

State Council of Higher Education for Virginia Data Memo

Strategic Plan Development Project

August 6, 2014

Contents

Executive summary 7

Virginia background 10

 Economic and demographic characteristics of Virginia 10

 Ethnic and racial diversity 10

 Poverty 12

 Aging population 14

 Section summary 14

 Regional differences 14

 Section summary 17

 Projection of High School graduates by race and ethnicity 18

 College Ready Skills 19

 Remediation 20

 Section summary 20

 Education levels 21

 Employment profile 22

 Federal Government 24

 Occupational demand 25

 General skills 28

 Section summary 29

 Higher education 29

 Higher education institutions 29

 Enrollment 29

 In-state and out-of-state enrollment 32

 Historically Black Colleges in Virginia 33

 Distance education 34

 Military and veteran students 35

 Enrollment of underserved students 36

 Degree production 39

 Summary of section 45

Completion rates..... 45

 First-year persistence rates..... 45

 Transfer rates..... 45

 Graduation rates..... 47

 Section summary..... 49

Affordability 50

 Student Aid 53

 Debt burden of graduates..... 54

 Section summary..... 57

Sustainability..... 57

 Salaries 59

 Section summary..... 62

 Economic Impact of Higher Education..... 62

Research..... 62

 Research university faculty salaries 65

 Faculty racial/ethnic characteristics 67

Partnerships with business and communities 69

 Examples of employer/higher education partnerships in Virginia 70

Conclusion and summary..... 71

Bibliography 73

Appendix A. List of accredited postsecondary institutions operating in Virginia, JBLA..... 78

Appendix B. University research parks and off-campus centers 84

Appendix C. JBLA regional crosswalk..... 88

Appendix D. State Peer Groups and Policy Data..... 90

List of tables

TABLE 1. PROJECTED CHANGE IN DISTRIBUTIONS BY RACE AND ETHNICITY FOR VIRGINIA TO 2040.....	11
TABLE 2. HISPANIC POPULATION IN VIRGINIA BY NATIONAL ORIGIN 2011	11
TABLE 3. CHILDREN UNDER 18 IN VIRGINIA LIVING IN POVERTY BY RACE AND ETHNICITY	12
TABLE 4. OUTCOMES OF GROWING UP IN POVERTY	13
TABLE 5. REGIONAL DIFFERENCES ACROSS THE STATE.....	15
TABLE 6. PROJECTED CHANGE IN THE NUMBER OF 18 TO 24 YEAR OLDS FOR VIRGINIA TO 2030.....	19
TABLE 7. PERCENT OF POSTSECONDARY DEGREE HOLDERS AMONG INDIVIDUALS 25-44 YEARS OLD	21
TABLE 8. FIFTY LARGEST EMPLOYERS IN VIRGINIA.....	24
TABLE 9. THE TWENTY OCCUPATIONS PROJECTED TO HAVE GREATEST INCREASE IN DEMAND TO 2020	26
TABLE 10. LIST OF VIRGINIA’S 20 FASTEST GROWING OCCUPATIONS THAT REQUIRE A BACHELOR’S DEGREE 2010-2020 ..	27
TABLE 11. PERCENT OF VIRGINIA EMPLOYERS RATING A SKILL AS ESSENTIAL FOR NEW EMPLOYEES	28
TABLE 12. ENROLLMENT IN PUBLIC VIRGINIA COLLEGES AND UNIVERSITIES, FALL 2012.....	31
TABLE 13. ENROLLMENT IN PRIVATE-NOT-FOR-PROFIT COLLEGES AND UNIVERSITIES, FALL 2012.....	31
TABLE 14. ENROLLMENT IN PRIVATE, FOR-PROFIT COLLEGES AND SCHOOLS, FALL 2012	31
TABLE 15. ENROLLMENT IN ALL COLLEGES AND SCHOOLS, FALL 2012	32
TABLE 16. FIRST-TIME STUDENTS WHO ARE VIRGINIA CITIZENS ENROLLING IN PUBLIC FOUR-YEAR COLLEGES AND UNIVERSITIES IN VIRGINIA	33
TABLE 17. VIRGINIA HBCU FTE ENROLLMENT, NUMBER OF STUDENTS RECEIVING DEGREES, AND GRADUATION RATE 2012	34
TABLE 18. NUMBER OF VIRGINIA STUDENTS ENROLLED IN DISTANCE EDUCATION	34
TABLE 19. PERCENT OF VA PAYMENT RECIPIENTS (VETERANS ONLY) AMONG PUBLIC FOUR-YEAR, TWO-YEAR AND SELECT PRIVATE INSTITUTIONS 2007-14.....	36
TABLE 20. VETERANS AS A PERCENT OF TOTAL STUDENT POPULATION RECEIVING DVA BENEFITS AMONG TOP FOUR INSTITUTIONS WITH LARGEST VETERAN POPULATION BY INSTITUTION SECTOR 2007-14.....	36
TABLE 21. ENROLLMENT BY ETHNIC/RACIAL MINORITIES IN VIRGINIA FOUR-YEAR PUBLIC COLLEGES AND UNIVERSITIES, 2012-13	37
TABLE 22. HEADCOUNT ENROLLMENT BY ETHNIC/RACIAL MINORITIES IN VIRGINIA TWO-YEAR PUBLIC COLLEGES, 2012-13	38
TABLE 23. DEGREES AND CERTIFICATES AWARDED BY VIRGINIA POSTSECONDARY INSTITUTIONS, 2011-12	39
TABLE 24. DISTRIBUTION OF ENROLLMENT AND DEGREES AWARDED BY VIRGINIA INSTITUTIONS TO STUDENTS BY ETHNIC/RACIAL CATEGORIES	42
TABLE 25. PERCENT OF UNDERGRADUATE DEGREES (BA AND LOWER) AWARDED BY RACE/ETHNICITY, SEX, AND INSTITUTIONAL SECTOR 2012-13.....	44
TABLE 26. DISTRIBUTION OF DEGREES AWARDED BY PUBLIC AND PRIVATE, NOT-FOR-PROFIT COLLEGES AND UNIVERSITIES IN VIRGINIA BY RACE/ETHNICITY, 2012-13.....	44
TABLE 27. BACHELOR’S DEGREES CONFERRED PER 1,000 INDIVIDUALS 18–24 YEARS OLD, 1990–2011.....	45
TABLE 28. FOUR-YEAR COMPLETION RATES OF ALL STUDENTS TRANSFERRING TO ALL PUBLIC FOUR-YEAR INSTITUTIONS IN FALL AND SPRING	47
TABLE 29. ONE HUNDRED AND FIFTY PERCENT OF NORMAL TIME GRADUATION RATES FOR ALL UNDERGRADUATE DEGREE- SEEKING STUDENTS, BY LEVEL AND CONTROL	48

TABLE 30. ONE HUNDRED AND FIFTY PERCENT OF NORMAL TIME GRADUATION RATES FOR DEGREE-SEEKING UNDERSERVED MINORITY STUDENTS, BY LEVEL AND CONTROL 48

TABLE 31. PRICE OF ATTENDANCE FOR IN-STATE STUDENTS ATTENDING PUBLIC FOUR-YEAR COLLEGES AND UNIVERSITIES IN VIRGINIA, 2011-2013 51

TABLE 32. PRICE OF ATTENDANCE FOR IN-STATE STUDENTS ATTENDING PUBLIC TWO-YEAR COLLEGES AND UNIVERSITIES IN VIRGINIA, 2011-2013 52

TABLE 33. AVERAGE UNDERGRADUATE CHARGE AT PUBLIC FOUR-YEAR INSTITUTIONS AS A PERCENTAGE OF DISPOSABLE PERSONAL INCOME: 2000–2011..... 53

TABLE 34. STATE EXPENDITURES ON STUDENT AID/UNDERGRADUATE ENROLLMENT AT FOUR-YEAR INSTITUTIONS (\$) 53

TABLE 35. MEAN DEBT OF STUDENT BORROWERS AT PUBLIC FOUR-YEAR INSTITUTIONS 2011-12..... 55

TABLE 36. MEAN DEBT OF STUDENT BORROWERS AT PUBLIC TWO-YEAR INSTITUTIONS, 2011-12..... 56

TABLE 37. APPROPRIATIONS OF STATE TAX FUNDS FOR OPERATING EXPENSES OF HIGHER EDUCATION AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT, BY STATE: 2000–2012 59

TABLE 38. FACULTY SALARIES OF FULL-TIME FACULTY IN VIRGINIA PUBLIC FOUR-YEAR INSTITUTIONS (9-10 MONTH) 60

TABLE 39. FACULTY SALARIES OF FULL-TIME FACULTY IN VIRGINIA COMMUNITY COLLEGES (9-10 MONTH CONTRACT) 61

TABLE 40. INSTRUCTIONAL SALARY AS A PERCENT OF TOTAL E&G BY INSTITUTIONAL TYPE AND SECTOR 62

TABLE 41. VIRGINIA PUBLIC COLLEGES AND UNIVERSITIES WITH NSF INSTITUTIONAL RANK ON FOUR MEASURES OF RESEARCH AND GRADUATE EDUCATION..... 63

TABLE 42. STATE FUNDING FOR PUBLIC RESEARCH UNIVERSITIES PER FTE STUDENT NATIONALLY AND IN VIRGINIA: 2000-2010 63

TABLE 43. SUPPORT FOR RESEARCH AND DEVELOPMENT IN VIRGINIA PUBLIC COLLEGES AND UNIVERSITIES, 2012 65

TABLE 44. FACULTY SALARIES IN PEER GROUP UNIVERSITIES AND IN VIRGINIA RESEARCH UNIVERSITIES..... 66

TABLE 45. PERCENT OF FULL-TIME FACULTY AT PUBLIC FOUR-YEAR COLLEGES AND UNIVERSITIES THAT IDENTIFIES AS AMERICAN INDIAN OR NATIVE ALASKAN, ASIAN, BLACK/AFRICAN AMERICAN, HISPANIC OR LATINO, NATIVE HAWAIIAN OR PACIFIC ISLANDER, OR TWO OR MORE RACES 68

TABLE 46. PERCENT OF FULL-TIME FACULTY AT PUBLIC TWO-YEAR COLLEGES THAT IDENTIFIES AS AMERICAN INDIAN OR NATIVE ALASKAN, ASIAN, BLACK/AFRICAN AMERICAN, HISPANIC OR LATINO, NATIVE HAWAIIAN OR PACIFIC ISLANDER, AMERICAN OR TWO OR MORE RACES. 69

List of figures

FIGURE A. EDUCATIONAL ATTAINMENT BY REGION IN VIRGINIA 16

FIGURE B. UNEMPLOYMENT RATE, BY VIRGINIA REGION 17

FIGURE C. HIGH SCHOOL GRADUATES IN VIRGINIA 18

FIGURE D. PERCENT OF VIRGINIA HIGH SCHOOL GRADUATES WITH COLLEGE-READY SKILLS, 2009-11 20

FIGURE E. PERCENT OF VIRGINIA POPULATION BY RACE/ETHNICITY, 25 TO 64 WITH A COLLEGE DEGREE 21

FIGURE F. EDUCATION LEVELS OF VIRGINIA POPULATION 18+ 22

FIGURE G. SCIENCE AND ENGINEERING OCCUPATIONS, BY STATE..... 23

FIGURE H. DOLLARS FROM FEDERAL CONTRACTS TO COMPANIES IN VIRGINIA, 2000-2011 (IN BILLIONS) 25

FIGURE I. VIRGINIA HIGHER EDUCATION FALL ENROLLMENT IN DEGREE-GRANTING INSTITUTIONS, 1970 TO 2012 30

FIGURE J. STUDENTS TRANSFERRING FROM ALL PUBLIC TWO-YEAR INSTITUTIONS INTO ALL PUBLIC FOUR-YEAR INSTITUTIONS
IN THE FALL AND SPRING 46

FIGURE K. 150 PERCENT OF NORMAL TIME GRADUATION RATES IN PUBLIC FOUR-YEAR INSTITUTIONS, BY RACIAL/ETHNIC
GROUP..... 49

FIGURE L. PUBLIC FTE ENROLLMENT, EDUCATIONAL APPROPRIATIONS AND TOTAL EDUCATIONAL REVENUE PER FTE,
VIRGINIA—FY1988-2013 58

FIGURE M. VIRGINIA’S TALENT PIPELINE 71

Executive summary

The State Council of Higher Education for Virginia (SCHEV) has embarked on the development of a statewide strategic plan for higher education in Virginia. SCHEV has contracted with JBL Associates (JBLA), a research firm, to assist in the process. This document is one of a number of reports prepared by JBL Associates in fulfillment of its contract to assist SCHEV.

This environmental scan provides information relative to assessing risks, challenges, and opportunities that will be important considerations for higher education in the Commonwealth. This overview provides a summary of potential issues for each of these categories. Other reports include a Gap Analysis Memo, a Policy Scan Memo, a Goals and Strategy Memo, an Organizational Audit Memo, and a final report. As they are finalized, these documents and related updates will be posted on the SCHEV Strategic Plan webpage, <http://www.schev.edu/SCHEV/StrategicPlan.asp>.

Averages hide important issues in Virginia. Northern Virginia dominates state averages on measures of population, income, and jobs. Looking at the different regions of the state reveals a much more complicated set of issues. The success and reputation of Virginia colleges and universities do not reflect the experience of many Virginia citizens who do not have the money or the academic preparation to fully take advantage of the educational opportunities that are available. The eroding funding for public higher education in Virginia suggests that the levels of excellence gained in the past cannot be held in the future.

Higher education in Virginia will operate in a changing demographic environment. More minority students, for example, will be coming to the doors of the Commonwealth's colleges and universities. Many of these students will not have had the same level of education success or the same life experiences as better-off non-Hispanic White students. This change will take place during a period when there will be little increase in the state's college-age population.

The regional diversity of Virginia provides a different context defined in terms of what is needed from colleges and universities. The headquarter companies and federal agencies in Northern Virginia need a different mix of trained employees than do the smaller towns and rural areas of Virginia. College leaders will need to continue to be sensitive to local needs as well as larger state needs.

Technology will continue to change how education is delivered. Distance education has the potential to make education available to more students who need the flexibility to fit their education with work and family. On campus, technology has the potential to enable students to complete their coursework more quickly than in traditional classes, while maintaining the same educational standards.

State financial support of higher education in Virginia has been declining, and there have been associated increases in tuition and fees. This raises two issues. The first issue is finding a way to keep college affordable. The price of education at a four-year public college or university is beyond the ability of the average family to pay, even with student grants to help. At some point, Virginia runs the risk of reaching an upper limit to how much students can borrow to close the gap between the price of attendance and what families can afford.

The second issue is that the erosion of state support over the last several years threatens the capacity of public colleges and universities to attract and retain the personnel necessary to remain competitive with universities in other states. Human resources represent a major expense in colleges and universities, and having the talent necessary for breakthrough research and effective teaching is a significant concern for Virginia's colleges and universities.

There is little argument that higher education is important to Virginia. Universities and colleges need to continue to develop meaningful partnerships with high schools to help improve the preparation of incoming students. They also need to forge productive working relationships with employers to ensure graduates at all levels have the skills necessary to succeed in the workforce, and to fill high-demand jobs. Meeting the needs of the community, businesses, and the students should be an important goal of higher education in the state.

The scan of important environmental issues in Virginia suggests the following risks, challenges, and opportunities.

Risks

- An aging Virginia population will be an important political constituency that will be less likely than younger families to perceive higher education as a spending priority.
- A flat to declining number of high school graduates in the state will result in greater competition among institutions for qualified students, and make it more difficult to increase the number of degrees awarded in Virginia. This reduction in the number of students ready to enroll in college also has the potential to result in funding reductions for colleges that lose enrollment.
- Four-year universities and colleges in Virginia have become less affordable as state support declines and tuition increases. Even after an award of grant aid, many low-income students in Virginia may be dissuaded from attending college because of price. Or, if they do attend, such students may borrow more than is comfortable relative to their financial condition.
- Unpredictable and late state appropriation decisions introduce uncertainty into institutional planning processes and outcomes.
- Research universities in Virginia lag behind other major state universities in the amount of research funding they receive. Academic research is a critical component of a high-tech economy, and a requisite for economic growth. If support for research is inadequate, Virginia faces the possibility of losing emerging technology and science industries that depend not only on academic research as a springboard for their businesses, but on individuals coming out of universities with the cutting-edge skills necessary to staff these companies.
- As home to a number of federal agencies and military bases, along with companies that depend on federal contracts, Virginia's economy is vulnerable to changes in federal spending. Reductions in federal spending could reduce state tax revenues available for higher education.

Challenges

- An increasingly diverse ethnic/racial population, many of whom come from backgrounds without higher education experience, will require an education system that is able to meet their needs.
- Consideration for the significant variation in the levels of education, employment opportunities, and poverty among regions of Virginia must be included in any state higher education plan.
- The state will need significantly more graduates with skills in IT-related occupations than are currently projected to be generated. The same holds true for health related occupations. Simply increasing the number of graduates to meet general goals will not produce enough graduates in these high-demand fields.
- A significant number of institutions in Virginia offer students the option to enroll exclusively or partially online. Distance education introduces new competitors for students. Colleges and universities in Virginia need to be able to provide effective distance education to compete in an education market that has no boundaries.
- The decentralized higher education system in Virginia, in which each public four-year institution has a great deal of latitude to make decisions, is a strength; however, it is also a distinct challenge when trying to meet overarching state education goals.
- Academic research in the state is not well supported relative to other states. Finding the resources necessary to move up in the ranking of research institutions will take commitment from a number of different groups.

Opportunities

- Virginia is home to a well-educated population. This population is more likely to understand the need for an effective higher education, and to be willing to support it, than would those with less direct college experience.
- Virginia's four-year public higher education institutions have a history of better-than-average graduation rates and a reputation for quality, which provides a strong foundation upon which to build a system of change and improvement.
- The community colleges in Virginia are important resources for the regions they serve. They can work closely with employers and four-year colleges to help students succeed, regardless of their educational and occupational goals, and to meet local educational and employment needs.
- Private sector colleges and schools in Virginia provide educational choice for students at a relatively low cost to the state.
- Businesses in Virginia are willing to be actively engaged with colleges and universities to improve and address the state's workforce training needs.

Virginia background

With 8.2 million citizens, Virginia is the 12th most populous state, with the 10th largest economy and the seventh highest level of per capita personal income in the nation. The Commonwealth has the well-educated workforce that is vital for a high-tech service economy. Part of the growth in the high-tech economy is the result of federal expenditures. Virginia is ranked third in the number of Department of Defense civilian and military employees and second in per capita federal expenditures.¹

The following list provides some basic data about Virginia as reported in 2012:²

- Population 8,185,900
- Labor Force 4,209,500
- Unemployment Rate 5.9%
- Median Household Income \$64,600
- Per Capita Income \$48,400

This positive view is tempered when unpacking the averages and looking at different regions in the state that do not fully share in the prosperity and success. Virginia is a state of contrasts, with one of the most concentrated wealth regions in the northern end of the state and perhaps one of the lowest income regions in the country in the southern end. State projections suggest that one has a bright future of growth and opportunity and the other will probably lose population. Public higher education is charged with providing education that is appropriate to all regions of the state with their unique economies and needs.

Economic and demographic characteristics of Virginia

Ethnic and racial diversity

Younger Virginians, in many localities, will live in increasingly diverse communities. Racial and ethnic diversity will increase due to continued immigration, and interracial marriage and births among the growing minority population, especially Asian and Hispanic Virginians.

According to VirginiaLMI.com, the proportion of the Virginia population that is Hispanic will grow from 8 percent in 2010 to 19 percent in 2040, making them the fastest growing minority ethnic group in Virginia. Asians will increase as a share of the population as well. African Americans will maintain a stable share of the population until 2020, and drop slightly over the following two decades.

¹ Kusiak, J.N. (2013). *The Virginia Report 2013*. Council on Virginia's Future. Richmond, VA. <http://www.future.virginia.gov/publications/docs/VaReport/2013VirginiaReport-Web.pdf>.

² Data gathered from multiple sources as documented in this report.

Table 1. Projected change in distributions by race and ethnicity for Virginia to 2040

Race/Ethnicity Group	2010		2020		2030		2040	
White	5,486,852	69%	5,755,170	65%	5,978,914	62%	6,167,568	59%
Black or African/American	1,551,399	19%	1,678,122	19%	1,766,810	18%	1,820,482	17%
Asian	439,890	5%	605,366	7%	790,250	8%	1,014,116	10%
Other Races, Total	522,890	7%	772,855	9%	1,109,306	12%	1,528,062	15%
Total Population, All Races	8,001,031	100%	8,811,513	100%	9,645,280	100%	10,530,228	100%
Not Hispanic or Latino	7,369,199	92%	7,829,144	89%	8,225,824	85%	8,574,709	81%
Hispanic or Latino	631,825	8%	982,367	11%	1,419,457	15%	1,955,519	19%
Total Population, All Ethnicities	8,001,031	100%	8,811,511	100%	9,645,281	100%	10,530,228	100%

Note: May not equal 100% because of rounding.

Source: Virginia Employment Commission.

http://bi.virginialmi.com/rdPage.aspx?rdReport=Imitools_demographics&tabsDemographics=tpnlPopProj&rdNoShowWait=True&rdWaitCaption>Loading. LMI Tools: Demographics.

Nearly half of the Hispanic population in Virginia was born outside the USA. The largest single group identifies as being from Central American countries. The diverse language, cultural and educational experiences represented by the Hispanic community need to be considered in all educational efforts in the state.

Table 2. Hispanic population in Virginia by national origin 2011

Hispanic Origin	All	Native born	Foreign born
Mexican	157,000	99,000	58,000
Central American	221,000	80,000	141,000
South American	122,000	38,000	84,000
Caribbean	104,000	94,000	10,000
Other Hispanic	44,000	34,000	10,000
Total	648,000	345,000	303,000
Distribution	100%	53.2%	46.8%

Source: Pew Research Center's Hispanic Trends Project tabulations of the 2011 ACS (1% IPUMS sample) <http://www.pewhispanic.org/>.

Conclusion: Virginia's population, especially the younger population, is becoming increasingly diverse. By 2040, it is expected that half of Virginia's population will be other than White, non-Hispanic.

Poverty

One of the problems posed by the changing demographics of the state is the fact that Black/African American and Hispanic children are more likely to grow up in poverty than are either Asian American or White, non-Hispanic children. However, poverty is not just a minority issue; Virginia had 100,000 White children growing up in poverty as of 2012.

Table 3. Children under 18 in Virginia living in poverty by race and ethnicity

Race/Ethnicity		2008	2009	2010	2011	2012
Asian and Pacific Islander	Number	7,000	6,000	9,000	11,000	9,000
	Percent	8%	7%	9%	10%	8%
Black or African American	Number	114,000	109,000	109,000	110,000	113,000
	Percent	30%	28%	28%	28%	30%
Hispanic or Latino	Number	28,000	31,000	36,000	49,000	42,000
	Percent	16%	17%	18%	24%	19%
Non-Hispanic White	Number	87,000	96,000	100,000	93,000	100,000
	Percent	8%	9%	10%	9%	10%
Two or More Races	Number	11,000	15,000	15,000	22,000	19,000
	Percent	13%	15%	13%	20%	15%
Total	Number	247,000	253,000	265,000	280,000	279,000
	Percent	14%	14%	14%	15%	15%

Source: Kids Count Data Center. (2013). <http://datacenter.kidscount.org/data/tables/44-children-in-poverty-by-race-and-ethnicity?loc=48&loct=2#detailed/2/48/false/868,867,133,38,35/10,11,9,12,1,13,185/324,323>. US Census Bureau American Community Survey.

Poverty is a pernicious problem that hands itself off to the next generation. Table 4 shows measures on the loss of personal income potential and the societal costs associated with early poverty. Increased welfare costs, higher incarceration costs, and single motherhood are all outcomes of growing up in poverty. It is important to decide what higher education can do to help resolve these issues in Virginia.

Table 4. Outcomes of growing up in poverty

	Below official poverty line	Between one and two times poverty line	More than twice the poverty line
Completed years of schooling	11.8	12.7	14
Earnings (\$1,000s)	\$17.90	\$26.80	\$39.70
Annual work hours	1,512	1,839	1,963
Food stamps, annual	\$896	\$337	\$70
Poor health	13%	13%	5%
Arrested (men only)	26%	21%	13%
Non-marital birth (women only)	50%	28%	9%

Source: Duncan, G. J., & Magnuson, K. (2011, Winter). *The long reach of early childhood poverty*. Pathways, pp. 22–27.

Virginia today is living with a racial heritage that was forged in the past. The following summary represents the conclusions of the Demographics & Workforce Group at the Weldon Cooper Center (University of Virginia, www.coopercenter.org/demographics). The experts from the Weldon Cooper Center conclude that the residual effects of historical inequalities are still a challenge as higher education works to improve economic and social mobility for all of Virginia’s citizens.

“Over the past thirty years, blacks in Virginia have achieved significant gains in educational attainment and income, despite patterns of persistent divergence between black and white Virginians—patterns with deep and wide roots in Virginia history. The divergences in place, in educational outcomes, in economic wellbeing between Virginia’s largest minority group and the majority are reflected in these patterns:

- Black Virginians continue to be concentrated in the southern and eastern portions of the state, a pattern established during Virginia’s pre-Civil War history.
- Rates of residential racial segregation in Virginia’s large metropolitan areas remain high, with little change in the last two decades.
- Despite gains in education, blacks still lag far behind the educational attainment of whites.
- The household income of blacks continues to trail significantly behind that of whites, despite absolute gains; and a significant differential income is found even among blacks and whites with the same level of education and number of hours worked.
- On additional metrics of economic wellbeing, unemployment, home ownership, and poverty, black Virginians remain consistently worse off than white Virginians.”³

³ Claibourn, M.P., (2012). *Blacks in Virginia: Demographic trends in historical context*. Weldon Cooper Center, UVA. http://www.coopercenter.org/sites/default/files/publications/NC_Blacks-in-Virginia_4_30_12.pdf. p. 13.

