# The Central Shenandoah Valley Region of Virginia

## DEMOGRAPHIC FORECASTS 2006

October 16, 2006

Presented By: Central Shenandoah Planning District Commission

> Prepared By: Darryl D. Crawford, Senior Planner

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### We Welcome Your Comments and Questions. Please Contact:

Darryl D. Crawford Senior Planner Central Shenandoah Planning District Commission 112 MacTanly Place Staunton, VA 24401 Phone: (540) 885-5174

Fax: (540) 885-2687 E-mail: darryl@cspdc.org

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# The Central Shenandoah Valley Region of Virginia Demographic Forecasts 2006

#### Introduction

The Central Shenandoah Planning District Commission (CSPDC) has disseminated public source historical data on the Central Shenandoah Valley Region (CSVR) of Virginia's demographic and economic conditions for over 25 years. The CSPDC provides regional data through both the State Data Center Affiliate program managed by the Virginia Employment Commission and the Economic Development District Technical Assistance Program of the U.S. Department of Commerce's Economic Development Administration.

Numerous requests have been received over the years for forecast data on the region and its sub-regions. Until recently; however, the purchase of privately generated forecast data was not a viable option. Beginning in 2005, the CSPDC began an annual program of purchasing projection data. *The 2006 State Profile: State and County Projections to 2030*, published by Woods & Poole Economics, Inc., Washington, D.C., Copyright 2006, includes a database with historical data from 1969 to the present and projections to 2030 for the nation, the state, and the counties / cities within the Central Shenandoah Planning District.

The purpose of this publication is to promote discussions of potential scenarios of what the Central Shenandoah Valley Region might expect if current trends were to continue over time. It is not intended to be an exact prediction of the future.

CSPDC staff compared other sources of projection data prior to beginning this project and found the overall trends forecasted to be similar. The data included in *The Central Shenandoah Valley Region of Virginia – Demographic Forecasts 2006* is used by permission from Woods & Poole Economics, Inc. The use of their data in this publication should not be considered an endorsement of one source of projection data over another. The projections used were representative of similarly forecasted trends available from other sources and the single provider was selected to provide consistency. *The 2006 State Profile: State and County Projections to 2030* is one amongst many good sources of projection data available.

Please forward all questions or comments to the CSPDC staff contact listed on the title page (i) of this document.

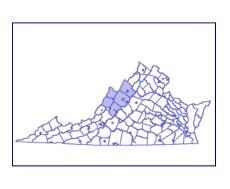
#### Where is the study area?

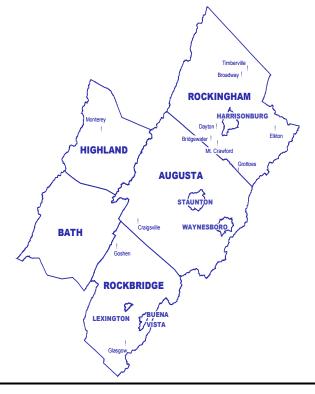
The Central Shenandoah Valley Region is located the heart of the historic and scenic Shenandoah Valley of west-central Virginia. Covering approximately 3,439 square miles, the region is home to some 260,000 persons. The Central Shenandoah Planning District is comprised of the five counties of Augusta, Bath, Highland, Rockbridge, and Rockingham, the five cities of Buena Vista, Harrisonburg, Lexington, Staunton, and Waynesboro, and the eleven incorporated towns of Bridgewater, Broadway, Craigsville, Dayton, Elkton, Glasgow, Goshen, Grottoes, Monterey, Mt. Crawford, and Timberville.

The Central Shenandoah Valley Region is bounded on the west by elevations of the Allegheny Mountains and on the east by the crest of the Blue Ridge Mountains. Of the region's 2.2 million acres of land, approximately 1.2 million are publicly held and protected. The headwaters of the James, Shenandoah, and Maury rivers are located in the region. Bisected by Interstates 81 and 64, the region is approximately 100 miles west of Richmond, 125 southwest of Washington, D.C., and 200 miles northwest of the Port of Hampton Roads.

CSPDC staff compiled the regional data figures for the Central Shenandoah Valley Region by combining the separate county-equivalent figures from the aforementioned *2006 State Profile* database. The county-equivalent definitions were defined by the Bureau of Economic Analysis as follows:

- Harrisonburg–Rockingham (Metropolitan Statistical Area)
- Staunton-Waynesboro-Augusta (Micropolitan Statistical Area)
- Lexington-Buena Vista-Rockbridge
- Bath County
- Highland County





#### What is included in this publication?

The Central Shenandoah Valley Region of Virginia - Demographic Forecasts 2006 provides an overview of projected growth to 2030 in five areas. They include Population, Employment, Earnings, W&P Wealth Index, and Households.

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#### Summary Observations.....

- 1) The Central Shenandoah Valley Region's projected 31.4% increase in overall population by 2030 is forecast to be closer to the national growth rate of 34.1% than to the state's growth rate, which is projected to increase at a significantly higher rate of 44.4%.
- 2) The region's fastest growing age cohort is forecast to be Age 65 & Over, with a projected increase of over 32,000 or 88.9%, and growing to over 20.0% of the population by 2030.
- 3) Nearly 23.0% of the region's increase in total population is projected to come from the Hispanic population, which is forecast to replace the Black population as the region's most prevalent minority population as a percentage of overall population by 2030. Some 15,000 of the estimated 18,500 new Hispanic residents in the region are projected to locate in the Harrisonburg-Rockingham MSA.
- 4) The projected increase of some 28,000 persons in the 20-64 Workforce Age cohort is less than half of the projected increase in regional employment of 58,500.
- 5) Increases in Service and Wholesale / Retail Trade Sector employment are significant in that over 43,000 or 73.7% of the forecasted increases in regional employment are projected to come from those two Sectors. The Service and Wholesale / Retail Trade Sectors have typically paid over 1/3 less in weekly wages than the Manufacturing Sector, which had been the predominant Sector in the region in terms of employment prior to 1990 and projected total earnings through 2010.
- 6) At 38.9%, the increase in Number of Households is forecast to outpace the projected 31.4% increase in overall population due to the decreasing average of number of Persons Per Household across the region. The 54.4% projected increase in Households locating in the Harrisonburg-Rockingham MSA is greater than the 51.1% and 37.9% increases in Households projected in Virginia and nationally by 2030.

