

# **The Impact of Career Colleges on Virginia's Economy**

**February, 2005**

A Study Commissioned by the  
Virginia Career College Association

MANGUM ECONOMIC  CONSULTING, LLC

## **Executive Summary**

Virginia's Career Colleges play two vital roles in the state's economy. First, Career Colleges provide a ladder to success for many under-employed Virginians by providing a career-focused environment that enables them to efficiently upgrade their skills and get a better job. Second, Career Colleges enhance workforce productivity and economic output through the trained graduates they produce. The purpose of this report is to assess the contribution these services make to Virginia's economy. The key findings of that assessment are as follows.

### **Career Colleges comprise some of the most rapidly growing and successful postsecondary education institutions in Virginia:**

- Between 1991 and 2001, enrollment in Virginia's four-year Career Colleges increased by 164 percent and enrollment in two-year Career Colleges increased by 240 percent. Over the same period, enrollment in Virginia's four-year public colleges and universities grew by 11 percent, enrollment in private-non-profit institutions grew by only 2 percent, and enrollment in public two-year colleges grew by 8 percent.
- Virginia Career Colleges do an exceptional job of getting their students through to graduation. Graduation rates in four-year and two-year Career Colleges are 45 and 65 percent, respectively. In comparison, the graduation rate in Virginia's four-year public colleges and universities is 56 percent, in private non-profit institutions it is 53 percent, and in the state's two-year public colleges it is 19 percent.

### **Career College students tend to be adults who are returning to college to upgrade their skills and get a better job:**

- Career College students tend to be more mature. Over half of Virginia Career College students are over the age of 24, as compared to 32 percent of public college students and 18 percent of private non-profit students.
- Career College students also tend to be more diverse. Minorities account for nearly half of all undergraduate enrollments in Virginia Career Colleges, as compared to 26 percent in Virginia's public colleges and universities, and 28 percent in private-non-profit institutions.

### **Career Colleges make a significant contribution to Virginia's economy:**

- Career Colleges are the primary suppliers of those individuals – like Computer Specialists and Electrical Engineering Technicians – who are the nuts and bolts of Virginia's technology sector.

- The dollar value of the increased workforce productivity generated by the education and training provided by Virginia Career Colleges is approximately \$71.5 million per year. The present value of the stream of benefits created by that increase in productivity is approximately \$678.5 million. Comparing this present value benefit to the \$87.5 million in economic costs associated with it, shows that the benefit/cost ratio for Career College services is 7.8 – the benefits to Virginia's economy are almost eight times as great as the costs required to generate those benefits.

**Career College students face a severe inequity in state financial aid that places them, and Virginia, at a disadvantage:**

- Currently, Virginia provides state financial aid to every category of college student except those attending Career Colleges.
- This policy probably contributes to the disproportionate number of Career College students – 86 percent in the four-year colleges and 70 percent in the two-year colleges – who must take out loans to finance their educations. In contrast, only 48 percent of public four-year college and university students, 57 percent of private non-profit institution students, and 7 percent of public two-year college students resort to loans.
- This policy also places Virginia at a competitive disadvantage relative to other states. Nationally, 37 states and the District of Columbia provide more state financial aid to Career College students than Virginia. This means that, where 37 other states and the District of Columbia are pursuing a policy that improves their pipeline of technology workers, Virginia is not.

*This report was prepared by Mangum Economic Consulting, LLC at the request of the Virginia Career College Association.*

## **Introduction**

The technological revolution dramatically changed the role of Career Colleges. Where years ago they were considered mainly business, secretarial, or “trade” schools, over the last two decades they have grown into true collegiate institutions and the primary supplier of those individuals – like Computer Specialists and Electrical Engineering Technicians – who are the nuts and bolts of Virginia’s technology sector. The purpose of this report is to illuminate the many contributions that these institutions make to Virginia’s current, and future, economic prosperity.

The remainder of the report is divided into four main sections: 1) Profile of Virginia Career Colleges, 2) Impact State Economy, 3) Impact on State Workforce, and 4) Summary. This report was prepared by Mangum Economic Consulting, LLC at the request of the Virginia Career College Association.

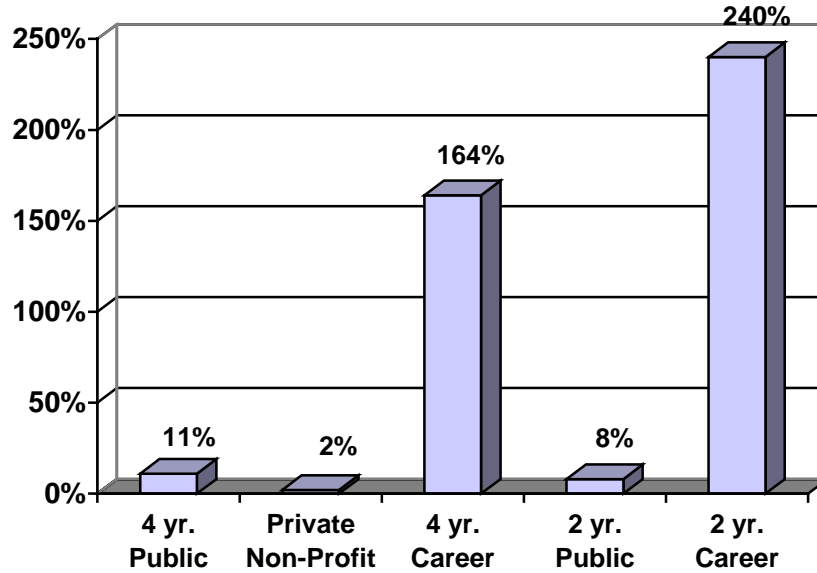
## **Profile of Virginia Career Colleges**

In this section, we use data from the U.S. Department of Education’s National Center for Education Statistics to provide a profile of Virginia’s Career Colleges and the students that attend them.

