

A Regional Audit of Workforce Supply and Demand

Southwestern Pennsylvania Region



T H R E E R I V E R S
WORKFORCE INVESTMENT BOARD

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Executive Summary

This report is the beginning of an effort to develop a permanent means by which to measure the supply and demand of the region's occupations and knowledge and skill characteristics. Largely based on the collection of secondary data, this report is supplemented by additional products that include more detailed cluster by cluster information, as well as a map that links education and training programs with occupational and career clusters.

Key Findings of the Report

- The Southwestern Pennsylvania Region enjoys **strong balance (i.e. "alignment") in the growth of jobs over the past decade as compared to the growth in its labor force**, although both trail national trends. Furthermore, there is **strong balance and alignment in most occupational categories within the region although there is a shortage of service workers** in the region. In order to fill shortages, employers will need to recruit from outside of the area, hire or train less qualified workers or foreign-born workers.
- Perhaps more important is the clear imbalance in the supply and demand around education at the level of high school or less. **There is much more demand for low-levels of education than there is supply**. While on the surface this might seem good in terms of placing entry level workers, it shows that too many people are underemployed, bringing higher education levels to their jobs than those jobs demand.
- **Air Transportation and Electronics Manufacturing are gaining shares of employment in the region at faster rates than in the Commonwealth of Pennsylvania or the nation (1995-2000)**. In addition, a number of "high-skill" industries are gaining employment share within the regional economy, including Business Services (which includes computer services), Engineering and Management Service, and Security and Commodity Brokers.
- **Health Care, one of the region's five clusters of focus, is losing employment share in the region at rates that are higher than the declining share in either the Commonwealth or the nation**. This does not necessarily reflect poorly on the region's emphasis on the health care cluster, but rather speaks to the need to be more focused on specific sub-clusters within health care. In addition, Logistics and Distribution (including trucking and warehousing and wholesale trade-durable goods) also saw a decline in the share of employment in the region.
- **Between July 2001 and June 2002 over 21,191 workers lost their jobs in 109 mass layoffs, an average of 194 separations per mass layoff event**. While these were seen in a variety of industries including manufacturing, construction, and retail

trade, it is important to note that despite an increased share in employment between 1995 and 2000, **over 1,000 workers in the region lost jobs in Air Transportation due to mass layoffs during this time period.**

- **When reviewing lists of occupations ranked by demand, most of the jobs require little education and training, and are prone to unemployment and part-time employment. Of jobs considered to have a good mixture of current employment, projected growth, and annual wages, computer occupations dominate the top 25 list.** The list includes computer systems analysts, computer and information systems managers, computer programmers, and computer software engineers-applications. This indicates that technology has a considerable influence on our business operations and occupational functions, and that impact is increasing at exponential rates in ways that we still do not fully understand. It is clear that the need for technology education and lifelong learning is an important and vital part of the 21st Century workforce.
- **The current industry clusters trail a more focused set of similar high-performing industry sectors in various important criteria, including location quotient, employment growth, and local competitiveness.** For example, while information technology has experienced employment growth, a more focused set of information technology sub-industries has actually grown at exponential rates.
- **An additional set of industry cluster-specific reports have been created for the five clusters of focus.** These reports include detailed information on labor market trends, staffing patterns, critical knowledge and skill requirements, current employer needs, and career mobility.
- **Top knowledge requirements of the regional economy regardless of industry include administration and management, clerical, computers and electronics, customer and personal service; education and training; English language; mathematics, and psychology.** More specific knowledge requirements are needed for certain industry clusters, for example economics and accounting (for Financial Services), medicine and dentistry, therapy and counseling (for Health Care), and production and processing (for manufacturing).
- **Top skill requirements of the regional economy regardless of industry include active learning; active listening, critical thinking, information gathering, monitoring, problem identification, reading comprehension, speaking, and writing.** These are more advanced than the traditional reading and writing skills that have dominated basic education, particularly active learning, critical thinking, and problem identification.
- **Knowledge and skill sets for the new economy** are best understood by disaggregating them by **employability skills** (communication, organization, team contribution, professionalism, critical thinking, customer relations, and continuous learning); **cross-sector skill areas** (project management, task management, and problem-solving/troubleshooting); and **core curriculum** (analytical skills and problem solving, business organization and environment, coordination and

communication, project and process flow, core computer and hardware skills, and core field of study skills.

- **There is a need to put the customer back in the (customer) service economy.** The emphasis on the customer is seen in a variety of places in the above knowledge, skills, and curriculum information, including customer and personal service as a critical knowledge requirement; active listening, information gathering, and speaking as critical skill requirements; and communication skills, professionalism, and customer relations as skill standards. Efforts must be made to understand the consequences of this on education and training, as well as to educate various stakeholders as to current and planned efforts to address this challenge.
- **A future report will concentrate on mapping supply and demand between adult, secondary, post-secondary, and vocational education and training programs with occupational and career clusters.** Occupational clusters (demand) as defined by the U.S. Department of Labor and career clusters (supply) as defined by the U.S. Department of Education use two different structures. Therefore, one of the steps involved in mapping supply and demand will focus on relating these structures so that this information can be used by employers, policy makers, job seekers, and educators as they seek to make workforce policy and career decisions.

Recommended First Steps

This report identifies a number of important issues, and attempts should be made to understand the implications, prioritize their importance, and evaluate the ability to impact them in the near and far terms. These are not intended to be exhaustive but rather to provoke thought and discussion. Consider them possible first steps rather than next steps:

- Develop strategies to address the shortage of service workers including a significant focus on customer service education and training programs and courses.
- Proactively work with all stakeholders to address the educational imbalance and begin honest dialogues about the relationship between college education and the realities of the labor market.
- Begin discussion of the region's 21st Century workforce curriculum needs and provide incentives to education and training providers that adhere to any formal curriculum recommendations adopted.
- Review the current clusters to determine if a more specific focus is needed within existing clusters or if there are alternative clusters to pursue. Continue this process every few years in order to remain ahead of the curve, and proactively examine future labor shortages that will be identified through the educational mapping portion of this project.

- Use the supplemental line of cluster specific reports along with the educational index to dig deeper into the issues raised in this report. For example, knowing that registered nurses are in high demand, look to the health care sector report to better understand why, and the educational index to consider the supply-demand alignment between the number of nurses needed and the number being produced by the regional education and training system.

Introduction

Purpose and Overall Project Components

The Southwestern Pennsylvania Region (SWPA) was awarded a Community Audit Demonstration Grant from the U.S. Department of Labor. The purpose of the grant was to develop mechanisms to identify emerging trends that affect skill demands, i.e. a means by which to permanently measure the supply and demand of critical occupations, knowledge, and skills.

In order to develop a permanent means of measurement, a three-tier approach was implemented.

- **Tier One:** Secondary data collection and manipulation – The first tier involves collecting and manipulating secondary data in order to understand general economic trends and shifts in the economy, with particular emphasis placed on the region’s five clusters of focus: financial services, health care, hospitality and tourism, information technology, and manufacturing. The general results of this first tier comprise the primary portion of this report. Individual, smaller reports have been created for each cluster with more detailed information.
- **Tier Two:** Education and training provider mapping – The second tier involves the development of a tool to permanently monitor supply and demand; that is, the mapping of all adult and vocational education and training providers to career and occupational programs. This process involves interactive discussion with local providers and ultimately has led to an educational index that is aimed at scoring supply and demand. For example, the index could be used to identify that despite the need for 2,500 nurses in the next four years, the pipeline is only likely to produce 1,200, or vice versa.
- **Tier Three:** Partner staff training – A final tier involves the development and facilitation of replication training of partner staff to understand the research and methodology so that internal team members are able to repeat this process over time. To that extent, the results of this project should be seen as baseline data from which to measure change over time.

