An Introduction to Virginia Issues: Information and Analysis

Special Report for

Virginia Cooperative Extension

Jim Pease

Wayne Purcell

George McDowell

Pamela Gibson

Karen Mundy

Rural Economic Analysis Program

Department of Agricultural and Applied Economics

Special Report

April 2005

James Pease is Associate Professor,
Wayne Purcell is Alumni Distinguished Professor,
George McDowell is Professor (retired),
Pamela Gibson is Research Associate, and
Karen Mundy is Rural Economics Analysis Program Communications Coordinator,
Department of Agricultural Economics.

Table of Contents

Preface i
Demographics 1
Economics 18
Agriculture 29
Environment 45
Local Government 49
Education 55
Child, Youth, and Families 61
Health 70
Infrastructure 84

Preface

The principal objective of this report is to begin an examination of macro issues that affect individuals, families, communities, and local governments in Virginia. Our purpose is to provide data, implications, and analysis of issues that Virginia Cooperative Extension should consider in development and delivery of educational programs to residents of the six extension districts. As new data and resources become available, the analysis may be updated and expanded.

The report is organized by major socio-economic factors, such as demographics, economy, or infrastructure. This format was chosen rather than extension district-by-extension district profiles because we are better able to compare and contrast the situation and analysis across regions of Virginia. Comparisons across extension districts in this report will describe a consistent story—the social and economic characteristics and educational needs of residents in urbanizing counties/cities of the northern and eastern regions of Virginia are diverging at an increasing rate from those of the more rural regions. Communities in rural areas are overwhelmingly concerned with generating more economic development, while those in urban areas are concerned with managing the impacts of extremely rapid economic development. Virginia Cooperative Extension should consider how its programs will be developed and delivered to the "two Virginias." This report provides a foundation for such consideration.

Demographics

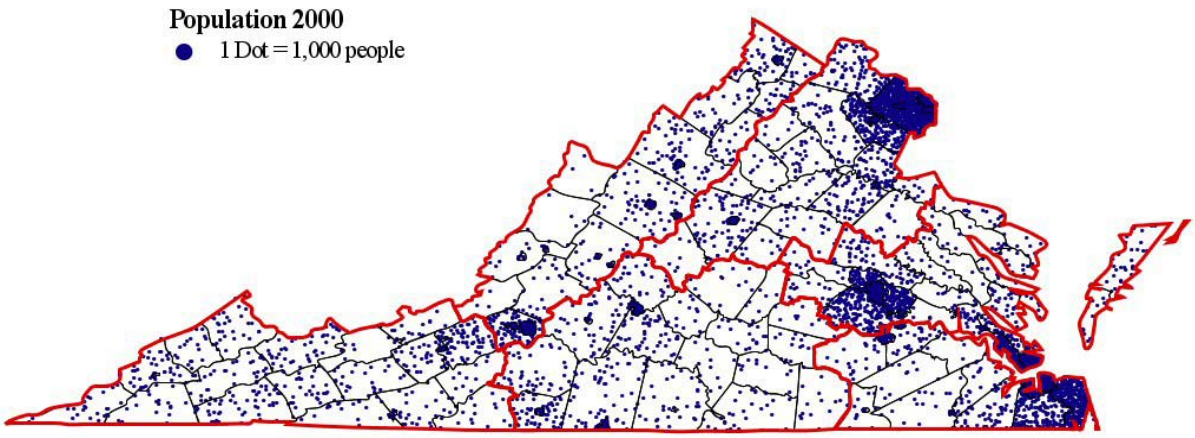
Population Growth as Force of Change

Developments in the size and composition of the population have major implications for a wide range of social, environmental, governmental, and economic issues. Demographic changes are driving the transformation of Virginia society. Analyzing the impacts of these changes is imperative.

Virginia Population Centers

The United States population increased by 13.2 percent, or 32.7 million individuals from 1990 to 2000. Among comparable states, Virginia ranked third in rate of population increase behind North Carolina and Tennessee. Virginia's population increased by 14.4 percent or by 891,000 individuals, mostly around the three urbanized regions of Washington, D.C., Richmond City, and Hampton Roads/Virginia Beach (Figure 1). Even with other densely populated small urban centers (such as the Roanoke-Salem metro area and others), the population "weights" in Virginia illustrate the further development of two Virginias—the densely populated crescent curving from Arlington through Richmond to Virginia Beach, and the more sparsely populated, more rural localities both east and west of the crescent.

Figure 1. Virginia population, 2000



Source: U.S. Bureau of the Census, 2000 Census of Population and Housing, Census File STF-1. Online at *http://www.census.gov*. Last accessed 4 Mar. 05.

Age Distribution of the Population

For purposes of this document, population data from the 2000 Census of Population and Housing for the U.S. and states are grouped by age as youth—under 18; working age—18 to 64; and retired—65 and over. The distribution across age groups in 2000 was similar for all states and the U.S. except Pennsylvania (Table 1). Pennsylvania had a lower working age group and a higher retired group than the average.

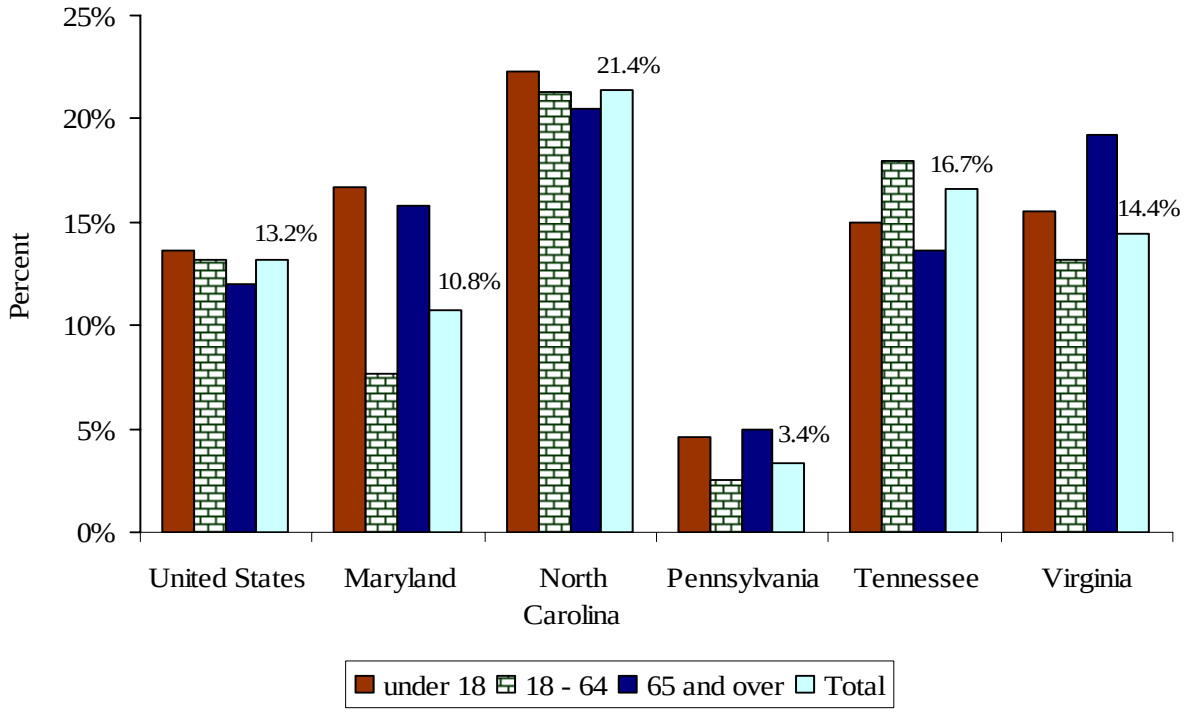
Table 1. Population in U.S. and comparable states, 2000 (percent)

	Under 18 years	18-64 years	65 years and over	Total
	----------million----------			
United States	72.3	174.1	35.0	281.4
	(25.7)	(61.9)	(12.4)	
Maryland	1.4	3.3	0.6	5.3
	(26.4)	(62.3)	(11.3)	
North Carolina	2.0	5.1	1.0	8.1
	(24.7)	(63.0)	(12.3)	
Pennsylvania	2.9	7.4	1.9	12.3
	(23.6)	(60.2)	(15.4)	
Tennessee	1.4	3.6	0.7	5.7
	(24.6)	(63.2)	(12.3)	
Virginia	1.7	4.5	0.8	7.1
	(24.6)	(64.2)	(11.2)	

Source: U.S. Bureau of the Census, 2000 Census of Population and Housing, STF-1. Online at *http://www.census.gov.* Last accessed 4 Mar. 05

Among U.S. age cohorts, the youth cohort grew slightly faster than the working or retirement age cohorts from 1990 to 2000 (Figure 2). However, growth rates do not tell the whole story. The U.S. youth population in 2000 had 8.7 million more individuals than in 1990, indicating many more children requiring placement in daycare and schools, health care and other services related to childcare, and preparation for the work force. The U.S. working age group in 2000 had 20.3 million more individuals, indicating the need for a growing number of jobs as well as social services. And the retirement age group had 3.8 million more individuals, indicating the growing need for recreation, health care, and a host of other services for the elderly. Estimates for 2010 show another 11.6 million individuals will be added to the retirement population, as “baby boomer” retirements increase the relative proportion of this age cohort.

Figure 1. Population change by age cohort, 1990 – 2000



Source: US Census Bureau, Census of Population, 1990 and 2000. Online at *http://www.census.gov*. Last accessed 5 Mar. 05.

The Virginia youth cohort increased at a more rapid rate (15.5 percent) than the U.S. average or all comparable states except North Carolina. The Virginia working age cohort grew at a rate equal to the U.S. average, well behind rates in North Carolina and Tennessee, but well ahead of rates in Maryland and Pennsylvania. The retirement cohort grew sharply in Virginia from 1990 to 2000, at a rate much ahead of the U.S. and second among comparable states only to North Carolina. Disparities in growth rates among the age cohorts groups are likely to put pressure on services for the young and old. Compared to 1990, relatively fewer Virginians of working age are available to support needed services for the growing youth and retirement populations.

Population by Extension District

More than one-third of all Virginians lived in the Northern District in 2000. More than one-half of the population lived in the Northern and Northeastern Districts. At the other extreme, Central, Northwest, and Southwest Districts each have fewer than one million residents, and the sum of their population falls well short of the 2.4 million population in Northern District.

Approximately one-third of the state's youth age cohort, one-third of its working age cohort, and one-fourth of its retirement age cohort live in the Northern Extension District (Table 2). In general, the distribution of population across age groups is not substantially different from one extension district to another. Approximately one-fourth of the population in each extension district is under the age of 18. This observation is most directly contradicted in Southwest District, where the under-18 group is only 21 percent of the extension district's total population. The job-rich Northern Extension District and the job-poor Southwest Extension District share the same characteristic of a slightly larger-than-normal proportion of the working age cohort. This characteristic may be attributed to differing causes—in

Northern Extension District, the working age may be too busy to have families; and in the Southwest Extension District, young families with their children may leave in search of jobs. Approximately one Virginian in nine is of the retirement- age cohort. Central, Northwest, and Southwest Extension Districts share the same characteristic of somewhat higher retirement-age population. Probably because of the high cost of social services, these districts will face a larger challenge in providing services to these elderly.

Table 2. Virginia population by extension district and age cohort, 2000

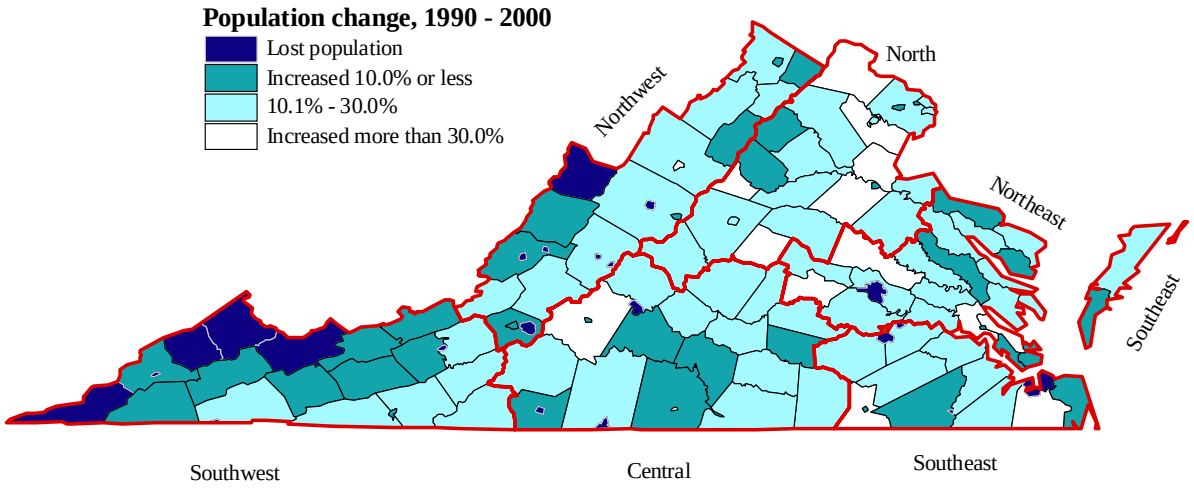
	Under 18	18-65	65 and over	Total
	----------Number (%) of district total----------			
Central	147,359 (23%)	397,516 (62%)	99,786 (15%)	644,661 (9%)
Northern	604,261 (25%)	1,589,290 (66%)	197,123 (8%)	2,390,674 (34%)
Northeast	365,438 (25%)	919,896 (63%)	168,194 (12%)	1,453,528 (21%)
Northwest	160,809 (23%)	444,085 (63%)	103,718 (15%)	708,612 (10%)
Southeast	340,257 (26%)	817,479 (63%)	139,433 (11%)	1,297,169 (18%)
Southwest	120,138 (21%)	379,654 (65%)	84,079 (14%)	583,871 (8%)
Virginia	1,738,262 (25%)	4,547,920 (64%)	792,333 (11%)	7,078,515

Source U.S. Bureau of the Census, 2000 Census of Population and Housing, Census File STF-1. Online at *http://www.census.gov*. Last accessed 4 Mar. 05.

Population Growth by Extension District

Population growth of age cohorts and of total population within extension districts varies considerably from the statewide pattern (Figure 3). The most important phenomenon is extremely rapid growth in the cities and counties around Washington, D.C. Population in the Northern Extension District grew by 473,000 (24.7 percent) between 1990 and 2000, much faster than any other district. Population growth in Northern Extension District was 53 percent of total Virginia growth for the decade. This population increase cannot be over-emphasized: population growth in the Northern Extension District from 1990 to 2000 was more than twice the population growth of Central, Northwest, Southeast, and Southwest Extension Districts combined. This population dynamic is quickly changing Virginia politics, economy, and society.

Figure 3. Virginia population growth, 1990 – 2000.



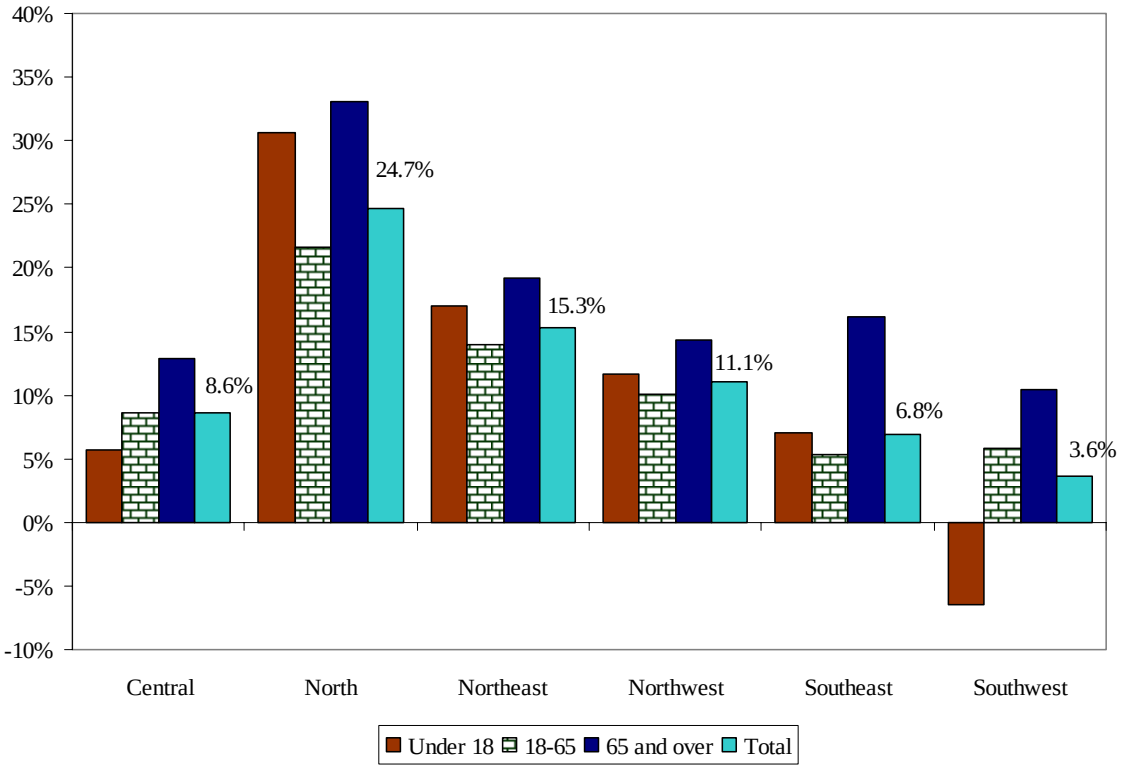
Source: US Census Bureau, Census of Population, 1990 and 2000. Online at *http://www.census.gov*. Last accessed 5 Mar. 05

Northeast Extension District also saw population growth greater than the state average, primarily in the counties surrounding Richmond City, which lost population to these outlying counties. Central and Southwest Extension Districts experienced the slowest population growth from 1990 to 2000, gaining only 51,000 and 20,000 residents, respectively.

Population growth among age cohorts in all extension districts is dominated by faster growth among the retirement population than other age groups. The population of retirement-age citizens increased by 33 percent in Northern Extension District, and this retiree population growth was more than one-third of state growth of the over-65 population (Figure 4). Slower growth in other extension districts masks the impacts, because such districts as Southwest, Central, and Northwest already had a relatively larger proportion of retirement age populations in 1990.

Another noteworthy indicator is the 6.5 percent *decline* in Southwest Extension District population under 18 years old the only decline in population of any age cohort in any extension district. Without further examination, determining the reason is not possible, but it may well be true that young families have left the counties/cities of the extension district in search of better jobs and quality of life for their offspring. Alternatively, couples may be choosing to restrict family size due to the lack of economic growth.

Figure 4. Population growth by age cohorts and extension district, 1990 – 2000



Source: US Census Bureau, Census of Population, 1990 and 2000. Online at *http://www.census.gov*. Last accessed 5 Mar. 05

Social and economic stresses of population change are likely in both the localities experiencing very rapid growth, mostly in the Interstate 95 corridor, and those experiencing slow growth or population declines, mostly in southwestern Virginia.

Population Projections

The Virginia Employment Commission predicts that Virginia population will reach 9.275 million by 2030, an increase of 24 percent over the last Census. The annual state population growth rate from 2010 to 2030 is predicted to be 0.9 percent (Table 3). Annual population growth from 2010 to 2030 is predicted to be 1.4 percent in the Northern Extension District and will have increased from 34 percent to 40 percent of state population by 2030. Central and Southwest Extension Districts are predicted to have a slightly smaller proportion of state population than in 2000. If the projections prove correct, Central Extension District will see a dramatic increase (from 15 percent to 27 percent) in the proportion of its population in the retirement cohort, as its population ages with only slight changes in its youth and working age cohorts. The growth rate of the retirement cohort is far above that of other age groups in every district, with Northeast Extension District growing at a rate of 5.3 percent. By 2030, the retirement age population will make up more than one in five people in all districts except Northern and Southeastern Extension Districts.

Table 3. Projected annual population growth rate, 2010-2030

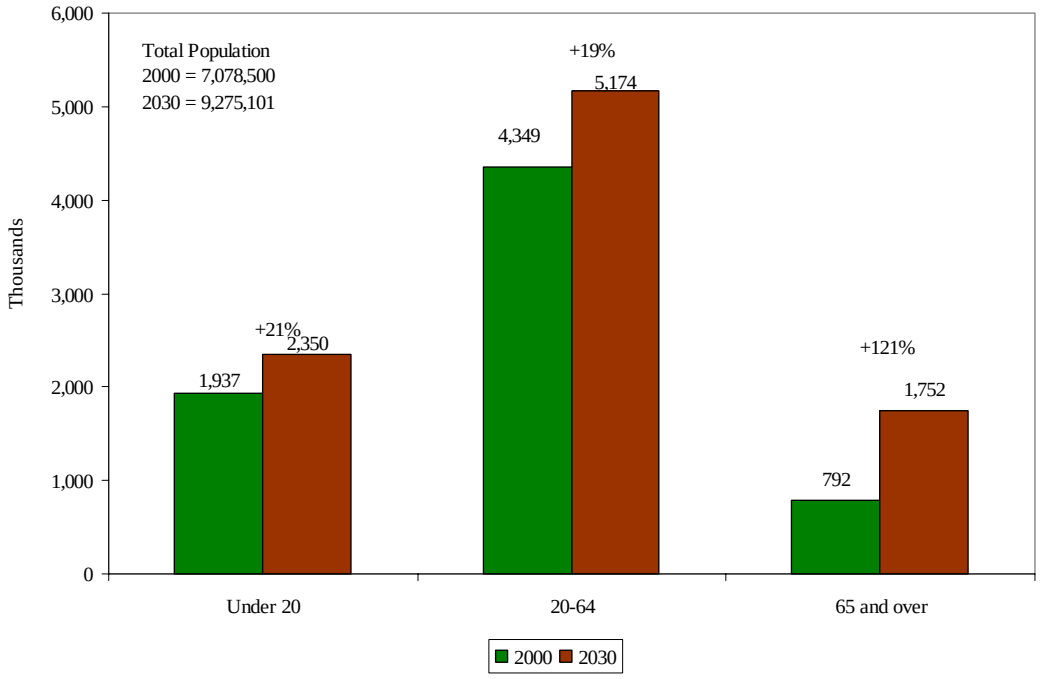
	Under 20 years[1]	20-64 years	65 years and over	All Ages
	----------Percent----------			
Central	0.5	-0.5	3.0	0.4
Northern	1.3	1.0	3.9	1.4
Northeast	0.7	0.1	5.3	0.9
Northwest	0.9	-0.1	3.0	0.6
Southeast	0.3	0.1	2.8	0.4
Southwest	0.3	-0.4	2.2	0.2
Virginia	0.8	0.3	3.6	0.9

Source: VEC Population Projections. PSA data compiled by VDA from Final Population Projections prepared by VEC, 5/2003. Online at *http://www.aging.state.va.us/download%20vecfinalloc.htm.* Last accessed 7 Mar. 05.

The impact of the projected population change in Virginia is perhaps most clearly seen by comparing the 2000 population with the projected 2030 population by age group. The youth and working age groups increase by 19 and 21 percent, respectively (Figure 5). The retirement group population is expected to skyrocket by 121 percent, comprising 45 percent of the 2000 to 2030 increase in the Virginia population.

[1] Data limitations of the VEC population projections required slightly different definitions of the youth, working age, and retirement groups for this section.

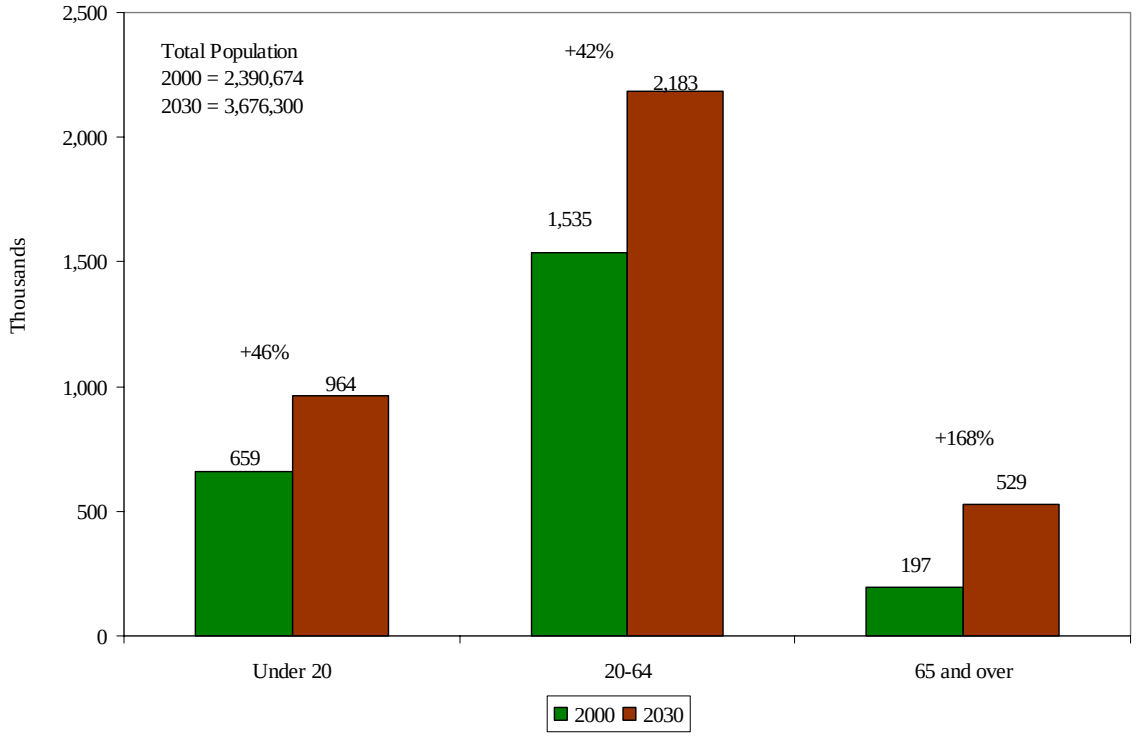
Figure 5. Virginia population projections by age group, 2000 and 2030



Source: Virginia Dept. of Aging. Online at *http://www.aging.state.va.us.* Last accessed 6 Apr. 05

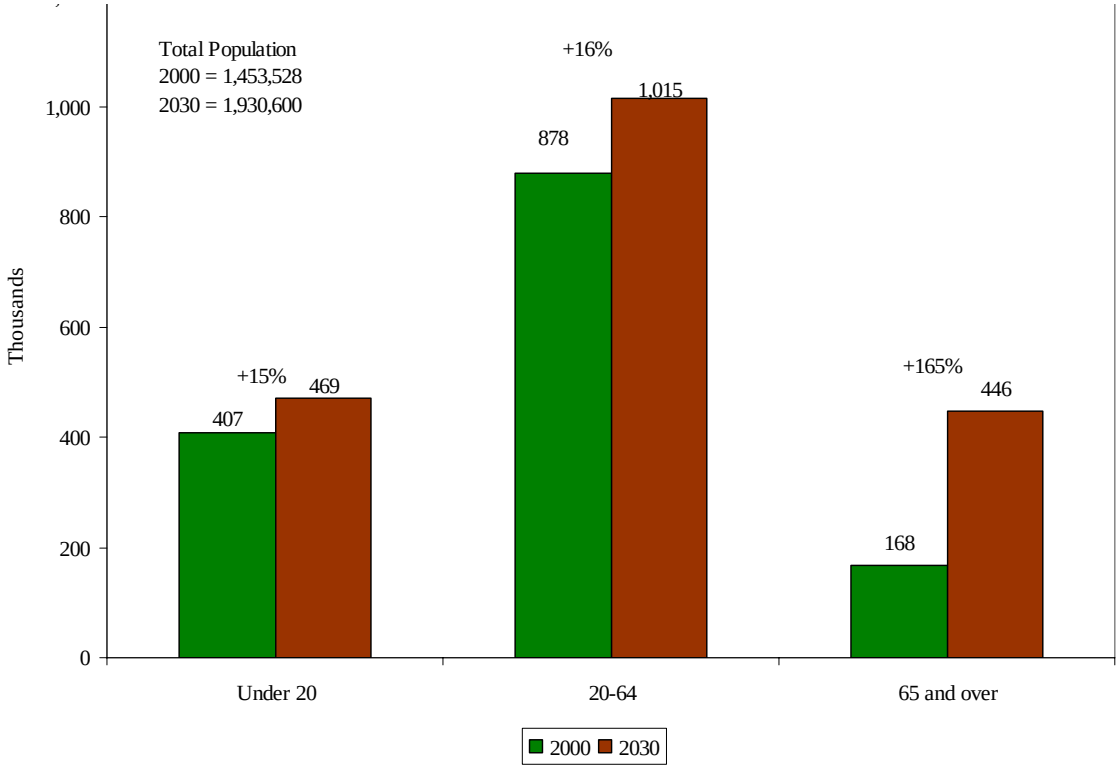
The Northern and Northeastern Extension Districts show the largest projected growth in the 65 and over age group: 168 and 165 percent, respectively (figures 6 and 7). At the other end of the spectrum is the Southwest Extension District which is projected to have only a 61 percent increase in the 65 and over age group and decreases in the other age groups (Figure 8). The Central Extension District is estimated to show no change in the under 20 age group and a loss in the 20 to 64 age group (Figure 9). The Northwest and Southeast Extension Districts are projected to have increases across all age groups (figures 10 and 11).

Figure 6. Northern Extension District population projections by age group, 2000 and 2030



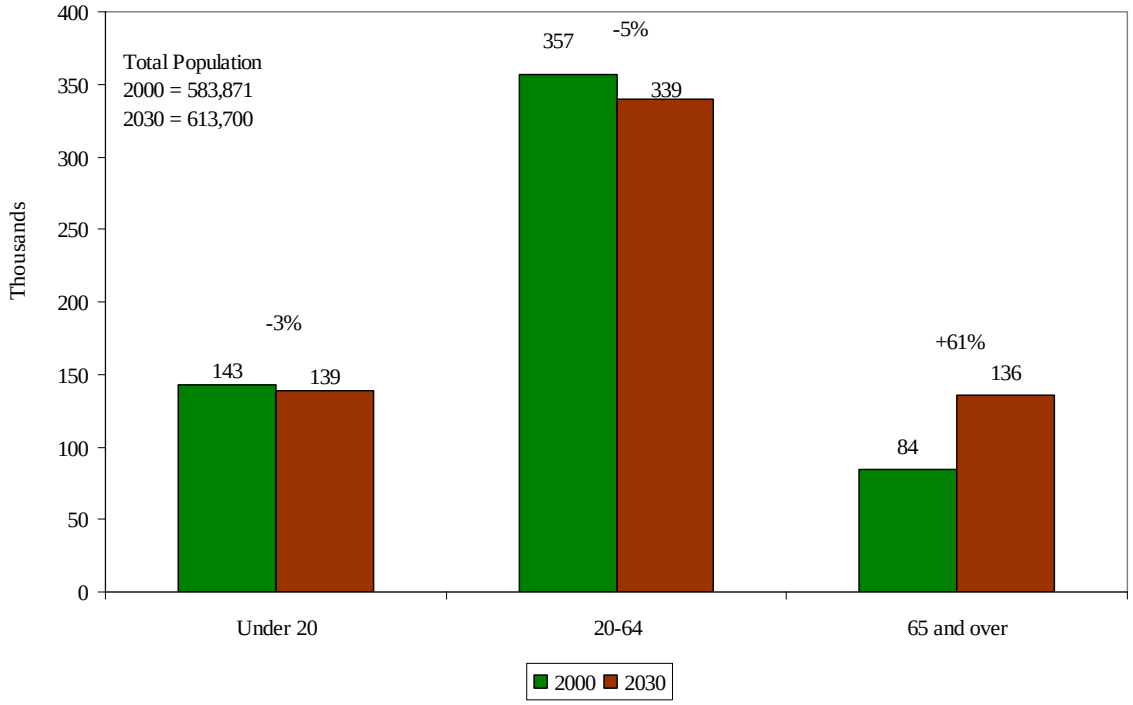
Source: Virginia Dept. of Aging. Online at *http://www.aging.state.va.us.* Last accessed 6 Apr. 05

Figure 7. Northeast Extension District population projections by age group, 2000 and 2030



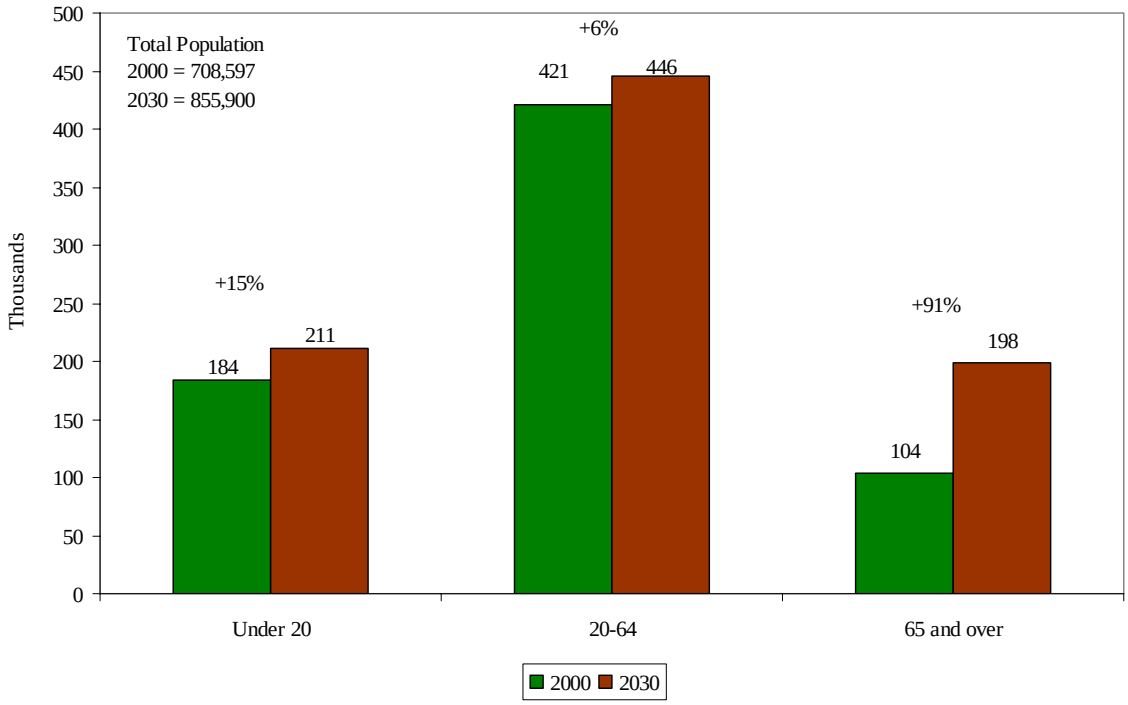
Source: Virginia Dept. of Aging. Online at *http://www.aging.state.va.us.* Last accessed 6 Apr. 05

Figure 8. Southwest Extension District population projections by age group, 2000 and 2030



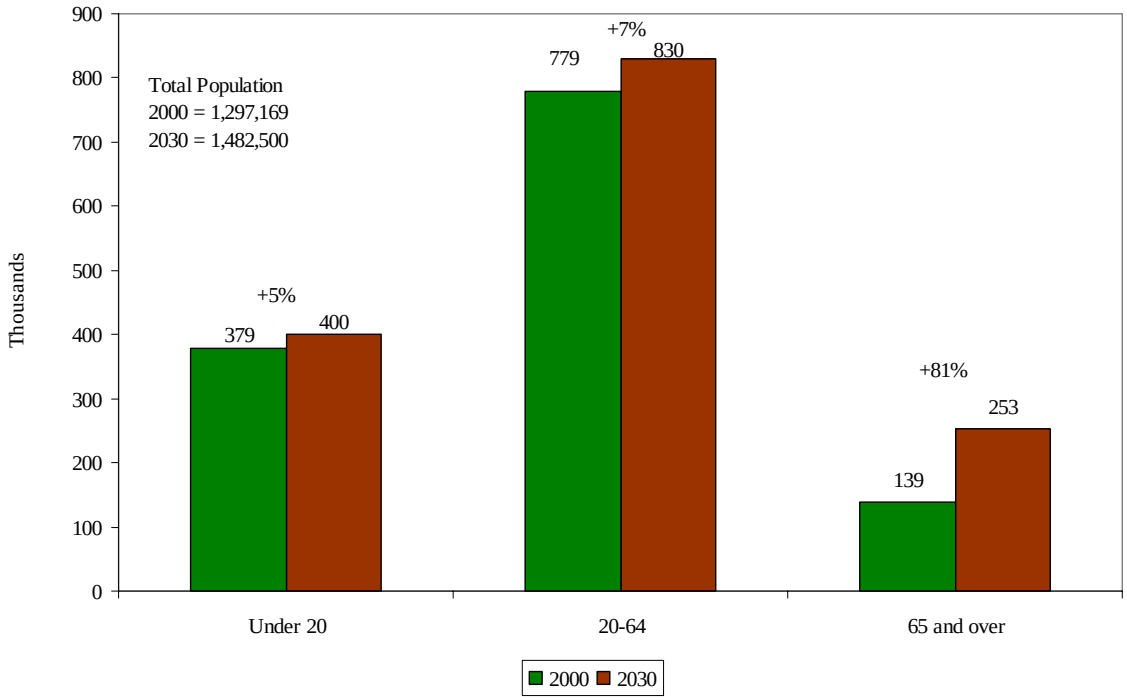
Source: Virginia Dept. of Aging. Online at *http://www.aging.state.va.us.* Last accessed 6 Apr. 05

Figure 9. Northwest Extension District population projections by age group, 2000 and 2030



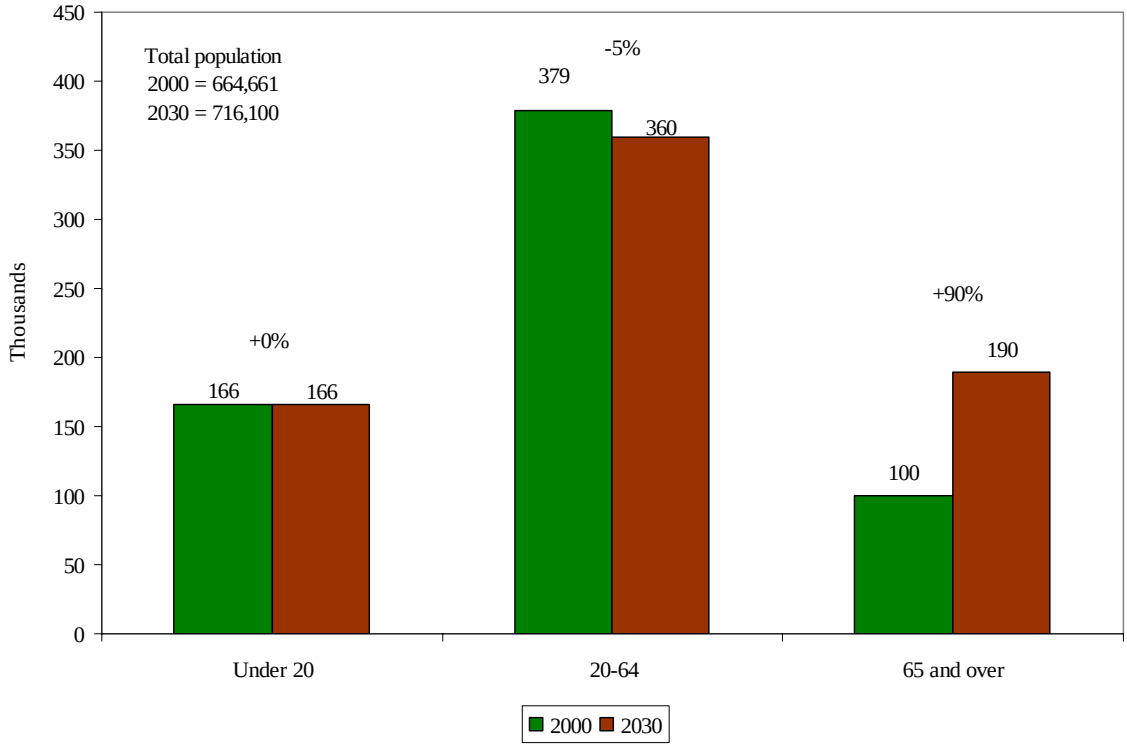
Source: Virginia Dept. of Aging. Online at *http://www.aging.state.va.us.* Last accessed 6 Apr. 05

Figure 10. Southeast Extension District population projections by age group, 2000 and 2030



Source: Virginia Dept. of Aging. Online at *http://www.aging.state.va.us.* Last accessed 6 Apr. 05

Figure 11. Central Extension District population projections by age group, 2000 and 2030



Source: Virginia Dept. of Aging. Online at *http://www.aging.state.va.us.* Last accessed 6 Apr. 05

Other demographic issues that may affect Extension programs include:

- Composition of households with children
- Ethnic characteristics
- Ability to speak English

Composition of Households with Children

Among U.S. households with children under 18 years, the 2000 Census reveals that the traditional married-couple family makes up slightly more than two-thirds of such households (Table 4). The proportion of such households in Virginia is close to 75 percent. Across the U.S. and comparable states, approximately one household in five with children under 18 is headed solely by a female householder with no husband present. The proportion of such female-headed households varies little across comparable states. Approximately one household in twenty with children is headed solely by a male householder with no wife present, reflecting a significant demographic change over time. Male or female single heads of household bear a tremendous responsibility for childrearing that is traditionally shared by married couples.