Conclusion: The long-term effects of poverty are negative for the individual and costly for the state. Education provides one of the best ways to move the poor into a better pathway, but overcoming the burdens of poverty will require a concentrated effort. Poverty undermines self-confidence, limits life experiences and raises obvious financial barriers to success. Efforts to improve college attainment rates statewide must address all of the needs associated with poverty, and cannot ignore the historical legacy that intertwines racial and ethnic identities with socioeconomic status in Virginia.

Aging population

Race, ethnicity and poverty are not the only demographic issues of importance to Virginia. The state is aging, which has the potential to change public priorities. By 2030, almost 20 percent of Virginians will be over 65, compared with 12 percent in 2010. By 2030, the youngest of the Baby Boomer generation will have turned 65, and the oldest Boomers will be turning 85. Many localities will be challenged to address the growing needs of their senior population in the coming decades. This has the potential to shift public priorities toward addressing the needs of the aging, rather than the young.

Section summary

Virginia is becoming more diverse, and that diversity will challenge higher education in the state to provide education to students with greater variation in cultural and economic backgrounds. Higher rates of poverty are associated with being from a minority racial or ethnic background. The long-term social costs of poverty are measured in public dollars going to welfare, prisons and health care, and in lost taxes. Higher education can be an important partner in assuring that more Virginia citizens who have not historically realized their full potential are prepared for a productive future.

Regional differences

According to the Weldon Cooper Center for Public Service, growth will continue to be uneven across regions and localities of Virginia.

- The Northern Virginia and Richmond regions are projected to continue to grow faster than other regions in the state.
- Regions with older populations and more people moving out than in – such as Southwest, Southside and Eastern – are expected to experience stagnant to low growth.
- The Hampton Roads region is projected to maintain moderate growth through this decade.

Over the last decade, the population in Northern Virginia grew by 24 percent, while eight communities in Southside Virginia lost population.⁴

The following table shows the variation in poverty levels, ranging from 6 percent in Northern Virginia to 20 percent in Southside. Northern Virginia leads the state in percent of population with a high school diploma, a BA or higher, and in median family income. Southside and Southwest trail on those measures. Racial/ethnic diversity also varies across the regions. Hampton Roads has the highest

⁴ Weldon Cooper Center for Public Service, Demographic Research Center, University of Virginia.

proportion of African American citizens, Northern Virginia has the largest share of Hispanic citizens, and Southwest has the highest predominance of White citizens.

Southside and Southwest have poverty rates two and three times higher than the more prosperous regions in the state. High poverty rates are associated with lower educational attainment rates. These variations from the mean represent very different challenges for higher education in the different regions of Virginia.

Table 5. Regional differences across the state

Region	Population 2012	Population estimate 2020	% Below poverty line 2008-12	% with BA or higher 2008-12 (Age 25+)	% HS graduate or higher 2008-12 (Age 25+)	% White 2012	% Black 2012	% Hispanic or Latino 2012	Median household income 2008-12
<i>Central</i>	1,608,666	1,780,663	12%	33%	86%	63%	26%	5%	\$60,311
<i>Eastern</i>	142,353	148,686	13%	21%	82%	65%	27%	5%	\$51,774
<i>Hampton Roads</i>	1,669,237	1,746,578	11%	29%	89%	56%	31%	6%	\$60,249
<i>Northern</i>	2,753,553	3,017,815	6%	52%	91%	57%	12%	16%	\$102,198
<i>Southside</i>	383,977	392,314	20%	14%	76%	61%	34%	3%	\$36,118
<i>Southwest</i>	413,334	420,604	19%	14%	76%	94%	3%	2%	\$35,819
<i>Valley</i>	485,971	530,801	14%	24%	83%	86%	5%	6%	\$49,950
<i>West Central</i>	729,537	774,052	16%	26%	85%	81%	13%	3%	\$47,188
Virginia	8,186,628	8,811,512	11%	35%	87%	64%	19%	8%	\$63,636
United States	313,914,040	333,896,000	15%	29%	86%	63%	12%	17%	\$53,046

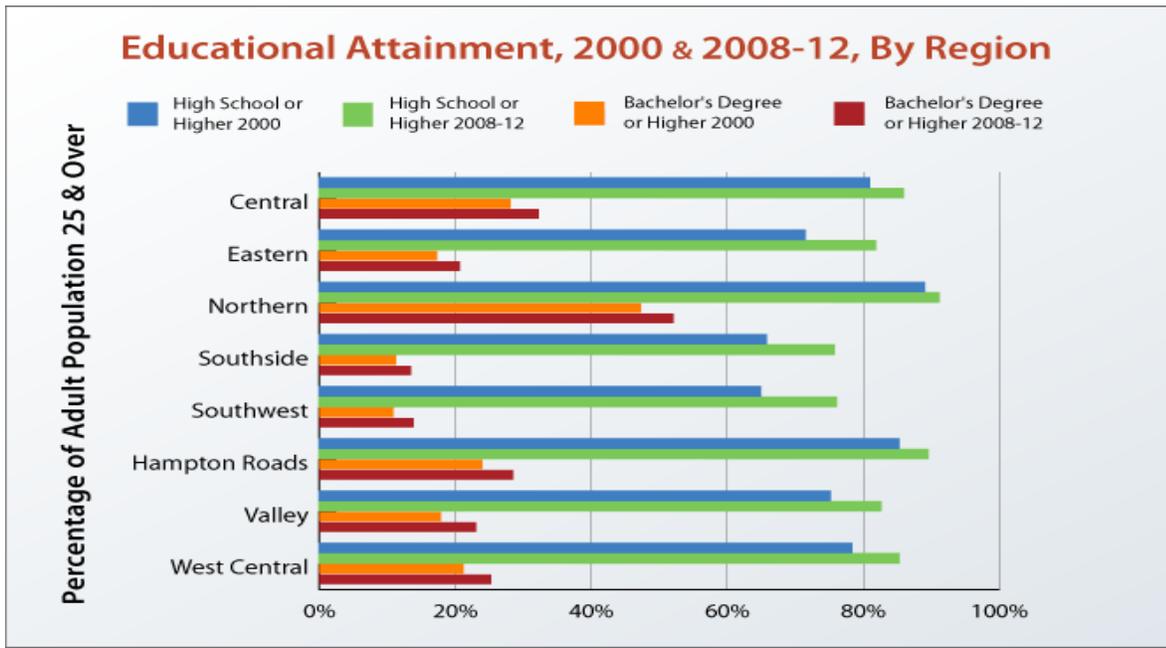
Note: Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Non-employer Statistics, Economic Census, Survey of Business Owners, Building Permits. Population projection data comes from Virginia State Demographer Projections. Table does not include racial categories: American Indian and Alaskan, Asian, Native Hawaiian and Other Pacific Islander, and Two or More Races due to low overall representation. Northern Virginia has a relatively high proportion of Asians at 12.3%.

Sources: US Census Bureau State and County Quick Facts. http://quickfacts.census.gov/qfd/download_data.html.

Demographics Research Group. <http://www.coopercenter.org/demographics/virginia-population-projections>.

The following chart tracks the changes in educational attainment in each of the regions. The regions with the lowest high school graduation rates show the greatest improvement between the 2000 and 2008-12 attainment rates. Increases in bachelor degree attainment are consistent but modest in all the regions.

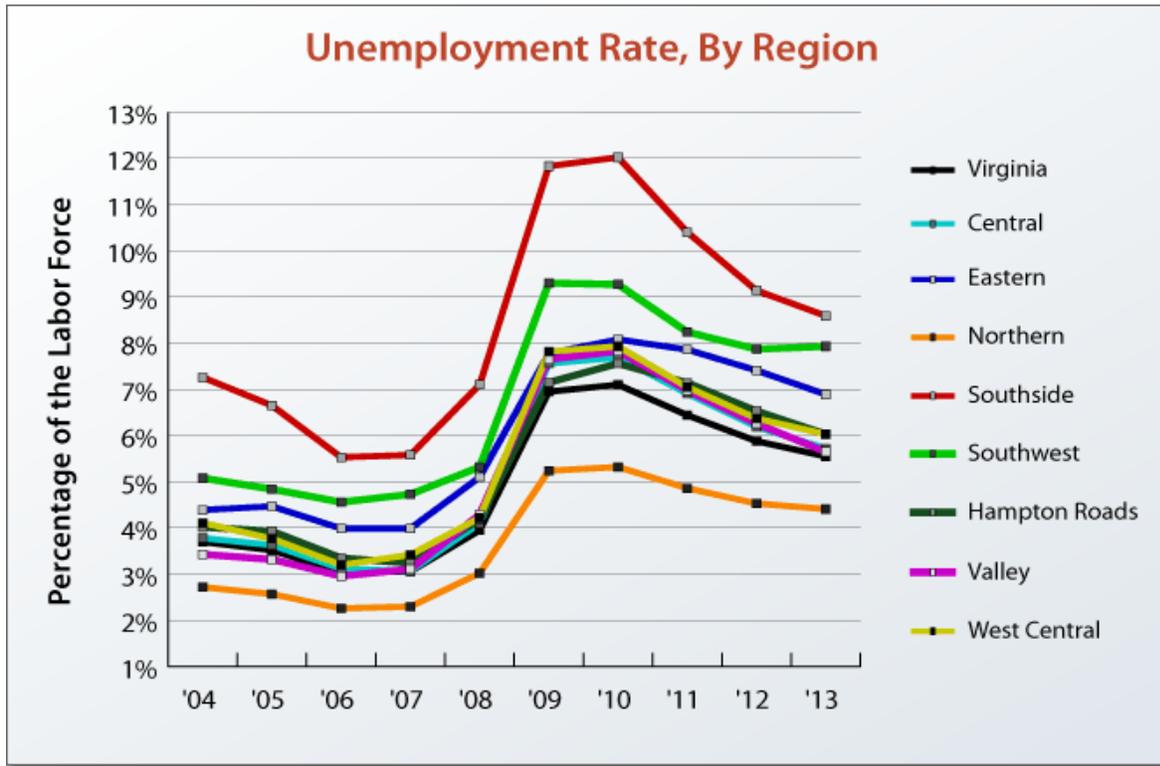
Figure A. Educational attainment by region in Virginia



Source: Virginia.gov. (2014). *Educational Attainment*. Council on Virginia’s Future: Virginia Performs. <http://vaperforms.virginia.gov/indicators/education/edAttainment.php>.

The following chart marking the unemployment rate between 2004 and 2013 shows the effects of the recession in Virginia. All regions showed increasing unemployment rates starting in 2009, with a declining rate in 2010-11. The negative effects were greatest in Southside and much more modest in Northern Virginia, where government employment was not as vulnerable to the recession as was private employment. The lowest unemployment year in Southside was higher than the highest unemployment year in Northern Virginia. As of 2013, unemployment in each region was still higher than was the case prior to the recession.

Figure B. Unemployment rate, by Virginia Region



Source: Virginia.gov, (2014). *Unemployment*. Council on Virginia’s Future: Virginia Performs. <http://vaperforms.virginia.gov/indicators/economy/unemployment.php>.

Virginia’s community colleges have initiated a program called the Rural Horseshoe Initiative, which is designed to address the needs of regions in Virginia that are generally rural, lower income and losing employment. They make the case that many parts of Virginia are seeing positive economic activity as the state grows out of the recession; this is not the case for nearly 75 percent of the Commonwealth’s geography. If Virginia’s education gap in the Rural Horseshoe is not addressed, vast areas of the state will face a future of high poverty, population decline, and a continuing reliance on support from government entities.

Conclusion: Northern Virginia has a population that is wealthy, well-educated and increasing in numbers. Because of its size, it obscures the economic and educational issues that are more typical of the rest of the state. The rural areas of the state face a much less optimistic future unless coordinated efforts are made to develop employment opportunities, and the education necessary to prepare the next generation for those opportunities.

Section summary

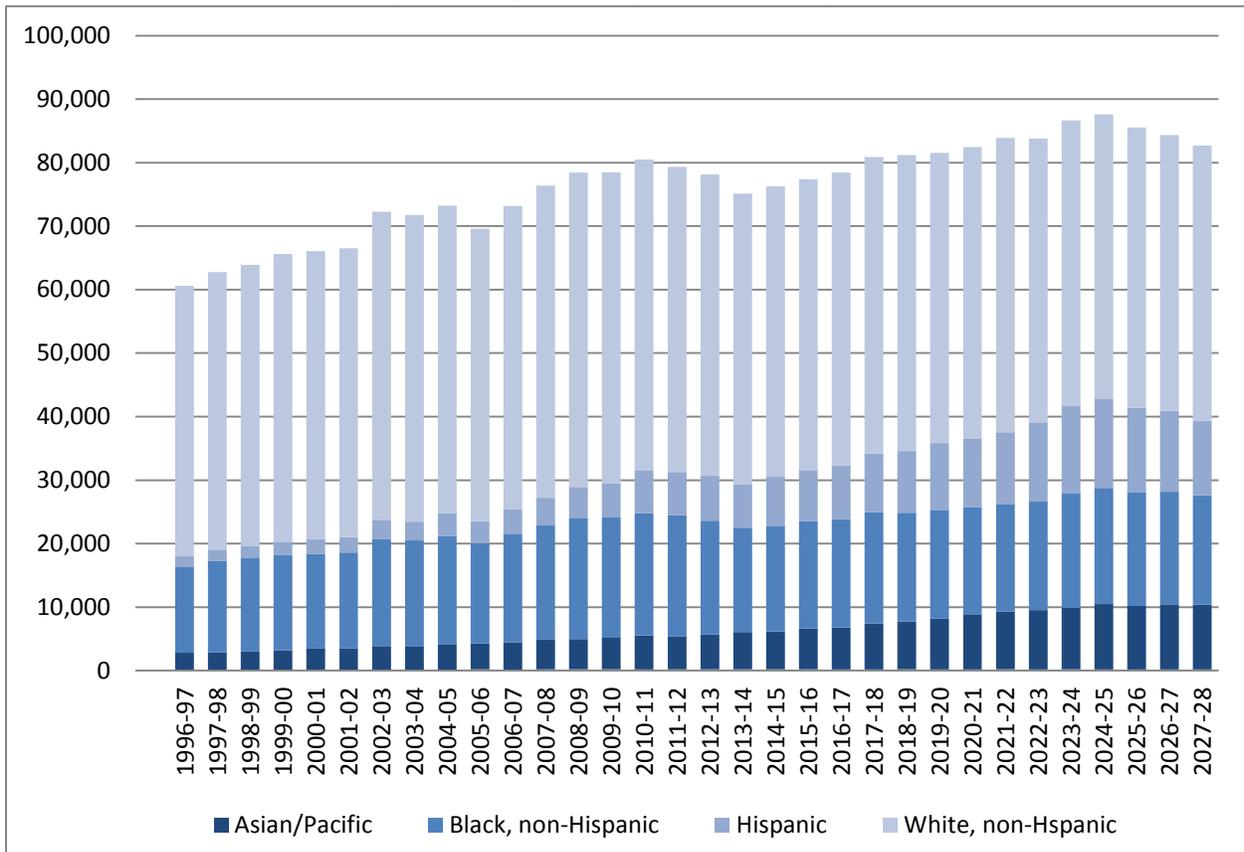
The regions in Virginia represent different economic, demographic and educational contexts for higher education. Northern Virginia is dominated by big government, big contracting companies and all the consulting needs that drive the demand for trained experts. Some of the other regions of the state face

potential decline with an aging population, limited job opportunities and out-migration of younger residents. Higher education institutions in the state need to find ways to contribute to all regions of the state and build partnerships that will sustain local economies.

Projection of High School graduates by race and ethnicity

The projection of the number of high school graduates in Virginia shows several things. First, the Commonwealth is in the midst of a period of declining numbers of high school graduates, with modest growth projected for the next few years. The number of Hispanic and Asian/Pacific graduates will increase, and Black, non-Hispanic students will maintain their numbers. By 2027, nearly half the high school graduates in Virginia will be other than White, non-Hispanic. Many of the Hispanic students will come from first-generation families who may have little knowledge of American postsecondary education opportunities. Higher education institutions in Virginia need to anticipate this change and find ways to help these students succeed.

Figure C. High School graduates in Virginia



Source: WICHE. (2012). *Knocking at the College Door: Projections of High School Graduates*. <http://www.wiche.edu/pub/knocking-8th-and-supplements>.

Some students do not enroll in college immediately after graduating from high school, so the number of citizens in the college-age group is another indicator of potential enrollment. According to the Southern

Regional Education Board (SREB), the number of Virginians from age 18 to 24 is expected to change by 4 percent between 2010 and 2020 before increasing from 2020 through 2030.

Table 6. Projected change in the number of 18 to 24 year olds for Virginia to 2030

Year	Actual	Projected			
	2010	2015	2020	2025	2030
Population	807,186	837,024	838,974	900,687	950,207
% Change from 2010		4%	4%	12%	18%

Source: SREB. http://info.sreb.org/DataLibrary/tables/FB13_06.xlsx.

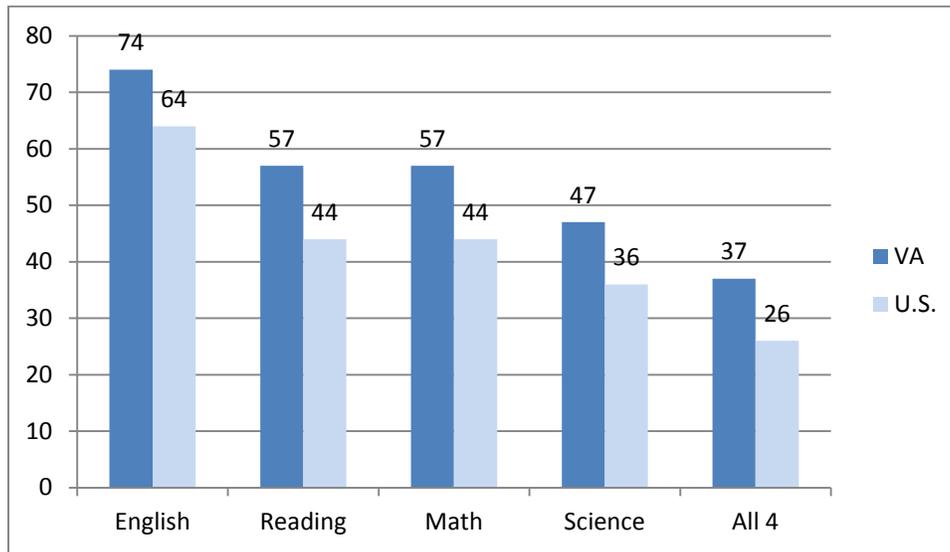
Conclusion: Virginia will experience a period of slow to no growth in the college-age population over the next few years. An increasing share of that population will be Hispanic and African American. Improving the college enrollment rates of these students will be necessary to maintain college and university enrollment in Virginia.

College Ready Skills

Students with a combined SAT score of 1,550 across the critical reading, math, and writing portions of the college entrance exam have a 65 percent chance of earning a 2.67 GPA or higher during their first year of college, according to College Board research. Students who meet that benchmark have a much higher chance of graduating from college than do students who score below the benchmark. The average combined SAT score for Virginia high school students in 2013 was 1528. Students in the 25th percentile received a combined score of 1260. By this measure, the average SAT test taker in Virginia falls below the score at which College Board predicts that two-thirds would succeed in their first year. Those in the bottom quarter would struggle to succeed in college.

ACT has validated measures that predict the college readiness of high school graduates. Not all Virginia students take the ACT, but it provides an indicator of the scores below which high school graduates in the state might have problems in college. The following figure shows the percent of high school graduates between 2009 and 2011 deemed ready for college-level work. The good news is that 37 percent of Virginia’s high school graduates who took the test were prepared in all four areas tracked by ACT, which is well above the national average. The bad news is that, given that NCHEMS reports that 67.2 percent of Virginia high school graduates go directly to college, the difference suggests that nearly half of new college students in Virginia are starting with less-than-adequate college level skills, whether they are remanded to developmental education or not.

Figure D. Percent of Virginia high school graduates with college-ready skills, 2009-11



Source: ACT. (2013). <http://www.act.org/newsroom/data/2013/states/pdf/Virginia.pdf>.

Remediation

An indicator of academic risk for incoming students is the need for remedial or developmental education when the student enters college. Twenty-two percent (nearly 10,000) of incoming students in Virginia were in at least one remedial course last year. Remedial courses include English, ESL, reading and math. The largest enrollments were in English and math.

Virginia has been working on a College and Career Readiness Initiative to ensure that college-ready standards in reading, writing and mathematics are taught in each Virginia high school classroom. The goal is to strengthen students’ preparation for college and the workforce before they leave high school.

Conclusion: Improving the academic skills of incoming students will be an important precondition necessary to increase the number of successful college and university graduates.

Section summary

Virginia has been and is working to develop college- and career-ready skills in their high school curriculum. Colleges and employers need to be partners in the process to help more students make a successful transition from high school to college and on to employment. Alignment of standards will help assure that students leaving high school will not find themselves having to take remedial courses before they can start “real college.” If not successful, remedial education is costly for the student, as measured in time spent that does not lead to employment skills, and for the institution, as it pays the cost of enrolling a student who will not continue.

Education levels

Virginia is home to more postsecondary degree holders than the national average. That trend has been true for a long time. In 2011, nearly half the Virginia population 25 to 44 years old had a postsecondary degree. Not all of these degree holders received a degree from a Virginia institution, and some may have moved from other states.

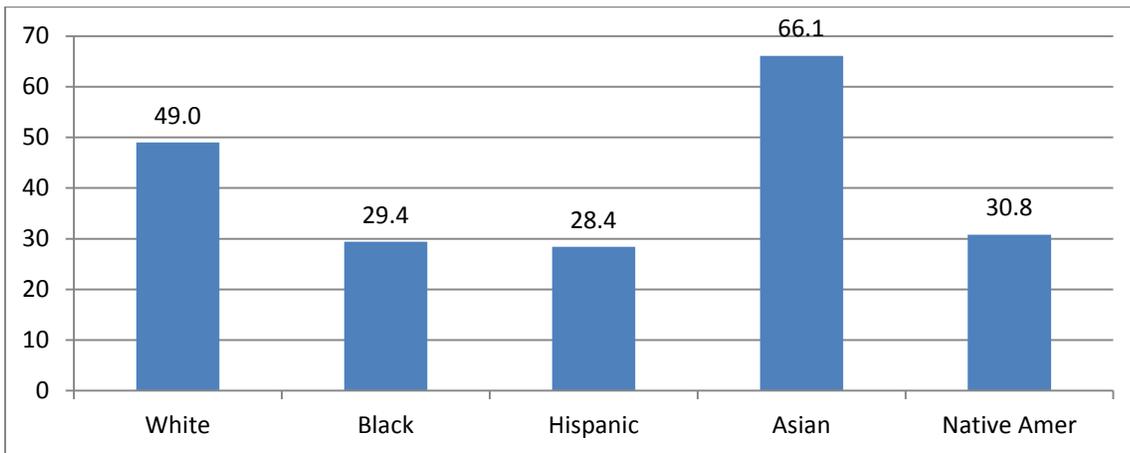
Table 7. Percent of postsecondary degree holders among individuals 25-44 years old

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	34.7	35.3	36.0	36.9	37.6	37.9	38.3	38.7	39.0	39.7	39.6	40.4
Virginia	39.1	40.1	40.4	41.2	41.8	42.2	43.3	43.5	43.8	44.3	45.9	47.4

Source: National Science Foundation. <http://www.nsf.gov/statistics/seind14/index.cfm/state-data/table.htm?table=31>. Census Bureau, 2000 and 2010 Decennial Censuses, Population Estimates Program (various years), and American Community Survey (various years).

The distribution of college degrees is not uniform across races and ethnicities, however. Figure E shows college degree attainment by Virginia citizens ages 25 to 64. White and Asian citizens are more likely to have a college degree than are those from other ethnic or racial groups. Given the increasing diversity of Virginia’s population and the growing demand for an educated workforce, these education gaps will have an increasingly negative impact on the state unless addressed.