Working with Cluster Coordinators and Other Partners

This project has been done in coordination with Workforce Connections and the Cluster Coordinators of the five clusters, including working with clusters and coordinators to identify and work with employer roundtable members. This coordination helped to minimize employer burden and maximize outreach efficiencies. Furthermore, additional partnerships have been developed with others involved in similar or related efforts including the Lyceum Group and local universities such as Duquesne’s Institute

for Economic Transformation. Others have been engaged as needed, including over 40 education and training providers who participated in the educational mapping meeting, and employers who have participated in the roundtables.

Defining the Southwestern Pennsylvania Region

The Three Rivers Workforce Investment Board is the lead partner for the Community Audit project. The SWPA Region consists of four workforce investment areas covering nine counties as outlined below:

Three Rivers: Allegheny County

Southwest Corner: Beaver, Greene, and Washington Counties

Tri-County: Armstrong, Butler, and Indiana Counties

Westmoreland-Fayette: Fayette and Westmoreland Counties

The Report Format

This report includes four major sections: supply and demand alignment; general labor market trends; key clusters of the region; and the 21st Century Workforce Curriculum. In addition, there is information on mapping supply and demand (i.e., educational index) as well as a sneak peek at the contents contained within the individual cluster reports.

This report does not include detailed data tables for all of the data collected. That information is available via request to the Three Rivers Workforce Investment Board.

Chapter 1: Supply and Demand Alignment

At the very core of the relationship between supply and demand is the alignment among and between various related data sets. For example, is the growth of the labor force (supply) similar to or different from the growth in jobs (demand)? Are there similar or different patterns to the occupations reported by employers (demand) as opposed to those reported by the local population (supply)? Is the education required for local occupations (demand) similar to or different from the educational attainment levels of the local population (supply)?

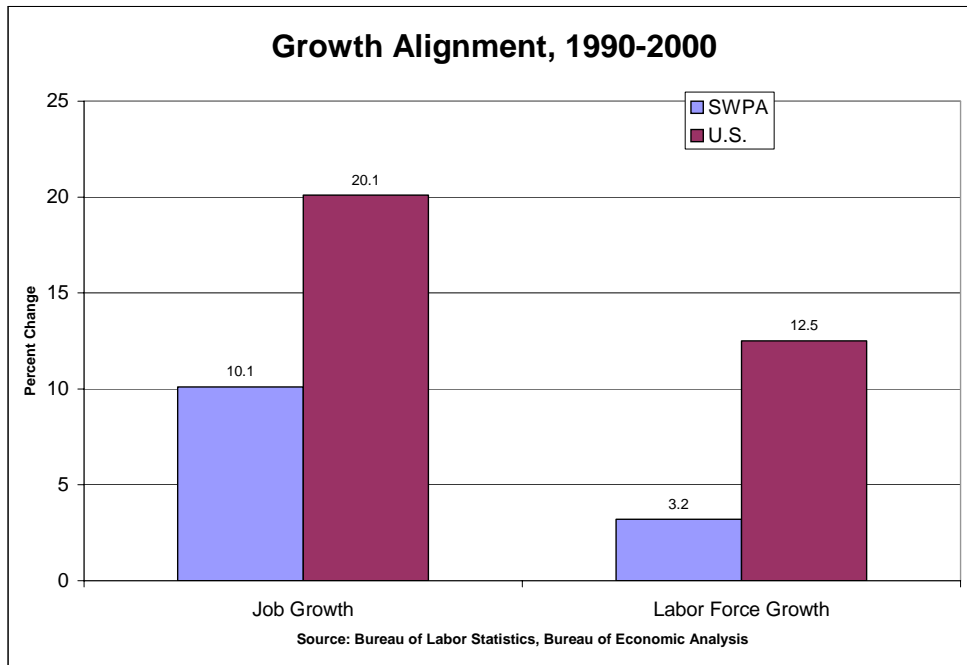
Understanding these relationships and the extent to which they are aligned can provide a sense of labor shortages or labor surpluses. Providing glimpses into these relationships can be a difficult and trying task, largely due to the fact that critical data needed for a more thorough review are either not collected, or not publishable due to confidentiality restrictions. An additional challenge lies in the comparison of different data sets collected by multiple agencies.

Even so, the authors believe that it is important to view disparate data sets together in order to begin to paint a picture that at a broad level can help policy makers and leading stakeholders begin asking additional, more detailed questions.

Growth Alignment Mirrors National Trends

By looking at the alignment between the growth in labor force (supply) and jobs (demand), we can see that the Southwestern Pennsylvania (SWPA) region is growing at a less rapid rate than the United States as a whole. The region's employment grew 10.1% (1,130,511 jobs in 1990 to 1,244,606 in 2000) at the same time the labor force grew 3.9% (from 1,213,195 in 1990 to 1,260,563 in 2000.) The U.S. rates for the same time period of time were 20.1% for job growth, and 12.5% for labor force growth.

Growth Alignment, 1990-2000



Despite smaller gains, the region and the U.S. as a whole share similar alignment patterns. Both the SWPA and the U.S. have job growth that exceeds labor force growth by about seven percent. This indicates labor shortages and the need to import workers from outside of the region and to maximize the existing local labor force, including non-traditional populations such as persons with disabilities or those traditionally not attached to the labor force (e.g., persons receiving temporary public assistance for families.)

Labor force shortages across the nation are projected to become more severe over the next twenty years as the growth in natural-born citizens continues to show zero or negative growth. Many workforce scholars believe this shortage will be solved in the future only by an increased emphasis on older workers and immigrants. Both older workers and immigrants bring with them workforce challenges such as skills training or retraining, English literacy, and development of teamwork concepts.

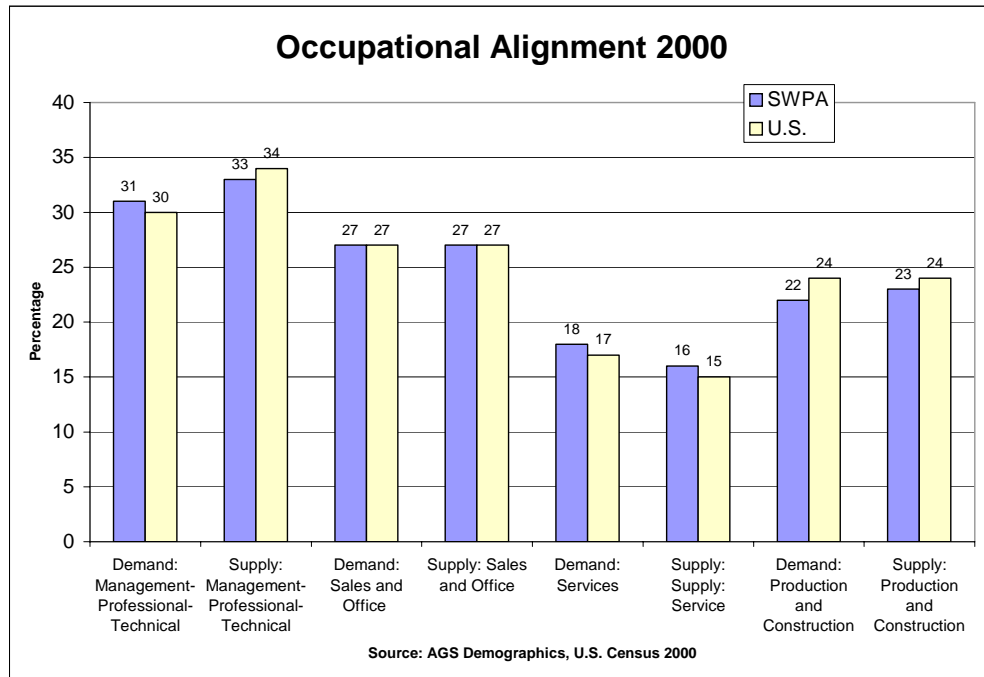
Occupational Alignment Indicates Shortage of Service Workers

By comparing the alignment between the types of jobs reported by employers (demand and work-site based) and those reported by people (supply and household-census based), we are able to hone in on where potential labor force imbalances lie. Consider the data below that shows the largest regional imbalance in four major occupational classifications is in service workers. Consider that there are multiple data sets used in this analysis, including Bureau of Labor Statistics and County Business Patterns (as

used by AGS Demographics) and population data recently released with the detailed U.S. Census 2000 data.