### Enrollment Trends

There is an old adage that says, “if you want to find a good restaurant, look for one with a full parking lot.” By that measure, Virginia’s Career Colleges are doing an exceptionally good job. Over the ten-year period between 1991 and 2001, enrollment in Virginia’s four-year Career Colleges increased from 4,856 students to 12,844 – a growth rate of 164 percent. Enrollment in Virginia’s two-year Career Colleges increased from 1,845 students to 6,270 – a growth rate of 240 percent.

In contrast, enrollment in Virginia’s public four-year colleges and universities grew by 11 percent over the same period. While enrollment in private-non-profit institutions grew by only 2 percent, and enrollment in public two-year colleges (primarily community colleges) grew by 8 percent (*see* Figure 1).

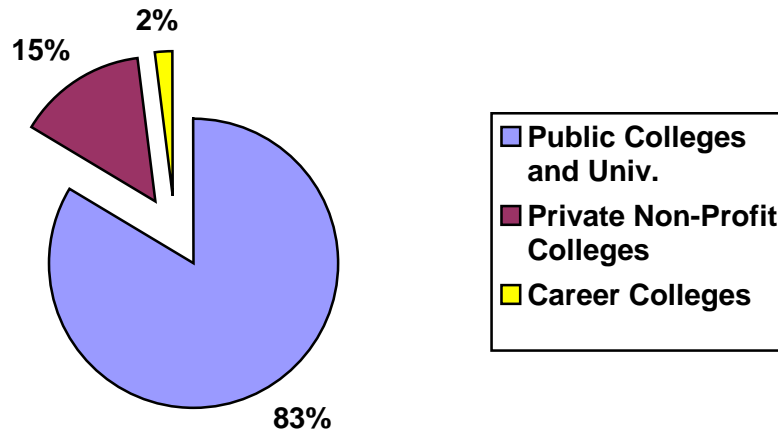


**Figure 1: 1991 to 2001 Enrollment Growth in Virginia Colleges and Universities by Sector<sup>1</sup>**

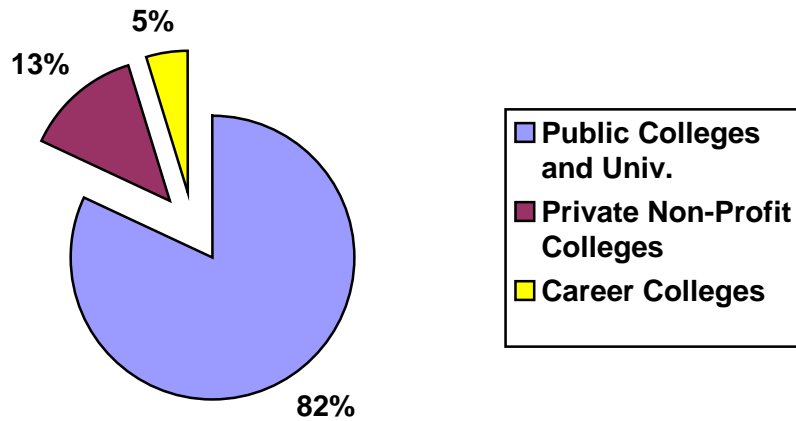
The result of this growth was that between 1991 and 2001 the Career Colleges more than doubled their market share of all undergraduate and graduate students enrolled in Virginia (*see* Figures 2 and 3). This explosive growth is a clear sign that Career Colleges do a superior job of providing demand-driven services that effectively meet the rapidly changing needs of students and their future employers.

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<sup>1</sup> *Data Source:* "Integrated Postsecondary Education Data System," National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>. 2001 enrollment data for four Career Colleges (Strayer University's Alexandria, Arlington, Chesterfield, and Fredericksburg campuses) were not reported. As a result, data for these institutions are based on 2000 enrollment levels.



**Figure 2:** 1991 Market Share of Postsecondary Students Enrolled in Virginia by Sector<sup>2</sup>



**Figure 3:** 2001 Market Share of Postsecondary Students Enrolled in Virginia by Sector<sup>3</sup>

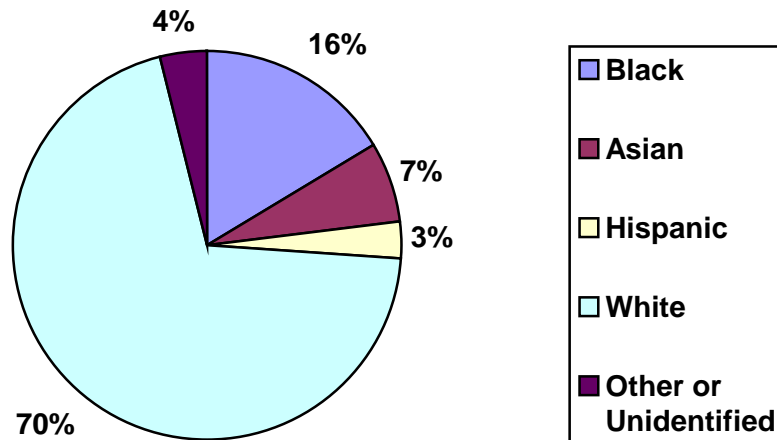
<sup>2</sup> Data Source: "Integrated Postsecondary Education Data System," National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>.

<sup>3</sup> Ibid.