#### Forecasts at a Glance.....

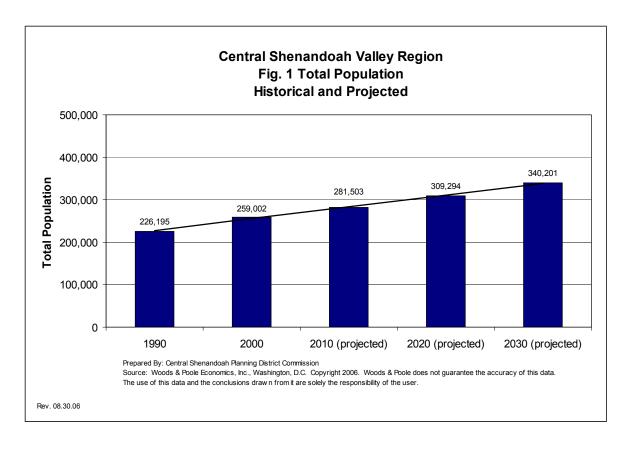
- **Total Population** in the region is projected to increase by approximately 81,200 additional residents by 2030.
- **Percentage Increase in Total Population** in the region is projected to be 31.4% from 2000 to 2030, as compared to 44.4% statewide and 34.1% nationally.
- Population By Age Cohort in the region is projected to show increases from 2000 to 2030 of 20,821 or 30.5% for those Age 19 & Under; 28,195 or 18.2% for those in the 20-64 Workforce Age cohort; and, 32,183 or 88.9% for those Age 65 & Over.
- Percentage of Population By Age Categories in the region is projected to show the population Age 19 & Under remaining relatively stable through 2030 at just over 26.0%, following a slight decrease to 24.4% in 2010. The population in the 20-64 Workforce Age cohort is projected to decrease to 53.7%, while the population Age 65 & Over is projected to increase significantly to 20.1%.
- Percent of Population Age 19 and Under in the region is projected to remain slightly below the state and national averages, but to draw closer to the national average of around 26.0% by 2030.
- Percent of Population Age 20 to 64 in the region is projected to mirror state and national trends of decrease after 2010, declining from roughly 60.0% of the population to just below 54.0% regionally by 2030.
- Percent of Population Age 65 & Over in the region is also projected to follow state and national trends as the percentage of population Age 65 & Over increases significantly. The 65 & Over population is expected to grow to over 20.0% regionally, as compared to just over 18.0% statewide and nationally.
- Median Age in Years in the region has traditionally been higher than the state and national median ages in all sub-regions of the CSVR, except the Harrisonburg-Rockingham MSA. The trend is forecast to continue as the median age is projected to increase to 37.5 statewide and 38.6 nationally. All CSVR sub-regions are projected to have median ages over 42.5 years by 2030, except for the Harrisonburg-Rockingham MSA, where the projected median age is 34.0.
- Percent of Population by Race in the region is projected to follow national and state trends of White population decreasing as a percentage of total population, the percentage of Black population remaining steady, and Hispanic population percentages increasing significantly over time.

#### Forecasts at a Glance.....

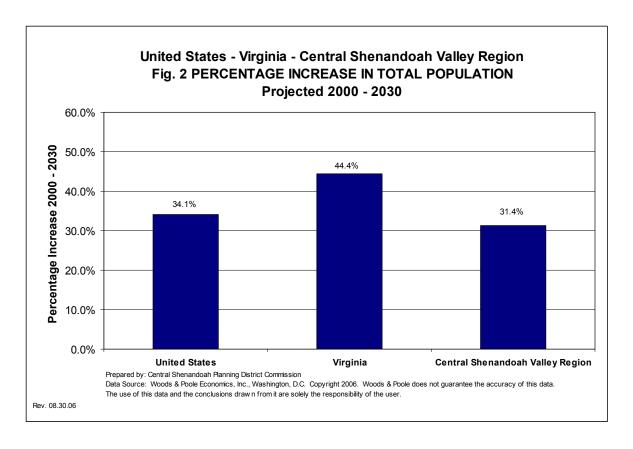
- **Total Employment** in the region is projected to increase by over 58,500 additional jobs or 38.0% from 2000 to 2030. Comparatively, Virginia's Total Employment is projected to increase by 50.7% statewide and an increase of 44.1% is projected nationwide.
- Employment By Categories in the region is projected to follow state and national trends with the highest number of jobs being added in the Service and Wholesale / Retail Trade sectors. By 2030, the two sectors are projected to account for 73.7% of new jobs regionally, 69.3% of new employment statewide, and 70.1% nationally. On the other hand, Manufacturing sector employment is projected to decline 10.8% regionally, 2.9% statewide, and 6.2% nationally.
- Percent Employment By Categories in the region is projected to see a steadily increasing percentage of employment in the Service sector, eventually reaching over 30.0% of regional employment. Service sector employment is projected to exceed 38.5% both statewide and nationally by 2030.
- **Total Earnings** in the region are projected to increase by 71.8% from 2000 to 2030 when adjusted for inflation. Comparatively, inflation adjusted Total Earnings are projected to increase 103.1% statewide and 84.5% nationally.
- Earnings By Categories in the region are projected to experience the
  greatest increases in the Service Sector. The projected 141.2% increase
  in Service sector earnings regionally is significantly less than the 171.2%
  increase projected across Virginia, but only slightly less than the 145.3%
  increase projected nationwide.
- Percent Of Total Earnings By Categories in the region show only the Service sector projected to experience significant growth as a percentage of Total Earnings, increasing to 27.6% regionally. Earnings in the Service sector are projected to be at 41.4% statewide and 37.9% nationally by 2030. Earnings in the Manufacturing sector are projected to continue their decline regionally, dropping to 20.5% of Total Earnings, but still significantly greater than the 7.0% statewide and 10.7% projected nationally.
- W&P Wealth Index in the region is projected to run below the national W&P Wealth Index of 100 for all sub-regions through 2030, while Virginia is projected to run well above 100 statewide.

#### Forecasts at a Glance.....

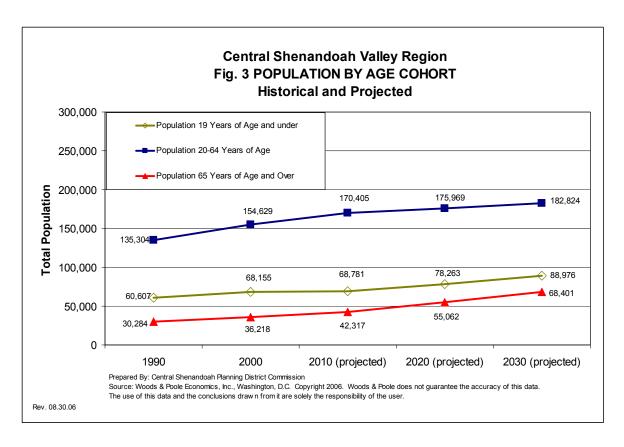
- **Number of Households** in the region is projected to increase by approximately 38,000 for an increase of 38.9% by 2030. Increases of 51.1% and 37.9%, respectively, are projected for Virginia and nationwide.
- **Number of Households (sub-regions)** is projected to see the most growth in the Harrisonburg-Rockingham MSA and the Staunton-Waynesboro-Augusta Micro Areas, where 89.9%, or over 34,000, of the new households in the region are projected to locate.
- Persons Per Household in the region are projected to continue the
  decreasing trends which are also being seen statewide and nationally.
  Even with the decrease, the Harrisonburg-Rockingham MSA is projected
  to remain roughly equivalent to the national average for Persons Per
  Household at 2.51 and 2.52, respectively. Virginia is projected to
  decrease to 2.43, while the Staunton-Waynesboro-Augusta Micro Area
  and the remaining sub-regions are all projected to decrease to 2.27 or
  less.



Total population in the Central Shenandoah Valley Region (CSVR) is projected to increase from 259,002 in 2000 to 340,201 by 2030. This represents an increase of 81,199 persons or 31.4%.