While a comparison of percentages (necessary for comparison to U.S. data) shows strong alignment between the four major categories¹, a closer examination of total numbers reveals several items of note:

Occupational Alignment 2000



- Management, Professional, and Technical occupations (including managers, computer professionals, health care practitioners, financial analysts, etc.) are the only ones of the four major occupational clusters to have greater supply than demand.
- Services occupations (including customer service, personal service, protective services, tourism, etc.) have the largest total imbalance of 46,273, followed by Production and Construction occupations (including manufacturing, construction, transportation) at 24,595, and Sales and Office occupations (23,296).
- Only 80% of demand for Service occupations – four out of five – is met by the supply. At a time when the nation, state, and region continue to move towards a service-oriented economy this should be seen as a cautionary flag that will be further explored with the educational mapping and index.
- The downturn in the economy may provide some relief from skill shortage imbalances.

¹ Percentages may not add to 100 due to rounding or an additional occupational category with little or no employment – Agriculture, Forestry, and Fishing.

Occupational Alignment Totals, 2000

SWPA Occupational Alignment	Demand (Jobs)	Supply (Employed Persons Age 16 or Older)	Total Alignment	Supply as a Percentage of Demand
Management, Professional, and Technical Jobs	380,991	384,824	Greater Supply by 3,833	101.0%
Sales and Office	341,198	317,902	Greater Demand by 23,296	93.2%
Services	231,020	184,747	Greater Demand 46,273	80.0%
Production and Construction	291,952	267,357	Greater Demand by 24,595	91.6%

Educational Alignment Provides Glimpse into Larger Issues

Many areas across the country like to talk about how “70% of our workforce has a bachelor’s degree” or “50% of our jobs require a bachelor’s degree.” However, it is the alignment between the two that is important – whether the educational demand of various jobs (demand) matches the educational attainment of adult workers (supply).

According to the U.S. Bureau of Labor Statistics, of the 2.8 million teens who graduated from high school nationwide in 1997, 67% were enrolled in college the following October; within two years of graduation, 72% were enrolled. But while college enrollments grow, so do college remediation and dropout rates. By the late 1990’s, college dropout rates were at record levels. Two-thirds of all college students now withdraw at least once before finishing, 41% of students now enrolled at two-year institutions are in remedial courses; the current rate of students able to graduate four-year programs within six years of entry is only 52%. Additional data shows only 40% of the nation’s teens graduate from high school with the academic skills needed to go to college².

² Paragraph excerpted from *Getting Real: Helping Teens Find Their Future*, Dr. Kenneth Gray, Professor of Education in the Workforce Education and Development Program, College of Education, Penn State University, Corwin Press Inc., 2000.

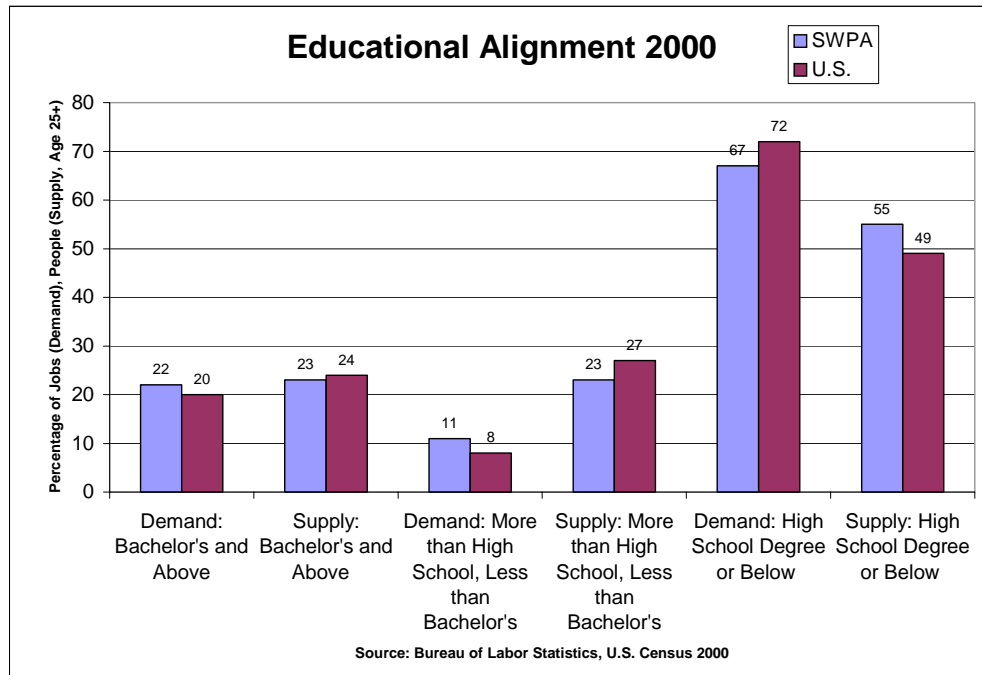
According to Dr. Kenneth Gray, author of *Getting Real: Helping Teens Find Their Future*, the above data combines with three other factors to form a paradox between college expectations and realities. The other three factors are:

- Teens say the main reason they were going to college was to get a good job (American Council on Education, 1998), yet they are doing so without good judgment. Of the 67% of the high school class of 1997 who enrolled in higher education immediately after graduation, about two in three matriculated in four-year colleges to earn bachelor's degrees, but only 23% of all employment requires this level of education³ (and in 2000 that figure was only 20%, see graphic on next page.)
- While increasing numbers of college graduates were ending up in low-wage service jobs, the nation's economy was generating record numbers of unfilled positions for technicians in high-skill, high-wage technical jobs. The problem was not an undersupply of college graduates, but rather an undersupply of technically-skilled graduates.
- On discovering they had made a mistake, many young adults became "reverse transfers," enrolling in one and two-year technical programs at community colleges even though many already had four-year degrees and even graduate degrees. Why? They hoped it would give them what their bachelor's degrees had not – an advantage in competing for high-skill/high-wage employment.

Dr. Gray's observations are particularly meaningful when looking at the graphic on the next page that combines education levels associated with occupations (as defined by the U.S. Department of Labor) with the education levels reported by household from the U.S. Census, both for the year 2000.

³ Ibid

Educational Alignment 2000



Educational Alignment Totals⁴, 2000

SWPA Educational Alignment	Demand (Jobs)	Supply (Employed Persons Age 16 or Older)
Bachelor's Degree or Above	172,130	409,883
More than High School, Less than Bachelor's	76,080	410,223
High School Degree or Below	514,860	957,399

While the Southwestern Pennsylvania Region appears to have educational imbalance in its labor market, it is no different than the rest of the nation. The mismatch between the education and skills needed by employers and those held by the population is at epidemic levels, the causes of which are described in Dr. Gray's observations. College is more accessible now than ever before and attended by more people than ever before, yet the success rate is not as it should be, and most jobs do not require a bachelor's degree.