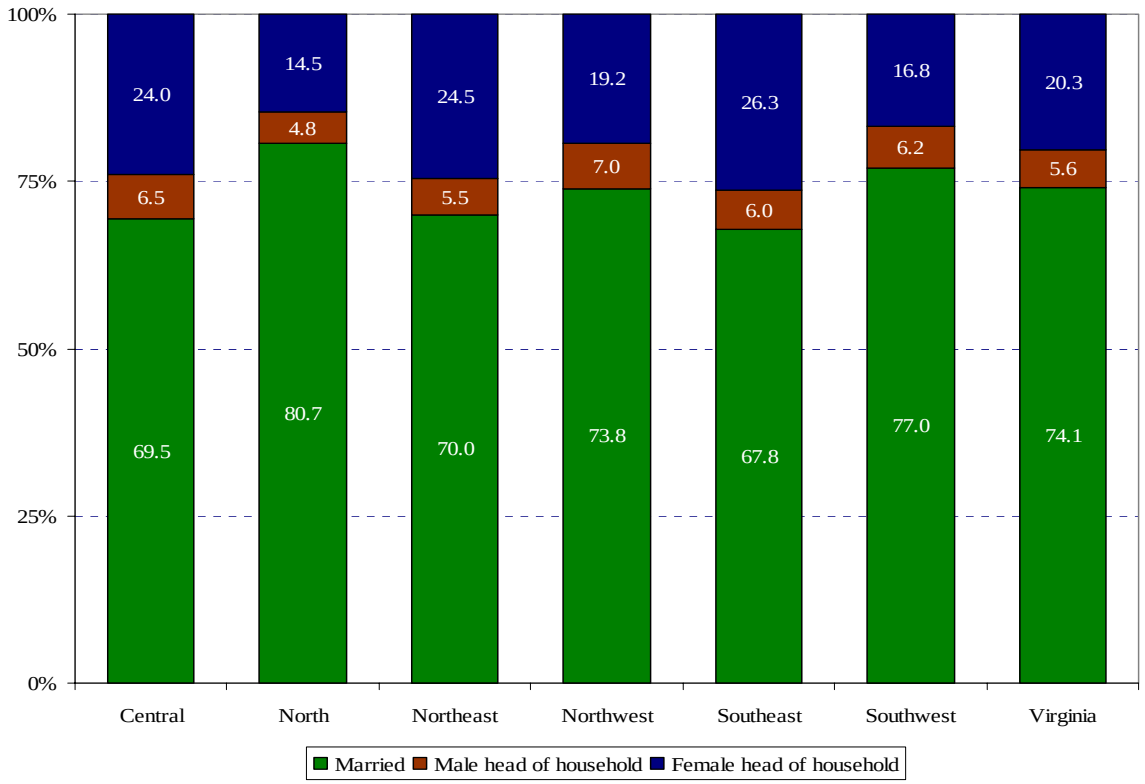
Table 4. Heads of household with children under 18, 2000

	Married-couple family	Female householder, no husband present	Male householder, no wife present
		--Percent --	
United States	72.9	20.9	6.2
Maryland	70.8	23.1	6.1
North Carolina	72.0	22.1	6.0
Pennsylvania	73.9	20.0	6.1
Tennessee	71.6	22.7	5.7
Virginia	74.1	20.3	5.6

Source: US Census Bureau. P15. Family type by presence of own children under 18 years by age of own children Summary File 3. Online at *http://www.census.gov/*. Last accessed 7 Mar. 05.

In Virginia, the proportion of married-couple households with children under 18 decreased from 79.5 percent in 1990 to 74.1 percent in 2000. The relative proportion of single-head households with children has increased from 20.5 percent to 25.9 percent in 2000. In Southeast Extension District, nearly one-third of households with children under 18 are headed by single parents (Figure 5). In contrast, less than 20 percent are single-head households in Northern Extension District.

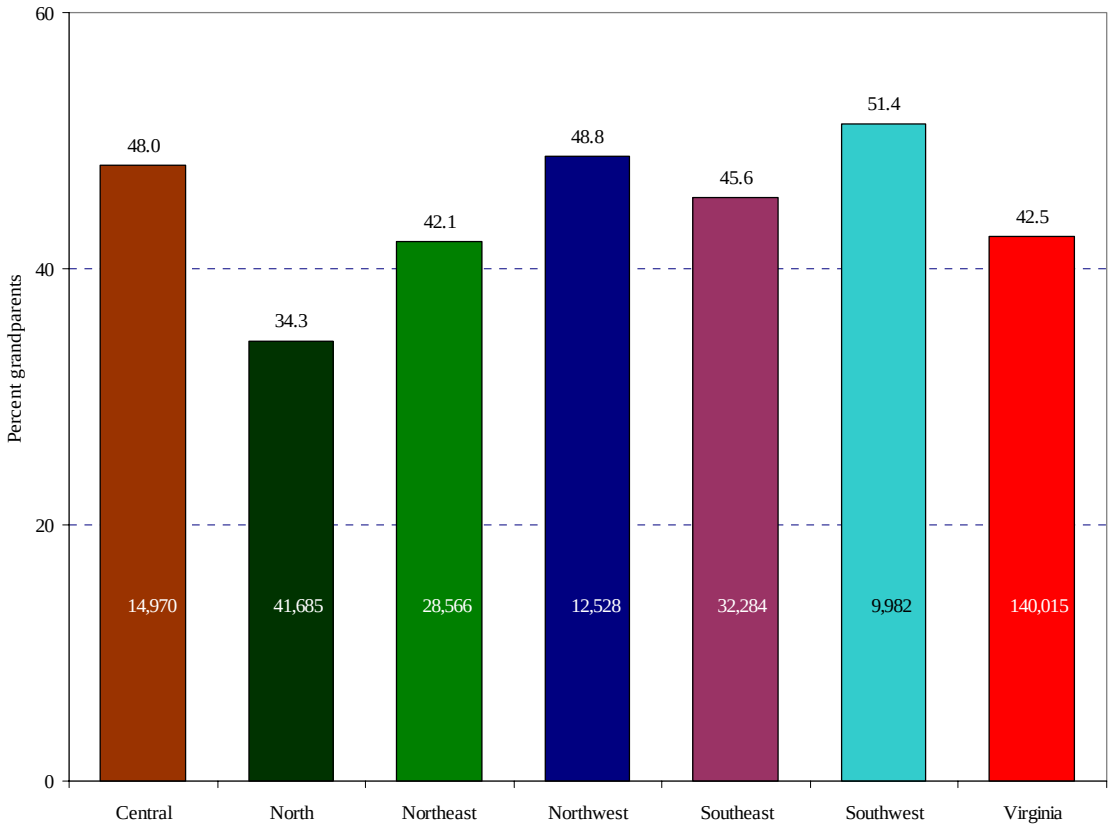
Figure 5. Head of households with children under 18 years by extension district, 2000



Source: US Census Bureau. P15: Family type by presence of own children under 18 years by age of own children Summary File 3. Online at *http://www.census.gov/*. Last accessed 7 Mar. 05

Unique in the 2000 Census are data on the number of households headed by grandparents who are responsible for their own grandchildren. These data are separate from the head of household data so that determining the proportion of all households with children that are headed by grandparents is not possible. The Southwest and Northwest Extension Districts have a slightly higher percentage of grandparents responsible for own grandchildren than the state average or other extension districts. However, Southeast and Northern Extension Districts have the most actual number of households with grandparents responsible for their own grandchildren. Even if two grandparents share the rearing of grandchildren, the responsibilities and strain will be great.

Figure 6. Grandparents living in household with own grandchildren and responsible for grandchildren under 18 by extension district, 2000



Source: US Census Bureau. DP 2: Social Characteristics. Summary File 3. Online at *http://www.census.gov/*. Last accessed 26 April 05

What is the proper societal support for households with children that are non-traditionally headed by a female, a male, or grandparents? These changes in family composition have implications for extension, social services, and public schools. Reaching single parent and grandparent heads of household and providing programs that meet their needs will challenge all social programs.

Race and Ethnic Background

The U.S. Census Bureau requests self-identification of race and ethnicity in the population survey. Respondents identify themselves and their household members as White only, Black or African American only, Native American, Native Hawaiian and Pacific Islanders, Asian, Other, or two or more races. Since the population of many groups is small, they are aggregated below as "White" (only); "Black" (only); "Asian" (includes Native Hawaiian and Pacific Islanders); "Other" (includes Native American, other, and two or more races). A separate Census question asks the respondent to indicate ethnicity. Individuals who indicate their ethnicity as "Hispanic" could belong to any of the racial groups indicated. We include Hispanics in our discussion below, without attempting to distinguish their race. The numbers for race do not include Hispanics.

Somewhat more than two-thirds of U.S. Census 2000 respondents identified themselves as white only. Virginia had 4.96 million (70 percent) white only respondents (Table 5). Over 1.37 million (19 percent of the total population) Virginia respondents identified themselves as Black or African American, a considerably higher proportion than in the U.S. population (12 percent) but lower than either Maryland or North Carolina. Other than white and black, the proportions of other races or Hispanic were all relatively small, just under 5 percent of total population in Virginia or comparable states. In the U.S., however, Hispanics are a greater proportion of the population than blacks.

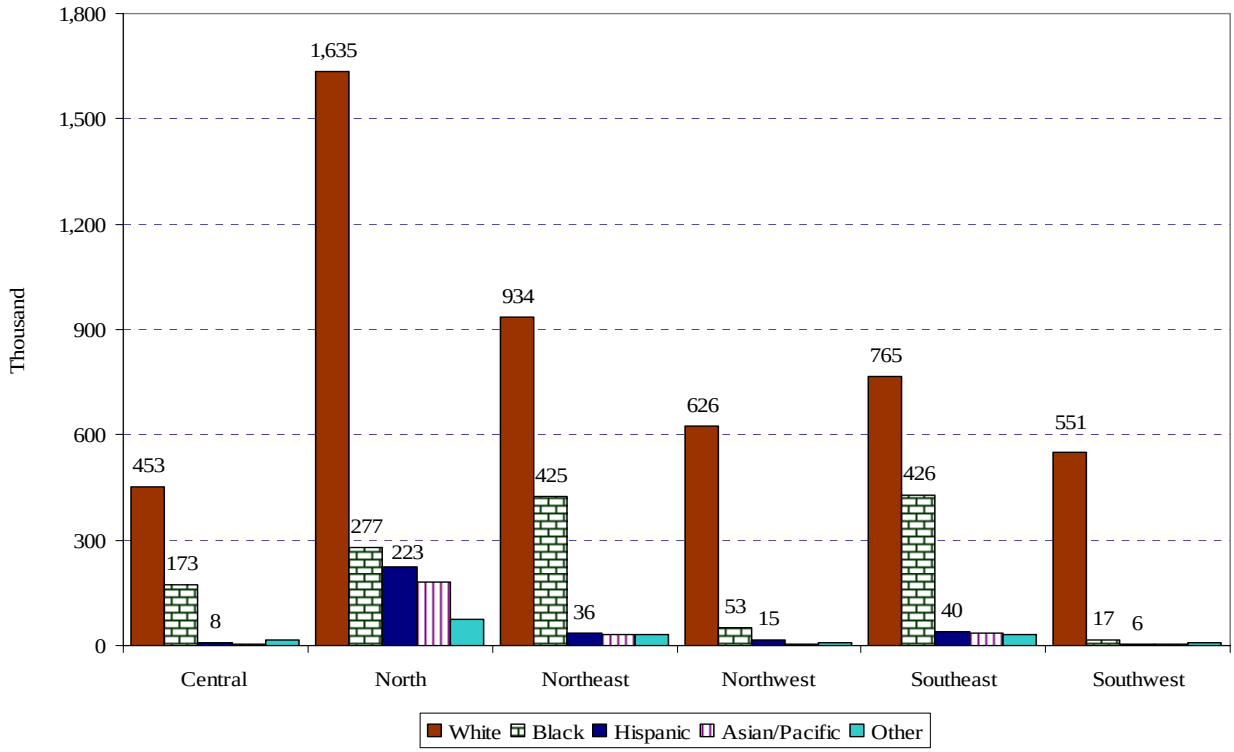
Table 5. Race and ethnic background, U.S. and comparable states (percent), 2000

	Total	White alone[1]	Black or African American alone[1]	Asian and Pacific Island[1]	Hispanic or Latino[2]	Other
United States	281,421,906	194,514,140 (69.1)	33,707,230 (12.0)	10,410,556 (3.7)	35,238,481 (12.5)	7,551,499 (2.7)
Maryland	5,296,486	3,287,071 (62.1)	1,457,336 (27.5)	210,413 (4.0)	227,105 (4.3)	114,561 (2.2)
North Carolina	8,049,313	5,648,953 (70.2)	1,720,197 (21.4)	113,248 (1.4)	372,964 (4.6)	193,951 (2.4)
Pennsylvania	12,281,054	10,327,998 (84.1)	1,190,508 (9.7)	218,177 (1.8)	392,121 (3.2)	152,250 (1.2)
Tennessee	5,689,283	4,508,623 (79.2)	925,756 (16.3)	55,769 (1.0)	119,425 (2.1)	79,710 (1.4)
Virginia	7,078,515	4,963,910 (70.1)	1,371,339 (19.4)	257,712 (3.6)	327,273 (4.6)	158,281 (2.2)

[1] Does not include Hispanic or Latino
[2] Hispanic, any race
Source: U.S. Bureau of Census, Census 2000 Summary File 3 P7 Hispanic or Latino by Race. Online at *http://factfinder.census.gov/*. Last accessed 28 Apr. 05.

In some Virginia extension districts, concentrations of racial and ethnic populations indicate challenges for educational programming. In other extension districts, the absence of racial or ethnic diversity poses equal challenges. Southwest and Northwest Extension Districts are the least racially or ethnically diverse (Figure 6). Only 5.7 percent of the Southwest Extension District population identifies itself as non-white. On the other hand, Northern Extension District is quite diverse, with scarcely more than two-thirds of its population identifying itself as white. The remainder of district population is made up of 11.6 percent black, 9.3 percent Hispanic, 7.5 percent Asian/Pacific Islander, and 3.1 percent other.

Figure 6. Race and ethnicity by extension district, 2000

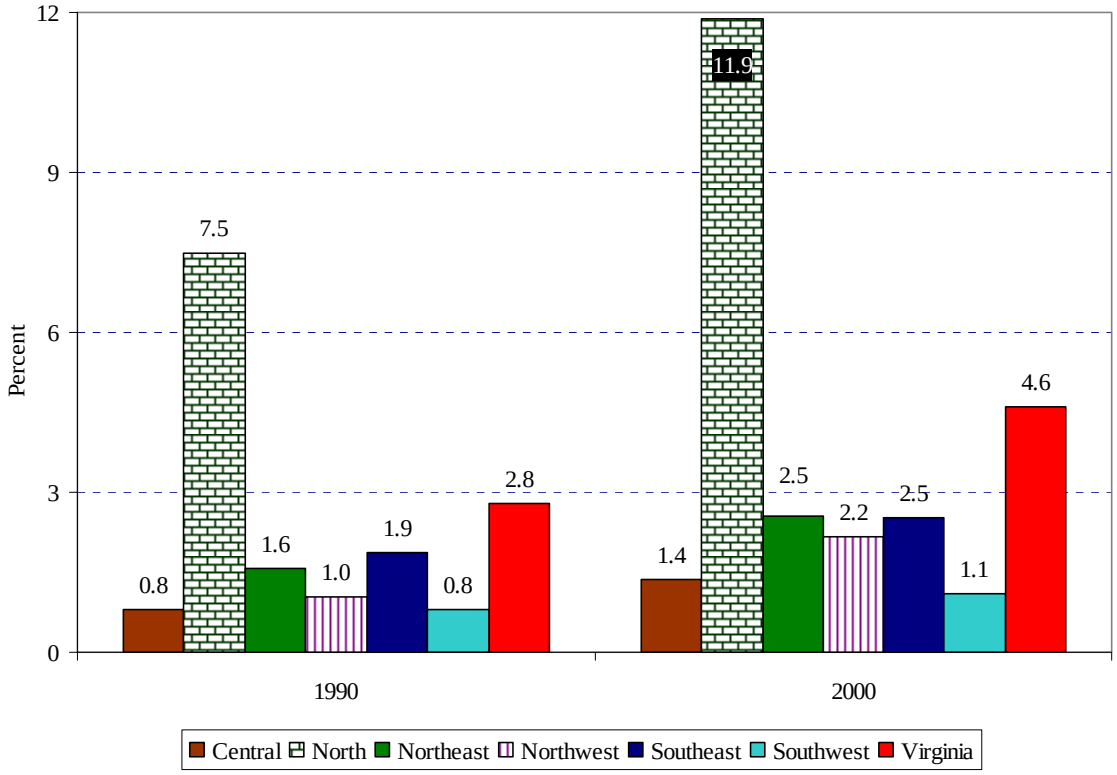


Source: U.S. Bureau of Census, Census 2000 Summary File 1 (SF 1). Online at *http://factfinder.census.gov*. Last accessed 7 Mar. 05.

Language

Language proficiency is a key factor in school and in the workplace. In Virginia, 4.6 percent of the population (322,000 individuals) reported in the 2000 Census that they did not speak English "very well" (Figure 8). This proportion increased in the state from 1990, when only 2.8 percent reported speaking English less than very well and in every extension district. Northern Extension District has by far the largest proportion of its population that does not speak English well; over one person in ten reports his limited language ability.

Figure 8. Population responding that they speak English less than very well, 1990 and 2000



Source: U.S. Bureau of Census, Census 2000 Summary File 1 (SF 1). Online at *http://factfinder.census.gov/*. Last accessed 7 Mar. 05.

Demographic Implications

The most important driver of demographic change is the burgeoning population growth in the Washington/Richmond/Virginia Beach crescent. Such rapid growth will put great strains on the political process as demands for more representation will be forcefully presented. Population growth will put additional pressures on land values and extensive land uses such as agriculture or forestry will be hard pressed to compete with urban land uses. The demand for services such as education, police protection, and health care will continue to increase and stress existing capacity.

A second major driver of demographic change is the aging of Virginia. If projections prove accurate, Virginia will have 1 million more who are 65 years or older by 2030, while the working age population will grow only slowly in the state, and will actually decline in Central, Northwest, and Southwest Extension Districts. The retiree population will put great pressures on the political process in support of its causes, and pressure for related services will severely strain state capacity.

Economy

Introduction

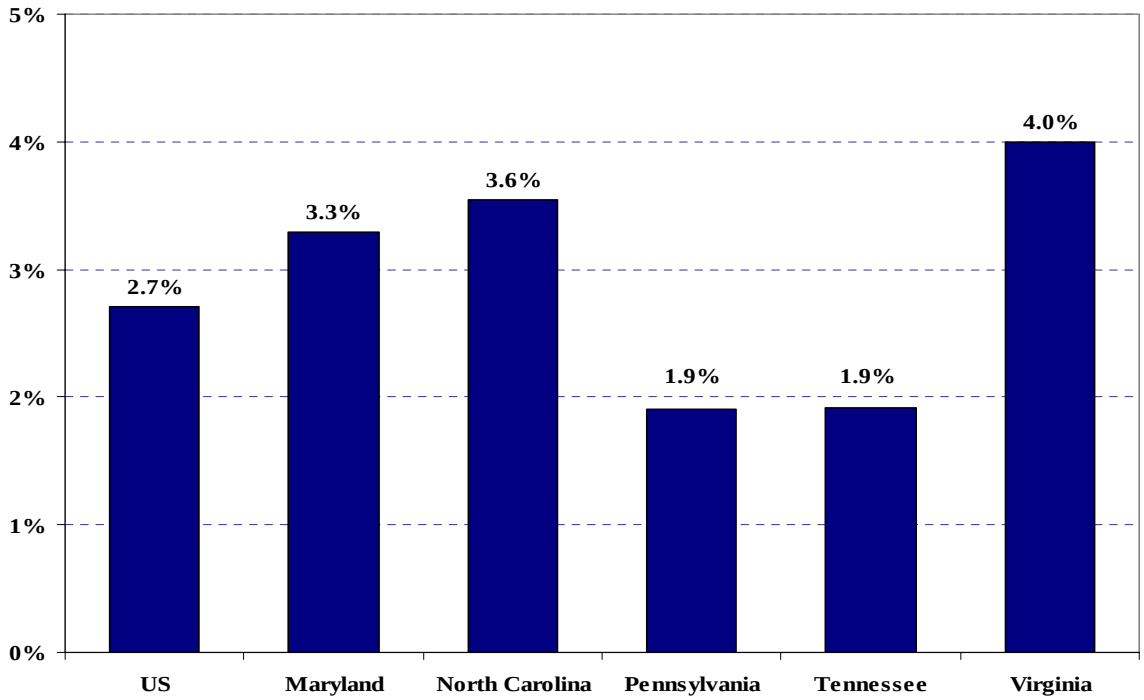
The following issues will be addressed in this section:

- The Virginia macro-economy
  - How large is the Virginia economy?
  - Is the Virginia economy growing as fast as the economy in other states?
  - What are the principal producing sectors of the economy?
- Is the economy effectively using the Commonwealth's labor resources?
- Are regional economies able to provide sufficient employment/investment income for Virginians?

Gross State Product

The Gross State Product (GSP) is the state's contribution to the U.S. Gross Domestic Product, and is the sum of value added by all industries in the state. In 2003, Virginia's GSP ranked 12th in the U.S. The Virginia economy performed very well over the period from 1998 to 2002. Across comparable states, the average annual GSP growth rate for 1998 to 2002 ranged from 1.9 percent to 4.0 percent (Figure 1). The largest (Pennsylvania) and smallest (Tennessee) economies both grew at only 1.9 percent. Over this period, real Virginia GSP grew at an average 4.0 percent per year, better than any other state in the region, and much higher than the U.S. rate of 2.7 percent.

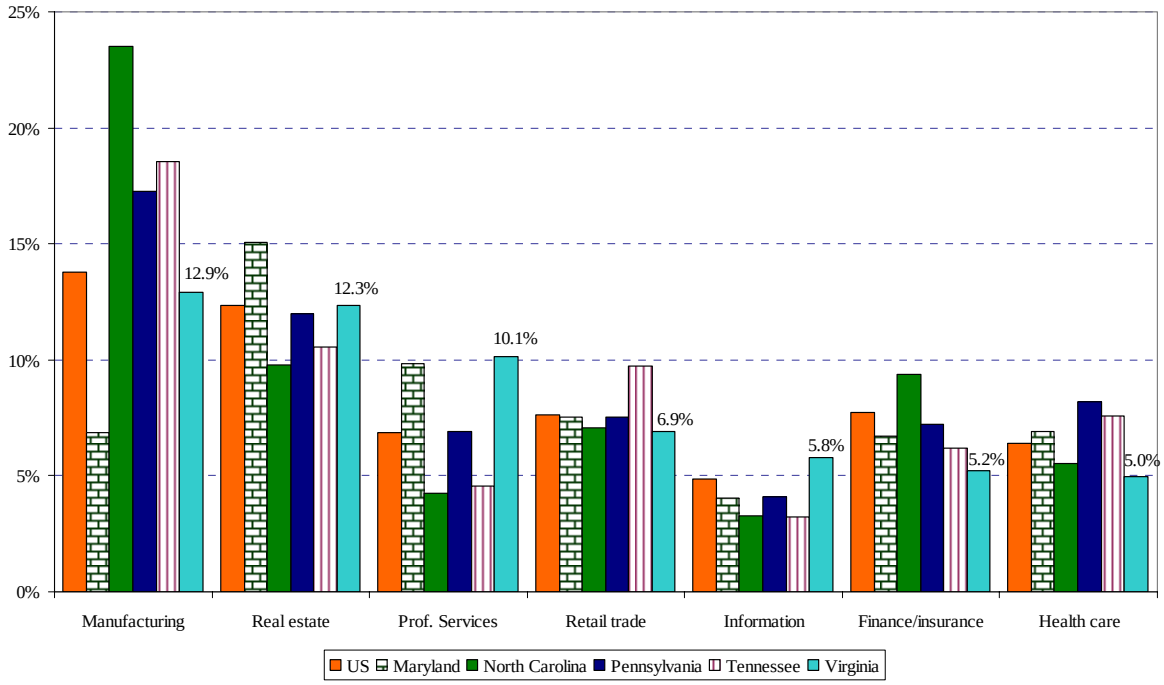
Figure 1. Mean real gross state product growth, 1998 - 2002



Source: Bureau of Economic Analysis. Gross State Product. Found at *http://www.bea.doc.gov/bea/regional/gsp.htm.* Last accessed 2 Mar. 05.

The proportion of GSP generated by the principal industries in Virginia and comparable states shows that manufacturing generates more than 15 percent of North Carolina, Pennsylvania, and Tennessee state value added, but somewhat less of the Virginia GSP (Figure 2). The historical significance of manufacturing in rural Virginia may lead one to expect that the sector contributes disproportionately to the state's economy, but Virginia's manufacturing sector generates a slightly smaller proportion of state GSP than the U.S. average.

Figure 2. Gross state product for selected industries, 2002



Source: Bureau of Economic Analysis. Gross State Product. Found at *http://www.bea.doc.gov/bea/regional/gsp.htm*. Last accessed 2 Mar. 05.

The proportion of GSP generated by the real estate sector has remained about 12 percent from 1998 to 2002. Popular wisdom suggests that rapid growth in real estate activity from northern Virginia down to the Tidewater area would be an important vehicle of economic growth, but Virginia's real estate sector made the same to the GSP as the average proportion across the nation during this period.

The Virginia economy has exhibited rapid growth in the professional and technical services sector. Professional services generated 10 percent of Virginia's GSP in 2002. This sector includes accounting and legal firms, bookkeeping, computer research, advertising, photographic services, and other high-skill companies Professional/technical firms generated a higher proportion of Virginia's GSP than in comparable states, and contributed to GSP at a rate approximately one-third higher than that of the nation as a whole. Economic activities of this sector may be closely associated with activities of the federal government in northern and southeastern Virginia.

Other sectors contributing significantly to GSP include retail trade, information, finance/insurance, and health care. Retail trade generated nearly 7 percent of GSP in 2002, but that proportion was slightly less than the industry generated in any of the comparable states, and somewhat lower than the average

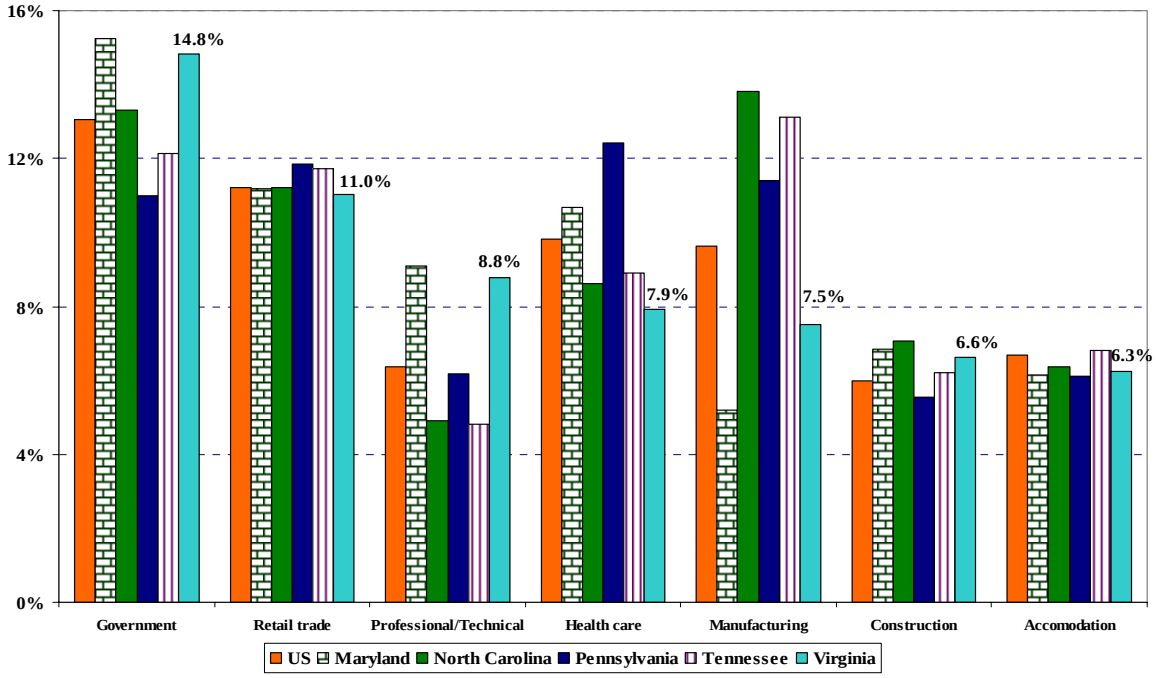
contribution of the industry in the U.S. The information industry includes all film, sound, software publishing, internet, and telecommunications sectors. Although this sector generated only 6 percent of 2002 GSP, the proportion of GSP generated in Virginia exceeded that of comparable states, and was substantially above the national average from the information sector. The Virginia finance/insurance industry, including banking, securities, and insurance firms, generated 5 percent of GSP, a somewhat smaller proportion than in any comparable state or the nation. The health care industry generates only 5 percent of state GSP, a lower contribution than in comparable states or the nation. Many factors may contribute to the relatively small health sector in Virginia, including the age distribution of the population. The health sector of the Virginia economy is growing steadily, however. Its average growth rate was 4.7 percent from 1998 to 2002, versus 2.8 percent for the nation.

Employment

An indicator of the health and sustainability of a state's economy is employment of its labor force. Non-farm employment is a widely used measure of economic activity at the state and county level.

The Virginia employment is well diversified with no single sector providing more than one job in every six. The government sector, which includes state, local, and federal government employees, but in the presented data excludes military personnel, is the largest Virginia employment sector, with nearly 15 percent of all workers in 2002 (Figure 3). Across comparable states, Virginia government employment is higher than that of the U.S. or any comparable state except Maryland. However, government employment in Virginia is disproportionately dominated by federal employment. Employment by state and local government in Virginia is actually lower than the U.S. average.

Figure 3. U. S. and state employment by industry, 2002



Source: Bureau of Economic Analysis. Gross State Product. Online at *http://www.bea.doc.gov/bea/regional/gsp.htm.* Last accessed 2 Mar. 05.

Other sectors contributing substantial employment to the Virginia economy include retail trade, professional/technical, health care, manufacturing, construction, and accommodation. Across comparable states and the nation, the retail trade sector contributes approximately the same proportion of employment (11 to 12 percent). Professional/technical firms contribute 8.8 percent of Virginia employment, a proportion considerably higher than in the nation as a whole. Health care employment in Virginia was 7.9 percent of total state employment, a proportion lower than the U.S. (9.8 percent), and exceeded by all comparable states. Manufacturing, once a much larger component of Virginia employment, generated only 7.5 percent of employment in 2002, versus 9.6 percent in the U.S. The construction and accommodations sectors generate approximately 5 to 6 percent of total employment in each of the comparable states and the U.S.