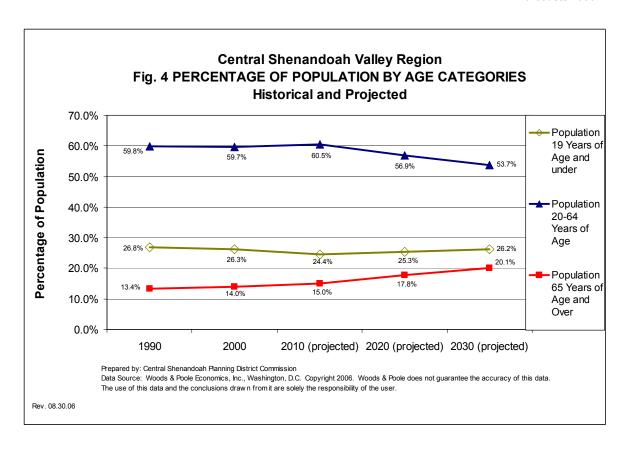
Population growth, nationally, is projected to be 34.1% for the period from 2000 to 2030. Statewide, growth in population is forecast to be 44.4% for the same period. Projected population growth for the CSVR is 31.4%.



The CSVR population in the Age 19 & Under cohort is projected to grow from 68,155 in 2000 to 88,976 in 2030, resulting in an increase of 20,821 persons or 30.5%.

Regional population in the 20-64 Workforce Age cohort is projected to grow from 154,629 in 2000 to 182,824 by 2030, resulting in an increase of 28,195 persons or 18.2%.

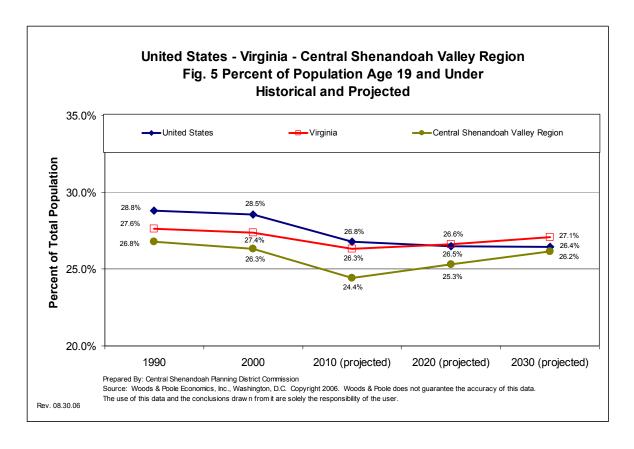
Those in the Age 65 & Over cohort are projected to experience the most growth in population, increasing from 36,218 in 2000 to 68,401 by 2030. The result would be an increase of 32,183 persons or 88.9%.



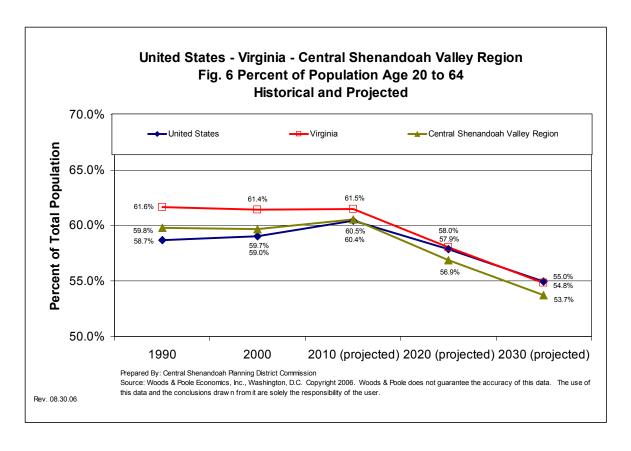
The percentage of the CSVR population in the Age 19 & Under cohort is projected to decrease from 26.3% of the total population in 2000 to 24.4% in 2010 and then increase back to 26.2% of the population by 2030.

Population in the 20-64 Workforce Age cohort is projected to increase from 59.7% of the total population in 2000 to 60.5% in 2010 and then decrease to 53.7% of the region's population by 2030.

The Age 65 & Over population in the region is projected to increase from 14.0% in 2000 to 20.1% by 2030.

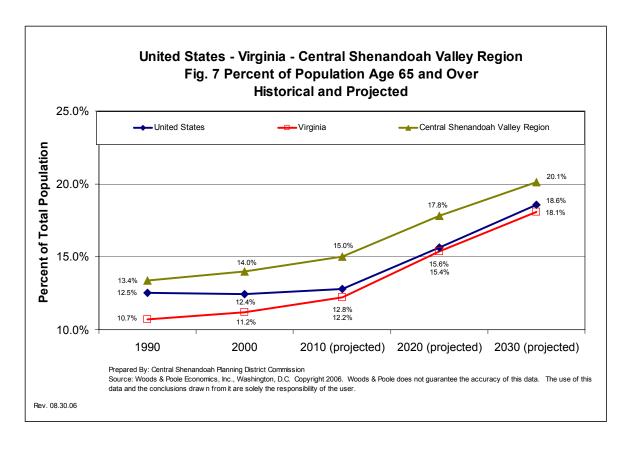


Comparatively, the percentage of total population in the Age 19 & Under cohort is projected to decrease nationally, statewide, and regionally from 2000 to 2010 and then level off somewhat for the remainder of the period. After 2010, the CSVR's percentage of population in the Age 19 & Under cohort is projected to increase at a faster rate than the state and nation and move closer to the state and national averages by 2030 at around 26.0-27.0%.

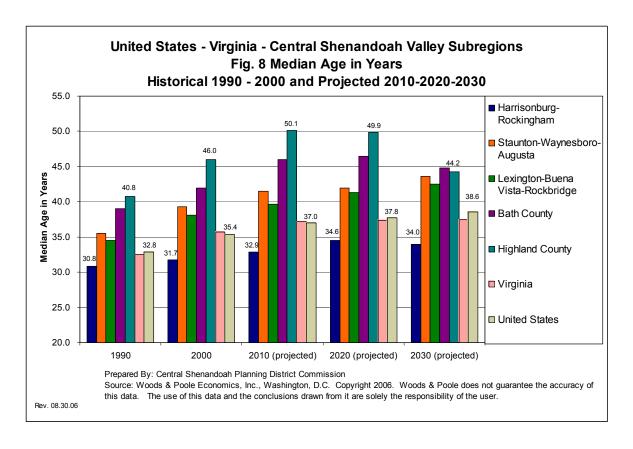


Population in the 20-64 Workforce Age cohort is projected to increase slightly as a percentage of population from 2000 to 2010 to make up 60.4% of the total population nationally, 61.5% statewide, and 60.5% of the population in the region. The percentages of those in the 20-64 Workforce Age cohort are then projected to decrease significantly to 55.0% of the total population nationally, 54.8% statewide, and 53.7% in the region by 2030.

Through 2000, the CSVR had a higher percentage of total population in the 20-64 Workforce Age cohort than the national average. The region is projected to have a lesser percentage of its population in this age cohort than the national average after 2010.

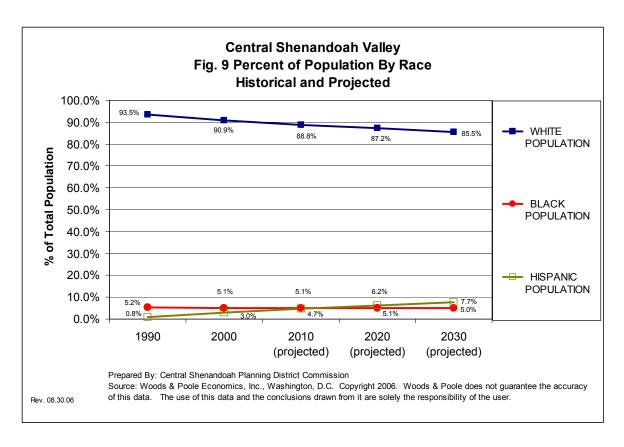


In 2000, the percentage of the total population in the Age 65 & Over cohort was 12.4% nationally, 11.2% statewide, and 14.0% in the Central Shenandoah Valley Region. After slight increases from 2000 to 2010, the percentage of the total population in the Age 65 & Over cohort is projected to increase significantly to reach 18.6% nationally, 18.1% statewide, and 20.1% regionally by 2030.