Figure E. Percent of Virginia population by race/ethnicity, 25 to 64 with a college degree

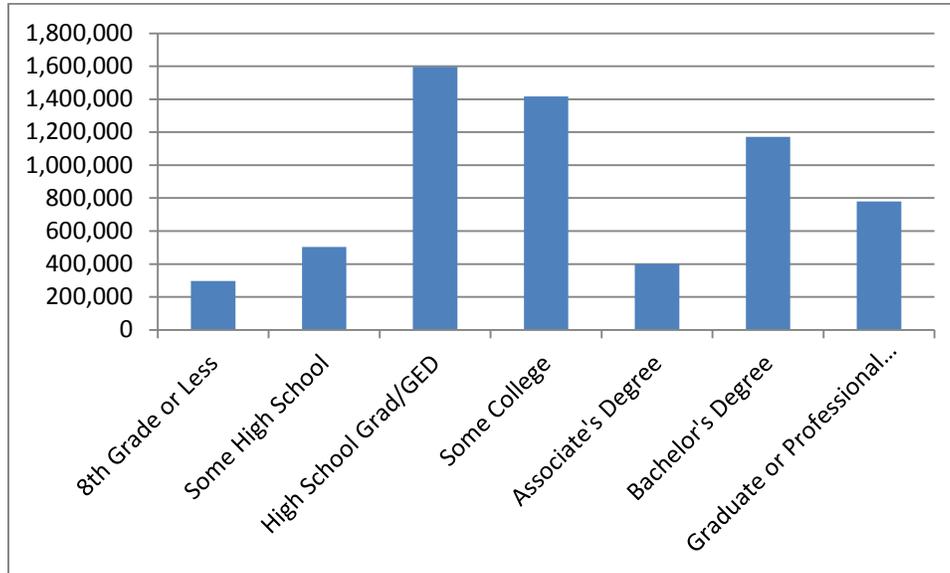


Source: Matthews, D. (2014). [http://www.luminafoundation.org/publications/A stronger nation through higher education-2014.pdf](http://www.luminafoundation.org/publications/A%20stronger%20nation%20through%20higher%20education-2014.pdf). Lumina Foundation.

The chart below provides an overview of the education levels of the population in Virginia that is 18 years old or over. The two largest groups are high school graduates and those with some college. Some college could mean they were a dropout or received a certificate of less than two-years. Given the

demand for an educated workforce, these two groups represent those individuals that could continue in college, especially at a time when traditional-age high school graduates will be in short supply.

Figure F. Education levels of Virginia population 18+



Source: Virginia Employment Commission, Virginia Community Profile.

http://virginialmi.com/report_center/community_profiles/5101000000.pdf

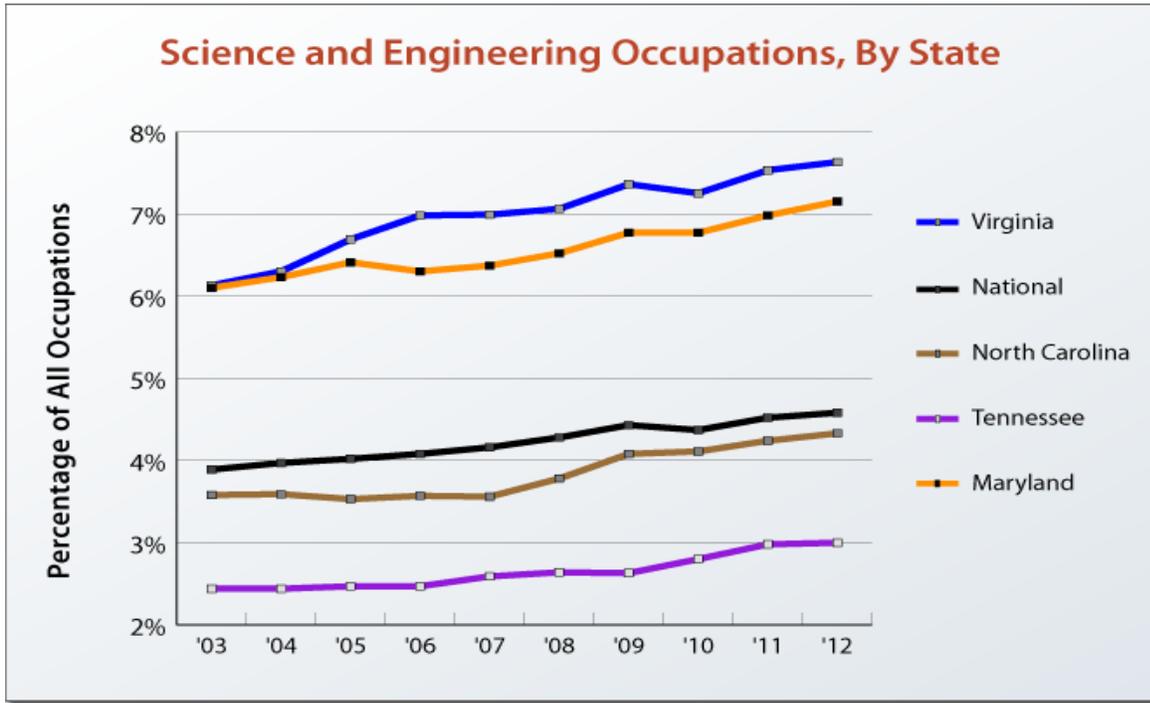
Conclusion: Virginia has more postsecondary degree holders than most states, but the two largest groups by education level are high school graduates with no college and those with some college. Helping adults in these groups return to college would help Virginia meet its goal of increasing the number of postsecondary degree holders.

Employment profile

Virginia’s workforce has a high proportion of science and engineering occupations compared with other states in the region. Virginia’s occupational shift to professional, scientific, and technical services has been concentrated in Northern Virginia. Technology companies have been expanding in Virginia to take advantage of one of the largest concentrations of high-tech workers in the U.S.; 9.8 percent of the state’s private sector workforce is in tech, according to TechAmerica Foundation’s annual Cyberstates report. Amazon.com has added roughly 2,000 jobs in the area in the recent past for two distribution centers and its cloud computing business (Amazon Web Services). Microsoft has invested \$1 billion to build and expand a data center in southern Virginia.

The following figure shows the trend in the percent of the workforce that is defined as science and engineering occupations in Virginia, compared with other states and the nation. The chart also shows the high density of these jobs in Virginia compared with bordering states and the nation.

Figure G. Science and engineering occupations, by state



Source: Virginia.gov. (2014). *Workforce Quality*. Council on Virginia’s Future: Virginia Performs. <http://vaperforms.virginia.gov/indicators/economy/workforceQuality.php>.

The following list of the 50 largest employers in the state includes several higher education-related organizations that are shown in bold. The list shows the importance of health and education organizations as major employers in the state. The list also shows the importance of service jobs provided by these large organizations, especially government (in italics). Only one of the big employers, Huntington Ingalls Industries, builds, mines, or makes anything as a central business. The number of employees is a headcount, where a part-time employee counts the same as a full-time employee.

Table 8. Fifty largest employers in Virginia

1. <i>U.S. Department of Defense</i>	26. <i>Henrico County School Board</i>
2. Walmart	27. The Home Depot
3. <i>Fairfax County Public Schools</i>	28. MCV Hospital
4. Huntington Ingalls Industries, Inc.	29. U.P.S.
5. Sentara Healthcare	30. <i>U.S. Department of Veterans Affairs</i>
6. Food Lion	31. Wells Fargo Bank NA
7. <i>Postal Service</i>	32. <i>VDOT</i>
8. <i>County of Fairfax</i>	33. Bon Secours Richmond Health System
9. HCA Virginia Health System	34. <i>City of Virginia Beach</i>
10. <i>U.S. Department of Homeland Defense</i>	35. <i>Chesapeake City Public School Board</i>
11. <i>Prince William County School Board</i>	36. <i>Norfolk City School Board</i>
12. Capital One Bank	37. Northrop Grumman Corporation
13. <i>City of Virginia Beach Schools</i>	38. University of Virginia Medical Center
14. Inova Health System	39. Roanoke Memorial Community Hospital
15. <i>Loudoun County Schools</i>	40. George Mason University
16. University of Virginia / Blue Ridge Hospital	41. Dominion Virginia Power
17. Target Corp	42. Red Lobster & the Olive Garden
18. Virginia Commonwealth University	43. Science Applications International Corporation
19. <i>U.S. Department of Commerce</i>	44. GEICO, Government Employees Insurance
20. Lowe's Home Centers, Inc.	45. Centra Health
21. Booz Allen Hamilton	46. Giant Food
22. Virginia Tech Cooperative Extension Office	47. <i>Arlington County School Board</i>
23. Riverside Regional Medical Center	48. <i>City of Norfolk</i>
24. Kroger	49. United Airlines Inc.
25. <i>Chesterfield County School Board</i>	50. Navy Federal Credit Union

Source: Virginia Employment Commission, Quarterly Census of Employment and Wages (QCEW), 4th Quarter (October, November, December) 2013.

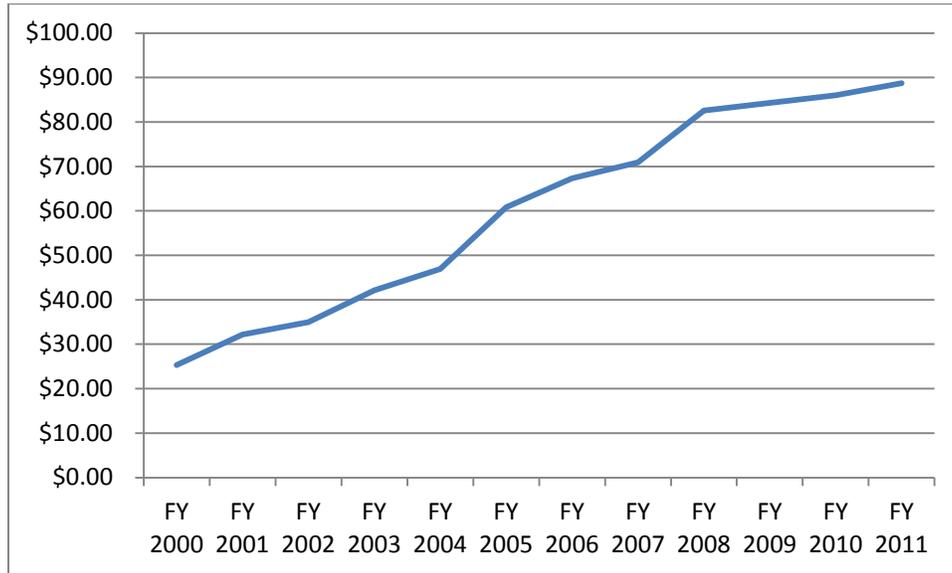
Federal Government

Virginia is the number one state for federal contracts. The growing role of the federal government in Virginia is apparent from the percentage of jobs in federal, state and local governments rising from 18.1 percent to 19.3 percent between 2006 and 2011. Military personnel are not included in these numbers, and would add 129,699 (as of August 2013) more to the total government employment in Virginia if counted.

Any reduction in government contracts will have the biggest effect in Northern Virginia and Hampton Roads. Federal contracts given to companies in Virginia represented 13.7 percent of Virginia's gross state product (Fedspending.org). When direct government spending is included in the total, roughly 30 percent of Virginia's economy is tied to the federal government. As a result, the threats of a federal sequester, or a long-term reduction in government spending, are very real risks for the state economy and could have a negative effect on hiring and tax revenue.

Experts suggest that even with federal cutbacks, the state economy is diverse enough to be able to absorb federal cuts.⁵ It is reasonable to anticipate that even in a best-case scenario, federal spending in the state will not increase at the same rate as experienced over the last decade. The rate of increase started to slow in 2008.

Figure H. Dollars from federal contracts to companies in Virginia, 2000-2011 (in billions)



Source: FedSpending.org. (2011). *Contracts Performed in Virginia*.
http://www.fedspending.org/fpds/fpds.php?reptype=p&detail=1&fiscal_year=2011&sortby=f&database=fpds&datatype=T&stateCode=VA.

Chase/JP Morgan anticipates that Virginia’s economy will grow a little faster than it has into 2014, despite losses related to the sequestration. Compared with national averages, professional and business services, as well as the government sector, contribute a disproportionate amount to the Commonwealths gross state product.

Conclusion: Virginia’s economy is dominated by service jobs and government employment. There is the risk that declining federal funding could have a negative effect on hiring and, in turn, on tax revenues in the state.

Occupational demand

In a related document called the Gap Analysis Memo, JBLA has identified a specific need by degree level for students trained for specific occupations. This overview provides a general assessment of occupations in Virginia with high need. The results suggest a demand for employees with strong backgrounds in computer and IT skills or health-related training.

⁵Badenhausen, K. (2013). *Virginia Tops 2013 List of the Best States for Business*. Forbes.
<http://www.forbes.com/sites/kurtbadenhausen/2013/09/25/virginia-tops-2013-list-of-the-best-states-for-business/>.

The Virginia Employment Commission, through VirginiaLMI.com, provides projections of employment demand for the Commonwealth. Included are projections for the number of openings by occupation statewide between now and 2020, without regard for education level. Openings are the result of individuals leaving the occupation, and growth. Three of the top ten occupations needing the largest number of employees will be computer- or health-related. The occupations in bold on the list are those that require STEM-H preparation.

Table 9. The twenty occupations projected to have greatest increase in demand to 2020

Rank	Occupation	Projected annual growth Rate	Projected openings by 2020
1	Office and Administrative Support Occupations	1.25	71,402
2	Computer and Mathematical Occupations	2.98	67,976
3	Computer Specialists	2.99	66,340
4	Business and Financial Operations Occupations	2.11	59,804
5	Sales and Related Occupations	1.33	58,348
6	Education, Training, and Library Occupations	2.15	55,568
7	Healthcare Practitioners and Technical Occupations	2.30	48,903
8	Construction and Extraction Occupations	2.13	46,186
9	Food Preparation and Serving Related Occupations	1.46	45,967
10	Business Operations Specialists	2.24	44,228
11	Personal Care and Service Occupations	2.55	37,198
12	Construction Trades Workers	2.12	34,395
13	Retail Sales Workers	1.35	32,822
14	Healthcare Support Occupations	3.13	32,141
15	Transportation and Material Moving Occupations	1.29	31,037
16	Other Personal Care and Service Workers	3.40	29,970
17	Health Diagnosing and Treating Practitioners	2.34	29,935
18	Food and Beverage Serving Workers	1.58	29,623
19	Installation, Maintenance, and Repair Occupations	1.57	25,778
20	Primary, Secondary, and Special Education School Teachers	2.19	25,390

Source: VirginiaLMI.com. http://virginialmi.com/download_center/industry_occupation_projections/occprj.zip.

The following list is the projection of the 20 fastest-growing occupations in Virginia that will require a bachelor's degree over the decade 2010-20. Some of them represent a relatively small number of jobs. Those that represent a larger number of jobs are indicated in bold. All of the fastest-growing occupations with the largest number of job slots requiring a bachelor's degree are related to computer technology and programming.

Table 10. List of Virginia's 20 fastest growing occupations that require a bachelor's degree 2010-2020

	Employment		Percent
	2010	2020	Change
1 Biomedical Engineers	460	910	96%
2 Interpreters and Translators	4,850	7,780	60%
3 Meeting, Convention, and Event Planners	3,660	5,670	55%
4 Software Developers, Systems Software	31,370	48,180	54%
5 Market Research Analysts and Marketing Specialists	11,370	16,740	47%
6 Personal Financial Advisors	3,820	5,370	41%
7 Software Developers, Applications	31,900	44,600	40%
8 Cost Estimators	7,260	10,110	39%
9 Database Administrators	5,880	8,190	39%
10 Athletic Trainers	520	720	38%
11 Logisticians	6,640	9,160	38%
12 Coaches and Scouts	7,030	9,680	38%
13 Training and Development Specialists	8,990	12,270	36%
14 Network and Computer Systems Administrators	20,040	27,290	36%
15 Agricultural Engineers	270	360	35%
16 Financial Examiners	880	1,180	34%
17 Geographers	90	120	33%
18 Health Educators	1,290	1,720	33%
19 Credit Counselors	620	820	31%
20 Computer Systems Analysts	32,220	42,180	31%

Source: CareerOneStop: Fastest Growing Occupations Virginia.

<http://www.careerinfonet.org/oview1.asp?next=oview1&Level=edu3&optstatus=&jobfam=&id=1&nodeid=3&soccode=&stfips=51&ShowAll>. Virginia Employment Commission.

A Brookings Institution study (*The Hidden STEM Economy*, by Jonathan Rothwell) found that half of all STEM jobs nationally are available to workers without a four-year college degree. These jobs pay \$53,000 on average—a wage 10 percent higher than jobs with similar educational requirements.

Half of all STEM jobs are in manufacturing, health care, or construction industries. Installation, maintenance, and repair occupations constitute 12 percent of all STEM jobs. Other blue-collar or technical jobs in fields such as construction and production also frequently demand STEM knowledge.

STEM jobs that require at least a bachelor's degree are highly clustered in certain metropolitan areas, while sub-bachelor STEM jobs are prevalent in every community. San Jose, CA, and Washington, D.C. and its suburbs, have the most active STEM-based economies among large metro areas. These sub-bachelor STEM jobs are more evenly distributed among smaller towns and localities that are not home to high-tech employers, but they pay relatively high wages in the large metropolitan areas as well.

Conclusion: IT and computer-related occupations will require the most new employees over the next few years. Those college graduates with degrees or certificates below the bachelor's degree represent half the need.

General skills

A difference exists between listing high-demand occupations that require specific training and the general skills employers are looking for in their hiring, regardless of occupation. The top qualities look more like what colleges and universities argue is their strength in producing liberal arts graduates than a list of technical skills. Employers look for new employees with certain applied skills, but beyond that they are looking for a set of traits and abilities that may not be directly taught in colleges and universities. The following table lists the percent of Virginia employers rating a skill as essential. Most of the desired skills represent broader capacities than specific applied skills.

Table 11. Percent of Virginia employers rating a skill as essential for new employees

1	Positive Work Ethic	96%
2	Speaking & Listening	96%
3	Professional Ethics	95%
4	Participates As A Team Member	89%
5	Reading & Writing	89%
6	Diversity Awareness	82%
7	Reasoning, Problem-Solving, & Decision-Making	76%
8	Technology Applications	68%
9	Understanding Health, Wellness, & Safety	67%
10	Understands The Big Picture	64%
11	Lifelong Learning	63%
12	Job Acquisition & Advancement	60%
13	Telecommunications	58%
14	Internet Use & Safety	58%
15	Creativity, Innovation, & Adaptability	57%
16	Leadership & Resource Management	54%
17	Research & Synthesis	53%
18	Applying & Understanding Mathematics	51%
19	Data & File-Management	50%
20	Computer Hardware Basics	34%
21	Employment-Related Financial Literacy	34%

Source: Carrier, A., Gunter, M. (2010). Weldon Cooper Center.

<http://www.coopercenter.org/sites/default/files/publications/Critical%20Workplace%20Skills%20for%20Virginia.pdf>.

Conclusion: The greatest job opportunities are in the fields of computer/IT and health. Employers, however, are looking for more than specific job skills. New employees need broader personal skills to succeed over the long run.

Section summary

Occupational demand in IT and computer technology fields is robust and growing in the state, as is the constant demand for health care workers. Equally important as specific employment skills, however, are the soft skills of being able to communicate, analyze and be creative. The foundations of a well-rounded education program should provide both.

Many students who have taken a program of study that would be logically linked to specific occupations do not necessarily follow that direct road. Plans change, other opportunities present themselves and occupational requirements may change quickly. All of this makes tying specific majors to specific occupations questionable as a planning tool.

Higher education**Higher education institutions**

The public higher education institutions in Virginia are part of a larger postsecondary community, ranging from barber colleges to medical schools. The U.S. Department of Education (ED) recognizes 189 accredited postsecondary institutions in Virginia that are eligible for Title IV student aid. The list does not include institutions that do not offer federal student aid. One hundred of these recognized schools and colleges are for-profit, including four-year, two-year and less-than-two-year institutions. The 42 recognized non-profit postsecondary institutions in the state range from professional graduate programs to less-than-two-year institutions, with the majority providing four-year undergraduate programs with some graduate degrees. Twenty-three community colleges are on the ED list, and some of these colleges have several campuses. There is also one two-year college, Richard Bland that is not part of the Virginia Community College System. Several of the four-year institutions in the state offer two-year degrees, but are not included as community colleges. Five of the institutions in the state are classified as HBCUs, two public and three private, not-for-profit, one of which is a two-year college. ED does not list any Hispanic-serving institutions in Virginia.

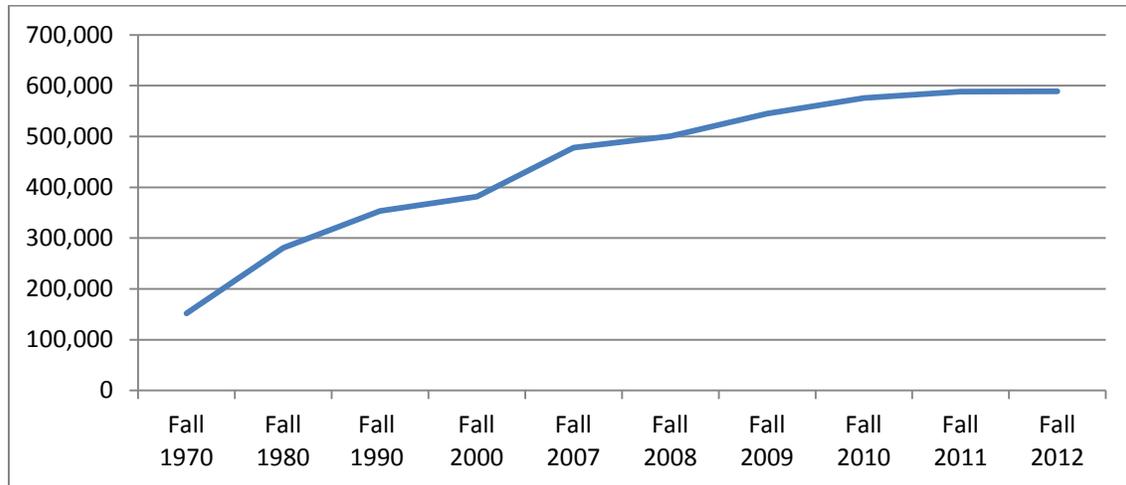
SCHEV recognizes institutions from other states that offer programs in Virginia. In addition, students living in Virginia may be taking courses online that originate from providers in other states.

Enrollment

Students have many ways that they can attend college. Most traditionally, they can enroll in a physical campus located in the state or attend college in another state. In addition, they can take courses online, or attend a program provided by a college headquartered in another state, but offering classes in Virginia. Some students may take classes in more than one of these settings. During the span of the year, a student could be counted more than once because he/she takes classes from different providers. (See Appendix A for list of accredited postsecondary institutions in Virginia)

Enrollment⁶ growth in Virginia colleges and universities started slowing in 2010. Nevertheless, enrollment has increased by 23 percent since 2007, compared with a national growth rate of 13 percent for the same period. The majority of postsecondary students in Virginia are enrolled in public institutions, but according to NCES, the greatest growth has been in private colleges, with a 66 percent increase in enrollment since 2007 in the private sector, compared with 10.6 percent in the public sector. Enrollment includes students from other states and online enrollment.

Figure I. Virginia higher education fall enrollment in degree-granting institutions, 1970 to 2012



Source: NCES, Digest of Education Statistics. (2013). Table 304.1.
http://nces.ed.gov/programs/digest/d13/tables/dt13_304.10.asp

The following tables show several measures of enrollment in all postsecondary institutions in the state, including for-profit institutions. These tables include all students that are enrolled in accredited degree and certificate programs in postsecondary institutions that are eligible for Federal student aid in Virginia. Institutions are classified according to the highest degree offered.

Public colleges and universities account for 69 percent of the total fall enrollment; 22 percent of the students attend not-for-profit institutions, and 9 percent for-profit institutions. Table 12 shows the relatively large number of part-time students enrolled in public two-year colleges in Virginia.

⁶ Enrollment can be measured in different ways. First, head count treats full- and part-time students the same, while full-time-equivalent counts three part-time students as equal to one full-time student. Second, there is a difference between higher education enrollment, which includes only institutions that offer academic associate or higher degrees, and the more inclusive postsecondary enrollment. Postsecondary enrollment includes students enrolled in shorter occupational programs. Third, enrollment can be reported as the number of students enrolled in the fall, or as an annual number, which includes all the unique students enrolled at any point in the year.

Table 12. Enrollment in public Virginia colleges and universities, Fall 2012

	Fall enrollment				Annual
	Full-time	Part-time	FTE	Total Fall	
Public, 2	67,370	127,057	109,722	194,427	290,976
Public, < 2	378	164	433	542	942
Public, 4+	174,550	40,776	188,142	215,326	257,162
Total Public	242,298	167,997	298,297	410,295	549,080

Source: IPEDS data (2012) with calculations by JBL Associates.

The majority of students attending private, not-for-profit colleges and universities attend four-year colleges. The shorter programs include nursing schools and other specialized programs.

Table 13. Enrollment in private-not-for-profit colleges and universities, Fall 2012

	Fall enrollment				Annual
	Full-time	Part-time	FTE	Total Fall	
Not-for-profit 2	902	154	953	1,056	1,474
Not-for-profit < 2	76	150	126	226	396
Not-for-profit 4+	77,984	50,222	94,725	128,206	159,351
Total not-for-profit	78,962	50,526	95,804	129,488	161,221

Source: IPEDS data (2012) with calculations by JBL Associates.

Annual enrollment is a better measure of enrollment in for-profit colleges and schools than the more traditional fall enrollment. For-profit schools and colleges generally do not follow traditional semester enrollment cycles; they start new classes monthly and operate year-round.

Table 14. Enrollment in private, for-profit colleges and schools, Fall 2012

	Fall enrollment				Annual
	Full-time	Part-time	FTE	Total Fall	
For-profit, 2-	7,460	1,866	8,082	9,326	16,735
For-profit, < 2	2,056	660	2,276	2,716	4,492
For-profit, 4+	26,024	15,721	31,264	41,745	75,212
Total, for-profit	35,540	18,247	41,622	53,787	96,439

Source: IPEDS data (2012) with calculations by JBL Associates.

