Analysis of the Economic Contribution that HACC makes to Central Pennsylvania

May 2012

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Dr. Mangum earned his Ph.D. in economics from George Mason University in 1995, where he received his training under Nobel Laureate James Buchanan and the team of esteemed colleagues, such as Dr. Mark Crain and Dr. Robert Tollison, that Dr. Buchanan had recruited to the Center for Study of Public Choice. He has nearly two decades of experience in quantitative analysis and policy development at both the federal and state level.

MANGUM
ECONOMIC CONSULTING, LLC

www.mangum-consulting.com
50 Pear Street, Richmond, VA 23223
804-363-8663

Outline

Executive Summary

This report assesses the economic contribution HACC makes Central Pennsylvania. The principle findings from that assessment are as follows:

1. **HACC serves one of the fastest growing areas of Pennsylvania:**
    - Between 2000 and 2010, where statewide Pennsylvania's population grew by 3.4 percent, the population of HACC's core service area grew by 10.9 percent.
2. **HACC is one of Pennsylvania's largest and fastest growing postsecondary education institutions:**
    - Between 2002 and 2010, HACC's fall enrollment increased from 13,082 to 23,210, an increase of 10,128 students or 77 percent.
    - Over that same period the average growth across all Pennsylvania community colleges was 28 percent, across all four-year state universities 16 percent, and across all four-year state-related universities 11 percent.
3. **HACC plays a pivotal role within its service area:**
    - HACC is the institution of choice for 83 percent of Pennsylvania residents attending any public or private two-year college within its service area, and 34 percent of Pennsylvania residents attending any public or private, two- or four-year, college or university within its service area.
    - Within its service area HACC is the largest provider of Associate's degrees, the largest provider of postsecondary education to "non-traditional" adult students, the largest provider of postsecondary education to minorities, and the most significant on-ramp for affordable access to higher education.
4. **HACC makes a major economic and fiscal contribution to Central Pennsylvania through its operations and capital expenditures, and spending from its students:**
    - In fiscal year 2010-11, HACC was responsible for contributing $173 million dollars in direct spending to Central Pennsylvania.
    - Accounting for leakages from the regional economy, that $173 million generated $106 million in net spending that stayed in the regional economy.

- The economic ripple effects from those dollars then created a total of $178 million in additional economic activity within Central Pennsylvania, supported a total of 2,308 jobs, and generated $10.1 million in state and local tax revenue.

5. **HACC makes a critical contribution to Central Pennsylvania through the human capital it produces, it students:**
    - Differences in wages reflect differences in the value that employers place on worker skills obtained through education and training.
    - The typical median wage for occupations in Central Pennsylvania that require an Associate's degree is $48,166, while the typical median wage for occupations that require only a high school diploma is $37,015, a difference of $11,152 a year.
    - The credit and non-credit education that HACC supplied in 2010-11 was responsible for creating $42 million in additional human capital in Central Pennsylvania that year. Moreover, the discounted present value of that increase, over the 29 years that HACC students are likely to remain active in the regional workforce, is $876 million.
    - The annual economic impact on Central Pennsylvania from that increase in human capital is $47 million in additional economic activity, 417 additional jobs, and $3.1 million in state and local tax revenue. Moreover, the discounted present value of that increase in economic activity is $964 million, and the discounted present value of the state and local tax revenue stream created is $67 million.
6. **HACC makes a significant contribution to ensuring that Central Pennsylvania will have the trained graduates it needs to prosper in the future in key growth areas such as healthcare and education.**
    - HACC is currently meeting:
        - 45 percent of the regional demand for *Registered Nurses*
        - 40 percent of the regional demand for *Licensed Practical Nurses*
        - 100 percent of the regional demand for *General Operating Managers*
        - 84 percent of the regional demand for *Preschool Teachers*
        - 36 percent of the regional demand for *Dental Assistants*
        - 98 percent of the regional demand for *HVAC Mechanics*

7. **In sum, HACC is a rapidly growing institution, that plays a pivotal role within its service area as one of the region's most important providers of postsecondary education, and has a significant economic and fiscal impact on Central Pennsylvania as a result of its own economic contributions and those of the well trained students that it produces.**

This report was commissioned by HACC and produced by Mangum Economic Consulting, LLC.

Introduction

This report assesses the economic contribution that HACC, Central Pennsylvania's Community College, makes to its service area. The remainder of the report is divided into six sections. The *HACC Profile* section describes the general characteristics of the institution and looks at the key role it plays within its service area. The *Central Pennsylvania Profile* section provides context for the analyses that follow by illuminating key economic and demographic characteristics of the communities that HACC serves. The *Economic and Fiscal Impact* section quantifies the economic and fiscal contribution that HACC makes to Central Pennsylvania. The *Return on Investment* section details the return that state and local governments, and students, realize as a result of their investment in HACC. The *Workforce Impact* section details the role that HACC plays in filling the pipeline of qualified workers that feeds and sustains Central Pennsylvania businesses and industry. Finally, the *Conclusion* section provides a summary and concluding comments.

This report was commissioned by HACC, Central Pennsylvania's Community College, and produced by Mangum Economic Consulting, LLC.

HACC Profile

History and General Characteristics

HACC was chartered as Pennsylvania's very first community college in 1964 to serve the residents of Cumberland, Dauphin, and Perry counties. In the fall of that year, HACC welcomed its first entering class of 465 students to a campus comprised of two buildings at the former Harrisburg Academy. Over the ensuing 48 years, HACC has grown to be Pennsylvania's largest community college and currently serves the needs of ten Pennsylvania counties (for a graphical depiction of HACC's service area, *see* Figure 1).[1] In fall of 2011, HACC enrolled 22,595 degree-seeking students at five campus locations (its current 157 acre Harrisburg campus – opened in 1967, the Gettysburg and Lancaster campuses – both opened in 1989, the Lebanon campus – opened in 1990, and the York campus – opened in 2005), multiple community locations, and its Virtual Campus (established in 2005 and currently serving the needs of 5,171 students in 39 Pennsylvania counties, as well as eight other states and the District of Columbia).

[1] In general, throughout this report when we refer to the HACC service area, we are referring to the core eight counties that HACC serves: Adams, Cumberland, Dauphin Franklin, Lancaster, Lebanon, Perry, and York

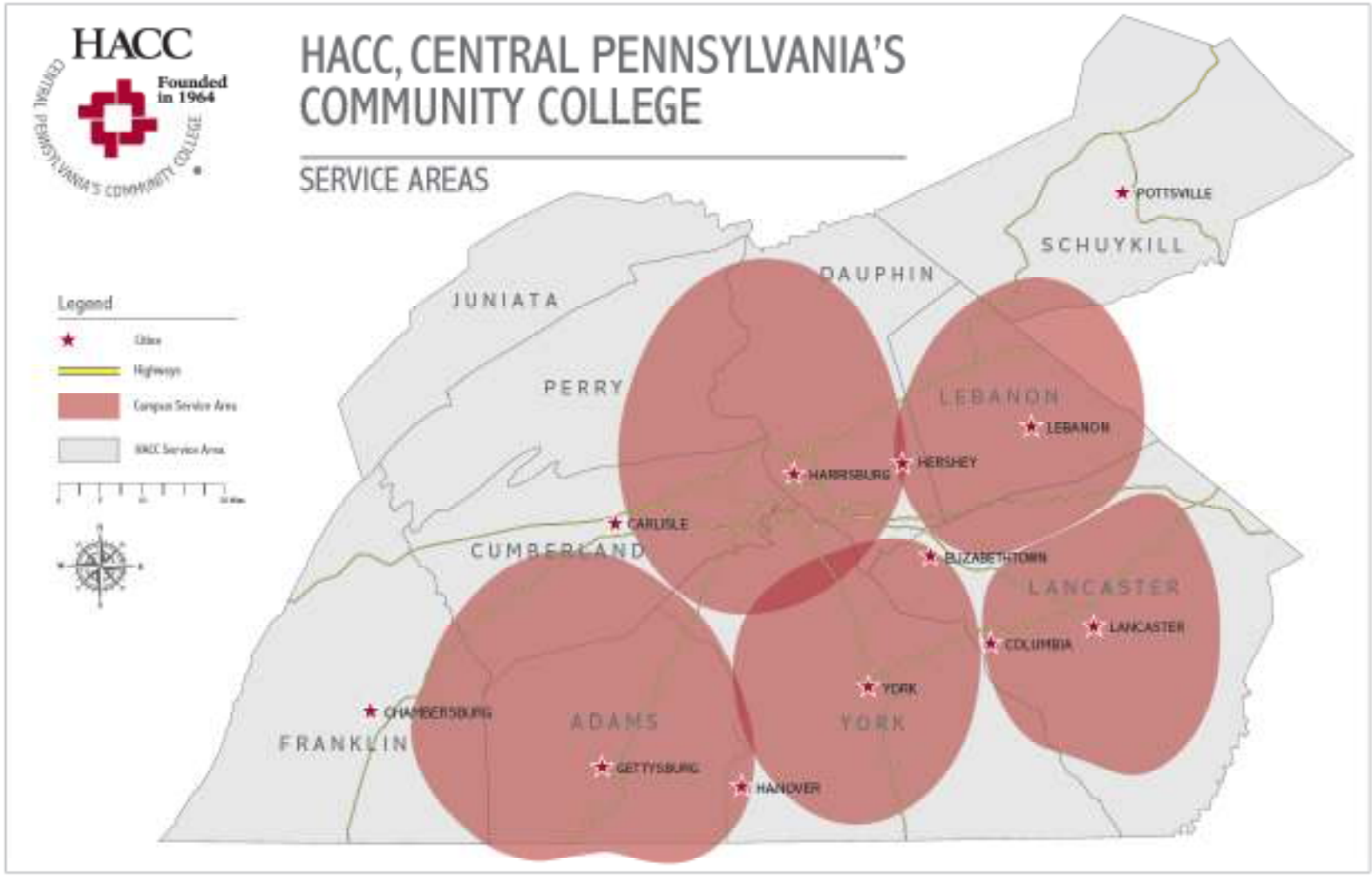

Figure 1: HACC Service Area

In addition to serving the needs of degree-seeking students, HACC also provides non-credit workforce training to meet the short-term training requirements of businesses and individuals. In the 2010-11 school year, these programs provided training for 650 local businesses and approximately 50,000 individuals. It should also be noted that HACC's Public Safety Center, opened in 1988 on the college's Harrisburg campus, hosts Pennsylvania's second largest Police Academy, and provides training to approximately 38,000 fire, rescue, law enforcement, and emergency medical personnel each year.

Enrollment

Enrollment Trends

Figure 2 depicts the growth in HACC's total fall headcount enrollment between 2002 and 2010. Overall over this period, headcount enrollment increased from 13,082 in the fall of 2002 to 23,210 in the fall of 2011, an increase of 10,128 students or 77.4 percent.

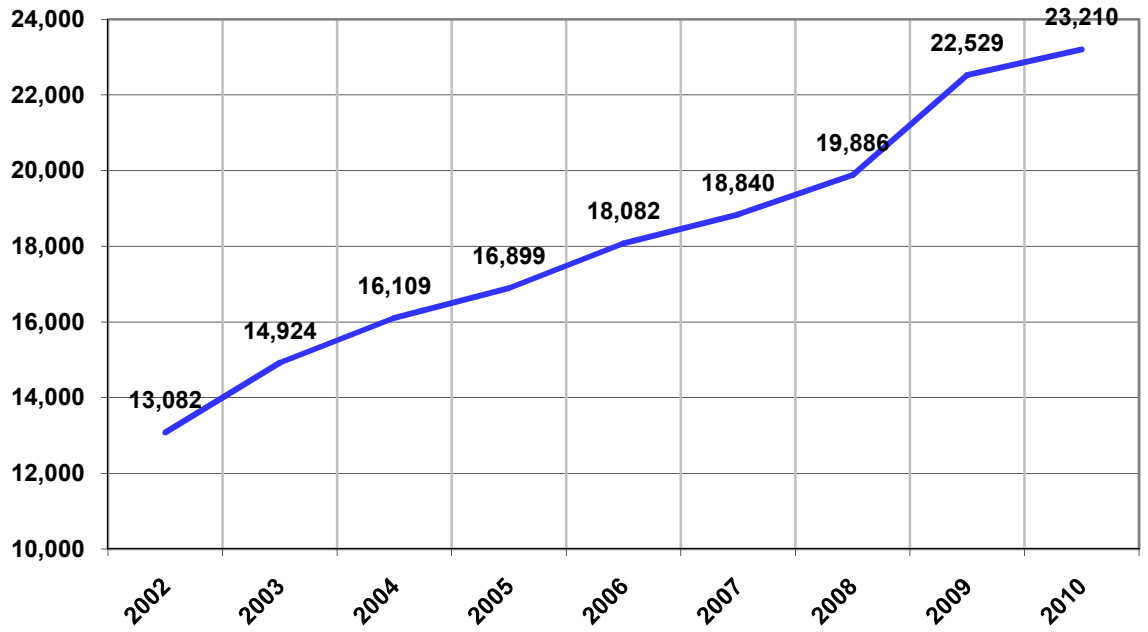

Figure 2: HACC Fall Headcount Enrollment – 2002 to 2010[2]

[2] *Data Source*: HACC Office of Institutional Research and Planning.

To place this growth in perspective, Figure 3 compares it to the comparable growth rate in each of Pennsylvania's higher education sectors. As these data show, in contrast to HACC's 77.4 percent fall headcount enrollment increase between 2002 and 2010, enrollment across all Pennsylvania community colleges statewide increased by only 28.4 percent over the period. Looking at Pennsylvania's other public sector colleges and universities, fall headcount enrollment increased by 15.9 percent between 2002 and 2010 in the state's four-year state universities, and by 10.8 percent in the state's four-year state-related universities. The largest enrollment increases over the period tended to occur in the private sector, with fall headcount enrollment in the state's two-year private non-profit colleges increasing by 134.7 percent, and enrollment in four-year private non-profit universities increasing by 20.8 percent.

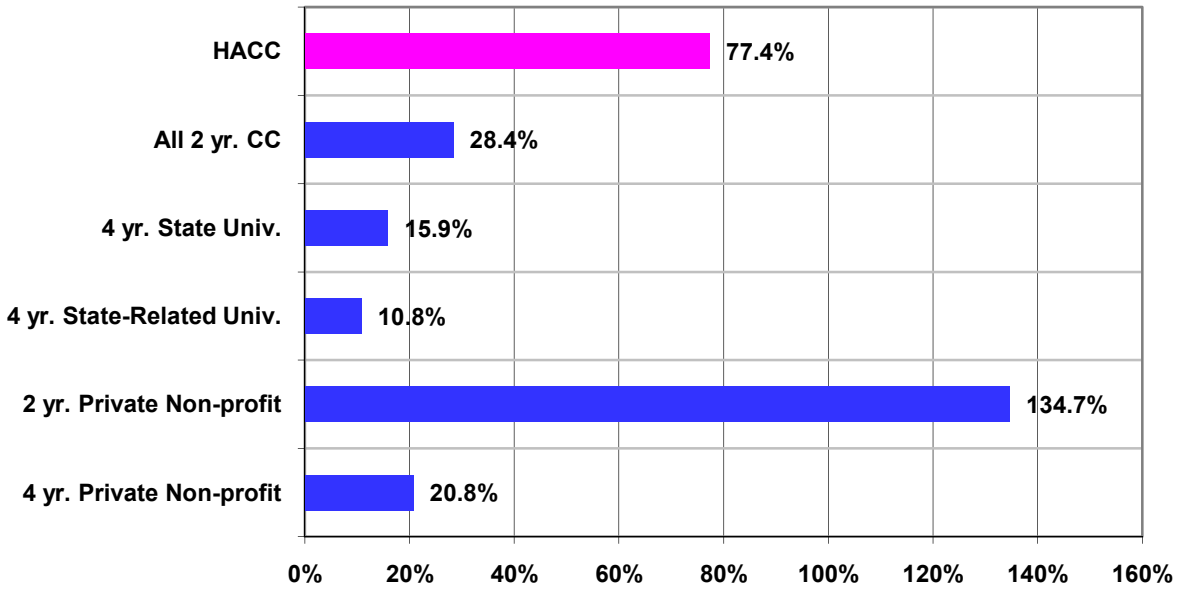

Figure 3: Pennsylvania Higher Education Fall Headcount Enrollment Growth by Sector – 2002 to 2010[3]

Enrollment by Campus

To provide a clearer picture of the relative distribution of HACC's enrollment across its five campuses, Figure 4 depicts data on campus-level fall headcount enrollment in 2010. As these data indicate, HACC's Harrisburg campus is by far its largest, accounting for 10,747 students or 46 percent of fall headcount enrollment that year. Following in order

[3] *Data Source*: Pennsylvania Department of Education.

of size were the Lancaster campus (5,477 students or 24 percent of total enrollment), the York campus (3,141 students or 14 percent of total enrollment), the Gettysburg campus (2,477 students or 11 percent of total enrollment), and the Lebanon campus (1,368 students or 6 percent of total enrollment).

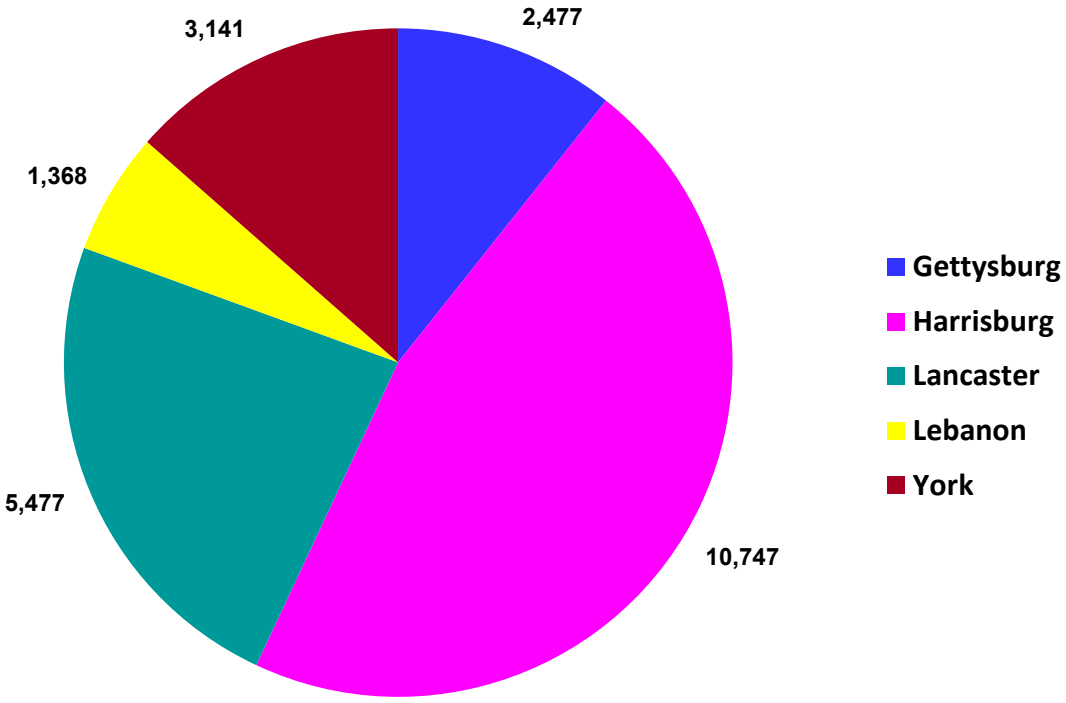

Figure 4: HACC 2010 Fall Headcount Enrollment by Campus[4]

Completions

During the 2010-11 academic year, HACC awarded a total of 1,847 Associate's degrees (two year curriculum), 224 certificates (between one and two year curriculum), and 124 diplomas (less than one year curriculum). Figure 5 provides information on the distribution of these awards across various academic programs. As this chart shows, the largest number of HACC's graduates were in: *Health Professions and Related Clinical*

[4] *Data Source*: HACC Office of Institutional Research and Planning.

Sciences (594 awards), *Business, Management, Marketing and Related Support Activities* (454 awards), *Liberal Arts and Sciences/General Studies and Humanities* (198 awards), *Security and Protective Services* (131 awards), and *Education* (117 awards).

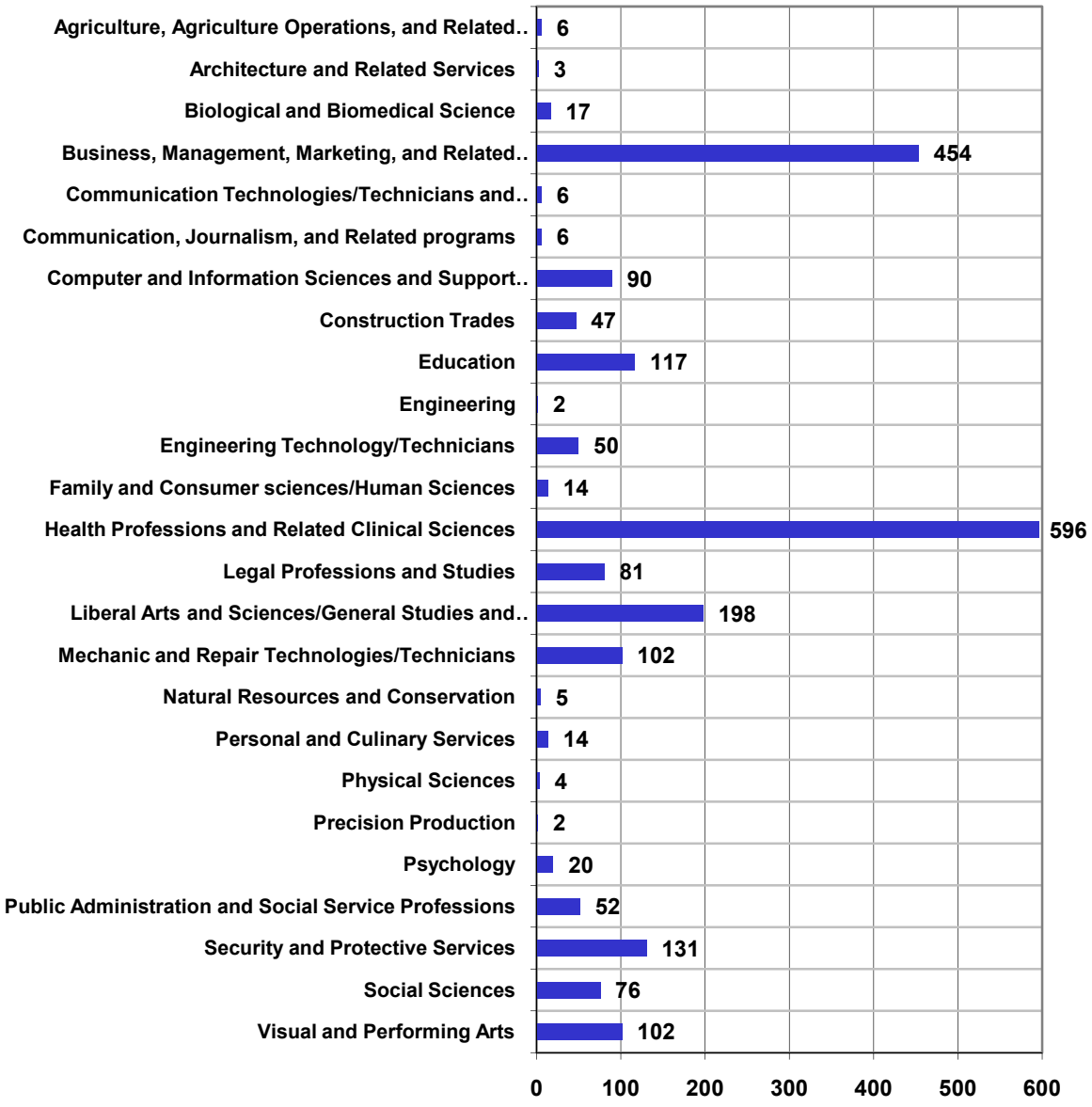

Figure 5: HACC 2010-11 Completions by Major Academic Program[5]

[5] *Data Source*: HACC Office of Institutional Research and Planning.