⁴ When viewing totals it is important to consider that the supply is measured by U.S. Census household data of the adult population 16+, many of whom may not be working (youth likely to be in school, seniors likely to be retired, others simply not attached to the labor force). Therefore, while totals are helpful on the demand side, percentages provide a more accurate relationship of alignment in regards to education.

Understanding that the region's trends are rooted in a national problem provides great opportunity. Those areas that are able to better align their labor markets – either through economic development that changes the industrial and occupational mix and / or changes to the educational curriculum to ensure a properly skilled workforce – will be those that succeed in the 21st Century.

This discussion is not meant to discount the value of a college degree; it remains an important antidote to poverty and most data show those with higher educational attainment typically make more money than those with less attainment. This is simply an attempt to start an open and honest dialogue based on strong academic work by Dr. Gray and the latest educational alignment between supply and demand. Are we training our students for the right careers? As Dr. Gray recommends, the goal for graduating high school students should not first and foremost be college, but rather postsecondary success; every student who graduates from high school should have a postsecondary plan that has a high probability of success.

The Bottom Line

The Southwestern Pennsylvania Region enjoyed strong alignment in the growth of jobs and labor force over the past decade. Furthermore, there is strong alignment in most occupational categories, but there appears to be a shortage of service workers in the region, and filling that shortage may necessitate recruiting outside of the area, hiring non-traditional workers, or hiring or training non-qualified workers.

Perhaps more important is the clear imbalance in the supply and demand around education at the level of high school or less. There is much more demand for lower levels of education than there is supply of workers. While on the surface this might seem good, it shows that too many people are underemployed, bringing higher education levels to jobs that don't demand it. This further exacerbates the high-school level problem; those workers who can't find jobs requiring their higher levels of education are "settling" for the jobs that require lower levels of education.

What should workforce policy makers do? As stated earlier, those areas that are able to better align their labor markets through economic development that changes the industrial and occupational mix will succeed. Likewise, those areas that are willing to change or are changing the educational curriculum to ensure a properly skilled workforce will be those that succeed in the 21st Century.

Chapter 2: General Labor Market Trends

Business Services Gains Largest Share of Employment in Region; Electronics Manufacturing Makes Strong Competitive Gains

To better understand recent labor market trends, an analysis was performed for all standard two-digit industrial classifications that compared the share of employment for each industry and its change over time. This change in share of employment was then compared to the same industry change for the commonwealth and the nation.

For example, despite the fact that Business Services enjoyed the largest change in employment share (+. 92%) in the region, the change in employment share for the industry in the region trailed in comparison to the change in employment for the industry in the commonwealth (+1.05%) and the nation (1.68%).

Conversely, the change in employment share for Air Transportation (+. 51% in the region) exceeded the change in employment share for Air Transportation for the commonwealth and nation, likewise for Electronics Manufacturing (+. 37% in the region.) Air Transportation remains tumultuous and must be watched closely in the coming months.

Even with the impact of current world events, Air Transportation and Electronics Manufacturing are becoming a bigger part of the regional economy at higher rates than those industries within the scope of the commonwealth and national economies. Heavy Construction and Insurance Carriers are two other industries that also enjoy healthy change in share advantages compared to the commonwealth and nation.

However, regardless of change in employment share relative to Pennsylvania and the U.S., the region enjoys positive trends in a number of highly educated industries including Business Services (including computer services), Engineering and Management, and Security and Commodity Brokers. Additionally, other industries such as Special Trade Contractors require highly skilled workers as well.

Noteworthy Increases	Noteworthy Decreases	Keep an Eye On
Electronics Manufacturing	Health Services	Air Transportation
Business Services	Eating and Drinking Places	Special Trade Contractors
Heavy Construction	Primary Metals	Engineering and Management
Insurance Carriers	Trucking and Warehousing	Miscellaneous Retail

Changes in Share of Employment, 1995-2000

Largest Increases

SIC	Industry	2000 SWPA employment level	Total Change 1995-2000	Changes in Share of Employment			SWPA v. PA	SWPA v. US
				SWPA	PA	US		
7300	Business Services	66,968	14,117	0.92%	1.05%	1.68%	-0.13%	-0.76%
4500	Transportation By Air Electronic & Other Electric	21,376	6,846	0.51%	0.40%	0.32%	0.11%	0.19%
3600	Equipment	12,887	4,773	0.37%	0.00%	-0.09%	0.37%	0.46%
1700	Special Trade Contractors Engineering &	35,103	6,108	0.36%	0.46%	0.53%	-0.10%	-0.17%
8700	Management Services	36,237	5,316	0.28%	0.38%	0.26%	-0.10%	0.02%
1600	Heavy Const, Ex. Building	11,651	2,783	0.19%	0.04%	0.10%	0.15%	0.09%
5900	Miscellaneous Retail	28,889	3,490	0.15%	0.10%	0.06%	0.05%	0.10%
8300	Social Services	34,283	3,762	0.15%	0.25%	0.16%	-0.10%	-0.01%
1500	General Bldg Contractors Auto Repair, Services, &	13,726	2,180	0.12%	0.10%	0.11%	0.02%	0.01%
7500	Parking	10,615	1,875	0.11%	0.11%	0.07%	0.00%	0.04%
6300	Insurance Carriers Security & Commodity	12,470	1,987	0.11%	-0.13%	-0.07%	0.24%	0.19%
6200	Brokers	5,341	1,509	0.11%	0.10%	0.13%	0.01%	-0.02%

Largest Decreases

SIC	Industry	2000 SWPA employment level	Total Change 1995-2000	Changes in Share of Employment			SWPA v. PA	SWPA v. US
				SWPA	PA	US		
8000	Health Services	129,209	(1,495)	-0.91%	-0.37%	-0.45%	-0.54%	-0.46%
5800	Eating & Drinking Places	74,101	(210)	-0.46%	0.11%	-0.12%	-0.57%	-0.34%
3300	Primary Metal Industries	26,081	(2,497)	-0.39%	-0.25%	-0.10%	-0.14%	-0.29%
5400	Food Stores	38,439	(835)	-0.31%	-0.24%	-0.23%	-0.07%	-0.08%
5000	Wholesale Trade-Dur. Goods	39,144	(426)	-0.27%	-0.13%	-0.01%	-0.14%	-0.27%
4200	Trucking & Warehousing Electric, Gas, & Sanitary	14,255	(1,837)	-0.26%	-0.22%	-0.21%	-0.04%	-0.05%
4900	Services	16,359	(1,390)	-0.23%	-0.17%	-0.16%	-0.05%	-0.07%
5300	General Merch Stores	26,393	(425)	-0.20%	-0.21%	-0.11%	0.01%	-0.09%
6000	Depository Institutions	26,033	1	-0.15%	-0.29%	-0.19%	0.14%	0.04%
5600	Apparel & Accessory Stores	10,183	(904)	-0.15%	-0.03%	-0.07%	-0.12%	-0.07%

Source: Center for Workforce Information and Analysis, Pennsylvania Department of Labor and Industry

Noteworthy increases included in the table above generally reflect positive change in share as well as those that fare well compared to Pennsylvania and the U.S. Those worth keeping an eye on have one or the other but not both.