Total enrollment of students in Virginia postsecondary institutions that are eligible for federal student aid is approaching 594,000. Sixty-nine percent of the total fall enrollment is accounted for by public colleges and universities. Twenty-two percent of the students enrolled in fall attend non-profit colleges and universities. The remaining 9 percent attended for-profit schools and colleges. Annually, more than 806,000 students are enrolled in a postsecondary institution somewhere in the state.

Table 15. Enrollment in all colleges and schools, Fall 2012

	Fall enrollment				Annual
	Full-time	Part-time	FTE	Total Fall	
Total Public	242,298	167,997	298,297	410,295	549,080
Total not-for-profit	78,962	50,526	95,804	129,488	161,221
Total, for-profit	35,540	18,247	41,622	53,787	96,439
Total	356,800	236,770	435,723	593,570	806,740

Source: IPEDS data (2012) with calculations by JBL Associates.

Conclusion: Public colleges and universities enroll the majority of students at all levels, but private sector schools enroll a significant share.

In-state and out-of-state enrollment

Part of the enrollment in Virginia colleges and universities comes from other states. The following table shows the number and percentage of Virginia citizens enrolled in public four-year colleges and universities in the state as they start their first year, along with the share of entering enrollment represented by students coming from other states. Out-of-state students pay higher tuition in public institutions and represent more revenue than is available from in-state students. Students are classified as being in-state/out-of-state based on their tuition classification as reported by the institution.

Table 16 shows that three public colleges have the largest share of students from other states. Virginia Military Institute enrolls 46 percent of its students from other states. Thirty-six percent of the College of William and Mary's entering students come from other states, as do 35 percent of those entering UVA.

Table 16. First-time students who are Virginia citizens enrolling in public four-year colleges and universities in Virginia

	% In-State 1st-time Students	% Out-of-State 1st-time Students
Public 4-year	77.5%	22.5%
Longwood University	96.1%	3.9%
University of Virginia's College at Wise	94.0%	6.0%
Radford University	93.9%	6.1%
Christopher Newport University	92.7%	7.3%
University of Mary Washington	89.9%	10.1%
Old Dominion University	89.2%	10.8%
Virginia Commonwealth University	85.6%	14.4%
Norfolk State University	83.7%	16.3%
George Mason University	79.0%	21.0%
James Madison University	70.1%	29.9%
Virginia State University	68.9%	31.1%
Virginia Tech	68.4%	31.6%
University of Virginia	64.9%	35.1%
College of William and Mary	64.1%	35.9%
Virginia Military Institute	53.9%	46.1%

Source: SCHEV. (2012). http://research.schev.edu/enrollment/E2_Report.asp.

Virginia is a net importer of students, according to NCES data. In 2012, 13,478 Virginia residents enrolled for the first time in a college located in another state, while 20,680 students came from another state to enroll in a Virginia college or university.

Conclusion: Students from other states tend to enroll in the most selective Virginia public universities, or those with a special mission. They represent a revenue stream to the institution and help diversify the student body, but may take enrollment slots away from qualified Virginia residents.

Historically Black Colleges in Virginia

Historically Black Colleges and Universities (HBCUs) provided an enrollment option for African American students who were excluded from enrolling in other colleges prior to the end of segregated education in the 1960s. The Higher Education Act of 1965, as amended, defines an HBCU as any accredited HBCU that was established prior to 1964, whose principal mission was, and is, the education of black Americans. The five HBCUs in Virginia include both public and private not-for-profit institutions.

- Hampton University, four-year, Private not-for-profit
- Norfolk State University, four-year, Public
- Virginia State University, four-year, Public
- Virginia Union University, four-year, Private not-for-profit
- Virginia University of Lynchburg, four-year, primarily associate's, Private not-for-profit
- St. Paul's College four-year, Private not-for-profit (closed)

Table 17. Virginia HBCU FTE enrollment, number of students receiving degrees, and graduation rate 2012

Institution Name	FTE fall enrollment 2012	Doctor's degree 2012	Master's degree 2012	Bachelor's degree 2012	Associate's degree 2012	Graduation rate total cohort 2012
Virginia University of Lynchburg	388	7	8	18	29	82%
Hampton University	4,631	79	144	830	0	59%
Virginia State University	5,698	3	135	836	21	42%
Norfolk State University	6,220	5	261	813	77	34%
Virginia Union University	1,719	12	103	153	0	30%
Saint Paul's College*	111	0	0	68	0	17%

*Closed

Source: IPEDS data (2012).

Enrollment in Virginia's HBCUs has been erratic over the last few years, but overall enrollment has been improving since 2007.

Conclusion: Historically Black Colleges and Universities have played an important role in Virginia, but are challenged by changing conditions. How best to position these institutions to continue to be successful in the future is an important consideration.

Distance education

Virginia enrolls a higher percentage of students in distance education than is found nationally. The following table shows the enrollment of students in colleges and universities located in Virginia who are enrolled in distance education. An important part of the online enrollment is accounted for by Liberty University, which now exceeds 74,000 enrolled students, with nearly 62,000 enrolled online. That makes Liberty the largest university in Virginia).⁷

Table 18. Number of Virginia students enrolled in distance education

	Virginia		US
	Number	Percent	Percent
Enrolled students	592,273	100%	100%
Exclusively in Distance Ed	109,927	18.6%	12.5%
Some Distance Ed	97,038	16.4%	14.2%
No Distance Ed	385,308	66.1%	74.2%

Note: May not equal 100% because of rounding.

Source: NCES. (2014). <http://nces.ed.gov/pubs2014/2014023.pdf>.

⁷ Anderson, N. (2013). *Virginia's Liberty Transforms into Evangelical Mega-University*. The Washington Post. http://www.washingtonpost.com/local/education/virginias-liberty-transforms-into-evangelical-mega-university/2013/03/04/931cb116-7d09-11e2-9a75-dab0201670da_story.html.

The popularity of distance education among students is generally accounted for in terms of convenience. The option to attend class when you can and where you want is helpful for working students with families. Students enrolled in physical courses may take a class online as a way to manage their time more efficiently. The Electronic Campus of Virginia is a cooperative instructional technology initiative among the state's public and private colleges and universities that links students to offerings provided by colleges and universities across the state. NOVA's Extended Learning Institute is used by community colleges across the state to support online learning. Increasingly, online education is part of almost every institution's offering.

The Southern Regional Education Board's Electronic Campus is a central marketplace for some 28,000 courses and more than 800 degree programs offered online by colleges and universities in the South. Under a reciprocity agreement among participating states, the Electronic Campus offers courses and programs that have won approval from regulators within their home states. This approval is based on a set of commonly developed "principles of good practice" that are consistent across the states and function as a regional certification of course or program quality.

These digitally mediated approaches, and others like them, provide the option to improve course delivery, reduce the time it takes to finish a class, and make college available to people who otherwise could not enroll. Online education is an important part of the higher education delivery system in Virginia.

Conclusion: One-third of Virginia students are taking some or all of their coursework online. This complicates traditional definitions of what it means to be in college, but online tools have the potential to increase access and productivity at the same time.

Military and veteran students

Virginia is home to a significant military and veteran community, and the state's colleges and universities have welcomed both active military personnel and veterans. The distribution of students receiving VA benefits show that the private institutions have more than doubled their share of recipients since 2007 while the public colleges and universities have lost share.

Table 19. Percent of VA payment recipients (veterans only) among public four-year, two-year and select private institutions 2007-14

	2007	2008	2009	2010	2011	2012	2013	2014
Public, 4-year research	24.2%	22.5%	21.2%	19.1%	15.0%	14.8%	16.7%	16.7%
Public, 4-year other	9.9%	8.8%	8.8%	7.5%	6.2%	6.3%	6.3%	6.7%
Public, 2-year	44.1%	44.4%	44.8%	41.7%	33.5%	34.6%	33.2%	30.3%
Private, Institutions with over 300 veterans	21.8%	24.3%	25.2%	31.7%	45.2%	44.3%	43.8%	46.3%
Total	100%							

Note: Please be reminded that the numbers will appear to be low because the report is a point in time and reflects only the Veterans that have received payment from DVA. Richard Bland College is not included in Public, 2-year count. Private institutions included: Liberty University, ECPI University, Saint Leo University, ITT Technical Institute, Medical Careers Institute, Regent University, Stratford University, Advance Technology Institute, University of Phoenix, Everest College, DeVry University, South University, Bryant & Stratton, The Art Institute.
Source: SCHEV provided data.

Table 20. Veterans as a percent of total student population receiving DVA benefits among top four institutions with largest veteran population by institution sector 2007-14

		2007	2008	2009	2010	2011	2012	2013	2014
Public, 4-year	Old Dominion U	9%	9%	8%	7%	6%	7%	6%	6%
	George Mason U	5%	5%	5%	5%	4%	2%	4%	4%
	Virginia Commonwealth U	4%	4%	3%	3%	2%	2%	2%	2%
	Virginia Tech	3%	3%	3%	2%	2%	2%	2%	2%
Public, 2-year	Tidewater CC	14%	15%	15%	16%	13%	16%	14%	11%
	Northern Virginia CC	9%	9%	8%	10%	9%	7%	7%	8%
	Thomas Nelson CC	5%	5%	5%	4%	3%	3%	3%	3%
	Germanna CC	2%	2%	1%	2%	1%	1%	1%	2%
Private institutions with over 300 veterans	Liberty U	9%	12%	15%	11%	11%	14%	15%	17%
	ECPI U	5%	5%	6%	8%	13%	8%	8%	8%
	Saint Leo U	7%	6%	5%	6%	4%	9%	4%	4%
	ITT Technical Institute	0%	0%	0%	0%	4%	3%	3%	2%

Note: Please be reminded that the numbers will appear to be low because the report is a point in time and reflects only the Veterans that have received payment from DVA.
Source: Data provided by SCHEV, July 2014.

Enrollment of underserved students

Providing access to higher education to traditionally underserved student populations, including students of color, is an important part of Virginia’s higher education strategy. The following table shows the racial/ethnic enrollment for each of the public four-year colleges and universities in Virginia. The weighted average minority enrollment is nearly 20 percent when the two HBCUs are included. The remaining institutions range from 8 percent minority enrollment to 28.2 percent. George Mason enrolls the most Hispanic students, and Norfolk State has the largest African American enrollment.

Table 21. Enrollment by ethnic/racial minorities in Virginia four-year public colleges and universities, 2012-13

Institution	African American Fall enrollment	American Indian or Alaskan Native Fall enrollment	Hispanic or Latino Fall enrollment	Total Fall enrollment	% minority
Norfolk State U*	5,916	14	168	7,100	85.90%
VA State U*	5,151	12	92	6,208	84.60%
Old Dominion U ¹	5,475	93	1,384	24,670	28.20%
VA Commonwealth U ¹	5,055	99	1,845	31,445	22.30%
George Mason U ¹	2,810	68	2,915	32,961	17.60%
College of William and Mary ¹	597	25	610	8,258	14.90%
U of Mary Washington	345	10	309	5,093	13.00%
Christopher Newport U	408	12	241	5,186	12.70%
Longwood U	359	14	190	4,834	11.60%
Radford U	708	33	351	9,573	11.40%
The U of VA College at Wise	223	6	37	2,420	11.00%
U of VA-Main Campus ¹	1,408	34	1,165	23,907	10.90%
VA Military Institute	81	5	64	1,664	9.00%
VA Polytechnic Institute and State U ¹	1,201	56	1,337	31,087	8.30%
James Madison U	779	29	788	19,927	8.00%
Total	30,630	518	11,506	215,326	19.8%

* Historically Black College or University.

¹ Classified as a research university.

Source: IPEDS Data Center (2012-13).

The minority enrollment in community colleges ranges from 4 percent to 44 percent. The results are consistent with the distribution of Virginia population distribution by race/ethnicity. The largest share of Hispanic/Latino students is in Northern Virginia. Nine of the community colleges have an enrollment that is at least one-third minority.

Table 22. Headcount enrollment by ethnic/racial minorities in Virginia two-year public colleges, 2012-13

Institution	African American Fall enrollment	American Indian or Alaskan Native Fall enrollment	Hispanic or Latino Fall enrollment	Total Fall enrollment	% minority
Eastern Shore CC	386	2	45	988	44%
Thomas Nelson CC	3919	75	665	10,928	43%
Paul D Camp CC	583	11	34	1,493	42%
Tidewater CC	10,424	171	1,873	30,015	42%
J Sargeant Reynolds CC	4,608	84	527	12,746	41%
Southside Virginia CC	2,319	18	106	6,028	41%
Danville CC	1,617	12	90	4,414	39%
Northern Virginia CC	8,986	175	9,198	50,347	36%
Richard Bland College	495	6	46	1,532	36%
John Tyler CC	2,500	51	606	10,122	31%
Patrick Henry CC	773	6	106	3,074	29%
Germanna CC	1,173	34	591	7,509	24%
Rappahannock CC	724	25	138	3,708	24%
Central Virginia CC	781	23	108	4,888	19%
Piedmont Virginia CC	791	18	229	5,671	18%
Virginia Western CC	907	31	222	8,405	14%
Blue Ridge CC	280	16	288	4,684	12%
Lord Fairfax CC	361	31	423	7,265	11%
Wytheville CC	279	11	93	3,706	10%
New River CC	273	24	114	5,011	8%
Dabney S Lancaster CC	63	9	27	1,463	7%
Southwest Virginia CC	76	11	22	2763	4%
Virginia Highlands CC	70	7	38	2,569	4%
Mountain Empire CC	58	4	32	3,089	3%
Total	42,446	855	15,621	192,418	31%

Source: IPEDS data (2012-13) with calculations by JBL Associates.

Conclusion: Enrollment of minority students varies by institution mission, selectivity and in the case of community colleges, by region of the state. The opportunity to enroll in college is, for many students, defined by where they live and what they can afford.

Degree production

Virginia colleges and universities awarded over 133,000 certificates and degrees to students in 2012-13. Bachelor's degrees were the most often awarded, with associate and Master's degrees in a close tie for second most frequently awarded.

The following tables provide an overview of the number of degrees and certificates awarded by institutions in Virginia. Table 23 includes awards at less than the associate level and those awards made by any postsecondary institution recognized by the U.S. Department of Education, not just institutions of higher education. For-profit institutions produced a third of the associate degrees awarded in the state, with 63 percent awarded by community colleges in the state.

In order to be included in this list, the certificate program must be offered by an accredited school, be at least three months in length, and prepare an individual for employment. Community colleges awarded 54 percent of the certificates. It is worth noting that some four-year colleges award associate degrees and certificates.

Public colleges and universities in the state provided 68 percent of the bachelor degrees awarded in the state, 55 percent of the master's degrees, 78 percent of the doctoral degrees, and half the professional degrees.

Table 23. Degrees and certificates awarded by Virginia postsecondary institutions, 2011-12

	Total Postsecondary Degrees and Certificates awarded by Virginia Public Postsecondary Institutions						
	Total degree	Assoc. degree	Bachelor degree	Master degree	Doctoral degree	Prof. degree	Certificate
Public, 2	31,780	17,926					13,854
Public, < 2	364						364
Public 4+	53,970	148	37,508	11,967	1,627	1,623	1,097
Total Public	86,114	18,074	37,508	11,967	1,627	1,623	15,315
	Total Postsecondary Degrees and Certificates awarded by Virginia Private, not-for-profit Institutions						
Not-for-profit 2	510						510
Not-for-profit <2	170						170
Not-for-profit 4+	26,034	813	14,485	7,727	428	1,586	995
Total non-profit	26,714	813	14,485	7,727	428	1,586	1,675
	Total Postsecondary Degrees and Certificates awarded by Virginia private, for-profit institutions						
For-profit 2	5,787	1,304					4,483
For-profit <2	1,656						1,656
For-profit 4+	13,310	6,041	4,011	1,855	41	89	1,273
Total	20,753	7,345	4,011	1,855	41	89	7,412

	Total Postsecondary Degrees and Certificates awarded by all postsecondary institutions in Virginia						
	Total degree	Assoc. degree	Bachelor degree	Master degree	Doctoral degree	Prof. degree	Certificate
Total Public	86,114	18,074	37,508	11,967	1,627	1,623	15,315
Total non-profit	26,714	813	14,485	7,727	428	1,586	1,675
Total for-profit	20,753	7,345	4,011	1,855	41	89	7,412
Total	133,581	26,232	56,004	21,549	2,096	3,298	24,402

1. Other includes two or more races; Enrollment and degree data: Other includes two or more races and race/ethnicity unknown.

Source: IPEDS data (2011-12) with calculations by JBL Associates.

Overall, the number of associate degrees and certificates together exceed the number of bachelor degrees awarded to students by postsecondary institutions in Virginia.

The following table is long and complicated, but provides an overview of the enrollment and degrees awarded to students from different ethnic/racial backgrounds in Virginia’s postsecondary education institutions. It provides several comparisons that provide information about the success of institutions in meeting the needs of students from different ethnic/racial backgrounds.

The table makes several points. First, the enrollment of minority students, defined in this case as Black/African American and Hispanic/Latino students, varies by education type and control. Second, minority students do less well in public research universities in the state than they do in other institutional groups. Third, the enrollment and degree completion pattern for Black/African American students is different than the pattern for Hispanic/Latino students.

The following table shows the distribution of enrollment as full-time or part-time student by level of enrollment (undergraduate, masters, doctoral, and post-graduate certificate) across ethnic/racial groups.

- The first row in the table is a reference that indicates the distribution of the college age population in Virginia. Fifty-nine percent are White, non-Hispanic, 22 percent Black/African American, 5 percent Asian, 10 percent Hispanic/Latino, and 3 percent other.
- The results for Black/African American students show that they are less likely to be enrolled full-time in a public research university (12.2 percent) compared with their share of the population (22.3 percent). Compared with their enrollment, they represent a smaller share of bachelor degree recipients (10.9 percent). The distributional differences for Hispanic/Latino students follow the same pattern, with a decline in full-time enrollment compared with population, and a decline in degrees compared with full-time enrollment.
- The full-time enrollment of Black/African American students is close to the population distribution in other four-year public institutions, but the Black/African American share of bachelor degrees is less than the enrollment share. Hispanic/Latino students are less likely to enroll full-time in other four-year public institutions compared with their presence in the age-group population, but their achievement of bachelor degrees matches their enrollment share.

- The full-time enrollment of Black/African American students is in close approximation of the 18-24 year old population in community colleges, but their share of associate degrees is less than their share of enrollment. Hispanic/Latino students' enrollment at community colleges is well below the population share, and the share receiving an associate degree is well below their enrollment share.
- The private, non-profit colleges and universities in the state enroll Black/African American students full-time at roughly the same rate as in the population, but the production of degrees lags enrollment. The non-profit institutions' enrollment of Hispanic/Latino students does not reach the level of the population, and with the exception of the associate degree, the share of degrees going to Hispanic/Latino students in the sector falls below their share of enrollment.
- Private, for-profit colleges and schools present a more complicated profile because they include students seeking anything from a certificate to a Ph.D. Measured by enrollment, both the four-year and two-year institutions' full-time enrollment exceeds the population distribution for Black/African American students. The production of degrees at all levels for this population is close to the enrollment distribution. Hispanic/Latino students enroll in four-year private, for-profit colleges at a rate equal to their population presence, but the share of degrees going to Hispanic/Latino students falls below their share of enrollment. Hispanic student enrollment in two-year for-profit schools exceeds their share of the population, and their completion of degrees and certificates exceeds their share of enrollment.

Table 24. Distribution of enrollment and degrees awarded by Virginia institutions to students by ethnic/racial categories

	White	Black or African American	Asian	Hispanic or Latino	Other ⁶	Total
Virginia population 18-24¹	59.1%	22.3%	5.2%	9.7%	3.3%	100.0%
Fall enrollment 2012 and degrees/certificates - 2011						
Public Research²						
undergraduate FT	60.0%	12.2%	10.9%	7.1%	9.3%	100%
graduate FT	69.7%	7.4%	8.5%	4.4%	9.7%	100%
undergraduate PT	54.9%	15.1%	9.4%	7.8%	12.1%	100%
graduate PT	67.8%	10.1%	5.6%	4.6%	11.5%	100%
<i>bachelor's</i>	63.0%	10.9%	10.3%	5.6%	9.7%	100%
<i>master's</i>	66.8%	7.8%	5.9%	4.1%	15.0%	100%
<i>doctor's</i>	69.7%	6.6%	10.0%	3.1%	10.0%	100%
<i>Postbac</i>	59.6%	10.0%	8.9%	3.5%	17.5%	100%
Public 4-year³						
undergraduate FT	63.9%	21.8%	2.7%	3.9%	7.3%	100%
graduate FT	62.8%	25.1%	2.2%	2.4%	7.1%	100%
undergraduate PT	55.6%	30.5%	2.0%	2.6%	8.8%	100%
graduate PT	64.1%	24.5%	1.3%	2.0%	7.7%	100%
<i>bachelor's</i>	67.4%	16.2%	3.9%	3.4%	8.7%	100%
<i>master's</i>	70.9%	15.3%	1.9%	2.3%	9.2%	100%
<i>doctor's</i>	68.0%	13.1%	4.7%	0.7%	13.5%	100%
<i>postbac</i>	84.3%	10.1%	2.2%	3.4%	0.0%	100%
Public 2-year⁴						
undergraduate FT	56.8%	21.9%	6.8%	8.8%	4.9%	100%
undergraduate PT	60.2%	22.2%	4.9%	7.8%	4.2%	100%
<i>certificate⁵</i>	66.2%	19.3%	5.1%	5.4%	1.2%	100%
<i>associate's</i>	65.1%	15.9%	7.3%	6.6%	1.3%	100%
NFP- 4yr, 2yr, <2yr						
undergraduate- FT	60.0%	20.6%	1.8%	3.7%	13.2%	100%
graduate FT	53.2%	21.4%	3.3%	2.3%	19.2%	100%
undergraduate PT	45.0%	23.5%	1.0%	2.8%	26.9%	100%
graduate PT	49.0%	23.3%	1.6%	2.4%	23.2%	100%
<i>certificate</i>	65.0%	23.5%	2.0%	2.8%	6.1%	100%
<i>associate's</i>	58.5%	19.4%	1.0%	6.8%	14.0%	100%
<i>bachelor's</i>	66.7%	18.4%	1.5%	3.8%	9.0%	100%
<i>master's</i>	59.9%	22.2%	1.7%	3.7%	12.0%	100%
<i>doctor's</i>	68.5%	13.3%	5.6%	2.5%	9.3%	100%

	White	Black or African American	Asian	Hispanic or Latino	Other ⁶	Total
<i>postbac</i>	57.8%	24.2%	3.9%	3.6%	9.7%	100%
FP 4-year						
undergraduate FT	33.9%	39.2%	3.6%	8.3%	14.3%	100%
graduate FT	25.9%	32.8%	19.6%	5.6%	15.4%	100%
undergraduate PT	28.2%	48.4%	3.0%	6.5%	13.4%	100%
graduate PT	26.7%	48.1%	7.8%	5.1%	11.8%	100%
<i>associate's</i>	36.0%	37.6%	2.4%	6.9%	16.6%	100%
<i>bachelor's</i>	35.2%	33.1%	12.0%	6.2%	13.1%	100%
<i>master's</i>	20.2%	33.1%	30.0%	3.9%	12.4%	100%
<i>doctor's *</i>	46.9%	34.6%	13.1%	0.8%	4.6%	100%
<i>postbac*</i>	21.1%	54.4%	5.3%	8.8%	8.8%	100%
FP 2yr, <2yr						
undergraduate- FT	24.9%	51.1%	4.1%	12.3%	6.8%	100%
undergraduate PT	30.2%	51.9%	5.7%	5.9%	5.7%	100%
<i>certificate</i>	28.1%	45.4%	6.0%	15.8%	4.1%	100%
<i>associate's</i>	30.9%	59.6%	1.3%	4.1%	4.0%	100%

Note:

Enrollment and degree: IPEDS data center; group statistics for VA institutions by sector and degree level

Population data: US Census Bureau American Fact Finder, Population Division

Note: Enrollment and Degree data are from AY 2011-12 and Population data are from 2012

American Indian and Alaska Native and Native Hawaiian and Other Pacific Islander have been excluded from table due to small population size

*n count is below 500, interpret with caution. Associate degrees awarded by four-year universities are not reported

1. Annual Estimates of the Resident Population by Sex, Age, Race, and Hispanic Origin for the United States and States: April 1, 2010 to July 1, 2012. Source: U.S. Census Bureau, Population Division Release Date: June 2013

2. Research=CWM, GMU, ODU, VTech, UVA, VCU: Pub other=CNU, JMU, LU, UMW, NSU, RU, Wise, VMI, VSU; does not include Eastern VA Medical School.

3. Does not include Eastern VA Medical School.

4. Includes Richard Bland College.

5. Certificate includes awards of less than 1 academic year and awards of at least 1 but less than 4 academic years.

6. Population data: Other includes two or more races; Enrollment and degree data: Other includes two or more races and race/ethnicity unknown.

Source: IPEDS data. (2011-12).

These results suggest some questions. Why are Black/African American students so likely to enroll at for-profit schools, and graduate, compared with the result in other sectors? Why do community colleges in the state seem to have difficulty enrolling and graduating Hispanic/Latino students when that population would seem to be a natural fit with the mission of community colleges? What needs to happen to help more students from these groups enroll and succeed in public research universities in the state?

The following table shows the difference in graduation between male and female students by race/ethnicity. The results show that more females complete a degree than males. The difference is

greatest for African American/Black students. This result suggests that more women will have greater earning power and better job prospects than will the men in the same generation. Increasing minority educational achievement will depend in large part on finding ways to help young minority men succeed in school and college.