## Student Characteristics

### *Racial Composition*

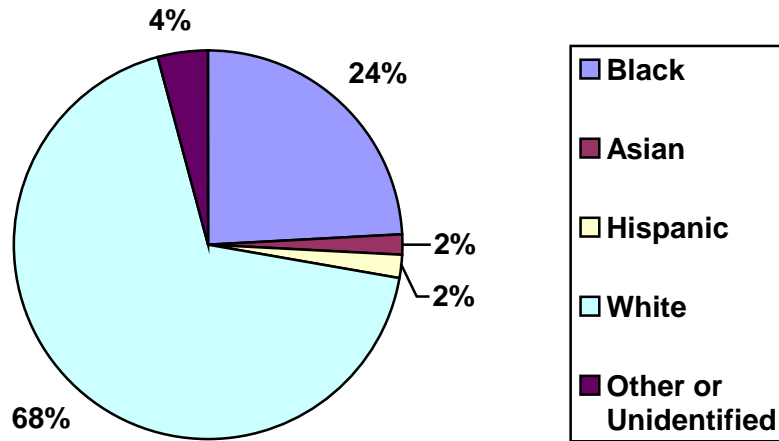
Proportionally, Virginia Career Colleges serve a far larger number of minority students than either the public colleges and universities or the private-non-profit institutions. In 2001, minorities accounted for nearly half of all undergraduate enrollments in Virginia Career Colleges. In that same year, minorities made up 26 percent of undergraduate enrollment in Virginia's public colleges and universities, and 28 percent in the private-non-profit institutions (*see* Figures 4 through 6).



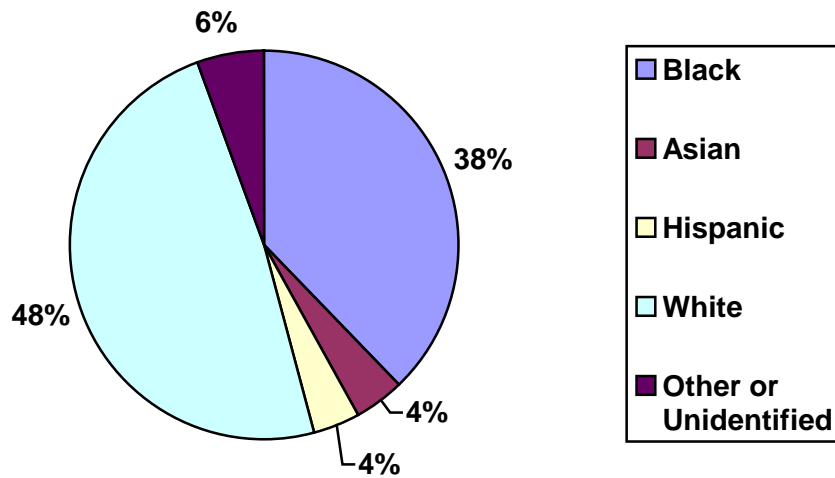
**Figure 4: 2001 Undergraduate Enrollment in Virginia Public Colleges and Universities by Race<sup>4</sup>**

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<sup>4</sup> *Ibid.*



**Figure 5: 2001 Undergraduate Enrollment in Virginia Private-Non-Profit Colleges and Universities by Race<sup>5</sup>**



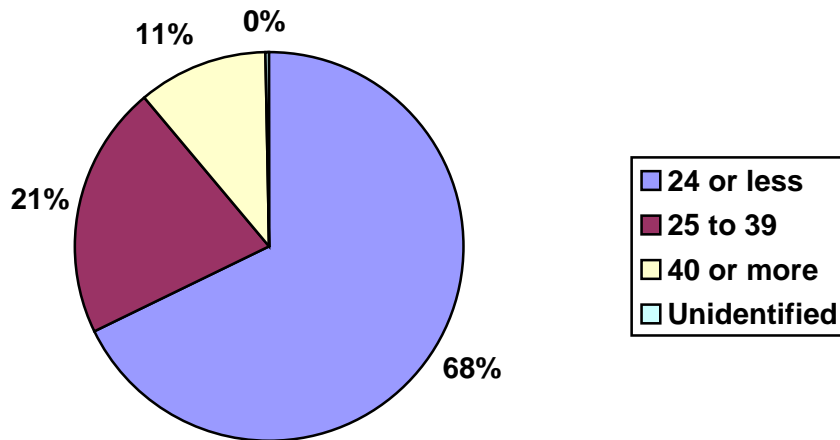
**Figure 6: 2001 Undergraduate Enrollment in Virginia Career Colleges by Race<sup>6</sup>**

<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

*Age Distribution*

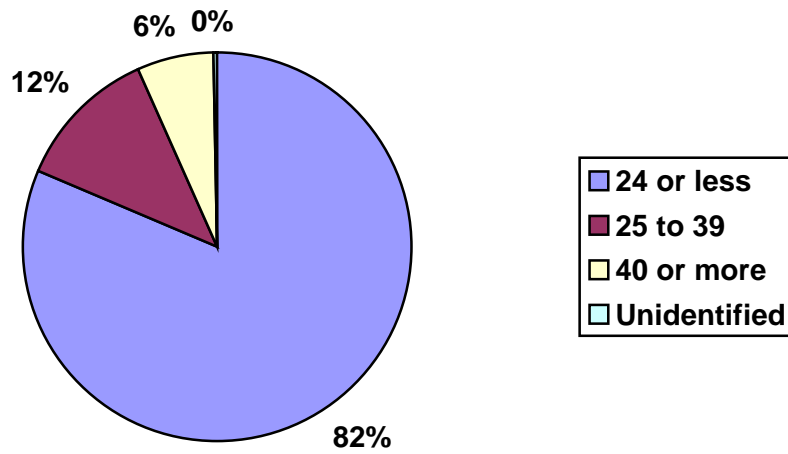
Another characteristic of Career College students is that they tend to be more mature. As shown in Figures 7 through 9, where 52 percent of Career College undergraduates in 2001 were over the age of 24, the comparable figures for the public and private-non-profit colleges and universities were 32 percent and 18 percent, respectively. These data are consistent with the general impression that Career College students are often adults who have been in the workforce for a while and are returning to school to acquire specific skills that will enable them to get a better job, and better provide for themselves and for their families.