Importance to Service Area

In this portion of the section we quantify and illuminate certain aspects of the unique role that HACC plays within its Central Pennsylvania service area.

Largest Provider of Education Services to Pennsylvania Residents

Figure 6 compares the estimated number of Pennsylvania residents enrolled at HACC in fall 2010 to the total number enrolled in other colleges and universities within HACC's service area (for a detailed listing of these institutions, *see* Table 1 in the Appendix). As these data clearly demonstrate, HACC is the largest provider of post-secondary education services to in-state students within its service area. In fact, HACC is the institution of choice for 34.3 percent of Pennsylvania residents attending any public or private college or university within its service area, and the choice of 82.9 percent attending any public or private two-year college.

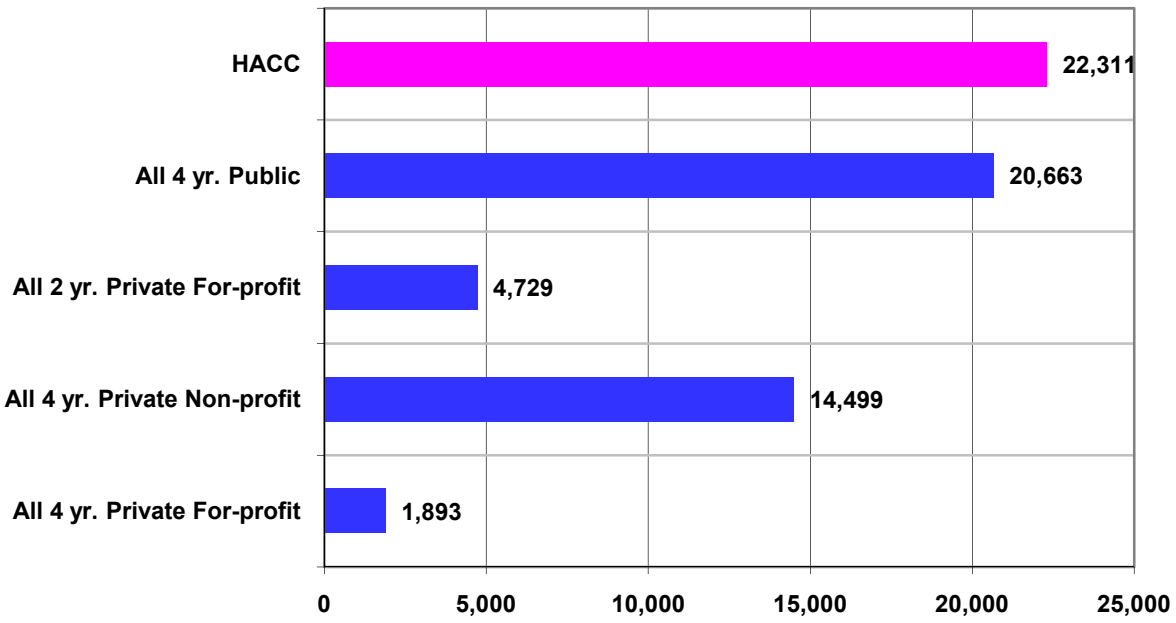

Figure 6: Estimated Fall 2010 In-State Headcount Enrollment in Colleges and Universities within the HACC Service Area[6]

[6] *Data Source*: National Center for Education Statistics, IPEDS Data Center. Because data on total in-state enrollment are not available from the IPEDS database, these figures are estimated by applying reported proportions of in-state first-time freshmen to total fall headcount enrollment.

Largest Provider of Associate's Degrees

Figure 7 provides a similar comparison between the number of Associate's degrees HACC awarded in academic year 2009-10 and the total number awarded by other colleges and universities within HACC's service area. What these data show is that HACC is also the largest provider of Associate's degrees within its service area. And as will be demonstrated later in this report, many of these degrees (*e.g.*, Nursing) are in fields for which there is significant occupational demand in Central Pennsylvania.

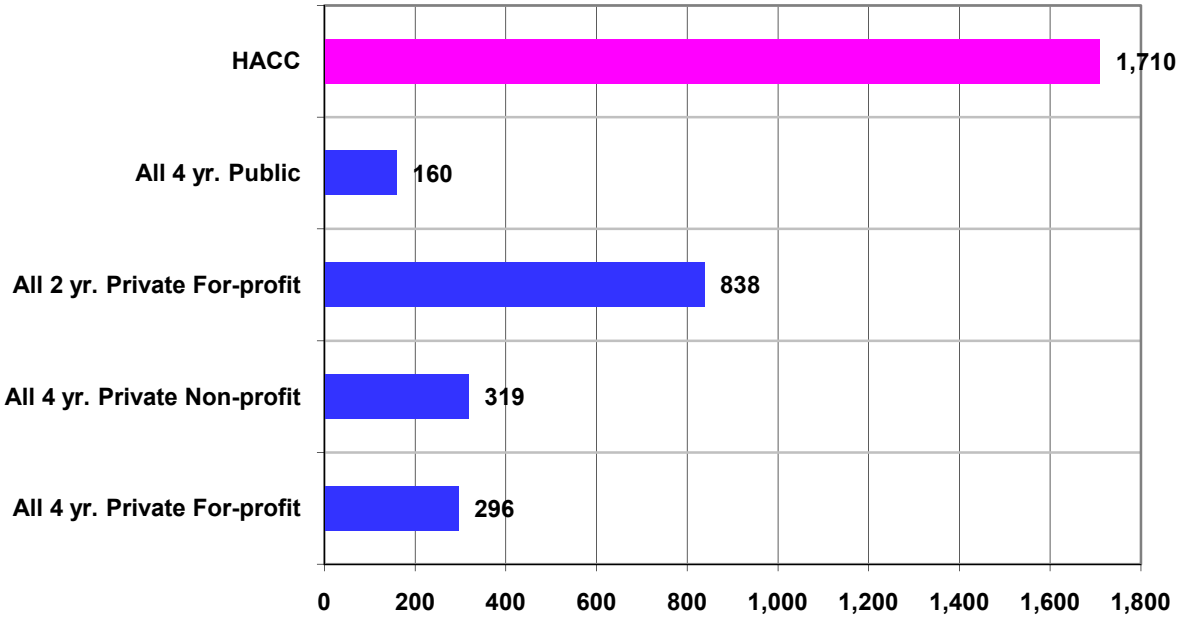

Figure 7: Associate's Degrees Awarded in Academic Year 2009-10 in Colleges and Universities within the HACC Service Area[7]

Largest Provider of Educational Services to Non-Traditional Students

As we continue to make the transition from the old economy to the new economy, and also adapt to the lingering economic challenges brought about by the 2007-09 recession, more and more adult workers are finding it necessary to upgrade their skills and education. As opposed to the traditional eighteen-year-old first-time student, these "non-traditional" students typically have special needs. They are more often employed full time, married, or have children. As a result, they frequently require classes that are

[7] *Data Source*: National Center for Education Statistics, IPEDS Data Center.

offered at non-traditional times. In addition, they are often not seeking a degree, but instead to enhance specific skills by taking a limited number of specific classes.

Figure 8 depicts the number of "non-traditional" students (25 years of age and older) enrolled at HACC in fall 2010 and contrasts that number to the total estimated number of "non-traditional" students enrolled in other colleges and universities within HACC's service area that fall. These data indicate that HACC is by far the largest provider of post-secondary education services to "non-traditional" students in its service area and plays a critical role in Central Pennsylvania as a regional access point for these adult learners. In total, HACC is the institution of choice for 50.6 percent of adult learners attending any public or private college or university within its service area, and the choice of 78.1 percent of those attending any public or private two-year college.

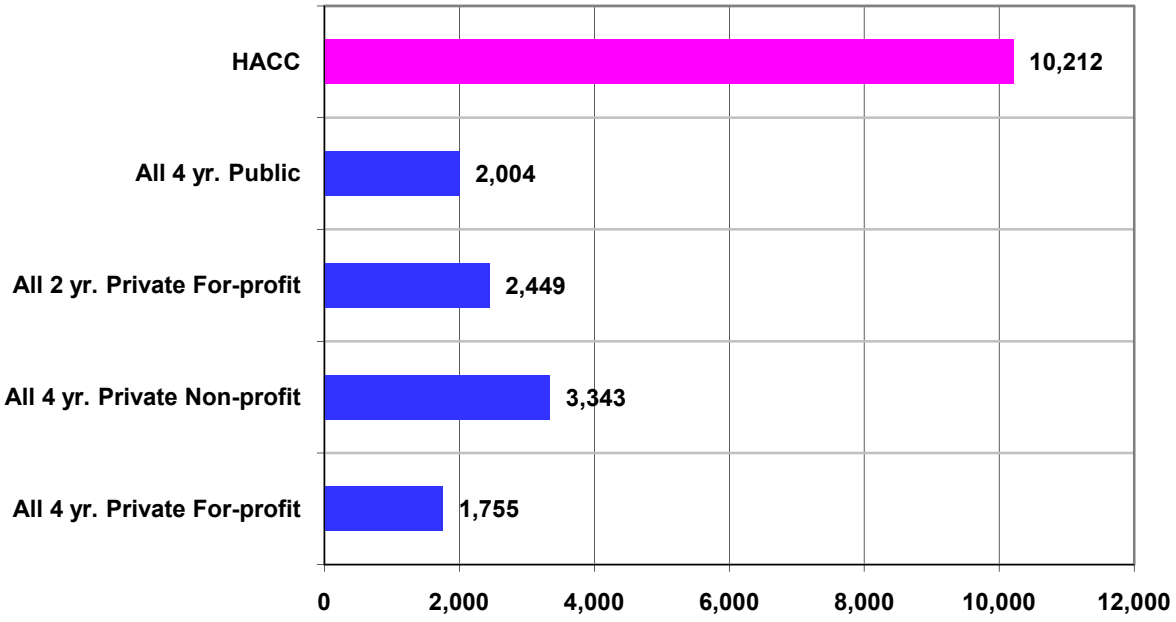

Figure 8: Fall 2010 Estimated "Non-Traditional" Students Enrolled in Colleges and Universities within the HACC Service Area[8]

[8] *Data Source*: National Center for Education Statistics, IPEDS Data Center. Because not all institutions within HACC's service area reported their percentage of "non-traditional" students to IPEDS for fall 2010, these figures are estimated by applying data from reporting institutions to total fall headcount enrollment.

Largest Provider of Educational Services to Minorities

Figure 9 compares the number of minority students enrolled at HACC in fall 2010 to the total number enrolled that fall at other colleges and universities within HACC's service area. As these data show, HACC was also the largest provider of post-secondary education services to minority students enrolled in any public or private college or university within its service area.

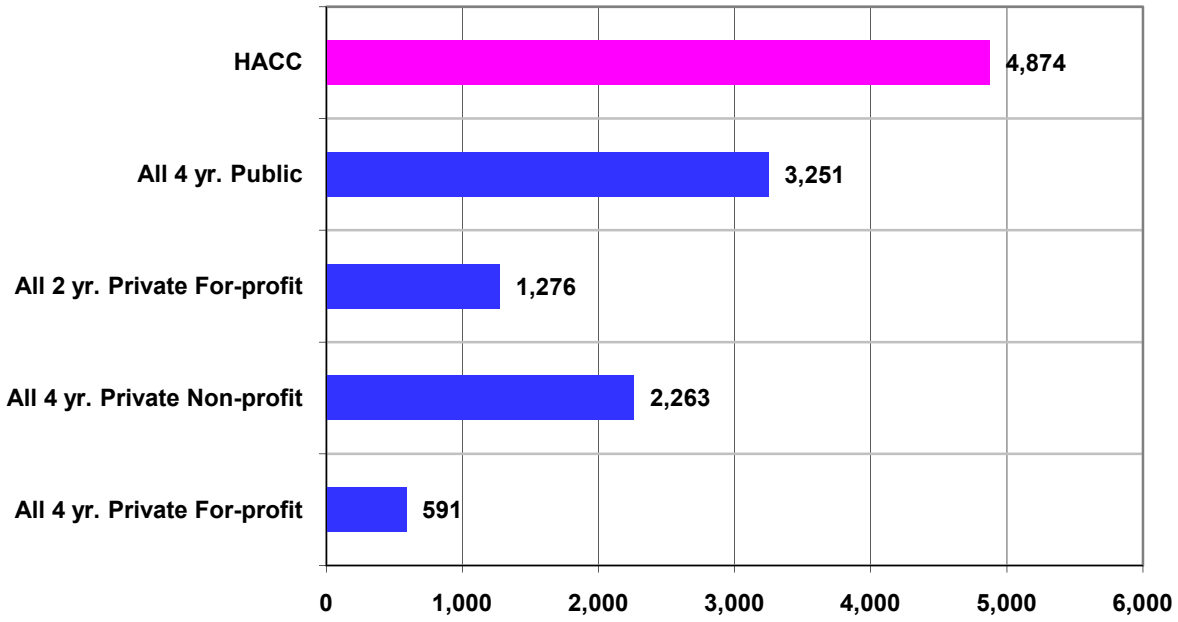

Figure 9: Fall 2010 Minority Students Enrolled in Colleges and Universities within the HACC Service Area [9]

Most Affordable Access to Higher Education

Finally, Figure 10 depicts the average in-state tuition for full-time undergraduate students charged by HACC in academic year 2010-11 as well as that by the other colleges and universities located within HACC's service area. As these data show, average in-district tuition at HACC that year was $3,195, while average out-of-district tuition was $5,490.[10] With regard to in-district tuition, that was $10,989 dollars less than the average charged by two-year for-profit colleges in HACC's service area, $6,366 less than four-year public

[9] *Data Source*: National Center for Education Statistics, IPEDS Data Center. For purposes of this graph, "minority" is defined to include students identified as Asian, Black, or Hispanic.

[10] In-district tuition applies to students residing in sponsoring school districts (primarily in Cumberland, Dauphin, and Perry counties).

colleges, $23,810 less than four-year non-profit colleges, and $11,073 less than four-year for profit colleges. With regard to out-of-district tuition, the $5,490 charged by HACC was $8,694 dollars less than the average charged by two-year for-profit colleges, $4,071 less than four-year public colleges, $21,515 less than four-year non-profit colleges, and $8,778 less than four-year for profit colleges. In short, HACC clearly provides the most affordable access to post-secondary education for students within its service area.

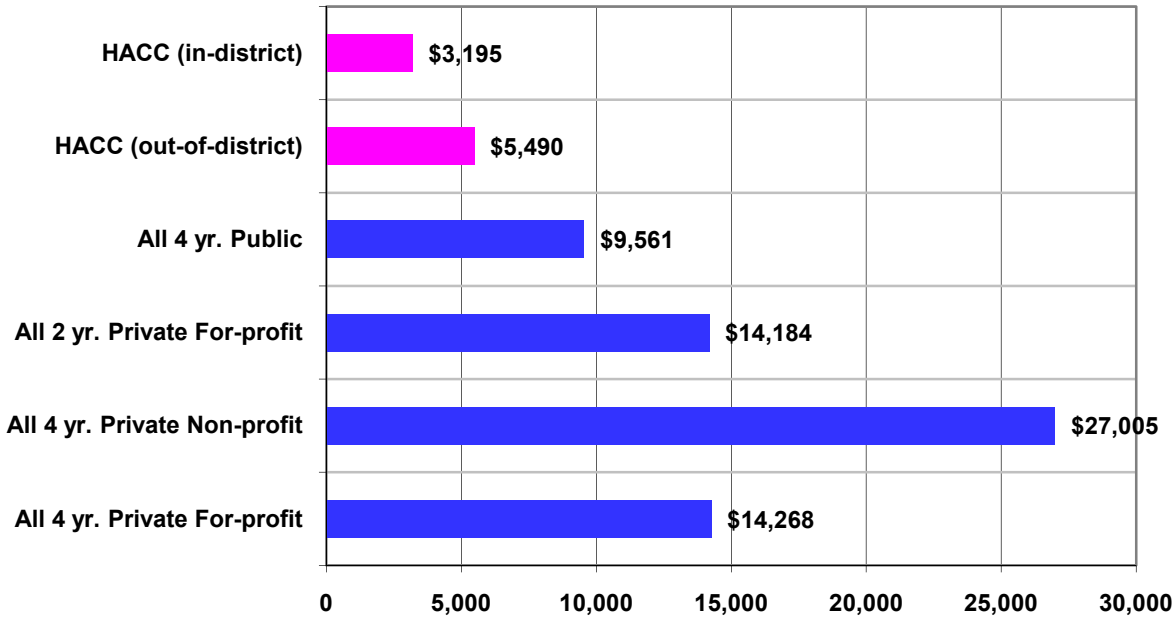

Figure 10: Academic Year 2010-11, Average In-State Tuition for Full-time Undergraduate Students Enrolled in Colleges and Universities within the HACC Service Area [11]

Central Pennsylvania Profile

In this section, we set the stage for the analyses that follow by providing background information on some of Central Pennsylvania's key economic and demographic characteristics.

[11] *Data Source*: National Center for Education Statistics, IPEDS Data Center. For purposes of this graph, "minority" is defined to include students identified as Asian, Black, or Hispanic.

Employment Characteristics

Employment Trends

Figure 11 details the change in total employment between March 2007 and March 2012 in HACC's Central Pennsylvania service area. As this graph shows, total employment remained fairly steady through the middle of 2008. However, starting in July of that year, as the full effects of the 2007-09 recession began to manifest themselves, employment fell precipitously. Between July of 2008 and February of 2010, total employment declined from 807,900 to 764,300 in Central Pennsylvania, a loss of 43,600 jobs, or 5.4 percent of employment. Since February of 2010, employment has generally demonstrated weak but positive growth, rising to 785,900 in March of 2012, for an increase of 21,600 jobs.

Figure 12 attempts to place these numbers in perspective by comparing year-over-year changes in employment in Central Pennsylvania over the same March 2007 to March 2012 period to comparable data for the state as a whole. These data reveal three important findings.

- Central Pennsylvania entered the recession later than the rest of the state, with year-over-year employment growth remaining positive for two months longer than at the statewide level.
- However, once Central Pennsylvania entered the recession it suffered slightly larger proportional employment losses that were typical for the state as a whole. For example, although both Central Pennsylvania and the state as a whole suffered their worst month of year-over-year employment loss in September of 2009, at the statewide level that loss was minus 3.8 percent, where in Central Pennsylvania it was minus 4.3 percent.
- Just as Central Pennsylvania lagged the rest of the state in entering the 2007-09 recession, it has also lagged it in exiting it as well. Where statewide year-over-year employment growth turned positive in May of 2010, in Central Pennsylvania that transition did not occur until August of that year. In addition, throughout the recovery, year-over-year employment growth in central Pennsylvania has remained about a half a percentage point below the statewide growth rate. Although, recent data indicate that Central Pennsylvania may be closing that gap.

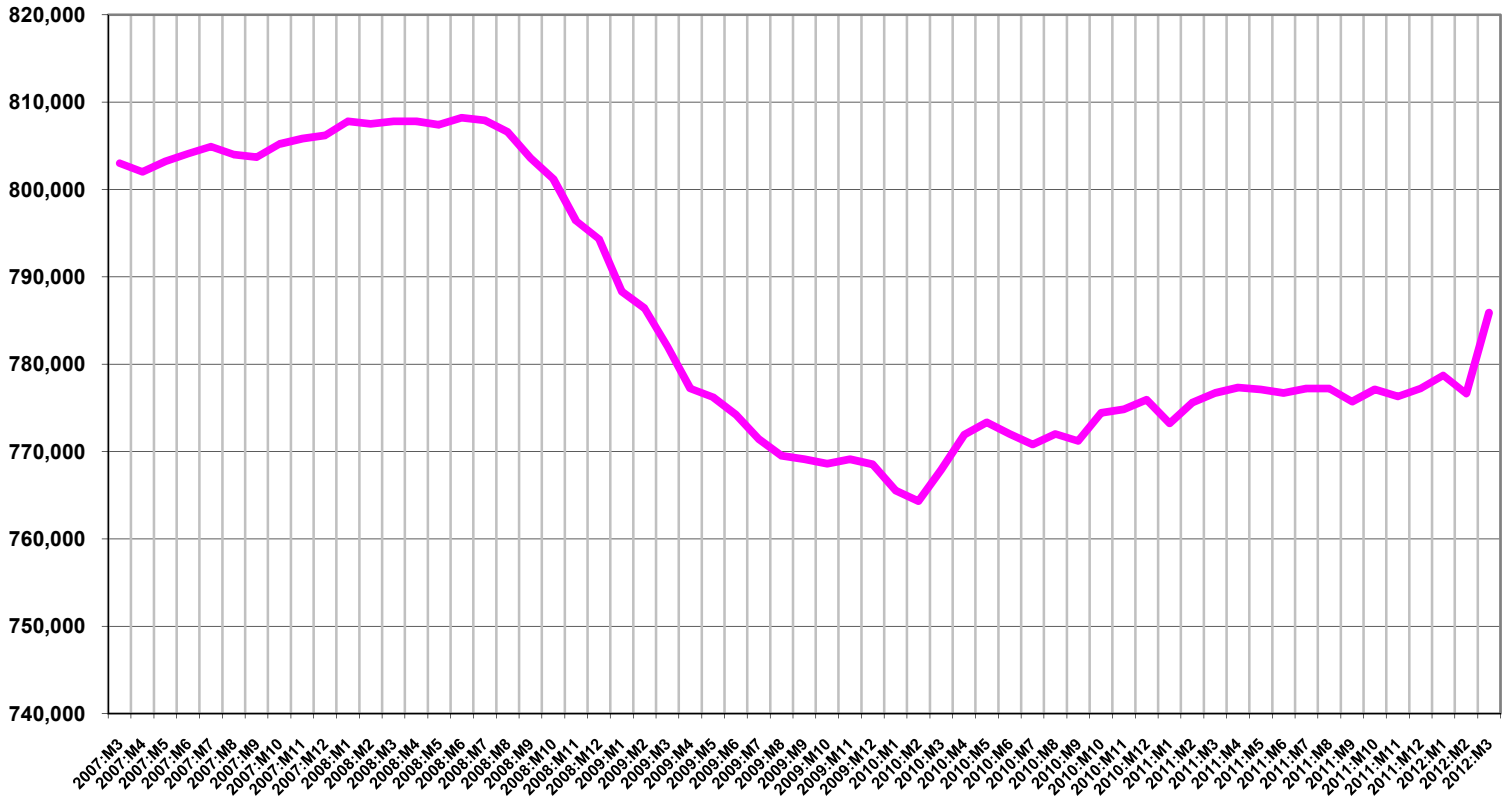

Figure 11: Central Pennsylvania Total Employment – March 2007 to March 2012[12]

[12] *Data Source*: Pennsylvania Department of Labor and Industry, "Current Employment Survey." The data depicted are for the Harrisburg-Carlisle MSA (Cumberland, Dauphin, and Perry counties), the Lancaster MSA (Lancaster County), the Lebanon MSA (Lebanon County), and the York-Hanover MSA (York County). It should be noted that data for the other two counties in HACC's eight county primary service area, Adams and Franklin, are not available through the Pennsylvania Department of Labor and Industry's Current Employment Survey.