Table 25. Percent of undergraduate degrees (BA and lower) awarded by race/ethnicity, sex, and institutional sector 2012-13

	White		African American or Black		Asian		Hispanic or Latino		Other		Total		All	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Public, 4-year research	47%	53%	34%	66%	49%	51%	40%	60%	43%	57%	12,282	15,079	45%	55%
Public, 4-year other	40%	60%	36%	64%	44%	56%	41%	59%	41%	59%	4,737	7,156	40%	60%
Public, 2-year	41%	59%	33%	67%	44%	56%	40%	60%	42%	58%	12,974	19,820	40%	60%
Private, Not-for-profit	40%	60%	35%	65%	32%	68%	37%	63%	42%	58%	7,013	10,876	39%	61%
Private, For-profit	42%	58%	35%	65%	46%	54%	34%	66%	41%	59%	6,506	10,446	38%	62%

1. Other includes two or more races and race/ethnicity unknown.

Source: IPEDS data (2011-12) with calculations by JBL Associates.

The SCHEV data below show the distributions of degrees for different ethnic/racial groups. The table shows that foreign students account for one-fifth of doctoral degrees, African American students account for over one-quarter of the certificates of less than a year, and Hispanics account for less than 5 percent of all degrees and certificates awarded. Caution should be used because the share of each column assigned to unknown/unreported race/ethnicity varies by degree level from 1.4 percent for awards of less than a year to 18 percent for master’s degrees.

Table 26. Distribution of degrees awarded by public and private, not-for-profit colleges and universities in Virginia by race/ethnicity, 2012-13

Ethnicity	Awards Less Than A Year	Awards >= 1yr & <2 yrs	Assoc.	Awards >2r & < 4 yr*	Bach.	Post Bach.	First Prof.	Masters	Post Masters	Doc.	Total Deg.
Unknown/Unreported	1.4%	2.6%	4.3%	0.0%	11.6%	15.1%	10.0%	17.9%	13.2%	12.3%	10.3%
Foreign Student	0.6%	0.8%	1.6%	3.3%	2.2%	1.3%	1.4%	6.7%	0.7%	20.1%	3.2%
African American or Black	26.5%	14.9%	16.4%	10.0%	13.0%	11.8%	11.2%	12.1%	19.3%	10.2%	14.2%
Native American*	0.3%	0.5%	0.5%	0.0%	0.3%	0.4%	0.3%	0.3%	0.0%	0.5%	0.3%
Asian and Pacific Islander	2.6%	5.2%	7.1%	3.3%	6.4%	8.4%	10.6%	3.9%	1.1%	3.8%	5.8%
Hispanic	4.2%	6.2%	7.1%	30.0%	4.7%	3.5%	3.0%	3.2%	3.6%	2.0%	4.8%
White, Caucasian American	63.2%	68.5%	61.9%	53.3%	60.0%	57.8%	61.9%	55.0%	61.4%	50.7%	59.9%
Multi-Race	1.4%	1.3%	1.2%	0.0%	1.9%	1.6%	1.6%	1.1%	0.7%	0.4%	1.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: SCHEV data with JBLA calculations, <http://research.schev.edu/apps/info/Reports.Guide-to-the-Degrees-Awarded-Reports.ashx>.

*Small cell sizes.

The next table shows the bachelor’s degrees produced per 1,000 individuals age 19-24 in the state. Virginia shows a climb from being close to the national average to exceeding the national average starting in 2008.

Table 27. Bachelor’s degrees conferred per 1,000 individuals 18–24 years old, 1990–2011

	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	38.9	45.3	44.4	45.4	46.6	47.8	48.9	50.2	51.1	51.8	52.5	53.6	55.2
Virginia	37.3	49	46.4	45.8	47.1	47.3	48.1	49.6	50.5	52	53.1	56.2	60.2

Sources: National Science Foundation. <http://www.nsf.gov/statistics/seind14/index.cfm/state-data/table.htm?table=17>, IPEDS, (various years); Census Bureau, 2000 and 2010 Decennial Censuses and Population Estimates Program (various years).

Conclusion: Virginia does better than average in getting students graduated, but there are significant differences in the level of degree awarded by ethnic/racial group. Improving equity may be more challenging than increasing the number of degrees and certificates awarded.

Summary of section

Degree production for students differs among sectors and levels of degrees. For-profit schools in the state enroll and graduate much higher shares of Black/African American students than do other sectors. That fact raises the question as to what could be done in other sectors of higher education to achieve the same levels of success. The data also suggest that private, non-profit colleges in the state enroll a larger share of Black/African American students than do the public four-year colleges and universities. This speaks to the value of private education in Virginia in expanding opportunity.

Completion rates

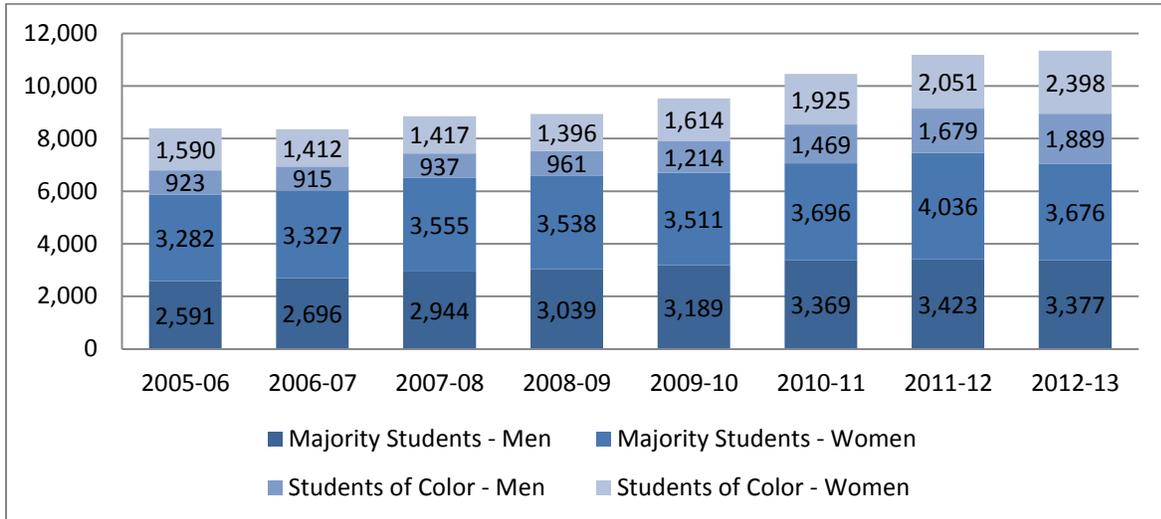
First-year persistence rates

In order to graduate, students must first complete the initial year of college. This early indicator does not definitively predict later success, but it is a necessary step toward eventual graduation. First-year persistence rates available from SREB indicate that at 83 percent persistence, Virginia’s public four-year institutions have the highest first-year persistence in the region, and Virginia’s two-year colleges are near the top with a 67 percent first-year persistence rate.

Transfer rates

The 150% of normal time graduation rates for two-year institutions do not include students who successfully transfer from a two-year college to four-year institutions to complete their degrees. Figure J, below, shows the growth in the number of students transferring from public two-year institutions to public four-year institutions within Virginia. In all years, more women transfer than men do. That holds true for both students of color and majority students. Since 2005, the number of men of color transferring to four-year colleges in Virginia has doubled.

Figure J. Students transferring from all public two-year institutions into all public four-year institutions in the fall and spring



Source: adapted from chart created by SCHEV, <http://research.schev.edu/feedback/transfer/TR01.asp>.

SCHEV data show that the four-year completion rate for students who transfer to four-year institutions in Virginia hovers around 60 percent. Students who transfer with 31 credits or more, or who earn an associate’s degree before transferring, have the greatest success.

Table 28. Four-year completion rates of all students transferring to all public four-year institutions in fall and spring

Degree Completion	2009-10
Summary Totals	
New Transfer (All)	60%
Student Demographics	
New Transfers, Age 17 to 19	62%
New Transfers, Age 20 to 24	62%
New Transfers, Age 25 and Older	55%
Financial Aid Programs at Entry	
New Transfer with Pell	57%
Student Effort and Progress	
Students earning 6 credits or fewer in First Year	7%
Transfer-specific Characteristics	
CC Transfer Students with 15 CC credits or Fewer	47%
CC Transfer Students with between 16 and 30 CC credits	58%
CC Transfer Students with 31 CC credits or Greater (No AA)	72%
AA/AS Awarded Prior to Transfer	68%
AA/AS Awarded Prior to Transfer, 2 or fewer years prior to Transfer	69%
AA/AS Awarded Prior to Transfer, 2.01 to 5 years prior to Transfer	52%
AA/AS Awarded Prior to Transfer, 5 or more years prior to Transfer	52%

Source: SCHEV. (2009-10). <http://research.schev.edu/apps/info/Reports.Guide-to-the-Degrees-Awarded-Reports.ashx>.

Conclusion: Successful community college transfer is an important step in increasing the number of Virginia students with a baccalaureate degree. If a student finishes at least 31 units in community colleges, the chances of completing a bachelor degree improve significantly.

Graduation rates

In general, Virginia's graduation rates by type and control are equal to or higher than those for two- and four-year public institutions compared with the Bordering States group and the JBLA-Identified Peer Group⁸, and ahead of the SREB group for four-year institutions, but lag the SREB group's two-year institutions.

⁸States chosen based on similar enrollment mix between public and private institutions: Colorado, Georgia, Indiana, Minnesota, New Jersey, North Carolina, Ohio, Tennessee, Wisconsin

Table 29. One hundred and fifty percent of normal time graduation rates for all undergraduate degree-seeking students, by level and control

	Institutions (#)	Private, for-profit 2-year	Private, for-profit 4-year	Private, not-for-profit 2-year	Private, not-for-profit 4-year	Public, 2-year	Public, 4-year
Virginia	107	63%	38%	80%	50%	20%	68%
Bordering States Peer Group	456	55%	26%	56%	51%	19%	53%
SREB Peer Group	1332	64%	45%	61%	52%	19%	51%
JBLA-Identified Peer Group	1003	62%	28%	49%	58%	19%	54%

Note: Number of institutions varies based on availability of data elements used to calculate metrics.

Source: IPEDS Spring 2013 Graduation Rates survey; Spring 2013 Fall Enrollments survey.

The next table shows the same report for underserved minority students. The success rate for minority students is not appreciably different than the average in private, for-profit and not-for-profit two-year programs, and public-four year universities in Virginia. There was a drop-off in graduation rates for minority students among the peer groups. The biggest discrepancy between graduation rates for all students and underserved minority students in Virginia is in the private, not-for-profit four-year sector, where there is a 10-percentage point difference. This differential is found across the comparison groups.

Table 30. One hundred and fifty percent of normal time graduation rates for degree-seeking underserved minority students, by level and control

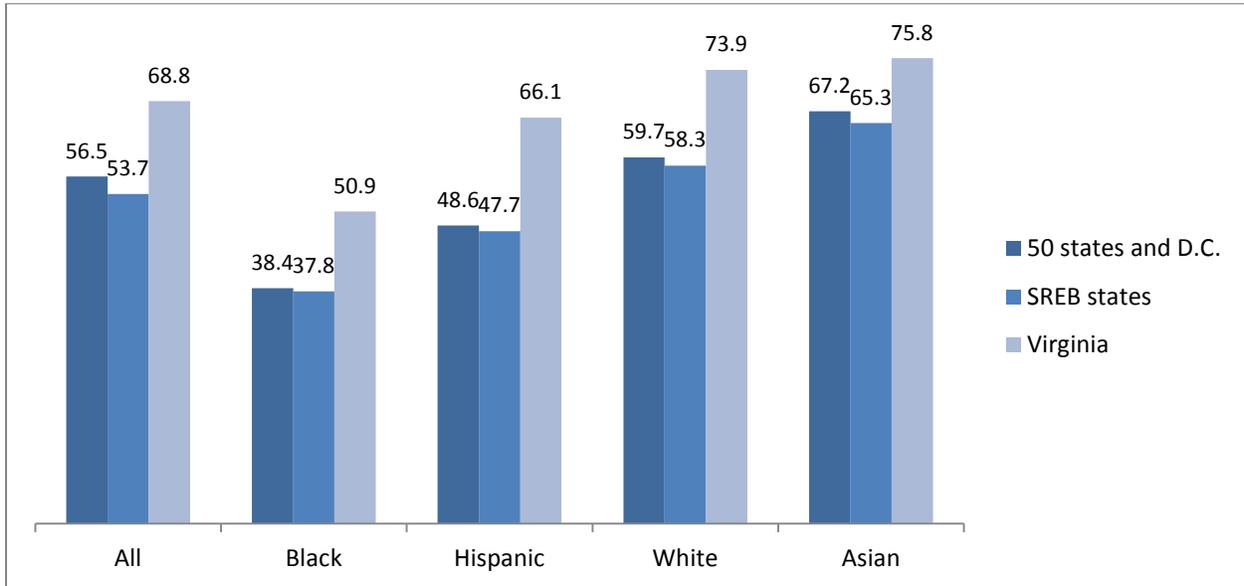
	Institutions (#)	Private, for-profit 2-year	Private, for-profit 4-year	Private, not-for-profit 2-year	Private, not-for-profit 4-year	Public, 2-year	Public, 4-year
Virginia	107	63%	24%	80%	40%	14%	67%
Bordering States Peer Group	456	53%	27%	53%	41%	13%	46%
SREB Peer Group	1332	62%	46%	60%	45%	16%	46%
JBLA Identified Peer Group	1003	58%	25%	45%	46%	13%	44%

Note: Number of institutions varies based on availability of data elements used to calculate metrics.

Source: IPEDS Spring 2013 Graduation Rates survey; Spring 2013 Fall Enrollments survey.

The following chart provides more detail on graduation rates for students from different racial/ethnic backgrounds in public four-year colleges and universities in Virginia compared with peers. Virginia has better results for all groups than do the SREB states or the nation. The good news is tempered by the fact that African American/Black students have a lower graduation rate than do students from other ethnic/racial groups.

Figure K. 150 percent of normal time graduation rates in public four-year institutions, by racial/ethnic group



Note: The rates are based on the first-time, full-time bachelor’s-seeking students who enrolled in public four-year institutions and on the first-time, full-time degree- or certificate-seeking students who enrolled in public two-year colleges in the fall term.
 Source: SREB, http://info.sreb.org/DataLibrary/tables/FB13_45_46_47.xlsx.

Graduation rates are harder to interpret in community colleges than they are in four-year institutions. The limitation is that two-year graduation rates provide a relative measure of outcomes, but understate the absolute rates of successful completion. By this measure, Virginia does not demonstrate the same relative success as shown in the four-year graduation rates, which are in the same range of the various peer comparisons.

Conclusion: Graduation rates in Virginia are competitive with peers, but Black/African American students are less likely to finish than are students from other ethnic/racial groups in Virginia.

Section summary

The path from enrolling to graduating is often complicated. Many students start in one college and finish in another. Students fit their enrollment around the needs of family and jobs, attending part-time in some semesters and full-time in others. Helping students find a way to graduate while taking all their personal needs into consideration means providing a clear curricular path with the advising that will help them stay on that path. Access needs to lead to success.

Affordability

Affordability has three components.

- First is the tuition and fees charged by the institution, which is the *published price*.
- Second is student grants and scholarships that are awarded to students to reduce the price of attendance to the *net price*.
- Third is the *family ability to pay* the net price, often expressed as the percent of income needed to send a student to college after all aid is provided.

Table 31 shows the tuition and fees for in-state students by each public college and university in Virginia. The net price calculations are for all students and include the additional costs of room, board and other costs such as books and materials. Net price is the total estimated price of attending college that the student needs to pay after all grant aid is awarded. The table includes two estimates of net price; the first is for students who received any grant aid, and the second is for students from low-income families who received Title IV student aid (defined as family income between \$0 and \$30,000).

The net price for low-income students is a more important measure of access for those who have the least discretionary income. Low-income students and their families generally have little or no expected family contribution toward paying the costs associated with going to college full-time, so price is a larger barrier for a family already close to not being able to pay for basic needs than it is for a family with more discretionary income.

These numbers are the ones used in federal reports and guides for students as they select colleges. If a student did not receive any grant aid, the price of attendance would be the published price, which is tuition and fees plus the direct costs associated with attending college. The price of attendance used here is for in-state students attending full-time and living on campus. Some students may live off campus or at home, and would have a lower cost of attendance. Fees include mandatory fees students must pay to attend, and may vary by program. Classes such as photography or engineering that require special materials or equipment may charge higher fees than a social science program.

The range in published tuition and fees among the institutions varies from \$6,860 to \$13,670. The range in net price paid by low-income students is much greater, ranging from \$14,370 at the top to \$3,528 at the bottom. Net price is affected by available grant aid from federal, state, institutional and private sources. The two universities with the lowest percent of students receiving a Pell grant, which is a marker for low-income, have the lowest net price for low-income students. It appears that a college or university with more resources and a smaller share of low-income students is able to use grants to reduce the price of attendance for low-income students more than is possible for an institution with fewer resources and more high-need students.

Table 31. Price of attendance for in-state students attending public four-year colleges and universities in Virginia, 2011-2013

Institution	Published in-state tuition 2012-13	Published in-state fees 2012-13	Published in-state tuition and fees 2012-13	% of students paying in-state tuition rates 2011-12	% of undergraduate students receiving Pell grants 2011-12	Average Pell grant aid received by undergraduates 2011-12	Price of attendance, In-state, on campus 2011-12	Average net price-students receiving grant or scholarship aid 2011-12	Average net price (income 0-30,000)-students receiving Title IV financial aid 2011-12
U of VA-Main Campus ¹	\$9,622	\$2,594	\$12,216	67	12	\$3,958	\$26,075	\$12,672	\$4,405
VA Polytechnic Institute and State U ¹	\$9,187	\$1,736	\$10,923	70	18	\$3,977	\$26,165	\$17,375	\$11,775
College of William and Mary ¹	\$8,677	\$4,893	\$13,570	62	12	\$3,982	\$28,808	\$13,246	\$3,528
VA Commonwealth U ¹	\$7,860	\$2,026	\$9,886	88	29	\$3,917	\$28,297	\$15,838	\$13,672
George Mason U ¹	\$7,010	\$2,610	\$9,620	75	28	\$3,904	\$25,335	\$14,709	\$12,120
Virginia Military Institute	\$6,880	\$6,880	\$13,760	57	17	\$3,806	\$25,642	\$13,133	\$5,137
Christopher Newport U	\$6,210	\$4,362	\$10,572	96	18	\$3,666	\$25,808	\$19,812	\$14,370
Longwood U	\$6,120	\$4,770	\$10,890	96	22	\$3,872	\$23,724	\$16,883	\$12,984
Radford U	\$5,702	\$2,888	\$8,590	94	28	\$4,022	\$20,700	\$12,159	\$10,023
Old Dominion U ¹	\$5,203	\$2,987	\$8,190	68	32	\$4,019	\$22,267	\$11,775	\$9,244
James Madison U	\$4,862	\$3,946	\$8,808	70	14	\$3,751	\$22,740	\$14,029	\$9,727
U of Mary Washington	\$4,686	\$4,620	\$9,306	86	16	\$3,703	\$24,076	\$15,218	\$10,957
VA State University*	\$4,550	\$2,870	\$7,420	63	67	\$4,195	\$28,297	\$13,028	\$10,812
The U of VA College at Wise	\$4,454	\$3,653	\$8,107	94	41	\$3,969	\$21,567	\$10,537	\$6,687
Norfolk State U*	\$3,540	\$3,320	\$6,860	80	67	\$4,357	\$20,700	\$11,354	\$10,513
Average	\$6,304	\$3,610	\$9,915	78	28	\$3,940	\$24,385	\$14,118	\$9,730

* Historically Black College or University.

¹ Classified as a research university.

Note: Eastern VA Medical School has no undergraduate program.

Source: IPEDS data (2011-13) with calculations by JBL Associates.

The average price of attendance in community colleges is generally lower than is the price at most four-year colleges and universities, but the difference is not universally lower. Community college cost of attendance is calculated based on the student living at home with a parent. The student is credited with a room and board cost, even though the family will not have any change in expenses. This is the basis for calculating student aid and helps assure that community college students receive a reasonable Pell Grant.

Table 32. Price of attendance for in-state students attending public two-year colleges and universities in Virginia, 2011-2013

Institution	Published in-state tuition 2012-13	Published in-state fees 2012-13	Published in-state tuition and fees 2012-13	% of students paying in-state tuition rates 2011-12	% of undergraduate students receiving Pell grants 2011-12	Average Pell grant aid received by undergraduates 2011-12	Price of attendance, In-state, on campus 2011-12	Average net price-students receiving grant or scholarship aid 2011-12	Average net price (income 0-30,000)-students receiving Title IV financial aid 2011-12
Virginia Western CC	\$3,780	\$-	\$3,780	9%	30%	\$3,369		\$6,065	\$5,264
John Tyler CC	\$3,735	\$50	\$3,785	20%	31%	\$3,220		\$6,481	\$5,516
J Sargeant Reynolds CC	\$3,573	\$480	\$4,053	10%	41%	\$3,182		\$6,549	\$5,805
Blue Ridge CC	\$3,510	\$894	\$4,404	14%	38%	\$3,203		\$7,442	\$6,515
Central Virginia CC	\$3,510	\$375	\$3,885	7%	27%	\$3,485		\$4,470	\$3,474
Danville CC	\$3,510	\$285	\$3,795	5%	48%	\$3,677		\$5,946	\$5,246
Germanna CC	\$3,510	\$488	\$3,998	4%	26%	\$3,126		\$6,503	\$5,732
Lord Fairfax CC	\$3,510	\$330	\$3,840	6%	29%	\$3,033		\$6,056	\$5,067
Patrick Henry CC	\$3,510	\$295	\$3,805	7%	56%	\$3,457		\$5,919	\$5,686
Paul D Camp CC	\$3,510	\$290	\$3,800	5%	48%	\$3,425		\$6,551	\$6,573
Piedmont Virginia CC	\$3,510	\$320	\$3,830	11%	28%	\$2,744		\$6,624	\$5,770
Southside Virginia CC	\$3,510	\$300	\$3,810	7%	40%	\$3,285		\$7,910	\$7,812
Thomas Nelson CC	\$3,510	\$268	\$3,778	16%	41%	\$3,196		\$6,749	\$5,941
Virginia Highlands CC	\$3,510	\$300	\$3,810	7%	43%	\$3,105		\$6,064	\$5,580
Wytheville CC	\$3,510	\$300	\$3,810	5%	39%	\$3,566		\$1,978	\$1,258
Eastern Shore CC	\$3,388	\$266	\$3,654	4%	53%	\$3,454		\$4,834	\$4,578
Southwest Virginia CC	\$3,276	\$252	\$3,528	6%	39%	\$3,198		\$6,933	\$6,257
Northern Virginia CC	\$3,255	\$230	\$3,485	6%	21%	\$3,446		\$8,200	\$7,017
Richard Bland College	\$3,112	\$546	\$3,658	98%	32%	\$3,866	\$18,879	\$10,343	\$8,429
Dabney S Lancaster CC	\$2,808	\$240	\$3,048	10%	34%	\$3,285		\$4,538	\$3,119
Mountain Empire CC	\$2,808	\$252	\$3,060	6%	49%	\$3,379		\$4,627	\$3,931
New River CC	\$2,808	\$240	\$3,048	14%	33%	\$3,396		\$5,474	\$4,357
Rappahannock CC	\$2,808	\$281	\$3,089	5%	24%	\$3,205		\$10,556	\$9,744
Tidewater CC	\$2,808	\$836	\$3,644	11%	43%	\$3,279		\$5,746	\$5,147
Average	\$3,345	\$338	\$3,683	12%	37%	\$3,316		\$6,357	\$5,576

Source: IPEDS data (2011-13) with calculations by JBL Associates.

Table 33 shows the net price of attendance at four-year public colleges and universities as a percent of disposable personal income compared with the national average. This calculation shows how much of families’ disposable income would need to be used to pay college costs after all grant aid is taken into consideration. This provides a relative measure of affordability and indicates that on average, a family in Virginia would have to pay roughly 45 percent of their income remaining after they had paid for necessities. In 2011, that was higher than the national average, after a decade of being equal to, or lower than, the average.

Table 33. Average undergraduate charge at public four-year institutions as a percentage of disposable personal income: 2000–2011

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	31.8	32.3	33.1	34.1	35.2	36.5	36.5	37	37.1	40.9	41.8	42.9
Virginia	32.2	30.9	30.5	30.9	33.5	34.2	34.2	35	35.6	38.8	39.7	44.6

NOTE: The national average for the United States is from the *Digest of Education Statistics*. Average charges are for full-time equivalent students but are not adjusted for student residency. Average charges include tuition, fees, room, and board. SOURCE: National Science Foundation, <http://www.nsf.gov/statistics/seind14/index.cfm/state-data/table.htm?table=27> IPEDS (various years); Bureau of Economic Analysis, State and Local Personal Income data.

Conclusion: the net price of attendance for low-income students varies a great deal among public four-year universities in Virginia. The two most selective institutions with the smallest share of Pell Grant recipients offers low-income students the lowest net price. This raises questions of affordability for low-income students attending the universities that are most likely to accept them.