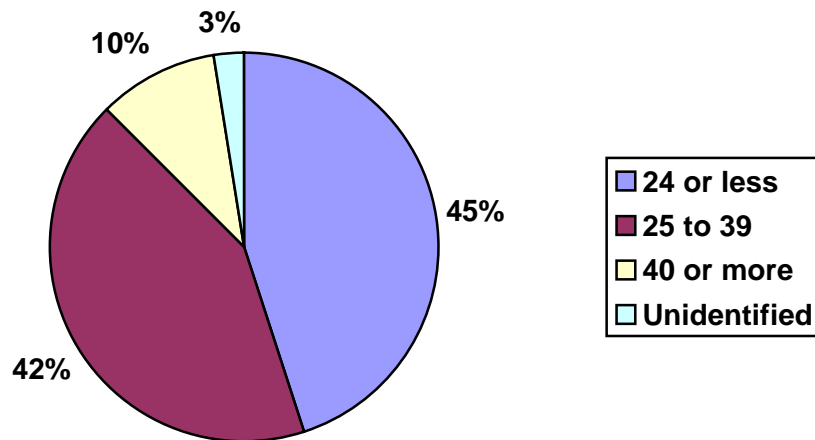
**Figure 7: 2001 Undergraduate Enrollment in Virginia Public Colleges and Universities by Age Distribution<sup>7</sup>**

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<sup>7</sup> *Ibid.*



**Figure 8: 2001 Undergraduate Enrollment in Virginia Private-Non-Profit Colleges and Universities by Age Distribution<sup>8</sup>**



**Figure 9: 2001 Undergraduate Enrollment in Virginia Career Colleges by Age Distribution<sup>9</sup>**

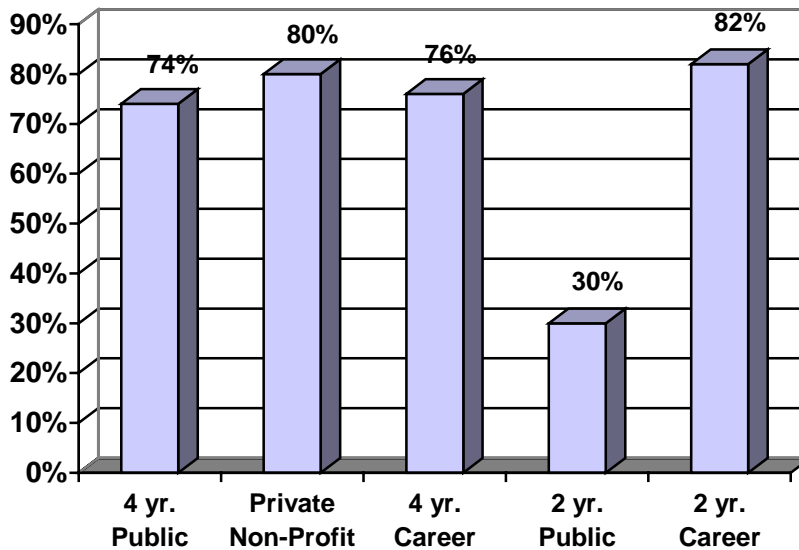
<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

*Proportion of Full-Time Students*

Finally, it should be noted that the proportion of students attending Virginia Career Colleges on a full-time basis is comparable to that found in the public and private-non-profit and colleges and universities. As shown in Figure 10, in 2001 the proportion of full-time undergraduates who attended four-year Career Colleges was 76 percent. That same year, the proportion of full-time undergraduates attending four-year public colleges and universities was 74 percent, and the proportion attending private non-profit institutions was 80 percent.

With regard to two-year institutions, the proportion of full-time undergraduates attending Career Colleges was 82 percent, while the proportion attending public colleges was 30 percent. This statistic illustrates the extent to which Career Colleges have evolved into true collegiate institutions, where a high degree of commitment is required from both the student and from the institution itself.

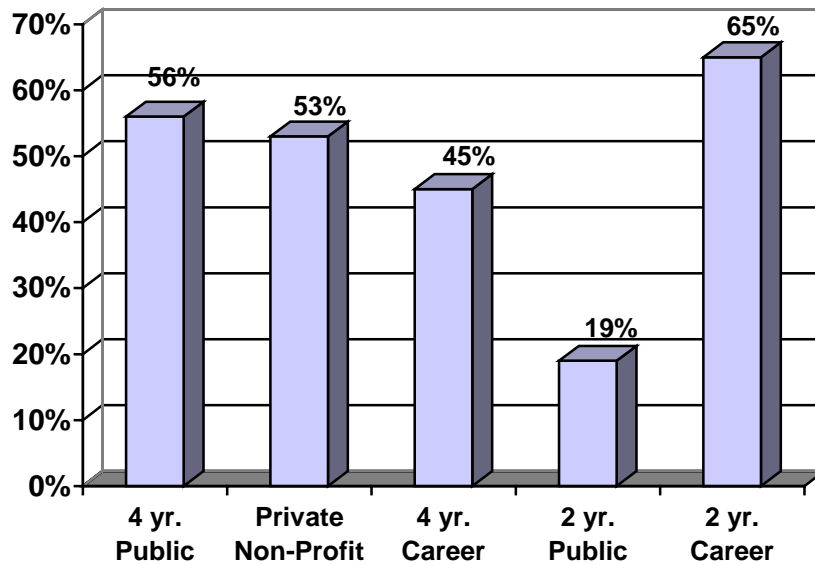


**Figure 10: 2001 Undergraduate Enrollment in Virginia Colleges and Universities by Proportion of Full-Time Students<sup>10</sup>**

<sup>10</sup> *Ibid.*

## Completions

Another area where Virginia Career Colleges excel is in ensuring that a large proportion of their students make it through to graduation. Figure 11 depicts graduation rates for Virginia colleges and universities as taken from the National Center for Education Statistics' 2001 survey of institutions. As these data show, two-year Career Colleges had the highest graduation rate of any postsecondary education sector within Virginia (65 percent), while four-year Career Colleges had the fourth highest rate (45 percent).