As for noteworthy decreases, it is important to consider not only those industries that are increasing in their share of the economy, but also those that are shrinking. Surprisingly, Health Care is one of those that are shrinking, having lost nearly 1% of the

economic employment between 1995 and 2000. The decline in the share of employment in the region was double that of the nation’s decrease. Other traditionally strong industries also lost employment shares between 1995 and 2000 including Wholesale Trade – Durable Goods, and Trucking and Warehousing. These latter two industries comprise most of the region’s distribution and logistics economy; these trends should be monitored closely, given the importance of logistics and distribution to a manufacturing economy.

Between 1999 and 2000, industries that gained employment shares include: Special Trade Contractors, Miscellaneous Retail, Wholesale Trade-Durable Goods, and Educational Services. These annual changes in share of employment may be too small to be useful, as industries grow and contract over time. The preceding five-year change in share analysis would provide more accurate data on trends in the economy than a one-year analysis.

Nearly all of the industries that experienced a significant decline between 1995 and 2000 also experienced declines between 1999 and 2000 including Health Services, Primary Metal Industries, Food Stores, and Depository Institutions (banks).

Impact of Recent World and National Events

Most general labor market information is “rear-view mirror” and annual averages often fail to reflect more recent economic changes. Few would argue the dramatic changes to our economy since the events of September 11, 2002. Some of those changes can be attributed to the world, national, and regional economies including corporate scandals and other recent current events. Regardless of the reason, it is important to note and understand the most recent changes. Consider the following table:

Mass Layoff Statistics, July 2001-June 2002

County	Events	Separations	Separations/Event	Major Industries Impacted
Allegheny	62	15,636	252	Department Stores, Air Transportation, Special Trades and Heavy Construction, Steel Manufacturing
Beaver	1	60	60	Steel Manufacturing, Special Trades, and School Buses
Butler	7	732	105	Heavy Construction, School Buses
Fayette	3	235	78	Eating and Drinking Places, Food Manufacturing
Indiana	2	150	75	Auto Manufacturing (seats for autos)
Washington	11	2,070	188	Heavy Construction, Glass Manufacturing
Westmoreland	15	1,230	82	Highway Construction, Manufacturing (glass, food, electronics), Membership Clubs (flying clubs)
Southwestern Pennsylvania Region	109	21,191	194	

Source: Mass Layoff Statistics, Center for Workforce Information and Analysis, Pennsylvania Department of Labor and Industry Note: No events in Greene County

Over 100 mass layoff events occurred between July of 2001 and June of 2002, with the greatest impact felt in Allegheny County. The average event caused 195 separations, largely felt in Air Transportation, Manufacturing, Construction, and Retail Trade.

Identifying Critical Occupations

Top Occupations by Demand, 2001

SOC Title	2001 Employment	Avg. Annual Wage	Part-time Quartile ⁵	Unemployed Quartile	E&T Category
1. Retail Salespersons	36,420	\$18,450	Very High	Very High	Short-term on-the-job training
2. Cashiers	31,800	\$14,580	Very High	Very High	Short-term on-the-job training
3. Office Clerks, General	24,480	\$20,450	High	High	Short-term on-the-job training
4. Registered Nurses	23,330	\$43,320	High	Very Low	Associate's degree
5. Secretaries, Except Legal, Medical, and Executive	20,120	\$22,160	High	Low	Moderate-term on-the-job training
6. Customer Service Representatives	19,990	\$25,490	High	High	Moderate-term on-the-job training
7. Waiters and Waitresses	19,240	\$14,670	Very High	Very High	Short-term on-the-job training
8. General and Operations Managers	19,170	\$71,030	Very Low	Very Low	Degree plus work experience
9. Janitors and Cleaners, Except Maids and Housekeeping Cleaners	18,370	\$20,130	High	Very High	Short-term on-the-job training
10. Stock Clerks and Order Fillers	15,330	\$19,100	Very High	Very High	Short-term on-the-job training
11. Secondary School Teachers, Except Special and Vocational Education	15,320	\$52,540	Low	Very Low	Bachelor's degree
12. Combined Food Preparation and Serving Workers, Including Fast Food	14,770	\$14,830	Very High	Very High	Short-term on-the-job training
13. Laborers and Freight, Stock, and Material Movers, Hand	13,700	\$24,260	High	Very High	Short-term on-the-job training
14. Truck Drivers, Heavy and Tractor-Trailer	13,190	\$36,550	Low	High	Moderate-term on-the-job training
15. Executive Secretaries and Administrative Assistants	13,100	\$30,840	High	Low	Moderate-term on-the-job training
16. Bookkeeping, Accounting, and Auditing Clerks	12,860	\$24,460	Very High	Low	Moderate-term on-the-job training
17. Nursing Aides, Orderlies, and Attendants	11,860	\$19,900	High	High	Short-term on-the-job training
18. Maintenance and Repair Workers, General	11,860	\$29,490	Very Low	High	Long-term on-the-job training

⁵ Part-time quartile represents the likelihood the occupation will be part-time (i.e. very high 76% or greater, high 51%-75%, low 26%-50%, very low 0% to 25%). Unemployment quartile represents the likelihood an occupation is susceptible to unemployment.

SOC Title	2001 Employment	Avg. Annual Wage	Part-time Quartile⁵	Unemployed Quartile	E&T Category
19. First-Line Supervisors/Managers of Office and Admin Support Workers	11,850	\$37,310	Very Low	Very Low	Work experience in a related occupation
20. Sales Representatives, Wholesale and Mftg, Except Technical and Scientific Products	11,600	\$43,630	Low	Low	Moderate-term on-the-job training
21. Elementary School Teachers, Except Special Education	10,470	\$50,980	Low	Very Low	Bachelor's degree
22. First-Line Supervisors/Managers of Retail Sales Workers	10,370	\$30,700	Low	Very Low	Work experience in a related occupation
23. Receptionists and Information Clerks	9,600	\$20,310	Very High	High	Short-term on-the-job training Moderate-term on-the-job training
24. Construction Laborers	8,970	\$28,920	Low	Very High	
25. Food Preparation Workers	8,860	\$15,240	Very High	Very High	Short-term on-the-job training

Source: Bureau of Labor Statistics

Understanding the occupational composition of a region is essential to determining education and training needs and requisite knowledge and skill requirements. In order to better understand the occupations essential to the workforce, it is important to look at two views. The first is a list based solely on annual demand for occupations including employment, wages, part-time and unemployment quartiles, and education and training requirements. This view is shown in the table above.

This information is perhaps most useful at a direct service level, so that job seekers and job counselors are aware of the occupations in most demand overall, as well as the educational levels necessary to perform those jobs. This table shows that there are clear opportunities for placing job seekers in entry-level positions. Yet questions remain such as career mobility for many of these occupations, plus concerns about the part-time nature and susceptibility to unemployment. Consider:

- The top three jobs and six of the top 10 require only short-term-on-the-job-training; an additional two require moderate-term on-the-job-training.
- The top seven occupations and nine of the top 10 are either highly likely or very highly likely to be part-time. Only the occupation of general managers is not.
- The top two occupations and seven of the top 10 are prone to periods of unemployment.