Student Aid

State-provided student aid per full-time undergraduate has varied between \$391 and \$839 in the period shown. In 2011, the state provided \$661 per student, well below the national average of \$858. The following table shows that state expenditures for student aid lags the average for the United States. Virginia cannot claim to be a high aid state.

Table 34. State expenditures on student aid/undergraduate enrollment at four-year institutions (\$)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	55.3	61.3	64.8	64.4	69.2	75.8	78.5	81.8	83.9	82.8	83.8	85.8
Virginia	39.2	63.9	59.4	57	54.6	58.8	60.6	65.2	72.7	71.3	69.7	66.1

SOURCE: National Science Foundation, <http://www.nsf.gov/statistics/seind14/index.cfm/state-data/table.htm?table=29>, National Association of State Student Grant and Aid Programs, Annual Survey Report (various years); National Center for Education Statistics, Integrated Postsecondary Education Data System (various years).

NASSGAP reports that Virginia awarded a total of \$224.2 million to students in 2011-12, of which \$206 million went to undergraduates. The state provides several small programs, but the majority of money comes through four programs. The purpose of the *Virginia Commonwealth Award* is to assist undergraduate students with financial need, and graduate students, to pay part of their college costs. The funds are appropriated directly to each state-supported institution. Institutions may use funds for need-based grants to Virginia resident undergraduates or for grants or assistantships to graduate

students (both in state and out-of-state). The law requires that the awards to undergraduates be proportional to need, so that the students with the greatest need receive the largest awards.

The *Virginia Guaranteed Assistance Program (VGAP)* provides awards to financially needy students currently attending elementary and secondary schools in Virginia to raise their expectations and their academic performance, and to consider higher education an achievable objective. The law requires that the awards to undergraduates be proportional to need so that the students with the greatest need receive the largest awards. The public institution makes the award. Public institutions in the state also provided another \$197.5 million in tuition waivers.

The Two-Year College Transfer Grant Program provides grants to students who have received an Associate's degree at a Virginia two-year public institution. Recipients must have a cumulative GPA of 3.0 on a scale of 4.0 for the Associate's degree, and enroll full-time in a Virginia four-year public or Virginia four-year private non-profit college or university by the fall following completion of the Associate's degree.

The state provides support to Virginia citizens attending private, not-for-profit colleges in the state through the *Tuition Assistance Grant (TAG)* program. TAG provided \$56.6 million to students last year. This is not a need-based program, as all eligible students receive the award. Taken all together, the state provided \$426.5 million in student aid of different types in 2011.

NASSGAP ranks Virginia 21st in total state grant dollars/population 18 to 24, 23rd by undergraduate grant dollars/undergraduate FTE, and 21st by number of awards/FTE. This puts the state just above the national midpoint on these measures.

Conclusion: Public institutions award state student aid to needy students with few state requirements. All students who are Virginia citizens in private, not-for-profit colleges and universities receive a state grant regardless of need. Student aid is an important tool in providing affordability, but the current process makes it difficult to assure that state residents with the most need will always get an award appropriate to that need.

Debt burden of graduates

Student loans, mostly provided by the federal government, have become an increasingly important part of the college finance picture. The issue of debt burden is an important consideration for students, and has implications in their lives long after they graduate. Simply put, debt burden is the amount that a borrower will have to pay, as a percent of their income, to pay off their student loans. Generally, the burden is greatest when a young graduate is just starting out after college. The burden may be even greater for a student who borrows but does not graduate.

Seven in ten college seniors nationally (71 percent) who graduated in 2012 had student loan debt, with an average of \$29,400 per borrower. The average debt of students graduating from either a public or a

non-profit institution with a bachelor degree in Virginia was \$25,017. It is estimated that 60 percent of the graduates in Virginia leave college needing to repay a loan.⁹ The average debt of student borrowers at graduation in Virginia's public four-year colleges ranges from \$33,100 at Norfolk State University to a low of \$18,795 for students graduating from UVA-Wise. Borrowers in the two HBCUs borrow significantly more on average than do borrowers at College of William and Mary and UVA.

Table 35. Mean debt of student borrowers at public four-year institutions 2011-12

Public, 4-years	Mean Debt of Student Borrowers at Graduation 2011-12
Norfolk State University	\$33,076
Virginia State University	\$30,185
Virginia Commonwealth University	\$28,464
Longwood University	\$26,309
Virginia Poly Tech. Institute & State University	\$26,037
Old Dominion University	\$25,710
Christopher Newport University	\$25,393
Radford University	\$24,424
George Mason University	\$23,901
College of William and Mary	\$22,928
University of Mary Washington	\$22,808
James Madison University	\$22,783
University of Virginia	\$21,018
Virginia Military Institute	\$20,903
University of Virginia's College at Wise	\$18,795

Source: SCHEV. (2011-12). <http://research.schev.edu/apps/info/Reports.Guide-to-the-Graduate-Debt-Reports.ashx>.

Students in community colleges borrow less frequently and borrow less, given the shorter enrollment period, lower price of attendance, and the loan maximum limits that are imposed on lower-division students. The following tables report the amount owed at graduation for students who have prepared for a vocation and those who plan to continue their education. Those continuing will probably continue to borrow as upper-division students, so the amount shown here will only be part of their debt.

Students in community colleges are less likely to borrow than are those in four-year institutions. Community college borrowing is divided into two categories, one for students who plan to pursue a bachelor's degree, and the other for those who plan to enter employment upon completion of an associate degree or a certificate.

⁹ Reed, M., & Cochrane, D. (2013). The Institute for College Access and Success. <http://projectonstudentdebt.org/files/pub/classof2012.pdf>.

Table 36. Mean debt of student borrowers at public two-year institutions, 2011-12

Public, 2-year	Mean Debt of Student Borrowers at Graduation (Bachelor Credit)	Mean Debt of Student Borrowers at Graduation (Occupational/ Technical Credit)
Rappahannock Community College	\$13,842	\$ -
John Tyler Community College	\$13,316	\$15,612
J Sargeant Reynolds Community College	\$12,346	\$17,055
Blue Ridge Community College	\$12,316	\$13,786
Northern Virginia Community College	\$11,865	\$15,522
Virginia Western Community College	\$11,756	\$17,164
Thomas Nelson Community College	\$11,462	\$12,468
New River Community College	\$11,101	\$12,131
Tidewater Community College	\$10,766	\$12,706
Richard Bland College	<u>\$10,468</u>	<u>\$ -</u>
Central Virginia Community College	\$10,342	\$ -
Southside Virginia Community College	\$10,199	\$ -
Dabney S. Lancaster Community College	\$9,001	\$14,197
Patrick Henry Community College	\$8,891	\$8,953
Germanna Community College	\$8,591	\$11,871
Piedmont Virginia Community College	\$8,148	\$15,135
Danville Community College	\$7,943	\$5,923
Lord Fairfax Community College	\$7,808	\$8,984
Wytheville Community College	\$6,575	\$6,104
Southwest Virginia Community College	\$ -	\$ -
Paul D Camp Community College	\$ -	\$ -
Virginia Highlands Community College	\$ -	\$ -
Eastern Shore Community College	\$ -	\$ -
Mountain Empire Community College	\$ -	\$ -

Source: SCHEV. (2011-12). <http://research.schev.edu/apps/info/Reports.Guide-to-the-Graduate-Debt-Reports.ashx>.

Conclusion: Increasing student debt is a reflection of price of attendance increasing faster than families' ability to pay. Loan debt of graduates in Virginia is lower than the national average.

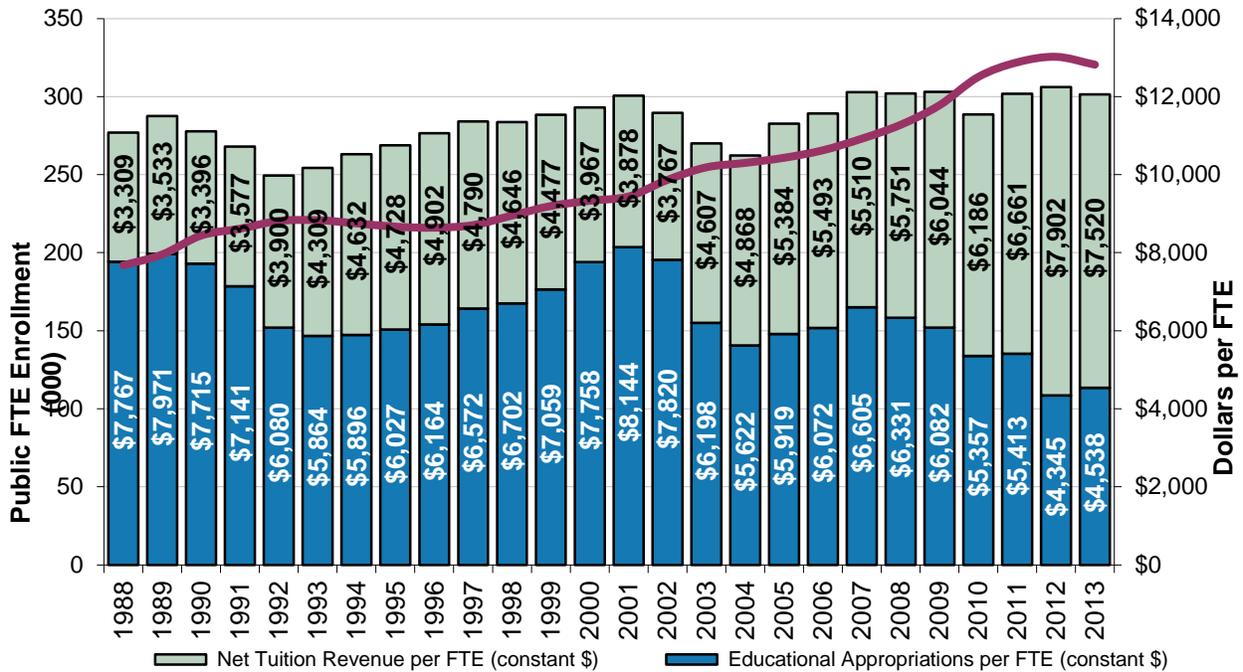
Section summary

Assuring that the average family from the Southwest part of the state, with an average income of \$36,000 could send their daughter to a public four-year university in the state would at best take nearly 15 percent of their income, or at worst over a third. The only option available to that family would be loans. That would mean that student would graduate with a debt of at least \$21,000, while the student of the Northern Virginia family with an income over \$100,000 would probably be able to graduate debt-free. Lower-income students attending public universities with a higher net price are more likely to borrow to finance their education than are higher-income students who attend public universities with a lower net-price.

Sustainability

The following chart shows the change in net tuition revenue per full-time equivalent student enrolled in public colleges and universities, and Virginia's educational appropriations per FTE student in constant dollars, from 1988 to last year. The line tracks FTE enrollment over the same years. The chart shows that the student share of costs over the period has more than doubled, from \$3,309 to \$7,520. The state share has dropped from \$7,767 to \$4,538. In 1988, students paid 30 percent of the cost; by 2013, that share had increased to 62 percent. The total revenue from these two sources has increased over the long term, with declines and increases that track business cycles. Expressed as constant dollars, the minimum wage in 1988 was within pennies of what it is today. That means a Virginia student would have to work over 1,000 hours today to pay the average annual net tuition charged by public colleges in the state, compared with 500 hours in 1988.

Figure L. Public FTE enrollment, educational appropriations and total educational revenue per FTE, Virginia—FY1988-2013



Note: Constant 2013 dollars adjusted by SHEEO Higher Education Cost Adjustment (HECA). Educational Appropriations include ARRA funds.

Source: <http://www.sheeo.org/resources/publications/shef-%E2%80%94state-higher-education-finance-fy13>.

Over the last five years, state funding per FTE student has slipped 28.3 percent in constant dollars. In 2008, the state provided \$6,341 per FTE; by 2013, the amount was \$4,545.¹⁰ This period includes the recession; however, Virginia’s large federal government employment base sheltered the state from experiencing as deep a cut as other states.¹¹

The following table shows the decline in state funds going to higher education in Virginia. The national average of appropriations of state tax funds for operating expenses as a percent of GDP has slipped from .57 to .46, but Virginia has dropped to .36, with the biggest drop coming in two periods, 2003 and 2010. Virginia has fallen behind the nation on this measure.

¹⁰ SHEEO, State Higher Education Finance, FY2012

¹¹ A Tale of Two Labor Markets: Government Spending’s Impact on Virginia by Keith Hall and Robert Greene, September 2013, Mercatus Center at George Mason University

Table 37. Appropriations of state tax funds for operating expenses of higher education as a percentage of gross domestic product, by state: 2000–2012

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
United States	57	61	60	57	53	52	53	54	57	56	51	50	45
Virginia	57	58	58	46	41	42	43	48	47	47	41	39	35

SOURCES: National Science Foundation, <http://www.nsf.gov/statistics/seind14/index.cfm/state-data/table.htm?table=28>, State Higher Education Executive Officers College Board, State Higher Education Finance (various years); Bureau of Economic Analysis, Gross Domestic Product data (June 2013).

Not only is state support for higher education declining, but it is also below average on key measures. According to SHEEO, Virginia support for higher education lags national averages on every important measure of support for higher education.

- Higher education support per capita: VA=.85 to U.S.=1
- Higher education support per \$1,000 personal income: VA=.76 to U.S.=1
- Allocation of state tax returns and lottery profit to higher education: VA=5.8% to U.S.=6.8%

Maryland, on the other hand, is at or above national averages on all of these measures.

Conclusion: State support for higher education in Virginia lags national averages in every category, and has been declining at a relatively sharp rate. This decline took place as enrollment increased. Tuition increases have compensated for reductions in public support. Having adequate and predictable funding is important to the orderly operation of universities and colleges.

Salaries

Nationally, salaries in four-year public colleges that offer a master’s degree but no doctorate were \$66,037 in 2012-13. The national average for doctoral-granting universities was \$81,902. Salaries can change over time due to retirement and hiring. In several Virginia public colleges and universities, salaries of full-time faculty have declined in this last year.

Table 38. Faculty salaries of full-time faculty in Virginia public four-year institutions (9-10 month)

Rank	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% change 2005-06 to 2012-13
U of Virginia-Main Campus	\$91,935	\$95,908	\$100,308	\$101,656	\$104,497	\$107,528	\$112,185	\$106,017	15.32%
George Mason U	\$79,247	\$84,993	\$88,587	\$88,055	\$88,645	\$89,225	\$91,883	\$91,117	14.98%
College of William and Mary	\$82,107	\$83,058	\$88,037	\$88,583	\$86,133	\$85,764	\$90,659	\$87,786	6.92%
Virginia Polytechnic Institute and State U	\$77,509	\$80,714	\$83,626	\$84,624	\$83,333	\$82,068	\$84,432	\$83,171	7.3%
Old Dominion U	\$64,543	\$67,586	\$69,373	\$71,359	\$71,668	\$71,940	\$74,404	\$76,040	17.81%
Virginia Military Institute	\$67,841	\$70,226	\$72,708	\$73,569	\$73,618	\$72,409	\$73,891	\$74,559	9.9%
James Madison U	\$59,224	\$61,925	\$66,729	\$66,235	\$66,765	\$66,188	\$67,090	\$68,821	16.2%
Radford U	\$58,872	\$60,944	\$61,496	\$64,146	\$63,681	\$63,270	\$65,551	\$67,980	15.47%
U of Mary Washington	\$57,527	\$61,105	\$65,193	\$65,917	\$67,426	\$66,867	\$67,243	\$67,458	17.26%
Christopher Newport U	\$63,845	\$66,531	\$69,236	\$68,129	\$68,137	\$66,856	\$66,599	\$66,009	3.39%
Virginia State U	\$58,575	\$59,353	\$62,430	\$62,942	\$64,678	\$64,153	\$64,117	\$65,669	12.11%
Norfolk State U	\$57,254	\$58,308	\$60,646	\$63,783	\$64,655	\$65,094	\$66,520	\$65,668	14.7%
Longwood U	\$52,199	\$55,097	\$57,433	\$59,421	\$59,295	\$60,401	\$59,778	\$61,510	17.84%
Virginia Commonwealth U	\$68,779	\$71,512	\$73,039	\$73,394	\$73,056	\$71,427	\$72,638	\$61,361	-10.79%
The U of Virginia's College at Wise	\$52,251	\$54,226	\$56,638	\$57,640	\$56,791	\$57,735	\$57,941	\$58,421	11.81%
Average	\$71,601	\$74,722	\$77,935	\$78,739	\$79,044	\$78,942	\$81,096	\$80,398	12.29%

Source: National Education Association's College and University Data Analysis System (CUDAS).

<http://cudas.nea.org/reports/reportselection.aspx>.

Northern Virginia Community College salaries dominate the average salary in the state given the size of their faculty. Northern Virginia CC faculty also has the highest average salary among the community colleges in the state. Nationally, full-time community college faculty members were paid an average of \$62,443 in 2012-13. With the exception of Northern Virginia, average community college salaries in the Commonwealth are below the national average.

Table 39. Faculty salaries of full-time faculty in Virginia Community Colleges (9-10 month contract)

Rank	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2005-06 to 2012-13
Northern Virginia CC	\$52,107	\$55,410	\$59,601	\$62,494	\$61,852	\$61,016	\$62,823	\$63,546	22.0%
New River CC	\$49,516	\$53,142	\$57,066	\$59,277	\$58,858	\$59,170	\$61,490	\$61,252	23.7%
Piedmont Virginia CC	\$50,366	\$51,286	\$55,200	\$58,014	\$57,924	\$57,949	\$58,834	\$58,409	16.0%
Tidewater CC	\$46,600	\$49,637	\$53,532	\$56,994	\$57,042	\$56,940	\$58,104	\$57,949	24.4%
Thomas Nelson CC	\$45,925	\$49,520	\$52,275	\$54,478	\$54,760	\$53,549	\$53,889	\$57,851	26.0%
John Tyler CC	\$46,280	\$49,697	\$53,172	\$57,472	\$57,387	\$56,826	\$58,259	\$57,656	24.6%
Richard Bland College	\$52,879	\$52,729	\$53,591	\$56,461	\$55,425	\$54,434	\$55,960	\$57,446	8.6%
Virginia Highlands CC	\$48,614	\$51,535	\$54,842	\$56,848	\$56,400	\$56,209	\$56,874	\$57,374	18.0%
J Sargeant Reynolds CC	\$49,177	\$51,385	\$54,151	\$57,278	\$56,663	\$56,740	\$57,483	\$57,161	16.2%
Dabney S Lancaster CC	\$46,107	\$49,280	\$52,589	\$55,984	\$55,896	\$56,578	\$56,787	\$56,825	23.3%
Lord Fairfax CC	\$46,028	\$49,066	\$52,712	\$54,756	\$55,398	\$54,483	\$56,489	\$56,770	23.3%
Paul D Camp CC	\$49,005	\$50,711	\$53,484	\$56,163	\$56,022	\$55,258	\$57,680	\$56,553	15.4%
Danville CC	\$47,841	\$50,137	\$51,635	\$53,920	\$53,596	\$54,108	\$55,769	\$56,173	17.4%
Southside Virginia CC	\$47,241	\$50,577	\$52,651	\$55,470	\$55,089	\$55,713	\$57,155	\$56,030	18.6%
Germanna CC	\$46,010	\$47,830	\$50,260	\$54,344	\$54,352	\$54,968	\$56,560	\$55,605	20.9%
Blue Ridge CC	\$48,303	\$50,756	\$52,836	\$55,107	\$55,634	\$54,897	\$55,633	\$55,068	14.0%
Wytheville CC	\$45,959	\$48,424	\$51,235	\$54,834	\$54,033	\$53,911	\$56,603	\$55,009	19.7%
Central Virginia CC	\$48,938	\$51,912	\$54,186	\$55,638	\$55,621	\$55,137	\$55,914	\$54,776	11.9%
Virginia Western CC	\$46,386	\$49,464	\$51,220	\$53,905	\$54,108	\$54,345	\$55,288	\$54,689	17.9%
Mountain Empire CC	\$46,970	\$50,449	\$53,357	\$56,684	\$55,526	\$55,226	\$53,904	\$53,593	14.1%
Eastern Shore CC	\$45,725	\$48,336	\$49,684	\$52,228	\$52,619	\$51,893	\$54,771	\$53,315	16.6%
Southwest Virginia CC	\$48,079	\$50,318	\$52,883	\$54,884	\$53,901	\$52,458	\$53,853	\$53,221	10.7%
Rappahannock CC	\$44,829	\$46,894	\$49,039	\$51,763	\$51,609	\$51,550	\$52,502	\$52,759	17.7%
Patrick Henry CC	\$46,287	\$48,963	\$51,842	\$54,834	\$53,626	\$52,497	\$52,579	\$52,360	13.1%
Average	\$48,659	\$51,509	\$54,764	\$57,742	\$57,503	\$57,158	\$58,443	\$58,644	20.5%

Source: National Education Association's College and University Data Analysis System (CUDAS).

<http://cudas.nea.org/reports/reportselection.aspx>.

Instructional salaries include all salaries paid to classroom faculty members, and to those who have a faculty designation, but may not teach. The following table shows that instructional salaries have been declining as a share of total education and general expenditures in all institutional type and control groups in the state. The results also show that the share of institutional spending on instruction varies among different types of institutions. The decline may represent less being spent on instruction due to increasing the number of part-time faculty members (who are paid significantly less than are full-time faculty members), or retirement of senior faculty who are replaced by lower-paid junior faculty members. In addition, spending on non-instructional functions may be increasing.

Table 40. Instructional salary as a percent of total E&G by institutional type and sector

	2005	2006	2007	2008	2009	2010	2011
Public, 4-year research	30%	31%	29%	28%	24%	23%	23%
Public, 4-year other	35%	35%	33%	32%	27%	27%	27%
Public, 2-year	36%	37%	30%	30%	27%	26%	26%
Private, Not-for-profit	17%	18%	18%	18%	17%	17%	16%

Source: IPEDS data (2005-11) with calculations by JBL Associates.

Section summary

Salaries comprise the majority share of the cost of higher education. The data suggest that instruction has not been the main cost driver of increasing college and university costs. Complying with increased regulation, fundraising and developing alternative revenue streams for colleges and universities to compensate for declining state support all may add to cost increases that are unrelated to instruction.

Economic Impact of Higher Education

It may help to think of Virginia higher education in terms of a state investment, instead of an expenditure. The economic activity related to Virginia public higher education stems from the expenditures made by the institutions, foundations, students, and visitors as well as human capital improvements measured by increased productivity and earnings of graduates who enter and stay in the state workforce. In 2009, the *Study of the Economic Impact of Virginia Public Higher Education* for The Virginia Business Higher Education Council, found that the total economic footprint attributable to one year of higher education operations in Virginia was \$24 billion in Virginia gross domestic product (expressed as 2007 dollars). Public higher education operations accounted for 144,550 total Virginia jobs.

Conclusion: Higher education in Virginia makes a positive impact on the economy as an employer and purchaser of local goods, by improving the human capital of the state, and supporting research necessary for progress.

Research

Virginia is ranked first among states in the number of high-tech jobs per 1,000 private sector workers, and first in the number of scientists and engineers as a percent of the workforce, but it is 41st in academic R&D per \$1,000 of gross domestic product. By every measure, academic research lags in the state relative to the needs of the economy.

Table 41 shows the National Science Foundation ranking of individual public colleges and universities in Virginia by four measures of research and graduate education activities. Virginia Tech receives the highest ranking, but is not in the top 25 on any of the measures.

Table 41. Virginia public colleges and universities with NSF institutional rank on four measures of research and graduate education

Institution*	2012	2012	2011	2012
	Earned doctorates (415 ranked)	Full-time graduate students (554 ranked)	Total federal obligations (1,128 ranked)	Total R&D expenditures (653 ranked)
	Rank	Rank	Rank	Rank
Virginia Tech	27	34	60	40
University of Virginia	44	72	55	59
George Mason	90	66		154
Virginia Commonwealth U	92	117	89	101
Old Dominion U	125	171	147	145
College of William and Mary	206	240	202	195
James Madison		292	365	343
Eastern VA Medical School		328	319	215
Norfolk State U	368		259	350
Virginia State University		471	261	324
Christopher Newport			458	595
Virginia Community College			534	
Radford U		391	630	
U of Mary Washington			1,011	638

*not all public institutions in Virginia are included in NSF rankings

Source: National Science Foundation (most recent years)

<https://ncesdata.nsf.gov/profiles/site%3Bjsessionid=0F0E056730CADDEDE43B4A6D4A9AAB4?method=ranking#V>

Virginia lags in funding research universities in the state compared with the national average. This has been true for the decade. According the National Science Foundation, state funding per full-time equivalent student lagged national averages by \$5,000 per student in 2010. That gap has been increasing over the decade.

Table 42. State funding for public research universities per FTE student nationally and in Virginia: 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
US	10,567	11,131	12,431	11,932	11,576	11,926	12,432	13,195	14,042	13,514	12,810
VA	8,663	9,249	9,809	8,714	7,715	8,279	8,766	9,855	9,752	8,941	7,752

SOURCE: National Science Foundation. <http://www.nsf.gov/statistics/seind14/index.cfm/state-data/table.htm?table=30>, IPEDS Analytics; Delta Cost Project Database: 2000-2010.

Two of the major budgetary funding streams by which the Commonwealth supports academic-research are Educational and General (E&G) Programs and Financial Assistance for E&G Services.

E&G Programs: The general fund, tuition, and fees finance the educational and general programs. Research, along with instruction, academic support, student services, institutional support, and

operation and maintenance of facilities/physical plant, comprise the E&G expenditures. Research has never received a significant share of E&G funding given the Commonwealth's historical focus on undergraduate instruction. Generally, academic research accounts for only about only three percent of the total E&G budget.