**Figure 11: 2001 Graduation Rates for Virginia Colleges and Universities by Sector<sup>11</sup>**

Overall, in 2001 Virginia Career Colleges graduated 1,463 students with certificates, 1,594 with Associate's degrees, 48 with Baccalaureate degrees, 23 with Master's degrees, and 39 with doctoral degrees.<sup>12</sup>

<sup>11</sup> *Data Source:* "Integrated Postsecondary Education Data System," National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>. These data depict the proportion of individuals that graduate from a specific class cohort within 150 percent of the normal time (the amount of time necessary for a student to complete all requirements for a degree or certificate according to the institution's catalog). Data for four-year institutions are based on cohort year 1995 and data for two-year institutions are based on cohort year 1998.

<sup>12</sup> *Data Source:* "Integrated Postsecondary Education Data System," National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>.

## Financial Aid

Table 1 compares average financial aid received by students attending Virginia Career Colleges in 2001 to students in other postsecondary education sectors in Virginia. The data presented in this table reveal two very interesting facts.

First, where the federal commitment to student financial aid is fairly consistent across all sectors of higher education in Virginia, the state commitment is not. In 2001, average state aid for students attending private-non-profit institutions was \$2,622, for students attending public four-year colleges and universities it was \$2,534, and for students attending public two-year colleges it was \$741. Average state aid for students attending Career Colleges, however, was \$0 (*see* Figure 12).

This disparity in state support is due to the fact that, unlike residents who attend private-non-profit institutions, resident Virginians who attend Career Colleges do not currently qualify for state Tuition Assistance Grants. One result of this policy is that in 2001, Virginia ranked at the bottom of all states in the financial aid it provided to Career College students.<sup>13</sup>

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<sup>13</sup> According to National Center for Education Statistics data, in 2001 37 states and the District of Columbia provided higher levels of financial aid support to students attending two-year and four-year Career Colleges than did Virginia.

**Table 1: Average Financial Aid Received by Students Attending Virginia Colleges and Universities in 2001<sup>14</sup>**

	Four-Year Institutions			Two-Year Institutions	
	Private-non-profit Colleges and Universities	Public Colleges and Universities	Career Colleges and Universities	Public Colleges	Career Colleges
<b>Federal Aid<sup>15</sup></b>	\$2,952	\$2,510	\$2,252	\$2,287	\$2,138
<b>State Aid<sup>16</sup></b>	\$2,622	\$2,534	\$0	\$741	\$0
<b>% of Students Receiving Loans<sup>17</sup></b>	57%	48%	86%	7%	70%
<b>Average Loan<sup>18</sup></b>	\$4,035	\$3,026	\$6,146	\$1,405	\$4,570

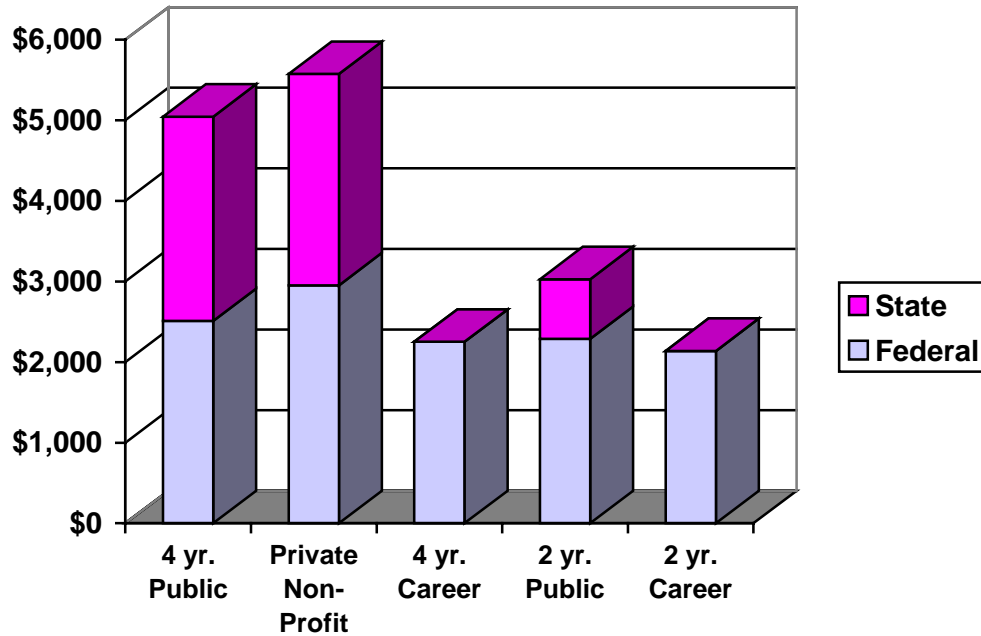
<sup>14</sup> *Data Source:* Integrated Postsecondary Education Data System, National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>.

<sup>15</sup> Average amount of federal grants (grants/educational assistance funds) received by full-time, first-time degree/certificate-seeking students.

<sup>16</sup> Average amount of state grants (grants/scholarships/waivers) received by full-time, first-time degree/certificate-seeking students.

<sup>17</sup> Percentage of full-time, first-time degree/certificate-seeking students who received student loans.

<sup>18</sup> Average amount of student loans received by full-time, first-time degree/certificate-seeking students.