Employment by Extension District

Jobs and job growth are increasingly concentrated in urban northern and eastern Virginia (Table 2). In 2003, combined employment in Northern, Northeast, and Southeast Extension Districts summed to more than three of every four jobs in the Commonwealth. Employment in Northern Extension District in 2003 exceeded one-third of total state employment. The region had more than one-quarter million additional jobs than in 1994, and its share of total state employment had grown substantially. More than one in five jobs was located in Northeast Extension District, which includes the city of Richmond and the spreading urban fringe of northern Virginia. Nearly one in five jobs was located in the Southeast Extension District, another rapidly urbanizing region.

Table 2. Virginia Employment by Extension District, 1994 and 2003.

	1994		2003	
Extension District	Jobs	State total	Jobs	State total
		Percent		Percent
Central	267,917	8.1	259,952	6.9
Northern	1,113,502	33.5	1,399,648	36.9
Northeast	728,442	21.9	816,593	21.5
Northwest	339,808	10.2	375,389	9.9
Southeast	647,597	19.5	712,541	18.8
Southwest	222,621	6.7	229,147	6.0
Virginia	3,319,887		3,793,270	

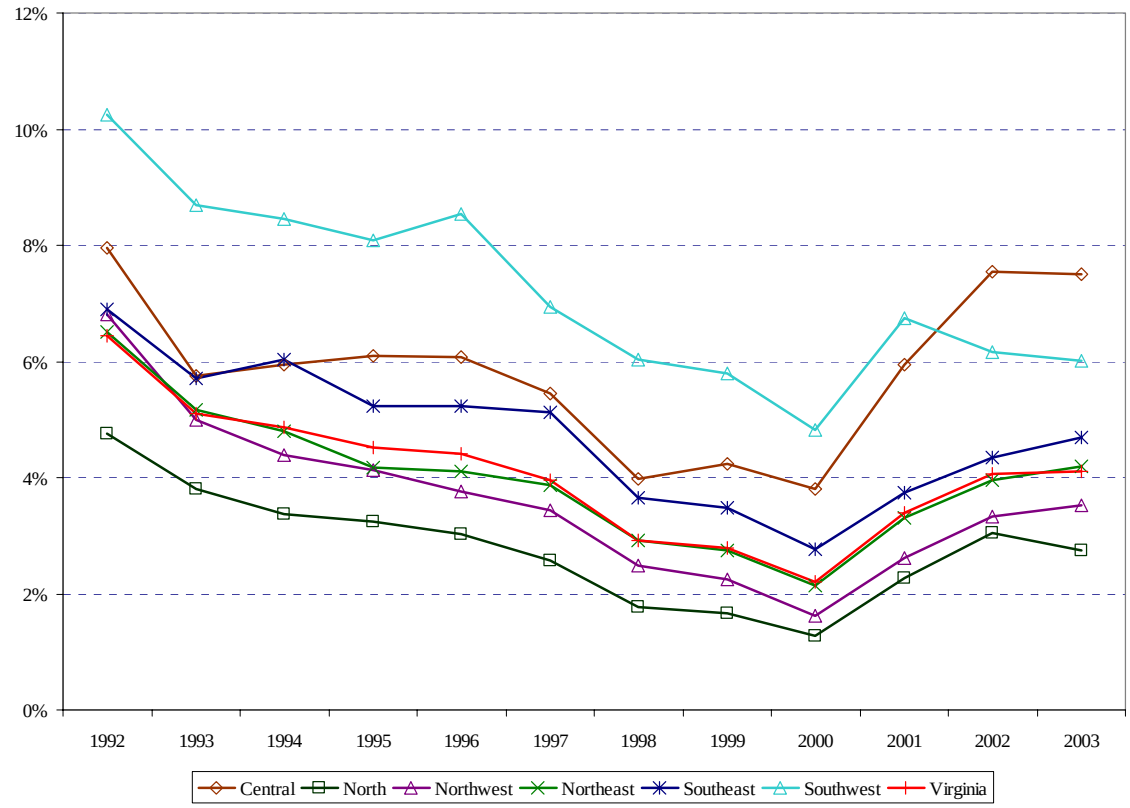
Source: Virginia Employment Commission. Labor Market Information Data. Found at *http://velma.virtuallmi.com/analyzer/startanalyzer.asp*. Last accessed 2 Mar. 2005

Employment growth from 1994 to 2003 in Northern Extension District far exceeded the sum of growth in all other extension districts, and all other extension districts saw their share of state employment shrink over this 10-year period. Southwest Extension District generated only 650 new jobs per year between 1994 and 2003, and Central Extension District lost approximately 8,000 jobs over the 10-year period. Employment in the Southwest and Central Extension Districts combined totaled only one job for every three in the Northern Extension District, and only one in every eight jobs in the Commonwealth.

Unemployment by Extension District

The other side of the employment coin is regional unemployment. The unemployment rate in Northern Extension District was the lowest in the state throughout 1992 to 2003 (Figure 4). Although the rate increased sharply after reaching a low of 1.3 percent in 2000, it remains below the level of the early part of the 1990s, and well below the state and national averages. Until 2001, Southwest Extension District was the perennial leader in unemployment, although the rate declined from over 10 percent in 1992 to less than 6 percent in 2000. From 2000 to 2003, Central Extension District experienced surging unemployment, and remains well above all other extension districts.

Figure 4. Unemployment rate, 1992-2003



Source: Virginia Employment Commission. Labor Market Information Data. Found at *http://velma.virtuallmi.com/* Last accessed 2 Mar. 2005

Virginia Employment Projections

By late 2004, Virginia had begun to recover from the economic downturn and stock market crash. Nearly 3.8 million people were employed across the Commonwealth—14 percent more than the previous high in 2000. In 2004, non-farm employment appeared to be expanding well in Virginia. Preliminary estimates indicated that employment had grown by over 2 percent in Virginia, well above U.S. employment growth. Particularly strong sectors were professional/technical, construction, and retail trade, each increasing by more than 4.0 percent. Employment growth in these sectors outweighed losses in manufacturing (–4.7 percent), information (–1.5 percent), and transportation (–0.4 percent). Employment expansion was fastest in northern Virginia, at a growth of 4.4 percent. Employment declined in the southern and western metropolitan areas.

The Virginia Employment Commission makes 10-year projections of job growth by industry sector. Table 1 displays the projections of Virginia job growth for 2002-2012. Industries expected to experience the greatest job growth include professional and business services, education and health services, and information. Job training and formal education programs will be needed to satisfy demand for skilled and professional employees in these sectors. Manufacturing and mining are industries expected to experience job losses.

Table 1. Virginia Employment Commission Projected Employment 2002-2012

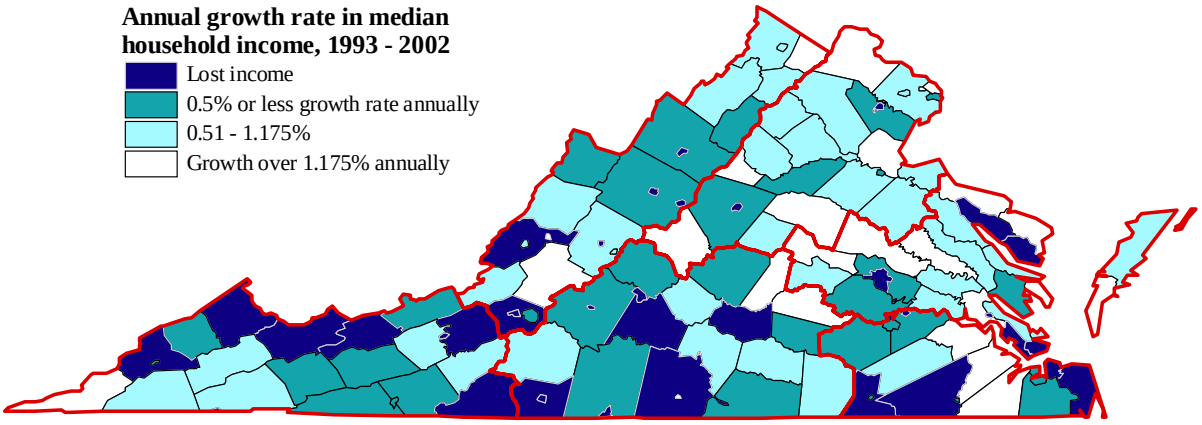
Industry	Employment 2002	Projected employment 2012	Projected employment change	Projected percent change
Total Employment, All Jobs	3,457,427	4,097,672	640,245	18.5
Natural Resources and Mining	73,068	69,624	-3,444	-4.7
Construction	214,452	248,707	34,255	16.0
Manufacturing	321,049	317,509	-3,540	-1.1
Trade, Transportation, and Utilities	637,003	727,926	90,923	14.3
Information	105,954	129,376	23,422	22.1
Financial Activities	180,403	212,185	31,782	17.6
Professional and Business Services	548,754	737,121	188,367	34.3
Education and Health Services	609,045	770,931	161,886	26.6
Leisure and Hospitality	304,030	368,905	64,875	21.3
Other Services (Except Government)	120,212	143,269	23,057	19.2
Government	343,457	372,119	28,662	8.3

Source: Virginia Employment Commission. Labor Market Information Data. Online at *http://velma.virtuallmi.com/ analyzer/startanalyzer.asp.* Last accessed 2 Mar. 2005

Income

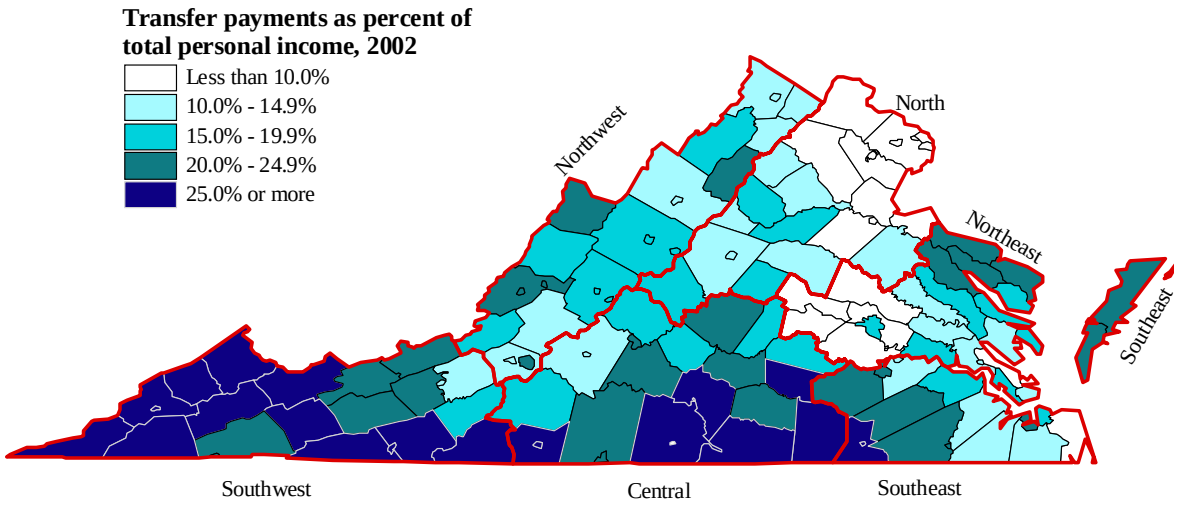
Acceptable performance of the economy is indicated by rising household incomes. Nominal incomes may rise, but rising inflation could indicate falling or stable real spending power. If inflation-adjusted incomes decline, the standard of living goes down. Six counties in Southwest Extension District and four counties in Central Extension District experienced falling real household incomes between 1993 and 2002 (Figure 5). Based solely on household income, living standards must have declined in these counties. However, transfer payments from social programs, migrant family members, and other sources may bolster living standards. Social transfer payments include social security, retirement pensions, welfare, food stamps and related programs, and other forms of income that are not earnings. Central and Southwest Extension Districts include 18 counties with more than 25 percent of income as transfer payments in 2002 (Figure 6). The magnitude of transfer payments emphasizes that local economies are not providing enough income to support family needs in many rural communities.

Figure 5. Real annual growth rate of median household income 1993 – 2002.



Source: U.S. Census Bureau, Small Area Income & Poverty Estimates. Online at *http://www.census.gov/hhes/www.saipe/county.html*. Last accessed 5 Mar. 05.

Figure 6. Transfer Payments as Percent of Income, 2002.

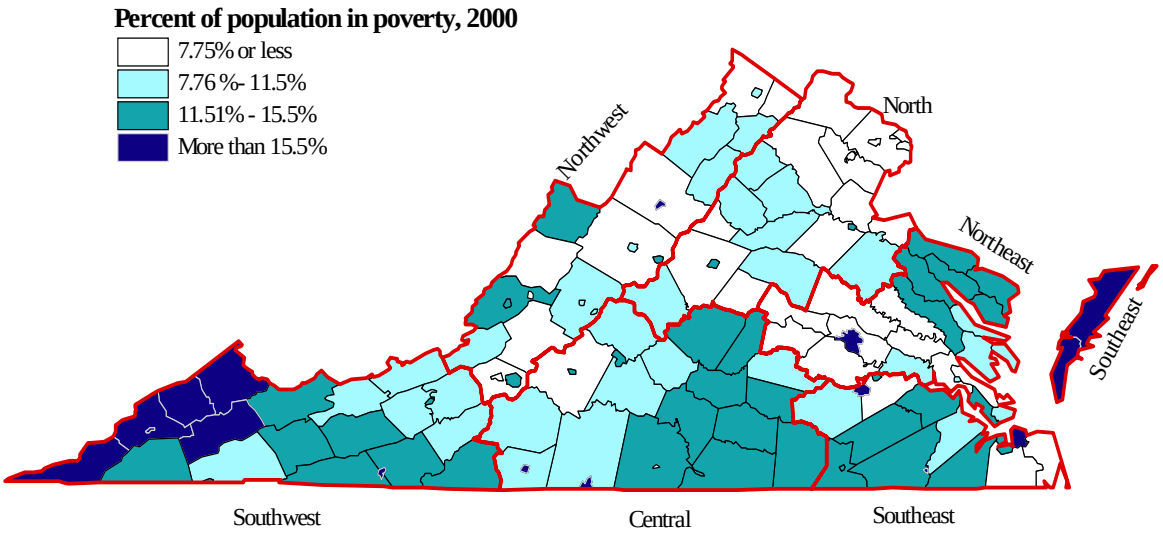


Source: Bureau of Economic Analysis, Regional Economic Information System. Online at *http://www.bea.doc.gov/bea/regional/data.htm.* Last accessed 7 Mar 05.

Poverty

Even with relatively high transfer payments as a proportion of income, individuals and families within Virginia counties with poorly performing economies suffer from high rates of poverty. Southwest Extension District includes five of the seven Virginia counties with more than 15.5 percent of the population living in poverty, while Northampton and Accomack on the Eastern Shore are the other two high-poverty counties (Figure 7). Many independent cities also have high rates of their populations living in poverty.

Figure 7. Estimated percent of people living in poverty, 2000

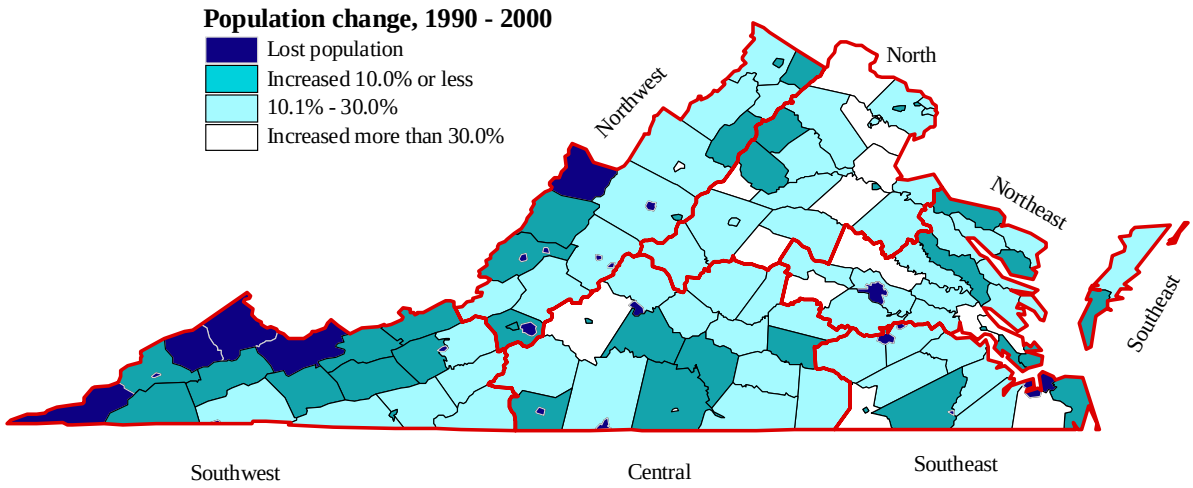


Source: U.S. Census Bureau. Small Area Income & Poverty Estimates. Online at *http://www.census.gov/hhes/www/saipe/county.html*. Last accessed 5 Mar 05.

Population Change

The slow economic growth in rural Virginia is closely related to income levels and to the loss of manufacturing jobs in particular. Individuals and families seeking better opportunities will migrate from economically depressed regions. The impact of slow economic growth and population migration shows many rural counties with net population loss from 1990 to 2000 (Figure 8). Declines in population or slow rates of growth can be seen widely throughout Southwest Extension District, in the Alleghany Highlands, in Southside, and scattered throughout other regions, reflecting poor economic opportunities in those localities.

Figure 8. Population change, 1990 – 2000.



Source: U. S. Census Bureau. Population estimates. Online at *http://www.census.gov/popest/counties/*. Last accessed 5 Mar 05.

Virginia Economy in Perspective

The Virginia economy has performed well in recent years compared to average U.S. economic growth. Overall increases in GSP, in jobs, and in incomes have become more concentrated in the affluent Arlington/Richmond/Virginia Beach crescent. Many counties/cities in Central and Southwest Extension Districts, regions such as the Northern Neck, the Eastern Shore, the Alleghany Highlands, and other isolated counties have recurrent poverty and few signs of the economic growth needed to close the economic gap with more affluent regions. Whatever the definition of rural localities, the Virginia economic perspective is clear: there are two Virginias, one increasingly affluent and the other lagging ever further behind.

Agriculture and Forestry

Background

Fundamental forces in the international, national, and state arenas are reshaping Virginia agriculture. In a 2003 address, Dr. Michael Boehlje characterized these forces as

- Expanded global production
- Growing and diversified global demand
- Ever-rising consumer expectations
- New science and technology
- Modernized agricultural business model
- New government policy

Food production continues to increase in formerly importing nations, and the U.S. faces flat or declining trends in its share of world production and world trade in most farm commodities. Markets for U.S. field crops, vegetables, and fruit are threatened by expanding production in countries with lower production costs. At the same time, U.S. involvement in global animal and poultry products markets is growing. In the changing global and U.S. commodity markets, Virginia faces competitive disadvantages in some markets and possible opportunities in others.

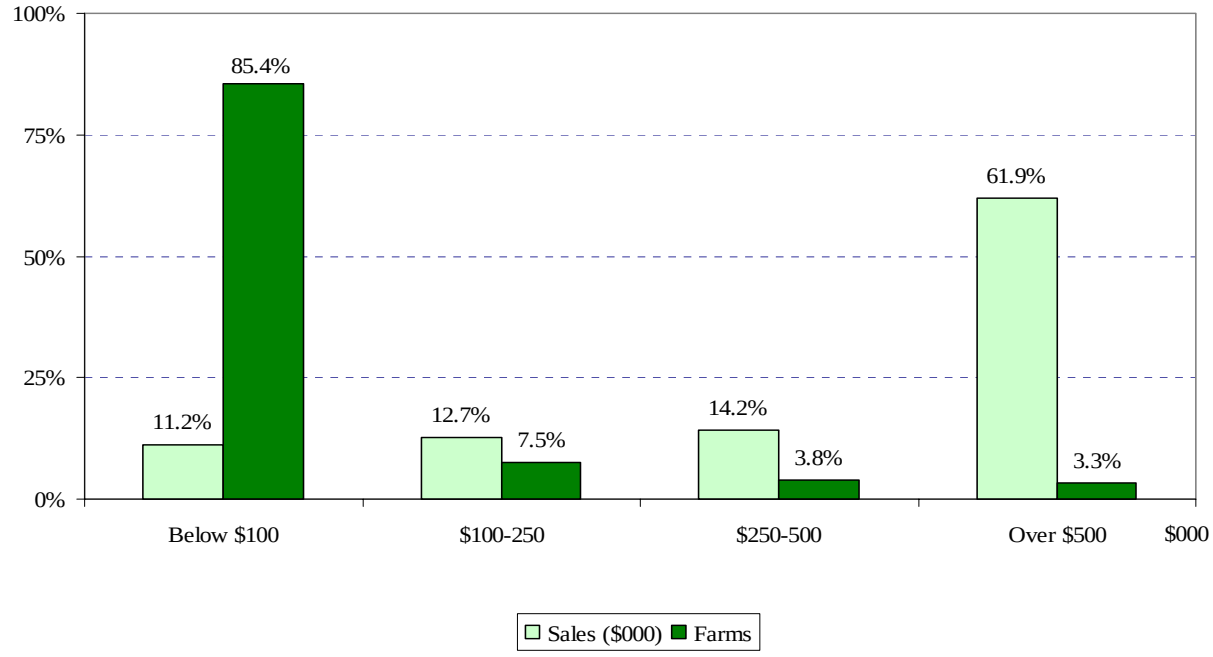
Except for the lowest cost producers, production of globally grown commodities such as No.2 yellow corn will offer few opportunities for profit in the future. Consumer markets are growing ever more highly differentiated. Food and fiber markets have matured across the globe, with dietary transition, value-added exports, and agro-industrial production of energy and synthetic materials as the newest frontiers. Consumer expectations now go far beyond low prices. Consumers demand additional characteristics such as convenience, taste, variety, nutrition, quality, and health benefits.

The U.S. agricultural economy is experiencing a convergence in biotechnology, information technology, and process control technology. This convergence will create additional value in already highly differentiated products and will foster competition on cost, quality attributes, and speed in response time to consumer demands. The dynamic sectors of the U.S. agricultural economy will increasingly operate outside of, or in spite of, the protective umbrella of government support.

Changes in U.S. Farms

Rural America has changed dramatically in the past few decades, with some household incomes exceeding their urban counterparts, and production increasingly concentrated in fewer large farm businesses. From nearly 7 million farms in 1935, the number of farms has decreased to 2.1 million in 2002. Farms generating less than $100,000 in farm sales made up 85 percent of all farms in 2002 but produced only 11 percent of total sales (Figure 1). At the other extreme, the largest 3 percent of U.S. farms (less than 71,000 farms) generated 62 percent of total sales.

Figure 1. U.S. Farm numbers and sales by sales class, 2002



Source: USDA. 2002 Census of Agriculture, Table 2, NASS. Online at *http://www.nass.usda.gov/census/* Last accessed 3 Mar. 05.

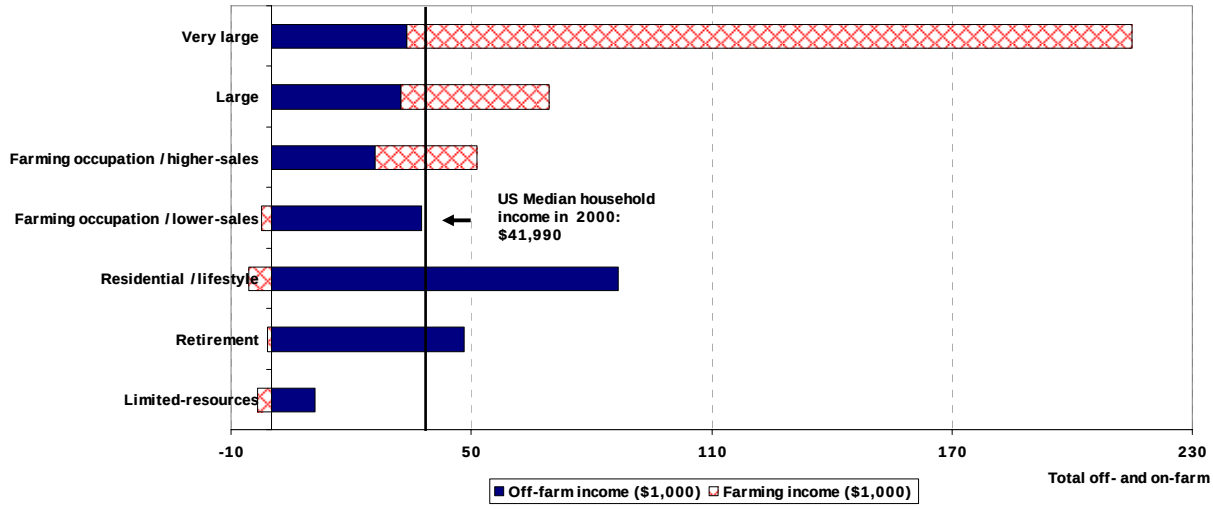
USDA's Economic Research Service has developed a typology of U.S. farms that characterizes farms by criteria other than sales. The typology is useful in discussing the educational needs of farm families.

- **Limited-resource:** Any small farm with gross sales less than $100,000, total farm assets less than $150,000, and total operator household income less than $20,000. Limited-resource farmers may report farming, a nonfarm occupation, or retirement as their major occupation.
- **Retirement**: Small farms whose operators report they are retired (excludes limited-resource farms operated by retired farmers).
- **Residential/lifestyle:** Small farms whose operators report a major occupation other than farming (excludes limited-resource farms with operators reporting a nonfarm major occupation).
- **Farming occupation/lower-sales:** Small farms with sales less than $100,000 whose operators report farming as their major occupation (excludes limited-resource farms whose operators report farming as their major occupation).
- **Farming occupation/higher-sales:** Small farms with sales between $100,000 and $249,999 whose operators report farming as their major occupation.
- **Large family farms**: Farms with sales between $250,000 and $499,999.
- **Very large family farms:** Farms with sales of $500,000 or more.

- **Nonfamily farms:** Farms organized as nonfamily corporations or cooperatives, as well as farms operated by hired managers.

All farms generating less than $250,000 in total farm sales are classified by this typology as Small Family Farms. On average, farms with higher sales generated net profits from the farming operation, and smaller farms had negative earnings from farming (Figure 2). In 2001, over 91 percent of all U.S. farms were Small Family Farms, and such farms accounted for 68 percent of all farmland and other assets. However, such Small Family Farms generated only 33 percent of total farm production. Among Small Family Farms, only the higher sales farms ($100,000 – $250,000) generated positive net incomes from farming. Combining farm with nonfarm income, the average high-sales family household income exceeded the average for all U.S. households. The average lower sales farm household has losses from farming, and insufficient off-farm income to bring it up to the U.S. average household income level. The average limited-resource farm household loses money from farming and has only modest off-farm income. Among the approximately 2.1 million U.S. farms, approximately 140,000 are limited-resource farm households, and about twice that number are retirement farm households. Among Small Family Farms, only the residential/lifestyle and retirement farming households had total income exceeding the U.S. average. The U.S. has approximately 850,000 residential/lifestyle farm households. If stability in rural communities and farming as a way of life with related open space benefits are objectives, the small and part-time farms will need family income from nonfarm sources.

Figure 2. Source of farm household income by farm typology groups, 2001



Source: USDA/Economic Research Service, 2001 USDA Agricultural Resource Management Survey. Data from personal communication with Robert Hoppe, March, 2004.

Virginia Farming

Global and national trends have affected Virginia farming more rapidly and perhaps more dramatically than elsewhere. Cash farm income on cropping farms is increasingly threatened by low commodity prices, rising costs, and uncertain yields. Government payments form an increasing share of crop farm incomes. And the vast majority of Virginia farm households receive most of their income from off-farm sources. Virginia production of traditional crops such as peanuts and tobacco is threatened by competition from other states and nations. Virginia livestock production also suffers from more acute competition and faces higher costs for inputs and environmental compliance. The Virginia public generally supports agriculture as a favorable land use, but residents in urbanizing rural areas often complain about the noise, odor, and other side-effects of agricultural business operations.

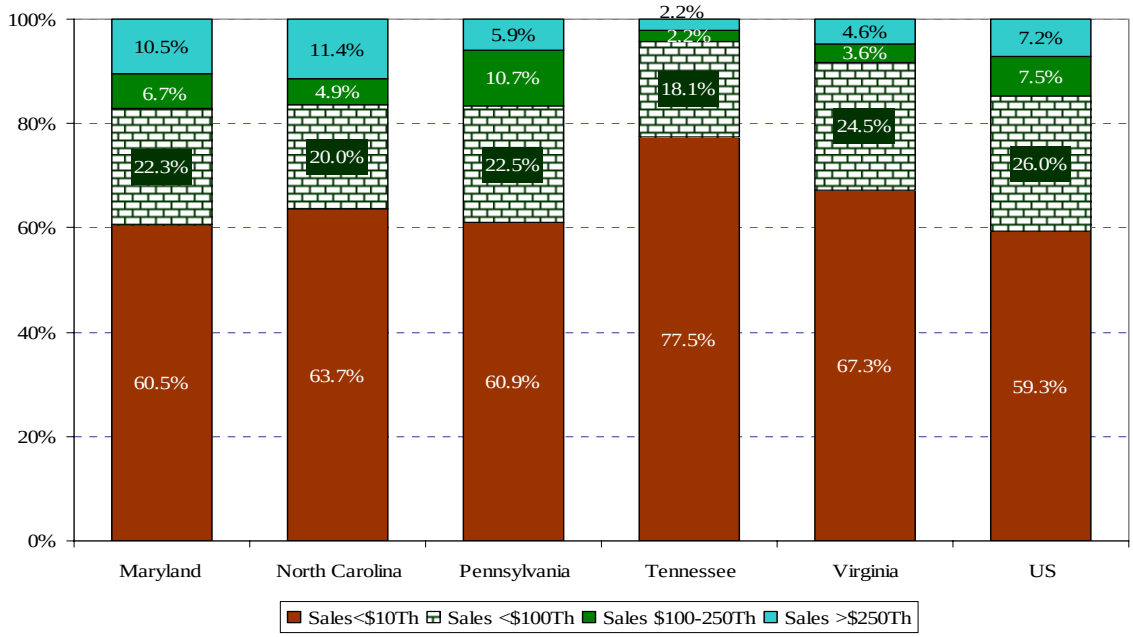
The 2002 Census records 47,606 Virginia farms with total sales valued at $2.36 billion, just 0.8 percent of gross state product. However,

> [t]o suggest that agriculture is a small sector of the Virginia economy is a mistake. Today, Virginia's agriculture includes not only traditional field crops, vegetables, and livestock, and seafood, but aquaculture, landscape and nursery products, ornamentals, and premium farm wines as well. Moreover, it has significant links to the tourism and forestry industries (pp 1-2). [1]

Using backward- and forward-linkages to other economic sectors, Lamie estimated that 11.2 percent of Gross State Product and 10 percent of state employment are related to activities of the agricultural sector.

Virginia farms and those of comparable states are typically farms with very low sales. Except for Tennessee, Virginia has the largest proportion of "micro-farms" (67 percent or 32,039 farms) recording less than $10,000 in 2002 farm sales. Among the comparable states, 61 to 78 percent of total farms recorded less than $10,000 in 2002 farm sales, versus 59 percent among all U.S. farms (Figures 3). This large percentage of Virginia's farms generated less than 4 percent of farm sales. Among comparable states, the proportion of total 2002 sales recorded by these farms ranged from 1 percent to 7 percent.

Figure 3. Proportion of farms by sales class, 2002

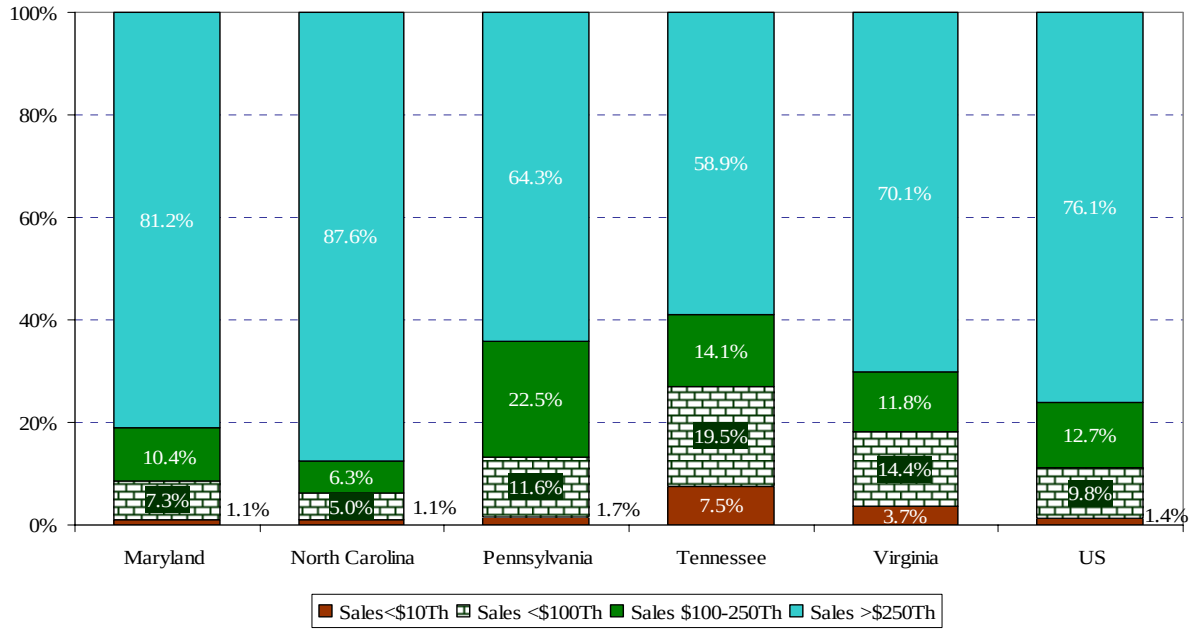


Source: USDA. 2002 Census of Agriculture, Table 2, NASS. Online at *http://www.nass.usda.gov/census/* Last accessed 3 Mar. 05.

[1] R. David Lamie. *The Economic Impact of Agriculture and Ag-Related Industries on the Commonwealth of Virginia*. VCE Pub 448-243/REAP R035. 1998. Online at *www.reap.vt.edu*.

At the other end of the sales spectrum are Large and Very Large farms selling greater than $250,000 and $500,000, respectively, in 2002. Among comparable states, the proportion of Large and Very Large farms ranges from 2 percent to 11 percent, versus 7 percent among all U.S. farms (Figure 4). Virginia has only 2,213 farms (5 percent) that are Large or Very Large farms. Large and Very Large farms produce slightly more than three-quarters of all U.S. farm sales, and even higher proportions in states such as Maryland and North Carolina. In Virginia, these Large and Very Large farms produce 70 percent ($1.66 billion) of farm sales (Figure 4).