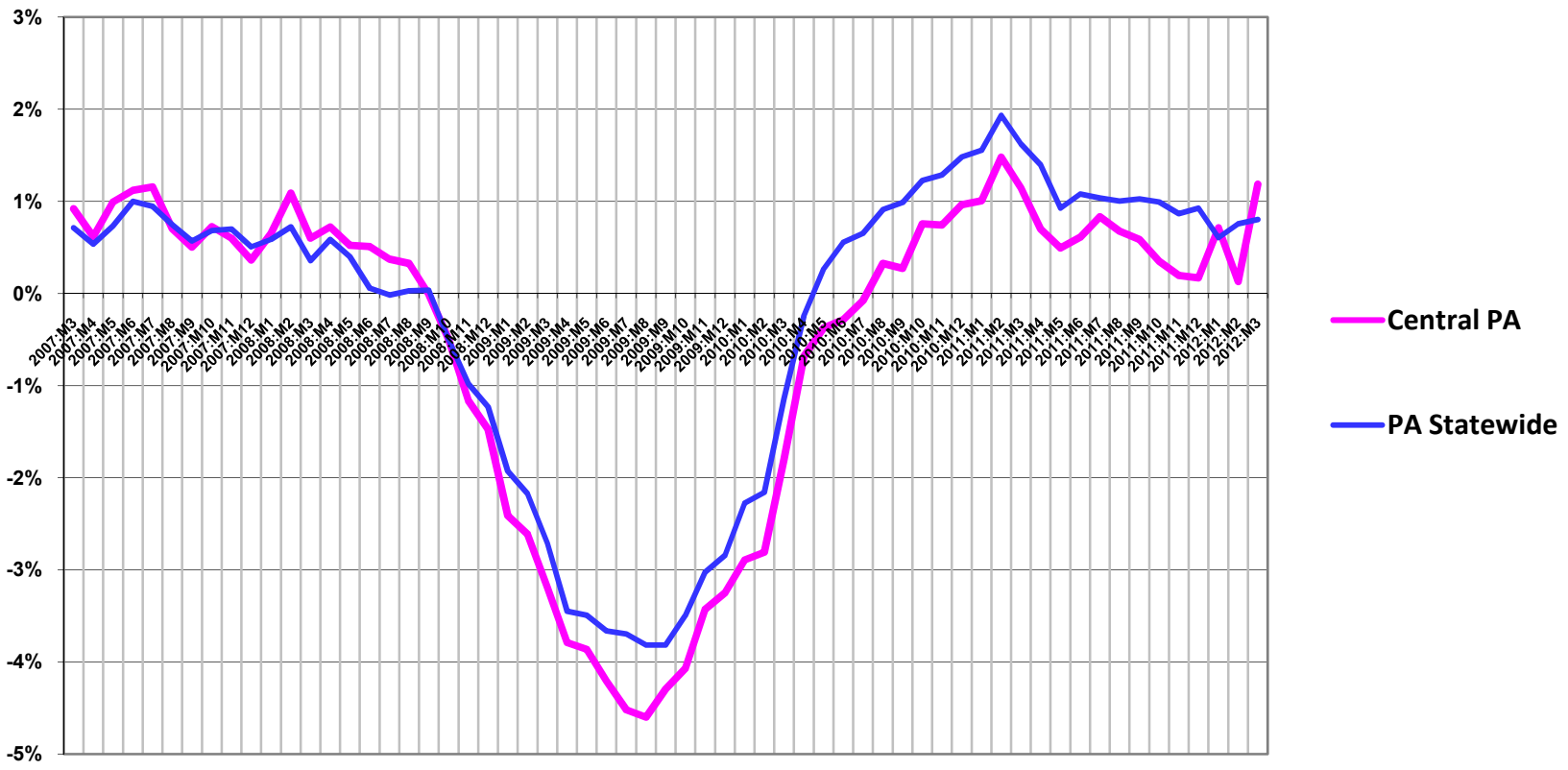

Figure 12: Year-Over-Year Changes in Total Employment – March 2007 to March 2012[13]

[13] *Data Source*: Pennsylvania Department of Labor and Industry, "Current Employment Survey." The data depicted are for the Harrisburg-Carlisle MSA (Cumberland, Dauphin, and Perry counties), the Lancaster MSA (Lancaster County), the Lebanon MSA (Lebanon County), and the York-Hanover MSA (York County). It should be noted that data for the other two counties in HACC's eight county primary service area, Adams and Franklin, are not available through the Pennsylvania Department of Labor and Industry's Current Employment Survey.

Employment and Wages by Industry

Figures 13 and 14 provide a snapshot of private employment and wages in HACC's Central Pennsylvania service area by major industry sector in 2010 (the most recent year for which annual data are available). As shown in Figure 13, the largest employment sectors in Central Pennsylvania that year were: 1) *Healthcare and Social Assistance* (114,839 jobs or 16.4 percent of total employment), 2) *Manufacturing* (111,282 jobs or 15.9 percent of total employment), 3) *Retail Trade* (97,946 jobs or 14.0 percent of total employment), 4) *Accommodation and Food Services* (63,895 jobs or 9.1 percent of total employment), and 5) *Transportation and Warehousing* (43,630 jobs or 6.2 percent of total employment).

Comparing the employment data presented in Figure 13 to statewide data for Pennsylvania allows us to evaluate the extent to which Central Pennsylvania is more or less dependent on specific industries than the state as a whole. What that comparison shows is that employment in Central Pennsylvania's *Transportation and Warehousing* sector is about a third larger than one would expect, and employment in its *Manufacturing* sector is about a quarter larger than one would expect, based on statewide norms. At the other end of the spectrum, employment in the region's *Professional and Technical Services* sector is about half of what one would expect, and employment in its *Management of Companies and Enterprises* (*i.e.*, corporate headquarters) is about a quarter less than one would expect, based on statewide norms.

As shown in Figure 14, the highest average weekly wages paid in Central Pennsylvania in 2010 were in: 1) *Utilities* ($1,979 per week), 2) *Management of Companies and Enterprises* ($1,629 per week), 3) *Finance and Insurance* ($1,114 per week), 4) *Professional and Technical Services* ($1,104 per week), and 5) *Mining, Quarrying, and Oil and Gas Extraction* ($1,008 per week). Among Central Pennsylvania's largest employment sectors, average weekly wages were: 1) *Healthcare and Social Assistance* ($822 per week), 2) *Manufacturing* ($973 per week), 3) *Retail Trade* ($452 per week), 4) *Accommodation and Food Services* ($274 per week), and 5) *Transportation and Warehousing* ($776 per week)

Finally, Figure 15 depicts the change in private employment in Central Pennsylvania's major industry sectors between 2009 and 2010. As these data show, the largest loss in employment over the period occurred in the *Manufacturing* (down 4,077 jobs), *Construction* (down 1,567 jobs), and *Finance and Insurance* (down 1,567 jobs) sectors. While the largest increases occurred in the *Administrative Services and Waste* (up 2,344 jobs) and *Healthcare* (up 1,085 jobs) sectors.

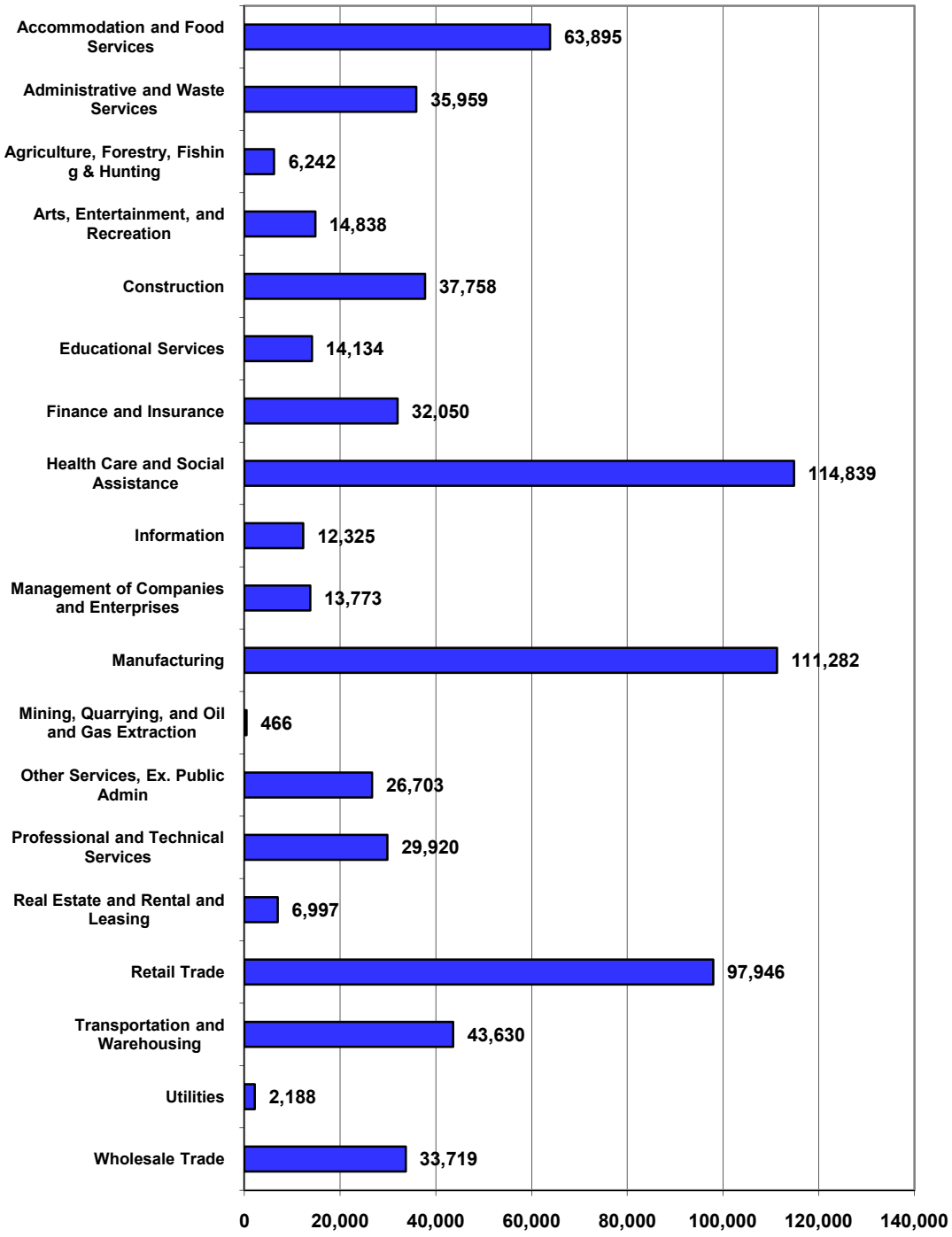

Figure 13: 2010 Private Employment by Major Industry Category – Central Pennsylvania[14]

[14] *Data Source*: Pennsylvania Department of Labor and Industry, "Quarterly Census of Employment and Wages." Data included are for the counties of Adams, Cumberland, Dauphin, Franklin, Lancaster, Lebanon, Perry, and York.

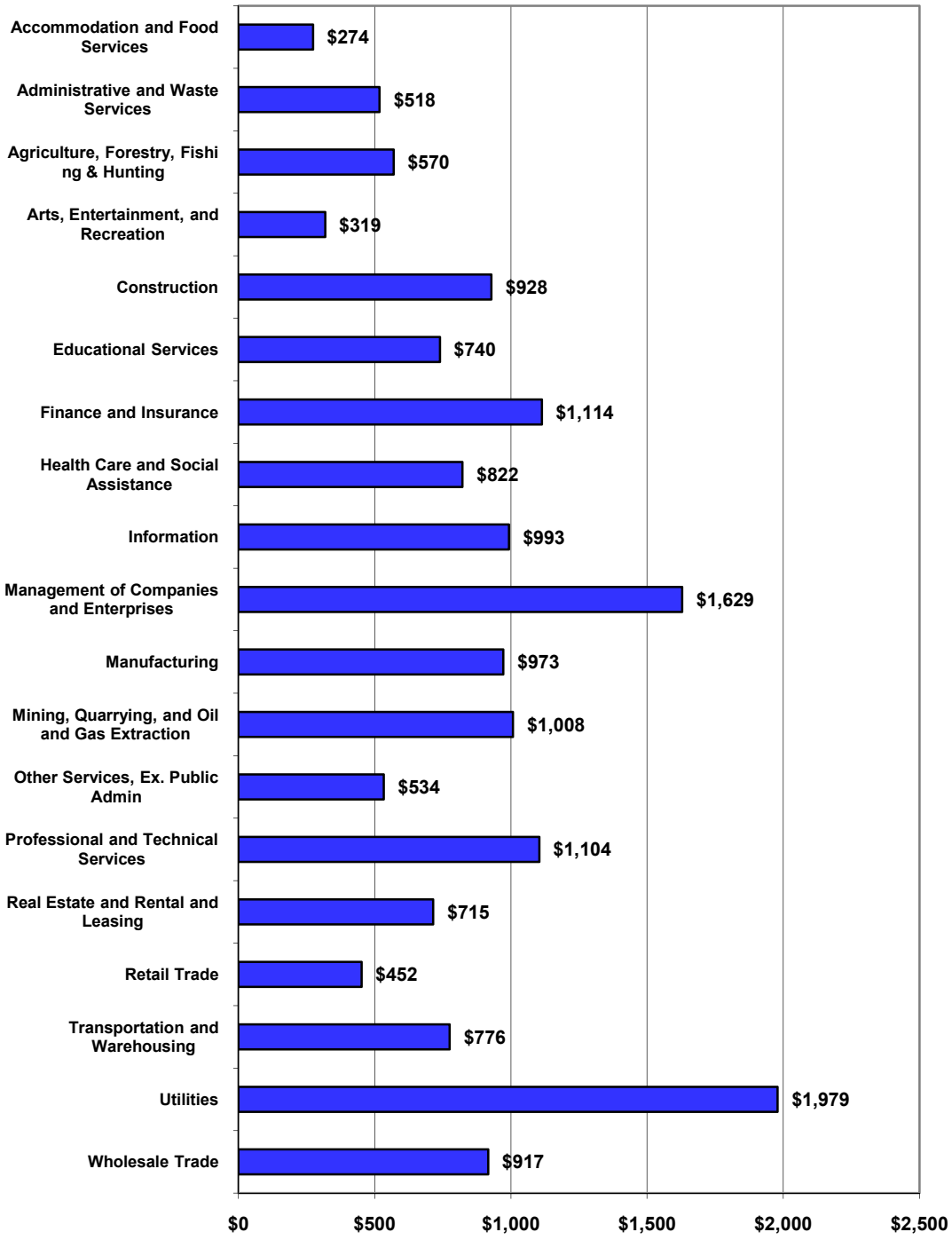

Figure 14: 2010 Average Weekly Wages by Major Industry Category – Central Pennsylvania[15]

[15] *Data Source*: Pennsylvania Department of Labor and Industry, "Quarterly Census of Employment and Wages." Data included are for the counties of Adams, Cumberland, Dauphin, Franklin, Lancaster, Lebanon, Perry, and York.

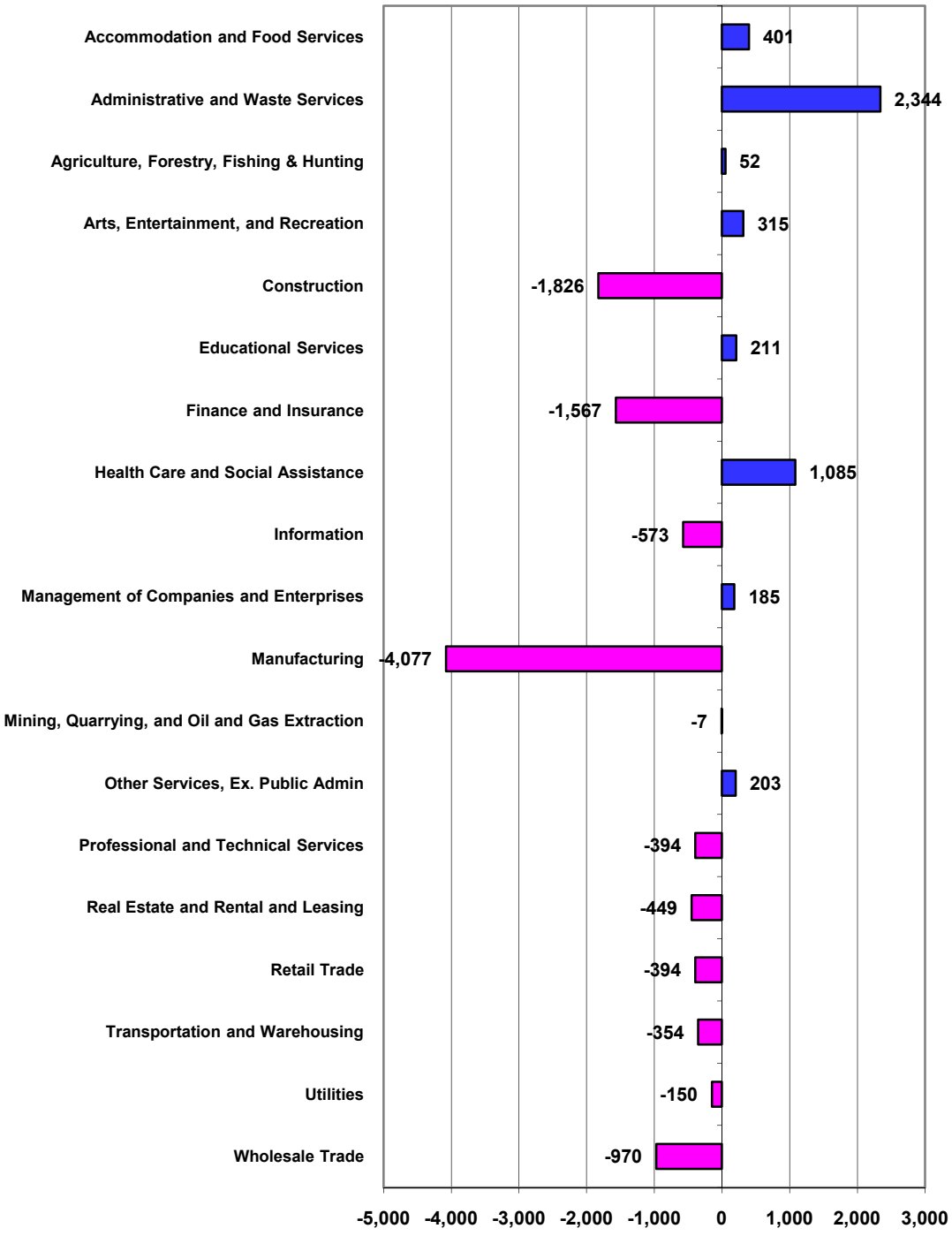

Figure 15: 2009 to 2010 Change in Private Employment by Major Industry Category – Central Pennsylvania[16]

[16] *Data Source*: Pennsylvania Department of Labor and Industry, "Quarterly Census of Employment and Wages." Data included are for the counties of Adams, Cumberland, Dauphin, Franklin, Lancaster, Lebanon, Perry, and York.