In 2000, only the Harrisonburg-Rockingham MSA population had a Median Age at or below the Virginia state Median Age of 35.8 and the national Median Age of 35.4. The Harrisonburg-Rockingham MSA, which is home to a number of institutions of higher learning, had a Median Age of 31.7 years in 2000, while the Staunton-Waynesboro-Augusta Micro Area had a Median Age of 39.3 years. The Lexington-Buena Vista-Rockbridge Area, also a home to institutions of higher learning, had a Median Age of 38.1. The counties of Bath and Highland had Median Ages of 41.9 and 46.0, respectively.

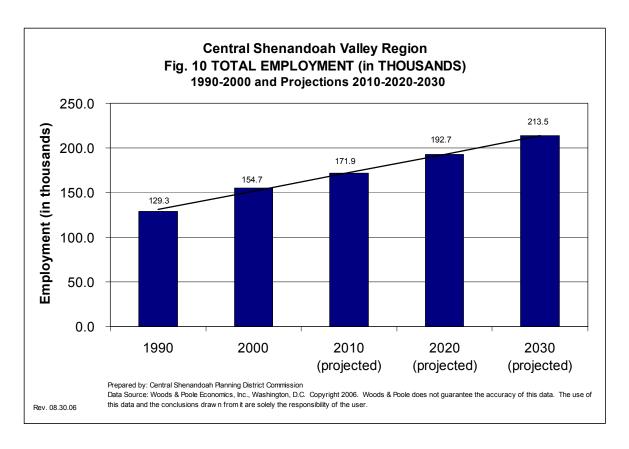
By 2030, the Median Age in Virginia is projected to increase to 37.5 and the national Median Age is projected to increase to 38.6. The Harrisonburg-Rockingham MSA's Median Age is projected to rise to only 34.0, while the Staunton-Waynesboro-Augusta Micro Area's Median Age is projected to rise to 43.6. The Median Age in the Lexington-Buena Vista Rockbridge Area is projected to increase to 42.5 by 2030 and Bath County's Median Age is projected to rise to 44.8. Highland County's Median Age is projected to be 44.2, following a projected rise to a Median Age of 50.1 in 2010.



White population as a percentage of the total population in the CSVR is projected to decrease from 90.9% in 2000 to 85.5% by 2030. Black population is projected to remain steady as a percentage of the total population, ranging from 5.1% to 5.0%. Hispanic population (which can be any race) is projected to grow from roughly 3.0% of the region's population in 2000 to 7.7% by 2030.

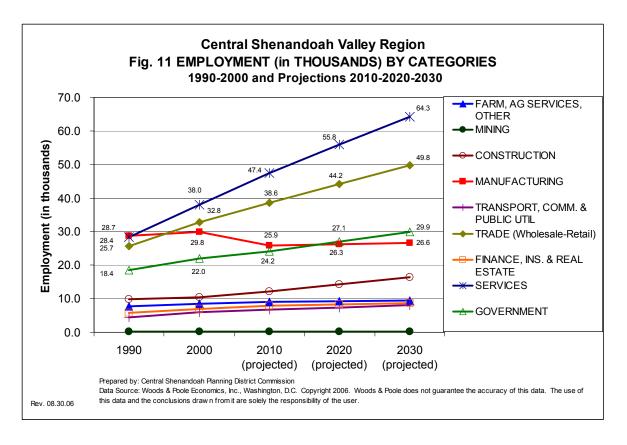
Comparatively, the national and statewide demographic makeup by race is projected to follow similar patterns with White population decreasing as a percentage of overall population, Black population remaining relatively steady, and the Hispanic population increasing significantly.

White population is projected to decrease from 70.0% nationally and 71.1% statewide in 2000 to 57.4% and 59.3%, respectively, by 2030. Black population is projected to increase slightly from 12.5% nationally and 19.9% statewide to 13.1% and 20.7%, respectively. Hispanic population is projected to increase from 12.6% nationally and 4.7% statewide to 21.0% and 11.3%, respectively.



Total Employment (full or part-time jobs by place of work) in the CSVR was 154,726 in 2000. Employment in the region is projected to increase to 213,468 by 2030. That represents 58,742 additional jobs or an increase of 38.0%.

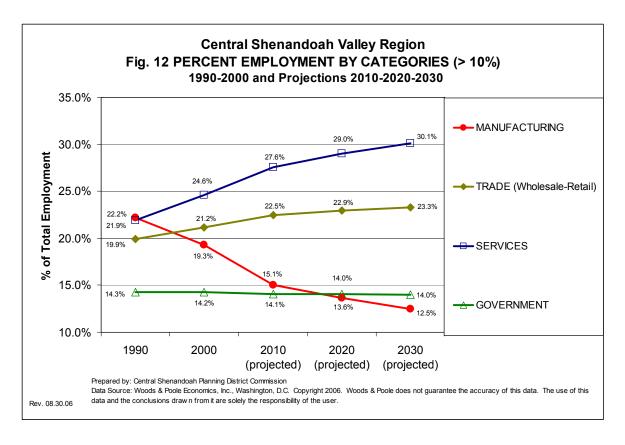
Comparatively, Virginia is projected to increase its Total Employment by 50.7% statewide and employment is projected to increase by 44.1% nationally between 2000 and 2030.



The greatest increases in employment in the Central Shenandoah Valley Region are projected to be in the Service and Wholesale/Retail Trade Sectors. Of the 58,742 projected growth in employment between 2000 and 2030, 73.7% of new jobs are projected to come in those two Sectors. Service Sector employment is projected to add 26,285 jobs for an increase of 69.1%. The Wholesale/Retail Trade Sector is projected to add 17,026 more jobs for an increase of 52.0%. The Manufacturing Sector is projected to lose an additional 3,224 jobs for a 10.8% reduction and drop to fourth in total Sector employment in the region.

Comparatively, 69.3% of new employment across Virginia is projected to come from the Service and Wholesale/Retail Trade Sectors with projected increases 82.9% and 44.4%, respectively. Manufacturing is projected to decrease by 2.9% between 2000 and 2030.

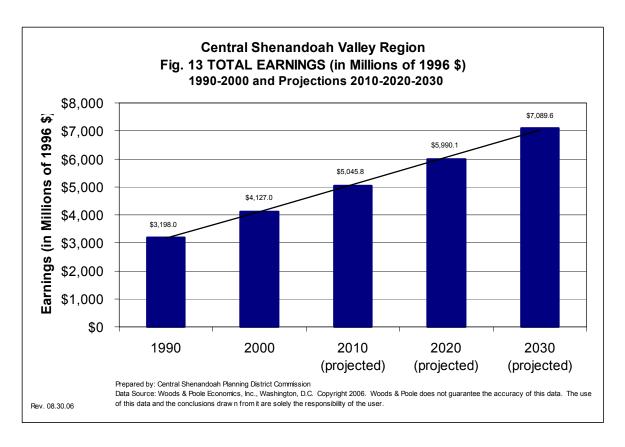
Nationally, 70.1% of new employment is also projected to come from the Service and Wholesale/Retail Trade Sectors. Service employment is projected to increase by 74.6% from 2000 to 2030, while Wholesale/Retail Trade is projected increase by 34.5%. Manufacturing employment is projected to decline by 6.2% over the period.