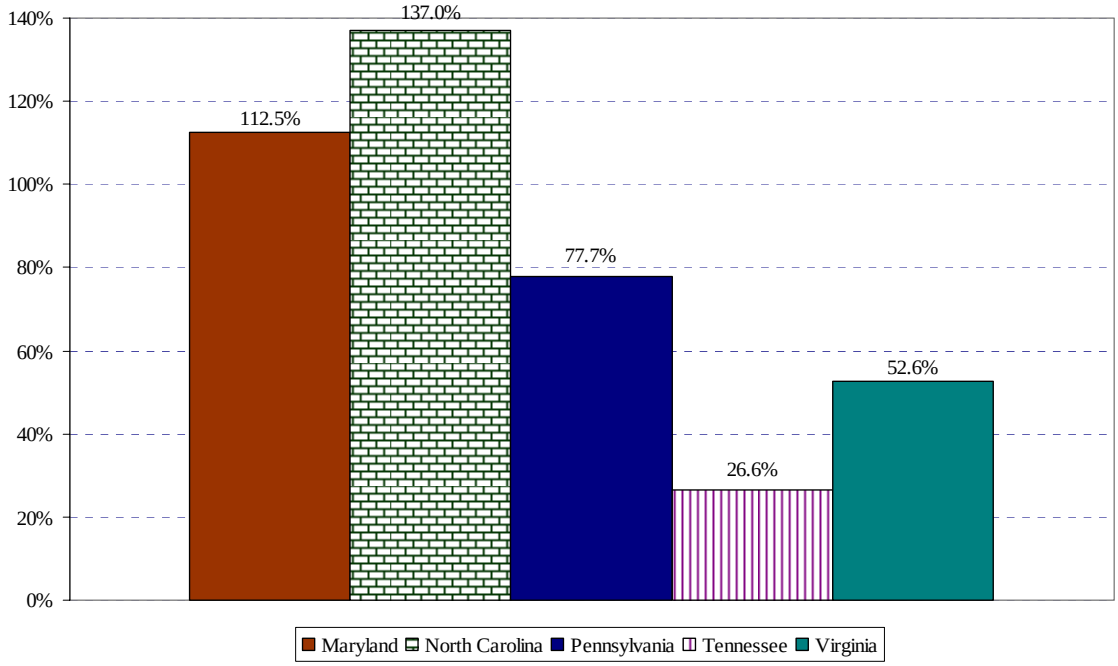
Figure 4. Proportion of farm sales by sales class, 2002



Source: USDA. 2002 Census of Agriculture, Table 2, NASS. Online at *http://www.nass.usda.gov/census/* Last accessed 3 Mar. 05.

The average U.S. farm had sales of $94,245 in 2002, but the average Virginia farm had sales of only $49,593 in that year. Average Virginia sales are 53 percent of average U.S. farm sales, a lower proportion than any comparable state except Tennessee (Figure 5).

Figure 5. Farm sales by state as proportion of U.S. average



Source: USDA. 2002 Census of Agriculture, Table 2, NASS. Online at *http://www.nass.usda.gov/census/* Last accessed 3 Mar. 05.

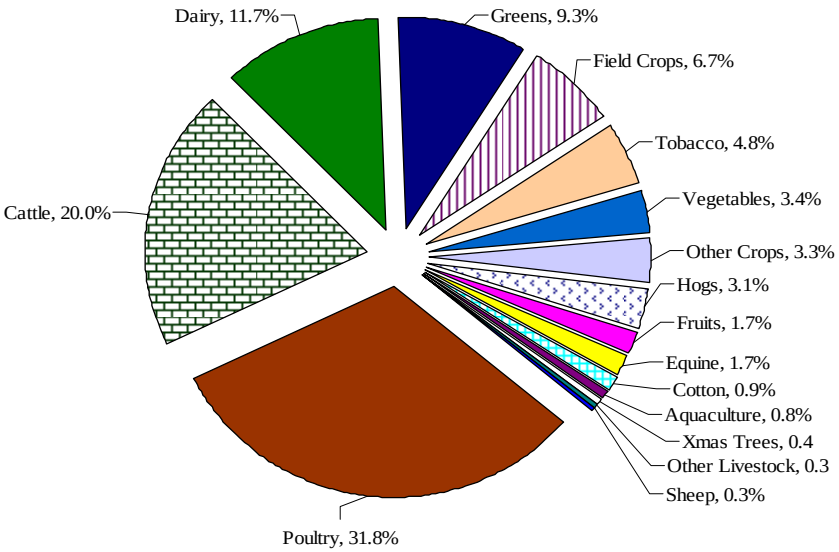
The 2002 Census of Agriculture estimates 8.62 million acres on Virginia farms. Between 1997 and 2002, an annual average of 25,800 acres (about ¼ percent per year) exited farming[2]. Available information does not indicate the current use of land previously included in farms, but likely a considerable proportion of such land has been converted to urban uses.

[2] Because of new adjustments for census coverage, this acreage is not directly comparable to acreage recorded in previous census counts. However, data indicate that between 1 million and 1.5 million acres of the Virginia landscape that were included in farms during 1974 are now in some other land use.

Farming Sectors in Virginia

Virginia's agricultural economy is primarily an animal (livestock and poultry) economy. Over the period 1998 to 2003, total cash receipts averaged $2.3 billion, with animal and animal product sales constituting, on average, two-thirds of all receipts. Poultry, cattle, and dairy in Virginia farm had the biggest share of cash receipts in 2003 (Figure 6).

Figure 6. Virginia value of farm cash receipts by commodity group, 2003



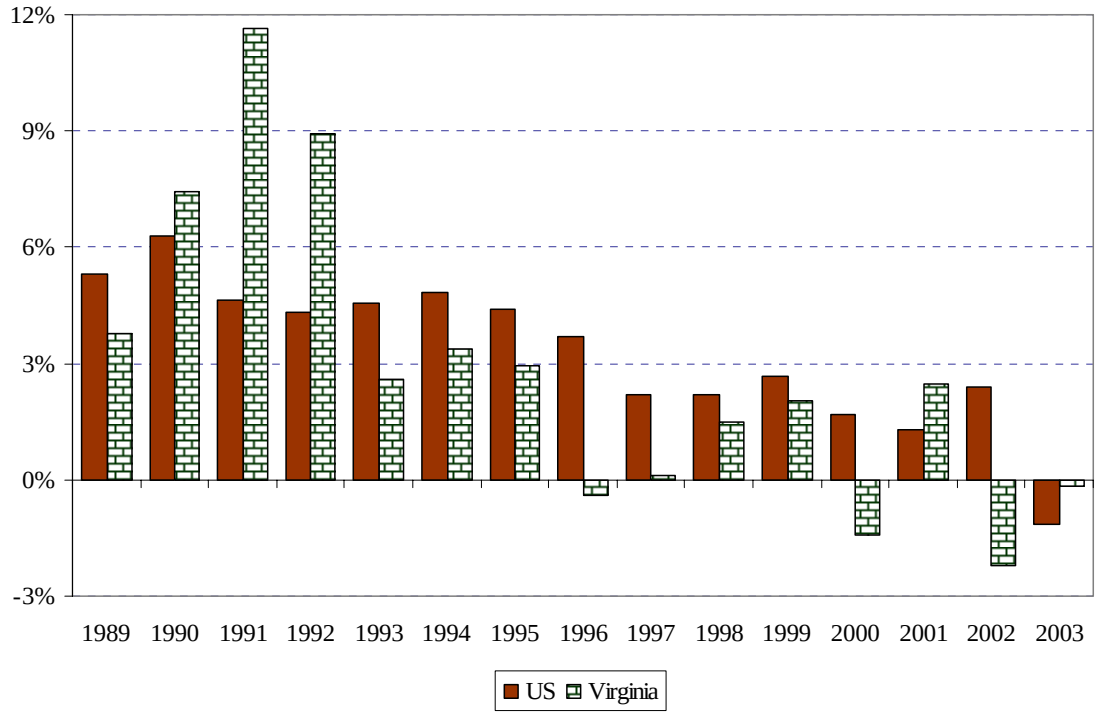
Source: Virginia Agricultural Statistics. *Virginia Agricultural Statistics Bulletin and Resource Directory*, 2003. Online at *http://www.nass.usda.gov/va/*. Last accessed 3 Mar. 05.

Poultry and Livestock Farming

Poultry

Broiler cash receipts averaged $459 million per year from 1998 to 2003, or 20 percent of all Virginia farm receipts. The industry is concentrated in three regions: the Shenandoah Valley, the southern Piedmont, and the Eastern Shore. Almost all of the approximately 850 broiler farms produce birds under contract to a poultry integrator. Although Virginia broiler industry growth was strong in the 1980s, most of the 1990s and the present decade have seen little growth as the industry has been faced with growing competition from other U.S. production regions, sporadic losses from disease infestations, and increased costs to comply with state and federal environmental policies. From 1989 to 2003, broiler production grew by an average 3 percent per year in both the Virginia and U.S. Virginia production grew more strongly than the national industry until 1993 but has experienced nearly as many years of production decline as of production growth since 1996 (Figure 7). Although the U.S. industry is still strong, the first ever year-to-year production decline occurred in 2003.

Figure 7. U.S. and Virginia broiler production: percent change from previous year, 1989-2003

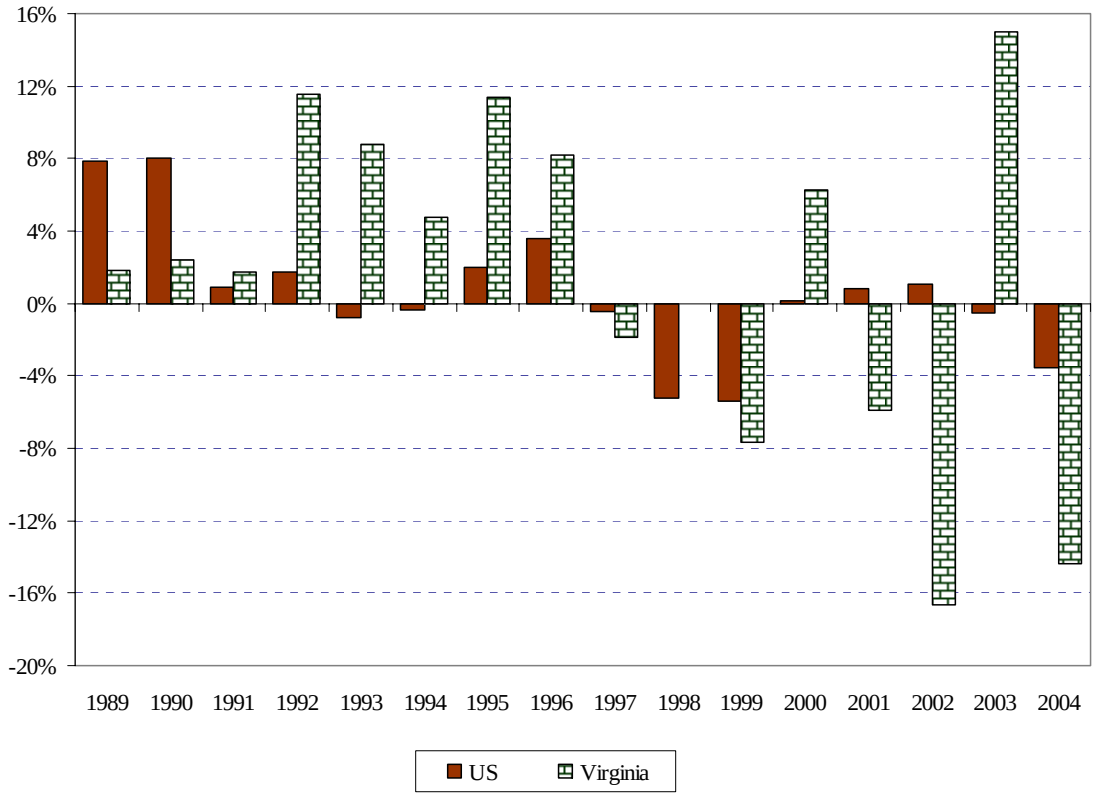


Source: USDA/NASS. Poultry Production and Value. Online at *http://usda.mannlib.cornell.edu/data-sets/livestock/95910*. Last accessed 14 Dec. 04.

The Virginia turkey industry is much smaller than the broiler industry but still averaged $203 million annual sales (nearly 9 percent of total farm receipts) during 1998 to 2003. The industry is located almost entirely in four counties of the Shenandoah Valley, where approximately 350 turkey farms produce for corporate or cooperative integrators. Virginia turkey production continued to grow through the mid-1990s (Figure 8), but low prices, profit stagnation in the national industry, disease infestations, and the cost of environmental compliance have caused wild swings in Virginia production, and the industry has grown in only two years since 1997. In the short run, the industry would be strengthened by success of the new turkey producers' cooperative, but over the longer term, the industry must innovate to overcome

feed and environmental cost disadvantages, bio-security issues, and other obstacles to satisfying new consumer demands.

Figure 8. U.S. and Virginia turkey production: percent change from previous year, 1989-2003

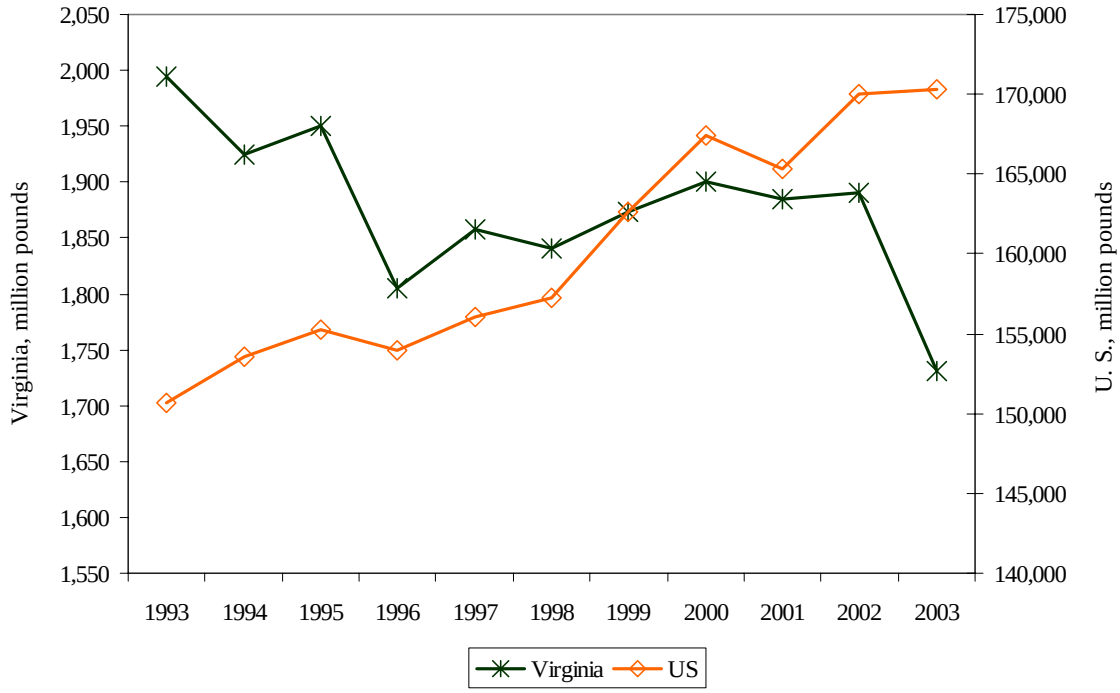


Source: USDA/NASS. Poultry Production and Value. Online at *http://usda.mannlib.cornell.edu/data-sets/livestock/95910*. Last accessed 14 Dec. 04

Livestock

Dairy has been a critical sector of the Virginia agricultural industry, but the industry has suffered relentless competition from other U.S. production regions in recent years. U.S. production increased by an average 1.2 percent per year from 1993 to 2003, while Virginia production decreased by 1.3 percent per year (Figure 9). Virginia producers have been forced to become larger and more cost-efficient or else leave the industry. One in six Virginia farms with dairy cows in 1998 is no longer in the business. Exiting dairy farms are often smaller operations. The fate of ex-dairy farmland is uncertain, but the environmental and land use implications of this rapidly changing industry structure are significant.

Figure 9. Milk production, U.S. and Virginia, 1993-2003



Source: USDA/NASS. Milk and Cow Production Estimates, 1993 – 2003. Online at *http://usda.mannlib.cornell.edu/usda/reports/general/sb/b9520199.pdf*

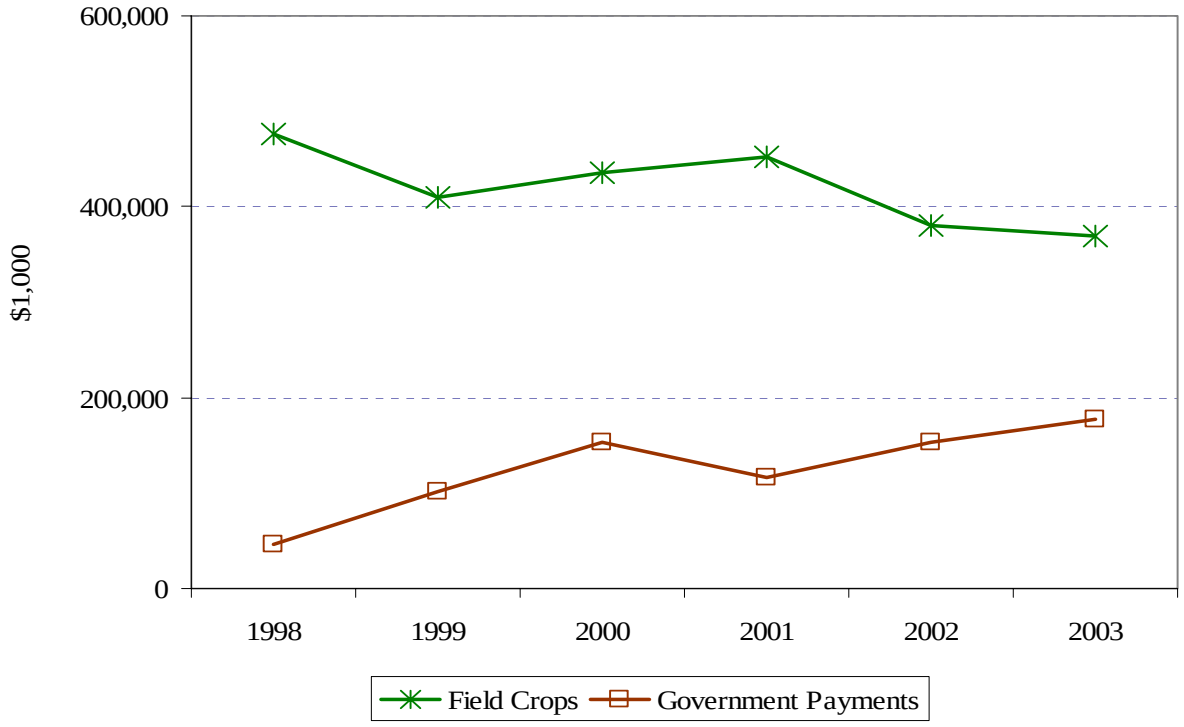
Virginia cash receipts from beef cattle and calves represented approximately 14 percent of total farm cash receipts from 1998 to 2003. Demand for Virginia beef production is a derived demand from domestic and international markets for beef and related products. Because of increased demand based on introduction of innovative retail beef products and because the Virginia industry was well poised to respond with increased calf production in the late 1990s, cash receipts from beef production have averaged $323 million per year from 1998 to 2003. Beef producers have enjoyed solid returns from beef cattle and calf production during the current decade. The number of Virginia farms with beef cows has remained stable during this decade, at approximately 23,000 farms, or about one-half of all farms in the state. The most significant challenges for the beef sector are health concerns that may reduce consumer demand, bio-security concerns such as outbreaks of disease, expected cyclical upturns in U.S. production that put pressure on prices, and the costs of environmental protection.

Crop Farming in Virginia

Field Crops

Cash receipts from field crops are highly subject to weather conditions and yields. Virginia field crop cash receipts from marketings declined from 1998 to 2003 (Figure 10) as acreages for some crops have been reduced, and prices of alternative field crops have been insufficient to maintain cropping farm incomes. Increased government direct and counter-cyclical payments for many field crops have provided compensation for income losses[3]. Government payments are likely to provide at least one-fifth of all field crop gross cash receipts.

Figure 10. Virginia field crop cash marketings and government payments, 1998-2003

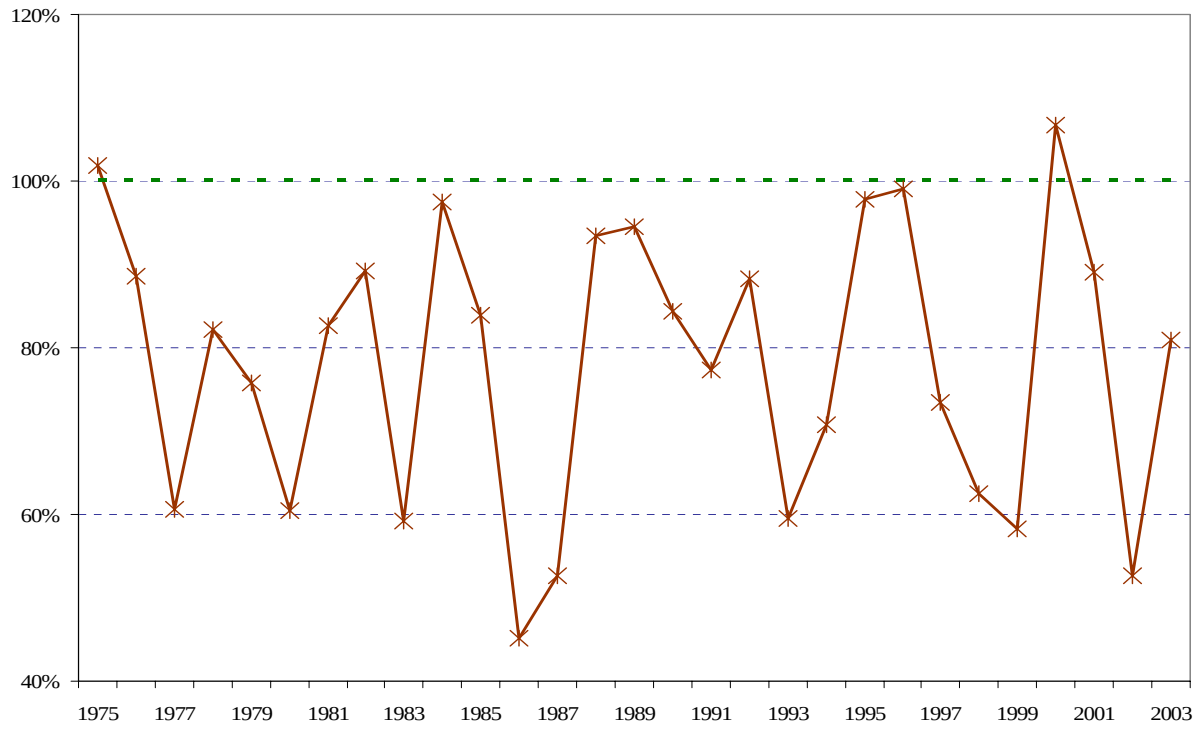


Source: Virginia Agricultural Statistics. *Virginia Agricultural Statistics Bulletin and Resource Directory*. Various years. Online at *http://www.nass.usda.gov/va/*. Last accessed 3 Mar. 05.

The difficulties faced by Virginia field crop producers include higher transportation costs to terminal markets, small and inefficient field size, frequent drought conditions at critical growing periods, and uncompetitive yields relative to low-cost producers. The Virginia corn yield relative to the U.S. average yield illustrates these difficulties (Figure 11). The Virginia corn yield averages only 79 percent of the U.S. average yield. The Virginia yield has exceeded the U.S. yield in only two years from 1975 to 2003, and has exceeded 90 percent of the U.S. yield in only seven of those years. Although the Virginia broiler industry consumes at least 27 million bushels of corn each year, Virginia corn production does not compete effectively with Midwest corn transported by rail into the poultry producing regions.

[3] Although most government payments are for field crops, the totals in Figure 10 also include some direct commodity program payments to dairy producers.

Figure 11. Virginia corn yield per acre as percent of U.S. yield, 1975-2003



Source: USDA. Quick Stats Agricultural Statistics Data Base. Online at *http://www.nass.usda.gov:81/ipedb.* Last accessed 3 Mar. 05.

Virginia Greens Industry

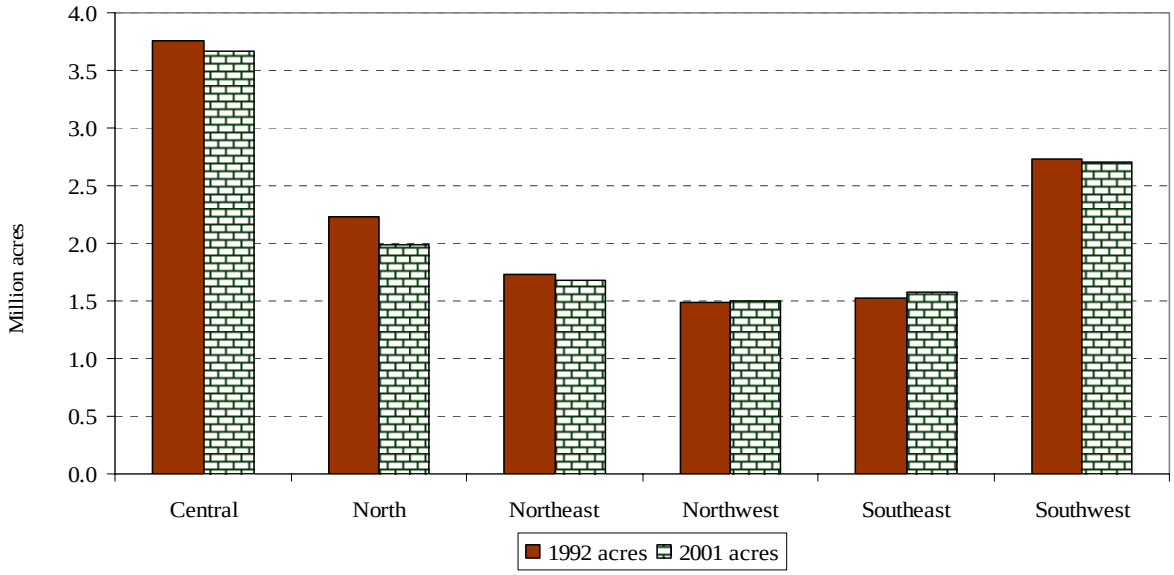
The "greens industry" consists of various types of enterprises, including both farm and nonfarm businesses. A 2002 Virginia Agricultural Statistics Service survey[4] lists businesses belonging to the greens industry as performing the following business functions: plant sales, landscaping maintenance, landscaping installation, design/architectural services, and other functions. The industry was estimated to employ 23,350 full-time, part-time, and unpaid workers in 2002. The survey estimates greens industry 2002 sales as $1.1 billion, or equivalent to approximately one-half of farm cash receipts in the same year. The greenhouse, nursery, and forest products sector on Virginia farms overlaps to some degree with the larger greens industry and is estimated to have produced $182 million in cash receipts in 2003: approximately 8 percent of all farm cash receipts. On-farm cash receipts from greenhouse, nursery, and forest products did not grow significantly from 2000 to 2003.

[4] Virginia Dept. Agriculture and Consumer Services. *Green Industry Survey, 2000.* Online at *http://www.nass.usda.gov/va/pub.htm*, Last accessed 3 Mar. 05.

Forestry in Virginia

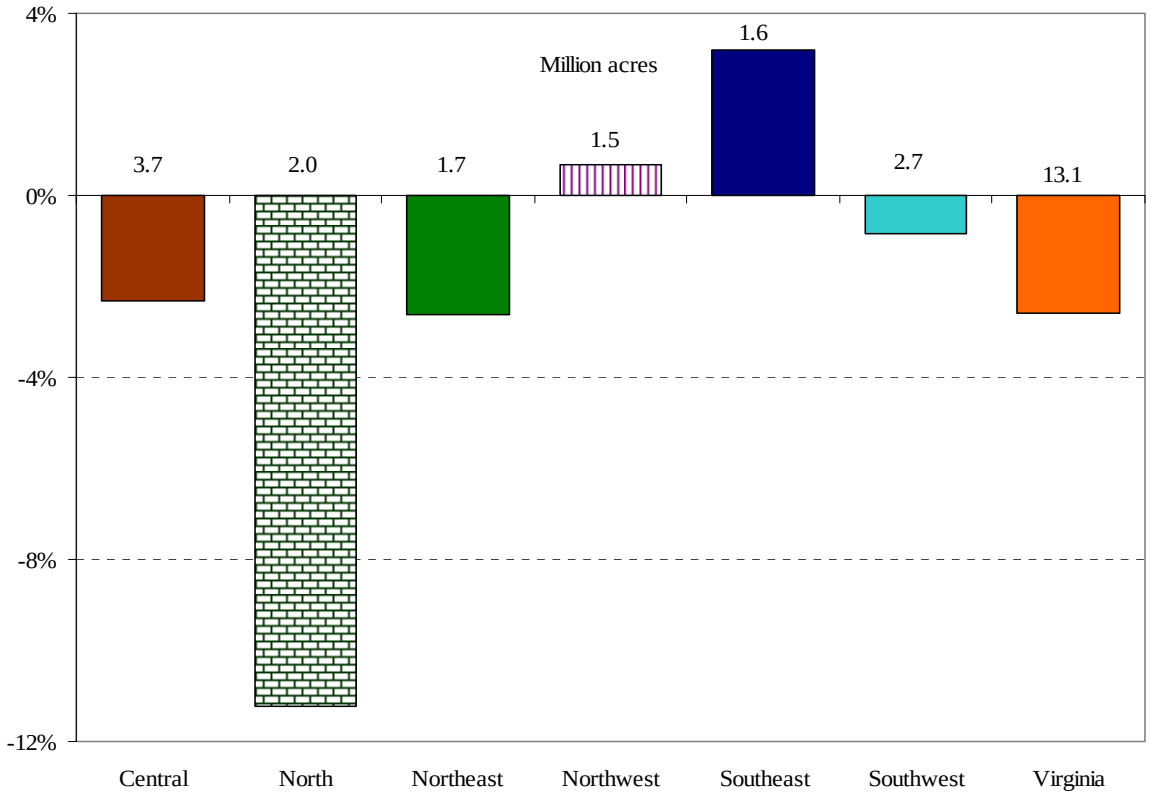
In 2001, private forested acres totaled 13.1 million in Virginia. Across extension districts, 28 percent of private forested acres are in the Central Extension District, and 21 percent are in the Southwest Extension District (Figure 12). The Northeast, Northwest, and Southeast Extension Districts each have approximately 1.5 million acres. From 1992 to 2001, private forest acreage in Virginia declined by approximately 350,000 acres (-2.6%) (Figure 13). The Northern Extension District experienced the biggest decline in forest acres, with more than one-quarter million less forest acres in 2001 than in 1992 (-11.2%). Although the current use of cut-over land is not known, a sizeable portion of formerly forested acres have likely been developed into rural and urban housing and commercial establishments.

Figure 12. Virginia private forested acres by extension district, 1992 and 2001



Source: USDA/Forest Service, Southern Research Station Publications. Online at *www.srs.fs.usda.gov/pubs*. Last accessed 15 Jan. 05.

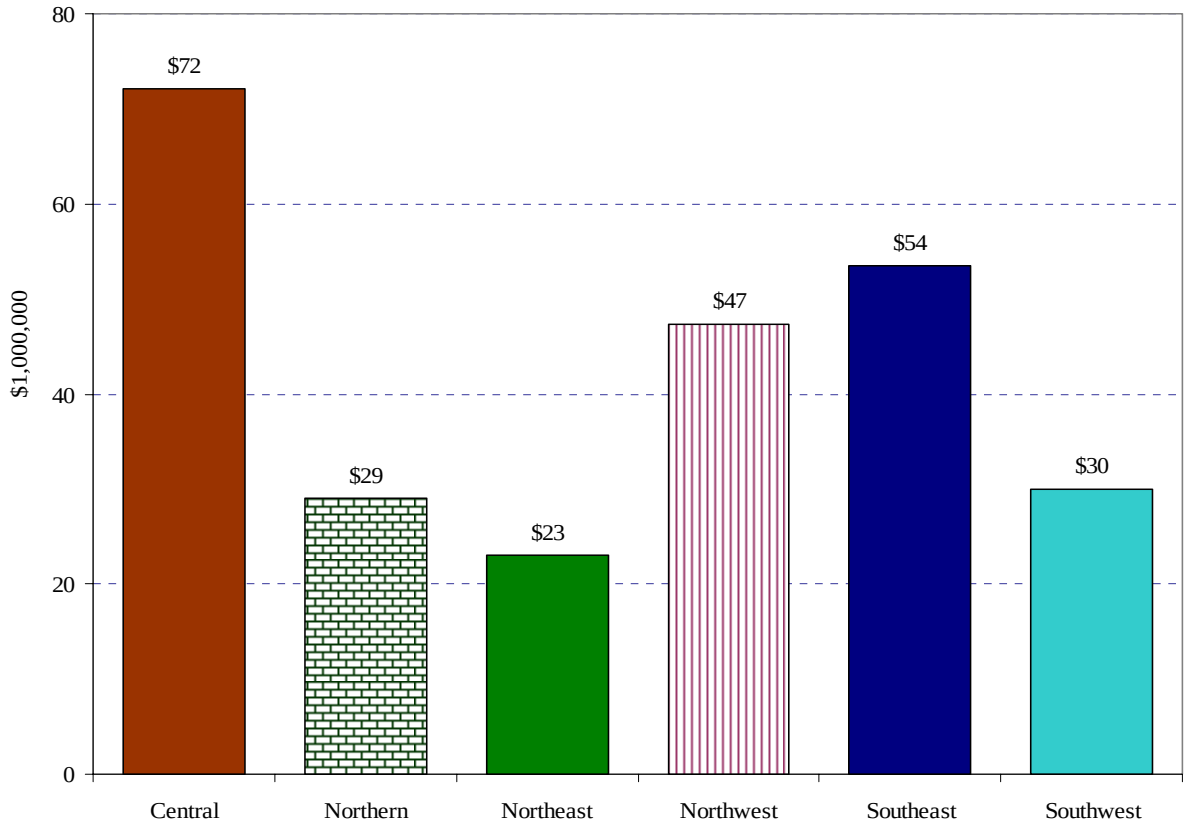
Figure 13. Change in forested lands by extension districts, 1992 – 2001.



Source: USDA/Forest Service, Southern Research Station Publications. Online at *www.srs.fs.usda.gov/pubs*. Last accessed 15 Jan. 05

Forest products are an important part of the rural Virginia economy. The total value of timber harvested was approximately $225 million in 2001 (Figure 14). All extension districts share in the sale of timber, but the Central Extension District sales are one-third of total state sales. The Southeast and Northwest Extension Districts contribute 24 percent and 21 percent, respectively.

Figure 14. Value of Virginia timber harvested by extension district, 2001



Source: USDA/Forest Service, Southern Research Station Publications. Online at. *http://www.srs.fs.usda.gov/pubs.* Last accessed 15 Jan. 05.

The Virginia Agricultural Economy in Perspective

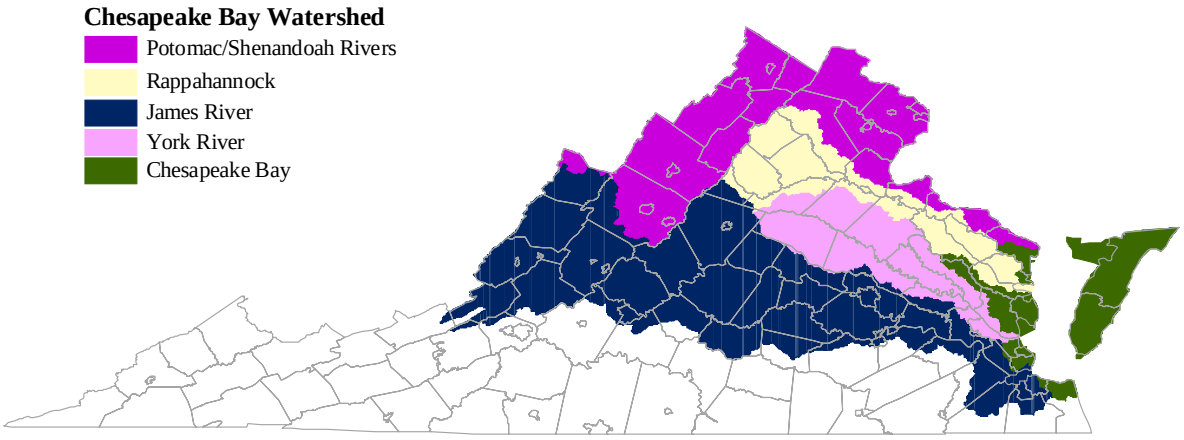
Several critical factors contribute to an understanding of the Virginia agricultural economy:

- Virginia's agriculture economy has important linkages that contribute a significant portion of state economic product and employment.
- Nearly all Virginia farms are very small and likely contribute only marginally to farm family income.
- In 2002, 5 percent of Virginia farms produced 70 percent of all farm sales.
- Livestock and poultry production contribute more than two-thirds of all Virginia farm receipts.
- Field crop production receipts from cash sales declined from 1998 to 2003, and government payments form an ever-more important source of farm income.
- Greens industry sales, direct-marketed vegetable and fruit sales, and other non-commodity, non-traditional entrepreneurial ventures are of increasing importance in Virginia agriculture.
- More than 13 million acres of private forest land is spread widely across Virginia, generating more than $200 million sales per year and playing a vital role in the rural landscape.