Top SWPA Occupations for 2001 Using Employment, Projected Growth, and Annual Wage

	SOC Title	Employment 1998	Employment Rank	Growth, 1998- 2008	Growth Rank	Annual Wage	Wage Rank	Total Score
1	Computer Systems Analysts	4,240	3	6.7%	1	\$60,540	2	6
2	Computer and Information Systems Managers	2,670	4	3.6%	2	\$72,530	1	7
3	Computer Programmers	4,070	3	2.5%	3	\$56,670	2	8
4	Computer Software Engineers, Applications	2,130	5	12.2%	1	\$57,010	2	8
5	Engineering Managers	2,120	5	3.6%	2	\$79,120	1	8
6	Management Analysts	2,210	5	3.0%	2	\$59,380	2	9
7	Lawyers	4,670	3	1.3%	6	\$72,900	1	10
8	Electrical Engineers	3,150	4	1.8%	5	\$63,380	1	10
9	Secondary School Teachers, Except Special and Vocational Education	15,980	1	1.9%	5	\$45,590	5	11
10	Police and Sheriff's Patrol Officers	7,070	2	2.4%	3	\$43,320	6	11
11	Medical and Health Services Managers	1,930	5	2.5%	3	\$56,230	3	11
12	Middle School Teachers, Except Special and Vocational Education	3,220	3	1.9%	5	\$50,900	4	12
13	Sales Managers	3,050	4	1.0%	7	\$73,870	1	12
14	Securities, Commodities, and Financial Services Sales Agents	2,790	4	3.9%	2	\$43,920	6	12
15	Registered Nurses	23,960	1	1.6%	5	\$40,850	7	13
16	Chief Executives	6,340	2	0.5%	10	\$90,810	1	13
17	Computer Support Specialists	3,200	3	8.8%	1	\$36,560	9	13
18	Computer Software Engineers, Systems Software	740	11	12.2%	1	\$66,960	1	13
19	Marketing Managers	1,800	6	1.0%	7	\$68,720	1	14
20	Education Administrators, Elementary and Secondary School	1,660	6	1.1%	7	\$74,280	1	14
21	Special Education Teachers, Preschool, Kindergarten, and Elementary School	1,630	6	3.0%	2	\$43,520	6	14
22	Special Education Teachers, Secondary School	1,340	7	3.0%	2	\$45,300	5	14
23	Family and General Practitioners	1,330	7	1.3%	6	\$95,490	1	14
24	Business Teachers, Postsecondary	1,130	8	2.2%	4	\$57,010	2	14
25	Physical Therapists	1,060	8	2.4%	3	\$55,840	3	14

Source: Center for Workforce Information and Analysis, Pennsylvania Department of Labor and Industry

This list provides a better sense of “new economy” occupations that are more managerial, professional, and technical in nature, including a series of computer-related occupations, management analysts, engineering-related occupations, and teachers.

The Bottom Line

While recent growth between 1995 and 2000 has been keyed by air transportation and electronics manufacturing, the former industry has suffered mass layoffs since the events of September 11, 2001 and remains volatile. Steel manufacturing has also seen mass layoffs.

Yet professional and technical industries such as Business Services, Insurance, and Securities have seen increases in their share of industrial employment. Furthermore, despite the dot.com bust of the past several years, many computer-related jobs dominate the list of top occupations based on recent employment, projected growth, and wages.

The dominance of computer occupations shows that while the new economy is churning and sorting itself out after years of high growth and dramatic declines, one fact remains clear. The impact that technology has on our business operations and occupational functions is large and increasing at exponential rates in ways that we still do not fully understand. It is clear that the need for technology education and lifelong learning is an important and vital part of the 21st Century workforce.

Chapter 3: Key Clusters of the Region

What are Industry Clusters?

The National Governor’s Association (NGA) defines an industry cluster as similar, related, or complementary businesses that are geographically bounded; have active channels for business transactions, communications, and dialogue; share specialized infrastructure, labor markets, and services; and are faced with common opportunities and threats.

Businesses typically benefit from clustering, according to the NGA, by providing access (to more suppliers, more skilled labor pools, more transfers of knowledge) and allowing companies to focus on what they do best by using resources more efficiently and collectively producing more than the sum of their individual outputs.

The National Network of Sector Practitioners identifies a series of strategies that are common to employer-led workforce initiatives including: training, sector research and analysis, worker retention, employer management, career path development, new worker recruitment, organizing, enterprise development, and changing the “systems” of the industry.

The Five Industry Clusters

The Southwestern Pennsylvania Region has selected five “clusters” on which to concentrate its collective workforce efforts. These efforts have thus far included workforce summits for each cluster, the hiring of “cluster coordinators” to work with businesses in the area, and additional research and studies including but not limited to this report. The five clusters are (see Appendix for complete definitions by standard industrial classification):

- Financial Services
- Health Care
- Hospitality and Tourism
- Information Technology
- Manufacturing

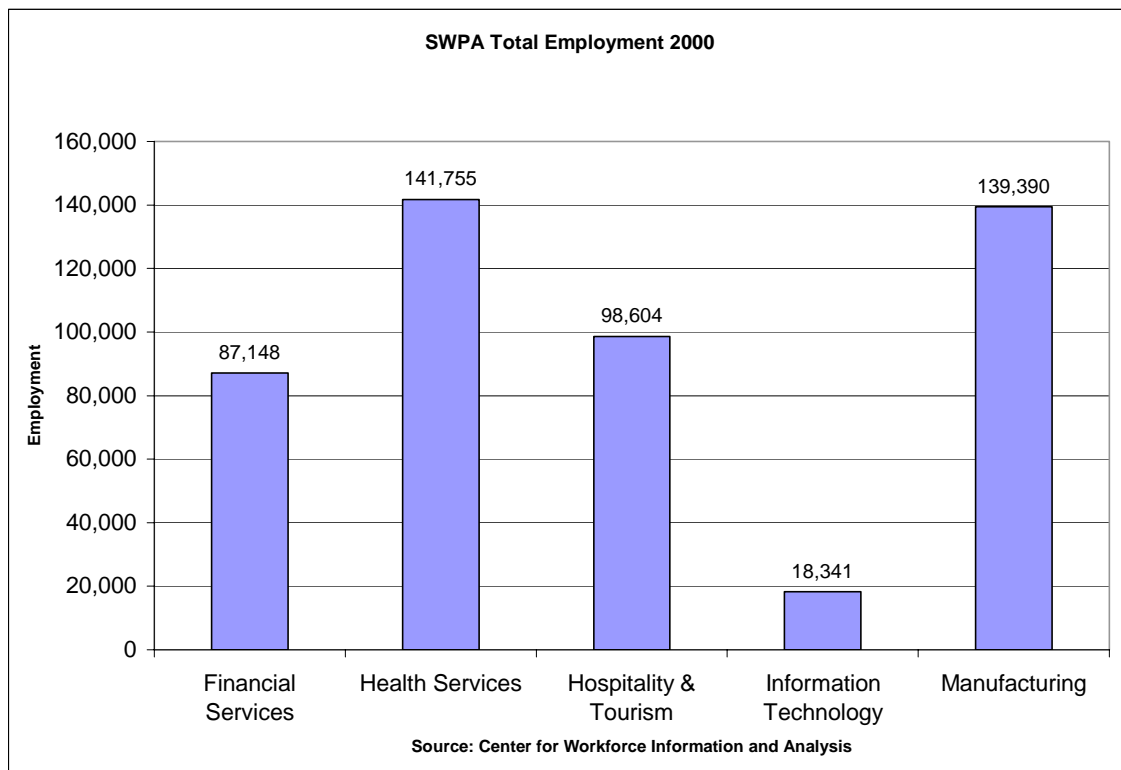
In 2001, Professor Michael E. Porter and the Council on Competitiveness studied clusters of innovation in the Pittsburgh area⁶ through a paper and web-based survey and interviews with leading regional executives and cluster representatives. He analyzed the local economy and identified the strengths and weaknesses of various

⁶ Clusters of Innovation Initiative for Pittsburgh, Professor Michael E. Porter, Council of Competitiveness, Monitor Company Group LP; and on the *Frontier*, 2001.