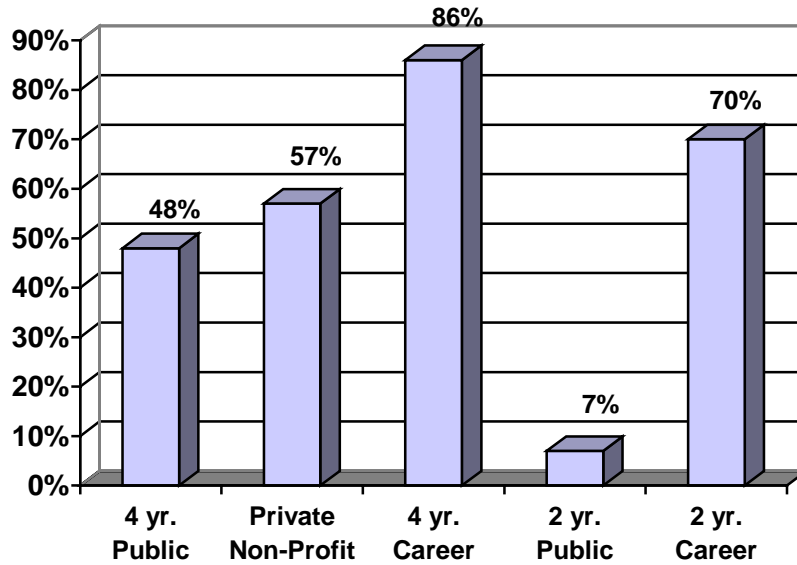
**Figure 12: Average Financial Aid Received by Virginia Students in 2001<sup>19</sup>**

The second interesting fact revealed by the data in Table 1 is that, Career College students more frequently take out loans to finance their education than students in private-non-profit institutions or public colleges and universities. In 2001, 86 percent of students enrolled in Virginia four-year Career Colleges took out loans to finance their education, as compared to 48 percent of students in four-year public colleges and universities and 57 percent of students in private non-profit institutions. In the two-year institutions, 70 percent of Career College students took out loans, as compared to 7 percent of public college students (see Figure 13).

Moreover, not only is the percentage of Virginia Career College students who resort to loans high relative to other postsecondary sectors in Virginia, it is high relative to the national average. Nationally, only 59 percent of four-year Career College students (vs. 86 percent in Virginia), and 62 percent of two-year Career College students (vs. 70 percent in Virginia), took out loans in 2001 to finance their educations.<sup>20</sup>

<sup>19</sup> Data Source: "Integrated Postsecondary Education Data System," National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>.

<sup>20</sup> *Ibid.*



**Figure 13: Proportion of Students Receiving Student Loans in 2001<sup>21</sup>**

Although it is beyond the scope of this report to prove a relationship between these two facts – the absence of state financial aid for Career College students and their higher dependence on student loans – a side-by-side comparison of Figures 12 and 13 certainly supports the conclusion that such a relationship exists.

## Impact on State Economy

Traditional economic impact analysis measures the total effect that an enterprise's expenditures on salaries, supplies, equipment, and construction have as they ripple through the economy. The problem with applying this "traditional" model to education institutions is that it ignores the primary contribution those institutions make to the economy – their students.

As individuals improve their skills through education, they become more productive. A pertinent example of this would be the difference between what is accomplished when a computer is placed in the hands of a trained user, and what is accomplished when the computer is placed in the hands of an untrained user – same computer, very different outcome. Moreover, this difference in outcomes has significant implications for the overall economy, because greater productivity translates into increased economic output. This education-driven increase in

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<sup>21</sup> *Ibid.*

productivity, and the resulting increase in output, is the most significant contribution that any educational institution makes to the economy.

To measure the effect that the educational services provided by Virginia Career Colleges have on economic productivity, and therefore Virginia's economy, we must first know the empirical relationship between education and productivity. Fortunately, a widely cited study by Sandra Black and Lisa Lynch provides that information.<sup>22</sup> Black and Lynch use new data from the National Center on the Educational Quality of the Workforce to estimate the impact of education on productivity. They find that a 10 percent increase in education level leads to a 4.9 to 8.5 percent increase in the dollar value of manufacturing output, and a 5.9 to 12.7 percent increase in the dollar value of non-manufacturing output.

The next step in quantifying the economic impact of Career College educational services is to estimate the contribution those services make to increasing the overall education level of Virginia's workforce. According to U.S. Census data on Virginia's population by educational attainment<sup>23</sup> and by labor force participation rates,<sup>24</sup> the baseline level of education embodied in Virginia's workforce in 2000 consisted of 47,452,436 years of education. In that same year, Virginia Career Colleges enrolled 13,530 full-time-equivalent (FTE) students in instructional programs.<sup>25</sup> FTEs are a mathematical construct that identifies the number of full annual course loads, or "person years" of education, delivered.<sup>26</sup> This means that in 2000, Career Colleges increased the baseline education level of Virginia's workforce by 13,530 years of education.

By combining these data on the contribution Career Colleges make to increasing the overall education level of Virginia's workforce, with Black and Lynch's empirical estimates, we are able to create a Virginia-specific model that projects

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<sup>22</sup> Sandra E. Black and Lisa M. Lynch, "Human-Capital Investments and Productivity," *AEA Papers and Proceedings*, vol.86, no.2, May 1996, pp.263-67.

<sup>23</sup> *Data Source*: "Sex by Age by Educational Attainment for the Population 18 and Over," *Census 2000*, Summary File 3, Table PCT25, U.S. Census Bureau.

<sup>24</sup> *Data Source*: "Sex by Age by Employment Status for the Population 16 Years and Over," *Census 2000*, Summary File 3, Table PCT35, U.S. Census Bureau.

<sup>25</sup> *Data Source*: "Integrated Postsecondary Education Data System," National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>.