Environment

Virginians are very concerned about environmental issues such as water and air quality, waste disposal, and hazardous material exposure. A principal issue of concern is water quality in the Chesapeake Bay. The Bay is the largest and most productive estuary in North America, and the watershed includes nearly 22,000 square miles (52 percent) of the Commonwealth land area (Figure 1). Since 1983, Virginia has joined with its Bay partner states (Maryland, Pennsylvania, and the District of Columbia) in seeking to improve water quality and achieve sustainable conditions for aquatic plants and fish/shellfish. Goals set for the year 2000 included a 40 percent reduction in controllable loadings[1] of nitrogen (N) and phosphorus (P). According to the latest simulation model estimates, controllable nitrogen loadings were reduced by approximately 62 million pounds (18 percent) between 1987 and 2002, and phosphorus loadings were reduced by 8 million pounds (29 percent) over that time.[2] The greatest single source of N reductions has come from the agricultural sector (60 percent), while the greatest single source of P reductions has come from wastewater treatment plants and other point sources, which accounted for 58 percent of total P reductions. However, other areas, such as urban and septic, showed increased loadings (Figure 2).

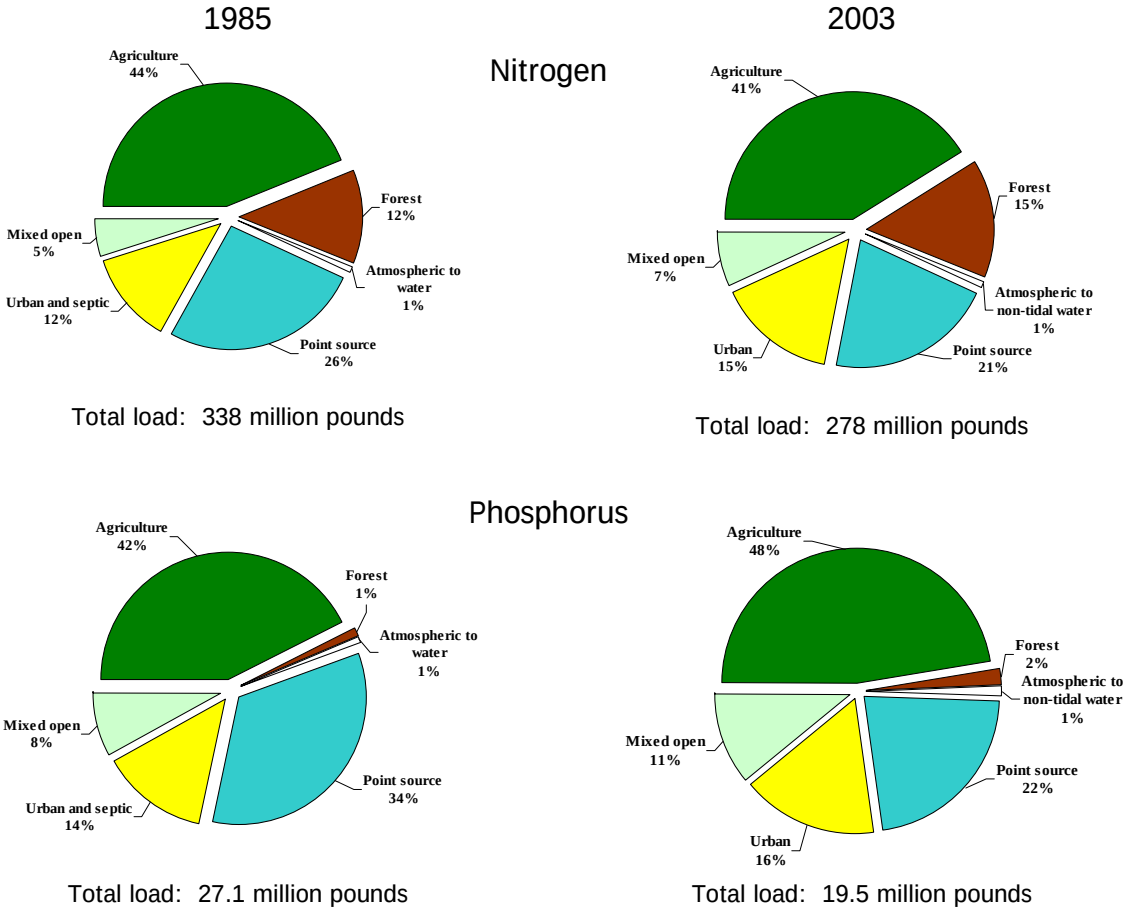
Figure 1. Virginia portion of the Chesapeake Bay watershed



[1] "Controllable loadings" are pollutant discharges to the Bay or its tributaries that can be managed by human intervention.

[2] Karl Blankenship, "Chesapeake Cleanup Update," *Chesapeake Bay Journal* March 2005

Figure 2. 1985 Baseline and estimated 2000 loadings, N and P by source

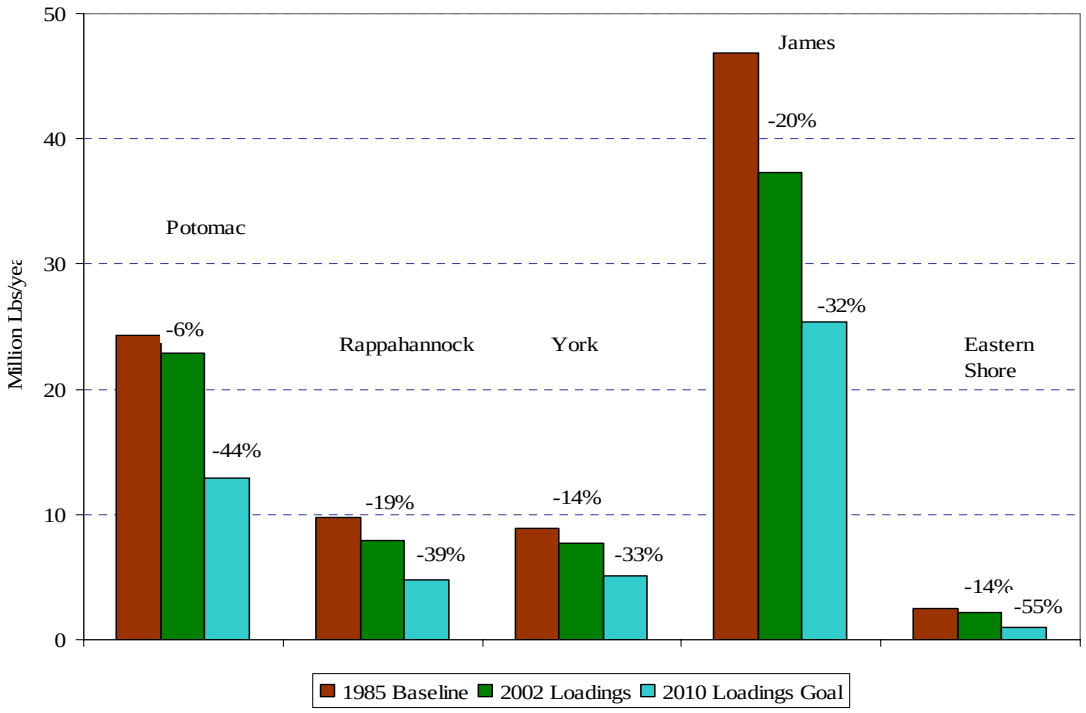


Source: Chesapeake Bay Program Phase 4.3 watershed model. Online at *http://www.chesapeakebay.net/about.html*. Bay Trends/Indicators, Pay Pollutants, Sources of N Loads to Bay, Sources of P Loads to Bay. Last accessed 6 May, 05.

On-site water quality monitoring shows that the situation is not as good as indicated by the Chesapeake Bay simulation model. Some Virginia rivers show increasing N and P concentrations, while others show no significant trend either up or down. The apparent slow progress in improving water quality may be attributable to such factors as the time lag between reduction of discharges and water quality indicators or the impact of uncontrollable discharges or inaccuracies in the Chesapeake Bay model.

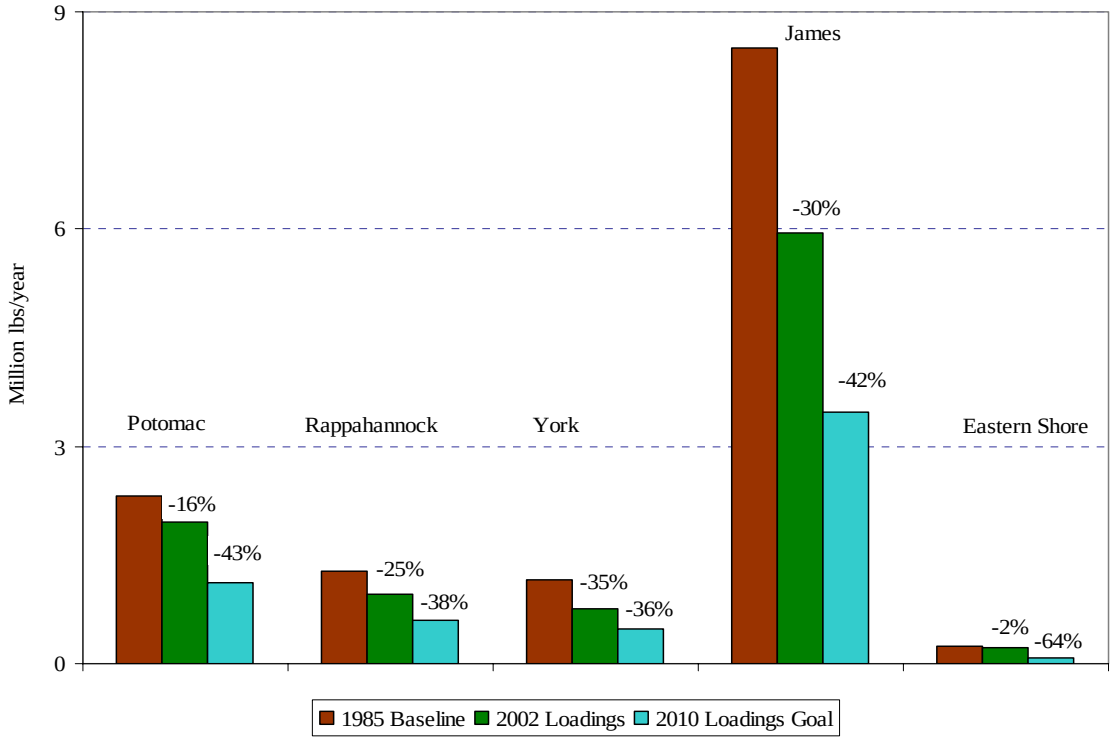
Recognizing the importance of nutrient reductions to the long-term sustainable health of the Bay, and responding to a 1999 ruling by the U.S. Environmental Protection Agency that the entire Bay was not meeting water quality standards, the Bay partners established the Chesapeake Bay 2000 agreement. Under the terms of this agreement, the 2010 goal for nitrogen loadings is 175 million pounds per year, a reduction of 48 percent from the 1985 baseline. The 2010 goal for phosphorus loadings is 12.8 million pounds per year, a reduction of approximately 55 percent from the 1985 baseline. These loading goals will then form an annual cap on discharges of these pollutants into the Bay. Overall, the Virginia 2010 goals for N, and P are decreases of 39 percent below 2002 levels. Population projections for 2020 for the Chesapeake Bay watershed are 11 percent (from 16.2 million to 18 million). This population increase could make these reductions increasingly difficult to meet. Reductions from the 1985 baseline loadings to the estimated 2002 loadings and the 2010 Virginia Tributary Strategy goals for N and P differ by watershed (figures 3 and 4).

Figure 3. Virginia nitrogen loadings by watershed



Source: Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy, January 2005

Figure 4. Virginia phosphorus loadings by watershed



Source: Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy, January 2005

Point sources such as wastewater treatment plants and factories are those which discharge pollutants through pipes or conveyances to surface water. Point sources are regulated under the federal Clean Water Act and state water quality acts. In general, the 2010 goals call for point sources to reduce discharges to the limit of available control technology.

Nonpoint sources discharge pollutants from many different locations, and include forest, agriculture, urban, mixed open, septic systems, and atmospheric sources. In general, nonpoint discharges are reduced by adoption of voluntary practices by landowners. Education plays a key role in securing and maintaining adoption of environmentally safe practices by landowners and other citizens. The Chesapeake Bay 2000 agreement calls for Virginia to secure Best Management Practice (BMP) adoption on 92 percent of all available agricultural land, on 85 percent of all mixed open lands, on 74 percent of all urban lands, and for 60 percent of all septic systems. Currently, only 30 percent of agricultural lands are covered by conservation BMPs. Approximately 40 percent of all agricultural land targeted for nutrient management plans have plans in place. The 2010 goal calls for 90 percent coverage of targeted lands—a little over 1 million acres under nutrient management. On urban land such as lawns, currently only 3 percent of land is covered by a nutrient management plan, while the 2010 goal calls for virtually all such land to have a nutrient management plan. Open mixed land includes parks, golf course, athletic fields, and other land not classified as urban use (usually in transition from agricultural use to urban use). Nearly one million acres of open mixed land needing nutrient management plans should be covered by nutrient management plans by 2010.

Other goals include consolidation of the Virginia Stormwater Management Program, enhancement of the Virginia Erosion and Sediment Control Program, and strengthening implementation of the Chesapeake Bay Preservation Act. These and other provisions of the 2010 goals will significantly affect urban and rural Virginia citizens. Considerable education and other efforts will be required to accomplish these goals. The Virginia Tributary Strategy document notes that, "[t]he Bay Act has been in place for 15 years in Virginia, yet many citizens and elected officials still are not fully informed about the program and its purpose."[3]

[3] Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy, January 2005, online at *www.naturalresources.virginia.gov/Initiatives/TributaryStrategies.* Last accessed 3 Apr 2005.

Local Government in Virginia

Virginia is a low-tax state. The total tax burden of state and local taxes as a proportion of personal income ranked Virginia 40th in the nation[1], and 37th in the nation in state and local spending per capita. Within the political context of a low-tax state and the desire to foster economic growth, local governments face recurrent, serious fiscal problems as they attempt to obtain resources to provide locally demanded services. The atypical structure of Virginia government further complicates such problems. Virginia is comprised of 95 counties, 39 independent cities, and 191 incorporated towns. Towns function as extensions of county government, but Virginia is unique in that independent cities have governing powers and taxing authority independent of and different from county government. Virginia is also one of a few states in the United States in which local governments are governed by Dillon's Rule. Under Dillon's Rule, local governments are granted limited powers by the General Assembly and must have legislative approval to institute changes such as tax programs.[2]

A board of supervisors and an administrator govern counties in Virginia and have traditionally concentrated on K-12 education, with a smaller proportion of expenditures dedicated to law enforcement and social services. Cities typically have higher population densities. A professional manager and city council normally manage cities and provide a broader range of services including education, crime prevention, social services, community development, and recreation. The distinctive roles of county and city governments have changed in recent years as counties in northern and eastern Virginia have become much more densely populated. For example, Arlington is a county, but has the second highest population density in the state (over 7,300 inhabitants per square mile) and offers a full range of services traditionally associated with a city.

For many years, considerable controversy has surrounded the proper role of local government in Virginia. Arguments are made that small local units of government are obsolete because they are too small to capture scale economies that reduce the unit costs of delivering services. But local government is not just about the delivery of services. Local governments have defined geographical boundaries entitling only people living within those boundaries to participate in community decisions.

[1] Thomas Jefferson Institute for Public Policy. "Where Virginia Ranks," University of Virginia, 2003. Online at *http://www.thomasjeffersoninst.org/pdf/articles/where_va_ranks.pdf*. Last accessed 3Mar. 05

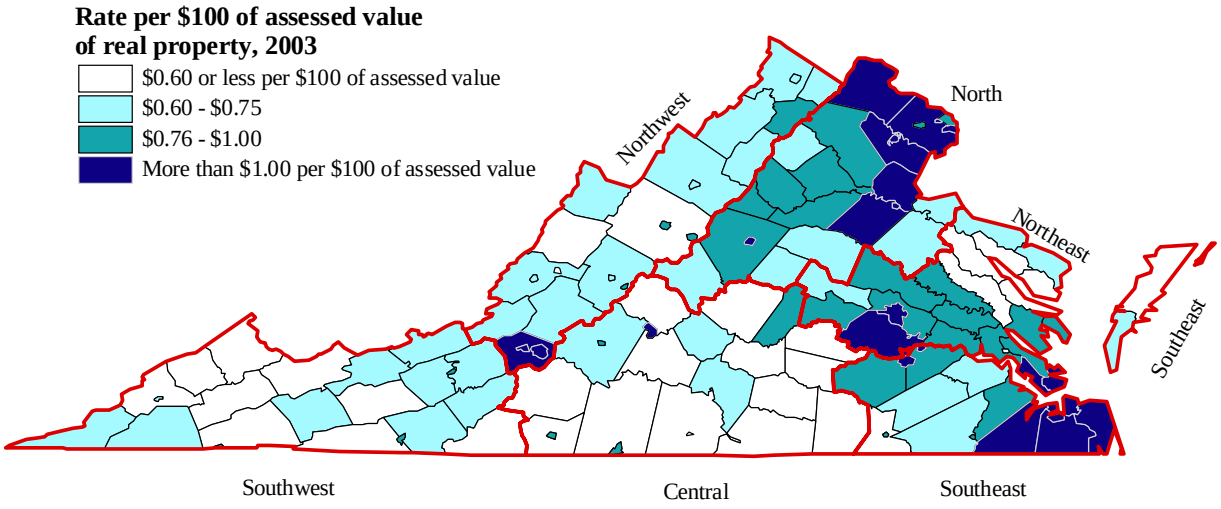
[2] For an in-depth discussion of Dillion's Rule, see "Variation on 'Mother, May I?': Dillon's Rule" by Jesse Richardson, November/December 1998, *Horizons*.

Local Government Taxes

Tax rates applied to real and personal property are the principal determinants of local government resources needed to provide services. Local governments have authority to alter property tax rates, although the General Assembly has forced changes in the categories and rates of property to be taxed. The reduction in the "car tax" was a major blow to the financial autonomy and stability of local government finances. Per capita property taxes paid in 2003 ranked Virginia 24th in the nation in 2003.

Local government real property tax rates vary widely across the state (Figure 1), with much higher rates in northern and southeastern Virginia, as well as in certain independent cities such as Richmond and Roanoke. More rural localities, including nearly all of Southwest, Central, and Northwest Extension Districts, have much lower property tax rates. Low tax rates at the local and state levels result in restricted government revenues for state and local services.

Figure 1. Rate per $100 of real property assessed value, 2003



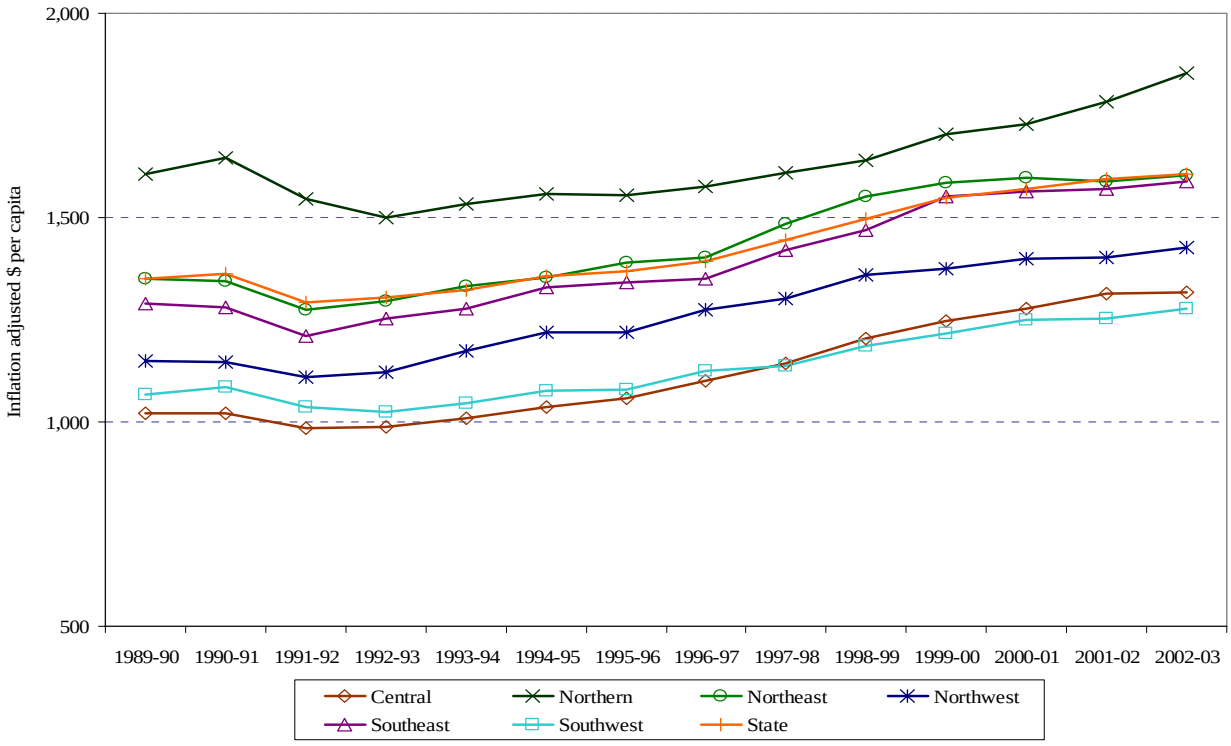
Source: Weldon Cooper Center for Public Service. "Tax Rates 2003, Table 2.1." Online at *http://www.virginia.edu/coopercenter/vastat/taxrates2003/taxrates03.html* Last accessed 3 Mar 05.

The temptation is to conclude that rural counties/cities should raise their tax rates to generate income and support economic development or local services. However, since families in economically depressed localities have lower disposable incomes, increasing tax payments to support economic development could create disproportionate financial stress.

Per Capita Local Expenditures in Inflation-Adjusted Dollars

Although unit cost of providing services is likely to depend upon the scale of government operations, an indicator of the cost of local services per resident is local government maintenance and operating expenditures per capita (Figure 2). Per capita local government expenditures show the same pattern as economic indicators—local governments in Central and Southwest Extension Districts are not able to provide services to their constituents on a par with those of other districts, and Northern District expenditures are increasing at a faster pace than any other region. Per capita inflation-adjusted expenditures in Southwest Extension District, the lowest-spending extension district, average 69 percent of expenditures in the Northern Extension District. Southwest and Central Extension District expenditures have typically been about 80 percent of the state average throughout 1989 to 2003.

Figure 2. Inflation-adjusted[a] per capita local government maintenance and operations expenditures by extension district, 1989 - 2003



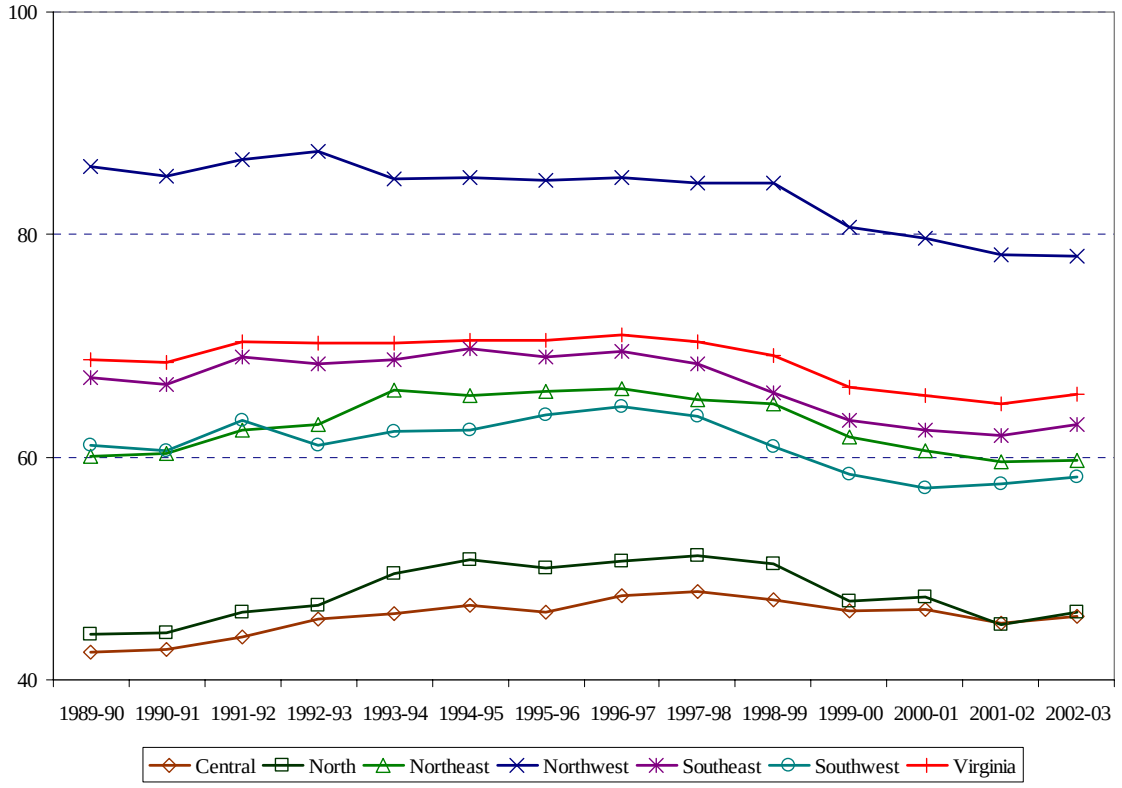
[a] Expenses adjusted based on 1989-90 as base year.

Source: Auditor of Public Accounts. *Comparative Report of Local Government Revenues and Expenses.* Various years. Online at *http://www.apa.state.va.us/local_government/comparative_cost.htm.* Last accessed 3 Mar. 05. Department of Labor. Consumer Price Index, All Urban Consumers, 1982-84. Online at *http://www.bls.gov/cpi/home.htm#data*. Last accessed 5 Mar. 05.

Local Government Financial Stability

The financial stability of local governments can be measured by the degree to which they are self-supporting Local governments in Southwest, Central, and Northwest Extension Districts have generated 40 to 50 percent of their operating expenditures from local revenues from 1989 to 2003 and have been dependent on formula or legislated funding from the General Assembly for the remainder. Relatively small cuts in state funds may dramatically affect the ability of these local governments to provide services. By comparison, the communities of Northern Extension District have traditionally generated between 80 to 90 percent of their own operating expenditures, although this proportion fell with forced reductions in the "car tax" (Figure 3). Local governments in all extension districts are more reliant on funds from the General Assembly than they were in the mid-1990s.

Figure 3. Local revenues as percent of local expenditures



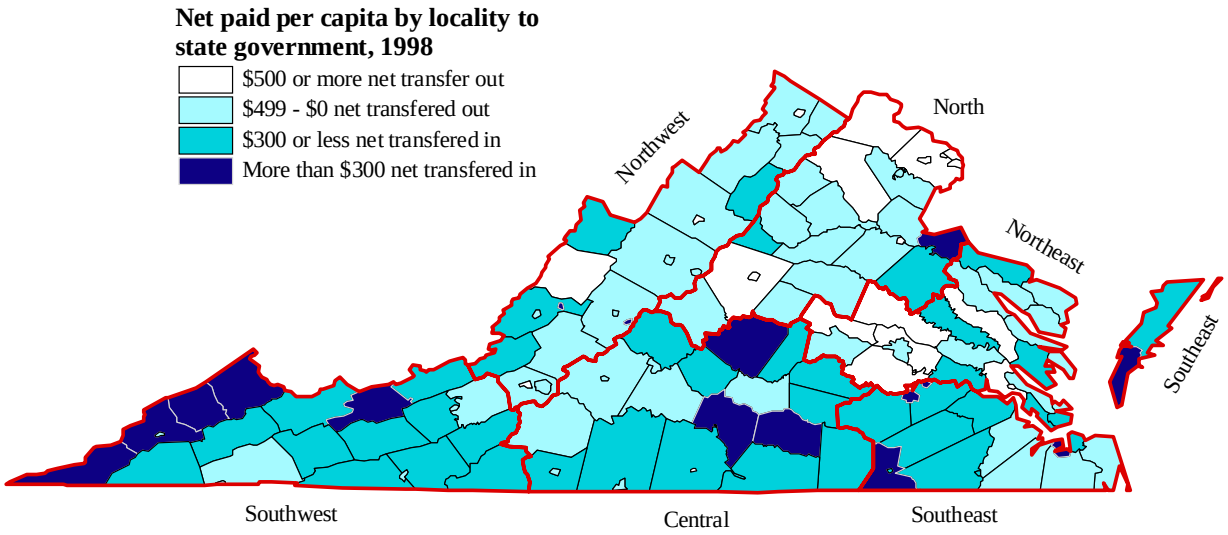
Source: Auditor of Public Accounts. *Comparative Report of Local Government Revenues and Expenses.* Various years. Online at *http://www.apa.state.va.us/local_government/comparative_cost.htm.* Last accessed 3 Mar. 05.

Local Government Subsidies from the State

All local governments receive considerable assistance from the state. Much of that assistance is for K-12 expenditures, but other local government functions are also supported with state monies. Some local governments receive a substantially larger share of their total spending from state coffers than others through redistribution of income and sales taxes and other state revenue sources.

In conjunction with work for the Rural Virginia Prosperity Commission, a special analysis of state/local budget transfers was conducted for fiscal year 1998. The findings are startling. In 1998, the more affluent counties/cities sent an estimated $346 million more to Richmond than they received to support local expenditures (Figure 4). Of this total, $189 million was redistributed to 42 rural counties and 4 independent rural cities. Expressed on a per capita basis, the subsidy is nearly $2,000 per capita from Fairfax County and somewhat less for other affluent counties and cities. In a policy, political, and social context, this transfer is unlikely to be politically stable or sustainable.[3]

Figure 4. Net per capita transfers to/from state government, 1998



Source: Special study, Va. Dept. of Taxation, 1998

[3] For further discussion, see Purcell, Wayne, 2004. "Information is Not Just Data," *HORIZONS*, Nov/Dec, REAP Program, Department of Agricultural and Applied Economics, Virginia Tech.

One final point needs be made about local governments in Virginia: K-12 education dominates the financial concerns and the budgets of all local governments in the state. However, great differences exist among local governments in education expenditures as a proportion of total spending. Education funding in 2001 - 2002 as a proportion of local government budgets ranged from over 70 percent in counties such as Augusta and Spotsylvania to less than 35 percent in cities such as Lexington and Williamsburg. Where education dominates local spending, fewer other services are provided to citizens. More affluent local governments have more flexibility to devote time and resources to non-education services.

Local Government in Perspective

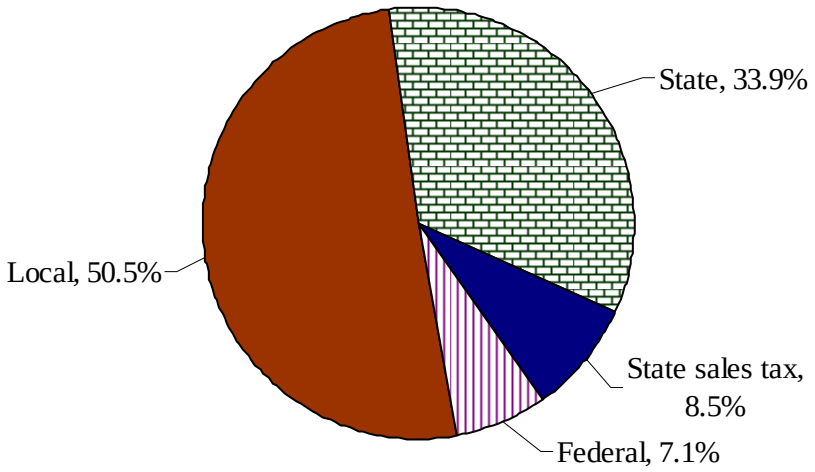
Because of the Dillon's Rule organization of Virginia government, local governments are in chronic crisis as they seek revenues to support locally demanded services. Local governments will not overlook recently enacted state reforms allowing greater autonomy for colleges and universities and are likely to press their case for more local government autonomy. The more independent, affluent localities are likely to raise more the effective objections to the state revenue transfers to poorer governments. The result of their objections has serious implications for the well-being of less affluent communities.

K-12 Education in Virginia

K-12 education is a responsibility of the states under the U.S. Constitution, but differences are common among the states in the means of financing education. Typically, the local school district (whether an agency of local government or an independent agency with its own taxing authority) is responsible for organizing, partially funding, and managing schools. The state government supplements local resources, hopefully achieving a spending level commensurate with standards established by the state. K-12 education in Virginia is organized and managed by this method. Total state and local per capita government spending on education K-12 was 17th in the nation in 2003, while K-12 per pupil spending ranked 38th[1]. Considering only state spending, Virginia ranks 49th in the nation.

In fiscal year 2003, Virginians spent approximately $9.44 billion on operating their public schools (Figure 1). Slightly over one-half of total expenditures came from local government coffers, compared to 43 percent across the U.S. The federal government has considerable influence in local educational policies and procedures through such legislation as the No Child Left Behind Act (2001), but it contributed only 7.1 percent of Virginia K-12 funding (compared to the average of 8.1 percent nationwide). The state government, through direct allocations and transfers of state sales taxes collected in the locality, contributed 42 percent of total funding, as compared to the average of 49 percent nationwide for state funding.

Figure 1 Virginia expenditures on K-12 budget, fiscal year 2003



Source: Virginia Dept. of Education. "Table 15 - Sources of Financial Support for Expenditures, Total Local Expenditures for Operations and Total Per Pupil Expenditures for Operations, Fiscal Year 2003." Online at *http://www.pen.k12.va.us/VDOE/Publications/rep_page.htm*. Last accessed 1 Mar. 05.

Spending per pupil on K-12 education is one measure of investment in education, although cost-of-living and other cost differences complicate comparisons across states and regions. In 2001-02, local and state per pupil expenditures varied across the nation from $4,706 to $13,993 per pupil with a median expenditure of $7,201. Virginia ranked 41st among all states in expenditures per pupil (Table 1), with expenditures only 84 percent of the national average. Among comparable states, Virginia expenditures per pupil were lower than all states except Tennessee.

[1] Thomas Jefferson Institute for Public Policy. "Where Virginia Ranks," University of Virginia, 2003. Online at *http://www.thomasjeffersoninst.org/pdf/articles/where_va_ranks.pdf*. Last accessed 3Mar. 05

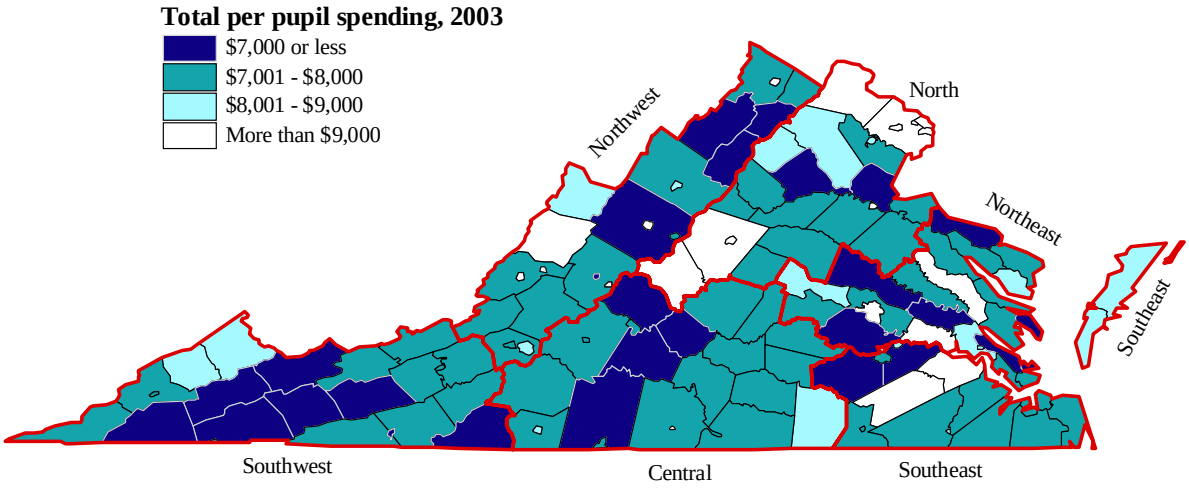
Table 1. Expenditures per pupil, 2001-02

State	National rank	Dollars per pupil
Maryland	22	7,658
North Carolina	40	6,364
Pennsylvania	15	8,070
Tennessee	46	5,947
Virginia	41	6,343
US		7,532

Source: NEA, Rankings and Estimates. "Table H-10. Current Expenditures for Public K.12 Schools per Student in Fall Enrollment as Percentage of National Average, 2001.02 (Revised)." Online at *www.nea.org/edstats/images/04rankings.pdf*. Last accessed 1 Mar. 05

Per pupil total spending across Virginia in 2003 varied from a low of $6,353 in Page to $14,717 in Arlington. Approximately 70 percent of localities spend below the 2003 state average of $7,942 per pupil, while 20 localities spend more than $10,000 per pupil (Figure 2).