clusters. According to Professor Porter, the characteristics of three of the region's clusters are:

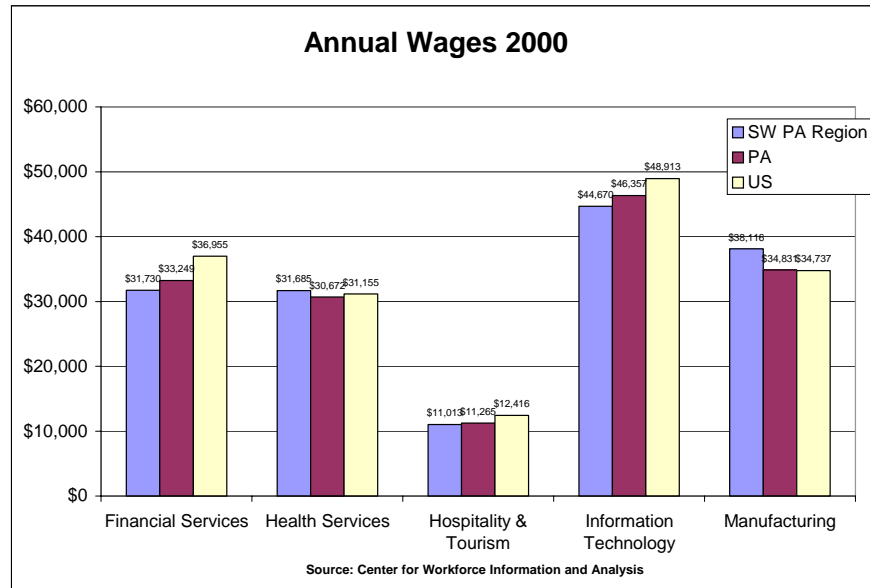
- Biotechnology and pharmaceuticals (within health care): young cluster, but growing industries; strong clinical presence; high levels of research and development; numerous specialized research and training centers; weak in research and development commercialization process and weak ties with other cluster members.
- Information technology: relatively young and small cluster; particularly small in core industries; numerous scientists and engineers; high level of research and development funding; low levels of local competition; low levels of inter-firm collaboration; and weak linkages among cluster members.
- Production technology: stabilizing after the recession and steel industry fallout of 1980s; skilled labor with many training programs; youth drain could have negative impact on cluster; no strong cluster ties; few effective organizations within cluster; robotics has potential; small tool and die firms showing resurgence in 1990s Cluster Trends.

2000 Employment by Cluster



Health Care and Manufacturing are the region's two largest clusters of the five areas of focus. Interestingly, both exceed the wage levels of the state and nation.

Annual Wages by Cluster, 2000



Revisiting the Industry Clusters of Focus

The Southwestern Pennsylvania Region is a leader in the identification and deployment of industry workforce clusters. One way in which it can maintain its leadership in this area is to continue to push the envelope by revisiting the issue of which clusters to focus on. This revisiting should occur at least once every three years due to the rapidly changing nature of the economy and workplace.

Local labor market analyst William Ceriani of the Center for Workforce Information and Analysis (CWIA) recently proposed to the Three Rivers Workforce Investment Board that the Board might wish to narrow its focus on specific “high-performing” sub-sectors within each of the five clusters. Following that, Mr. Ceriani tailored his presentation to incorporate the entire Southwestern Pennsylvania region.

High-performing industry clusters were identified based on the following criteria:

- A location quotient of 1.15 or higher⁷.
- 1995 level of employment for the regional industry of 300 or more.
- Total employment growth between 1995 and 2000 of at least 3.0% or higher.
- A local competitiveness component⁸ of at least 2.5% of 1995 employment.

⁷ A location quotient of one signifies that the regional employment of the industry has the same overall concentration of employment that the nation does; greater than one signifies a larger concentration of employment than the nation; less than one a lower concentration of employment. For example, a location quotient of two indicates twice the concentration in the region than seen in the nation.

When reviewing this data, it is important to understand that the definitions of current clusters differ slightly from those previously used (see Appendix for complete listing) and that the definition of high-performing clusters was not identified by the regional partners. Nonetheless, this is important data in starting a necessary conversation regarding the utility and accuracy of the current cluster focus.

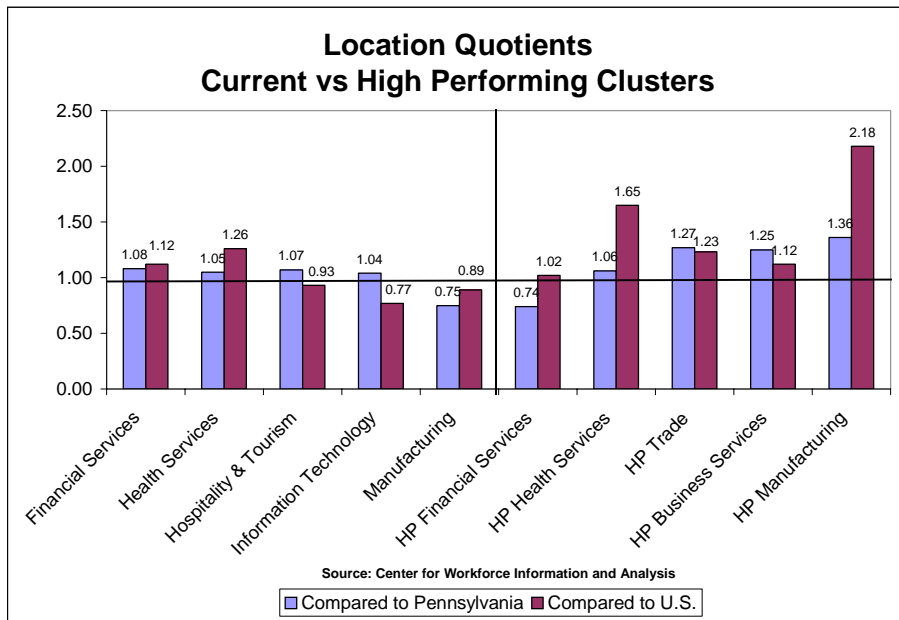
Comparing Current and High-Performing Clusters

While a full detailed list of standard industrial classifications is provided in the Appendix, here is a snapshot of the key differences between current and high-performing clusters.

Cluster	Current	High-Performing
Financial Services	Largely inclusive of finance, insurance, and real estate	Limited to central reserve depository; investment advice; insurance carriers; and holding and other investment offices
Health Services	Largely inclusive of health services plus manufacturing of medical instruments and supplies, wholesale trade of drugs, and research and testing services	Limited to offices of other health practitioners; nursing and personal care facilities; and residential care
Hospitality and Tourism	Varied detailed industries from transportation, retail trade (bars and restaurants), lodging, and amusements	Little or no focus on hospitality and tourism and strong focus on wholesale and retail trade
Information Technology	Broad definition including computer and data processing services, and telephone communications	Varied focus on business services including commercial art and graphic design, architectural services, and management and public relations
Manufacturing	Comprehensive list of all durable and non-durable manufacturing	Narrow focus on select industries including products of purchased glass, railroad equipment, industrial instruments for measurement, and medical instruments and supplies

