in the November 2006 report titled *The Need for Affordable/Workforce Housing in Fairfax County*. This analysis of unmet housing demand explicitly links the availability of affordable housing to the continued economic prosperity of the County by assessing housing need by job sector and income. Thus, this report provides an analysis of the need for housing **for future working households in the County only**. This analysis does not address the housing needs of the non-working population, particularly the elderly and disabled, nor does it forecast the demand for housing by Fairfax County residents who work outside of the County. Thus, the projections of unmet housing demand are just a portion of the overall housing demand that will be generated by the entire future County population.

The current analysis has refined those projections of future workforce housing needs made in GMU's November 2006 report. The enhancements in this report include the following:

- The November 2006 report made projections of housing needs by price levels assuming all jobs in Fairfax County would be filled by workers living in the County. This current report assumes that not all future workers in the County would live in the County. It is assumed that 65 percent of future workers will be housed in the County. The basis for this assumptions is detailed in the body of the report.
- This report uses more detailed and current data on jobs by sector and wage levels to better define projected housing needs. In addition, forecasts are made of housing needs by specific job categories.
- This report provides more in-depth analyses of commuting and migration patterns and their implications for future housing needs.

This report summarizes the County's current short-term and long-term job forecasts and provides detailed estimates of the housing demand in the County for the period 2007 through 2025. These forecasts include estimates of the total number of housing units that will be needed to support County job growth, by income, tenure, and unit size. Short-term (2007-2010) and longer-term (2010-2025) forecasts are presented in the main body of the report. Appendix tables include forecasts for the following intervals: 2007-2010, 2010-2015, 2015-2020, and 2020-2025. The report also provides analysis of the potential future economic outlook for Fairfax County if it is not able to meet this demand for housing.

Ensuring Fairfax County's Economic Prosperity Future Housing Need: 2007 - 2025

Fairfax County has been an economic engine in the greater Washington economy over the past fifteen years. To a base of 378,900 jobs in the county in 1990, total jobs in the County have increased by 295,100 to a total of 674,000 in 2007. This is an increase of 77 percent over the 17-year period. Fairfax County accounted for nearly 30 percent of the total job growth in the Washington metropolitan area.

The County will continue to be a magnet for jobs over the next 25 years so long as workers are able to afford housing. Between 2007 and 2025, the County has projected an increase of nearly 200,000 jobs, increasing its employment base by 29 percent. In order for the County to realize this job growth, it is going to have to make a concerted effort to meet the demand for housing from the entire spectrum of the labor force. Without this commitment, it is likely that some of these new jobs will not come.

Current job forecasts include growth in both high and low wage sectors in Fairfax County (Table 1.) The Professional and Technical Services and Management sectors are projected to be two of the fastest growing sectors of the economy and tend to include jobs with higher wages. For example, the average weekly wages for Fairfax County workers in the Professional and Technical Services sector was \$1,683 (or about \$87,500 annually) in 3rd quarter 2006, compared with \$1,179 for workers in all industries (about \$61,300 annually). Workers in the Management sector had average weekly wages of \$2,018 (or about \$105,000 annually). However, the other two fastest growing sectors in the County—Health Care and Social Assistance Services and Education Services—tend to have lower than average wages. The average weekly wages in 3rd quarter 2006 were \$923 and \$689 for workers in the Health Care and Social Assistance Services and Education Services sectors, respectively. These weekly wages correspond to annual earnings of about \$48,000 for Health Services workers and \$35,800 for Education Services workers.

**Table 1. Job Growth by Economic Sector: 2007-2025
Fairfax County**

Sector	2007 Estimate	2025 Estimate	Change	Percent Change
Total Employment	674,337	871,423	197,086	29.2
Agriculture	132	112	-20	-15.4
Utilities	2,173	1,438	-735	-33.8
Construction	40,369	45,872	5,503	13.6
Manufacturing	13,050	10,821	-2,230	-17.1
Wholesale Trade	18,411	17,659	-752	-4.1
Retail Trade	66,089	72,040	5,951	9.0
Transportation and Warehousing	12,387	15,347	2,960	23.9
Information	37,590	49,095	11,505	30.6
Finance and Insurance	28,934	33,096	4,162	14.4
Real Estate and Rental and Leasing	11,398	10,263	-1,135	-10.0
Professional, Scientific, and Technical Services	165,044	242,643	77,599	47.0
Management of Companies and Enterprises	21,859	31,309	9,449	43.2
Administrative and Support and Waste Management	47,838	63,877	16,039	33.5
Educational Services	49,963	70,682	20,719	41.5
Health Care and Social Assistance	54,637	79,591	24,954	45.7
Arts, Entertainment, and Recreation	11,947	15,752	3,805	31.9
Accommodation and Food Services	44,161	57,130	12,969	29.4
Other Services (Except Government)	24,321	31,866	7,544	31.0
Government, Excluding Education and Hospitals	23,970	22,831	-1,138	-4.7

Sources: Virginia Employment Commission, Fairfax County Cooperative Forecasts, GMU Center for Regional Analysis

Other important sectors of the economy will continue to grow. For example, the Administrative and Support and Waste Management Sector is forecast to grow 33.5 percent between 2007 and 2025, largely to support growth in other professional services sectors. The Arts, Entertainment, and Recreation and Accommodation and Food Services sectors are projected to grow about 30 percent over the 2007 through 2025 period to continue to provide services to residents, workers and visitors. These jobs are important to the continued quality of life in the County. Workers in these occupations tend to have lower wages. For example, workers in the Accommodation and Food Services sector have average weekly wages of about \$371 (or \$19,300 annually.)