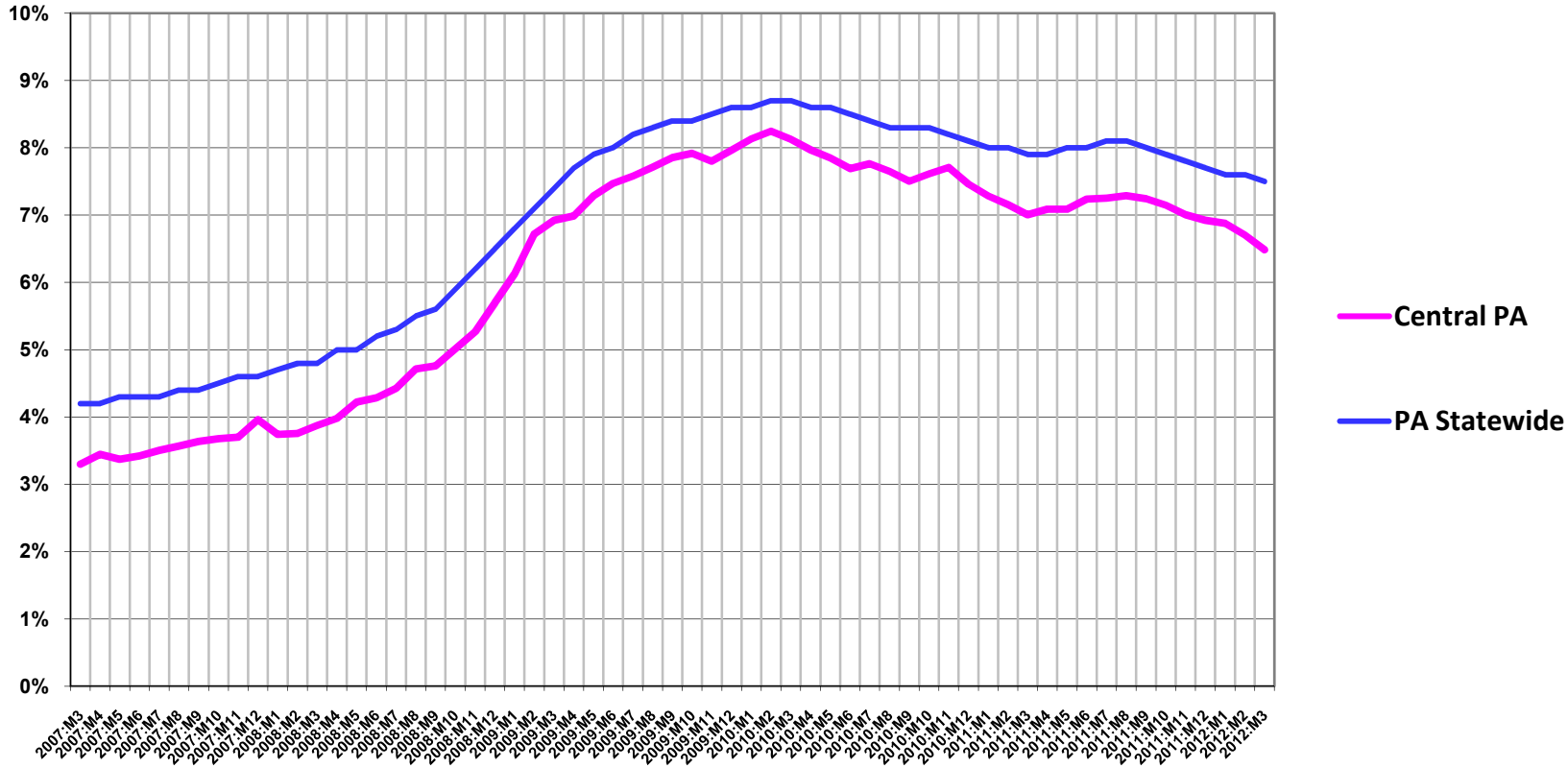

Figure 16: Unemployment Rate – March 2007 to March 2012[17]

[17] *Data Source*: Pennsylvania Department of Labor and Industry, "Labor Force, Employment, and Unemployment data." Data included are for the counties of Adams, Cumberland, Dauphin, Franklin, Lancaster, Lebanon, Perry, and York.

Unemployment

Figure 16 depicts unemployment rates in Central Pennsylvania and the state as a whole for the same period detailed in the total employment graph presented in Figure 11 – March 2007 through March 2012. As these data indicate, throughout this period unemployment in Central Pennsylvania has remained about three-quarters of a percentage point below the statewide average. Both in Central Pennsylvania and statewide, unemployment rates began to escalate rapidly around the middle of 2008 as the 2007-09 recession began to take its toll. Unemployment peaked in March of 2010 at 8.1 percent in Central Pennsylvania and 8.7 percent statewide. Since that time, it has generally drifted downward, but at a stubbornly slow pace. In March 2012, the most recent month for which data are available, unemployment stood at 6.5 percent in Central Pennsylvania and 7.5 percent statewide in Pennsylvania.

Demographic Characteristics

Population

Between 2000 and 2010, the total population in HACC's Central Pennsylvania service area increased from 1,702,415 to 1,888,485, an increase of 186,070 persons or 10.9 percent. As graphically depicted in Figure 17, this rate of population growth compares very favorably with Pennsylvania's 3.4 percent statewide increase in population over the period.

Table 1 provides additional detail on the 2010 geographic and age composition in HACC's Central Pennsylvania service area. As these data indicate, the three largest counties within HACC's service area that year were Lancaster (519,445 population), York (434,972 population), and Dauphin (268,100 population). In terms of age distribution, 27.5 percent of the population within HACC's service area was 0 to 19, 34.9 percent was 20 to 44, 23.3 percent was 45 to 64, and 14.3 percent was 65 or above. These percentages track very closely with statewide data.

Table 2 provides a similar geographic and age breakdown for the change in population between 2000 and 2010. With regard to absolute change, these data show that the three counties exhibiting the largest population increases were York (up 53,221), Lancaster (up 48,787), and Cumberland (up 21,732). Where in terms of age cohorts, the largest population changes occurred in the 45 to 64 age category (up 129,093) and the 65 or above age category (up 38,481).

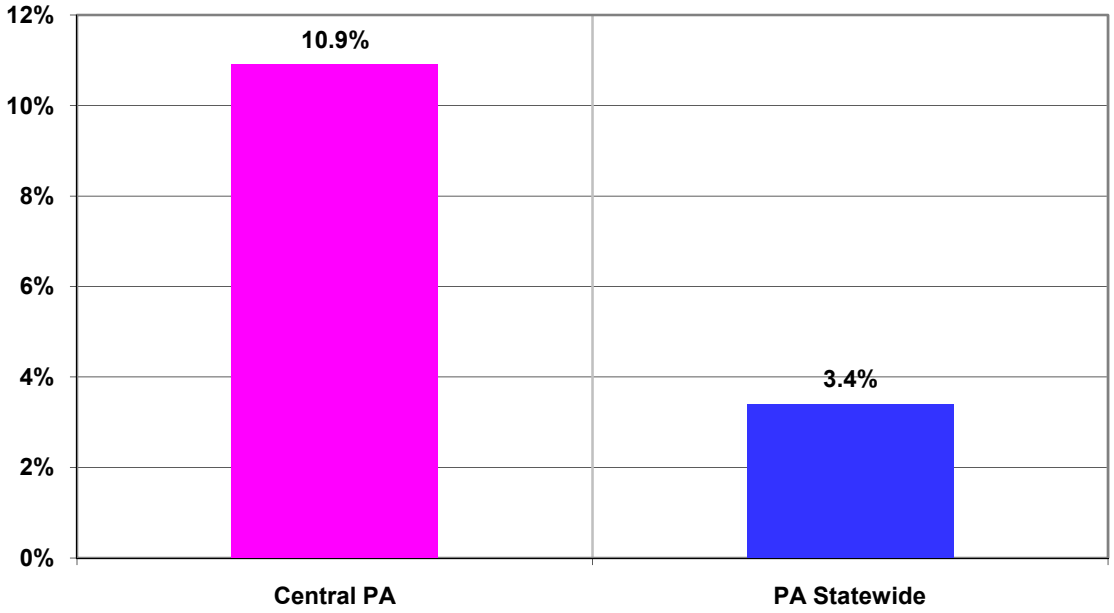

Figure 17: 2000 to 2010 Population Growth[18]

Table 1: 2010 Population Growth by Geography and Age[19]

	0 to 19	20 to 44	45 to 64	65+	Total
Adams County	25,709	30,395	29,349	15,954	101,407
Cumberland County	56,867	75,639	66,155	36,745	235,406
Dauphin County	68,781	85,463	77,015	36,841	268,100
Franklin County	39,644	44,985	40,310	24,679	149,618
Lancaster County	144,620	159,652	137,393	77,780	519,445
Lebanon County	34,175	39,567	37,097	22,729	133,568
Perry County	11,859	13,773	14,043	6,294	45,969
York County	113,188	135,648	125,079	61,057	434,972
Central Pennsylvania	**494,843**	**585,122**	**526,441**	**282,079**	**1,888,485**
Pennsylvania Statewide	**3,179,390**	**4,000,934**	**3,562,748**	**1,959,307**	**12,702,379**

[18] *Data Source*: U.S. Census Bureau. For purposes of this graph, Central Pennsylvania is defined to include HACC's core service area of Adams, Cumberland, Dauphin, Franklin, Lancaster, Lebanon, Perry, and York counties.
[19] *Data Source*: U.S. Census Bureau.

Table 2: 2000 to 2010 Population Growth by Geography and Age[20]

2000 to 2010 Absolute Change					
	0 to 19	**20 to 44**	**45 to 64**	**65+**	**Total**
Adams County	77	-1,605	8,345	3,298	10,115
Cumberland County	2,212	-220	14,749	4,991	21,732
Dauphin County	2,239	-3,916	16,982	997	16,302
Franklin County	5,318	1,450	9,609	3,928	20,305
Lancaster County	5,382	-2,779	34,464	11,720	48,787
Lebanon County	2,482	-828	8,554	3,033	13,241
Perry County	-333	-1,362	3,113	949	2,367
York County	9,896	483	33,277	9,565	53,221
Central Pennsylvania	**27,273**	**-8,777**	**129,093**	**38,481**	**186,070**
Pennsylvania Statewide	**-91,194**	**-253,714**	**726,091**	**40,142**	**421,325**
2000 to 2010 Percentage Change					
	0 to 19	**20 to 44**	**45 to 64**	**65+**	**Total**
Adams County	0.3%	-5.0%	39.7%	26.1%	11.1%
Cumberland County	4.0%	-0.3%	28.7%	15.7%	10.2%
Dauphin County	3.4%	-4.4%	28.3%	2.8%	6.5%
Franklin County	15.5%	3.3%	31.3%	18.9%	15.7%
Lancaster County	3.9%	-1.7%	33.5%	17.7%	10.4%
Lebanon County	7.8%	-2.0%	30.0%	15.4%	11.0%
Perry County	-2.7%	-9.0%	28.5%	17.8%	5.4%
York County	9.6%	0.4%	36.2%	18.6%	13.9%
Central Pennsylvania	**5.8%**	**-1.5%**	**32.5%**	**15.8%**	**10.9%**
Pennsylvania Statewide	**-2.8%**	**-6.0%**	**25.6%**	**2.1%**	**3.4%**

It bears notice, however, that in contrast to the statewide population decline that Pennsylvania experienced in its 0 to 19 age cohort, HACC's service area actually saw a population increase in this group. In addition, although the 20 to 44 age cohort declined both statewide and in HACC's service area, the declines were proportionally much smaller in HACC's service area.

[20] *Data Source*: U.S. Census Bureau.

These findings are further confirmed by the percentage changes displayed at the bottom of the table. As these data show, where statewide the 0 to 19 age cohort declined by minus 2.8 percent, in HACC's service area it grew by 5.8 percent. Similarly, where the 20 to 44 age cohort declined by minus 6.0 percent statewide, in HACC's service area the decline was only minus 1.5 percent. Another interesting aspect of the percentage change data is that both the largest percentage change in total population, and in the 0 to 19 age cohort, occurred in Franklin County – 15.7 percent and 15.5 percent respectively.

Other Demographic Characteristics

Table 3 provides a county by county breakdown for four other pertinent demographic characteristics drawn from the 2010 census:

- Educational attainment:
    - *High School*: The percentage of individuals 25 years of age an older with a high school degree or above varies from a low of 82.3 percent in Lancaster County to a high of 90.4 percent in Cumberland County. However, on average high school attainment rates in Central Pennsylvania are slightly below the statewide rate of 87.4 percent.
    - *Bachelor's Degree*: The percentage of individuals 25 years of age or older with a Bachelor's degree or higher varies from a low of 14.0 percent in Perry County to a high of 32.3 percent in Cumberland County. Regionally, however, bachelor's degree attainment rates in Central Pennsylvania are slightly below the statewide rate of 26.4 percent.
- Median Household Income: Median household income varies from a low of $51,035 in Franklin County to a high of $60,219 in Cumberland County. Across all counties, however, median household income in Central Pennsylvania exceeds the statewide norm of $50,398.
- Poverty: The percentage of persons below the poverty level varies from a high of 11.9 percent in Dauphin County to a low of 6.5 percent in Cumberland County. In all cases, however, the poverty rate in Central Pennsylvania falls the statewide norm of 9.1 percent.
- English Not Spoken at Home: The percentage of individuals five years of age and older for whom English is not spoken at home varies from a high of 15.6 percent in Lancaster County to a low of 3.4 percent in Perry County. On average, these proportions are consistent with the statewide norm of 9.9 percent.

Table 3: Other Demographic Characteristics from the 2010 Census[21]

Educational Attainment	PA	Adams	Cumber-land	Dauphin	Franklin	Lancaster	Lebanon	Perry	York
High school graduates, % of persons age 25+, 2006-2010	87.4%	84.7%	90.4%	88.5%	83.8%	82.3%	84.4%	85.4%	86.8%
Bachelor's degree or higher, % of persons age 25+, 2006-2010	26.4%	18.5%	32.3%	27.1%	18.3%	23.3%	18.3%	14.0%	21.5%
Household Income	**PA**	**Adams**	**Cumber-land**	**Dauphin**	**Franklin**	**Lancaster**	**Lebanon**	**Perry**	**York**
Median household income 2006-2010	$50,398	$56,529	$60,219	$52,371	$51,035	$54,765	$52,356	$52,659	$57,494
Poverty	**PA**	**Adams**	**Cumber-land**	**Dauphin**	**Franklin**	**Lancaster**	**Lebanon**	**Perry**	**York**
Persons below poverty level, percent, 2006-2010	12.4%	7.6%	6.5%	11.9%	8.2%	9.7%	8.9%	9.1%	9.0%
English as a Second Language	**PA**	**Adams**	**Cumber-land**	**Dauphin**	**Franklin**	**Lancaster**	**Lebanon**	**Perry**	**York**
Language other than English spoken at home, % age 5+, 2006-2010	9.9%	6.3%	7.6%	10.3%	6.5%	15.6%	9.0%	3.4%	6.7%

[21] *Data Source*: U.S. Census Bureau.

Economic and Fiscal Impact

In this section, we quantify the economic and fiscal contribution that HACC makes to Central Pennsylvania. In this context, it is important to keep in mind that, like any educational institution, HACC contributes to the regional economy in two ways. First, as an *economic* enterprise, HACC contributes to the regional economy through its expenditures on salaries, services, supplies, equipment, and construction. Second, as an *educational* enterprise, HACC also contributes to its regional economy through the human capital that it produces – its students. We assess each of these contributions in turn.

Operating, Capital, and Student Expenditures

To quantify the economic contribution that HACC makes to Central Pennsylvania through its expenditures on salaries, services, supplies, equipment, and construction, we employ a commonly used regional economic impact model called IMPLAN.[22] The IMPLAN model uses regional and national economic data to construct traditional Keynesian multipliers and uses these multipliers to quantify economic impact.

Keynesian multipliers are named after the British economist John Maynard Keynes. They measure the ripple effects that an expenditure has as it makes its way through the economy. For example, as when the expenditures that HACC makes on goods and services become income for someone else, and are then spent in turn on other goods and services, thereby becoming income for someone else, and so on, and so on. Through this process, one dollar in expenditures generates multiple dollars of income. The mathematical relationship between the initial expenditure and the total income generated is the Keynesian multiplier.

Economic impact is generally referred to in terms of "direct," "indirect," and "induced." Direct economic impact measures the immediate effect of an economic event (*e.g.*, college purchases of goods and services). Indirect economic impact measures the cumulative impact of the ripple effects generated by the direct economic impact through other business (non-household) purchases. While induced economic impact measures the cumulative impact generated through the household purchases of employees. In the estimates that follow, direct, indirect, and induced impact are further disaggregated into three categories of economic impact. The first is economic output, or the dollar value of the impact. The second, is the number of jobs that are created as a result of that economic output. The third, is the fiscal impact, or total tax dollars that are generated.

[22] IMPLAN is produced by Minnesota IMPLAN Group, Inc.

Total Expenditures

In fiscal year 2010-11, HACC was responsible for generating $173.1 million dollars in operating, capital, and other expenditures.[23] As shown in Figure 18, expenditures on goods and services accounted for 33 percent of that total ($57.2 million), while expenditures on salaries and benefits accounted for 62 percent ($107.1 million), expenditures on capital construction projects accounted for 4 percent ($7.8 million), and local spending by out-of-area students accounted for 1 percent ($1.1 million).[24] In the next portion of this section, we quantify the total economic impact that this direct spending had on Central Pennsylvania.

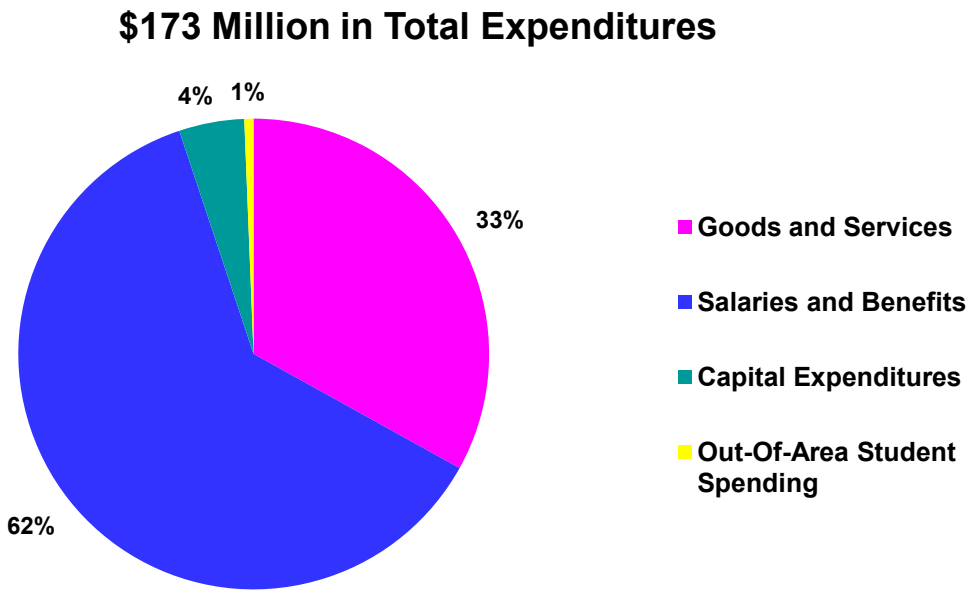

Figure 18: Distribution of HACC 2010-11 Expenditures

[23] In For purposes of the economic impact assessment, we define Central Pennsylvania to include all ten counties in HACC's extended service area: Adams, Cumberland, Dauphin, Franklin, Juniata, Lancaster, Lebanon, Perry, Schuykill, and York.

[24] *Data Source*: Data on college spending were obtained from HACC. Data on local expenditures by out-of-area students were estimated based on student residence data provided by HACC and a survey of expenditure profiles employed in similar analyses and Pennsylvania tourism.

Economic and Fiscal Impact

It is important to realize that not all of HACC's $173.1 million in 2010-11 expenditures made their way into Central Pennsylvania's economy. Some of those dollars were spent on goods produced outside of the region, some were paid to faculty and staff who lived outside of the region, some were siphoned off as payroll deductions for social security and other programs, and some went into savings. Based on data from the IMPLAN model, we estimate that these "leakages" from the regional economy totaled $67.2 million. As a result, total net spending in Central Pennsylvania attributable to HACC in 2010-11 is estimated to be $105.9 million.

As shown in Table 4, our analysis indicates that this $105.9 million in net regional spending was responsible for generating a total of $177.8 million in overall economic activity within Central Pennsylvania. That means that every $1.00 of HACC's net local spending ultimately generated $1.68 in total spending within the region. In addition, our analysis indicates that these expenditures were responsible for supporting a total of 2,308 full-time-equivalent jobs, and generating $10.1 million in state and local tax revenue, within Central Pennsylvania in 2010-11.

Table 4: Total Estimated Expenditures Impact of HACC on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$105,879,211	$29,393,708	$42,494,213	**$177,767,132**
Employment	1,694	238	376	**2,308**
State and Local Tax Revenue				**$10,144,640**

*Totals may not sum due to rounding.

In the subsections that follow, we provide detailed analysis for each of the spending components listed in Figure 18.

1. HACC Expenditures on Goods and Services:

In assessing the likely economic impact attributable to HACC's expenditures on goods and services within Central Pennsylvania in 2010-11, we employ the following assumption:

- HACC expenditures for goods and services were $57.2 million in FY 2010-11.[25]
- Approximately 58 percent of HACC expenditures for goods and services are made within Central Pennsylvania.[26]

By feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 5:

- Regional Economic Output: After accounting for leakages from the regional economy, HACC's $57.2 million in spending on goods and services was responsible for generating a total of $57.3 million in overall economic activity within Central Pennsylvania.
- Regional Employment: HACC expenditures on goods and services supported total of 511 jobs within Central Pennsylvania.
- State and Local Tax Revenue: HACC expenditures on goods and services generated $3.0 million in state and local tax revenue in Central Pennsylvania.

Table 5: Estimated Impact of HACC Goods and Services Expenditures on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$33,760,335	$9,559,106	$14,027,462	**$57,346,903**
Employment	308	79	124	**511**
State and Local Tax Revenue				**$2,970,406**

*Totals may not sum due to rounding.

2. HACC Expenditures on Salaries and Wages:

We employ the following assumptions in assessing the likely economic impact attributable to HACC's expenditures on salaries and wages within Central Pennsylvania in 2010-11:

- HACC expenditures on salaries and wages were in 2010-11 were $80.6 million.[27]
- HACC expenditures on employee health insurance in 2010-11 were $12.3 million.[28]

[25] *Data Source*: HACC.
[26] *Data Source*: HACC and regional purchase data included in the IMPLAN model.
[27] *Data Source*: HACC.
[28] *Data Source*: HACC.

- Approximately 96 percent of HACC expenditures on salaries and wages were paid to residents of Central Pennsylvania.[29]

By feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 6:

- Regional Economic Output: After accounting for leakages from the regional economy, HACC's $80.6 million in spending on wages and salaries and $12.3 million in spending on health insurance was responsible for generating a total of $106.2 million in overall economic activity within Central Pennsylvania.
- Regional Employment: HACC expenditures on salaries, wages, and health insurance supported total of 1,681 jobs within Central Pennsylvania.
- State and Local Tax Revenue: HACC expenditures on salaries, wages, and health insurance generated $6.6 million in state and local tax revenue in Central Pennsylvania.

Table 6: Estimated Impact of HACC Salaries and Wages on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$63,546,990	$17,491,401	$25,136,692	**$106,175,084**
Employment	1,317	141	223	**1,681**
State and Local Tax Revenue				**$6,590,992**

*Totals may not sum due to rounding.

3. HACC Expenditures on Capital Construction:

In assessing the likely economic impact attributable to HACC's expenditures on capital construction within Central Pennsylvania in 2010-11, we employ the following assumption:

- HACC expenditures on capital construction projects were $7.8 million in 2010-11.[30]

By feeding this assumption into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 7:

[29] *Data Source*: HACC and regional purchase data included in the IMPLAN model.
[30] *Data Source*: HACC.