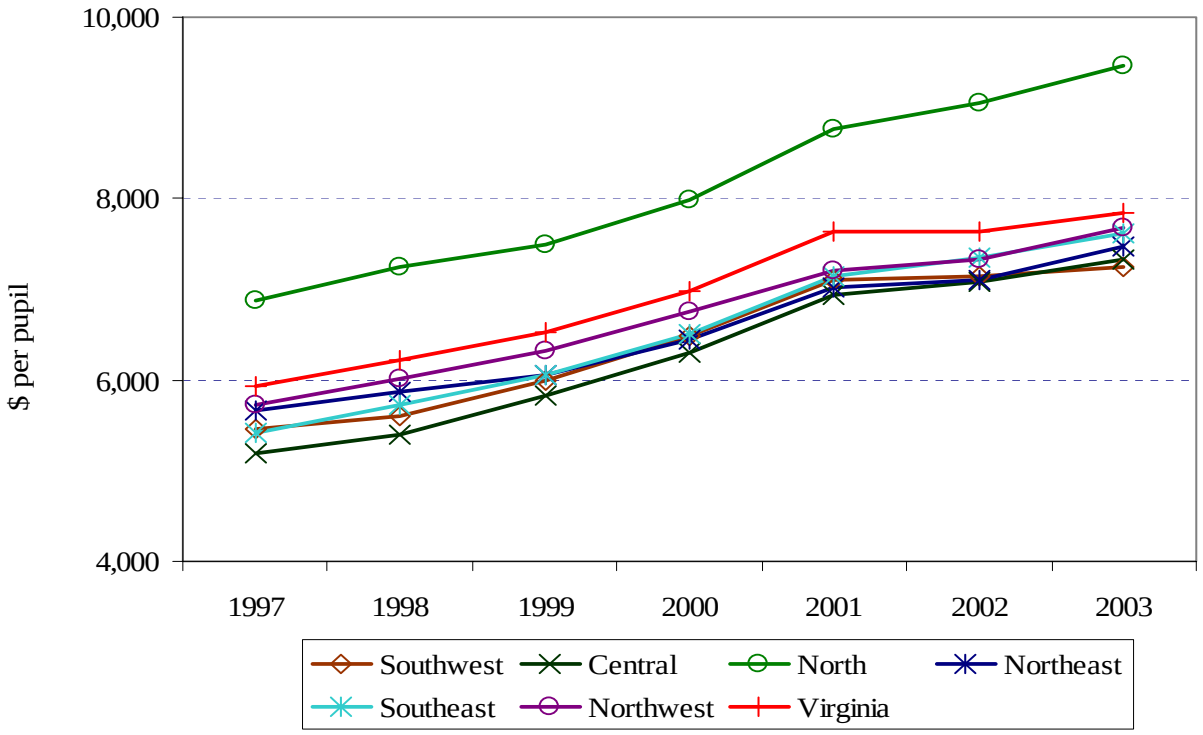
Figure 2. Per pupil spending on education, 2003



Source: Virginia Dept. of Education. "Table 15 - Sources of Financial Support for Expenditures, Total Local Expenditures for Operations and Total Per Pupil Expenditures for Operations, Fiscal Year 2003." Online at *http://www.pen.k12.va.us/VDOE/Publications/rep_page.htm*. Last accessed 1 Mar. 05.

Across all extension districts except for Northern Extension District, expenditures per pupil on average vary between $7,200 and $7,700 per pupil (Figure 3), and the difference between districts did not change markedly from 1997 to 2003. Northern Extension District is the dramatic exception, with total expenditures per pupil of nearly $9,500 per pupil in 2003. With approximately two-thirds of total expenditures coming from local sources, Northern Extension District schools are increasing their lead in educational spending per pupil each year.

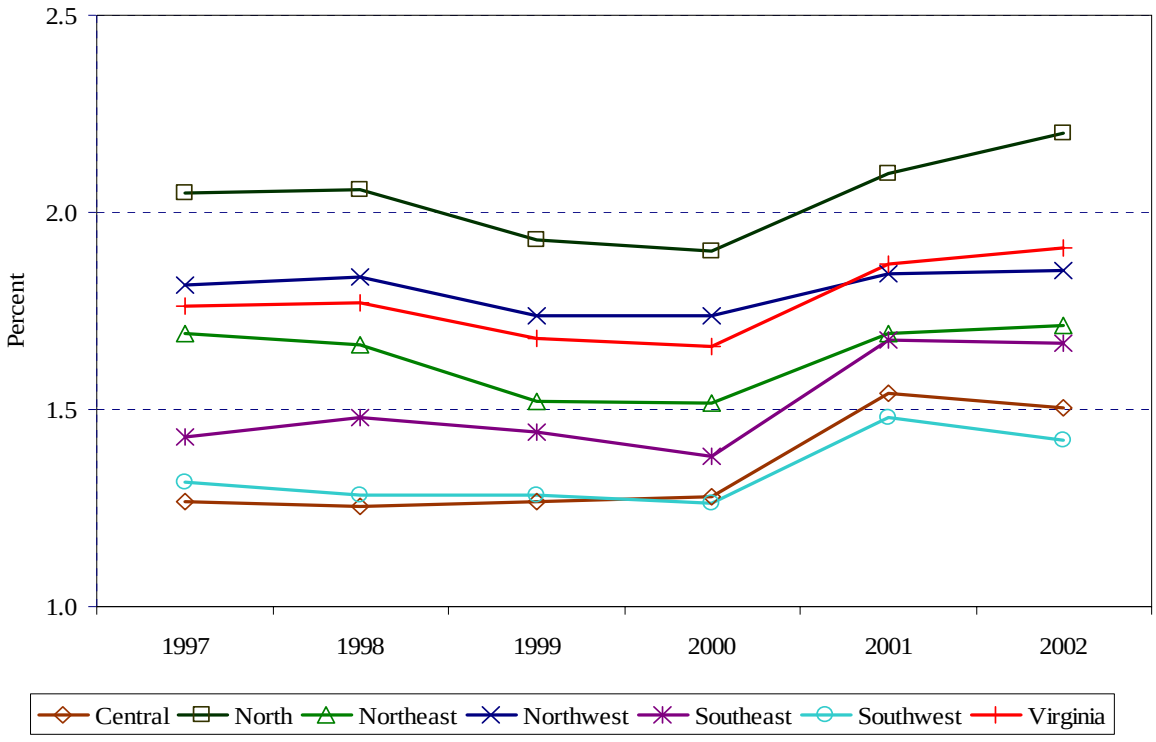
Figure 3. Per pupil total expenditure, 1997 - 2003



Source: Virginia Dept. of Education. "Table 15 - Sources of Financial Support for Expenditures, Total Local Expenditures for Operations and Total Per Pupil Expenditures for Operations, Fiscal Year 2003." Online at *http://www.pen.k12.va.us/VDOE/Publications/ rep_page.htm*. Last accessed 1 Mar. 05.

Per pupil expenditures do not measure the effort expended in supporting local schools. Residents of localities with more resources are better able to pay taxes that finance schools, while those in poorer localities may be forced to dig deeper into their pockets, even though they spend much less per pupil. Across extension districts, local spending on schools has varied from about 1.4 percent to 2.2 percent of the total personal income (Figure 4). Residents of Northern Extension District have consistently spent a higher proportion of their incomes on local schools than other districts. On the other hand, citizens of Southwest and Central Extension Districts have spent approximately one-half percent less of their lower personal income on local schools than the Virginia average. Overall, most citizens are carrying a somewhat heavier burden for K-12 education in the latter years of the 1997 to 2002 period.

Figure 4. School spending from local sources as a proportion of local personal income by extension district, 1997-2002

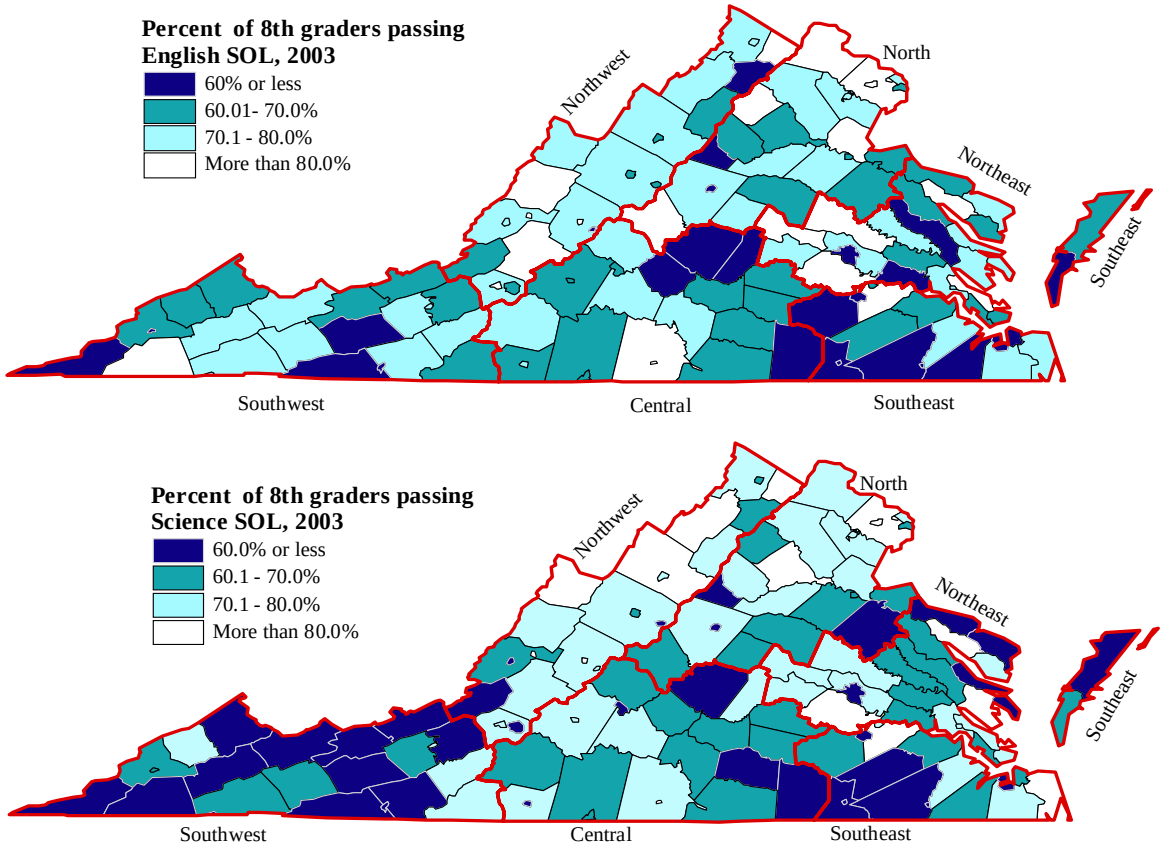


Source: BEA. "Personal Income." Regional Economic Information System Data, 1969 – 2002. Found at *http://www.bea.doc.gov/bea/regional/statelocal.htm*. Last accessed 1 Mar. 05. And Virginia Dept. of Education. "Table 15 - Sources of Financial Support for Expenditures, Total Local Expenditures for Operations and Total Per Pupil Expenditures for Operations, Fiscal Year 2003." Online at *http://www.pen.k12.va.us/VDOE/Publications/rep_page.htm*. Last accessed 1 Mar. 05.

Standards of Learning (SOL)

The primary goal of educational systems is to produce young people who have the necessary skills to enter the work force and who are prepared to participate in the society as citizens. The educational output measures currently required by federal and state governments are the Standards of Learning (SOL) tests. Test scores have generally improved in the past three years, but little evidence is available to associate test score results with increased skills and job performance. Marked differences are seen in Science and English test score performance across Virginia (Figure 5). English scores among eighth-graders are particularly poor in Central and Southeast Extension Districts, some southwest counties, and various other scattered counties. Science scores are lower among Virginia eighth-graders and are more clustered in Southeast, Central, and Southwest Extension Districts. In general, these variations are consistent with differences in school expenditures and other socio-economic indicators across the state. Whether these differences persist over time is a subject for further research.

Figure 5. Percent of 8th graders passing English and Science SOL tests, 2003

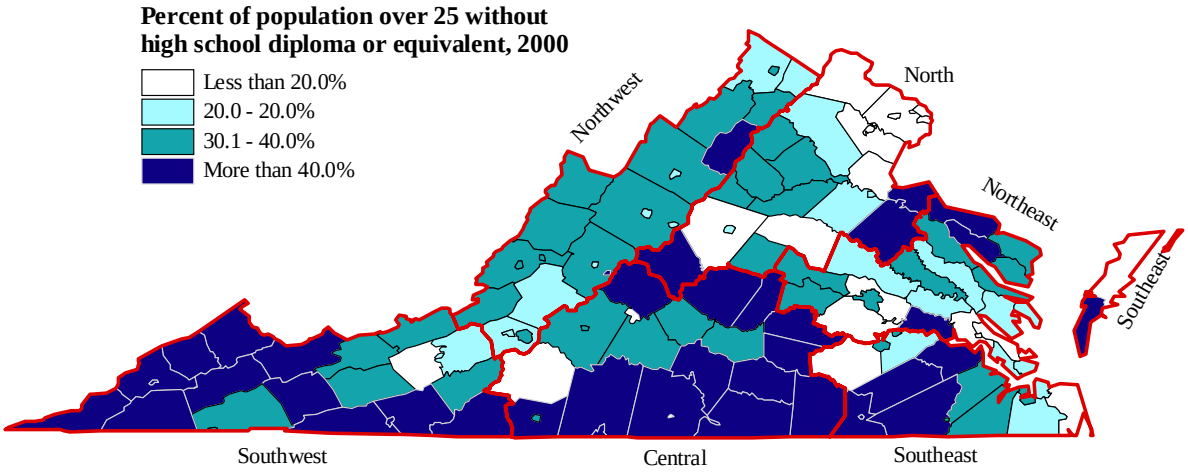


Source: Virginia Dept. of Education. Assessment, "2001-2003 School-by-School SOL Assessment Results." Online at *http://www.pen.k12.va.us/VDOE/Assessment/home.shtml*. Last accessed 1 Mar, 05.

The effects of past low spending on K-12 education and poor school retention rates are highlighted by the incidence of individuals without at least a high school diploma or equivalent (Figure 6). Adults without a high school diploma or General Educational Development (GED) degree primarily live in the Southwest, Central, and Southeast Extension Districts. The proportion of individuals with low educational achievement is exacerbated by long-term state budget cuts for public education and the migration of younger, better educated individuals leaving rural communities in search of jobs and economic

opportunities. The population of adults without a high school diploma will struggle finding employment in the emerging information and technology economy. Adult education and workforce enhancement will be very important to this set of people.

Figure 6. Percent of population over 25 without high school diploma or equivalent, 2000



Source: U.S. Bureau of Census, Census 2000 Summary File 3 (SF 3). Online at *http://factfinder.census.gov/*. Last accessed 7 Mar. 05.

Virginia K-12 Education in Perspective

This brief analysis of K-12 education has focused primarily on education financing, which is only one among many issues surrounding education in Virginia. Other major issues include social problems such as teen pregnancies and drug and alcohol abuse among students, economic problems such as low family incomes encouraging students to drop out of school to accept low paying jobs, and many other socio-economic, demographic, family-related, and community-related problems.

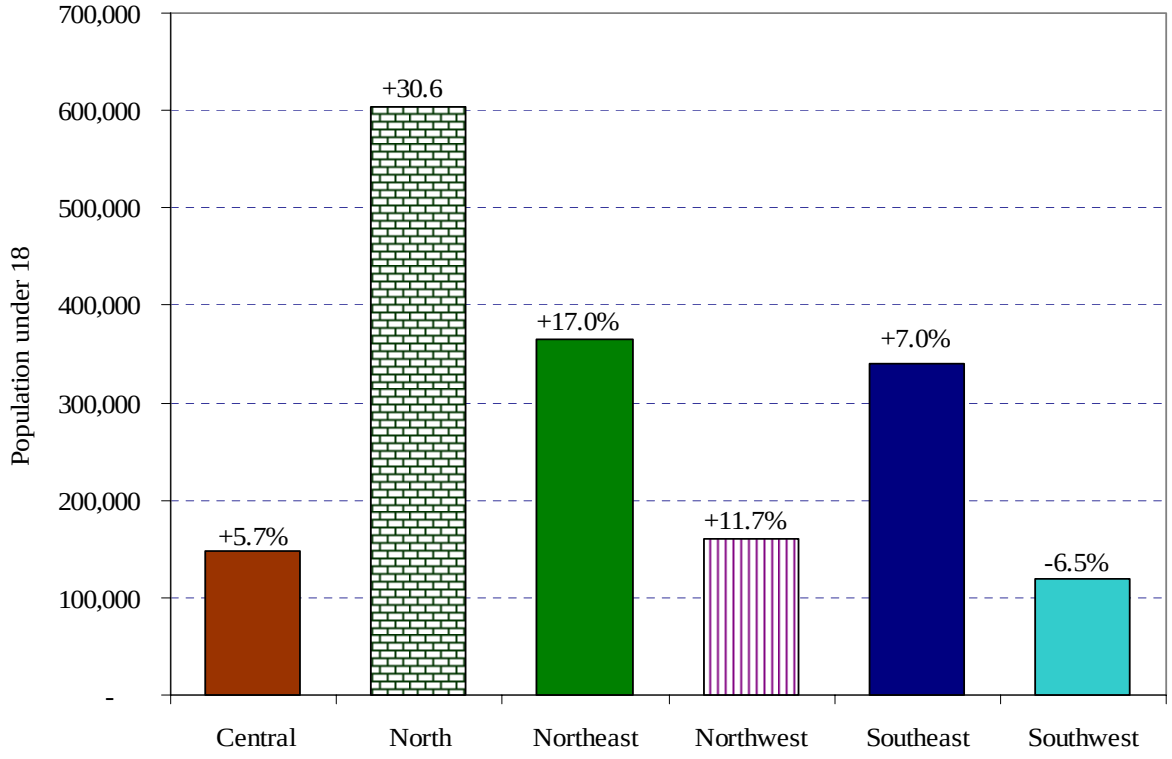
Children, Youth, and Families

Youth

In 2000, over 1.7 million Virginians were under 18 years of age, an increase of 15.5 percent from the 1990 Census. As these young Virginians pass through the school system and enter the workforce, public concern is for issues such as the quality of their education, their healthcare, and their behavior as citizens.

More than 600,000 young Virginians (35 percent) live in Northern Extension District. The youth population in this extension district has grown by more than 30 percent since 1990 (Figure 1). More than three-quarters of the population under 18 lives in North, Northeast, and Southeast Extension Districts. This burgeoning population poses major challenges for a wide-ranging set of issues such as daycare, schooling, and juvenile behavior. With a much smaller population under 18 in Central, Southwest, and Northwest Extension Districts, additional concerns are of population and workforce replacement. Will the regional economy generate enough jobs to support these young people as they enter the workforce? Will their communities promise a quality of life that will entice young people to settle in the region?

Figure 1. Percent change in population under 18 years old, 1990 - 2000

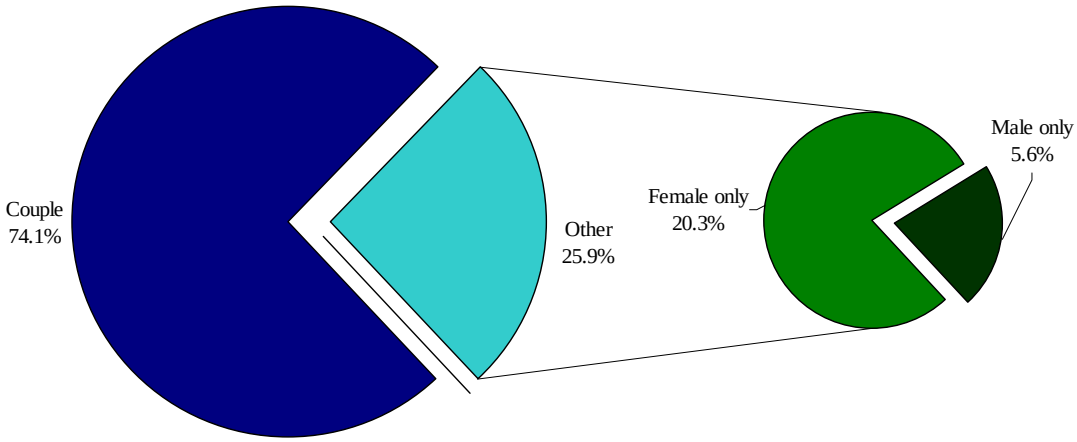


Source: US Census Bureau. P8, Sex by Age, SF 3. 2000 Census. And P013, Age, STF 3. 1990 Census. Online at *http://www.census.gov/Press-Release/www/2002/sumfile3.html*. Last accessed 1 Mar. 05.

Family Structure

Virginia family structure has changed, along with the rest of the U.S. Over one-quarter of Virginia households with children under 18 are not headed by married couples. Most of these non-traditional households are headed by single mothers (20.3 percent), but more than one Virginia household in 20 with children under 18 is now headed by either a single father (Figure 2). Of the 140,015 grandparents living with grandchildren, 42.5 percent are responsible for the grandchildren. Issues of daycare and parenting support are critical for these non-traditional families.

Figure 2. Heads of households with children under 18, 2000

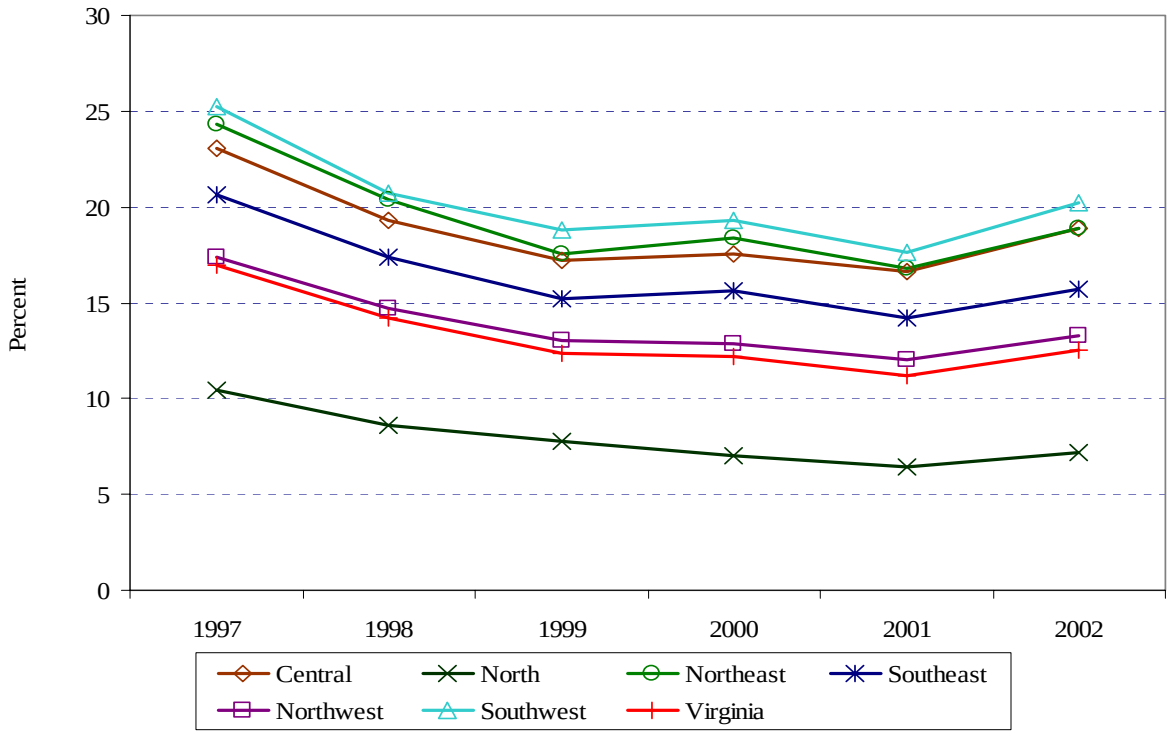


Source: US Census Bureau. "Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data." Online at *http://www.census.gov/Press-Release/www/2002/sumfile3.html*. Last accessed 1 Mar. 05.

Poverty

The proportion of the youth population under 18 that fell below the poverty level decreased by nearly one-quarter across the U.S. from 1997 to 2002. In Virginia, the decline slightly exceeded the U.S. average. Across extension districts, poverty rates for children declined through 2001, but rose in 2002 (Figure 3). Northern Extension District has much lower poverty rates than any other extension district, while approximately one child in five in Central, Southwest, and Northeast Extension Districts lives in poverty. Generally good economic conditions during the period are the likely cause of decreased poverty, as well as the increase in 2002.

Figure 3. Percent of population under 18 in living poverty, 1997 – 2002

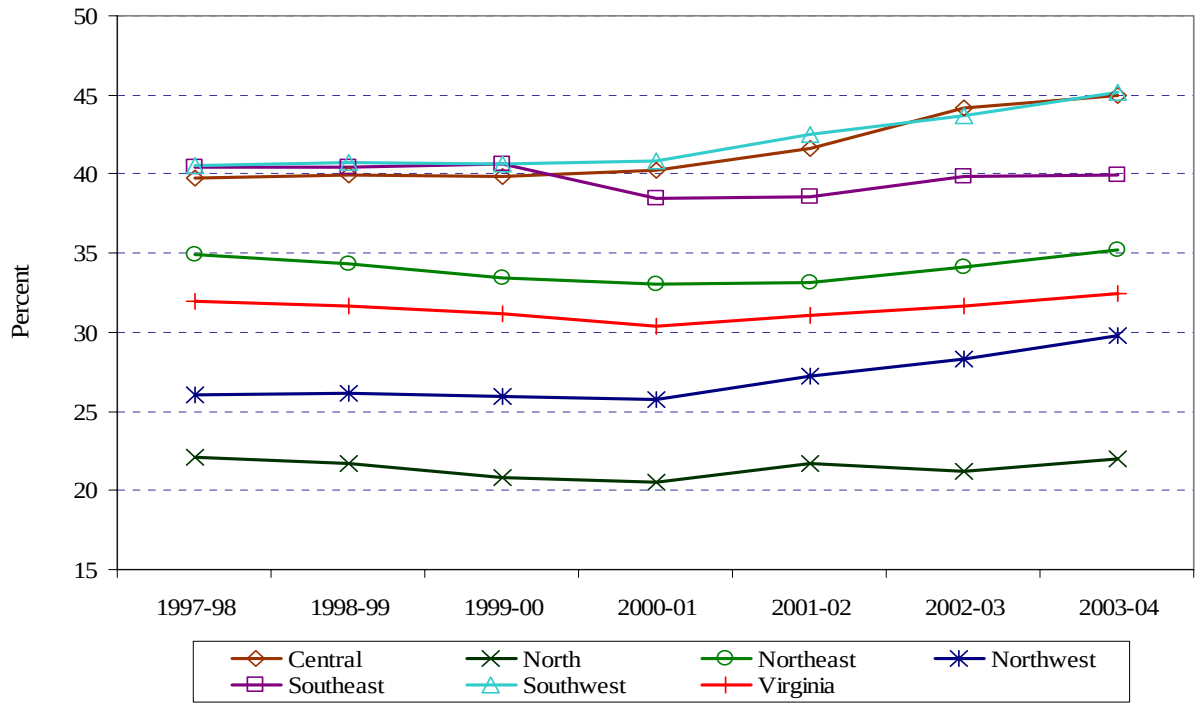


Source: US Census Bureau. Small Area Income & Poverty Estimates Annual Estimates for States, Counties & School Districts. Online at *www.census.gov/hhes/www/saipe/county.html*, Last accessed 7 Feb 2005

Free and Reduced Price Lunch

Children are eligible for free lunches if the family income is below 130 percent of the poverty level or for reduced price lunches if the family income is between 130 and 185 percent of the poverty level. While rates of children living in poverty have improved, the proportion of school children qualifying for free or subsidized school lunches is increasing (Figure 4). If the poverty level remained unchanged, this increase in free or reduced price lunches suggests that many family incomes throughout Virginia are still dangerously close to poverty. In Southwest and Central Extension Districts, 45 percent of the children qualified for free or subsidized school lunches in 2003-04 school year. In contrast, the proportion of children qualifying in Northern Extension District was one-half that of Central and Southwest Extension Districts in 2003-04. The proportion of qualifying children has trended upward since 2000-01 in all districts except Southeast Extension District, with the largest increases observed in Central, Southwest, and Northwest Extension Districts.

Figure 4. Schoolchildren receiving free and reduced priced meals by Extension District, 1997-2004.



Source: Virginia Department of Education. Data and Publications, School Nutrition. Various years. Online at *http://www.pen.k12.va.us/VDOE/Finance/Nutrition/statistics.html.* Last accessed 1, Mar. 05.

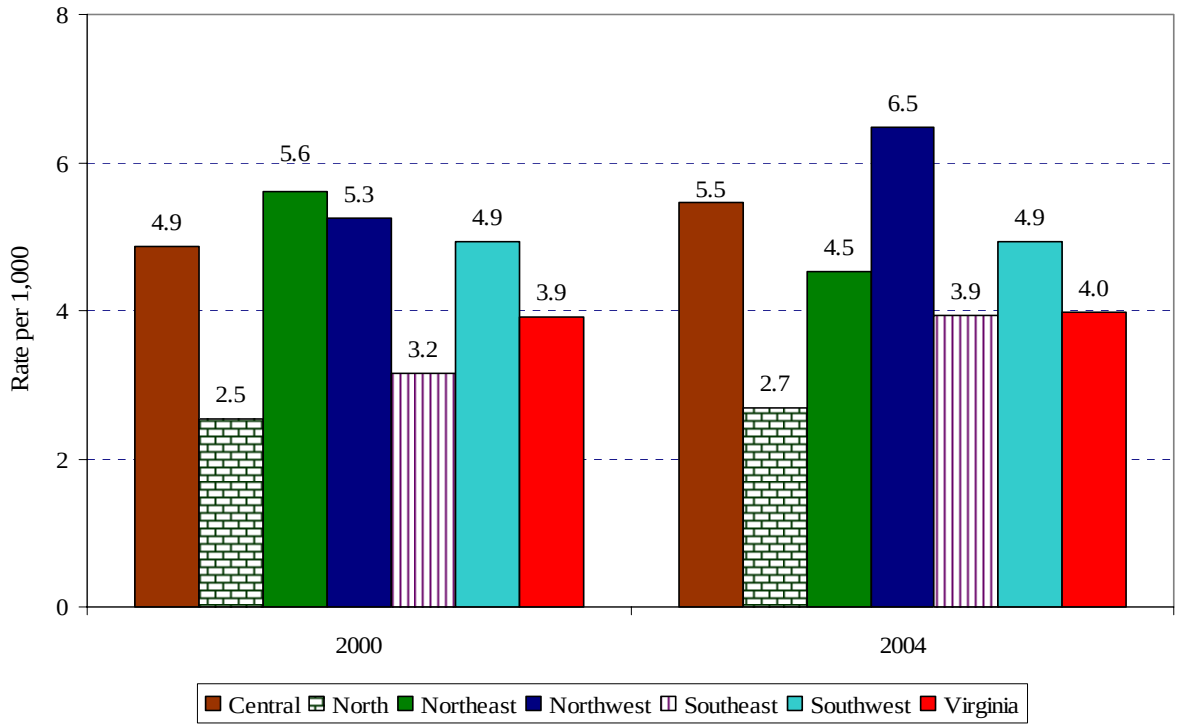
Health

Health insurance coverage is the major mechanism to assure good health among the youth population. In 2001, Virginia ranked 22nd in the nation in the proportion of children without health insurance. The national average rate of non-coverage was 12 percent, while Virginia's rate was 10 percent.

Foster Care

Clearly, foster care children are at risk. They are children who have runaway from home, who are in a trial-home placement, who were abused, whose parents are absent, ill or disabled, or in some non-home (residential facility) placement probably because of delinquent behavior. The state rate has remained relatively constant at 4 children in foster care per 1,000 in the population (Figure 5). Among extension districts, Northwest Extension District had the highest rate of children in foster care in 2004, and Northern Extension District had the lowest rate. Northeast Extension District saw a decrease in the rate of foster care between 2000 and 2004, and Southwest Extension District remained stable, but rates of other extension districts increased. Further analysis would be required to determine whether public or private programs have affected foster care rates or if the decreases are a lack of foster parents.

Figure 5. Rates of children in foster care by Extension District, 2000 and 2004



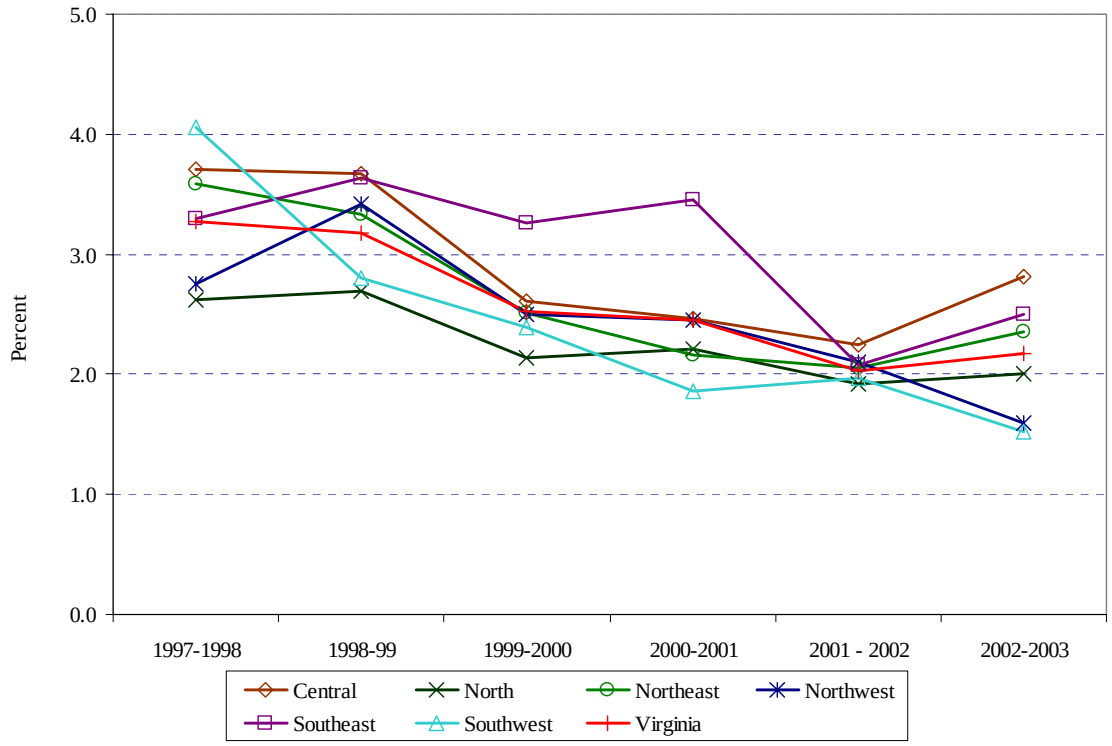
Source: The Annie E. Casey Foundation. Kids Count Data Book. Online at *http://www.aecf.org/kidscount/databook*. Last accessed 1 Mar. 05.