Households with workers in different sectors have varying abilities to afford housing. Approximately 38 percent of the future Accommodation and Food Services workers in Fairfax County will live in households with incomes less than 50 percent of the County median income (Table 2). About 30 percent of Administrative Support workers and 25 percent of Retail Trade workers will also live in households with incomes below 50 percent of County median income.

**Table 2. Estimates of Income Group by Sector
Percent of Households in Each Income Category
(ordered by lowest income)**

Sector	Less than 50% MI	50-80% MI	80-100% MI	100-120% MI	120% + MI
Accommodation and Food Services	37.7	25.5	14.1	10.0	12.8
Administrative and Support and Waste Management and Remediation	30.4	19.2	9.2	13.0	28.2
Retail Trade	24.8	21.1	14.9	9.0	30.2
Other Services (Except Government)	24.2	22.8	15.7	10.7	26.8
Health Care and Social Assistance	23.7	22.5	14.1	7.5	32.2
Real Estate and Rental and Leasing	23.6	19.8	12.6	8.4	35.6
Arts, Entertainment, and Recreation	23.3	36.8	7.6	7.9	24.5
Educational Services	22.2	21.7	13.9	10.6	31.6
Construction	20.0	22.2	13.3	10.5	33.9
Wholesale Trade	18.2	18.4	11.2	12.6	39.6
Transportation and Warehousing	17.9	23.2	15.0	12.5	31.5
Utilities	15.4	22.6	8.5	10.3	43.3
Finance and Insurance	12.1	19.2	12.8	9.4	46.5
Information	11.4	15.9	13.9	11.2	47.6
Government, Excluding Education and Hospitals	10.8	18.6	14.7	14.9	41.0
Manufacturing	10.8	14.7	10.7	13.3	50.5
Professional, Scientific, and Technical Services	9.3	15.0	11.6	10.5	53.6
Agriculture	0.0	17.9	0.0	25.0	57.1
Management of Companies and Enterprises	0.0	43.4	0.0	0.0	56.6

Source: U.S. Census Bureau, GMU Center for Regional Analysis
MI = County Median Household Income

A majority of workers in some sectors will live in households that have incomes below 80 percent of the County median. Sixty-three percent of Accommodation and Food Services workers and 60 percent of workers in the Arts, Entertainment and Recreation sector will live in households with income below 80 percent of County median income.

Fairfax County's economic vitality is inextricably tied to its ability to address the issue of the demand for affordable housing. The continued growth and diversity of Fairfax County's economy is highly dependent on the availability of housing that is affordable to workers from the full spectrum of the economy. Failing to plan for a balanced supply of housing in the future will reduce the County's opportunities for economic growth. The lack of affordable housing can jeopardize the County's economic health in several ways, including:

- 1) Out-migration of Businesses: Companies are increasingly footloose, meaning they are not dependent on proximity to natural resources or transportation routes and can locate almost anywhere. Many of the fastest growing sectors in the Washington DC region do not need to be tied to a particular location. More and more often, businesses are moving to where their employees are. If workers find it difficult to find affordable housing in Fairfax County, they will move elsewhere. Fast-growing, footloose companies are sure to follow them.
- 2) Reduced Availability of Personal and Business Services: Fairfax County residents and businesses depend on service workers to fulfill daily needs—from restaurant workers to dry cleaners to retail workers. Lower wage service workers who are not able to find affordable housing in the County will ultimately be forced to seek housing elsewhere. As a result, local business owners will have to pay higher wages to attract service workers to jobs in the County, which will increase the costs of goods and services to County residents and businesses. At the extreme, it may become too difficult to attract these workers and the availability and quality of personal and business goods and services will decrease substantially within the County.
- 3) Decline in “Livability”: Public services will suffer if the County has difficulty attracting public and school employees. These workers often have difficulty finding affordable housing in the County. As the quality of public services diminishes, the “livability” of the County will also suffer. “Livability” is becoming one of the most important factors to individuals and households, as well as to businesses, in deciding where to locate. Without sufficient affordable housing in the future, Fairfax County is at risk of losing its “livability” advantage.

Proportion of Future Workers That Will Live in the County

A plan to meet the demand for affordable housing for the County workforce must recognize the importance of workers in all economic sectors and at all wage levels. However, it is not realistic to assume that Fairfax County—or any jurisdiction in the Washington DC region—will house *all* of its future workers. No metropolitan county has ever housed all of its workers. There are at least two reasons why this is so. First, most households in the Washington DC metropolitan area have more than one worker. Often, the two (or more) workers work in different jurisdictions. Thus, it is logistically impossible for jurisdictions to house all of their workers given the number of multiple worker households.

Second, there are some households that choose not to live in Fairfax County even though they work there and could afford to live there. These households may have a preference to live near friends or family in other places. They may prefer living in a more rural (or urban) setting which cannot be found in Fairfax County. The section on migration and commuting above suggests that many workers choose to live outside of the County for non-economic reasons.