- Regional Economic Output: After accounting for leakages from the regional economy, HACC's $7.8 million in capital construction expenditures were responsible for generating a total of $12.9 million in overall economic activity within Central Pennsylvania.
- Regional Employment: HACC expenditures on capital construction supported total of 99 jobs within Central Pennsylvania.
- State and Local Tax Revenue: HACC expenditures on capital construction generated $0.5 million in state and local tax revenue in Central Pennsylvania.

Table 7: Estimated Impact of HACC Capital Construction Expenditures on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$7,758,637	$2,077,389	$3,033,870	**$12,869,896**
Employment	57	15	27	**99**
State and Local Tax Revenue				**$470,669**

*Totals may not sum due to rounding.

4. HACC Out-Of-Area Student Expenditures:

Our assessment of the economic impact that HACC out-of-area students had on Central Pennsylvania in 2010-11 is predicated on the following assumptions:

- In 2010-11, 891 students attended classes at HACC who were residents of counties that are outside of HACC's service area.[31] These students accounted for approximately 604 student full-time-equivalent students (FTEs).[32]
- Total local consumption expenditures by HACC out-of-area students are estimated to have been $1.1 million in 2010-11.[33]

By feeding this assumption into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 8:

[31] *Data Source*: HACC Office of Institutional Research and Planning.
[32] Estimate based on 2010-11 headcount to FTE ratios provided by the HACC Office of Institutional Research and Planning. FTE is a method for "norming" student enrollment to account for part-time students. An annual FTE is defined as 30 annual credit hours of instruction.
[33] *Data Source*: Based on a review of expenditure profiles employed in similar analyses and Pennsylvania tourism studies which indicated that average regional expenditures per day per FTE student are likely to be approximately $15, combined with the assumption that an FTE student spends approximately 120 days per year on campus.

- Regional Economic Output: After accounting for leakages from the regional economy, the $1.1 million in consumption expenditures by out-of-area HACC students were responsible for generating a total of $1.4 million in overall economic activity within Central Pennsylvania.
- Regional Employment: Consumption expenditures by out-of-area HACC students supported total of 17 jobs within Central Pennsylvania.
- State and Local Tax Revenue: Consumption expenditures by out-of-area HACC students generated $0.1 million in state and local tax revenue in Central Pennsylvania.

Table 8: Estimated Impact of Consumption Expenditures by Out-Of-Area HACC Students on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$813,249	$265,812	$296,189	**$1,375,249**
Employment	12	2	3	**17**
State and Local Tax Revenue				**$112,573**

*Totals may not sum due to rounding.

Campus Analyses

In this portion of the section, we provide a campus-by-campus breakdown of the total impact presented in Figure 18.

Gettysburg Campus

In assessing the total economic impact that HACC's Gettysburg campus had on Central Pennsylvania in 2010-11, we employ the following assumptions:

- Campus expenditures for goods and services were $5.7 million in FY 2010-11.[34]
- Campus expenditures on salaries and wages were $6.8 million in FY 2010-11.[35]
- Campus expenditures on health insurance were $1.0 million in FY 2010-11.[36]

[34] *Data Source*: Derived by apportioning campus-wide expenditures on goods and services across campuses in accordance with their relative share of campus-wide FTE enrollment.
[35] *Data Source*: Based on data from the HACC on campus-specific expenditures on salaries and wages. In addition, this total includes a portion of salary and wage expenditures allocated to Franklin County based on relative enrollment share, and a portion of those salaries and wages allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.

- Campus expenditures on capital projects were $0.8 million in FY 2010-11.[37]
- Out-of-area student consumption expenditures were $28,045 in 2010-11.[38]

By feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 9:

- Regional Economic Output: After accounting for leakages from the regional economy, spending by HACC's Gettysburg campus was responsible for generating a total of $16.4 million in overall economic activity within Central Pennsylvania.
- Regional Employment: Spending by HACC's Gettysburg campus supported total of 258 jobs within Central Pennsylvania.
- State and Local Tax Revenue: Spending by HACC's Gettysburg campus generated $0.9 million in state and local tax revenue in Central Pennsylvania.

Table 9: Total Estimated Expenditures Impact of HACC's Gettysburg Campus on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$9,741,741	$2,703,734	$3,916,642	**$16,362,118**
Employment	202	22	35	**258**
State and Local Tax Revenue				**$924,741**

*Totals may not sum due to rounding.

Harrisburg Campus

We employ the following assumptions in assessing the total economic impact that HACC's Harrisburg campus had on Central Pennsylvania in 2010-11:

[36] *Data Source*: Based on data from the HACC on campus-specific expenditures on health insurance. In addition, this total includes a portion of health insurance expenditures allocated to Franklin County based on relative enrollment share, and a portion of health insurance expenditures allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.

[37] *Data Source*: Derived by apportioning campus-wide expenditures on capital projects across campuses in accordance with their relative proportion of campus-wide FTE enrollment.

[38] Based on data from the HACC Office of Institutional Research and Planning on out-of-area students attending classes at the Gettysburg campus, in combination with: 1) a review of expenditure profiles employed in similar analyses and Pennsylvania tourism studies which indicated that average regional expenditures per day per FTE student are likely to be approximately $15, and 2) the assumption that an FTE student spends approximately 120 days per year on campus.

- Campus expenditures for goods and services were $27.1 million in FY 2010-11.[39]
- Campus expenditures on salaries and wages were $42.7 million in FY 2010-11.[40]
- Campus expenditures on health insurance were $6.6 million in FY 2010-11.[41]
- Campus expenditures on capital projects were $3.7 million in FY 2010-11.[42]
- Out-of-area student consumption expenditures were $0.7 million in 2010-11.[43]

By feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 10:

- Regional Economic Output: After accounting for leakages from the regional economy, spending by HACC's Harrisburg campus was responsible for generating a total of $92.9 million in overall economic activity within Central Pennsylvania.
- Regional Employment: Spending by HACC's Harrisburg campus supported total of 1,169 jobs within Central Pennsylvania.
- State and Local Tax Revenue: Spending by HACC's Harrisburg campus generated $5.4 million in state and local tax revenue in Central Pennsylvania.

[39] *Data Source*: Derived by apportioning campus-wide expenditures on goods and services across campuses in accordance with their relative share of campus-wide FTE enrollment.
[40] *Data Source*: Based on data from the HACC on campus-specific expenditures on salaries and wages. In addition, this total includes salaries and wages paid to the Virtual campus, a portion of salary and wage expenditures allocated to Franklin County based on relative enrollment share, and a portion of those salaries and wages allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[41] *Data Source*: Based on data from the HACC on campus-specific expenditures on health insurance. In addition, this total includes health insurance expenditures allocated to the Virtual campus, a portion of health insurance expenditures allocated to Franklin County based on relative enrollment share, and a portion of health insurance expenditures allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[42] *Data Source*: Derived by apportioning campus-wide expenditures on capital projects across campuses in accordance with their relative proportion of campus-wide FTE enrollment.
[43] Based on data from the HACC Office of Institutional Research and Planning on out-of-area students attending classes at the Harrisburg campus, in combination with: 1) a review of expenditure profiles employed in similar analyses and Pennsylvania tourism studies which indicated that average regional expenditures per day per FTE student are likely to be approximately $15, and 2) the assumption that an FTE student spends approximately 120 days per year on campus.

Table 10: Total Estimated Expenditures Impact of HACC's Harrisburg Campus on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$55,328,448	$15,349,876	$22,177,134	**$92,855,458**
Employment	849	124	196	**1,169**
State and Local Tax Revenue				**$5,351,533**

*Totals may not sum due to rounding.

Lancaster Campus

Our assessment of the total economic impact that HACC's Lancaster campus had on Central Pennsylvania in 2010-11 is based on the following assumptions:

- Campus expenditures for goods and services were $12.8 million in FY 2010-11.[44]
- Campus expenditures on salaries and wages were $15.8 million in FY 2010-11.[45]
- Campus expenditures on health insurance were $2.4 million in FY 2010-11.[46]
- Campus expenditures on capital projects were $1.7 million in FY 2010-11.[47]
- Out-of-area student consumption expenditures were $0.2 million in 2010-11.[48]

By feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 11:

- Regional Economic Output: After accounting for leakages from the regional economy, spending by HACC's Lancaster campus was responsible for generating a total of $37.8 million in overall economic activity within Central Pennsylvania.

[44] *Data Source*: Derived by apportioning campus-wide expenditures on goods and services across campuses in accordance with their relative share of campus-wide FTE enrollment.
[45] *Data Source*: Based on data from the HACC on campus-specific expenditures on salaries and wages. In addition, this total includes a portion of those salaries and wages allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[46] *Data Source*: Based on data from the HACC on campus-specific expenditures on health insurance. In addition, this total includes a portion of health insurance expenditures allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[47] *Data Source*: Derived by apportioning campus-wide expenditures on capital projects across campuses in accordance with their relative proportion of campus-wide FTE enrollment.
[48] Based on data from the HACC Office of Institutional Research and Planning on out-of-area students attending classes at the Lancaster campus, in combination with: 1) a review of expenditure profiles employed in similar analyses and Pennsylvania tourism studies which indicated that average regional expenditures per day per FTE student are likely to be approximately $15, and 2) the assumption that an FTE student spends approximately 120 days per year on campus.

- Regional Employment: Spending by HACC's Lancaster campus supported total of 490 jobs within Central Pennsylvania.
- State and Local Tax Revenue: Spending by HACC's Lancaster campus generated $2.1 million in state and local tax revenue in Central Pennsylvania.

Table 11: Total Estimated Expenditures Impact of HACC's Lancaster Campus on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$22,493,758	$6,247,379	$9,037,619	**$37,778,755**
Employment	359	51	80	**490**
State and Local Tax Revenue				**$2,143,854**

*Totals may not sum due to rounding.

Lebanon Campus

In assessing the total economic impact that HACC's Lebanon campus had on Central Pennsylvania in 2010-11, we employ the following assumptions:

- Campus expenditures for goods and services were $3.3 million in FY 2010-11.[49]
- Campus expenditures on salaries and wages were $3.8 million in FY 2010-11.[50]
- Campus expenditures on health insurance were $0.6 million in FY 2010-11.[51]
- Campus expenditures on capital projects were $0.4 million in FY 2010-11.[52]
- Out-of-area student consumption expenditures were $0.1 million in 2010-11.[53]

[49] *Data Source*: Derived by apportioning campus-wide expenditures on goods and services across campuses in accordance with their relative share of campus-wide FTE enrollment.
[50] *Data Source*: Based on data from the HACC on campus-specific expenditures on salaries and wages. In addition, this total includes a portion of those salaries and wages allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[51] *Data Source*: Based on data from the HACC on campus-specific expenditures on health insurance. In addition, this total includes a portion of health insurance expenditures allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[52] *Data Source*: Derived by apportioning campus-wide expenditures on capital projects across campuses in accordance with their relative proportion of campus-wide FTE enrollment.
[53] Based on data from the HACC Office of Institutional Research and Planning on out-of-area students attending classes at the Lebanon campus, in combination with: 1) a review of expenditure profiles employed in similar analyses and Pennsylvania tourism studies which indicated that average regional expenditures per day per FTE student are likely to be approximately $15, and 2) the assumption that an FTE student spends approximately 120 days per year on campus.

By feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 12:

- Regional Economic Output: After accounting for leakages from the regional economy, spending by HACC's Lebanon campus was responsible for generating a total of $5.6 million in overall economic activity within Central Pennsylvania.
- Regional Employment: Spending by HACC's Lebanon campus supported total of 118 jobs within Central Pennsylvania.
- State and Local Tax Revenue: Spending by HACC's Lebanon campus generated $0.5 million in state and local tax revenue in Central Pennsylvania.

Table 12: Total Estimated Expenditures Impact of HACC's Lebanon Campus on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$5,540,832	$1,541,024	$2,228,297	**$9,310,153**
Employment	86	12	20	**118**
State and Local Tax Revenue				**$526,961**

*Totals may not sum due to rounding.

York Campus

Our assessment of the total economic impact that HACC's York campus had on Central Pennsylvania in 2010-11 is based on the following assumptions:

- Campus expenditures for goods and services were $8.4 million in FY 2010-11.[54]
- Campus expenditures on salaries and wages were $8.2 million in FY 2010-11.[55]
- Campus expenditures on health insurance were $1.2 million in FY 2010-11.[56]
- Campus expenditures on capital projects were $1.1 million in FY 2010-11.[57]

[54] *Data Source*: Derived by apportioning campus-wide expenditures on goods and services across campuses in accordance with their relative share of campus-wide FTE enrollment.
[55] *Data Source*: Based on data from the HACC on campus-specific expenditures on salaries and wages. In addition, this total includes a portion of those salaries and wages allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[56] *Data Source*: Based on data from the HACC on campus-specific expenditures on health insurance. In addition, this total includes a portion of health insurance expenditures allocated to the central, non-credit, agency, auxiliary, and restricted budget categories based on relative enrollment share.
[57] *Data Source*: Derived by apportioning campus-wide expenditures on capital projects across campuses in accordance with their relative proportion of campus-wide FTE enrollment.

- Out-of-area student consumption expenditures were $0.3 million in 2010-11.[58]

By feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 13:

- Regional Economic Output: After accounting for leakages from the regional economy, spending by HACC's York campus was responsible for generating a total of $21.5 million in overall economic activity within Central Pennsylvania.
- Regional Employment: Spending by HACC's York campus supported total of 273 jobs within Central Pennsylvania.
- State and Local Tax Revenue: Spending by HACC's York campus generated $1.2 million in state and local tax revenue in Central Pennsylvania.

Table 13: Total Estimated Expenditures Impact of HACC's York Campus on Central Pennsylvania in 2010-11

	Direct	Indirect	Induced	Total*
Output	$12,774,430	$3,551,695	$5,134,516	**$21,460,641**
Employment	198	29	45	**273**
State and Local Tax Revenue				**$1,197,552**

*Totals may not sum due to rounding.

Human Capital

The traditional rational for public subsidization of education is that education generates externalities, or spillover effects, that exceed the private benefits to individuals. As a result, it is in the interest of the community at large to encourage higher levels of educational attainment. Some of these spillover effects take the form of greater civic responsibility, improved health, and reduced crime. From a purely economic perspective though, the largest spillover effect has to do with increased economic productivity.

As individuals increase their human capital through higher levels of educational attainment, not only do they become more productive, they also increase the productivity

[58] Based on data from the HACC Office of Institutional Research and Planning on out-of-area students attending classes at the York campus, in combination with: 1) a review of expenditure profiles employed in similar analyses and Pennsylvania tourism studies which indicated that average regional expenditures per day per FTE student are likely to be approximately $15, and 2) the assumption that an FTE student spends approximately 120 days per year on campus.

of the resources around them. A good example of this would be the difference between what can be accomplished by placing a computer in the hands of a trained user, and what can be accomplished when the computer is placed in the hands of an untrained user – same resource, very different result. Moreover, this difference in results has significant economic implications in the aggregate. Greater productivity translates into increased economic activity and higher incomes.

However, to measure the effect that HACC's educational services have on economic productivity and, therefore, Central Pennsylvania's economy, we must first be able to quantify the relationship between educational attainment and productivity. One of the early leaders in this area of economics was Gary Becker, who was awarded a Nobel Prize in 1992 for his work in the economics of human capital development. One of Becker's key insights was that, because education produces work skills that are valuable to all employers, in a competitive market employers will be forced to compensate workers for the full value of their skills, or otherwise risk losing them to other employers. A critical implication of this insight is that differences in wages provide a reasonable estimate of the economic value attributable to differences in educational attainment and skills training.

Table 14 presents data on average wages in Central Pennsylvania by educational attainment level for those occupations that typically require a certain level of education as a prerequisite for employment. To further refine our analysis to reflect only those occupations that HACC students are likely to enter, as opposed to all existing occupations and wages, these data are specifically based on regional wages within Central Pennsylvania, and on only those regional occupations that are projected to exhibit a positive number of average annual openings between 2008 and 2018.[59] Based on these data, the difference in annual wages between occupations that typically require an Associate's degree and those that typically require only a high school diploma or equivalent, is $11,152 across all workers, and $7,945 for entry level workers.

It is important to keep in mind, however, that an Associate's degree is not the educational goal of the majority of students who attend community college. Instead, the majority of community college students attend classes to enhance specific skills or to prepare for admission to a four-year college or university. As a result, to fully quantify the contribution that HACC makes to Central Pennsylvania's economy through increasing

[59] These data are derived using the 2008 to 2018 occupational projections produced by the Pennsylvania Department of Labor and Industry for the South Central and Lancaster County Workforce Investment Areas (WIAs), the two WIAs that span HACC's primary service area. These two WIAs encompass the counties of Adams, Cumberland, Dauphin, Franklin, Juniata, Lancaster, Lebanon, Perry, and York. Wage data were generated using a weighted average of May 2010 occupational wages reported by the Pennsylvania Department of Labor and Industry for the South Central and Lancaster WIAs.

the human capital of its students, we also need to quantify the economic value associated with incremental educational achievements that are below an Associate's degree.

One way to accomplish that task is to compute the annual income differential associated with a single credit hour of instruction, by dividing the difference in annual wages between occupations that require an Associate's degree and those that require only a high school diploma, by the number of credit hours required for an Associate's degree. As shown at the bottom of Table 14, that calculation indicates that the increase in average annual income associated with a single credit hour of HACC instruction is $186 across all workers, and $132 for entry level workers.

Table 14: Wages by Educational Attainment Level in Central Pennsylvania for Occupations with Projected Openings in 2008 to 2018[60]

Educational Attainment Level Required for Employment	Median Annual Wage	Entry Annual Wage
Doctoral or professional degree	$86,424	$57,058
Bachelor's degree	$58,428	$40,549
Associate's degree	$48,166	$35,186
High school diploma or equivalent	$37,015	$27,240
Less than high school	$25,769	$20,386
Difference between high school diploma or equivalent and Associate's degree	$11,152	$7,945
Difference per credit hour	$186	$132

A plausible criticism of this approach, however, is that the sum of the parts may be less than the whole. Which is to say that, because a degree serves as a third party affirmation of a worker's skills, it is likely to have an intrinsic value that exceeds the incremental value of the training that was required to obtain it. If that is true, then the per credit hour wage increase estimates presented in Table 14 likely overestimate the actual value of a credit hour of education. Recent empirical studies of the economic returns to worker training (as opposed to more traditional studies of the economic returns associated with different levels of educational attainment), provide reason to believe that this criticism, although theoretically appealing, may not be reflective of reality, however.

[60] *Data Source*: Pennsylvania Department of Labor and Industry.

In a comprehensive empirical evaluation of this issue that appeared in the Spring 2005 issue of the *Journal of Human Resources*, Harley Frazis and Mark A. Lowenstein find that 60 hours of formal training increases wages by about 5.7 percent on average.[61] By comparison, the per credit hour wage increases depicted in Table 14 imply that 60 hours of formal training increases wages by 2.0 percent across all workers, and by 1.9 percent for entry level workers.[62] In short, instead of overestimating the true value of a credit hour of education, it is very likely that the estimates presented in Table 14 actually underestimate it. Erring on the side of caution, however, these are the estimates that we will use.

Table 15 presents our analysis of the economic value that was created in Central Pennsylvania through the increased labor productivity that the education and training HACC provided in 2010-11 produced. The first two rows of Table 15 present data on the credit and non-credit FTE students that HACC served in 2010-11 (an FTE student is a mathematical construct that is equivalent to 30 credit hours of delivered instruction). Total FTEs are then multiplied by 30, and by the entry level wage increase per credit hour figure presented in Table 14, to derive an estimate of the total value of the increased labor productivity created as a result of HACC's educational services in 2010-11.

This total value is then further adjusted to account for: 1) the probability that students leave the state,[63] 2) average labor force participation rates,[64] and 3) selectivity bias, or the fact that individuals who pursue education tend to have higher than average innate abilities to start with,[65] to derive an adjusted final estimate. As shown in the last column

[61] Harley Frazis and Mark A. Lowenstein, "Reexamining the Returns to Training: Functional Form, Magnitude, and Interpretation," *The Journal of Human Resources*, vol.40, no.2, Spring 2005, pp.453-476. Frazis and Lowestein based their analysis on two national datasets: the National Longitudinal Study of Youth and the Employer Opportunity Pilot Project. The purpose of their paper was, in part, to empirically determine the optimal functional form to use for equations testing the relationship between training and wages.

[62] One credit hour is equivalent to 15 hours of formal training. Multiplying the per credit hour wage increase estimates presented in Table 14 by four and then dividing them by the average wages for individuals with a high school diploma or equivalent shown in that table indicates that, according to those per credit hour wage increase estimates, 60 hours of formal training is associated with a 2.0 percent increase in annual wages across all workers, and a 1.9 percent age increase for entry level workers.

[63] *Data Source*: U.S. Census Bureau, 2008-10 American Community Survey.

[64] *Data Source*: U.S. Census Bureau, 2010 American Community Survey.

[65] There is a substantial body of literature that indicates that not all of the difference in annual income between different educational attainment levels is attributable to educational attainment alone. The reason for this has to do with what is called selectivity bias – the tendency for those with greater innate abilities to go on to pursue higher levels of educational attainment. In other words, what you come out of the educational process with is partly attributable to what you had when you went into it. Although estimates differ, a frequently cited study by Larry L. Leslie and Paul Brinkman found that only about 79 percent of the difference in income between high school graduates and individuals with an undergraduate education is attributable to education alone. *See*, Larry L. Leslie and Paul Brinkman, *The Economic Value of Higher Education* (Phoenix: American Council of Education and the Oryx Press), 1993, pp.43-44.

of Table 15, for HACC as a whole, that estimate of the economic value of the human capital that HACC produced in 2010-11 is $42.2 million.

Finally, it is important to realize that these estimates of the value of the increased labor productivity are not one-time benefits. Rather, they are part of a stream of economic activity that continues over the entire time that the students that HACC taught in 2010-11 are active in the workforce. Based on recent analysis of the typical "work-life" of American men and women,[66] and the average age of HACC students, we estimate that time horizon to be approximately 29 years. Using this figure, along with the estimates of "adjusted total annual value of increased labor productivity" presented in Table 15, we can determine the present value, or value in today's dollars, of the stream of economic activity generated by HACC's 2010-11 educational services. As shown in the last column of Table 15, for HACC as a whole that present value is $875.9 million.[67]

In the remainder of this section, we once again use the IMPLAN model to quantify the economic and fiscal impact that is attributable to the estimates of increased labor productivity presented in Table 15. However, it is important to note that these estimates focus exclusively on the additional economic activity that is generated as former HACC students employed in the Central Pennsylvania economy turn the income differential they earn as a result of their enhanced skills and increased labor productivity into household consumption expenditures. As a result, they reflect the impact that comes from the economic ripple effects generated by the productivity-driven increase in economic activity presented in Table 15 and are an addition to that increase.