Service Sector employment is projected to increase to 30.1% of the CSVR's total employment by 2030. Conversely, Manufacturing Sector employment is projected to decrease to 12.5% of total employment over the same period. The combined Sectors of Service and Wholesale/Retail Trade are projected to make up over 50% of total Central Valley employment by 2010.

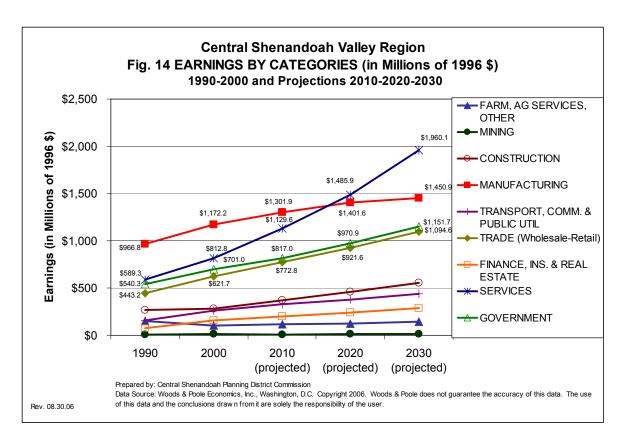
Comparatively, Service Sector employment statewide is projected to continue its increase in share of total employment from 31.8% in 2000 to 38.6% by 2030. The only other two major Sectors in terms of percentage of employment statewide (>10%), Wholesale/Retail Trade and Government, while growing in terms of total numbers of employment, are projected to decline to 18.9% and 16.5%, respectively, in the percentage of overall employment across the state.

Nationally, Service Sector employment is projected to follow a similar pattern, with an anticipated growth from 31.8% to 38.5% of total employment. Manufacturing Sector employment is projected to continue its decline nationally to drop below 10% of national employment by 2010 and be at roughly 7.5% by 2030.



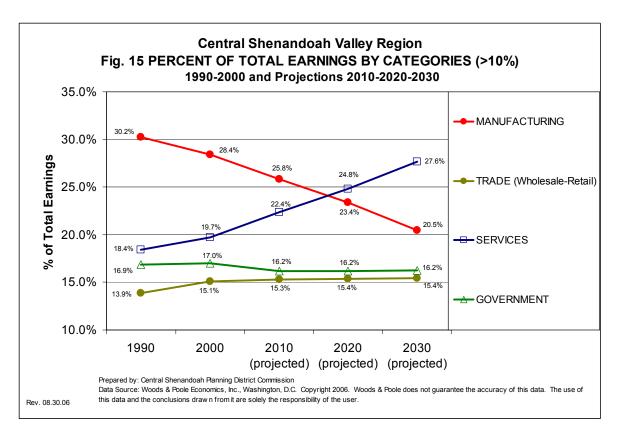
Total Earnings (by place of work) in the region are projected to increase from \$4,127,000,000 in 2000 to \$7,089,600,000 by 2030 or 71.8%, when adjusted for inflation using 1996 dollars.

Comparatively, Total Earnings are projected to increase 103.1% statewide and 84.5% nationally for the same period, when adjusted for inflation.



Service Sector earnings are projected to experience the greatest increase over the period from 2000 to 2030, with a projected increase of \$1,147,320,000 or 141.2% when adjusted for inflation using 1996 dollars. While the Manufacturing Sector is projected to provide the region's highest total earnings of all Sectors through 2010, it is projected to drop below total Service Sector earnings by 2020. Overall growth in inflation adjusted Manufacturing Sector earnings is projected to increase by only 23.8% across the region.

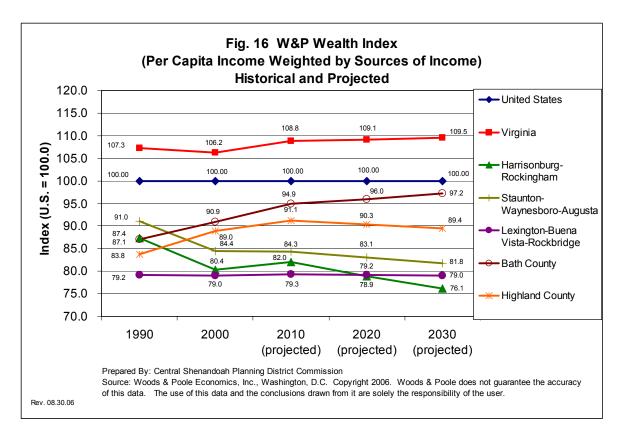
Comparatively, Service Sector earnings are projected to increase by 171.2% statewide and 145.3% nationally when adjusted for inflation.



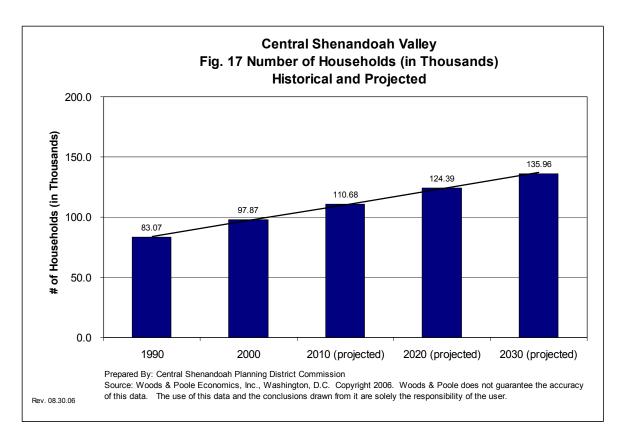
Of the four Sectors representing over 10% of Total Earnings in the region, only the Service Sector is projected to experience significant growth. Service Sector Earnings are projected to increase from 19.7% of Total Earnings in 2000 to 27.6% by 2030. Government and Wholesale-Retail Trade Earnings in the Central Valley are projected to remain relatively stable as a percentage of Total Earnings for the period. Manufacturing Sector Earnings are projected to continue their decline as a percentage of Total Earnings, dropping from 28.4% in 2000 to 20.5% by 2030.

Comparatively, across Virginia, the Service Sector is projected to increase from 31.0% of Total Earnings statewide in 2000 to 41.4% by 2030. The other major employment Sectors with over 10% of Total Earnings in 2000 are all projected to decrease slightly as a percentage of Total Earnings.

Nationally, a similar pattern is projected with Service Sector Earnings growing from 28.5% in 2000 to 37.9% by 2030. Again, the other major Sectors providing over 10% of the Total Earnings are projected to decrease slightly over the period, with the greatest drop in the Manufacturing Sector which is projected to drop from 16.5% in 2000 to 10.7% by 2030.