<sup>26</sup> The National Center for Education Statistics' formula for calculating credit FTEs is available from <[http://nces.ed.gov/ipeds/pas/selectVariables.asp?fileNumber=12&sType=REPORT&dType=VARs&tableTitle=Enrollments:+Full-time+equivalent+enrollment:+Fall+2000\(EF2000FTE\)&multiRecord=0&SurveyYear=2000&wherefrom=var](http://nces.ed.gov/ipeds/pas/selectVariables.asp?fileNumber=12&sType=REPORT&dType=VARs&tableTitle=Enrollments:+Full-time+equivalent+enrollment:+Fall+2000(EF2000FTE)&multiRecord=0&SurveyYear=2000&wherefrom=var)>. In addition to credit FTEs, the total FTE count used here includes 1,149 FTEs derived from contact hour data. The formula used for calculating contact hour FTEs is 1 FTE = 600 contact hours.

the likely contribution that Virginia Career Colleges make to the state's economy.<sup>27</sup> The results of this analysis are provided in Table 2.

**Table 2: Economic Benefit – Value of Productivity Increase (2003 dollars)**

	<b>Upper Bound</b>	<b>Lower Bound</b>	<b>Mid-Point</b>
Virginia Career Colleges 2000-2001 FTEs	13,530	13,530	13,530
Productivity Gain per FTE (combined manufacturing and non-manufacturing)	\$7,839	\$3,716	\$5,778
<b>Total</b>	<b>\$97.1 million</b>	<b>\$46.0 million</b>	<b>\$71.5 million</b>

The *Upper Bound*, *Lower Bound*, and *Mid-Point* columns in Table 1 correspond to upper and lower limits of Black and Lynch's empirical estimate of the relationship between education and productivity and the mid-point between the two.<sup>28</sup>

The *Productivity Gain per FTE* row in Table 1 identifies the combined productivity-driven increase in manufacturing and non-manufacturing output attributable to one FTE, or "person year" of education. Multiplying FTEs by the per-FTE increase in productivity yields the total annual projected increase in manufacturing and non-manufacturing output. These figures, \$97.1 million for the upper bound estimate, \$46.0 million for the lower bound estimate, and \$71.5 million for the mid-point estimate (in 2003 dollars), are shown in the bottom row of Table 1.

It is important to realize that these estimates of annual increased economic output are not one-time benefits. Rather, they are part of a stream of economic benefits that continue over the entire time that students are active in the labor force. Based on recent analysis of the typical "work-life" of American men and women, we

<sup>27</sup> For a fuller description of this model see "How Virginia's Community Colleges Contribute to Virginia's Economic Future," Mangum Economic Consulting, LLC, January, 2003  
<<http://www.so.cc.va.us/VCCS%20EIA%20FINAL%20031803.pdf>>.

<sup>28</sup> The upper bound estimate assumes that a 10 percent increase in education drives an 8.5 percent increase in manufacturing output and a 12.7 percent increase in non-manufacturing output. The lower bound estimate assumes that a 10 percent increase in education drives a 4.9 percent increase in manufacturing output and a 5.9 percent increase in non-manufacturing output. The mid-point estimate assumes that a 10 percent increase in education drives a 6.7 percent increase in manufacturing output and a 9.3 percent increase in non-manufacturing output.

know that the typical male Virginia Career College student is likely to remain active in the labor force for 27 to 29 years, and the typical female student is likely to remain active in the labor force for 25 years.<sup>29</sup> To determine the cumulative value of the increased economic output these trained workers add to Virginia's economy, however, we also need to know how many are likely to stay in the Commonwealth. Those data are available from the U.S. Census Bureau's 2000 *Current Population Report*, which shows that about three percent of individuals over the age of 25 and who have an Associate's degree or some college leave the state each year.<sup>30</sup>

Using these data on expected work-life and out-migration, along with the productivity-driven annual increases in output calculated in Table 1, it is possible to determine the present value, or value in today's dollars, of the stream of economic benefits generated by the Virginia Career College's educational services.<sup>31</sup> Based on the lower bound, upper bound, and mid-point estimates from Table 1, that present value is between \$436.4 million and \$920.1 million, with a mid-point estimate of \$678.5 million (in 2003 dollars).

Having determined the economic benefit derived from the educational services provided by Virginia Career Colleges, we now identify the economic costs associated with that training. Because Career Colleges are private enterprises that receive no government subsidies (and in fact, unlike public and private non-profit institutions of higher education, must pay taxes), these economic costs are comprised exclusively of the tuition and fees that students pay for their education. In 2000-2001, this figure was approximately \$87.5 million (in 2003 dollars).<sup>32</sup>

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<sup>29</sup> See James Ciecka, Seth Epstein, and Jerry Goldman, "Work Life Estimates at Millennium's End: Changes Over the Last Eighteen Years," *Illinois Labor Market Review*, vol.6, no.2, Summer, 2000. The expectation of a 27 to 29 year work-life for males, and a 25 year work-life for females, is based on analysis from Ciecka *et. al.*, and the age distribution of male and female students enrolled in Virginia Career Colleges in 2000 as reported in the Integrated Postsecondary Education Data System.

<sup>30</sup> "Geographic Mobility: March 1997 to March 1998," *Current Population Report*, Series P20-520, U.S. Census Bureau, 2000.

<sup>31</sup> Mathematically, this calculation is:

$$\sum_{1 \text{ to } n} ((\alpha)(1 - \alpha)^{n-1}(V))/(1 - r)^n.$$

Where,

n = work-life years,

$\alpha$  = 0.03 probability of out-migration,

V = the total annual increase in productivity, and

r = 0.06247, the 1993-2002 ten-year average of the 30-year Treasury bond constant maturity rate.

<sup>32</sup> *Data Source*: "Integrated Postsecondary Education Data System," National Center for Education Statistics, U.S. Department of Education, <<http://nces.ed.gov/ipeds/>>. Because not all Virginia Career Colleges reported tuition and fee revenue to the Integrated Postsecondary Education Data System for 2000-2001, it was necessary to interpolate some missing values on the basis of prior years data.