Thus, in establishing guidelines for its housing policy, it is recommended Fairfax County should seek to house

a majority of its new workers over the next 15 to 20 years. In this analysis, it is assumed that 65 percent of all future workers will be housed in the County. This figure is higher than the situation in 2000, when approximately 50 percent of County jobs were held by County residents. In considering what the goal should be for proportion of jobs that should be held by residents, a comparison was made of counties in other metropolitan areas that are quite large (approximately 1,000,000 population and 500,000 jobs), are also considered economic centers, and that are not central city counties. These comparable places include counties near New York, Detroit, Minneapolis, Atlanta, Chicago, and Washington DC. Overall, these comparable counties house an average of 67 percent of their workers.

Aiming to house 65 percent of future County workers recognizes that in the future, land use, transportation and housing planning decisions will necessarily become more regionally focused, with increasing attention paid to how to reduce traffic congestion and accommodate growth necessary to support regional growth.

Given forecasts of job growth, the County would need approximately 142,500 new units over the 2007 through 2025 time period to accommodate 100 percent of future workers, and about 93,000 new housing units if 65 percent of new workers are housed in the County (Table 3). These figures exclude new housing needed for non-workers, including the elderly and disabled, or any group housing, such as group homes or dormitories, as well as workers that prefer to live outside of the County. (Current COG forecasts call for about 99,000 new households in the County between 2005 and 2025.)

Table 3. Estimates of Housing Units Needed by 2025 by Selected Income Group

Household Income as a Pct. of County Median Income	If 100% of New Workers are Housed		If 65% of New Workers are Housed	
	Units	% of total	Units	% of total
<50%	30,000	35	20,413	32
50-80%	24,000	30	19,925	31
80-120%	30,000	35	23,322	37
Total Units Needed up to 120% Median income	84,000		63,660	
Total Units Needed (includes units affordable over 120% median income)	142,500		92,625	

The affordability levels needed for these net new units are calculated based on the wages among the mix of projected future workers by sector. These affordability levels are targeted by income group so that 65 percent of the new workers in all of the sectors of the economy would have housing that is affordable to them. The breakdown between rental and ownership units, as well as unit size, is also estimated.

Tables 4A and 4B summarizes the housing demand over the 2007 through 2025 period by income as a percent of County median income, tenure and unit size. Table 4A shows the total number of housing units needed to house 100 percent of future County workers. Table 4B shows the number of units needed if 65 percent of workers live in the County. According to Table 4B, there will be a demand for 36,619 rental units and 56,005 ownership units. These forecasts are lower than those reported in GMU's November 2006 report. The lower numbers are based on the assumption that 65 percent—not 100 percent—of future workers will demand housing in the County. The figures in this report also include a greater share of rental units. This change resulted from conversations with County staff and housing professionals about the likelihood that low income workers (i.e. households with income less than 50 percent of the County median income) would be able to afford to buy a home. In this analysis, it is assumed that households earning less than 50 percent of the County median income will have to

be renters in the future. It is assumed that homeownership for this group of working households is not a viable option in the future.

Using assumptions based on the tenure and unit size mix by job sector from the 2000 Census Public Use Microdata Sample (PUMS),¹ there will be demand on the renter side for an even mix of unit sizes—zero and one bedroom units, two bedroom units, and three-or-more bedroom units. On the ownership side, however, the demand is markedly toward larger (i.e. three-or-more bedroom) units. These preferences are based on recent data on unit mix size. Whether or not demand for larger units can be met over the next 15 or 20 years remains to be seen.

Given the forecast of job growth and income, it is projected that about 22 percent (20,413) of future housing units will be demanded by households earning 50 percent or less of County median income. These are units that are affordable to households with workers in the Accommodation and Food Services, Administrative Support and Waste Management, and Retail Trade Sectors, among other workers. All of these units are assumed to be rental units. Given the analysis of unit size by job sector, it is projected that there needs to be about an even split between zero or one bedroom, two bedroom and three-or-more bedroom apartments affordable to this income group. Thus, these forecasts call for the supply of 6,671 zero or one bedroom units, 6,970 two bedroom units, and 6,772 three-or-more bedroom units to meet the housing demand of working households with income below 50 percent of County median income.

Another 22 percent (19,925) of the future units will need to be affordable to households with incomes between 50 and 80 percent of County median income. Many households with workers in the Art, Entertainment and Recreation, Accommodation and Food Services, and Construction Sectors fall into this income category. These households will demand 7,696 rental units and 12,229 ownership units. This group of ownership units will require the most public assistance to make them affordable to this income range. It is projected that over the 2007 through 2025 period, there will be a demand for 2,487 zero or one bedroom rental units, 2,637 two bedroom rental units, and 2,572 three-or-more bedroom rental units. On the ownership side, there will be a greater demand for larger units. Nearly 88 percent (or 10,708 ownership units) will need to be three-or-more bedrooms.

Among households earning between 80 and 100 percent of County median income, there will be a demand for 3,275 rental units and 9,719 ownership units over the 2007 through 2025 period. This income category includes workers from all job sectors, notably Government, Education Services, and Health Care and Social Assistance Services. On the rental side, the demand will be for 1,052 zero or one bedroom units, 1,116 two bedroom units, and 1,106 three-or-more bedroom units. The majority of the ownership units demanded (8,529 units) will be for three-or-more bedroom units. It is anticipated that these households also will need assistance to afford to purchase homes in Fairfax County.