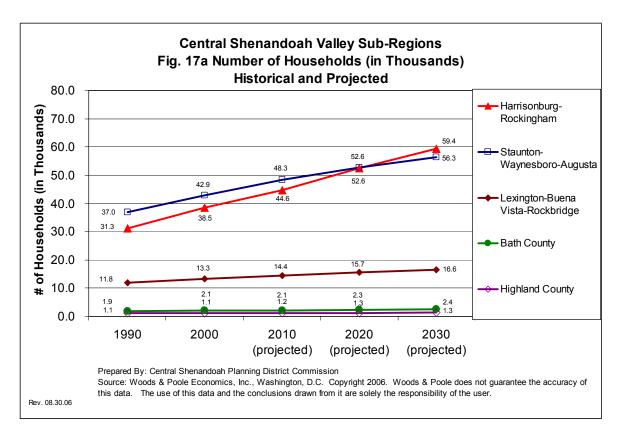


The W&P Wealth Index weights Per Capita Income by Sources of Income, with the national average at 100. Statewide, Virginia is projected to increase its Wealth Index from 106.2 in 2000 to 109.5 by 2030. Comparatively, all of the sub-regions in the CSVR are projected to remain below 100 through 2030. The two largest sub-regions in the Valley, the Harrisonburg-Rockingham MSA and the Staunton-Waynesboro-Augusta Micro Area, are projected to post declines over the period from 2000 to 2030 of 80.4 down to 76.1 and 84.4 down to 81.8, respectively, while the Lexington-Buena Vista-Rockbridge Area is projected to remain stable throughout the period at around 79.0. The highest W&P Wealth Indexes in the Central Shenandoah Valley Region are projected to be in the counties of Bath and Highland, with Bath County increasing from 90.0 in 2000 to 97.2 in 2030 and Highland County increasing slightly from 89.0 to 89.4 for the same period.



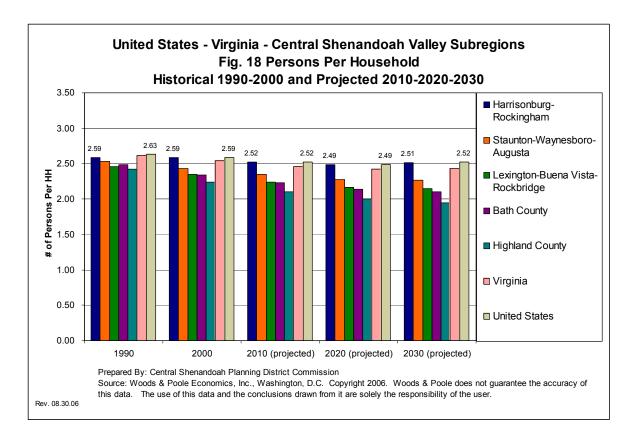
The total number of Households in the Central Shenandoah Valley Region is projected to increase from 97,868 in 2000 to 135,959 by 2030. The projected increase represents 38,091 additional households or an increase of 38.9%.

Comparatively, Households in Virginia are projected to increase by 51.1%. Nationally, a 37.9% increase in the number of households is projected.



Most growth in the number of Households region-wide is projected to be in the Harrisonburg-Rockingham MSA and the Staunton-Waynesboro-Augusta Micro Area. Combined, 34,259 or 89.9% of the 38,091 new Households are projected for these areas.

The Harrisonburg-Rockingham MSA is projected to increase by 20,913 Households from 2000 to 2030, representing an increase of 54.4%. The Staunton-Waynesboro-Augusta Micro Area is projected to increase by 13,346 new Households, or 31.1% over the same period.



In 2000, there were an average of 2.54 Persons Per Household in Virginia as compared to 2.59 Persons Per Household nationally. Regionally, there were 2.59 Persons Per Household in the Harrisonburg-Rockingham MSA and 2.43 in the Staunton-Waynesboro-Augusta Micro Area. Highland County had the lowest number of Persons Per Household with 2.24, while the Lexington-Buena Vista-Rockbridge Area had 2.35 and Bath County had 2.34 Persons Per Household.

By 2030, the average Persons Per Household across Virginia is projected to decrease to 2.43. A decline is also projected nationally with the average Persons Per Household forecast to be 2.52. Comparatively, the Harrisonburg-Rockingham MSA is projected to decrease to 2.51 and the Staunton-Waynesboro-Augusta Micro Area is projected to decrease to 2.27 Persons Per Household. The Lexington-Buena Vista-Rockbridge Area and Bath County are projected to decline to 2.15 and 2.10 Persons Per Household, respectively. Highland County is projected to drop below 2.0 to 1.95 Persons Per Household.

#### Appendix A

#### Sources

The source of both the historical and projection data provided in this publication was the 2006 State Profile: State and County Projections to 2030, Woods & Poole Economics, Inc., Washington, D.C. Copyright 2006. Woods & Poole Economics, Inc. does not guarantee the accuracy of the data. The use of this data and the conclusions drawn from it are solely the responsibility of the user.

Like similar forecasting programs, Woods & Poole Economics, Inc. analyzed historical data and developed projection models to estimate the future data. Most of the historical economic data used for the database was obtained from the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce. Other data sources included the U.S. Census Bureau and, in particular, the 1970, 1980, 1990, and 2000 Censuses, post-Census reports for population and household data, and the quinquennial Census of Retail Trade.

Support information included in Appendices A and B was adapted from *Chapter 2 Technical Description of the Woods & Poole Economics, Inc. 2006 Regional Projections and Database, pages 11-39, 2006 State Profile: publication, State and County Projections to 2030, Woods & Poole Economics, Inc., Washington, D.C. Copyright 2006. The information has been paraphrased to assist the user of this publication, but it is not intended to be a complete or full explanation of the process used to develop the projections or to answer all of the questions readers may have about this publication or the data included in it.* 

#### Please direct all questions or comments to:

Darryl D. Crawford
Senior Planner
Central Shenandoah Planning District Commission
112 MacTanly Place
Staunton, VA 24401
Phone: (540) 885-5174

E-mail: darryl@cspdc.org

#### **Accuracy of the Projections**

Woods & Poole Economics, Inc.'s accuracy rate in making data projections over time is well documented and is roughly comparable to the accuracy rates of other regional forecasting programs of a similar nature. However, it is important to keep in mind that all forecasts and projections are uncertain. Neither the Woods & Poole projections nor any other privately or publicly derived forecast should ever be interpreted as or represented as a perfect prediction of the future. The accuracy of the projections is not guaranteed in any way. Future projections and actual future data may vary significantly from the 2006 State Profile projections.

#### **Limitations of the Projections**

Users of forecast data are cautioned to carefully consider how they use long-term projections and any conclusions they draw from them. There are many limitations associated with projection data. While there is not sufficient space available to list them all here, a number of common limitations that affect the overall accuracy of the projections are listed below.

The primary limitation of all data projection models is that future economic and demographic conditions cannot be known with any degree of certainty. Thus, the base assumptions used in the forecasting models may not accurately reflect future circumstances. Government policies, changes in the economy, natural disasters, armed conflicts, and shifts or changes in technology are but a few of the things that can have major impacts on the accuracy of the projection models. For instance, the United States' move to a more global economy and the impact of foreign competition in the marketplace have resulted in a much different reality than may have been forecast 20 to 25 years ago.

It is also important to note that historical data are often subject to revision, even years later. Historical employment and income data are revised on a regular basis. Data revisions and definitional changes in the data can significantly affect projections issued from one year to the next for the same measure.

Revisions to historical data, the inability of projection models to accurately reflect demographic or economic shifts or changes, inaccurate assumptions about national or regional growth, or even errors in the projection models themselves can all limit the accuracy of the projections. Outcomes far different from the projections presented are very possible.