School Dropouts

Besides academic programs, other programs or activities that keep youth in school may make significant differences in their lives. An important indicator of the success of such efforts is the school dropout rate. Two measures are presented which give contradictory implications, partly because of very different definitions of a school dropout.

Under the Virginia state government definition, the dropout rate declined from the 1997-98 through the 2001-02 school years (Figure 4). Improvements in the dropout rate were quite consistent across extension districts, although the dropout rate increased in most extension districts during 2002-03. Only the Central Extension District rate was above 2.5 percent in 2002-03, but this relatively high dropout rate appears more permanent than transient. Improvements were most dramatic in Southwest Extension District, which saw its dropout rate plummet from over 4.0 percent to only 1.5 percent in 2002-03. The implication is that new efforts to reduce the dropout rate are in action in many schools, but more analysis would be required to confirm the effects.

Figure 5. School Drop-out Rates, 1997-98 to 2002-03 school years



Source: Virginia Department of Education Data and Publications. Annual Report of the Superintendent. Various years. Online at *http://www.pen.k12.va.us/VDOE/Publications/rep_page.htm.* Last accessed 2 Mar. 05.

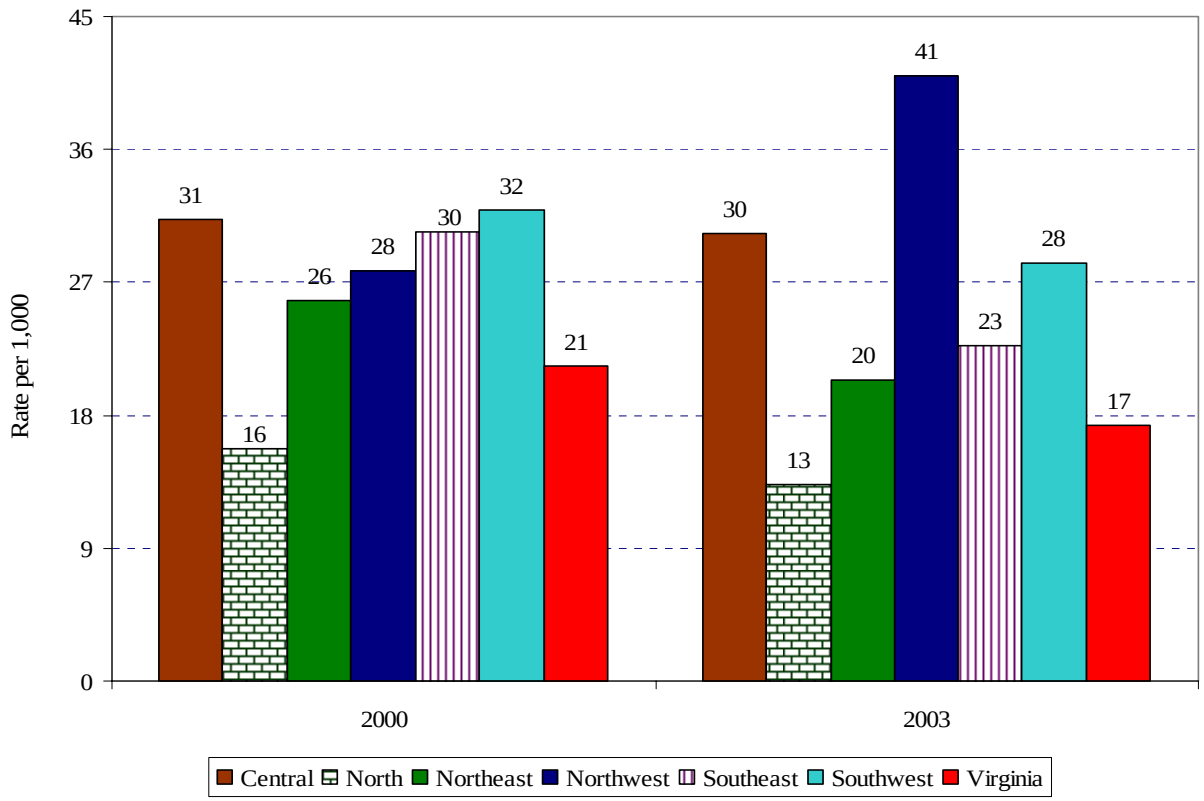
Different conclusions can be drawn from national data comparing state dropout rates defined as the proportion of the 16 to 19 age population that are not in school and have not graduated.[1] Under this definition, Virginia's dropout rate averaged 8 percent in 1995-97, and remained at 8 percent in 2000-02, when Virginia tied for 7th lowest dropout rate. Since this definition is cumulative over the 16 to 19 age population, it can be expected to be higher than the rates from the Virginia Department of Education, but the evidence of improvement is not apparent in the national data as it is in the Department of Education.

[1] The Annie E. Casey Foundation. The Kids Count Data Book. Online at *www.aecf.org/kidscount/databook/rawdata/auxiliary1.pdf.* Last accessed Feb. 28, 2005

Teen Birth Rates

The career and life opportunities of teenage mothers are often more limited than their age cohorts. Reducing teenage pregnancies is seen as a high priority objective in Virginia. The Virginia teen birth rate fell by nearly 20 percent between 2000 and 2003. However, evidence is much more mixed at the extension district level. The Northwest Extension District teen birth rate increased sharply to 26 births per 1,000 teenage females. Central, Southeast, and Southwest Extension District rates remained relatively constant, while Northeast and North Extension Districts saw sharp declines. Since nearly one-half of Virginia teenage females live in Northeast or North Extension Districts, their teen birth rate declines dominated the state results.

Figure 6. Teen births, rate per 1,000, 2000 and 2003

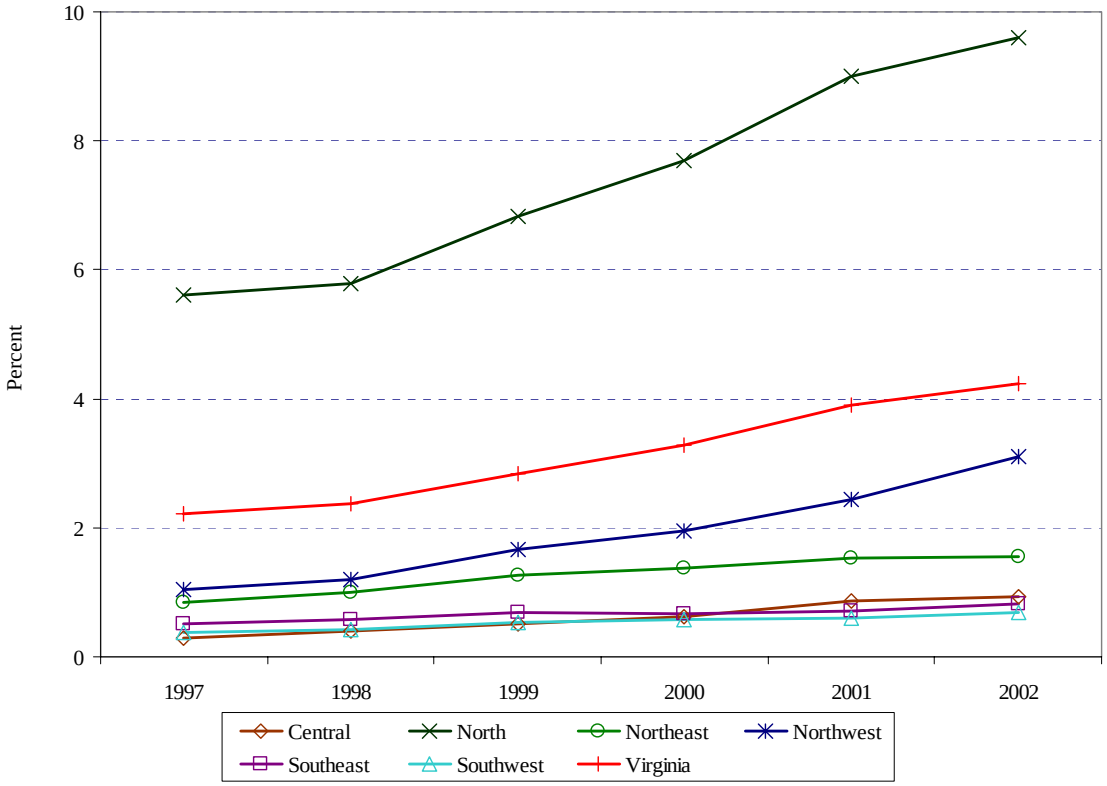


Source: The Annie E. Casey Foundation. Kids Count Data Book. On line at *http://www.aecf.org/kidscount/databook*. Last accessed 1 Mar. 05.

Limited English Language

Children of new immigrants and others with limited English ability have considerable difficulties to overcome. In the Southwest, Southeast, and Central Extension Districts, fewer than 1 percent of students have limited English (Figure 6). In extension districts with abundant economic opportunities and hence more in-migration from across the U.S. and foreign countries, larger numbers of school children have limited English. The proportion of students in Northern Extension District with limited English ability is climbing rapidly. In 2002, it reached nearly 10 percent of the school population (over 39,000 students). Northwest Extension District has also seen an increase in students with limited English, albeit on a smaller scale than the Northern Extension District.

Figure 7. School students with limited English proficiency

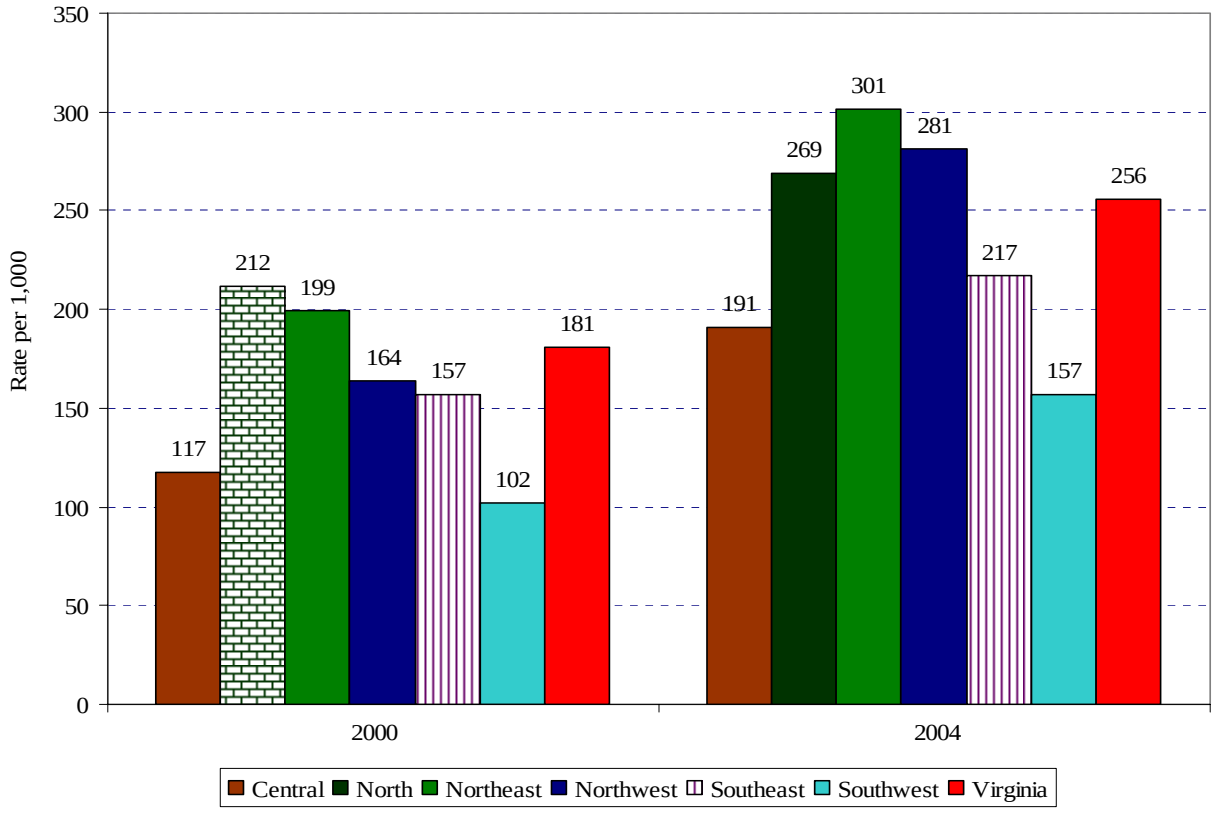


Source: Virginia Department of Education Data and Publications. Limited English Proficiency September 30. various years. Online at *http://www.pen.k12.va.us/VDOE/Publications/rep_page.htm.* Last accessed 2 Mar. 05.

Availability of Childcare Facilities

Access to childcare improves the well being of children, contributes to stability of families striving to earn incomes and meet family obligations for children, provides greater access of potential workers to the labor force, and contributes to economic development. Economic growth may also stimulate development of more childcare. Daycare slots in Virginia have increased considerably between 2000 and 2004. Large disparities are seen in access to childcare facilities among the extension districts (Figure 7). Over the period from 2000 to 2004, the total number of child care slots has increased, with the largest increases in slots per 1,000 being in Northwest Extension District (117 slots/1,000) and Northeast Extension District (102 slots/1,000). Southeast and Central Extension Districts have exhibited the greatest percentage growth in access to child care.

Figure 8. Number of childcare slots per 1,000, 2000 and 2004



Source: The Annie E. Casey Foundation. Kids Count Data Book. Online at *http://www.aecf.org/kidscount/databook*. Last accessed 1 Mar. 05.

Children, Youth, and Families in Perspective

Many other critical issues need to be examined with respect to Virginia's children, youth, and families. One for which little analytical data are available but the public perception is an overriding problem is drug use among youth. Another issue is the impact of nontraditional family structures, that is heads of households such as single-parents or grandparents, on children's behavior, school performance, and other measures. Improved data collection and analysis could contribute to more effective and informed discussions of youth issues.

Health in Virginia

Health issues involve complex combinations of personal, racial, ethnic, social, and economic factors that influence individuals and the community. This report does not attempt to survey the entire array of Virginia health issues. Instead, we have chosen two phenomena that are of intense concern among the public and the medical community: overweight/obesity and the often-related disease of diabetes.

Overweight and Obesity

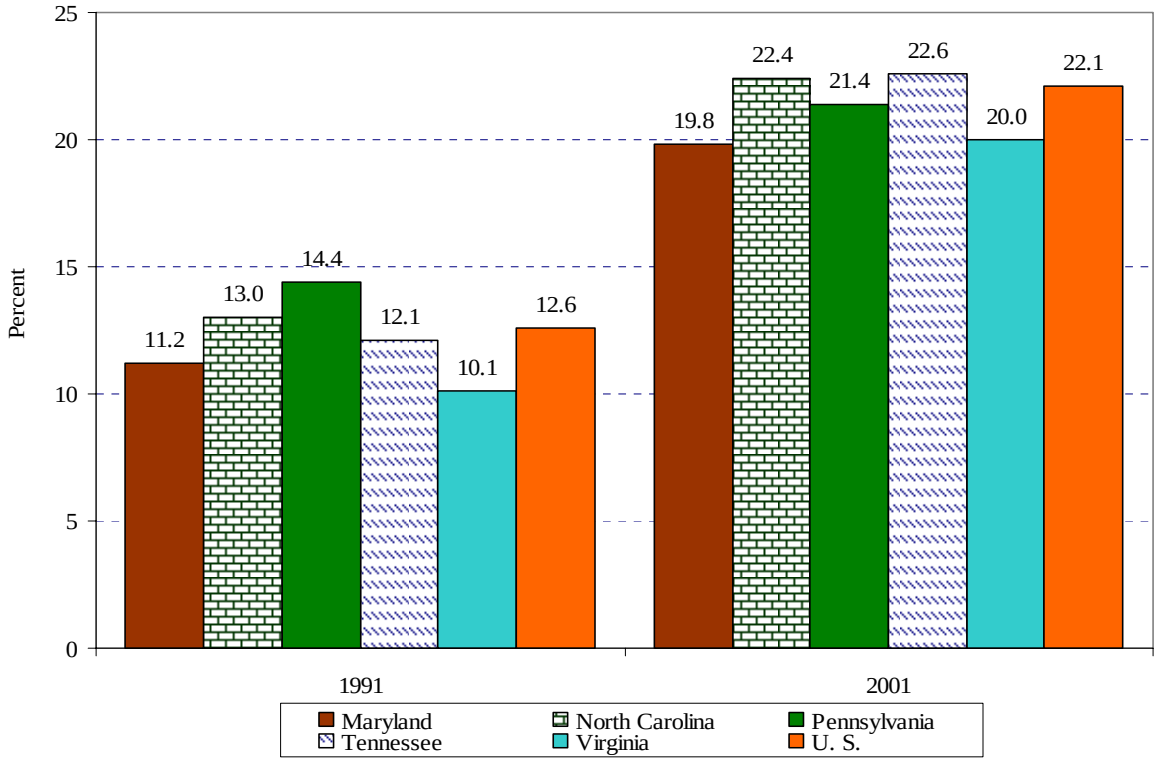
Overweight and obesity[1] are generally the result of inadequate exercise and high caloric intake, although they can also be hereditary. Insufficient exercise can lead to needing more medication, visiting a doctor more often, and being hospitalized more often. "People who are overweight or obese increase their risk for cardiovascular disease, diabetes, high blood pressure, arthritis-related disabilities, and some cancers."[2]

From 1991-2001, the proportion of the U.S. population that is overweight or obese has nearly doubled (Figure 1). All comparable states saw an increase of 7 to 10 percent of their populations who are overweight or obese. While Virginia's population is shows the same increases in overweight and obesity, Virginia has the lowest proportion of overweight individuals and the second lowest rate of obese individuals among the comparable states.

[1] Overweight and obesity are measured by the Body Mass Index (BMI), which relates weight and height. BMI of 25.0 to 29.9 is considered overweight, and BMI of 30.0 and over is considered obese (BMI - Body Mass Index: BMI for Adults: What Does This All Mean? Department of Health and Human Services, Centers for Disease Control and Prevention. Online at h*ttp://www.cdc.gov/nccdphp/dnpa/bmi/bmi-means.htm*. Last accessed 25. Feb. 05).

[2] National Center for Chronic Disease Prevention and Health. Promotion Chronic Disease Prevention Improving Nutrition and Increasing Physical Activity. Online at http://www.cdc.gov/nccdphp/bb_ nutrition/. Last accessed 25 Feb. 05

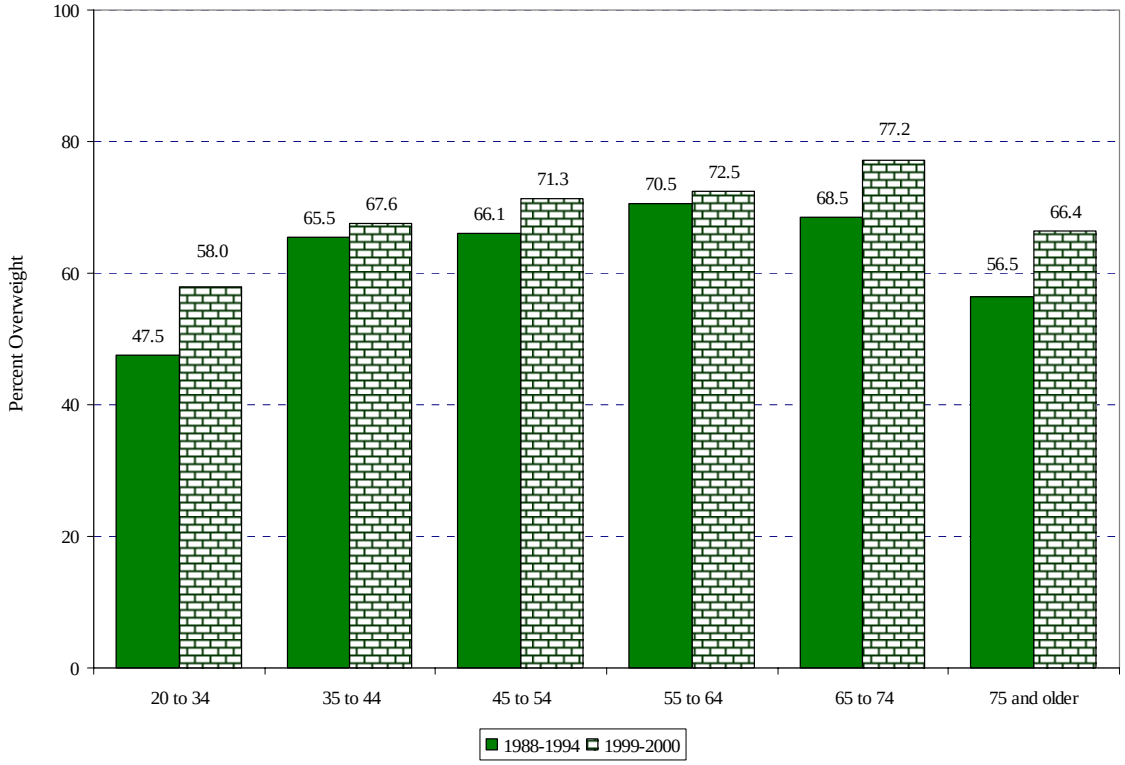
Figure 1. Percent of population over 18 who are overweight or obese, 1991 - 2001



Source: CDC, Behavioral Risk Factor Surveillance System, 1991 - 2001. National Center for Chronic Disease Prevention and Health Promotion. Online at *http://www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm* Last accessed 25 Feb. 05.

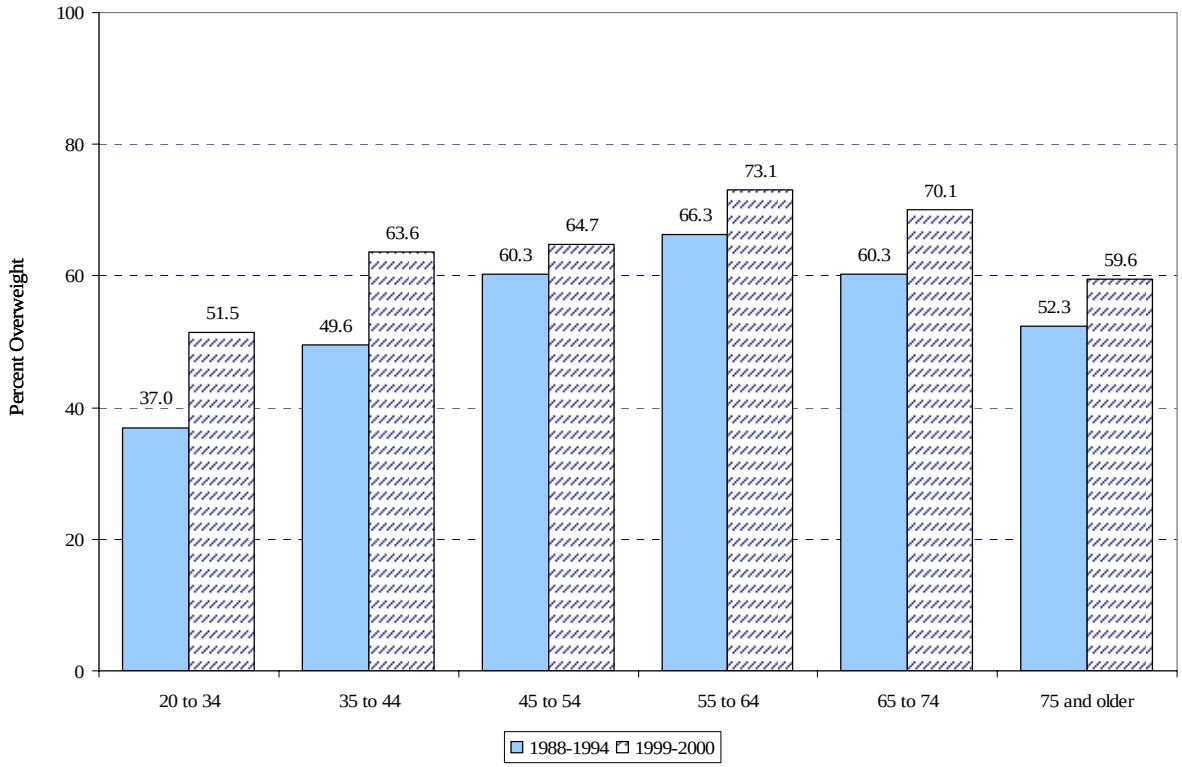
Over the relatively short time period covered by the data, the proportion of overweight individuals in the U.S. population has increased substantially for both genders and all age groups (figures 2 and 3). In all age groups over 20 years, a higher proportion of men are overweight than women. The proportion of both genders that are overweight increases for each age group from 20 to 34 through 55 to 64. By age 65 and over, the proportion of overweight women begins to decrease, and the proportion of overweight men falls in the 75 and older group. In general, over two-thirds of U.S. women between ages 35 and 74 years, and up to three-fourths of men in the same age groups are overweight. Although clearly a higher proportion of the population is overweight as each age cohort grows older, little data are available to support or refute that overweight individuals tend to progress to obese by gender or age.

Figure 2. Percent of overweight men by age, 1988 - 1994 and 1999 – 2000



Source: CDC, Behavioral Risk Factor Surveillance System, 1991 - 2001. National Center for Chronic Disease Prevention and Health Promotion. Online at *http://www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm* Last accessed 25 Feb. 05.

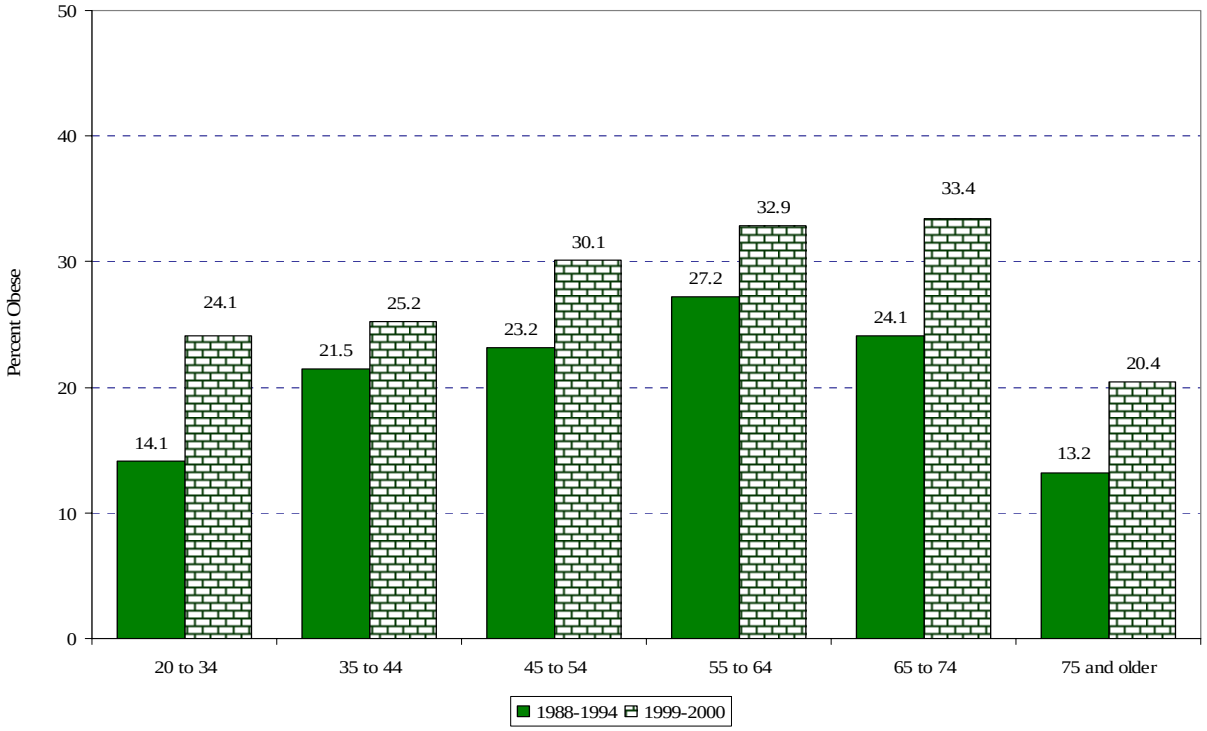
Figure 3. Percent of overweight women by age, 1988 - 1994 and 1999 – 2000



Source: CDC, Behavioral Risk Factor Surveillance System, 1991 - 2001. National Center for Chronic Disease Prevention and Health Promotion. Online at *http://www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm* Last accessed 25 Feb. 05.

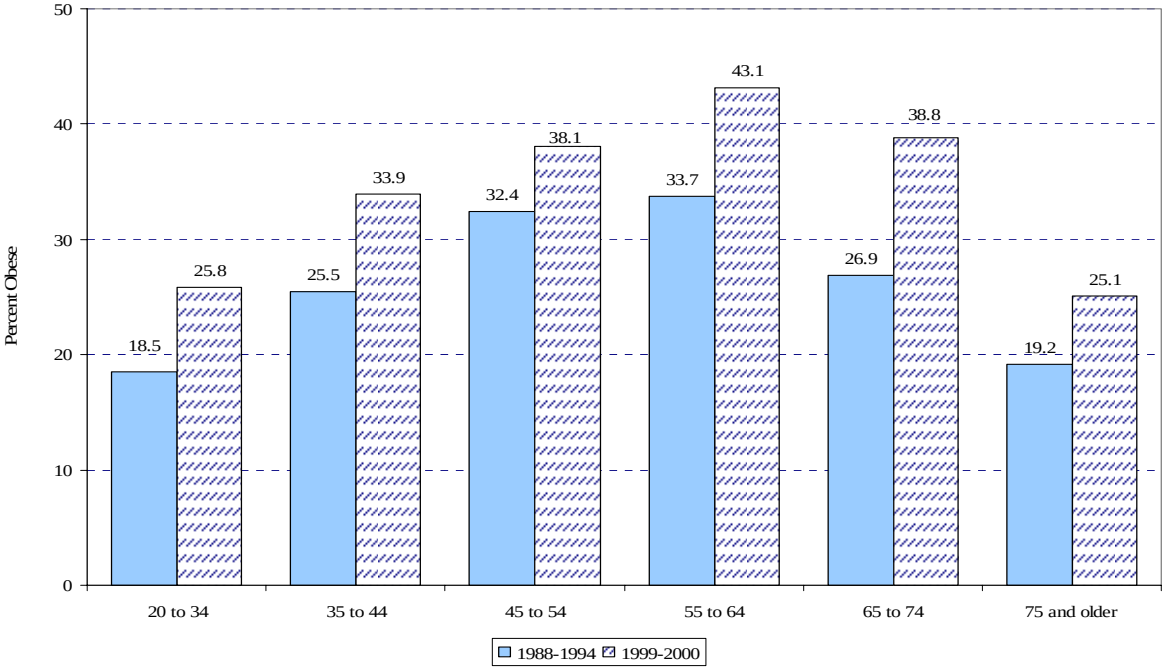
A subset of the overweight population is obese. In contrast to the overweight data, more women than men are obese in all age groups. The proportion of obese individuals in the U.S. population increased rapidly between the 1994-1998 and 1999-2000 periods (figures 4 and 5). Among men, obesity increased by approximately 4 to 10 percent of the population. Data for the 1999 to 2000 period indicate that nearly one-quarter of men between 20 to 34 years are obese, and the proportion of obese men rises past one-third before dropping off in the eldest category. Among women, more than one-quarter of the 20 to 34 year age group are obese, and the proportion rises to 43 percent of women who are 55 to 64 years. The most conspicuous change was the proportion of obese women in the 65 to 74 age group, which jumped nearly 12 percent to nearly 39 percent of that population between the two time periods. In 1999 to 2000, more than one-third of the U.S. population between 45 and 74 years old was obese. The sharp fall in the proportion of obesity within the 75 and older age group may be attributable to a higher mortality rate among obese individuals or to natural reductions in body mass with age.

Figure 4. Percent of obese men by age, 1994 - 1998 and 1999 – 2000



Source: CDC, Behavioral Risk Factor Surveillance System, 1991 - 2001. National Center for Chronic Disease Prevention and Health Promotion. Online at *http://www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm*. Last accessed 25 Feb. 05.

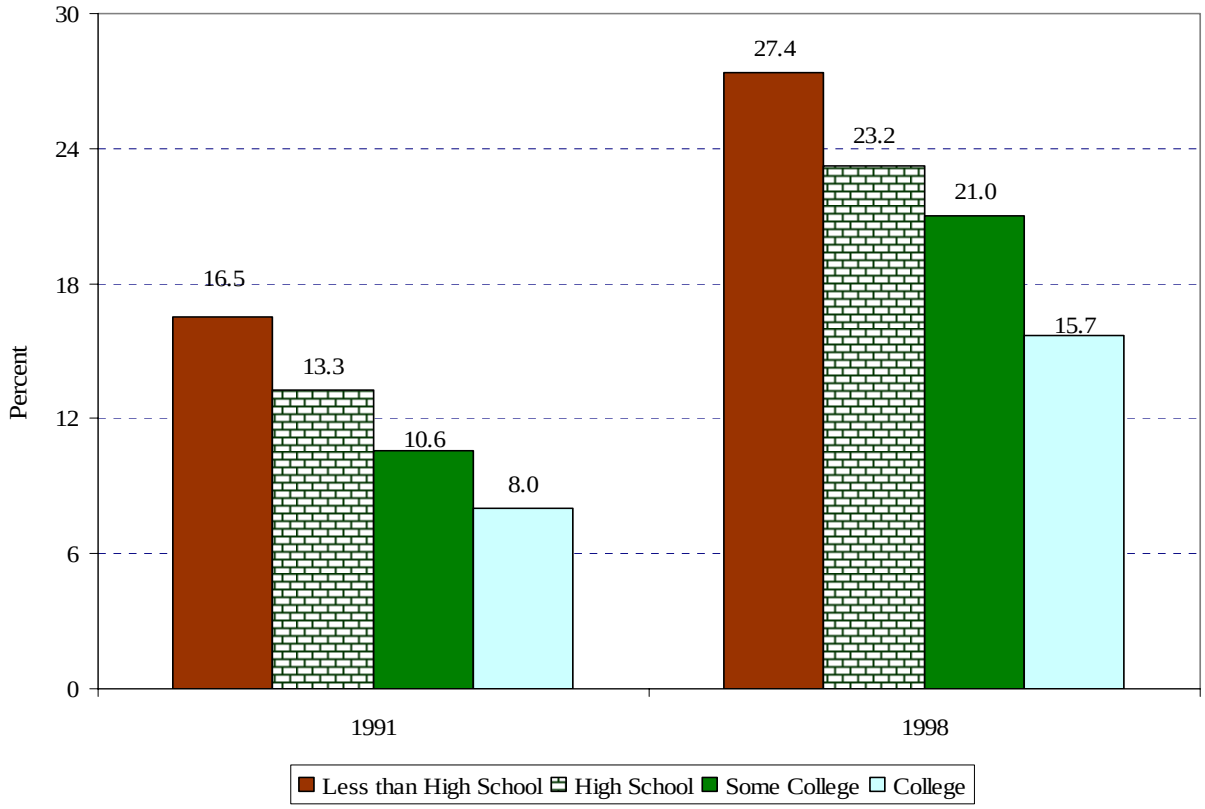
Figure 5. Percent of obese women by age, 1994 - 1998 and 1999 – 2000



Source: CDC, Behavioral Risk Factor Surveillance System, 1991 - 2001. National Center for Chronic Disease Prevention and Health Promotion. Online at *http://www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm*. Last accessed 25 Feb. 05.