Households earning between 100 and 120 percent of County median income will have a strong preference for ownership over rental units. Workers in many economic sectors live in households with incomes in this range. Over 78 percent of units demanded will be ownership units (or 8,103 units), while 22 percent will be rental units (2,225 units.) Again, the mix of rental units continues to be about evenly spread across unit sizes, with a demand for 705 zero or one bedroom units, 765 two bedroom units, and 755 three-or-more bedroom units. On the ownership side, there will be a very strong demand for units with three-or-more bedrooms (7,122 units.) It is assumed that even this group of working households will need some sort of assistance to purchase a home in Fairfax County, given projections of housing prices and incomes.

Finally, in the upper income group, there will be a demand for 3,009 new rental units and 25,955 new ownership units. More than half of workers in the Professional and Technical Services and Management Sectors live in households with incomes greater than 120 percent of County median income. It is assumed that for this highest income group, this demand will largely be met (and possibly over-met) by the private sector.

1 See the Appendix for details on the methodology.

Short-term (2007-2010)

Between 2007 and 2010, it is estimated that the Fairfax County economy will grow quickly, adding 52,675 jobs over three years. Assuming 1.5 workers per housing unit and that 65 percent of new jobs will be held by County residents, there will be a demand for 24,082 net new units in the County by 2010 (Table 5B). This corresponds roughly to 8,000 new residential units per year for the next three years. According to the U.S. Census bureau's building permit data, the County has authorized permits for an average of only 4,400 annually over the past three years.

In order to support new workers from all sectors of the County economy, there will need to be available housing affordable at all income levels. Based on this assessment, there will be a demand for 5,307 rental units affordable to households with incomes less than 50 percent of County median income; 5,180 rental and ownership units affordable at 50 to 80 percent of County median income; 3,378 rental and ownership units affordable at between 80 and 100 percent of County median income; 2,685 rental and ownership units affordable at between 100 and 120 percent of County median; and 7,531 rental and ownership units affordable to households earning 120 percent or more of County median income.

In the short-term, there will be a demand for 9,521 total rental units, including 3,081 zero or one bedroom units, 3,250 two bedroom units, and 3,190 three-or-more bedroom units. There will be a demand for a total of 14,562 ownership units, including 375 zero and one bedroom units, 1,400 two bedroom units and 12,787 three-or-more bedroom units.

Longer-Term (2010-2025)

Between 2010 and 2025, the County is projected to add 144,411 jobs, or 9,627 jobs annually. New workers in Fairfax County will demand a total of 68,542 net new housing units over this period (Table 6B). This projection indicates construction of 4,400 net new units annually is needed over this 15-year period. Based on the projected mix of jobs and incomes by sector, it is estimated that there will be a demand for 15,106 units affordable to households earning less than 50 percent of County median income; 14,744 units affordable at between 50 and 80 percent of County median income; 9,616 units affordable at between 80 and 100 percent of County median income; 7,643 units affordable at between 100 and 120 percent of County median income; and 21,434 units affordable to households earning 120 percent or more of County median income.

There will be a demand for 27,098 rental units over the longer-term, including 8,769 zero and one bedroom units, 9,250 two bedroom units, and 9,079 three-or-more bedroom units. The demand for ownership units will total 41,445 units, including 1,067 zero and one bedroom units, 3,984 two bedroom units, and 36,394 three-or-more bedroom units,

The demand for larger units, particularly among owners, is based on the current situation among Fairfax County homeowners. However, given the need to increase the amount of housing, and with increased emphasis on building smaller units, it may not be possible to meet the entire demand for larger units.

Table 4A. Forecasts of the Need for Affordable/Workforce Housing Units in Fairfax County by Income Group, Tenure and Unit Size
Assumes Fairfax County Houses 100% of New Workers
2007-2025

Income as a Pct. of County Median Income	Total Units	Rental Units				Owner Units			
		Total Rental	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms	Total Owner	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms
Totals	142,500	56,336	18,231	19,230	18,875	86,163	2,218	8,283	75,663
<50%	31,405	31,405	10,264	10,722	10,419	0	0	0	0
50-80%	30,653	11,840	3,827	4,057	3,957	18,813	486	1,852	16,475
80-100%	19,991	5,038	1,619	1,718	1,702	14,952	384	1,447	13,122
100-120%	15,889	3,423	1,085	1,177	1,161	12,466	328	1,182	10,956
120%+	44,561	4,630	1,437	1,556	1,636	39,931	1,019	3,802	35,110

Source: GMU Center for Regional Analysis

Table 4B. Forecasts of the Need for Affordable/Workforce Housing Units in Fairfax County by Income Group, Tenure and Unit Size
Assumes Fairfax County Houses 65% of New Workers
2007-2025

Income as a Pct. of County Median Income	Total Units	Rental Units				Owner Units			
		Total Rental	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms	Total Owner	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms
Totals	92,625	36,619	11,850	12,499	12,269	56,006	1,441	5,384	49,181
<50%	20,413	20,413	6,671	6,970	6,772	0	0	0	0
50-80%	19,925	7,696	2,487	2,637	2,572	12,229	316	1,204	10,708
80-100%	12,994	3,275	1,052	1,116	1,106	9,719	250	940	8,529
100-120%	10,328	2,225	705	765	755	8,103	213	768	7,122
120%+	28,965	3,009	934	1,012	1,064	25,955	663	2,471	22,822