Additionally, one should recognize that the smooth growth patterns indicated by the trend lines of long-term projections are not an accurate picture of actual growth. They do not reflect important economic or demographic changes (ups and downs) that occur over time.

Another limitation, especially when considering the low overall populations of the region's localities, results from projecting future data for small geographic areas for small data series. Projection models are statistically more reliable the larger the area and/or the series being studied. The small sample size of an area such as Highland County makes projections for that locality subject to much more statistical error than for the Central Shenandoah Valley Region as a whole for instance. The projection model attempted to minimize the errors, but it is not possible to eliminate all of the errors inherent with measuring such a small geography.

Forecast horizon is yet another key limitation. The further one gets away from the base historical data, the less accurate the projections become over time. Thus, the 1-year projection has less error than the 10-year projection, which has more reliability than the 30-year projection.

The type of data measured can also affect the accuracy of the projection over time. For instance, population projections have proven to be the most stable data series over time, while projections for measures such as personal income have been the least accurate. The accuracy of projections, even for the most stable series, can again be affected by small geographies where the amount of error is increased the smaller the geography. The effects of small geographies can be even greater on the less stable data measures.

An often misunderstood limitation is that historical data used in projection models generally runs a few years behind. The 2006 projections are not based upon 2006 data. They are based upon historical data through 2003 (2005 for population). With the exception of population, all projections included in the 2006 model are estimated beginning with 2004, even though they are presented as 2006 projections. Thus, a significant increase in the number of households in the region due to increased construction activity during 2005 would not be reflected in the forecast data until that historical data is makes its way into the data stream. As well, a major plant closing or layoff may have had a large impact on employment in a particular area or industry sector in 2004, but it would not be reflected in the 2006 projections for employment.

Finally, there may be concerns and limitations relating to how the historical public source government data was collected and how it may be used. One may need to consult the actual government sources of the historical data for caveats and explanations on the collection, limitations, and uses of the data.

Information included in Appendix A was adapted from Chapter 2 Technical Description of the Woods & Poole Economics, Inc. 2006 Regional Projections and Database, pages 11-39, 2006 State Profile: publication, State and County Projections to 2030, Woods & Poole Economics, Inc., Washington, D.C. Copyright 2006.

#### Appendix B

#### How were the measures defined in the database?

#### **Population**

Population was defined in the database as July 1 residential population and included:

- Civilian population
- Military population except personnel stationed overseas
- College residents
- Institutional populations, such as prison inmates and residents of mental institutions, nursing homes, and hospitals
- Estimates of undocumented aliens

Excluded from the population figures were persons residing in Puerto Rico, U.S. territories and possessions, and U.S. citizens living abroad.

Historical census population was used for the years 1969 to 2005 and the years from 2006 to 2030 were estimated.

#### **Employment**

Employment was measured using the number of full- and part-time jobs by place of work. Jobs were counted by place of work and not place of residence of the worker.

Included in the employment data were:

- Wage and salary workers
- Proprietors
- Private household employees
- Miscellaneous workers

Historical data was used for the years 1969 to 2003 and the years from 2004 to 2030 were estimated.

#### **Earnings**

Earnings were defined in the database as "the sum of wages and salaries, other labor income, and proprietors' income." The earnings figures included employees' personal contributions for social insurance, but did not include residence adjustments. It is important to remember that earnings data relates to workers' compensation and should not be used as a measure of sector or company earnings or profits.

Historical data was used for the years 1969 to 2003 and 2004 to 2030 was estimated.

#### **Woods & Poole Wealth Index**

Woods & Poole Economics, Inc. has developed a measure of wealth that enables regional areas to compare themselves to where they stand in relation to the national average. The measure is referred to as the Woods & Poole Wealth Index. The Index takes relative total personal income per capita and weights it by the sources of income.

The W&P Wealth Index was derived in the following manner:

- 80% of the index = Weighted average of regional income per capita divided by U.S. income per capita
  - + (plus)
- 10% of the index = Regional proportion of income from dividends/interest/rent divided by the U.S. proportion
  - + (plus)
- 10% of the index = U.S. proportion of income from transfers divided by the regional proportion

The relative income per capita for a region was weighted positively if there was a relatively high proportion of income from dividends, interest, and rent. Conversely, the relative income per capita was weighted negatively if there was a relatively high proportion of income from transfer payments.

#### Households

Households were defined as "occupied housing units." Under this definition, a housing unit was considered a house, an apartment, a group of rooms, or a single room occupied as separate living quarters.

Single families, persons living alone, two or more families living together, and groups of related or unrelated persons who shared living quarters were considered as occupants of housing units. All people were considered to be part of a household, except those who resided in group quarters. Group quarters included living arrangements such as prisons, homes for the aged, rooming houses, college dormitories, and military barracks.

The database defined the average size of households (Persons Per Household) as "the total population less any group quarters population divided by the number of households."

Census Bureau counts for 1970, 1980, 1990, and 2000 and Census Bureau estimates for 1985 were used to determine the number of households. Household data included in the database between the decennial censuses were estimates, while household data for the U.S. and states, 1969 to 2000, were based on reported historical data.

#### **Employment Sectors**

Employment and wage data was classified in the database under particular SIC industry categories or sectors depending on the primary activities of the establishments. If the establishments were engaged in activities in different sectors, all employees were classified according to the primary activities of the establishments regardless of their actual occupations. An exception to the rule was the Government Sector. All government employees were classified by Federal civilian, Federal military, or state and local government employment, regardless of the classification of the establishments where they worked.

#### 1987 Standard Industrial Classifications

The employment and wage data were shown in the database by one-digit SIC industry classifications (as defined in the 1987 Standard Industrial Classification Manual). The projections were not based on either the 1997 or 2002 North American Industry Classification System (NAICS) definitions. The SIC industry data for 2001-2003 was estimated using the BEA's NAICS data from 2001-2003 and historical SIC employment industry data for the years 1969-2000.

#### Sectors used in this document

For purposes of this document and to make graphing the data easier, some of the SIC categories used in the database were combined. Other sector titles were abbreviated.

The following employment categories or sectors were used in this document:

- Farm, Ag Services, Other
- Mining
- Construction
- Manufacturing
- Transport, Comm. & Public Util.
- Trade (Wholesale-Retail)
- Finance, Ins. & Real Estate
- Services
- Government

#### What was included under each employment category or sector?

#### Farm, Ag Services, Other

#### Farming

Farming included all establishments primarily engaged in the production of crops, plants, vines, trees (excluding forestry operations), and specialties such as sod, bulbs, and flower seed. It also included establishments primarily engaged in the keeping, grazing, or feeding of cattle, hogs, sheep, goats, poultry of all kinds, and special animals such as horses, bees, pets, and fish in captivity.

Examples of farming establishments included, but were not limited to:

- Farms
- Orchards
- Greenhouses
- Nurseries
- Ranches
- Dairies
- Feedlots
- Egg production facilities
- Poultry hatcheries

#### Agricultural services, forestry, fisheries, and other

- Agricultural services included establishments primarily engaged in performing soil preparation, crop services, veterinary services, farm labor and management, and horticultural services.
- Forestry included establishments engaged in the operation of timber tracts, tree farms, forest nurseries, and related activities such as reforestation.
- Fisheries included commercial fishing (including shellfish) and commercial hunting and trapping.
- Other included the jobs of U.S. residents working for international organizations, foreign embassies, and consulates in the U.S.