Clearly, socio-economic characteristics are related to the incidence of overweight and obesity. In general, individuals with more education are much less likely to be obese. Diet, overeating, and (possibly) a sedentary lifestyle may contribute to high obesity rates among the population with less education. The incidence of obesity dramatically increased in the period 1991 to 1998 for all levels of education, but the proportional increase was much greater among those not having a college education over the seven-year period (Figure 6). More current data are not available, but it is startling to consider that this increase might be a trend that could imply nearly 40 percent obesity among individuals without high school education and one-quarter of all the college-educated population within the next few years.

Figure 6. Percent of obesity by educational level, 1991 and 1998



Source: CDC, Behavioral Risk Factor Surveillance System, 1991 - 2001. National Center for Chronic Disease Prevention and Health Promotion. Online at *http://www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm.* Last accessed 25 Feb. 05.

The problem of overweight and obesity is not limited to adults. An increasing number of children are faced with weight problems from overeating, poor diets, and lack of physical activity. According to the Virginia Department of Health, nearly 61 percent of the children enrolled in the WIC program in 2002 had poor eating habits.[3] However, relatively little broad-based data document the incidence and impacts of obesity among children.

Overweight/obesity problems are costly. Health insurance typically does not cover the costs of surgery or dietary products for weight loss, even if the weight loss would reduce associated conditions like diabetes and heart disease. One study estimates the cost of care for overweight/obese adults was $1.64 billion from 1998 to 2000 for just 5.7 percent of the eligible population of overweight/obese individuals. For

[3] Commission on Youth, Final Report to the Governor and General Assembly of Virginia, *Childhood Obesity* rd4. Online at *http://coy.state.va.us.* 2003. p 4. Last accessed 2 Mar. 05

public health care programs, Medicare costs were estimated at $324 million and Medicaid costs were estimated at $374 million for 6.7 and 13.1 percent, respectively, of the eligible overweight/obese population (Finkelstein, Fiebelkorn, and Wang, 2004).

The National Center for Chronic Disease Prevention and Health Promotion has provided $300,000 to $450,000 available annually to states to develop Nutrition and Physical Activity Programs to Prevent Obesity and Other Chronic Diseases programs. For fiscal year 2005, 23 states are participating, but Virginia is not one of them.

Diabetes

In the U.S., about one-third of the overweight or obese population also has diabetes. Overweight or obese individuals are much more likely to develop Type 2 diabetes, characterized by the inability of the pancreas to generate enough insulin to control blood glucose levels. In many cases, weight reduction can be enough to "cure" Type 2 diabetes. The overweight diabetic requires more insulin, thus increasing health care costs and is likely unable to control blood sugars, thus running the risk of potentially fatal complications from the disease. Throughout the U.S. and the developed world, diabetes is increasing in prevalence.[4] It is estimated that approximately 18.2 million people (6.2 percent of the U.S. population) suffer from diabetes, with nearly one-third of the cases as yet undiagnosed[5]. From 1990 to 2000, the number of Americans with diabetes doubled[6]. In 1999, approximately 382,700 Virginians had diagnosed or undiagnosed cases of diabetes.[7].

Among Virginians, the incidence of diabetes increases with age groups up to 75 years and older. For those 20 to 34 years, only about 0.8 percent of the population is diabetic (Table 1). Most of the diabetics under 34 years are Type 1 diabetics, who are victims of the genetically determined auto-immune form of the disease, in which the pancreatic cells responsible for insulin generation are mistakenly destroyed by the body's immune system. The incidence of diabetics increases with age group until by age 65, nearly one in every seven individuals suffers from diabetes. Incidence then falls slightly in the 75 and older group, but this decrease may be a consequence of earlier diabetic mortality or of body mass shrinkage in the elderly, which could have the positive benefit of ameliorating diabetes.

Table 1. Presence of diabetes by age for Virginians over 20, 1999

Age (years)	Percent of population
20 – 34	0.8
35 - 44	2.6
45 – 54	6.0
55 – 64	9.7
65 – 74	13.4
75 and older	12.3

Source: Virginia Dept. of Health. *Diabetes in Virginia 2002* Table10. Online at *http://www.vahealth.org/diabetes.* Last accessed 25 Feb. 05

[4] The health community uses "prevalence" in several ways. For clarity, we use their definition of prevalence that means percent.

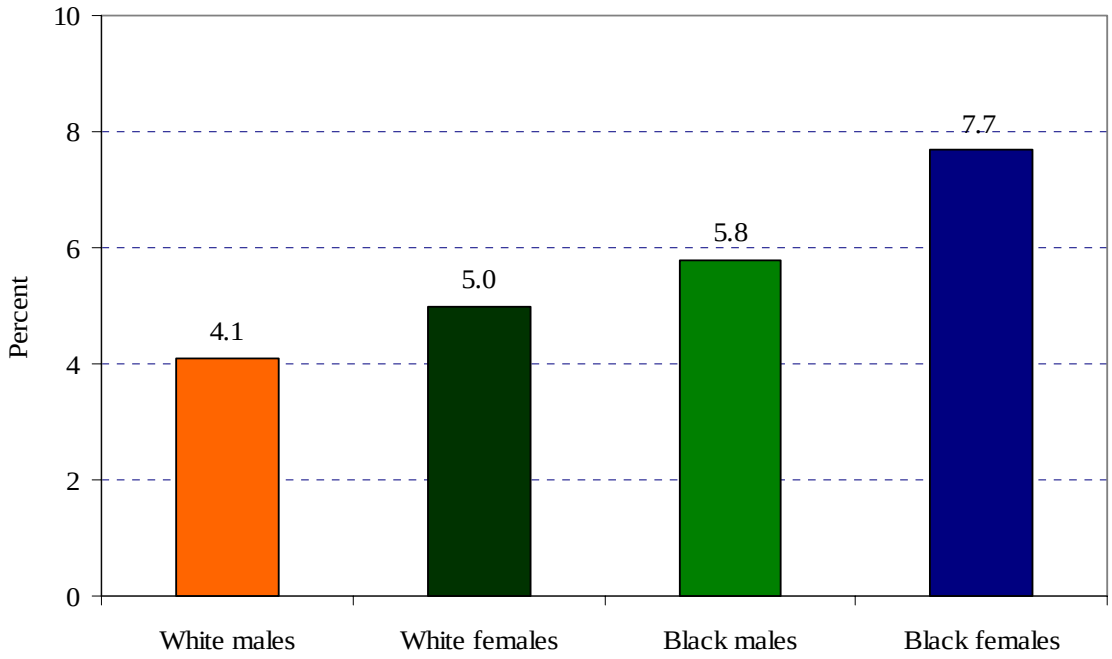
[5] American Diabetes Association. Online at *www.diabetes.org*, last accessed March 6, 2005.

[6] Center for Disease Control, Online at *www.cdc.gov/diabetes*, accessed March 6, 2005.

[7] Virginia Department of Health. Diabetes in Virginia 2002. Online at *http://www.vahealth.org/diabetes/Diabetes_in_VA_2002.pdf*. Last accessed 25 Feb. 05.

The incidence of diabetes is also affected by gender and race. More women suffer from diabetes than men (Figure 7). Diabetes incidence among whites, African-Americans, and other races increased substantially from 1995 to 1999. Diabetes prevalence among the African-American population is disproportionately high and is growing at epidemic rates.

Figure 7. Percent of Virginians over 20 years by gender and race with diabetes, 1999.



Source: Virginia Dept. of Health. *Diabetes in Virginia 2002* Table10. Online at *http://www.vahealth.org/diabetes.* Last accessed 25 Feb. 05.

According to the Center for Chronic Disease Prevention, 210,000 people (0.26 percent) under 20 in the U.S. have diagnosed or undiagnosed diabetes. While many doctors and researchers believe that the incidence of diabetes (especially Type 2) is increasing in children, no data are available to substantiate the belief. Historically, Type 2 diabetes has been associated with older age, obesity, inactivity, genetics, and race/ethnicity.[8] The incidence of diabetes decreases with higher levels of income and higher levels of education. Individuals within the Virginia population who are poor or poorly educated may be three or more times as likely to develop diabetes as their more educated and affluent fellow citizens.

Table 2. Percent of Virginians with diabetes by income and educational level, 1999

Income Level ($)	Percent
<10,000	10.5
10,000-14,999	9.3
15,000-19,999	7.5
20,000-24,999	6.0
25,000-34,999	4.7
35,000-50,000	2.8
>50,000	2.9
Educational Level	
Some high school	8.7
High School/GED	5.2
Some College	3.6
College/Graduate	2.7

Source: Virginia Dept. of Health. *Diabetes in Virginia 2002* Table 11. Online at *http://www.vahealth.org/diabetes.* Last accessed 25 Feb. 05.

People with diabetes often have other health problems. Obese individuals are nearly twice as likely to also suffer from diabetes (Table 3). A similar pattern is observed among individuals who have high cholesterol or high blood pressure. However, a sedentary lifestyle, repeated physical activity, smoking, and use of smokeless tobacco appear not to be closely related to diabetes.

Table 3. Risk factors associated with diabetes, 1997-1999

Risk factor	People with diabetes	People without diabetes
Obesity	60.6	34.1
High cholesterol	50.4	29.2
High blood pressure	56.6	22.3
Sedentary lifestyle	60.4	50.8
Physical activity	79.7	77.3
Smoking	16.4	23.1
Smokeless tobacco	3.3	3.1

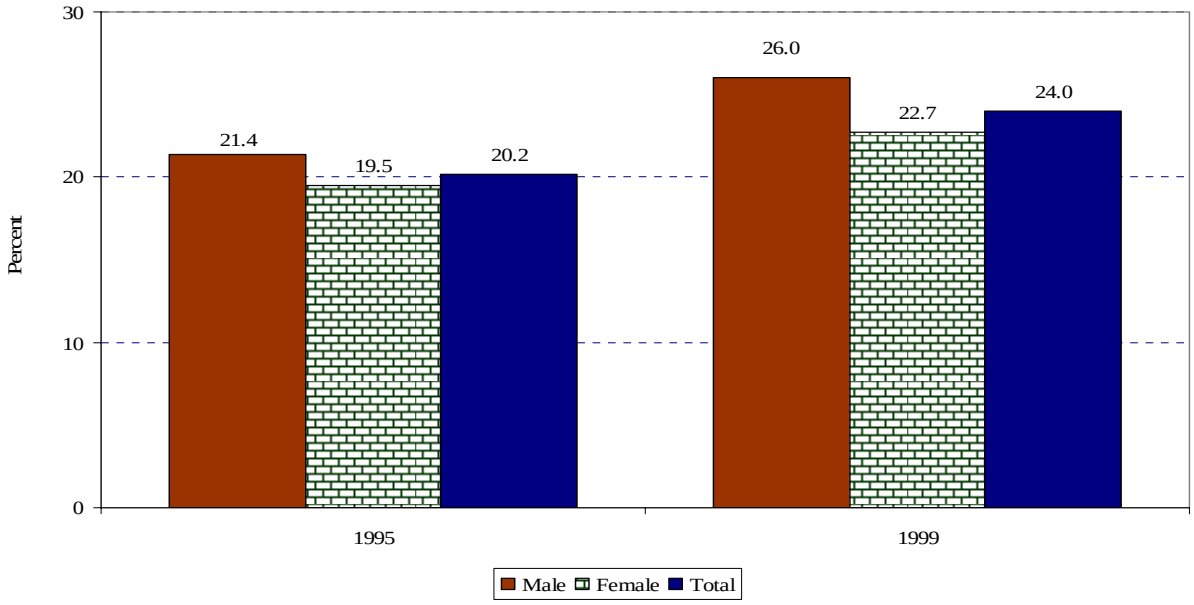
Source: Virginia Dept. of Health. *Diabetes in Virginia 2002* Table 16. Online at *http://www.vahealth.org/diabetes.* Last accessed 25 Feb. 05.

[8] National Center for Chronic Disease Prevention and Health Promotion. National Diabetes Fact Sheet. Online at *http://www.cdc.gov/ diabetes/pubs/general.htm#what.* Last accessed 18 Feb. 2005).

Diabetes is the sixth leading cause of death in the U.S. Cause of death among diabetics is usually complicated with other resultant side effects of the disease. The report *Diabetes in Virginia 2002* presented the following summary of mortality-related information about diabetes.

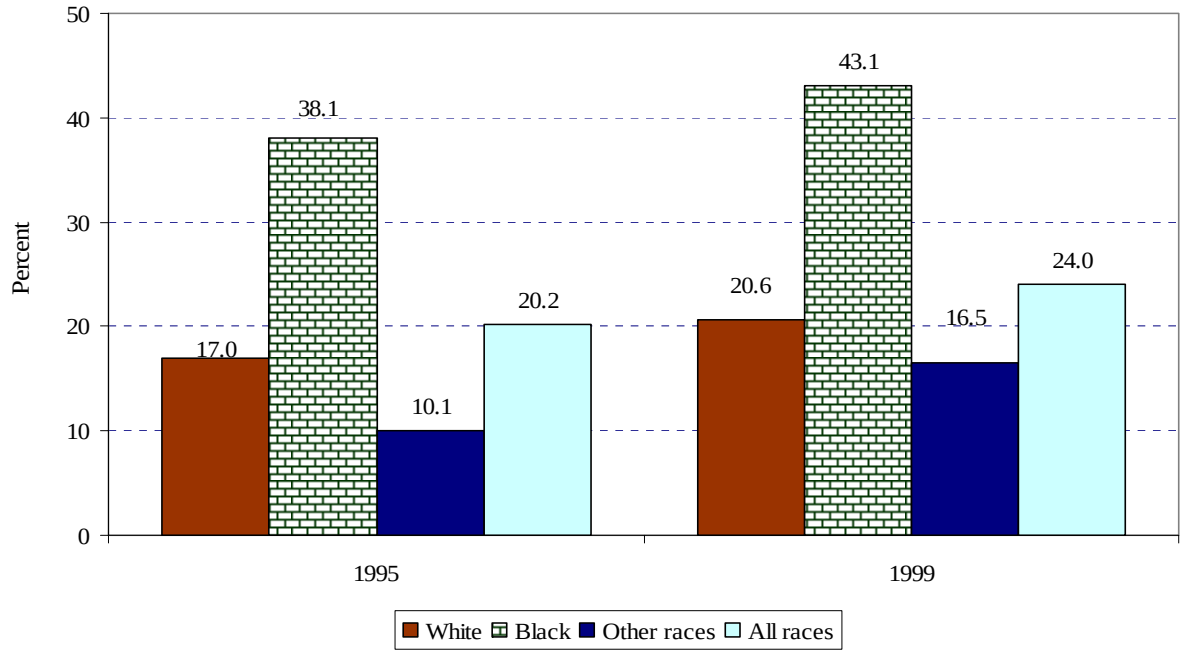
- From 1995 through 1999:
  - In 3 out of 10 diabetes-related deaths diabetes was the primary cause.
  - In 7 out of 10 diabetes-related deaths diabetes was a contributing cause.
- In 1999, 39 percent of all diabetes-related deaths were due to cardiovascular disease.
- From 1995 through 1999, diabetes mortality rates:
  - Were higher in males than females (Figure 8).
  - Increased exponentially with age.
  - Were higher among blacks than whites at every age group (Figure 9).
  - Have increased slightly.

Figure 8. Diabetes as primary cause of death by gender, 1995 – 1999



Source: Virginia Dept. of Health. *Diabetes in Virginia 2002* Table 39. Online at *http://www.vahealth.org/diabetes.* Last accessed 25 Feb. 05.

Figure 9. Diabetes as primary cause of death by race, 1995 – 1999

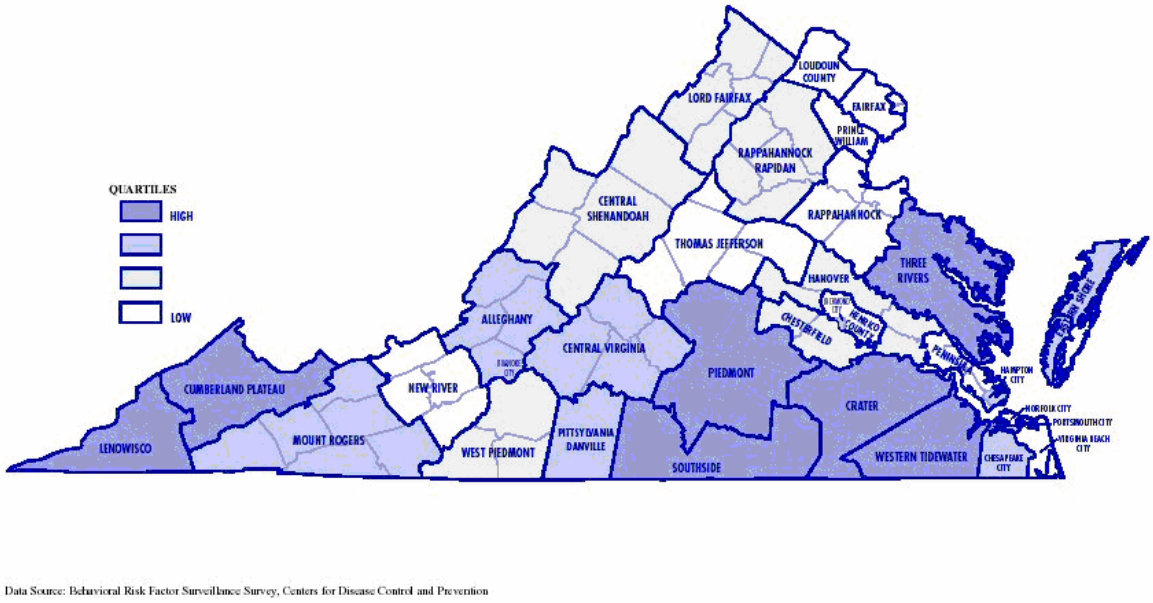


Source: Virginia Dept. of Health. *Diabetes in Virginia 2002* Table 39. Online at *http://www.vahealth.org/diabetes.* Last accessed 25 Feb. 05.

Diabetes Prevalence Across Virginia

The report *Diabetes in Virginia 2002* estimates diabetes incidence across its health districts in the state (Figure 10). According to their estimates, incidence is highest in far southwest Virginia, in Southside, and in northeastern Virginia.

Figure 10. Estimated prevalence of diabetes by Virginia Health District, 1999



Data Source: Behavioral Risk Factor Surveillance Survey, Centers for Disease Control and Prevention

Source: Virginia Dept. of Health. *Diabetes in Virginia 2002* Figure 9, p. 26. Online at *http://www.vahealth.org/diabetes.* Last accessed 25 Feb. 05.

Overweight/obesity and Diabetes in Perspective

The data indicate the situation of several years ago, whereas the prevalence of both overweight and obesity and of diabetes appears to be skyrocketing in Virginia as in other states. The Center for Disease Control reports that in 1994, only two states reported diabetes prevalence as more than 6 percent of the adult population. In 2003, 34 states reported prevalence higher than 6 percent, Virginia among them. Current data would only heighten the concerns expressed here.

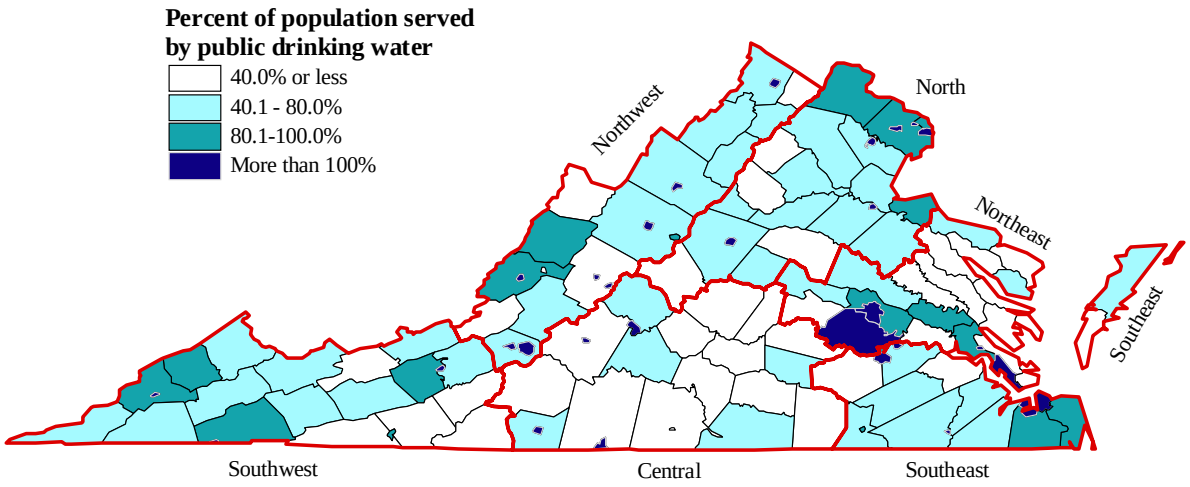
Infrastructure

Elements of state infrastructure that are of critical importance to the state's economy include roads, airports, information networks, ports, drinking water, and wastewater treatment. However, data on infrastructure are very difficult to find and compile. In this section, we present basic data on drinking water systems, roads, airports, and internet access.

Public Drinking Water

In 1997, nearly 30,000 Virginia households did not have access to a safe, convenient drinking water source for their homes.[1] Current data indicate that in many regions of the state, especially in the Southwest, Central, and Northeast Extension Districts, less than 40 percent of the population is served by public drinking water (Figure 1). The remainder of the population in these regions is served by private wells, springs, or in the case of the 30,000 households without private wells or springs, water hauled from a water treatment plant, a stream, or collected in cisterns. Localities that indicate more than 100 percent of the population served by public drinking water are those which contract with other localities to supply their drinking water.

Figure 1. Percent of population served by public drinking water



Source: Virginia Department of Health, Division of Drinking Water. Information for Consumers. Online at *http://www.vdh.state.va.us/dw/ListingWaterworks_Owners.asp*. Last accessed 15Feb. 05.

[1] Reaves and Younos, "Household Water Supply Challenges in Rural Virginia," *Horizons*. Vol. 12, No. 4, 2000.

Roads

The construction of major roads through a region is a necessary but not sufficient condition of economic development. In Virginia, state government maintains the majority of road miles (Table 1). Interstates account for 19.3 percent of the roads maintained by the state. Of the state maintained roads, the vast majority are not interstate or primary roads.

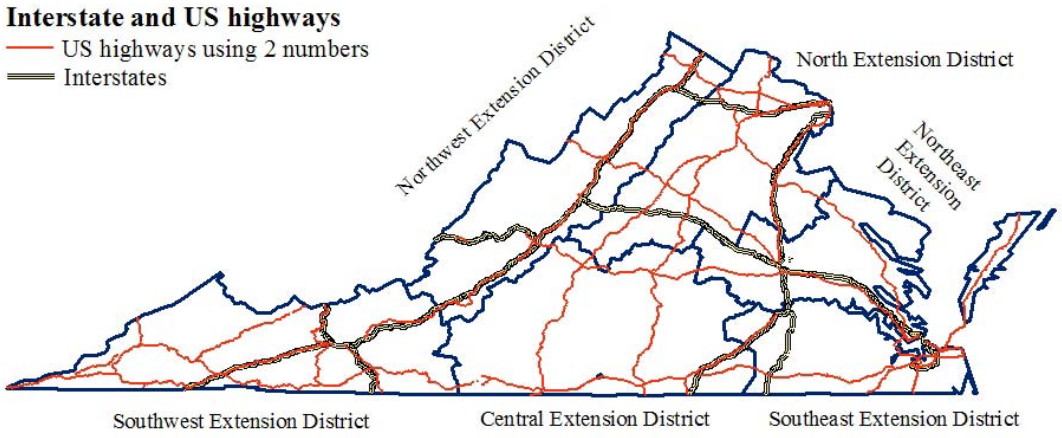
Table 1. Miles of road in Virginia, 2003

Interstate	5,188
Primary roads	21,011
All state maintained roads	117,720
County maintained roads	1,610

Source: Virginia Department of Transportation. Online at *http://www.virginiadot.org/projects/resources/MileageTables 2003.pdf*. Last accessed 25 Apr. 05

Central Extension District has only 161 miles of Interstate 85 (3.1 percent), by far the least miles of Interstate in any extension district (Figure 2). In contrast, the Northern Extension District has 23.6 percent (1,222 miles) of Interstate highway mileage, spread over 4 interstates—I-64, I-66, I-95, and the interstates around Washington, DC. Of state-maintained primary roads, 4,509 miles or 21.5 percent are located in the Central Extension District, the largest percentage in the state. The Southeast Extension District has the fewest miles of primary road: 2,205 miles or 10.5 percent. The contrast in Interstate and primary road miles in these two extension districts may help explain economic movement of goods and services across Virginia.

Figure 2. Location of Interstate and US Roads (single and two-digit numbers) in Virginia



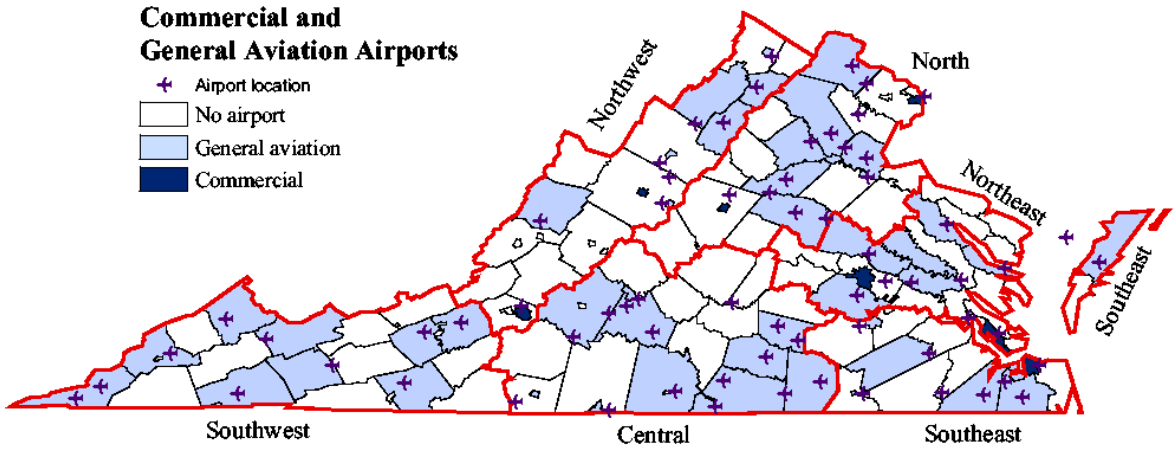
Source: Virginia Department of Transportation. Virginia County Map Series CD, Sept. 01.

Airports

Airports, like roads, play an important role in rural development. Businesses and other institutions must transport people to and from their locations, whether by commercial airlines or in business owned or personal aircraft. Having an easily accessible airport can enhance the economic viability of a business and community.

Virginia has nine commercial airports: Washington-Dulles, Ronald Reagan National, Richmond International, Norfolk International, Charlottesville-Albemarle, Roanoke Regional, Lynchburg Regional, Shenandoah Valley Regional, and Newport News-Williamsburg International (Figure 3). The remaining airports shown on the map are general aviation. The nine commercial airports, located primarily in larger cities, serve commercial airline traffic. General aviation airports are public access airports which do not serve commercial airlines. The state has 57 of these airports. In addition, numerous private airstrips are scattered around the state (not shown on the map).

Figure 3. Commercial and General Aviation Airports in Virginia



Source: Browse Airports of United States, Virginia Airports. Online at *http://www.airnav.com/airports/us* Last accessed 2 Mar. 05

An airport capable of handling commercial aircraft is important, but possibly not absolutely essential for economic development. Airlines will not service an area that does not have sufficient traffic to be profitable. A general aviation airport that can handle corporate-type jets and conventional aircraft may be adequate. Instrument landing service is not a requirement for corporate planes but may be for international airports.

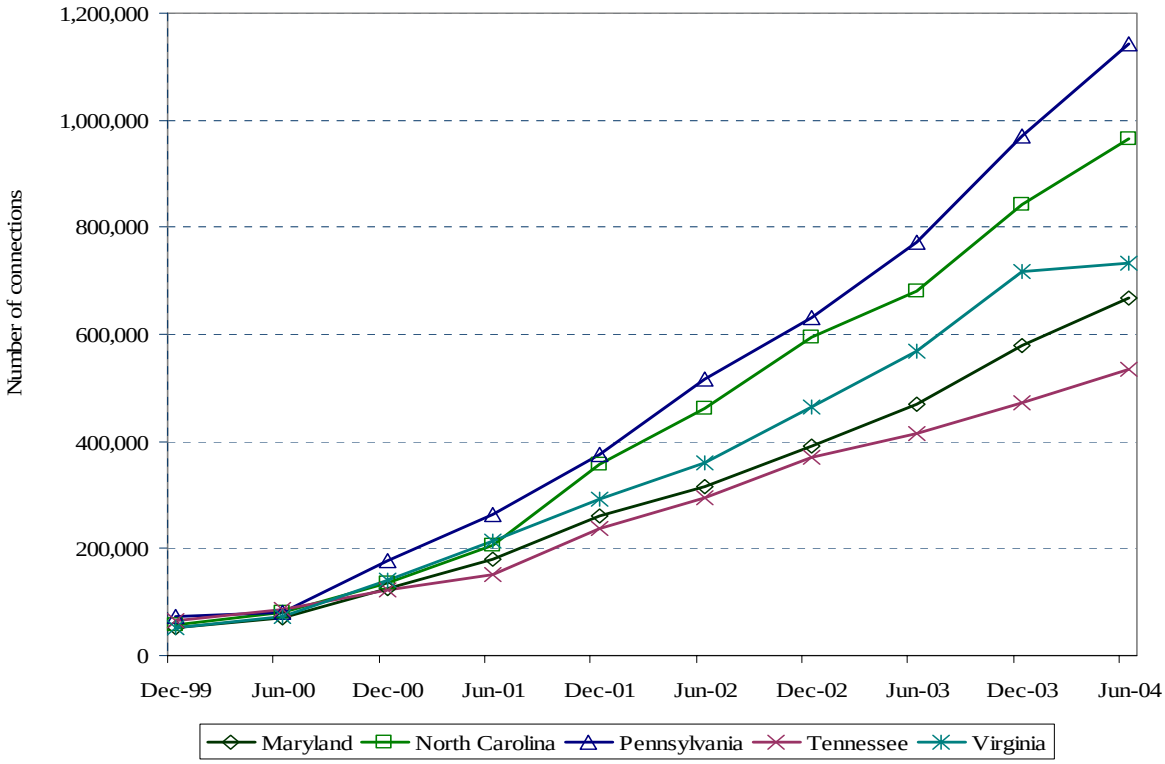
Only Southwest Extension District does not have a commercial airport. It has 10 general aviation airports, at least one of which is international (Dublin Airport in Pulaski County). The designation of "international" has to do with the presence of a customs agent so that goods can be shipped internationally. Northern Extension District has three commercial airports: National Airport in Alexandria, Dulles Airport in Loudoun, and Charlottesville Airport. In addition, it has 10 general aviation airports. Stafford County is in the process of up-grading its airport so that it will serve commercial airlines as a satellite to National and Dulles Airports.

Telecommunications

Telecommunications is "any transmission, emission, or reception of signs, signals, writing, images and sounds or information of any nature by wire, radio, optical or other electromagnetic systems."[2] Of primary interest is internet access. While many areas of Virginia have access to the internet, the service is not uniform across the state. During meetings of the Rural Virginia Prosperity Commission held across the state in 2000, one frequently discussed barrier to development was the lack of access to high speed internet connections. Many speakers observed that while major cable lines ran down the middle of the road in front of their businesses, the cost of access was prohibitive.

The Federal Communications Commission (FCC) defines high-speed lines as "connections that deliver services at speeds exceeding 200 kilobits per second in at least one direction . . ." (p. 1).[3] From June 2003 to June 2004 the number of high-speed lines connecting businesses and homes to the internet increased by 38 percent across the U.S. Among comparable states, high speed lines in Pennsylvania increased at the fastest pace, while Tennessee increased at the slowest pace (Figure 4). Virginia's increase in high speed connections was rapid through December 2003, but inexplicably slowed to a snail's pace in the last reporting period.

Figure 4. Growth in high-speed line access for at least one direction, December, 1999 to June, 2004



Source: Mark Wigfield. "News," Dept. of Commerce, FCC. 22 Dec. 04. Online at *http://www.fcc.gov*. Last accessed 8 May 05.

---

[2] Dept. of Commerce. "Federal Standard. Telecommunications: Glossary of Telecommunications Terms." National Telecommunications and Information Administration. Online at *http://www.its.bldrdoc.gov/fs-1037/dir-001/_0063.htm#RR*. Last accessed 9 May 05.

[3] Mark Wigfield. "News," Dept. of Commerce, FCC. 22 Dec. 04. Online at *http://www.fcc.gov*. Last accessed 8 May 05.

The FCC shows the breakdown of high-speed line users by residential and small business and medium and large businesses, institutional, and government. Residential and small businesses are by far the biggest users, accounting for almost 95 percent in Virginia and nearly 93 percent across the U.S. (Table 2)

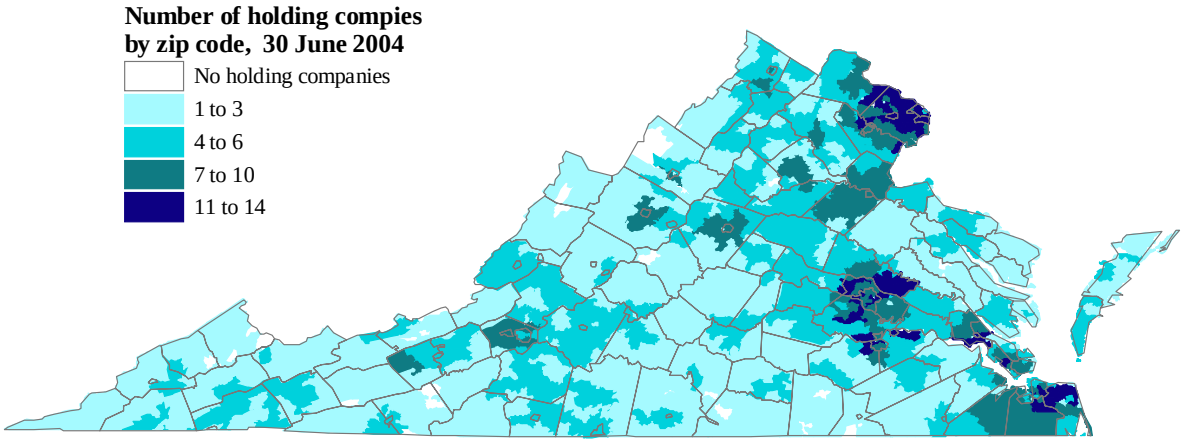
Table 2. High-speed lines by type of user, June 30, 2004

State	Residential and small business	Medium and large business, institutions, government	Total
United States	30,088,091	2,370,367	32,458,458
Maryland	635,846	32,413	668,259
North Carolina	869,612	96,792	966,404
Pennsylvania	1,080,226	61,537	1,141,763
Tennessee	478,774	57,125	535,899
Virginia	790,816	42,486	833,302

Source: Mark Wigfield. "News," Dept. of Commerce, FCC. 22 Dec. 04. Online at *http://www.fcc.gov*. Last accessed 8 May 05.

Most telecommunications data is proprietary. The FCC collects data by zip code on the number of companies serving an area but does not indicate cost or the type of service offered. Based on 2004 data, most regions of Virginia were serviced by one to three companies. Only the areas around Northern Virginia and down through the crescent to Virginia Beach, and a few smaller areas around the state are served by seven or more providers (Figure 5).

Figure 5. Number of holding companies within a zip code providing high-speed access (exceeds 200 kilobits per second) in at least one direction as of 30 June 2004.



Source: Federal Communications Commission. Local Telephone Competition and Broadband Deployment. HSPD1204.ZIP Online at *http://www.fcc.gov/wcb/iatd/comp.html*. Last accessed 11 May 05.

Low-speed connections may be adequate for private residences, but are not adequate for businesses and government. The "last mile" from the main cable line and service connections are the most costly to provide.

Infrastructure in Perspective

Much of the data to provide a concise picture of the situation, issues, and problems of the state's infrastructure is either proprietary data such as the location of high-speed internet switches or currently unavailable with adequate detail or explanation to analyze data such as location of wells, septic systems, and sewage treatment plants and lines. Without reliable, adequately detailed data, analysis of needed infrastructure is problematic.