Source: GMU Center for Regional Analysis

**Table 5A. Short Term Forecasts of the Need for Affordable/Workforce Housing Units in Fairfax County by Income Group, Tenure and Unit Size
Assumes Fairfax County Houses 100% of New Workers
2007-2010**

Income as a Pct. of County Median Income	Total Units	Rental Units					Owner Units				
		Total Rental	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms	Total Owner	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms		
		Totals	14,647	4,740	5,000	4,908	22,402	577	2,154	19,672	
<50%	8,165	2,669	2,788	2,709	0	0	0	0			
50-80%	7,970	995	1,055	1,029	4,891	126	482	4,283			
80-100%	5,198	421	447	442	3,888	100	376	3,412			
100-120%	4,131	890	282	306	3,241	85	307	2,849			
120%+	11,586	1,204	374	405	10,382	265	988	9,129			

Source: GMU Center for Regional Analysis

**Table 5B. Short Term Forecasts of the Need for Affordable/Workforce Housing Units in Fairfax County by Income Group, Tenure and Unit Size
Assumes Fairfax County Houses 65% of New Workers
2007-2010**

Income as a Pct. of County Median Income	Total Units	Rental Units					Owner Units				
		Total Rental	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms	Total Owner	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms		
		Totals	9,521	3,081	3,250	3,190	14,562	375	1,400	12,787	
<50%	5,307	1,735	1,812	1,761	0	0	0	0			
50-80%	5,180	647	686	669	3,179	82	313	2,784			
80-100%	3,378	274	290	288	2,527	65	244	2,218			
100-120%	2,685	578	199	196	2,107	55	200	1,852			
120%+	7,531	782	243	277	6,748	172	643	5,934			

Source: GMU Center for Regional Analysis

Table 6A. Long Term Forecasts of the Need for Affordable/Workforce Housing Units in Fairfax County by Income Group, Tenure and Unit Size
Assumes Fairfax County Houses 100% of New Workers
2010-2025

Income as a Pct. of County Median Income	Total Units	Rental Units				Owner Units			
		Total Rental	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms	Total Owner	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms
		Totals	41,689	13,491	14,230	13,968	63,761	1,641	6,129
<50%	23,240	7,595	7,935	7,710	0	0	0	0	
50-80%	22,684	8,762	2,832	3,002	2,928	360	1,371	12,191	
80-100%	14,793	3,728	1,198	1,271	1,259	284	1,071	9,710	
100-120%	11,758	2,533	803	871	859	243	875	8,108	
120%+	32,975	3,426	1,063	1,152	1,211	754	2,813	25,982	

Source: GMU Center for Regional Analysis

Table 6B. Long Term Forecasts of the Need for Affordable/Workforce Housing Units in Fairfax County by Income Group, Tenure and Unit Size
Assumes Fairfax County Houses 65% of New Workers
2010-2025

Income as a Pct. of County Median Income	Total Units	Rental Units				Owner Units			
		Total Rental	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms	Total Owner	0-1 Bed-rooms	2 Bed-rooms	3-or-More Bedrooms
		Totals	27,098	8,769	9,250	9,079	41,445	1,067	3,984
<50%	15,106	4,937	5,157	5,011	0	0	0	0	
50-80%	14,744	5,695	1,841	1,952	9,049	234	891	7,924	
80-100%	9,616	2,423	826	819	7,192	185	696	6,312	
100-120%	7,643	1,646	522	559	5,996	158	569	5,270	
120%+	21,434	2,227	691	749	19,207	490	1,829	16,888	

Source: GMU Center for Regional Analysis

Discussion of Key Job Sectors

In this section, we describe in more detail the future housing need of workers in key sectors of the Fairfax County economy. Sectors examined include i) Retail Trade, ii) Professional and Technical Services, iii) Administrative and Support and Waste Management, iv) Health Care and Social Assistance Services, v) Education Services, vi) Retail Trade, and vii) Accommodation and Food Services.

Professional and Technical Services

The Professional and Technical Services sector has been, and will continue to be, the main driver of the Fairfax County economy. Jobs in this sector includes lawyers, architects, engineers, accountants, scientific researchers, and management consultants. Many of the County's federal government contractors fall into this category.

In 2007, there are about 165,044 jobs in the Professional and Technical Services Sector, accounting for 24.5 percent of all jobs in the County. Households with workers in the Professional and Technical Services sector tend to be high income households. In the 3rd quarter of 2006, the average annual earnings for a worker in the sector was about \$87,500. According to our analysis, about 53 percent of households in Fairfax County that have a worker in the Professional and Technical Services Sector have incomes at 120 percent or greater of County median income.

This sector is projected to grow faster than the overall economy between 2007 and 2010. In the next three years, about 16,878 new jobs in the Professional and Technical Services Sector will be added to the Fairfax County economy, representing a 10.2 percent increase over the 2007 figure. The growth of the Professional and Technical Services sector will generate a demand for 6,269 new housing units between 2007 and 2010. The demand from this group of workers will be for 1,555 rental units and 4,714 ownership units.