#### Mining

Mining included establishments primarily engaged in the extraction, exploration, and development of coal, oil, natural gas, metallic minerals (such as iron and copper), and nonmetallic minerals (such as stone and sand).

Mining did not include refining, crushing, or otherwise preparing mining products; those activities were classified as manufacturing.

#### Construction

Construction included establishments engaged in building new structures and roads, alterations, additions, reconstruction, installations, and repairs.

Examples of construction establishments included, but were not limited to:

- General contractors engaged in building residential and nonresidential structures
- Contractors engaged in heavy construction, such as bridges, roads, tunnels, and pipelines
- Special trade contracting, such as plumbing, electrical work, masonry, and carpentry
- Installation of prefabricated building materials

Employment was counted at the fixed place of business where establishment-type records were maintained and not at the job site.

Establishments engaged in managing construction projects were classified under services.

Establishments engaged in the selling and installation of construction materials were generally classified under trade, except for materials such as installed elevators and sprinkler systems.

#### Manufacturing

Manufacturing included establishments engaged in the mechanical or chemical transformation of materials or substances into new products including establishments engaged in assembling component parts not associated with structures and those engaged in blending materials, such as lubricating oils or liquor.

Examples of manufacturing establishments included, but were not limited to:

- Food processing, such as canning, baking, meat processing, and beverages
- Tobacco products
- Textile mill products, such as fabric, carpets and rugs
- Apparel
- Wood products, including logging, sawmills, prefabricated homes, and mobile homes
- Furniture
- Paper
- Printing and publishing
- Chemicals, such as plastics, paints, and drugs
- Petroleum refining
- Rubber and plastics
- Leather products
- Stone, clay, and glass
- Primary metals, such as steel, copper, aluminum, and including finished products such as wire, beams, and pipe
- Fabricated metals, such as cans, sheet metal, cutlery, and ordnance
- Industrial machinery, including computers, office equipment, and engines
- Electronics and electrical equipment
- Transportation equipment, such as cars, trucks, ships, and airplanes
- Instruments
- Miscellaneous industries, such as jewelry, musical instruments, and toys

#### Transportation, Communications, and Public Utilities

#### **Transportation**

Transportation included establishments that provided, to the general public or to other business enterprises, passenger and freight transportation, communications services, electricity, gas, steam, water, or sanitation services, and the Postal Service.

Examples of transportation establishments included, but were not limited to:

- Railroads
- Highway passenger transportation
- Trucking and warehousing
- Shipping
- Air transportation
- Pipelines
- Transportation services such as travel agencies and tours.

#### Communications

Communications establishments included point-to-point telephone and telegraph services, radio, television, and cable broadcasting.

#### **Public Utilities**

Examples of public utilities establishments included, but were not limited to:

- Sanitary services
- Water supply
- Trash removal

#### **Trade**

#### Wholesale trade

Wholesale trade included establishments primarily engaged in selling merchandise to retailers; or to industrial, commercial, institutional, farm, construction contractors; or to professional business users; or to other wholesalers or brokers. The merchandise sold by wholesalers included all goods used by institutions, such as schools and hospitals, as well as virtually all goods sold at the retail level.

The three main types of wholesalers included were:

- Merchant wholesalers who purchased goods from manufacturers or other wholesalers and sold them
- Sales branches of manufacturing, mining, or farm companies engaged in marketing the products of the company to retail establishments
- Agents, merchandise or commodity brokers, and commission merchants

#### Retail trade

Retail trade included establishments that were engaged in selling merchandise for personal or household consumption and rendering services incidental to the sale of goods.

Buying goods for resale to the consumer was a characteristic of retail trade establishments that distinguished them from agricultural and extractive industries: farmers who sold only their own produce at or from the point of production were not classified as retailers.

Examples of retail trade establishments included, but were not limited to:

- Hardware stores
- Garden supply stores
- Mobile home dealers
- Department stores
- Food stores, including supermarkets, convenience stores, butchers, bakeries, and fruit stands
- Automobile dealers
- Gasoline service stations
- Apparel and accessory stores

- Furniture and home furnishing stores, including electronics and home appliances
- Eating and drinking places, including restaurants, bars, and takeout stands
- Miscellaneous establishments, including drug stores, liquor stores, thrift shops, bookstores, florists, mail-order houses, and pet stores.

#### Finance, Insurance, and Real Estate

Examples of finance, insurance, and real estate establishments included, but were not limited to:

- Depository institutions, such as commercial banks, savings and loans, and foreign banks
- Credit institutions
- Holding companies not engaged in operation
- Investment companies
- Brokers and dealers in securities and commodity contracts
- Security and commodity exchanges
- Carriers of all types of insurance
- Insurance agents and insurance brokers
- Real estate operators including operators of nonresidential facilities, apartments, other residential properties, mobile home parks, and railroad properties
- Real estate agents and managers
- Title offices
- Developers not engaged in construction

#### Services

Services included establishments that were primarily engaged in providing services for individuals, businesses, governments, and other organizations.

Examples of service establishments included, but were not limited to:

- Hotels and other lodging places
- Personal services, such as laundries, dry cleaners, barber shops, shoe repair, and funeral homes
- Business services, such as advertising, employment agencies, office equipment repair, computer and data processing, credit reporting and collecting
- Automobile repair and automobile services, including car washes and car
- Rental

- Motion pictures, including video rentals
- Entertainment, including theaters, casinos, amusement parks, and professional sports
- Health services, such as hospitals, clinics, nursing homes, and
- Dentists
- Legal services
- Education services, such as private elementary and secondary schools, colleges, junior colleges, universities, and vocational schools
- Social services provided in privately owned establishments
- Private museums and zoos
- Membership organizations, including churches, labor unions, professional
- membership organizations, and political organizations
- Professional services, such as engineering, architecture, accounting, research services, and public relations
- Private household employment, such as full-time baby-sitters, housekeepers, and butlers employed by a household on the premises

#### Government

Government included federal civilian, federal military, and state and local government employees.

#### Federal civilian

Federal civilian included all federal government workers regardless of their establishment classification.

Examples of federal civilian establishments included, but were not limited to:

- Executive offices and legislative bodies
- Courts
- Public order and safety
- Correctional institutions
- Taxation
- Administration and delivery of human resource programs, such as health, education, and public assistance services
- Housing and urban development programs
- Environmental programs
- Regulators, including air traffic controllers and public service commissions
- Other Federal government agencies

#### Federal military

Federal military establishments included the Air Force, Army, Marine Corps, National Guard, and Navy.

- Woods & Poole counted only personnel stationed in Alaska, Hawaii, and the continental U.S. towards employment and earnings.
- Civilians working on a military base were classified in the sector appropriate to their occupation.

#### State and local government

State and local government employees were similar to the federal civilian employees except that the activities they were engaged in were run by state and local governments.

Examples of state government establishments included, but were not limited to:

Public junior colleges, colleges, and universities

Examples of local government establishments included, but were not limited to:

- Public schools
- Police and fire departments

Information included in Appendix B was adapted from Chapter 2 Technical Description of the Woods & Poole Economics, Inc. 2006 Regional Projections and Database, pages 11-39, 2006 State Profile: publication, State and County Projections to 2030, Woods & Poole Economics, Inc., Washington, D.C. Copyright 2006.