[66] *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.
[67] The discount rate used for this calculation was 2.5 percent and was the long-term rate reported for 20 year U.S. Treasury bonds as of May 15, 2012.

Table 15: Value of Increased Labor Productivity Associated with HACC's Provision of Credit and Non-Credit Education and Training in 2010-11

	Gettysburg	Harrisburg	Lancaster	Lebanon	York	Total
2010-11 Annual FTE	1,546	7,444	3,546	888	2,164	15,587
2010-11 Non-Credit Annual FTE	24	1,237	51	26	17	1,431
Total 1010-11 Annual FTE	1,570	8,681	3,597	914	2,181	17,018
Estimated Entry Level Wage Increase Per Credit Hour	$132	$132	$132	$132	$132	$132
Total Annual Value of Increased Labor Productivity	$6,237,075	$34,484,666	$14,289,654	$3,629,024	$8,662,383	$67,604,724
Probability of Out Migration	0.030	0.030	0.030	0.030	0.030	0.030
Labor Force Participation	0.814	0.814	0.814	0.814	0.814	0.814
Selectivity Bias	0.790	0.790	0.790	0.790	0.790	0.790
Adjusted Total Annual Value of Increased Labor Productivity	$3,897,279	$21,547,979	$8,928,988	$2,267,620	$5,412,749	$42,243,272
Discounted Present Value	$80,809,597	$446,794,718	$185,141,478	$47,018,832	$112,232,692	$875,909,119

College Wide Analysis

In assessing the economic ripple effects associated with the increased labor productivity that HACC's 2010-11 educational services produced, we employ the following assumptions:

- The total adjusted annual value of increased labor productivity from HACC's 2010-11 educational services was $42.2 million.
- The discounted present value of that increase in labor productivity over the 29 years that HACC students are likely to remain active in the workforce is estimated to be $875.9 million.

Feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 16:

- Regional Economic Output: After accounting for leakages from the regional economy, the increase in wages attributable to enhanced labor productivity from HACC's 2010-11 educational services generated an additional $46.5 million in overall economic activity within Central Pennsylvania, and the discounted present value of that impact over the 29 years that HACC students are likely to remain active in the workforce is estimated to be $964.3 million.
- Regional Employment: Household consumption expenditures generated by these increased wages supported a total of 417 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: Household consumption expenditures generated by these increased wages also produced $3.1 million in additional state and local tax revenue in Central Pennsylvania, and the discounted present value of that revenue increase over the 29 years that HACC students are likely to remain active in the workforce is estimated to be $64.6 million.

Table 16: Estimated Impact on Central Pennsylvania of Increased Wages Attributable to Enhanced Labor Productivity from HACC's 2010-11 Education Services

Annual Impact	Direct	Indirect	Induced	Total*
Output	$28,232,137	$8,090,387	$10,185,280	**$46,507,804**
Employment	263	64	90	**417**
State and Local Tax Revenue				**$3,117,499**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$585,389,956	$167,753,192	$211,190,550	**$964,333,698**
State and Local Tax Revenue				**$64,640,967**

*Totals may not sum due to rounding.

Campus Analyses

Gettysburg Campus

Our assessment of the economic ripple effects attributable to the increased labor productivity generated by HACC's Gettysburg Campus' 2010-11 educational services is based on the following assumptions:

- The total adjusted annual value of increased labor productivity from HACC's Gettysburg Campus' 2010-11 educational services was $3.9 million.
- The discounted present value of that increase in labor productivity over the 29 years that Gettysburg Campus students are likely to remain active in the workforce is $80.8 million.

Feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 17:

- Regional Economic Output: After accounting for leakages from the regional economy, the increase in wages attributable to enhanced labor productivity from HACC's Gettysburg Campus' 2010-11 educational services generated an additional $4.3 million in overall economic activity within Central Pennsylvania, and the discounted present value of that impact is estimated to be $89.0 million.
- Regional Employment: Household consumption expenditures generated by these increased wages supported a total of 39 additional jobs within Central Pennsylvania.

- State and Local Tax Revenue: Household consumption expenditures generated by these increased wages also produced $0.3 million in additional state and local tax revenue in Central Pennsylvania, and the discounted present value of that revenue increase is estimated to be $6.0 million.

Table 17: Estimated Impact on Central Pennsylvania of Increased Wages Attributable to Enhanced Labor Productivity from HACC's Gettysburg Campus' 2010-11 Education Services

Annual Impact	Direct	Indirect	Induced	Total*
Output	$2,604,640	$746,403	$939,673	**$4,290,716**
Employment	24	6	8	**39**
State and Local Tax Revenue				**$287,614**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$54,006,892	$15,476,570	$19,484,012	**$88,967,474**
State and Local Tax Revenue				**$5,963,644**

*Totals may not sum due to rounding.

Harrisburg Campus

We employ the following assumptions in assessing the economic ripple effects attributable to the increased labor productivity produced by HACC's Harrisburg Campus' 2010-11 educational services:

- The total adjusted annual value of increased labor productivity from HACC's Harrisburg Campus' 2010-11 educational services was $21.5 million.
- The discounted present value of that increase in labor productivity over the 29 years that Harrisburg Campus students are likely to remain active in the workforce is $446.8 million.

Feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 18:

- Regional Economic Output: After accounting for leakages from the regional economy, the increase in wages attributable to enhanced labor productivity from HACC's Harrisburg Campus' 2010-11 educational services generated an additional $23.7 million in overall economic activity within Central Pennsylvania, and the discounted present value of that impact is estimated to be $491.9 million.

- Regional Employment: Household consumption expenditures generated by these increased wages supported a total of 213 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: Household consumption expenditures generated by these increased wages also produced $1.6 million in additional state and local tax revenue in Central Pennsylvania, and the discounted present value of that revenue increase is estimated to be $33.0 million.

Table 18: Estimated Impact on Central Pennsylvania of Increased Wages Attributable to Enhanced Labor Productivity from HACC's Harrisburg Campus' 2010-11 Education Services

Annual Impact	Direct	Indirect	Induced	Total*
Output	$14,401,005	$4,126,847	$5,195,436	**$23,723,287**
Employment	134	33	46	**213**
State and Local Tax Revenue				**$1,590,213**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$298,603,051	$85,569,652	$107,726,725	**$491,899,428**
State and Local Tax Revenue				**$32,972,876**

*Totals may not sum due to rounding.

Lancaster Campus

Our assessment of the economic ripple effects attributable to the increased labor productivity created by HACC's Lancaster Campus' 2010-11 educational services is predicated on the following assumptions:

- The total adjusted annual value of increased labor productivity from HACC's Lancaster Campus' 2010-11 educational services was $8.9 million.
- The discounted present value of that increase in labor productivity over the 29 years that Lancaster Campus students are likely to remain active in the workforce is $185.1 million.

Feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 19:

- Regional Economic Output: After accounting for leakages from the regional economy, the increase in wages attributable to enhanced labor productivity from HACC's Lancaster Campus' 2010-11 educational services generated an additional $9.8 million in overall economic activity within Central Pennsylvania, and the discounted present value of that impact is estimated to be $203.8 million.
- Regional Employment: Household consumption expenditures generated by these increased wages supported a total of 88 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: Household consumption expenditures generated by these increased wages also produced $0.7 million in additional state and local tax revenue in Central Pennsylvania, and the discounted present value of that revenue increase is estimated to be $13.7 million.

Table 19: Estimated Impact on Central Pennsylvania of Increased Wages Attributable to Enhanced Labor Productivity from HACC's Lancaster Campus' 2010-11 Education Services

Annual Impact	Direct	Indirect	Induced	Total*
Output	$5,967,446	$1,710,070	$2,152,869	**$9,830,385**
Employment	56	14	19	**88**
State and Local Tax Revenue				**$658,948**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$123,734,272	$35,458,106	$44,639,490	**$203,831,867**
State and Local Tax Revenue				**$13,663,205**

*Totals may not sum due to rounding.

Lebanon Campus

In assessing the economic ripple effects attributable to the increased labor productivity produced by HACC's Lebanon Campus' 2010-11 educational services, we employ the following assumptions:

- The total adjusted annual value of increased labor productivity from HACC's Lebanon Campus' 2010-11 educational services was $2.3 million.

- The discounted present value of that increase in labor productivity over the 29 years that Lebanon Campus students are likely to remain active in the workforce is $47.0 million.

Feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 20:

- Regional Economic Output: After accounting for leakages from the regional economy, the increase in wages attributable to enhanced labor productivity from HACC's Lebanon Campus' 2010-11 educational services generated an additional $2.5 million in overall economic activity within Central Pennsylvania, and the discounted present value of that impact is estimated to be $51.8 million.
- Regional Employment: Household consumption expenditures generated by these increased wages supported a total of 22 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: Household consumption expenditures generated by these increased wages also produced $0.2 million in additional state and local tax revenue in Central Pennsylvania, and the discounted present value of that revenue increase is estimated to be $3.5 million.

Table 20: Estimated Impact on Central Pennsylvania of Increased Wages Attributable to Enhanced Labor Productivity from HACC's Lebanon Campus' 2010-11 Education Services

Annual Impact	Direct	Indirect	Induced	Total*
Output	$1,515,502	$434,292	$546,746	**$2,496,540**
Employment	14	3	5	**22**
State and Local Tax Revenue				**$167,348**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$31,423,753	$9,004,997	$11,336,716	**$51,765,465**
State and Local Tax Revenue				**$3,469,929**

*Totals may not sum due to rounding.

York Campus

We employ the following assumptions in assessing the economic ripple effects attributable to the increased labor productivity produced by HACC's York Campus' 2010-11 educational services:

- The total adjusted annual value of increased labor productivity from HACC's York Campus' 2010-11 educational services was $5.4 million.
- The discounted present value of that increase in labor productivity over the 29 years that York Campus students are likely to remain active in the workforce is $112.2 million.

Feeding these assumptions into the IMPLAN model, we obtain the estimates of annual regional economic impact shown in Table 21:

- Regional Economic Output: After accounting for leakages from the regional economy, the increase in wages attributable to enhanced labor productivity from HACC's York Campus' 2010-11 educational services generated an additional $6.0 million in overall economic activity within Central Pennsylvania, and the discounted present value of that impact is estimated to be $123.6 million.
- Regional Employment: Household consumption expenditures generated by these increased wages supported a total of 54 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: Household consumption expenditures generated by these increased wages also produced $0.4 million in additional state and local tax revenue in Central Pennsylvania, and the discounted present value of that revenue increase is estimated to be $8.3 million.

Table 21: Estimated Impact on Central Pennsylvania of Increased Wages Attributable to Enhanced Labor Productivity from HACC's York Campus' 2010-11 Education Services

Annual Impact	Direct	Indirect	Induced	Total*
Output	$3,617,463	$1,036,644	$1,305,069	**$5,959,176**
Employment	34	8	12	**54**
State and Local Tax Revenue				**$399,455**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$75,007,664	$21,494,689	$27,060,440	**$123,562,793**
State and Local Tax Revenue				**$8,282,629**

*Totals may not sum due to rounding.

Total Economic and Fiscal Impact

In this portion of the section we sum the economic and fiscal impacts from the *Operating, Capital, and Student Expenditures* and *Human Capital* portions of the section to derive a *Total Economic and Fiscal Impact* at the college wide level and also for individual campuses.

College Wide Analysis

As shown in Table 22, HACC's total economic and fiscal impact on Central Pennsylvania in 2010-11 was:

- Regional Economic Output: After accounting for leakages from the regional economy, in 2010-11 HACC was responsible for generating an additional $224.3 million in annual overall economic activity within Central Pennsylvania, and if one includes the discounted present value of the human capital that HACC created in 2010-11, that impact increases to $1.1 billion.
- Regional Employment: The direct, indirect, and induced economic activity that HACC generated in 2010-11 supported a total of 2,725 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: The direct, indirect, and induced economic activity that HACC generated in 2010-11 produced $13.3 million in additional state and local tax revenue in Central Pennsylvania, and if one takes into account the

cumulative effects of the human capital that HACC created in 2010-11, that fiscal impact increases to $74.8 million.

Table 22: Total Estimated Campus Wide Economic and Fiscal Impact of HACC on Central Pennsylvania in 2010-11

Annual Impact	Direct	Indirect	Induced	Total*
Output	$134,111,348	$37,484,095	$52,679,493	**$224,274,936**
Employment	1,957	302	466	**2,725**
State and Local Tax Revenue				**$13,262,139**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$691,269,167	$197,146,900	$253,684,763	**$1,142,100,830**
State and Local Tax Revenue				**$74,785,607**

*Totals may not sum due to rounding.

Table 23 also lists the top ten industries in Central Pennsylvania that benefited from this economic impact in 2010-11, in terms of employment.

Table 23: Top Ten Industries in Central Pennsylvania that Benefited from HACC's 2010-11 Economic Impact

Industry	Employment Impact	Output Impact
Food services and drinking places	173	$8,911,238
Offices of physicians, dentists, and other health practitioners	171	$21,184,163
Real estate establishments	82	$10,653,902
Private hospitals	76	$10,083,170
Construction of new nonresidential commercial and health care structures	57	$7,758,637
Nursing and residential care facilities	55	$3,344,030
Transit and ground passenger transportation	53	$1,920,747
Wholesale trade businesses	50	$7,980,866
Retail Stores - Food and beverage	47	$2,312,644
Employment services	45	$1,451,787

Campus Analyses

Gettysburg Campus

As shown in Table 24, the total economic and fiscal impact on Central Pennsylvania in 2010-11 attributable to HACC's Gettysburg campus was:

- Regional Economic Output: After accounting for leakages from the regional economy, in 2010-11 HACC's Gettysburg campus was responsible for generating an additional $20.7 million in annual overall economic activity within Central Pennsylvania, and if one includes the discounted present value of the human capital that the campus created in 2010-11, that impact increases to $105.3 million.
- Regional Employment: The direct, indirect, and induced economic activity that HACC's Gettysburg campus generated in 2010-11 supported a total of 297 additional jobs within Central Pennsylvania.

- State and Local Tax Revenue: The direct, indirect, and induced economic activity that HACC's Gettysburg campus generated in 2010-11 produced $1.2 million in additional state and local tax revenue in Central Pennsylvania, and if one takes into account the cumulative effects of the human capital that the campus created in 2010-11, that fiscal impact increases to $6.9 million.

Table 24: Total Estimated Economic and Fiscal Impact of HACC's Gettysburg Campus on Central Pennsylvania in 2010-11

Annual Impact	Direct	Indirect	Induced	Total*
Output	$12,346,381	$3,450,137	$4,856,315	**$20,652,834**
Employment	226	28	43	**297**
State and Local Tax Revenue				**$1,212,355**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$63,748,633	$18,180,304	$23,400,654	**$105,329,592**
State and Local Tax Revenue				**$6,888,385**

*Totals may not sum due to rounding.

Harrisburg Campus

As shown in Table 25, the total economic and fiscal impact on Central Pennsylvania in 2010-11 attributable to HACC's Harrisburg campus was:

- Regional Economic Output: After accounting for leakages from the regional economy, in 2010-11 HACC's Harrisburg campus was responsible for generating an additional $116.6 million in annual overall economic activity within Central Pennsylvania, and if one includes the discounted present value of the human capital that the campus created in 2010-11, that impact increases to $584.8 million.
- Regional Employment: The direct, indirect, and induced economic activity that HACC's Harrisburg campus generated in 2010-11 supported a total of 1,382 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: The direct, indirect, and induced economic activity that HACC's Harrisburg campus generated in 2010-11 produced $6.9 million in additional state and local tax revenue in Central Pennsylvania, and if one takes

into account the cumulative effects of the human capital that the campus created in 2010-11, that fiscal impact increases to $38.3 million.

Table 25: Total Estimated Economic and Fiscal Impact of HACC's Harrisburg Campus on Central Pennsylvania in 2010-11

Annual Impact	Direct	Indirect	Induced	Total*
Output	$69,729,453	$19,476,723	$27,372,570	**$116,578,745**
Employment	983	157	242	**1,382**
State and Local Tax Revenue				**$6,941,746**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$353,931,499	$100,919,528	$129,903,859	**$584,754,886**
State and Local Tax Revenue				**$38,324,409**

*Totals may not sum due to rounding.

Lancaster Campus

As shown in Table 26, the total economic and fiscal impact on Central Pennsylvania in 2010-11 attributable to HACC's Lancaster campus was:

- Regional Economic Output: After accounting for leakages from the regional economy, in 2010-11 HACC's Lancaster campus was responsible for generating an additional $47.6 million in annual overall economic activity within Central Pennsylvania, and if one includes the discounted present value of the human capital that the campus created in 2010-11, that impact increases to $241.6 million.
- Regional Employment: The direct, indirect, and induced economic activity that HACC's Lancaster campus generated in 2010-11 supported a total of 578 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: The direct, indirect, and induced economic activity that HACC's Lancaster campus generated in 2010-11 produced $2.8 million in additional state and local tax revenue in Central Pennsylvania, and if one takes into account the cumulative effects of the human capital that the campus created in 2010-11, that fiscal impact increases to $15.8 million.

Table 26: Total Estimated Economic and Fiscal Impact of HACC's Lancaster Campus on Central Pennsylvania in 2010-11

Annual Impact	Direct	Indirect	Induced	Total*
Output	$28,461,204	$7,957,449	$11,190,488	**$47,609,140**
Employment	415	65	99	**578**
State and Local Tax Revenue				**$2,802,802**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$146,228,030	$41,705,485	$53,677,109	**$241,610,622**
State and Local Tax Revenue				**$15,807,059**

*Totals may not sum due to rounding.

Lebanon Campus

As shown in Table 27, the total economic and fiscal impact on Central Pennsylvania in 2010-11 attributable to HACC's Lebanon campus was:

- Regional Economic Output: After accounting for leakages from the regional economy, in 2010-11 HACC's Lebanon campus was responsible for generating an additional $11.8 million in annual overall economic activity within Central Pennsylvania, and if one includes the discounted present value of the human capital that the campus created in 2010-11, that impact increases to $61.1 million.
- Regional Employment: The direct, indirect, and induced economic activity that HACC's Lebanon campus generated in 2010-11 supported a total of 140 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: The direct, indirect, and induced economic activity that HACC's Lebanon campus generated in 2010-11 produced $0.7 million in additional state and local tax revenue in Central Pennsylvania, and if one takes into account the cumulative effects of the human capital that the campus created in 2010-11, that fiscal impact increases to $4.0 million.

Table 27: Total Estimated Economic and Fiscal Impact of HACC's Lebanon Campus on Central Pennsylvania in 2010-11

Annual Impact	Direct	Indirect	Induced	Total*
Output	$7,056,334	$1,975,316	$2,775,043	**$11,806,693**
Employment	100	15	25	**140**
State and Local Tax Revenue				**$694,309**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$36,964,585	$10,546,021	$13,565,013	**$61,075,618**
State and Local Tax Revenue				**$3,996,890**

*Totals may not sum due to rounding.

York Campus

As shown in Table 28, the total economic and fiscal impact on Central Pennsylvania in 2010-11 attributable to HACC's York campus was:

- Regional Economic Output: After accounting for leakages from the regional economy, in 2010-11 HACC's York campus was responsible for generating an additional $27.4 million in annual overall economic activity within Central Pennsylvania, and if one includes the discounted present value of the human capital that the campus created in 2010-11, that impact increases to $145.0 million.
- Regional Employment: The direct, indirect, and induced economic activity that HACC's York campus generated in 2010-11 supported a total of 327 additional jobs within Central Pennsylvania.
- State and Local Tax Revenue: The direct, indirect, and induced economic activity that HACC's York campus generated in 2010-11 produced $1.6 million in additional state and local tax revenue in Central Pennsylvania, and if one takes into account the cumulative effects of the human capital that the campus created in 2010-11, that fiscal impact increases to $9.5 million.

Table 28: Total Estimated Economic and Fiscal Impact of HACC's York Campus on Central Pennsylvania in 2010-11

Annual Impact	Direct	Indirect	Induced	Total*
Output	$16,391,893	$4,588,339	$6,439,585	**$27,419,817**
Employment	232	37	57	**327**
State and Local Tax Revenue				**$1,597,007**
Discounted Present Value	**Direct**	**Indirect**	**Induced**	**Total***
Output	$87,782,094	$25,046,384	$32,194,956	**$145,023,434**
State and Local Tax Revenue				**$9,480,181**

*Totals may not sum due to rounding.

Return on Investment

In this section, we use the analysis presented in the previous *Economic and Fiscal Impact* section to quantify the return on investment that state and local governments, and students, earn from their investment in HACC.

State and Local Government

In fiscal year 2010-11, HACC received $44.4 million in state and local appropriations. That same year, as shown earlier in Table 22, the discounted present value of the current and future state and local tax revenue generated as a result of HACC's regional spending and production of human capital was $74.8 million.[68] As demonstrated in Table 29, comparing these two figures indicates that the benefit/cost ratio was 1.68, which means that state and local governments received $1.68 back on every $1.00 of tax revenue they invested in HACC, a 68 percent return on investment.

[68] The total state and local tax revenue generated by HACC in 2010-11 is a combination of: 1) the state and local tax revenue generated that year from the direct, indirect, and induced economic impact that HACC created through its operations, capital, and student spending, and 2) the discounted present value of the stream of future state and local tax revenue attributable to the increased labor productivity that HACC's 2010-11 educational services produced.

Table 29: State and Local Government Return on Investment

State and Local Appropriations in 2010-11	HACC's Total State and Local Fiscal Impact in 2010-11	Benefit/Cost Ratio	Return on Investment
$44,383,542	$74,785,607	1.68	68%

Students

As shown in Table 10, in academic year 2010-11 average in-district tuition at HACC was $3,195, while average out-of-district in-state tuition was $5,490. This implies that the discounted present value of the two years of tuition payments that would have been required to complete an Associate's degree was $6,470 for in-district students and $11,117 for out-of-district in-state students.[69] Recall also from Table 14, that we estimate the in Central Pennsylvania average annual difference in income between occupations that require an Associate's degree and occupations that require only a high school diploma is $11,152. The discounted present value of that annual income differential over the 29 years that the average HACC student can be expected to remain in the labor force is $228,098. Table 30 compares these figures to show that the benefit/cost ratio for obtaining an Associate's degree at HACC is 35.25 for in-district students and 20.52 for out-of-district students. These benefit/cost ratios translate into a 3,425 percent return on investment for in-district students and a 1,952 percent return on investment for out-of-district students.