It is expected that the Professional and Technical Services Sector will experience strong growth in the long term. Between 2010 and 2025, the total number of jobs in the County is projected to increase by 19.9 percent, while growth in the Professional and Technical Services Sector is forecast to be 33.4 percent. Over this 15 year period, there will be 60,721 new Professional and Technical Services workers in the County. The longer-term growth in the Professional and Technical Services Sector will result in the demand for 22,553 new housing units, including 6,167 rental units and 16,386 ownership units.

Administrative Support and Waste Management

The Administrative Support and Waste Management Sector includes 47,838 total jobs in Fairfax County, accounting for 7.1 percent of all County jobs. Workers in these jobs often provide vital support to other sectors of the economy, including Professional and Technical Services. This sector includes workers in business service centers, document production, temporary help services, and convention/trade show organizers. This sector also includes workers in waste collection and waste disposal/treatment occupations.

Households with workers in the Administrative Support and Waste Management Sector tend to have low or moderate incomes. The average annual salary for workers in this sector was about \$28,800 in 3rd quarter 2006. Nearly half of all households with a worker in the Administrative Support and Waste Management Sector have incomes below 80 percent of County median income.

This sector is projected to grow slightly faster than the overall economy. Between 2007 and 2010, it is estimated that 4,091 jobs in the Administrative Support and Waste Management Sector will be added to the Fairfax County economy, reflecting a growth rate of 8.6 percent. These new workers will demand 1,522 new housing units in

Fairfax County between 2007 and 2010. The demand from workers in this sector will include demand for 630 rental units and 892 ownership units.

Growth in the Administrative Support and Waste Management Sector will continue to be strong in the longer-term. It is expected that this sector will add 11,942 jobs between 2010 and 2025, reflecting a 23.0 percent growth rate. The longer-term job growth in this sector will result in a demand for 4,435 new housing units, including 1,845 rental units and 2,590 ownership units.

Health Care and Social Assistance Services

Workers in this sector provide essential services to the Fairfax County community. In 2007, there were approximately 54,637 workers in the Health Care and Social Assistance Services Sector, comprising 8.1 percent of all jobs in the County. Included in this sector are doctors, nurses, dentists, home health care workers, child care providers, social workers, and vocational education service providers, among others.

Households with workers in the Health and Social Assistance Services Sector can be found in all income groups. On average, however, annual earnings for a worker in this sector in Fairfax County is about \$48,000. About 46 percent of workers in this sector live in households with incomes below 80 percent of County median income.

This sector is projected to grow in the short-term, but the prospects for growth are greater in the longer-term as the population ages. Between 2007 and 2010, it is estimated that 5,501 jobs will be added in this sector, reflecting a 10.1 percent increase. Growth in this sector will generate a demand for 2,032 new housing units in Fairfax County between 2007 and 2010. It is estimated that there will be a demand for 514 rental units and 1,518 ownership units.

With the aging of the population and advances in medial technology, the need for workers in health-related occupations will grow substantially in the future. In Fairfax County, it is estimated that the number of workers in the Health Care and Social Assistance Sector will grow by 32.3 percent between 2010 and 2025, or by 19,453 workers. Many of these workers will be in the lower paying health professions, such as nursing home aids and home health care workers. In the longer-term, workers in the Health Care and Social Assistance Sector will demand 7,225 new housing units in Fairfax County, including 1,828 rental units and 5,397 ownership units.

Education Services

All workers in the education field are included in this sector—primary and secondary school teachers and administrators, community college faculty and staff, and university professors and professionals. Workers in this sector serve the Fairfax County community by providing the skills, experiences, and enrichment necessary for the County to continue to grow. There are currently 49,963 people working in the County in the Education Services Sector. This sector comprises 7.4 percent of the total County economy.

Similar to the Health Care and Social Assistance Sector, there is a wide range of incomes in the Education Services Sector. Many workers in this sector make very low incomes. The average annual salary for a worker in the Education Services Sector in 3rd quarter 2006 was about \$35,800. Among households with at least one worker in the Education Services Sector, 43.9 percent have incomes below 80 percent of County median income.

Between 2007 and 2010, the number of jobs in the Education Services Sector is expected to grow somewhat faster than the overall economy. The County is expected to add 4,777 workers in the Education Services sector in the short-term, reflecting a 9.6 percent increase. In the short-term, new worked in the Education Services sector will demand 1,774 new housing units in Fairfax County. It is estimated that 408 rental units and 1,366 ownership units will be needed to meet the demand from these workers.

In the longer-term, the County will add 15,942 new workers in the Education Services Sector between 2010 and 2025, reflecting a 29.1 percent increase. To meet the demand for housing units by new Education Service workers, there will have to be 5,921 net new units added in the County between 2010 and 2025. It is estimated that new Education Services workers in the County will demand 1,362 rental units and 4,559 ownership units.

Retail Trade

Workers in the Retail Trade sector allow Fairfax County residents and workers to fulfill daily needs, while also serving consumers from a wide regional market. This sector includes workers in all types of retail shops, from building material and garden supply stores to food and beverage stores to gas stations and auto parts stores. Currently, there are 66,089 retail workers in Fairfax County and this sector comprises 9.8 percent of all jobs in the County.