As shown in Table 3, a comparison of the discounted present value of the stream of economic benefits generated by the Virginia Career College's educational services, and the economic costs associated with those services, reveals that the benefit/cost ratio is 7.8 – the benefits to Virginia's economy are almost eight times as great as the costs required to generate those benefits.

**Table 3: Benefit/Cost Ratio (2003 dollars)**

<b>Present Value of Increased Productivity (mid-point estimate)</b>	<b>Economic Costs</b>	<b>Benefit/Cost Ratio</b>
<b>\$678.5 million</b>	<b>\$87.5 million</b>	<b>7.8</b>

## **Impact on State Workforce**

As mentioned in the introduction to this report, Career Colleges have done an exceptional job of responding to the workforce demands placed on Virginia's economy by the technological revolution. By providing the graduates Virginia enterprises need to keep their technology infrastructure working and up to date, Career Colleges have contributed to the state's economy by preventing shortages of key technology personnel. Absent the Career Colleges, those shortages could have created bottlenecks that would have had a significant negative impact on Virginia's economic growth.

In this section, we use a crosswalk that identifies the educational programs required for employment in given occupations,<sup>33</sup> and combine that with projections of occupational employment for the Virginia,<sup>34</sup> to quantify the extent to which the Career Colleges are meeting Virginia's workforce needs. Table 4 provides the results of this analysis for several key occupations.

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<sup>33</sup> *Data Source:* National Crosswalk Service Center, <[http://www.xwalkcenter.org/xw\\_xwalk.html](http://www.xwalkcenter.org/xw_xwalk.html)>. The crosswalk used in this analysis was developed by the National Crosswalk Service Center (NCSC). NCSC is funded by the U.S. Department of Labor, Employment and Training Administration. The NCSC crosswalk identifies the prerequisite instructional programs necessary for employment in 656 specific occupations.

<sup>34</sup> *Data Source:* "Virginia's Electronic Labor Market Access (VELMA)," Virginia Employment Commission, <<http://velma.virtuallmi.com/>>.

**Table 4: Meeting Statewide Workforce Demand**

<b>Occupation</b>	<b>Average Annual Openings</b>	<b>Academic Program</b>	<b>2001-2002 Graduates</b>	<b>Percentage of Statewide Need Met</b>
Computer Specialists, All Other	643	Computer and Information Sciences, General	865	100%
Electrical and Electronic Engineering Technicians	177	Electrical and Electronic Engineering Technologies, Computer Technology, and Drafting and Design Technician	571	100%
Chefs and Head Cooks	142	Cooking and Related Culinary Arts, General	71	50%
Paralegals and Legal Assistants	242	Legal Assistant/Paralegals	32	13%
Medical Secretaries	182	Medical Administrative, Executive Assistant, and Medical Secretary	22	12%

As this Table 4 shows, in 2001-2002 Career Colleges provided enough trained graduates to meet 100 percent of Virginia's annual statewide demand for Computer Specialists – one of the fastest growing occupations in the Commonwealth. Career Colleges also provided enough graduates to meet 100 percent of the annual statewide demand for Electrical and Electronic Engineering Technicians, 50 percent of the demand for Chefs and Head Cooks, 13 percent of the demand for Paralegals, and 12 percent of the demand for Medical Secretaries.

## **Summary**

Virginia's Career Colleges play two vital roles. First, they provide a ladder to success for many under-employed Virginians by providing a career-focused environment that enables them to efficiently upgrade their skills and get a better job. Although important under any circumstances, this role will only become more critical as the baby-boom generation ages, the number of available workers declines, and it becomes essential that we use *all* our labor resources as effectively as possible. Absent such efficient use of our human resources, we are likely to experience the same demographically-driven economic stagnation that has plagued the Japanese economy for the last decade.

Second, Virginia Career Colleges fuel the state's economy through the trained graduates they produce. This is particularly true in the technology field where Career Colleges have grown into the primary supplier of individuals, like Computer Specialists and Electrical Engineering Technicians, who are the nuts and bolts of Virginia's technology sector. The overwhelming demand for these individuals is clearly evidenced in the explosive enrollment growth experienced by the Career Colleges in recent years. Between 1991 and 2001 four-year Career Colleges in Virginia grew by 164 percent, and two-year career Colleges grew by 240 percent.

More generally, the educational services provided by the Career Colleges contribute to Virginia's economy by enhancing the education level of the workforce and increasing productivity. For example, the dollar value of the increased workforce productivity generated by the Virginia Career Colleges' 2000-2001 education services was approximately \$71.5 million per year. The present value of the stream of benefits created by that increase in productivity is approximately \$678.5 million. Comparing this present value benefit to the \$87.5 million in economic costs associated with it shows that the benefit/cost ratio for the Career Colleges' services is 7.8 – the benefits to Virginia's economy are almost eight times as great as the costs required to generate those benefits.

Virginia's Career Colleges face several challenges however. Primary among these is achieving equity for their students in the area of state financial aid. Currently, Virginia provides state financial aid to every category of college student except those attending Career Colleges. This policy places Career College students at an obvious disadvantage and is probably responsible for the fact that a disproportionate number of Career College students – 86 percent in the four-year colleges and 70 percent in the two-year colleges – must resort to loans to finance their educations. In contrast, only 48 percent of students in Virginia's public four-

year colleges and universities, 57 percent in private non-profit institutions, and 7 percent in the state's two-year public colleges resort to loans.

Moreover, this policy places Virginia at a disadvantage. Nationally, 37 states and the District of Columbia provide more state financial aid to Career College students than Virginia. This means that, where 37 other states and the District of Columbia are pursuing a policy that improves their pipeline of technology workers, Virginia is not. Given that the technology sector is the biggest driver of economic growth in the United States, and given the inter-state mobility of technology industries, this policy of withholding state financial aid from Career College students is almost certain to place Virginia at a competitive disadvantage relative to other states.