[69] Consistent with the discounted present value calculation for benefits, includes opportunity cost of interest on first year of tuition.

Table 30: Total Estimated Economic and Fiscal Impact of HACC's York Campus on Central Pennsylvania in 2010-11

	In-District Students	Out-of-District In-State Students
Total Tuition Required for Associate's Degree	$6,470	$11,117
Annual Regional Income Differential between Associate's Degree and High School Degree	$11,152	$11,152
Discounted Present Value Over Typical 29 Year Student "Work-Life"	$228,098	$228,098
Benefit/Cost Ratio	35.25	20.52
Return on Investment	3,425%	1,952%

Workforce Impact

In this section, we quantify the contribution that HACC makes to ensuring that Central Pennsylvania is developing the qualified workforce it will need to be economically successful in the future by looking at the degree to which the HACC is meeting the region's occupation-driven demand for graduates. The method used to accomplish this analysis is not new and has been successfully employed in earlier studies conducted in several states.[70]

Demand for Graduates

To project the occupation-driven demand for graduates we start with projections of occupational employment. According to the most recent occupational employment projections for the Lancaster County and South Central Workforce Investment Areas (WIAs) – the two WIAs that span HACC's service area – between 2008 and 2018 the region will experience approximately 25,800 job openings each year.[71] Breaking this number down according to major occupational group shows that, the largest numbers of

[70] Similar methods are used in at least nine states (California, Georgia, Idaho, Illinois, New Jersey, Tennessee, Texas, Utah, and Virginia) to project anticipated education and training demands. For an excellent exposition of this method *see*, William J. Drummond and Jan L Youtie, "Occupational Employment, Demand for College Graduates, and Migration: A Statewide View," a report to the Board of Regents, University System of Georgia, 1999. For an example of how this method has been used previously in Virginia *see*, A. Fletcher Mangum, "System-Wide Needs Assessment for Virginia Education," State Council of Higher Education for Virginia, March 28, 2002, p.90.

[71] *Data Source*: Pennsylvania Department of Labor and Industry. The Lancaster County and South Central Workforce Investment Areas (WIAs) are the two WIAs that span HACC's primary service area. These two WIAs encompass the counties of Adams, Cumberland, Dauphin, Franklin, Juniata, Lancaster, Lebanon, Perry, and York.

annual openings are projected to occur in *Office and Administrative Support* occupations (3,485), *Food Preparation and Serving* occupations (3,251 per year), *Sales and Related* occupations (3,169 per year), *Transportation and Materials Moving* occupations (2,200 per year), *Production* occupations (2,004 per year), and *Healthcare Practitioners and Technical* occupations (1,549 per year). The numbers for these major occupation groups and all others are graphically displayed in Figure 19.

In addition, Figure 20 the provides a graphical breakdown of the educational attainment level that is required for entry level employment in these occupations. As these data indicate, 2,342, or approximately 10 percent, of the 23,622 projected annual openings in Central Pennsylvania in 2008 to 2018 for which entry level educational attainment requirements are known, will require an Associate's degree or some type of postsecondary certificate. For the remainder of this section, we restrict our analysis to the occupations associated with those 2,342 average annual openings.

In the next step of the process, we use a crosswalk developed by the National Crosswalk Service Center to "map" occupations into the specific education and training program(s) necessary for entry into that occupation.[72] Through this process, we are able to use the occupational projections for the Lancaster County and South Central WIAs to estimate the occupation-driven demand for postsecondary education graduates within Central Pennsylvania.[73]

[72] The National Crosswalk Service Center (NCSC) is funded by the U.S. Department of Labor, Employment and Training Administration. The specific NCSC crosswalk used in this analysis is the *2000 Standard Occupational Classification Crosswalk to 2000 Classification of Instructional Programs*. This crosswalk identifies the prerequisite instructional programs (classified according to the National Center for Educational Statistics' *2000 Classification of Instructional Program*, or *CIP*, code) necessary for employment in 1,364 specific occupations (classified according to the Bureau of Labor Statistics' *2000 Standard Occupational Classification*, or *SOC*, code). Often, these are many-to-many relationships where a given instructional program can serve as an avenue into one of many jobs, or one of several instructional programs can serve as a prerequisite for a given job.

[73] More formally, the demand for education and training programs is calculated as:

$$DCIP_i = \sum Dcip_{ji}$$

Where,

$$Dcip_{ji} = (SOC_j)(GCIP_i/\sum Gcip_{ij})$$

and,

$DCIP_i$ = the annual demand for instructional program *i*
$\sum Dcip_{ji}$ = the annual demand for instructional program *i* across all occupation(s) *j*
SOC_j = the projected annual openings for occupation *j*
$GCIP_i$ = Central Pennsylvania graduates from instructional program *i*
$\sum Gcip_{ij}$ = Central Pennsylvania graduates from all instructional program(s) *i* related to occupation *j*

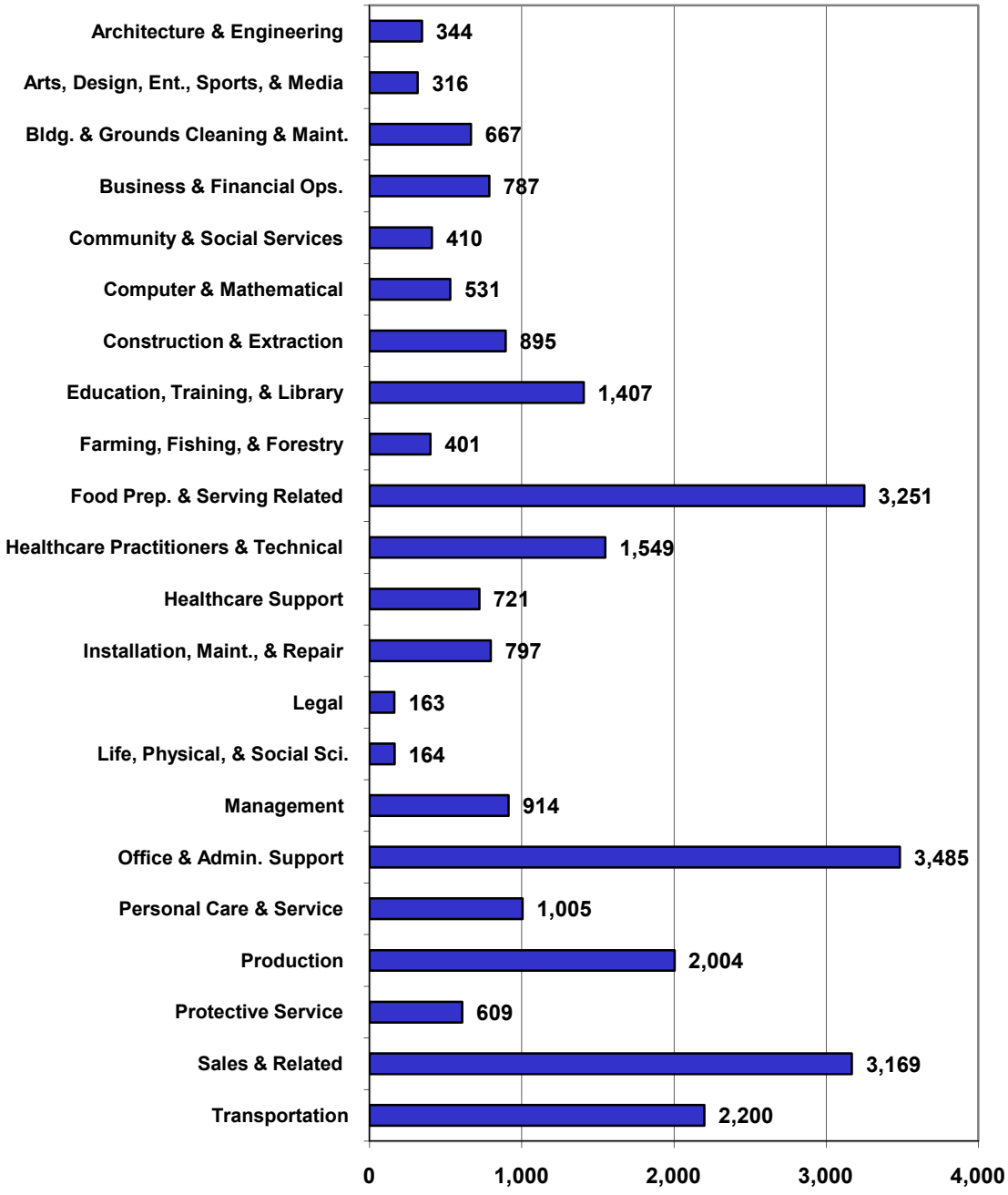

Figure 19: Projected Average Annual Openings in Central Pennsylvania by Major Occupation Category – 2008 to 2018[74]

[74] *Data Source*: Pennsylvania Department of Labor and Industry. These data are based on 2008 to 2018 occupational projections for the Lancaster County and South Central Workforce Investment Areas (WIAs), the two WIAs that span HACC's primary service area. These two WIAs encompass the counties of Adams, Cumberland, Dauphin, Franklin, Juniata, Lancaster, Lebanon, Perry, and York.

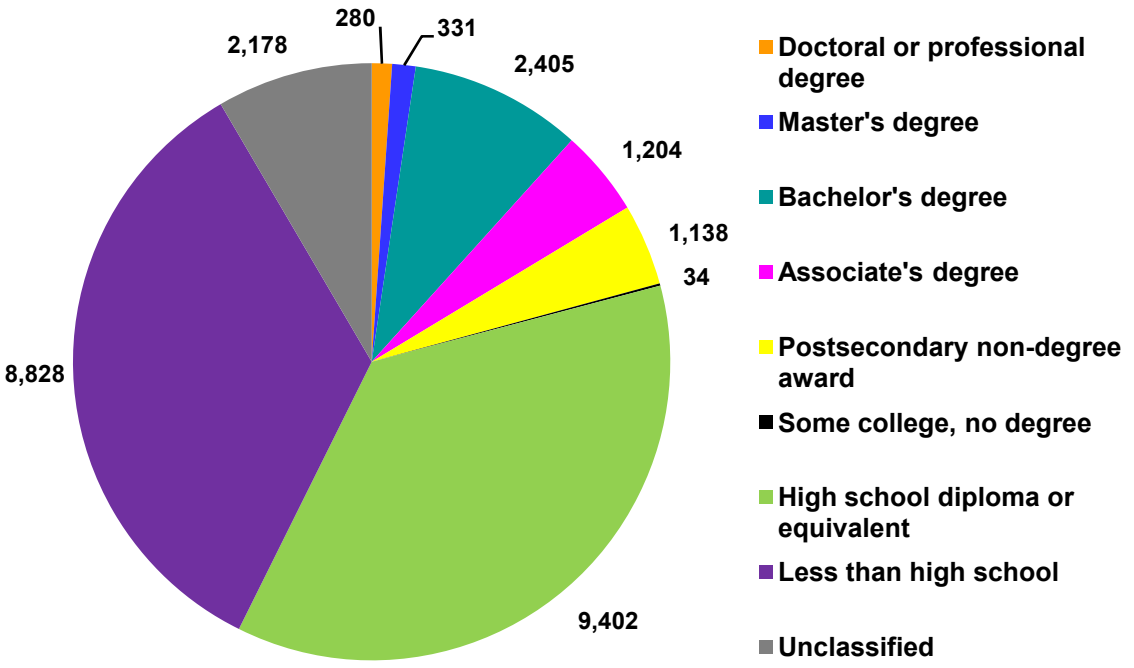

Figure 20: Distribution of 2008 to 2018 Projected Average Annual Openings in Central Pennsylvania by Educational Attainment Required for Entry Level Employment

Supply of Graduates

To estimate the likely supply of graduates within those education and training programs identified in the demand analysis, we use 2009-10 completions data from the National Center for Education Statistics' IPEDS Data Center for all colleges and universities within HACC's service area (for a detailed listing of these institutions, *see* Table 1 in the Appendix).

Percentage of Regional Occupation-Driven Demand for Graduates Met

Table 31 details the results obtained from a comparison of the occupation-driven demand for graduates in Central Pennsylvania and the supply of qualified graduates produced by HACC and other colleges and universities within HACC's service area, or the top 20 regional occupations in terms of projected average annual openings (for additional detail, *see* Table A2 in the Appendix). Looking at the top ten of these occupations, in 2010-11 HACC met:

- 45 percent of the regional demand for *Registered Nurses*,
- 40 percent of the regional demand for *Licensed Practical Nurses*,
- 100 percent of the regional demand for *General Operating Managers*,
- 84 percent of the regional demand for *Preschool Teachers*,
- 36 percent of the regional demand for *Dental Assistants*,
- 98 percent of the regional demand for *HVAC Mechanics*,
- 100 percent of the regional demand for *Construction Managers*,
- 0 percent of the regional demand for *Medical Records Technicians*,
- 13 percent of the regional demand for *Electrical Repairers*, and
- 76 percent of the regional demand for *Dental Hygienists*.

Table 31: Top 20 Demand Occupations – Workforce Demand and Supply in 2009-10

Occupation	Average Annual Openings	Median Annual Wage	Degree Required	Total Awards, All Institutions	GAP	% of Demand met by All Institutions	Total Awards, HACC	% of Demand met by HACC
Registered Nurses	573	N/A	Associate's degree	473	100	83%	258	45%
Licensed Practical & Licensed Vocational Nurses	219	$41,460	Certificate	87	132	40%	87	40%
General & Operations Managers	154	$84,088	Associate's degree	257	0	100%	172	100%
Preschool Teachers	55	$22,751	Associate's degree	46	9	84%	46	84%
Dental Assistants	53	$32,492	Certificate	105	0	100%	19	36%
Heating, A/C & Refrigeration Mechanics & Installers	47	$43,055	Certificate	138	0	100%	46	98%
Construction Managers	46	$73,650	Associate's degree	79	0	100%	55	100%

Table 31: Top 20 Demand Occupations – Workforce Demand and Supply in 2009-10

Occupation	Average Annual Openings	Median Annual Wage	Degree Required	Total Awards, All Institutions	GAP	% of Demand met by All Institutions	Total Awards, HACC	% of Demand met by HACC
Medical Records & Health Information Technicians	40	$29,225	Certificate	25	15	62%	0	0%
Elec. Repairers - Commercial & Industrial Equipment	37	$48,517	Certificate	5	32	13%	5	13%
Dental Hygienists	33	$62,890	Associate's degree	25	8	76%	25	76%
Emergency Medical Technicians & Paramedics	30	$26,853	Certificate	3	27	10%	3	10%
Architectural & Civil Drafters	28	$41,664	Associate's degree	53	0	100%	0	0%
Surgical Techs	27	$40,075	Certificate	20	7	74%	10	37%

Table 31: Top 20 Demand Occupations – Workforce Demand and Supply in 2009-10

Occupation	Average Annual Openings	Median Annual Wage	Degree Required	Total Awards, All Institutions	GAP	% of Demand met by All Institutions	Total Awards, HACC	% of Demand met by HACC
Medical & Clinical Laboratory Techs.	23	$37,988	Associate's degree	16	7	70%	10	43%
Fire Fighters	22	$49,240	Certificate	7	15	32%	7	32%
Paralegals & Legal Assistants	22	$41,472	Associate's degree	62	0	100%	46	100%
Mechanical Drafters	21	$44,607	Associate's degree	28	0	100%	0	0%
Respiratory Therapists	17	$56,646	Associate's degree	20	0	100%	5	30%
Physical Therapist Assistants	17	$43,131	Associate's degree	70	0	100%	0	0%
Chemical Technicians	12	$30,502	Associate's degree	1	11	5%	0	0%

Conclusion

This report has assessed the economic and fiscal contribution that HACC makes to Central Pennsylvania. That analysis has shown that HACC serves one of the fastest growing areas of Pennsylvania. Between 2000 and 2010, where statewide Pennsylvania's population grew by 3.4 percent, the population of HACC's core service area grew by 10.9 percent. In addition, our analysis has shown that HACC is one of Pennsylvania's largest and fastest growing postsecondary education institutions. Between 2002 and 2010, HACC's fall enrollment increased from 13,082 to 23,210, an increase of 10,128 students or 77 percent. In contrast, over that same period the average growth across all Pennsylvania community colleges was 28 percent, across all four-year state universities 16 percent, and across all four-year state-related universities 11 percent.

Our analysis has also illuminated the pivotal role that HACC plays within its service area. For example, HACC is the institution of choice for 83 percent of Pennsylvania residents attending any public or private two-year college within its service area, and 34 percent of Pennsylvania residents attending any public or private, two- or four-year, college or university within its service area. In addition, within its service area HACC is the largest provider of Associate's degrees, the largest provider of postsecondary education to "non-traditional" adult students, the largest provider of postsecondary education to minorities, and the most significant on-ramp for affordable access to higher education.

Our analysis has shown that HACC makes a major economic and fiscal contribution to Central Pennsylvania through its operations and capital expenditures, and spending from its students. In fiscal year 2010-11, HACC was responsible for contributing $173 million dollars in direct spending to Central Pennsylvania. After accounting for leakages from the regional economy due to expenditures on goods produced outside of the region (*e.g.*, any consumer good with "made in China" stamped on it), payroll deductions, and savings, that $173 million generated $106 million in net spending that stayed in the regional economy. The economic ripple effects from those dollars then created a total of $178 million in overall economic activity within Central Pennsylvania, which means that every $1.00 of HACCs net local spending ultimately generated $1.68 in overall economic activity for the region. In addition, our analysis indicates that HACC's 2010-11 net regional spending was responsible for supporting a total of 2,308 jobs within Central Pennsylvania, and generating $10.1 million in state and local tax revenue.

Even more importantly, our analysis has shown that HACC makes a critical contribution to Central Pennsylvania through the human capital it produces, it students. Differences in wages reflect differences in the value that employers place on worker skills obtained through education and training. If one looks just at the wages in those Central Pennsylvania occupations that are projected to experience employment growth between

2008 and 2018, the typical median wage for occupations that require an Associate's degree is $48,166, while the typical median wage for occupations that require only a high school diploma is $37,015, a difference of $11,152 a year. Based on that differential, we have shown that the credit and non-credit education that HACC supplied in 2010-11 was responsible for creating $42 million in additional human capital in Central Pennsylvania that year. Moreover, the discounted present value of that increase, over the 29 years that HACC students are likely to remain active in the regional workforce, is $876 million.

Looking only at the increased household expenditures that are facilitated by that increase in human capital and associated increase in income, we have shown that the annual economic impact on Central Pennsylvania is $47 million in additional economic activity, 417 additional jobs, and $3.1 million in state and local tax revenue. Moreover, if one takes into account the stream of economic benefits that accrue to the region over the time that HACC students are active in the workforce, the discounted present value of that increase in economic activity is $964 million, and the discounted present value of the state and local tax revenue stream created is $67 million.

Finally, we have demonstrated that HACC makes a significant contribution to ensuring that Central Pennsylvania will have the trained graduates it needs to prosper in the future in key growth areas such as healthcare and education. By comparing the regional occupation-driven demand for graduates in specific programs with the number of local graduates that HACC produces in those programs, we have shown that HACC is currently meeting: 1) 45 percent of the regional demand for *Registered Nurses*, 2) 40 percent of the regional demand for *Licensed Practical Nurses*, 3) 100 percent of the regional demand for *General Operating Managers*, 4) 84 percent of the regional demand for *Preschool Teachers*, 5) 36 percent of the regional demand for *Dental Assistants*, and 6) 98 percent of the regional demand for *HVAC Mechanics*.

In sum, HACC is a rapidly growing institution, that plays a pivotal role within its service area as one of the region's most important providers of postsecondary education, and has a significant economic and fiscal impact on Central Pennsylvania as a result of its own economic contributions and those of the well trained students that it produces.

Appendix

Table A1: Colleges and Universities Listed within the HACC Service Area[75]

Institution Name	Level	Control
Millersville University of Pennsylvania	4 yr.	Public
Pennsylvania State University-Penn State Harrisburg	4 yr.	Public
Pennsylvania State University-Penn State Mont Alto	4 yr.	Public
Pennsylvania State University-Penn State York	4 yr.	Public
Shippensburg University of Pennsylvania	4 yr.	Public
Pennsylvania State University-College of Medicine	4 yr.	Public
The Dickinson School of Law of the Pennsylvania State University	4 yr.	Public
Dickinson College	4 yr.	Private Non-Profit
Elizabethtown College	4 yr.	Private Non-Profit
Franklin and Marshall College	4 yr.	Private Non-Profit
Gettysburg College	4 yr.	Private Non-Profit
Lancaster Bible College	4 yr.	Private Non-Profit
Lebanon Valley College	4 yr.	Private Non-Profit
Messiah College	4 yr.	Private Non-Profit
Pennsylvania College of Art and Design	4 yr.	Private Non-Profit
Wilson College	4 yr.	Private Non-Profit
York College Pennsylvania	4 yr.	Private Non-Profit
Lancaster General College of Nursing & Health Sciences	4 yr.	Private Non-Profit
Harrisburg University of Science and Technology	4 yr.	Private Non-Profit
Lutheran Theological Seminary at Gettysburg	4 yr.	Private Non-Profit
Evangelical Theological Seminary	4 yr.	Private Non-Profit
Widener University-Harrisburg Campus	4 yr.	Private Non-Profit
Lancaster Theological Seminary	4 yr.	Private Non-Profit
The Art Institutes of York-PA	4 yr.	Private For-Profit
Central Pennsylvania College	4 yr.	Private For-Profit
University of Phoenix-Harrisburg Campus	4 yr.	Private For-Profit
Harrisburg Area Community College-Harrisburg	2 yr.	Public
Thaddeus Stevens College of Technology	2 yr.	Public

[75] *Data Source*: National Center for Education Statistics, IPEDS Data Center.