Retail Trade workers often have relatively low incomes. The average annual salary for Retail Trade workers was about \$19,344 in 3rd quarter 2006. Forty-six percent of households with a Retail Trade worker have a household income below 80 percent of County median income. The Retail Trade sector is forecasted to grow more slowly than the overall Fairfax County economy. Between 2007 and 2010, it is estimated that the Retail Trade sector will add 3,364 jobs, reflecting a 5.1 percent increase.

New workers in the Retail Trade sector will demand housing in Fairfax County. It is estimated that to serve these new workers, there will need to be 1,249 net new units affordable in the County between 2007 and 2010. It is projected that households with Retail Workers will demand 410 rental units and 836 ownership units.

The Retail Trade sector is projected to grow even more slowly in the longer-term. Between 2010 and 2025, the growth rate in this sector will be just 3.7 percent. This means that during that 15-year period, the County will add just 2,587 workers in the Retail Trade sector. To accommodate these new Retail Trade workers, it is estimated that there will need to be 961 net new units available in the County between 2010 and 2025. Of these, there will be a demand for 316 rental units and 645 ownership units.

Accommodation and Food Services

The Accommodation and Food Services Sector is an important component of the Fairfax County economy. Workers in this sector not only serve local residents and businesses, they also serve millions of visitors that stay and dine in the County annually. Occupations in this sector include hotel/motel workers, such as front desk personnel, bell boys, room attendants, and others, as well as restaurant workers in full-service restaurants, limited-service eating establishments and specialty food service establishments.

Workers in the Accommodation and Food Services sector have the lowest incomes among all County workers. The average annual salary for a worker in this sector was less than \$12,000 in 3rd quarter 2006. Nearly 40 percent of households with a worker in the Accommodation and Food Services sector have a household income less than 50 percent of the County median income. Another 25.5 percent have incomes between 50 and 80 percent of County median income. Thus, nearly two-thirds of these households have incomes below 80 percent of County median income.

In 2007, there are 44,161 workers in Fairfax County in the Accommodation and Food Services sector. This sector comprised 6.5 percent of all jobs in the County. Between 2007 and 2010, this sector is projected to grow at about the same rate as the overall economy. There will be 3,542 new Accommodation and Food Service workers between 2007 and 2010. These new Accommodation and Food Service workers will demand 1,315 net new housing units in Fairfax County, including 526 rental units and 789 ownership units.

In the longer-term, the Accommodation and Food Services sector is projected to grow by 19.8 percent, adding

9,427 new workers in Fairfax County between 2010 and 2025. As a result of this job growth, there will be a demand for 3,502 net new units in the County, including 1,401 rental units and 2,101 ownership units.

Table 7. Short-term Housing Demand by Selected Economic Sector: 2007 – 2010

Sector	Total Units	Rental Units	Owner Units
Professional and Technical Services	6,269	1,555	4,714
Administrative Support and Waste Management	1,522	630	892
Health Care and Social Assistance	2,032	514	1,518
Education Services	1,774	408	1,366
Retail Trade	1,249	410	836
Accommodation and Food Services	1,315	526	789

Table 8. Longer-term Housing Demand by Selected Economic Sector: 2010 – 2025

Sector	Total Units	Rental Units	Owner Units
Professional and Technical Services	22,553	6,167	16,386
Administrative Support and Waste Management	4,435	1,845	2,590
Health Care and Social Assistance	7,225	1,828	5,397
Education Services	5,921	1,362	4,559
Retail Trade	961	316	645
Accommodation and Food Services	9,427	1,401	2,101

APPENDIX

Methodology

Several datasets were used in this analysis. This section briefly summarizes each dataset and describes how the data were used to support the estimates and analyses.

Data Sources

U.S. Census Bureau, 2005 American Community Survey

The American Community Survey (ACS) is a nationwide survey designed eventually to replace the Census long form. The ACS includes data from a sample of individuals and households across the country. 2005 data are currently available for areas with 65,000 or more people. These data can be accessed from the U.S. Census Bureau's American FactFinder website: <http://factfinder.census.gov/>.

Because these data come from a sample, there is a margin of error associated with all of the estimates. For example, in this report Appendix, income by housing cost burdened is presented by low, midpoint, and high estimates. These estimates are calculated by the U.S. Census Bureau based on their sampling techniques.

The following data from the 2005 ACS were used in this report: tenure by income group and housing cost burden by tenure and income group.

U.S. Census Bureau, 2000 Census Public Use Microdata Sample

When the U.S. Census Bureau released the 2000 Census data tables, it also made available microdata. This Public Use Microdata Sample (PUMS) contains individual and household level data. In other words, this dataset includes one row of data for each household or individual that contains all of the information asked about on the Census long form. The data are presented in such a way that the confidentiality of each household or individual is assured. The 2000 PUMS is the most recent (and detailed) microdata available for Fairfax County.

The PUMS data are used to do much of the analysis on cost burden, tenure and unit type, and household income by job sector. The statistics generated using the 2000 data are applied to 2007 control totals for the analysis. This methodology assumes that the relative incomes and preferences of households in different job categories stayed the same in 2007 as they were in 2000.

The following data from the 2000 PUMS were used in this report: household income by job sector, tenure by income and job sector, and tenure and unit size by income and job sector.