Financial Assistance for E&G Services: Financial Assistance for E&G Services is the primary conduit for financial support of academic research. Sponsored Programs represents its largest component, totaling over \$1.2 billion in the current budget. The Sponsored Programs include external funds from federal, industry, non-profit, and other sources. Non-general-fund grants and contracts constitute about 99 percent of the total. Over 90 percent of these funds pass through the budget to the six public research universities.

State funds available to academic research projects may appear in other sections of the state budget. For example, the Financial Assistance for Economic Development section funds the Commonwealth Research Commercialization Fund (CRCF; \$4.8 million in FY2014); "gap fund" grants administered by the Center for Innovative Technology (CIT; \$3.2 million in FY2014); and monies for a bioscience research consortium between five universities and the Virginia Economic Development Partnership (VEDP; \$2.5 million in FY2014).

The following table shows the funds going to public colleges and universities in the state from general funds and non-general funds to support research activities. HEETF is the Higher Education Equipment Trust Fund, which helps pay for institutional purchases and replacements of instructional research equipment and is provided by the state.

Table 43. Support for research and development in Virginia public colleges and universities, 2012

Institution	GF	NGF	HEETF	Total
U of Virginia (UVA)	\$6,732,332	\$287,333,000	\$4,236,579	\$298,301,911
Virginia Tech (VT)	\$4,138,544	\$280,842,746	\$4,278,311	\$289,259,601
Virginia Commonwealth (VCU)	\$10,162,500	\$246,111,981	\$2,445,569	\$258,720,050
George Mason (GMU)	\$1,206,250	\$212,912,223	\$387,306	\$214,505,779
VA Community C System (VCCS)		\$50,117,500		\$50,117,500
James Madison (JMU)		\$36,936,471		\$36,936,471
C of William and Mary (CWM)	\$75,000	\$33,446,609	\$486,458	\$34,008,067
Virginia State (VSU)		\$30,464,447		\$30,464,447
Norfolk State (NSU)		\$24,686,497		\$24,686,497
Old Dominion (ODU)	\$3,099,838	\$13,417,163	\$268,659	\$16,785,660
Radford (RU)		\$8,797,374		\$8,797,374
Longwood (LU)		\$3,178,393		\$3,178,393
UVA's College at Wise (UVA-W)		\$2,087,321		\$2,087,321
Christopher Newport (CNU)		\$1,498,882		\$1,498,882
Virginia Military (VMI)		\$894,898		\$894,898
U of Mary Washington (UMW)		\$809,533		\$809,533
Richard Bland (RBC)		\$335,110		\$335,110
TOTAL	\$25,414,464	\$1,233,870,148	\$12,102,882	\$1,271,387,494
VA Inst Marine Science (CWM)		\$23,129,059	\$143,120	\$23,272,179
Higher Ed Centers (UMW)	\$1,750,000	\$250,000		\$2,000,000
Higher Ed Research Initiatives	\$3,020,000			\$3,020,000
C with Res Commercialization Fund*	\$4,800,000			\$4,800,000
Gap Fund Grants (CIT)*	\$3,200,000			\$3,200,000
Bioscience Consortium (VEDP)	\$2,500,000			\$2,500,000
TOTAL	\$40,684,464	\$1,257,249,207	\$12,246,002	\$1,310,179,673

*Funds are not exclusive to higher education research.

Source: SCHEV, Virginia Academic Research: A Primer in Advance of the Summit, June 2014.

Research university faculty salaries

The following table shows the average salaries paid to full-time instructional faculty in research universities who work on a 9-10 month contract. This is the standard for full-time faculty. The trend from 2005-06 to 2012-13 is reported in current dollars, so part of the increase reflects inflation over the years. The peer group is the standard used by SCHEV. The average faculty salary for the peer group was \$107,024 in 2012-13. None of the Virginia university salaries were at the average. Salaries in three of the Virginia universities were below the lowest salary paid in any of the peer institutions.

Table 44. Faculty salaries in peer group universities and in Virginia research universities

SCHEV PEER GROUP	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2005-06 to 2012-13
Tulane U of Louisiana	\$70,934	\$64,393	\$61,336	\$82,083	\$84,608	\$86,917	\$91,605	\$92,210	29.99%
Vanderbilt U	\$91,628	\$98,153	\$101,327	\$103,389	\$101,276	\$106,880	\$109,587	\$118,186	28.98%
Washington U in St Louis	\$94,867	\$100,239	\$105,235	\$112,533	\$112,159	\$115,897	\$119,998	\$120,977	27.52%
U of California-Los Angeles	\$106,216	\$110,085	\$114,545	\$119,733	\$125,634	\$127,667	\$133,447	\$134,281	26.42%
Rutgers U-New Brunswick	\$89,741	\$94,496	\$98,156	\$104,273	\$108,235	\$109,708	\$110,938	\$113,014	25.93%
U of North Carolina at Chapel Hill	\$86,720	\$94,688	\$101,982	\$106,399	\$105,655	\$105,278	\$104,672	\$106,859	23.22%
The U of Texas at Austin	\$84,090	\$87,822	\$92,258	\$96,056	\$96,332	\$99,973	\$102,251	\$103,522	23.11%
Duke U	\$97,755	\$103,732	\$106,836	\$112,135	\$112,715	\$114,671	\$118,251	\$119,173	21.91%
Buffalo State SUNY	\$60,893	\$63,143	\$64,027	\$68,011	\$70,948	\$74,260	\$75,242	\$73,815	21.22%
U of Iowa	\$77,372	\$82,295	\$88,130	\$92,021	\$91,882	\$92,203	\$92,785	\$93,702	21.11%
U of Michigan-Ann Arbor	\$94,009	\$96,599	\$100,820	\$105,120	\$107,365	\$109,430	\$111,554	\$113,639	20.88%
U of Southern California	\$98,078	\$101,985	\$105,628	\$109,213	\$109,952	\$114,536	\$118,152	\$118,216	20.53%
U of Illinois at Urbana-Champaign	\$87,126	\$89,970	\$92,619	\$94,616	\$94,280	\$97,439	\$100,681	\$102,229	17.33%
U of Colorado Boulder	\$79,298	\$81,809	\$86,388	\$86,058	\$86,199	\$84,988	\$89,908	\$91,044	14.81%
Cornell U	\$106,417	\$108,185	\$112,578	\$117,831	\$118,550	\$121,018	\$124,858	\$121,895	14.54%
U of Arizona	\$79,149	\$82,667	\$86,003	\$86,732	\$87,613	\$88,979	\$89,791	\$90,375	14.18%
U of Maryland-College Park	\$86,054	\$89,253	\$92,696	\$97,364	\$98,620	\$97,254	\$97,897	\$97,589	13.40%
U of Florida	\$82,440	\$82,163	\$82,470	\$84,898	\$85,596	\$90,568	\$91,756	\$91,729	11.27%
U of Pittsburgh-Pittsburgh Campus	\$79,335	\$81,472	\$82,114	\$85,411	\$85,182	\$87,290	\$89,756	\$88,014	10.94%
U of Nebraska-Lincoln	\$75,506	\$77,707	\$80,441	\$84,283	\$86,667	\$85,928	\$86,943	\$83,484	10.57%
U of Pennsylvania	\$124,167	\$129,632	\$134,707	\$124,239	\$124,679	\$128,502	\$132,785	\$135,879	9.43%
U of Wisconsin-Madison	\$85,082	\$86,774	\$89,151	\$93,036	\$93,988	\$96,710	\$97,596	\$92,973	9.27%
Emory U	\$105,754	\$110,212	\$97,318	\$105,001	\$107,584	\$108,099	\$111,238	\$109,378	3.43%
U of Washington-Seattle Campus	\$103,835	\$109,043	\$88,846	\$93,022	\$93,669	\$94,068	\$94,643	\$92,454	-10.96%
Average	\$91,297	\$94,760	\$97,032	\$100,604	\$101,745	\$103,882	\$106,474	\$107,024	17.23%

4 Year Public Research Institutions VA	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2005-06 to 2012-13
U of VA-Main Campus	\$91,935	\$95,908	\$100,308	\$101,656	\$104,497	\$107,528	\$112,185	\$106,017	15.32%
VA Polytechnic Institute and State U	\$77,509	\$80,714	\$83,626	\$84,624	\$83,333	\$82,068	\$84,432	\$83,171	7.30%
VA Commonwealth U	\$68,779	\$71,512	\$73,039	\$73,394	\$73,056	\$71,427	\$72,638	\$61,361	-10.79%

Note: The U.S. Department of Education did not collect Benefits data for the 2011-12 academic year.

Source: National Education Association's College and University Data Analysis System (CUDAS).

<http://cudas.nea.org/reports/reportselection.aspx>.

Conclusion: By every measure, Virginia academic research lags its peers in support, and state funding for research universities lags national averages. It is difficult to believe that university research in Virginia will reach top 10 levels unless sufficient resources are available, and salaries are adequate to attract and keep the best candidates to develop and lead new research.

Faculty racial/ethnic characteristics

Commitment to equity is part of the core beliefs of most colleges and universities. Not all of the public institutions in Virginia report faculty by race/ethnicity, but of those Virginia institutions that did so, the range was between 69 percent and five percent.

Table 45. Percent of full-time faculty at public four-year colleges and universities that identifies as American Indian or Native Alaskan, Asian, Black/African American, Hispanic or Latino, Native Hawaiian or Pacific Islander, or two or more races

Institution	FT instructional faculty	# Minority	%
VA State U	284	196	69.00%
Old Dominion U ¹	761	145	19.10%
VA Polytechnic Institute and State U ¹	1710	275	16.10%
George Mason U ¹	1226	190	15.50%
U of Mary Washington	244	35	14.30%
U of VA-Main Campus ¹	1807	242	13.40%
Christopher Newport U	258	25	9.70%
Radford U	411	40	9.70%
James Madison U	940	78	8.30%
Longwood U	221	15	6.80%
VA Military Institute	122	6	4.90%
College of William and Mary ¹	Not Reported		
Norfolk State U*	Not Reported		
The U of VA College at Wise	Not Reported		
VA Commonwealth U ¹	Not Reported		
Average	726	113	17%

Note: * Historically Black College or University ¹ Classified as a research university.

Source: IPEDS data (2012-13).

Conclusion: There is significant variance among public colleges and universities in the racial/ethnic composition of the faculty, even putting aside the HBCUs. A faculty that is sensitive to the life experiences of an increasingly diverse student body should be a consideration in preparing for the future.

Community colleges in Virginia have a higher proportion of minority students than is found in public four-year institutions. The ethnic/racial diversity of the full-time faculty varies among the colleges, but the average for the state is 12 percent, which is below the average for the public four-year institutions.

Table 46. Percent of full-time faculty at public two-year colleges that identifies as American Indian or Native Alaskan, Asian, Black/African American, Hispanic or Latino, Native Hawaiian or Pacific Islander, American or two or more races.

Institution Name	%
Paul D Camp CC	38.90%
Northern Virginia CC	27.40%
John Tyler CC	19.20%
J Sargeant Reynolds CC	19.10%
Thomas Nelson CC	18.30%
Germanna CC	14.30%
Tidewater CC	13.90%
Southside Virginia CC	13.00%
Central Virginia CC	11.50%
Rappahannock CC	11.50%
Eastern Shore CC	9.50%
Piedmont Virginia CC	9.50%
Patrick Henry CC	9.40%
New River CC	8.80%
Danville CC	7.90%
Dabney S Lancaster CC	4.50%
Mountain Empire CC	4.50%
Blue Ridge CC	4.10%
Virginia Highlands CC	3.50%
Virginia Western CC	3.50%
Wytheville CC	2.20%
Southwest Virginia CC	2.00%
Lord Fairfax CC	1.40%
Richard Bland College	Not reported
Paul D Camp CC	38.90%

Source: IPEDS Data (2012-13) with calculations by JBL Associates.

Partnerships with business and communities

The private business community is an important partner with higher education in Virginia. The following summary of a Lumina study represents what respondents to a national survey of business leaders said about higher education. The results suggest that not many business leaders are involved with higher education institutions, but would welcome closer ties. They do not have much confidence in the skills of graduates, but are even more suspect of online education graduates. Initial hires of college graduates are made based on work skills.

- Seven in 10 leaders say they would consider hiring someone without a degree or credential over someone with one.
- Just 13% of business leaders say higher education institutions collaborate with business a great deal.
- Most leaders (88%) favor an increased level of collaboration with higher education institutions.
- About one in ten business leaders strongly agree that higher education institutions in this country are graduating students with the skills and competencies their business needs.
- Just 14% of executives say they are very likely to hire a candidate who has a degree from an online higher education institution over a candidate with a traditional higher education.
- Business leaders were most likely to indicate the amount of knowledge a candidate has in the field is a very important factor to managers making hiring decisions for organizations.
- For business leaders, work skills top the list of factors that should drive immigration policy decisions.¹²

Examples of employer/higher education partnerships in Virginia

Goodwill of Greater Washington (GGW) works closely with local employers to develop in-depth programs that prepare people for jobs in specific industries, such as banking, building maintenance and environmental services, retail, and construction. In addition to formal classroom training, GGW often prepares clients for permanent jobs through a combination of supported, temporary, or transitional employment at a Goodwill facility or in the community. Completion of Goodwill training can earn students up to five credits at Northern Virginia Community College.

Center for Innovative Technology (CIT)—The Commonwealth Research Commercialization Fund (CRCF) advances science- and technology-based research, development, and commercialization to drive economic growth in Virginia. In support of these goals, former Governor McDonnell and the General Assembly appropriated \$4.8 million to the Fund in both FY2013 and FY2014. - See more at: <http://www.cit.org/initiatives/crcf/#sthash.UlfOssuS.dpuf>. A more extensive list of research and education centers along with research parks associated with Virginia universities is included in the appendix.

CIT has devised a measure of Virginia's progress in developing and finding talent for an expanding high-tech employment market. The measures include the net gain in college-educated knowledge workers, graduates in STEM fields, entrepreneurship degree programs, the degree to which the high-tech industry is concentrated or specialized in Virginia relative to the nation, and FIRST participation. FIRST is an organization that creates programs to motivate students aged six to 18 to pursue STEM education and career opportunities. Figure M shows the most recent scores on these measures.

¹² The 2013 Lumina Study of the American Public's Opinion on Higher Education and U.S. Business Leaders Poll on Higher Education What America Needs to Know About Higher Education Redesign, February 25, 2014

Figure M. Virginia’s talent pipeline

Indicator	1-Year Trend
Knowledge Worker Migration (2012)	↓
STEM Degrees (2012)	↑
Entrepreneurship Training	—
High-Tech Employment Concentration (LQ) (2012)	→
<i>FIRST</i> Participation (2012)	↑

This indicator has not been updated since 2012, so it may not be a helpful tool for planners and managers who are concerned with tracking progress on these trends.

Conclusion: Business leaders are interested in partnerships with higher education institutions, and there are structures in place to help make that happen, but it will need to take place at the local level to be most meaningful.

Conclusion and summary

Higher education in Virginia will operate in a changing environment. More minority students will be coming to the doors of the colleges, many of whom have not had the same level of education success or the same life experiences as better-off White students. This change will take place in a period of little increase in the state’s college age population.

The regional diversity of Virginia provides a different context defined in terms of what is needed from colleges and universities. The headquarter companies and federal agencies in Northern Virginia need a different mix of trained employees than the smaller towns and rural areas of Virginia. College leaders will need to continue to be sensitive to local needs as well as larger state needs.

Technology will continue to change how education is delivered. Distance education has the potential to make education available to more students who need the flexibility to fit their education with work and family. On campus, technology has the potential to allow students to finish course work more quickly than in traditional classes while maintaining the same educational standards.

State support of higher education in Virginia has been declining, and there have been associated increases in tuition and fees. This raises two issues. One is finding a way to keep college affordable. The price of education at a four-year public college or university is beyond the ability of the average family

to pay, even with student grants to help. There is an upper limit to how much students can borrow to close the gap between the price of attendance and what families can pay.

Second, the erosion of state support over the last several years threatens the capacity of public colleges and universities to attract and maintain the talent necessary to remain competitive with universities in other states. Human resources are the main expense in colleges and universities, and having the talent necessary for breakthrough research and effective teaching is an important issue for Virginia's colleges and universities.

There is little argument that higher education is important to Virginia. Universities and colleges need to continue to develop meaningful partnerships with high schools to help improve the preparation of incoming students and, at the same time, forge working relationships with employers to make sure graduates at all levels have the skills necessary to succeed. Meeting the needs of the community and the students should be an important goal of higher education in the state.

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Appendix A. List of accredited postsecondary institutions operating in Virginia, JBLA

It is difficult to agree on a standardized list of postsecondary institutions in any given state.

Organizations may use different criteria to determine which institutions are included or excluded from the final count. For the purposes of this report, we use IPEDS' list of postsecondary institutions in Virginia. In most cases, the list is used throughout the report to define institutional characteristics and measures such as sector and tuition and fees. Please note the following characteristics of the IPEDS list:

- IPEDS includes all separately accredited campuses in a multi campus system rather than reporting the single main institution.
- IPEDS does not include institutions ineligible for Title IV federal funding.
- IPEDS does not include branch campuses of out-of-state institutions that provide programs in Virginia.
- There is lag between institutional information collected by the state and data presented by the federal government; therefore, the status of select institutions may not be current in the IPEDS version.

The summaries and averages JBLA derived from IPEDS may differ from the same calculations if JBLA used another institutional list. JBLA believes that the direction and magnitude of results would be generally the same, but readers should understand that these are estimates and may differ from calculations created from another list. For clarity, JBLA has provided a list of postsecondary institutions operating in Virginia derived from IPEDS' count.

JBLA/IPEDS List of Institutions Operating in Virginia

UNITID	Institution (entity) name	Sector	Control
Private for-profit, 2-year			
419022	ACT College	Private for-profit, 2-year	Proprietary
231411	Advanced Technology Institute	Private for-profit, 2-year	Proprietary
427973	Aviation Institute of Maintenance-Chesapeake	Private for-profit, 2-year	Proprietary
445762	Aviation Institute of Maintenance-Manassas	Private for-profit, 2-year	Proprietary
441858	Career Training Solutions	Private for-profit, 2-year	Proprietary
420024	Centura College-Chesapeake	Private for-profit, 2-year	Proprietary
377449	Centura College-Newport News	Private for-profit, 2-year	Proprietary
377458	Centura College-Norfolk	Private for-profit, 2-year	Proprietary
427982	Centura College-Richmond Main	Private for-profit, 2-year	Proprietary
440378	Centura College-Richmond Westend	Private for-profit, 2-year	Proprietary
455983	Columbia College	Private for-profit, 2-year	Proprietary
480505	Court Reporting Institute of Arlington	Private for-profit, 2-year	Proprietary
232724	Danville Regional Medical Center School of Health Professions	Private for-profit, 2-year	Proprietary
442310	Everest College-Arlington	Private for-profit, 2-year	Proprietary
438647	Everest College-Chesapeake	Private for-profit, 2-year	Proprietary
445470	Everest College-McLean	Private for-profit, 2-year	Proprietary
232502	Everest College-Newport News	Private for-profit, 2-year	Proprietary
233329	Fortis College-Norfolk	Private for-profit, 2-year	Proprietary
382957	Fortis College-Richmond	Private for-profit, 2-year	Proprietary
455390	Global Health College	Private for-profit, 2-year	Proprietary
475246	Kaplan College-Chesapeake	Private for-profit, 2-year	Proprietary
131742	Medtech Institute	Private for-profit, 2-year	Proprietary
475194	Miller-Motte Technical College	Private for-profit, 2-year	Proprietary
233091	Miller-Motte Technical College-Lynchburg	Private for-profit, 2-year	Proprietary
437769	Richmond School of Health and Technology	Private for-profit, 2-year	Proprietary
451608	Southeast Culinary & Hospitality College	Private for-profit, 2-year	Proprietary
233082	Southside Regional Medical Center Professional Schools	Private for-profit, 2-year	Proprietary
460923	Virginia College-Richmond	Private for-profit, 2-year	Proprietary
Private for-profit, less-than 2-year			
448257	Avi Career Training	Private for-profit, less-than 2-year	Proprietary
231280	Bar Palma Beauty Careers Academy	Private for-profit, less-than 2-year	Proprietary
451592	Centura College-Alexandria	Private for-profit, less-than 2-year	Proprietary
479248	Columbia College	Private for-profit, less-than 2-year	Proprietary
461449	Cosmopolitan Beauty & Tech School	Private for-profit, less-than 2-year	Proprietary

451617	Dominion School of Hair Design	Private for-profit, less-than 2-year	Proprietary
444282	Empire Beauty School-Midlothian	Private for-profit, less-than 2-year	Proprietary
450599	Empire Beauty School-Richmond	Private for-profit, less-than 2-year	Proprietary
476179	Empire Beauty School-Virginia Beach	Private for-profit, less-than 2-year	Proprietary
480329	Everest College-Woodbridge	Private for-profit, less-than 2-year	Proprietary
406495	Graham Webb International Academy of Hair	Private for-profit, less-than 2-year	Proprietary
458122	Institute of Advanced Medical Esthetics	Private for-profit, less-than 2-year	Proprietary
461412	Northern Virginia School of Therapeutic Massage	Private for-profit, less-than 2-year	Proprietary
449995	Paul Mitchell the School-Mclean	Private for-profit, less-than 2-year	Proprietary
467605	Regency Beauty Institute-Manassas	Private for-profit, less-than 2-year	Proprietary
476133	Regency Beauty Institute-Newport News	Private for-profit, less-than 2-year	Proprietary
467650	Regency Beauty Institute-Roanoke	Private for-profit, less-than 2-year	Proprietary
441876	Rudy & Kelly Academy of Hair and Nails	Private for-profit, less-than 2-year	Proprietary
233657	Springfield Beauty Academy	Private for-profit, less-than 2-year	Proprietary
233666	Staunton School of Cosmetology	Private for-profit, less-than 2-year	Proprietary
231721	Suffolk Beauty Academy	Private for-profit, less-than 2-year	Proprietary
233286	Sylvain Melloul International Hair Academy	Private for-profit, less-than 2-year	Proprietary
232919	Tidewater Tech-Trades	Private for-profit, less-than 2-year	Proprietary
476568	Tomorrow's Image Barber Academy of Virginia	Private for-profit, less-than 2-year	Proprietary
234119	Virginia School of Hair Design	Private for-profit, less-than 2-year	Proprietary
430254	Virginia School of Massage	Private for-profit, less-than 2-year	Proprietary
234191	Wards Corner Beauty Academy-Norfolk	Private for-profit, less-than 2-year	Proprietary
445683	Wards Corner Beauty Academy-Virginia Beach	Private for-profit, less-than 2-year	Proprietary
Private for-profit, Public, 2-year or above			
419457	Argosy University-Washington D.C.	Private for-profit, 2-year or above	Proprietary
459107	Bryant & Stratton College-Hampton	Private for-profit, 2-year or above	Proprietary
231828	Bryant & Stratton College-Richmond	Private for-profit, 2-year or above	Proprietary
231785	Bryant & Stratton College-Virginia Beach	Private for-profit, 2-year or above	Proprietary
232016	Centura College-Virginia Beach	Private for-profit, 2-year or above	Proprietary
460871	Chamberlain College of Nursing-Virginia	Private for-profit, 2-year or above	Proprietary
437343	DeVry University's Keller Graduate School of Management-Virginia	Private for-profit, 2-year or above	Proprietary
440536	DeVry University-Virginia	Private for-profit, 2-year or above	Proprietary
248934	ECPI University	Private for-profit, 2-year or above	Proprietary
441964	ITT Technical Institute-Chantilly	Private for-profit, 2-year or above	Proprietary
368601	ITT Technical Institute-Norfolk	Private for-profit, 2-year or above	Proprietary
437051	ITT Technical Institute-Richmond	Private for-profit, 2-year or above	Proprietary
459602	ITT Technical Institute-Salem	Private for-profit, 2-year or above	Proprietary
441955	ITT Technical Institute-Springfield	Private for-profit, 2-year or above	Proprietary