Table A1: Colleges and Universities Listed within the HACC Service Area[75]

Institution Name	Level	Control
NAWCC School of Horology	2 yr.	Private Non-Profit
Keystone Technical Institute	2 yr.	Private For-Profit
YTI Career Institute	2 yr.	Private For-Profit
Consolidated School of Business	2 yr.	Private For-Profit
YTI Career Institute	2 yr.	Private For-Profit
Yorktowne Business Institute	2 yr.	Private For-Profit
Kaplan Career Institute	2 yr.	Private For-Profit
Consolidated School of Business	2 yr.	Private For-Profit
ITT Technical Institute-Harrisburg	2 yr.	Private For-Profit

Table A2: Workforce Gap Analysis – Award Detail

SOC Title	Avg. Open-ings	Annual Wage	Degree Req.	All						HACC				
				Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	Gap	% De-mand Met	Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	% De-mand Met
Registered Nurses	573	N/A	Assoc.	0	0	473	473	100	83%	0	0	258	258	45%
General & Operations Managers	154	$84,088	Assoc.	0	87	0	87	132	40%	0	87	0	87	40%
Preschool Teachers	55	$22,751	Assoc.	2	2	253	257	0	100%	0	1	171	172	100%
Construction Managers	46	$73,650	Assoc.	0	0	46	46	9	84%	0	0	46	46	84%
Dental Hygienists	33	$62,890	Assoc.	0	91	14	105	0	100%	0	19	0	19	36%
Architectural & Civil Drafters	28	$41,664	Assoc.	22	100	16	138	0	100%	22	14	10	46	98%
Medical & Clinical Laboratory Technicians	23	$37,988	Assoc.	0	0	78	79	0	100%	0	0	54	55	100%
Paralegals & Legal Assistants	22	$41,472	Assoc.	0	25	0	25	15	62%	0	0	0	0	0%
Mechanical Drafters	21	$44,607	Assoc.	0	2	2	5	32	13%	0	2	2	5	13%
Respiratory Therapists	17	$56,646	Assoc.	0	0	25	25	8	76%	0	0	25	25	76%
Physical Therapist Assistants	17	$43,131	Assoc.	0	2	1	3	27	10%	0	2	1	3	10%
Chemical Technicians	12	$30,502	Assoc.	0	0	53	53	0	100%	0	0	0	0	0%
Electrical & Electronic Engineering Technicians	12	$46,382	Assoc.	0	2	18	20	7	74%	0	0	10	10	37%

Table A2: Workforce Gap Analysis – Award Detail

SOC Title	Avg. Open-ings	Annual Wage	Degree Req.	All						HACC				
				Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	Gap	% De-mand Met	Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	% De-mand Met
Cardiovascular Technologists & Technicians	12	$44,832	Assoc.	0	6	10	16	7	70%	0	0	10	10	43%
Civil Engineering Technicians	10	$43,736	Assoc.	0	0	7	7	15	32%	0	0	7	7	32%
Industrial Engineering Technicians	9	$46,701	Assoc.	0	8	55	62	0	100%	0	8	39	46	100%
Electrical & Electronics Drafters	7	$49,734	Assoc.	0	0	28	28	0	100%	0	0	0	0	0%
Diagnostic Medical Sonographers	7	$59,469	Assoc.	0	0	20	20	0	100%	0	0	5	5	30%
Mechanical Engineering Technicians	6	$39,278	Assoc.	0	0	70	70	0	100%	0	0	0	0	0%
Occupational Therapist Assistants	6	$45,957	Assoc.	0	0	1	1	11	5%	0	0	0	0	0%
Radiation Therapists	4	$79,460	Assoc.	4	0	0	4	8	31%	4	0	0	4	31%
Nuclear Medicine Technologists	4	$63,943	Assoc.	0	53	103	156	0	100%	0	1	12	13	100%
Drafters, All Other	3	$52,253	Assoc.	0	2	15	17	0	100%	0	0	14	14	100%
Engineering Technicians, Except Drafters, All Other	3	$54,630	Assoc.	0	46	10	56	0	100%	0	0	0	0	0%
Respiratory Therapy Technicians	3	$47,707	Assoc.	0	0	8	8	2	77%	0	0	8	8	77%

Table A2: Workforce Gap Analysis – Award Detail

SOC Title	Avg. Open-ings	Annual Wage	Degree Req.	All						HACC				
				Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	Gap	% De-mand Met	Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	% De-mand Met
Social Science Research Assistants	1	$43,220	Assoc.	0	1	1	1	8	13%	0	1	1	1	13%
Licensed Practical & Licensed Vocational Nurses	219	$41,460	Cert.	0	0	38	38	0	100%	0	0	0	0	0%
Dental Assistants	53	$32,492	Cert.	0	0	9	9	0	100%	0	0	0	0	0%
Heating, A/C & Refrigeration Mechanics/Installers	47	$43,055	Cert.	0	4	16	20	0	100%	0	0	8	8	100%
Medical Records & Health Information Technicians	40	$29,225	Cert.	0	1	21	22	0	100%	0	1	12	13	100%
Elec. Repairers - Commercial & Industrial Equipment	37	$48,517	Cert.	0	0	15	15	0	100%	0	0	0	0	0%
Emergency Medical Technicians & Paramedics	30	$26,853	Cert.	0	0	0	1	4	12%	0	0	0	1	12%
Surgical Technologists	27	$40,075	Cert.	0	0	18	18	0	100%	0	0	0	0	0%
Fire Fighters	22	$49,240	Cert.	0	18	5	23	0	100%	0	0	5	5	100%
Audio & Video Equipment Technicians	12	$31,510	Cert.	0	0	1	1	2	33%	0	0	1	1	33%

Table A2: Workforce Gap Analysis – Award Detail

SOC Title	Avg. Open-ings	Annual Wage	Degree Req.	All						HACC				
				Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	Gap	% De-mand Met	Cert., < 1 yr.	Cert., > 1 yr and < 2 yrs	Assoc	Total	% De-mand Met
Massage Therapists	11	$34,920	Cert.	0	0	4	4	0	100%	0	0	0	0	0%
Computer, Automated Teller & Office Machine Repairers	9	$38,667	Cert.	0	5	13	18	0	100%	0	0	13	13	100%
Court Reporters	3	$44,830	Cert.	0	0	3	3	0	100%	0	0	1	1	30%
Elec. Installers & Repairers - Transportation Equipment	1	$34,940	Cert.	0	0	0	0	1	11%	0	0	0	0	11%
Elec. Equipment Installers & Repairers, Motor Vehicles	1	$22,860	Cert.	0	0	0	0	1	11%	0	0	0	0	11%
Insurance Appraisers, Auto Damage	1	$57,140	Cert.	0	0	0	0	1	20%	0	0	0	0	0%
Sound Engineering Technicians	1	$41,890	Cert.	0	0	0	0	1	31%	0	0	0	0	31%
Cooks, Private Household	1	N/A	Cert.	0	0	3	3	0	100%	0	0	3	3	100%
Private Detectives & Investigators	5	$62,610	Some col.	0	0	1	1	0	100%	0	0	0	0	14%

Table A3: Workforce Gap Analysis – HACC Program Detail

Occupation	Avg. Annual Open-ings	Required Degree	CIP	CIP Title	Award	2009-10 Comple-tions
Pesticide Handlers, Sprayers & Applicators, Vegetation	5	High school diploma or equivalent	010605	Landscaping and Groundskeeping.	Assoc.	1
Supervisors - Landscaping & Groundskeeping Workers	13	High school diploma or equivalent	010605	Landscaping and Groundskeeping.	Assoc.	1
Audio & Video Equipment Technicians	12	Postsecondary non-degree award	100203	Recording Arts Technology/Technician.	Cert., < 1 yr.	4
Data Entry Keyers	37	High school diploma or equivalent	110601	Data Entry/Microcomputer Applications, General.	Cert., < 1 yr.	3
Chefs & Head Cooks	12	High school diploma or equivalent	120501	Baking and Pastry Arts/Baker/Pastry Chef.	Cert., >1 & < 2 yrs.	1
Chefs & Head Cooks	12	High school diploma or equivalent	120503	Culinary Arts/Chef Training.	Assoc.	1
Supervisors - Food Preparation & Serving Workers	79	High school diploma or equivalent	120503	Culinary Arts/Chef Training.	Assoc.	8
Food Service Managers	35	High school diploma or equivalent	120504	Restaurant, Culinary, and Catering Management/Manager.	Cert., < 1 yr.	1
Supervisors - Food Preparation & Serving Workers	79	High school diploma or equivalent	120504	Restaurant, Culinary, and Catering Management/Manager.	Cert., < 1 yr.	3
Preschool Teachers	55	Associate's degree	131210	Early Childhood Education and Teaching.	Assoc.	46
Engineering Technicians, Except Drafters, All Other	3	Associate's degree	150101	Architectural Engineering Technology/Technician.	Assoc.	13
Civil Engineering Technicians	10	Associate's degree	150201	Civil Engineering Technology/Technician.	Assoc.	7
Electrical & Electronic Engineering Technicians	12	Associate's degree	150303	Electrical, Electronic and Communications Engineering Technology/Technician.	Cert., >1 & < 2 yrs.	1
Electrical & Electronic Engineering Technicians	12	Associate's degree	150303	Electrical, Electronic and Communications Engineering Technology/Technician.	Assoc.	12
Mechanical Engineering Technicians	6	Associate's degree	150805	Mechanical Engineering/Mechanical Technology/Technician.	Cert., >1 & < 2 yrs.	1
Mechanical Engineering Technicians	6	Associate's degree	150805	Mechanical Engineering/Mechanical Technology/Technician.	Assoc.	12
Civil Engineering Technicians	10	Associate's degree	151001	Construction Engineering Technology/Technician.	Assoc.	1
Construction Managers	46	Associate's degree	151001	Construction Engineering Technology/Technician.	Assoc.	3
Supervisors - Food Preparation & Serving Workers	79	High school diploma or equivalent	190505	Foodservice Systems Administration/Management.	Assoc.	1
Child Care Workers	231	High school diploma or equivalent	190709	Child Care Provider/Assistant.	Cert., < 1 yr.	2
Child Care Workers	231	High school diploma or equivalent	190709	Child Care Provider/Assistant.	Cert., >1 & < 2 yrs.	5

Table A3: Workforce Gap Analysis – HACC Program Detail

Occupation	Avg. Annual Open-ings	Required Degree	CIP	CIP Title	Award	2009-10 Comple-tions
Legal Support Workers, Other	3	High school diploma or equivalent	220302	Legal Assistant/Paralegal.	Cert., >1 & < 2 yrs.	1
Title Examiners, Abstractors & Searchers	4	High school diploma or equivalent	220302	Legal Assistant/Paralegal.	Cert., >1 & < 2 yrs.	1
Legal Support Workers, Other	3	High school diploma or equivalent	220302	Legal Assistant/Paralegal.	Assoc.	5
Title Examiners, Abstractors & Searchers	4	High school diploma or equivalent	220302	Legal Assistant/Paralegal.	Assoc.	7
Paralegals & Legal Assistants	22	Associate's degree	220302	Legal Assistant/Paralegal.	Cert., >1 & < 2 yrs.	8
Paralegals & Legal Assistants	22	Associate's degree	220302	Legal Assistant/Paralegal.	Assoc.	39
Court Reporters	3	Postsecondary non-degree award	220303	Court Reporting/Court Reporter.	Assoc.	1
Managers, Other	25	High school diploma or equivalent	420101	Psychology, General.	Assoc.	22
Correctional Officers & Jailers	164	High school diploma or equivalent	430102	Corrections.	Cert., >1 & < 2 yrs.	1
Managers, Other	25	High school diploma or equivalent	430103	Criminal Justice/Law Enforcement Administration.	Assoc.	28
Supervisors - Police & Detectives	28	High school diploma or equivalent	430103	Criminal Justice/Law Enforcement Administration.	Assoc.	31
Detectives & Criminal Investigators	14	High school diploma or equivalent	430107	Criminal Justice/Police Science.	Assoc.	1
Police & Sheriff's Patrol Officers	134	High school diploma or equivalent	430107	Criminal Justice/Police Science.	Cert., >1 & < 2 yrs.	3
Police & Sheriff's Patrol Officers	134	High school diploma or equivalent	430107	Criminal Justice/Police Science.	Assoc.	12
Supervisors - Other Protective Service Workers	4	High school diploma or equivalent	430112	Securities Services Administration/Management.	Cert., >1 & < 2 yrs.	1
Fire Fighters	22	Postsecondary non-degree award	430203	Fire Science/Fire-fighting.	Assoc.	7
Social Science Research Assistants	1	Associate's degree	450101	Social Sciences, General.	Assoc.	3
Managers, Other	25	High school diploma or equivalent	450101	Social Sciences, General.	Assoc.	69
Managers, Other	25	High school diploma or equivalent	450702	Geographic Information Science and Cartography.	Cert., >1 & < 2 yrs.	1
Managers, Other	25	High school diploma or equivalent	450702	Geographic Information Science and Cartography.	Assoc.	3

Table A3: Workforce Gap Analysis – HACC Program Detail

Occupation	Avg. Annual Open-ings	Required Degree	CIP	CIP Title	Award	2009-10 Comple-tions
Managers, Other	25	High school diploma or equivalent	450901	International Relations and Affairs.	Assoc.	4
Security & Fire Alarm Systems Installers	7	High school diploma or equivalent	460302	Electrician.	Assoc.	1
Electricians	106	High school diploma or equivalent	460302	Electrician.	Cert., < 1 yr.	1
Security & Fire Alarm Systems Installers	7	High school diploma or equivalent	460302	Electrician.	Cert., >1 & < 2 yrs.	1
Supervisors - Construction Trades & Extraction Workers	65	High school diploma or equivalent	460302	Electrician.	Assoc.	5
Electricians	106	High school diploma or equivalent	460302	Electrician.	Assoc.	8
Supervisors - Construction Trades & Extraction Workers	65	High school diploma or equivalent	460302	Electrician.	Cert., >1 & < 2 yrs.	9
Electricians	106	High school diploma or equivalent	460302	Electrician.	Cert., >1 & < 2 yrs.	15
Computer, Automated Teller & Office Machine Repairers	9	Postsecondary non-degree award	470104	Computer Installation and Repair Technology/Technician.	Cert., >1 & < 2 yrs.	1
Computer, Automated Teller & Office Machine Repairers	9	Postsecondary non-degree award	470104	Computer Installation and Repair Technology/Technician.	Assoc.	1
Elec. Repairers - Commercial & Industrial Equipment	37	Postsecondary non-degree award	470104	Computer Installation and Repair Technology/Technician.	Cert., >1 & < 2 yrs.	2
Elec. Repairers - Commercial & Industrial Equipment	37	Postsecondary non-degree award	470104	Computer Installation and Repair Technology/Technician.	Assoc.	2
Heating, A/C & Refrigeration Mechanics/Installers	47	Postsecondary non-degree award	470201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician.	Assoc.	10
Heating, A/C & Refrigeration Mechanics/Installers	47	Postsecondary non-degree award	470201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician.	Cert., >1 & < 2 yrs.	14
Heating, A/C & Refrigeration Mechanics/Installers	47	Postsecondary non-degree award	470201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician.	Cert., < 1 yr.	22
Industrial Machinery Mechanics	87	High school diploma or equivalent	470303	Industrial Mechanics and Maintenance Technology.	Cert., >1 & < 2 yrs.	1
Industrial Machinery Mechanics	87	High school diploma or equivalent	470303	Industrial Mechanics and Maintenance Technology.	Assoc.	7
Automotive Service Technicians & Mechanics	139	High school diploma or equivalent	470604	Automobile/Automotive Mechanics Technology/Technician.	Cert., >1 & < 2 yrs.	2
Automotive Service Technicians & Mechanics	139	High school diploma or equivalent	470604	Automobile/Automotive Mechanics Technology/Technician.	Assoc.	14

Table A3: Workforce Gap Analysis – HACC Program Detail

Occupation	Avg. Annual Open-ings	Required Degree	CIP	CIP Title	Award	2009-10 Comple-tions
Welders, Cutters, Solderers & Brazers	78	High school diploma or equivalent	480508	Welding Technology/Welder.	Cert., >1 & < 2 yrs.	1
Welders, Cutters, Solderers & Brazers	78	High school diploma or equivalent	480508	Welding Technology/Welder.	Cert., < 1 yr.	2
Woodworking Machine Oprs	34	High school diploma or equivalent	480703	Cabinetmaking and Millwork.	Cert., < 1 yr.	1
Cabinetmakers & Bench Carpenters	54	High school diploma or equivalent	480703	Cabinetmaking and Millwork.	Cert., < 1 yr.	1
Fine Artists	2	High school diploma or equivalent	500101	Visual and Performing Arts, General.	Assoc.	4
Photographers	15	High school diploma or equivalent	500101	Visual and Performing Arts, General.	Assoc.	30
Photographers	15	High school diploma or equivalent	500605	Photography.	Assoc.	12
Photographers	15	High school diploma or equivalent	500701	Art/Art Studies, General.	Assoc.	1
Dental Assistants	53	Postsecondary non-degree award	510601	Dental Assisting/Assistant.	Cert., >1 & < 2 yrs.	19
Dental Hygienists	33	Associate's degree	510602	Dental Hygiene/Hygienist.	Assoc.	25
Medical Assistants	109	High school diploma or equivalent	510801	Medical/Clinical Assistant.	Assoc.	5
Medical Assistants	109	High school diploma or equivalent	510801	Medical/Clinical Assistant.	Cert., >1 & < 2 yrs.	6
Cardiovascular Technologists & Technicians	12	Associate's degree	510901	Cardiovascular Technology/Technologist.	Assoc.	14
Emergency Medical Technicians & Paramedics	30	Postsecondary non-degree award	510904	Emergency Medical Technology/Technician (EMT Paramedic).	Assoc.	1
Emergency Medical Technicians & Paramedics	30	Postsecondary non-degree award	510904	Emergency Medical Technology/Technician (EMT Paramedic).	Cert., >1 & < 2 yrs.	2
Nuclear Medicine Technologists	4	Associate's degree	510905	Nuclear Medical Technology/Technologist.	Assoc.	5
Respiratory Therapy Technicians	3	Associate's degree	510908	Respiratory Care Therapy/Therapist.	Assoc.	1
Respiratory Therapists	17	Associate's degree	510908	Respiratory Care Therapy/Therapist.	Assoc.	5
Surgical Technologists	27	Postsecondary non-degree award	510909	Surgical Technology/Technologist.	Assoc.	10
Diagnostic Medical Sonographers	7	Associate's degree	510910	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician.	Assoc.	8
Medical & Clinical Laboratory Technicians	23	Associate's degree	511004	Clinical/Medical Laboratory Technician.	Assoc.	10
Registered Nurses	573	Associate's degree	513801	Registered Nursing/Registered Nurse.	Assoc.	258

Table A3: Workforce Gap Analysis – HACC Program Detail

Occupation	Avg. Annual Open-ings	Required Degree	CIP	CIP Title	Award	2009-10 Comple-tions
Licensed Practical & Licensed Vocational Nurses	219	Postsecondary non-degree award	513901	Licensed Practical/Vocational Nurse Training.	Cert., >1 & < 2 yrs.	87
General & Operations Managers	154	Associate's degree	520101	Business/Commerce, General.	Cert., >1 & < 2 yrs.	1
Transportation, Storage, & Distribution Managers	22	High school diploma or equivalent	520101	Business/Commerce, General.	Assoc.	8
Managers, Other	25	High school diploma or equivalent	520101	Business/Commerce, General.	Assoc.	9
Administrative Services Managers	32	High school diploma or equivalent	520101	Business/Commerce, General.	Assoc.	12
Construction Managers	46	Associate's degree	520101	Business/Commerce, General.	Assoc.	17
General & Operations Managers	154	Associate's degree	520101	Business/Commerce, General.	Assoc.	56
General & Operations Managers	154	Associate's degree	520201	Business Administration and Management, General.	Cert., >1 & < 2 yrs.	1
Transportation, Storage, & Distribution Managers	22	High school diploma or equivalent	520201	Business Administration and Management, General.	Assoc.	16
Managers, Other	25	High school diploma or equivalent	520201	Business Administration and Management, General.	Assoc.	19
Administrative Services Managers	32	High school diploma or equivalent	520201	Business Administration and Management, General.	Assoc.	24
Construction Managers	46	Associate's degree	520201	Business Administration and Management, General.	Assoc.	34
General & Operations Managers	154	Associate's degree	520201	Business Administration and Management, General.	Assoc.	115
Payroll & Timekeeping Clerks	34	High school diploma or equivalent	520302	Accounting Technology/Technician and Bookkeeping.	Cert., >1 & < 2 yrs.	1
Brokerage Clerks	7	High school diploma or equivalent	520302	Accounting Technology/Technician and Bookkeeping.	Assoc.	1
Tax Preparers	12	High school diploma or equivalent	520302	Accounting Technology/Technician and Bookkeeping.	Assoc.	1
Bookkeeping, Accounting, & Auditing Clerks	205	High school diploma or equivalent	520302	Accounting Technology/Technician and Bookkeeping.	Cert., >1 & < 2 yrs.	4
Payroll & Timekeeping Clerks	34	High school diploma or equivalent	520302	Accounting Technology/Technician and Bookkeeping.	Assoc.	4
Bookkeeping, Accounting, & Auditing Clerks	205	High school diploma or equivalent	520302	Accounting Technology/Technician and Bookkeeping.	Assoc.	25
Executive Secretaries & Administrative Assistants	100	High school diploma or equivalent	520401	Administrative Assistant and Secretarial Science, General.	Assoc.	3
Secretaries	203	High school diploma or equivalent	520401	Administrative Assistant and Secretarial Science, General.	Assoc.	6

Table A3: Workforce Gap Analysis – HACC Program Detail

Occupation	Avg. Annual Open-ings	Required Degree	CIP	CIP Title	Award	2009-10 Comple-tions
Managers, Other	25	High school diploma or equivalent	520703	Small Business Administration/Management.	Assoc.	4
Tellers	214	High school diploma or equivalent	520803	Banking and Financial Support Services.	Assoc.	2
Lodging Managers	11	High school diploma or equivalent	520901	Hospitality Administration/Management, General.	Assoc.	1
Food Service Managers	35	High school diploma or equivalent	520901	Hospitality Administration/Management, General.	Assoc.	2
Managers, Other	25	High school diploma or equivalent	520903	Tourism and Travel Services Management.	Assoc.	5
Food Service Managers	35	High school diploma or equivalent	520904	Hotel/Motel Administration/Management.	Assoc.	2
Food Service Managers	35	High school diploma or equivalent	520905	Restaurant/Food Services Management.	Assoc.	2
Real Estate Sales Agents	33	High school diploma or equivalent	521501	Real Estate.	Cert., < 1 yr.	1
Real Estate Sales Agents	33	High school diploma or equivalent	521501	Real Estate.	Assoc.	2
Purchasing Agents	42	High school diploma or equivalent	521801	Sales, Distribution, and Marketing Operations, General.	Assoc.	1
Sales Representatives	259	High school diploma or equivalent	521801	Sales, Distribution, and Marketing Operations, General.	Cert., < 1 yr.	2
Sales Representatives	259	High school diploma or equivalent	521801	Sales, Distribution, and Marketing Operations, General.	Assoc.	5
Supervisors - Retail Sales Workers	168	High school diploma or equivalent	521803	Retailing and Retail Operations.	Assoc.	1