Metropolitan Washington Council of Governments Cooperative Forecasts – Round 7.0

The Metropolitan Washington Council of Governments (COG) works with local jurisdictions to publish periodic forecasts of population, households and jobs. Each jurisdiction is responsible for generating its own forecasts, while COG helps with reconciliation issues and disseminates the data. The forecasts for all jurisdictions are available at COG's website: http://www.mwcog.org/publications/departmental.asp?CLASSIFICATION_ID=6&SUBCLASSIFICATION_ID=27

Fairfax County prepared forecasts of population, households and employment for COG's Round 7.0 forecasts. The County's forecast of total jobs was used in this analysis.

Virginia Employment Commission

The Virginia Employment Commission (VEC) collects and disseminates employment and earnings data by county and independent city. These data can be found on the web at: <http://velma.virtuallmi.com/>.

For this analysis, the following data from VEC were used: current mix of employment by sector, current wages

by sector, and county/city job forecasts by sector (to 2014).

Forecasts of Housing Need by Income, Tenure and Unit Size

The following section describes step-by-step the methodology used to forecast the demand for housing in Fairfax County by income group, tenure and unit size.

A. Employment Projections by Sector

1. Use employment projections from 2002 – 2012 from VEC. These projections are for the Fairfax/Arlington/Alexandria area and are produced by sector. Forecasts at the 2-digit sector were used. For each sector, an annual growth rate is calculated (for the 10-year period.)
2. Start with VEC data on Fairfax jobs by sector for 2005. *Adjust total number of jobs to Fairfax's 2005 estimate (but keep sectoral proportions the same.)*
3. Assume that each industry in Fairfax grows at the annual growth rate calculated in step A1. So between 2005 and 2010, assume the total number of jobs in each sector increases an amount equal to $(5 * \text{annual growth rate} * 2005 \text{ total})$. Sum up jobs in each industry to get total for 2010. *Adjust total number of jobs (but keep sectoral proportions the same) using Fairfax's COG estimate.*
4. Repeat step 3 for 2015, 2020, and 2025.
5. To estimate 2007 employment figures, use annual job change numbers for the 2005 through 2010 period. Assume the 2007 job number is equal to the 2005 job number plus $2/5$ of the job change (i.e. $2007 \text{ jobs} = 2005 \text{ jobs} + (2/5) * (2010 \text{ jobs} - 2005 \text{ jobs})$).

B. Total Units to House Workers in Each Sector

1. Divide total number of workers by 1.5 to get total housing units needed by sector.
2. Assume 65 percent of new workers in Fairfax County will be housed in the County. *The 2000 Census data shows that 50 percent of all jobs in the County are held by County residents. Using 65 percent for this analysis assumes that Fairfax County wants to do a better job of housing its workers than it has done in the past, within the constraints of workers' other residential preferences (i.e. desire to live near other household worker's job or desire for rural living/bigger house and lot).*

C. Determine Household Income as a Percentage of County Median Household Income by Sector

1. Use 2000 Public Use Microdata to tabulate frequencies of household income by job sector of the worker. *In other words, tabulate a frequency distribution of household income by job sector of the individual worker. Thus, if there is a Retail worker and a Construction worker living in the same household, the income for that household is included in the frequency distribution for the Retail worker and the frequency distribution of the Construction worker.*
2. From the frequency distributions, determine what percentage of households with workers in each sector have incomes in the following income ranges: less than 50% County median income; 50-80% County median income; 80-100% County median income; 100-120% County median income; and 120%+ County median income. *For these tabulations, use the 2000 County median income as the reference.*

3. Apply the percentages by sector calculated in step C2 to total workers in each sector in 2007. *This assumes that incomes in all sectors rose at about the same rate in the 2000 through 2007 period. This is probably an unrealistic assumption, but the alternative was to try to estimate income changes by sector and then make adjustments to the income distributions.*

D. Allocate Housing Units by Sector and Income Group

1. Use two pieces of information to allocate housing units by sector and income group: a) new housing units needed by sector calculated in Step B and b) distribution of new workers by sector by income category (i.e. less than 50% MI, 50-80% MI, etc.) *Assumes the total units needed by sector will be distributed across the income categories as defined in Step C. Assumes the income distributions do not change over the 2007 to 2025 time period.*

E. Allocate Housing Units by Sector, Income Group and Tenure

1. Use 2000 PUMS to determine tenure by job sector.
2. Use information from the 2005 ACS to determine overall rental/ownership rates by income group.
3. Adjust rental/ownership percentage within each job sector for the different income groups. Households with lower incomes are less likely to be homeowner, etc. Then adjust the rental/ownership rates for each income group within each job sector. *For example, for each job sector, the overall rental rate for the entire population in the sector is multiplied by 1.38 for the population in the 50-80% County MI group, because households in this income group are more likely to be renters.*

F. Allocate Housing Units by Sector, Income Group, Tenure and Unit Size (i.e. # of bedrooms)

1. Use the 2000 PUMS to estimate the distribution of unit size (i.e. 0-1 bedrooms, 2 bedrooms, 3+ bedrooms) by tenure (i.e. owner, renter) for households with workers in each sector. *Thus, if there is a Retail worker and a Construction worker living in the same household, the unit size for that household is included in the frequency tabulation for the Retail worker and the frequency distribution of the Construction worker.*
2. Apply these percentages to the counts of housing units needed by sector, income and tenure calculated in Step E. *This method does not assume a difference in unit sizes based on income group; the distribution of unit size is solely based on job sector of the household workers.*