232797	National College-Salem	Private for-profit, 2-year or above	Proprietary
442639	Potomac College-VA Campus	Private for-profit, 2-year or above	Proprietary
234216	Sanford-Brown College-Tysons Corner	Private for-profit, 2-year or above	Proprietary
261931	Skyline College-Roanoke	Private for-profit, 2-year or above	Proprietary
459259	South University-Richmond	Private for-profit, 2-year or above	Proprietary
459268	South University-Virginia Beach	Private for-profit, 2-year or above	Proprietary
438498	Stratford University	Private for-profit, 2-year or above	Proprietary
233684	Strayer University-Virginia	Private for-profit, 2-year or above	Proprietary
458496	The Art Institute of Virginia Beach	Private for-profit, 2-year or above	Proprietary
440341	The Art Institute of Washington	Private for-profit, 2-year or above	Proprietary
456010	The Art Institute of Washington-Dulles	Private for-profit, 2-year or above	Proprietary
437097	University of Management and Technology (The)	Private for-profit, 2-year or above	Proprietary
442189	University of Phoenix-Northern Virginia Campus	Private for-profit, 2-year or above	Proprietary
446756	University of Phoenix-Richmond Campus	Private for-profit, 2-year or above	Proprietary
448628	Westwood College-Annandale	Private for-profit, 2-year or above	Proprietary
447069	Westwood College-Arlington Ballston	Private for-profit, 2-year or above	Proprietary
Private not-for-profit, Public, 2-year or above			
233480	Bon Secours St Mary's Hospital School of Medical Imaging	Private not-for-profit, 2-year	Private, nfp
232618	Lynchburg General Hospital School of Nursing	Private not-for-profit, 2-year	Private, nfp
233408	Riverside School of Health Careers	Private not-for-profit, 2-year	Private, nfp
430306	Cayce Reilly School of Massotherapy	Private not-for-profit, 2-year	Private, nfp
427894	CET-Alexandria	Private not-for-profit, 2-year	Private, nfp
Private not-for-profit 4-year+			
449922	Appalachian College of Pharmacy	Private not-for-profit 4-year+	Private, nfp
432348	Appalachian School of Law	Private not-for-profit 4-year+	Private, nfp
231420	Averett University	Private not-for-profit 4-year+	Private, nfp
449931	Averett University-Non-Traditional Programs	Private not-for-profit 4-year+	Private, nfp
366793	Baptist Theological Seminary at Richmond	Private not-for-profit 4-year+	Private, nfp
458113	Bethel College	Private not-for-profit 4-year+	Private, nfp
231554	Bluefield College	Private not-for-profit 4-year+	Private, nfp
233356	Bon Secours Memorial College of Nursing	Private not-for-profit 4-year+	Private, nfp
231581	Bridgewater College	Private not-for-profit 4-year+	Private, nfp
232043	Eastern Mennonite University	Private not-for-profit 4-year+	Private, nfp
442806	Edward Via College of Osteopathic Medicine	Private not-for-profit 4-year+	Private, nfp
232025	Emory & Henry College	Private not-for-profit 4-year+	Private, nfp
232089	Ferrum College	Private not-for-profit 4-year+	Private, nfp
232256	Hampden-Sydney College	Private not-for-profit 4-year+	Private, nfp
232265	Hampton University	Private not-for-profit 4-year+	Private, nfp

232308	Hollins University	Private not-for-profit 4-year+	Private, nfp
445869	Institute for the Psychological Sciences	Private not-for-profit 4-year+	Private, nfp
231837	Jefferson College of Health Sciences	Private not-for-profit 4-year+	Private, nfp
232557	Liberty University	Private not-for-profit 4-year+	Private, nfp
232609	Lynchburg College	Private not-for-profit 4-year+	Private, nfp
232672	Mary Baldwin College	Private not-for-profit 4-year+	Private, nfp
232706	Marymount University	Private not-for-profit 4-year+	Private, nfp
233301	Randolph College	Private not-for-profit 4-year+	Private, nfp
233295	Randolph-Macon College	Private not-for-profit 4-year+	Private, nfp
231651	Regent University	Private not-for-profit 4-year+	Private, nfp
233426	Roanoke College	Private not-for-profit 4-year+	Private, nfp
233499	Saint Paul's College	Private not-for-profit 4-year+	Private, nfp
232885	Sentara College of Health Sciences	Private not-for-profit 4-year+	Private, nfp
233541	Shenandoah University	Private not-for-profit 4-year+	Private, nfp
233611	Southern Virginia University	Private not-for-profit 4-year+	Private, nfp
233718	Sweet Briar College	Private not-for-profit 4-year+	Private, nfp
233842	Union Presbyterian Seminary	Private not-for-profit 4-year+	Private, nfp
233374	University of Richmond	Private not-for-profit 4-year+	Private, nfp
233912	Virginia Intermont College	Private not-for-profit 4-year+	Private, nfp
234164	Virginia Union University	Private not-for-profit 4-year+	Private, nfp
234137	Virginia University of Lynchburg	Private not-for-profit 4-year+	Private, nfp
234173	Virginia Wesleyan College	Private not-for-profit 4-year+	Private, nfp
234207	Washington and Lee University	Private not-for-profit 4-year+	Private, nfp
Public, 2-year			
231536	Blue Ridge Community College	Public, 2-year	Public
231697	Central Virginia Community College	Public, 2-year	Public
231873	Dabney S Lancaster Community College	Public, 2-year	Public
231882	Danville Community College	Public, 2-year	Public
232052	Eastern Shore Community College	Public, 2-year	Public
232195	Germanna Community College	Public, 2-year	Public
232414	J Sargeant Reynolds Community College	Public, 2-year	Public
232450	John Tyler Community College	Public, 2-year	Public
232575	Lord Fairfax Community College	Public, 2-year	Public
232788	Mountain Empire Community College	Public, 2-year	Public
232867	New River Community College	Public, 2-year	Public
232946	Northern Virginia Community College	Public, 2-year	Public
233019	Patrick Henry Community College	Public, 2-year	Public
233037	Paul D Camp Community College	Public, 2-year	Public

233116	Piedmont Virginia Community College	Public, 2-year	Public
233310	Rappahannock Community College	Public, 2-year	Public
233338	Richard Bland College of the College of William and Mary	Public, 2-year	Public
233639	Southside Virginia Community College	Public, 2-year	Public
233648	Southwest Virginia Community College	Public, 2-year	Public
233754	Thomas Nelson Community College	Public, 2-year	Public
233772	Tidewater Community College	Public, 2-year	Public
233903	Virginia Highlands Community College	Public, 2-year	Public
233949	Virginia Western Community College	Public, 2-year	Public
234377	Wytheville Community College	Public, 2-year	Public
Public, less-than 2-year			
231688	Central School of Practical Nursing	Public, less-than 2-year	Public
446206	Culpeper Cosmetology Training Center	Public, less-than 2-year	Public
431266	Henrico County-Saint Mary's Hospital School of Practical Nursing	Public, less-than 2-year	Public
232593	Suffolk Public Schools-Sentara Obici Hospital School of Practical Nursing	Public, less-than 2-year	Public
137713	Suwannee-Hamilton Technical Center	Public, less-than 2-year	Public
377485	Virginia Beach City Public Schools School of Practical Nursing	Public, less-than 2-year	Public
234225	Washington County Skill Center	Public, less-than 2-year	Public
234359	Woodrow Wilson Rehabilitation Center	Public, less-than 2-year	Public
Public, 2-year or above			
231712	Christopher Newport University	Public, 2-year or above	Public
231624	College of William and Mary	Public, 2-year or above	Public
231970	Eastern Virginia Medical School	Public, 2-year or above	Public
232186	George Mason University	Public, 2-year or above	Public
232423	James Madison University	Public, 2-year or above	Public
232566	Longwood University	Public, 2-year or above	Public
232937	Norfolk State University	Public, 2-year or above	Public
232982	Old Dominion University	Public, 2-year or above	Public
233277	Radford University	Public, 2-year or above	Public
233897	The University of Virginia's College at Wise	Public, 2-year or above	Public
232681	University of Mary Washington	Public, 2-year or above	Public
234076	University of Virginia-Main Campus	Public, 2-year or above	Public
234030	Virginia Commonwealth University	Public, 2-year or above	Public
234085	Virginia Military Institute	Public, 2-year or above	Public
233921	Virginia Polytechnic Institute and State University	Public, 2-year or above	Public
234155	Virginia State University	Public, 2-year or above	Public

Source: IPEDS

Appendix B. University research parks and off-campus centers

University research parks offer private companies opportunities for co-location and cooperative relationships with major Virginia universities. In addition, there are two campus centers in the state where multiple colleges can provide courses. Finally, university-related research centers have become hubs for research relevant to a number of businesses.

The **Center for Innovative Technology (CIT)** creates technology-based economic development strategies to accelerate innovation, imagination and the next generation of technology and technology companies. Created in 1985, CIT, a non-profit corporation, plugs gaps at the earliest stages of the Innovation Continuum – commercialization and seed funding – as it helps entrepreneurs launch and grow high-growth technology companies and create high-paying jobs for the future. To facilitate national innovation leadership and accelerate the rate of technology adoption, CIT creates partnerships between innovative technology start-up companies and advanced technology consumers. Lastly, CIT builds the infrastructure for new-innovation economies with expert broadband strategies. The Center includes higher education institutions as members, but it is not part of any specific campus.

New College Institute is a state-funded educational entity that provides access to bachelor's degree completion programs, master's degrees, teacher endorsement programs, teacher recertification courses, and more through partnerships with colleges and universities. NCI strives to be accessible and convenient for students of all ages. Our staff, faculty, and board members are committed to making NCI a premier educational facility for students, businesses, and the community at large. In addition to college-level degree and certification programs, NCI offers experiential learning opportunities such as the NCI Internship Program and NCI's Academy for Engineering & Technology. Additional programs such as NCI's summer camps, non-credit lecture series, and financial aid resource events encourage and promote continued education throughout the Martinsville-Henry County region.

Commonwealth Center for Advanced Manufacturing (CCAM) is an applied research center that provides production-ready advanced manufacturing solutions to member companies across the globe. Members guide the research, leveraging talent and resources within CCAM and at Virginia's top universities, through a collaborative model that enables them to pool R&D efforts to increase efficiencies. Results can then be applied directly to the factory floor, turning ideas into profit faster and more affordably than ever before. CCAM is located in a state-of-the-art research facility in Prince George County, Virginia.

Innovation at Prince William is a 1,500-acre business and technology park that provides excellent opportunities for collaborative research, data centers, bio-manufacturing, and corporate and governmental campus locations. Anchored by George Mason University's life science campus, Innovation Technology Park has grown since its inception in 1992 to become home to biotech industry leaders. This unique public-private partnership has

evolved into a unique “university-centered” model for economic development within Prince William County, resulting in the creation of nearly 2,700 new jobs and a total investment in the county of over \$830 million.

Innovation Research Park at ODU is located in the University Village on the campus of Old Dominion University in Norfolk, Virginia. IRP was designed to leverage the access, proximity, and infrastructure of ODU, the surrounding federal labs, and military centers to aid companies at every point in their lifecycle. The Park currently consists of two 100,000 sq. ft. Class A/wet/dry labs.

The Institute for Advanced Learning and Research (IALR) is driving regional economic growth through strategic research, advanced learning programs, and advanced networking and technology in Southside Virginia. IALR serves as a regional catalyst for economic transformation. Core focus areas include research that provides a clear path to commercialization, advanced learning opportunities with academic partners Averett University and Danville Community College, and economic development through conferencing and a partnership with the Southern Virginia Regional Alliance. At the IALR research centers, Virginia Tech faculty conduct research in the fields of advanced polymers, unmanned systems, sustainable horticulture and forestry, and motorsports/vehicle engineering. IALR research centers include small and mid-sized companies.

Roanoke Higher Education Center (RHEC) provides over 200 programs of study, from GED preparation through doctoral studies, in southwestern Virginia. The RHEC works closely with the business community, member institutions, and civic leaders to develop a wide variety of educational resources. It is focused on stimulating economic development in the region and the revitalization of Gainsboro Neighborhood.

The mission of the **Southern Virginia Higher Education Center (SVHEC)** is to advance southern Virginia’s economic potential through education, innovation, and collaboration. Located on the service area of the closest community colleges, and more than 75 minutes from the nearest state supported four-year institution, the SVHEC provides vital educational access and workforce training to an under-served rural population. By serving as an incubator, broker, and developer of innovative educational and applied research pathways, the SVHEC is focused on re-tooling southern Virginia’s rural workforce for jobs in the New Economy.

Established in 1991, the **Southwest Virginia Higher Education Center** has sought to strengthen the economy of southwest Virginia through education and training of the current and future workforce. It is partnered with ten colleges and universities and provides undergraduate and graduate degree programs and professional development courses primarily for adult learners.

Stafford Technology and Research Center at Quantico is just getting started with the inclusion of George Mason University, Germanna Community College and the University of

Mary Washington. The new educational center will offer classes in Informatics, Data Science and Bio Sciences, particularly as they relate to homeland security, defense and intelligence efforts.

Thomas Jefferson National Accelerator Facility (Jefferson Lab) is a world-class research facility and a valued partner with the local, regional and national education community. Jefferson Lab's long-term commitment to science education focuses on increasing the number and quality of undergraduate and graduate students who complete degrees in science; strengthening the motivation and preparation of all students, especially minorities and females; and addressing the under representation of minorities and females in science, math, engineering and technology careers.

University of Virginia Research Park is a 562-acre, three-million-square-foot, mixed-use development zoned for office, light industry, hotel/conference center, laboratory/medical/pharmaceutical, and retail/support commercial uses. UVA promotes the park as providing businesses access to cutting-edge University research and technology programs, a highly educated and market-ready workforce, and undergraduate and graduate interns. Association with the University also creates consulting and joint research opportunities with faculty, and credibility with investors and clients.

Virginia Advanced Shipbuilding and Carrier Integration Center (VASCIC) was established in 1998 by the Commonwealth of Virginia's General Assembly. The purpose of VASCIC is to enhance and promote the quality and competitiveness of Virginia's shipbuilding industry and to promote the general welfare of Virginia citizens. In this state-of-the-art facility, Newport News, along with electronic system suppliers, software suppliers, U.S. Navy laboratories and program representatives, and Virginia institutions of higher learning, develops new technologies for aircraft carriers and advanced shipbuilding.

Virginia BioTechnology Research Park is a biosciences community headquartered in downtown Richmond, Va., in the heart of the nation's East Coast pharmaceutical and biotechnology corridor. Originally created as a partnership of Virginia Commonwealth University, the City of Richmond and the Commonwealth of Virginia, the Park is home to more than 50 biosciences companies, research institutes affiliated with the VCU Medical Center and major state and national medical laboratories and organizations involved with forensics, testing of biotoxins and management of the nation's organ transplantation process. The Park works with VCU, other academic institutions, business, government and not-for-profit organizations to facilitate technology transfer and business development. Its business accelerator — the Virginia Biosciences Development Center — assists biosciences startups in the Park's incubator with everything from legal and financial services to business planning.

Virginia Modeling, Analysis and Simulation Center (VMASC) is one of the world's leading research centers for computer modeling, simulation, and visualization. This program

supports the development and applications of modeling, simulation and visualization as enterprise decision-making tools to promote economic, business, and academic development. It is an important resource for students in the Colleges of Engineering and Technology, Sciences, Education, and Business. Annually, the Center conducts approximately \$10M in funded research. The Center works with more than one hundred industry, government, and academic members.

The Virginia Tech Carilion Research Institute is managed by Virginia Tech in close collaboration with Carilion Clinic and the Virginia Tech Carilion School of Medicine. Research is conducted at the Virginia Tech Carilion Research Institute. VTCRI creates a bridge between basic science research at Virginia Tech and clinical expertise at Carilion Clinic, and increases translational research opportunities for both partners. Research conducted by scientists at the Institute is aimed at understanding the molecular basis for health and disease, and development of diagnostic tools, treatments, and therapies that will contribute to the prevention and solution of existing and emerging problems in contemporary medicine.

Virginia Tech Corporate Research Park: The Virginia Tech Corporate Research Center is home to over 100 companies engaged in leading-edge research in diverse areas of technology. Its mission is to develop a research park for high-technology companies in collaboration with Virginia Tech (VT). The Park promotes the research, educational and technology transfer missions of the university. The VTCRC creates research relationships between companies at the VTCRC and VT; it works with the faculty to identify student projects that can be done at the VTCRC; it provides an incubator program called VT KnowledgeWorks that helps to create companies based on technology licensed by Virginia Tech.

Wallops Research Park consists of 202 acres adjacent to the NASA Wallops Flight Facility (WFF) and minutes away from the Mid-Atlantic Regional Spaceport. Park tenants have access to the NASA aerospace research facilities. The Research Park is a project of Accomack County, NASA WFF, and the Marine Science Consortium. Academic partners include Chincoteague Bay Field Station member universities, Eastern Shore Community College, Old Dominion University Department of Mechanical & Aerospace Engineering, and the Virginia Space Flight Academy.

Appendix C. JBLA regional crosswalk

Explanation of JBLA’s regional analysis

For the regional analysis portion of this study, JBLA divided the state of Virginia into eight regions: Central, Eastern, Hampton Roads, Northern, Southside, Southwest, Valley and West Central. These eight regions are strongly based on the regional divisions developed by the Council on Virginia’s Future as featured on the Virginia Performs website: <http://vaperforms.virginia.gov/extras/regions.php>. Counties and major metropolitan areas were collected from the United States Census Bureau.

Below JBLA has provided a crosswalk of counties and major cities and their respective regions.

County or Major City	Region
Albemarle County	Central
Amelia County	Central
Buckingham County	Central
Caroline County	Central
Charles City County	Central
Chesterfield County	Central
Culpeper County	Central
Cumberland County	Central
Dinwiddie County	Central
Fluvanna County	Central
Goochland County	Central
Greene County	Central
Hanover County	Central
Henrico County	Central
King and Queen County	Central
King William County	Central
Louisa County	Central
Madison County	Central
Nelson County	Central
New Kent County	Central
Orange County	Central
Powhatan County	Central
Prince George County	Central
Rappahannock County	Central
Sussex County	Central
Charlottesville City	Central
Colonial Heights City	Central
Hopewell City	Central
Petersburg City	Central
Richmond City	Central

Greensville County	Southside
Halifax County	Southside
Henry County	Southside
Lunenburg County	Southside
Mecklenburg County	Southside
Nottoway County	Southside
Patrick County	Southside
Pittsylvania County	Southside
Prince Edward County	Southside
Southampton County	Southside
Danville City	Southside
Emporia City	Southside
Franklin City	Southside
Martinsville City	Southside
Bland County	Southwest
Buchanan County	Southwest
Carroll County	Southwest
Dickenson County	Southwest
Floyd County	Southwest
Grayson County	Southwest
Lee County	Southwest
Russell County	Southwest
Scott County	Southwest
Smyth County	Southwest
Tazewell County	Southwest
Washington County	Southwest
Wise County	Southwest
Wythe County	Southwest
Bristol City	Southwest
Galax City	Southwest
Norton City	Southwest

Accomack County	Eastern
Essex County	Eastern
King George County	Eastern
Lancaster County	Eastern
Middlesex County	Eastern
Northampton County	Eastern
Northumberland County	Eastern
Richmond County	Eastern
Westmoreland County	Eastern
Gloucester County	Hampton Roads
Isle of Wight County	Hampton Roads
James City County	Hampton Roads
Mathews County	Hampton Roads
Surry County	Hampton Roads
York County	Hampton Roads
Chesapeake City	Hampton Roads
Hampton City	Hampton Roads
Newport News City	Hampton Roads
Norfolk City	Hampton Roads
Poquoson City	Hampton Roads
Portsmouth City	Hampton Roads
Suffolk City	Hampton Roads
Virginia Beach City	Hampton Roads
Williamsburg City	Hampton Roads
Arlington County	Northern
Clarke County	Northern
Fairfax County	Northern
Fauquier County	Northern
Loudoun County	Northern
Prince William County	Northern
Spotsylvania County	Northern
Stafford County	Northern
Warren County	Northern
Alexandria City	Northern
Fairfax City	Northern
Falls Church City	Northern
Fredericksburg City	Northern
Manassas City	Northern
Manassas Park City	Northern
Brunswick County	Southside
Charlotte County	Southside

Alleghany County	Valley
Augusta County	Valley
Bath County	Valley
Frederick County	Valley
Highland County	Valley
Page County	Valley
Rockbridge County	Valley
Rockingham County	Valley
Shenandoah County	Valley
Buena Vista City	Valley
Covington City	Valley
Harrisonburg City	Valley
Lexington City	Valley
Staunton City	Valley
Waynesboro City	Valley
Winchester City	Valley
Amherst County	West Central
Appomattox County	West Central
Bedford County	West Central
Botetourt County	West Central
Campbell County	West Central
Craig County	West Central
Franklin County	West Central
Giles County	West Central
Montgomery County	West Central
Pulaski County	West Central
Roanoke County	West Central
Bedford City	West Central
Lynchburg City	West Central
Radford City	West Central
Roanoke City	West Central
Salem City	West Central

Source: Counties and Major Cities gathered from US Census Data.

Regions derived from Council on Virginia’s Future: <http://vaperforms.virginia.gov/extras/regions.php>.

Appendix D. State Peer Groups and Policy Data

Peer comparison groups are a useful tool to get a sense of how Virginia's higher education system is performing relative to other states. Benchmarking against peer groups is useful in gauging the Commonwealth's performance on key metrics, but it is also important because Virginia competes against many of these states, both for students and to attract and retain skilled workers and entrepreneurial activity.

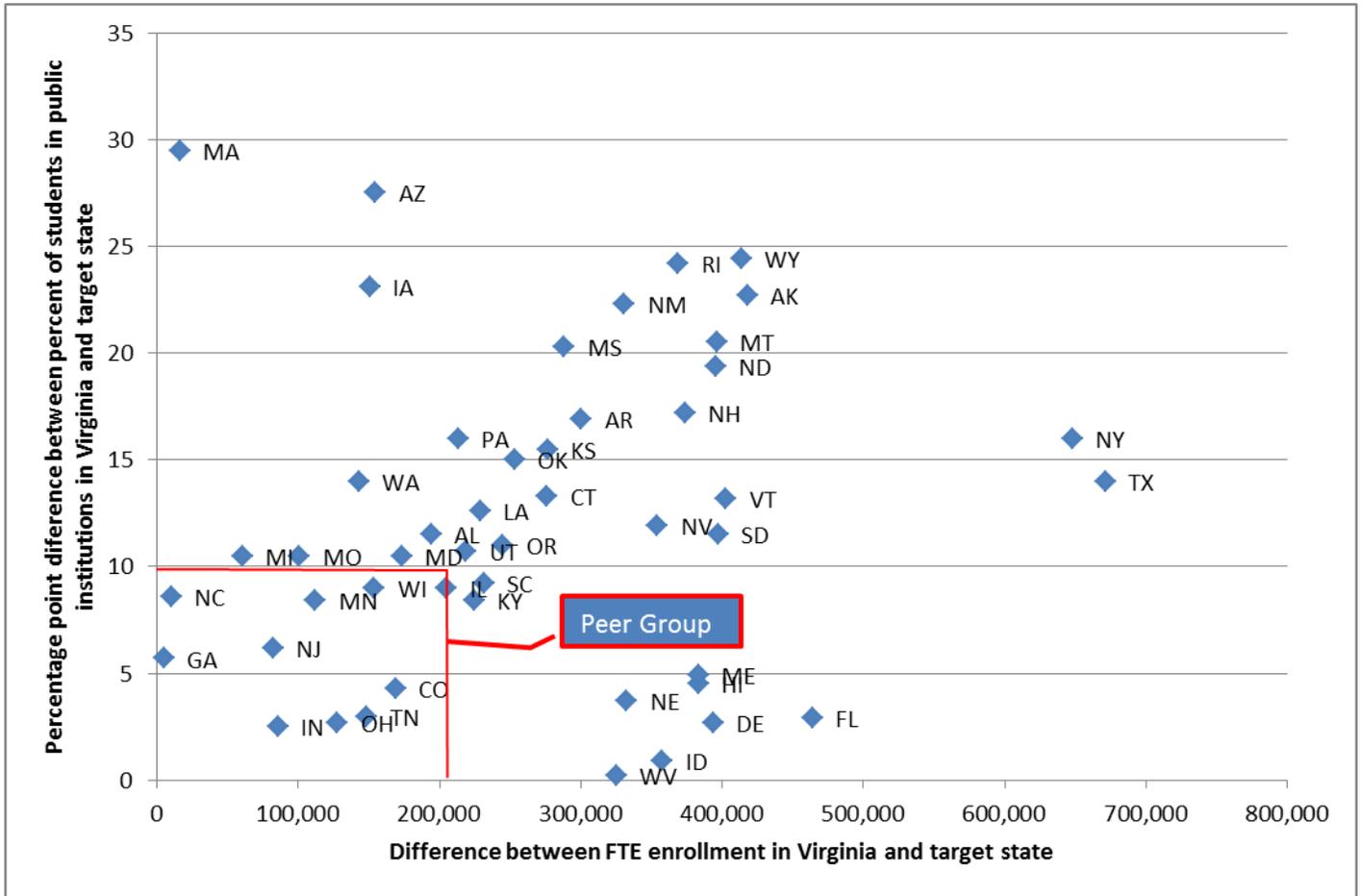
Three peer groups were selected for the purposes of this investigation. The first consists of states that immediately border Virginia, as these are states with which Virginia is likely to compete to attract students and businesses. The second group is based on the membership of SREB. It makes sense for Virginia to be attentive to its performance relative to other SREB members.

The third group is more wide-ranging, and consists of states selected as those being the closest to Virginia in terms of FTE student enrollment and percent of students enrolled in public, versus private, institutions. This group was selected to give a sense of how Virginia compares to states with broadly similar public higher education scopes and missions, but also to include states with a variety of policy approaches. Based on the following list, the peer group was selected as states having total FTE enrollment within 200,000 FTE students of Virginia's, and a percent of FTE students enrolled in all public institutions within 10 percentage points of Virginia's. North Carolina and Tennessee are included in all three peer comparisons.

State peer groups

JBLA Identified Peer Group	Bordering States Peer Group	SREB Peer Group
Colorado	District of Columbia	Alabama
Georgia	Kentucky	Arkansas
Indiana	Maryland	Delaware
Minnesota	North Carolina	Florida
New Jersey	Tennessee	Georgia
North Carolina	West Virginia	Kentucky
Ohio		Louisiana
Tennessee		Maryland
Wisconsin		Mississippi
		North Carolina
		Oklahoma
		South Carolina
		Tennessee
		Texas
		West Virginia

Differences between public FTE enrollment and percentage public FTE enrollment between Virginia and potential peers



Source: IPEDS