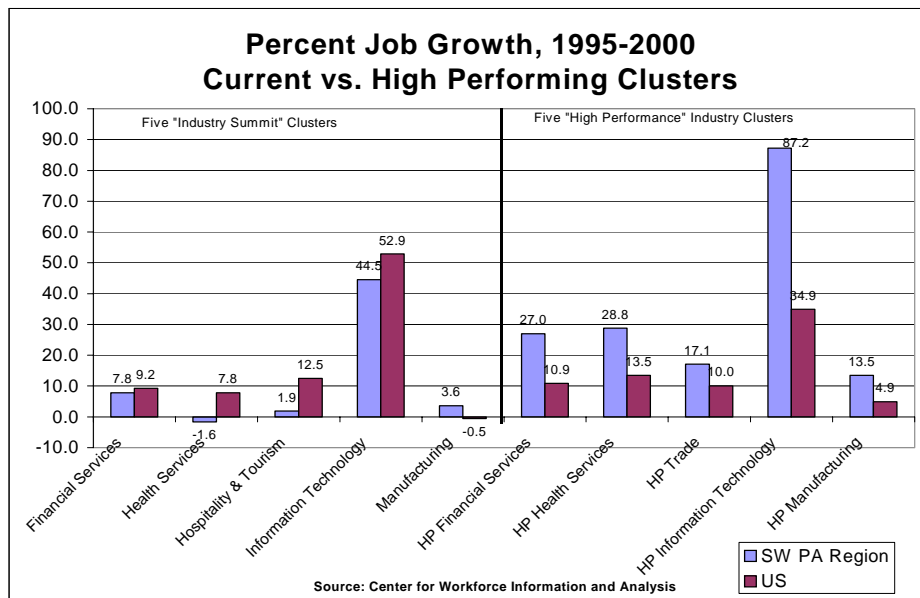
⁸ Local competitiveness component is a factor in shift-share analysis that represents the portion of local job growth or decline that can be attributed to advantageous or disadvantageous conditions in the local area that make the industries in the cluster either more competitive or less competitive than their counterparts nationally (or statewide.)

Location Quotients Point Towards a More Focused Emphasis on Specific Segments of Health Care and Manufacturing



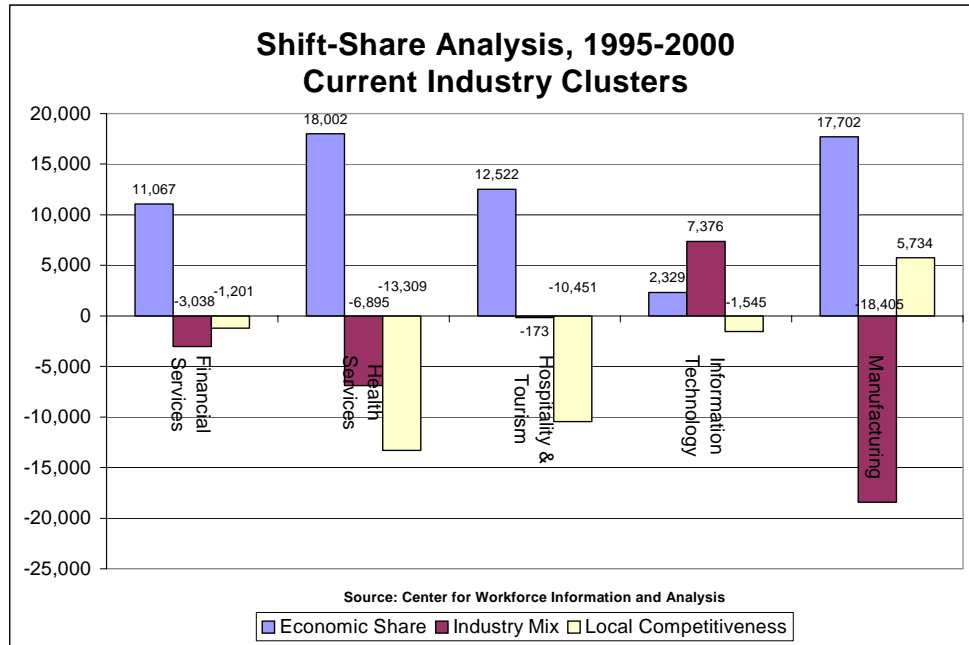
While only Financial Services and Health Services have a competitive location quotient (over 1.00) relative to the U.S., all of the high-performing clusters have competitive location quotients, paced by manufacturing and financial services. Of the five high-performing clusters, only financial services has a competitive disadvantage in location quotient relative to the commonwealth.

Outstanding Job Growth Seen in High Performing Clusters



While the current information technology cluster is the only one of the current clusters with a high rate of employment growth, the growth of high performing business services is substantially higher and outpaces the U.S. growth. Financial services and health services also exceed over 25% growth, and all high performing clusters enjoyed at least 10% growth. Conversely, hospitality, tourism and manufacturing barely grew at all, and health services experienced negative growth.

Growth in Local Clusters Largely Driven by National Trends



Shift Share Analysis factors include economic share component⁹, the industry mix component¹⁰, and the local competitiveness component¹¹. A look at the current clusters indicates that most of the growth was caused by economic share, or movement in the national and state economies.

Very little growth is attributed to the industry mix, with only information technology adding jobs within this component, and manufacturing seeing a significant decline due to the industry mix.

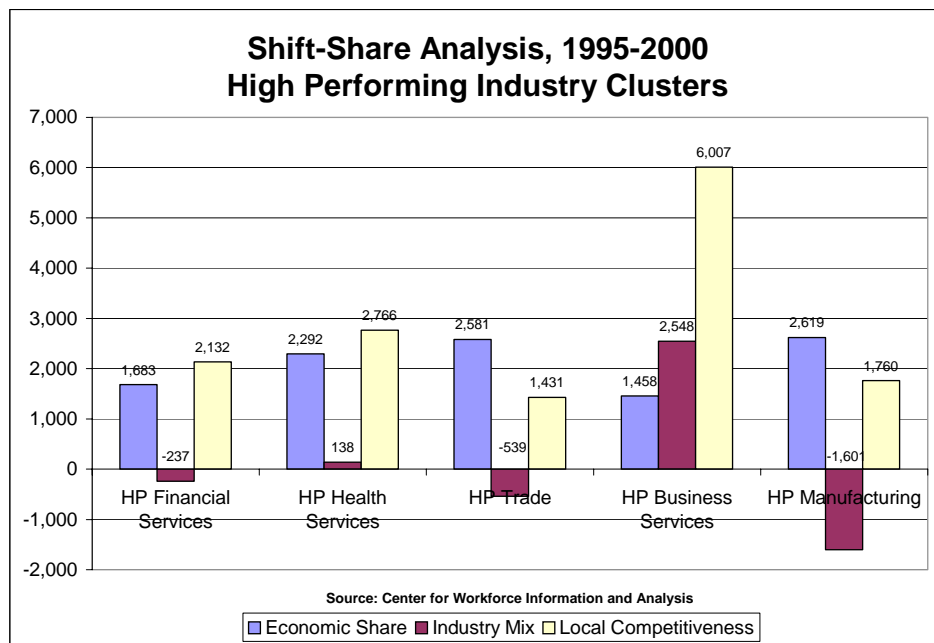
Conversely, manufacturing sees the largest advantage from local competitiveness, the only cluster to experience such a benefit.

⁹ Economic share component is the portion of local job growth or decline that can be attributed to growth or decline in the national (or state) economy.

¹⁰ Industry mix component is the portion of local job growth or decline that can be attributed to faster-than-average or slower-than-average growth in the industry cluster, compared with the average for all industries in the state or nation.

¹¹ Local competitiveness component is the portion of local job growth or decline that can be attributed to advantageous or disadvantaged conditions in the local area that make the industries in the cluster either more competitive or less competitive than their counterparts nationally (or statewide.)

Strong Local Competitiveness in High Performing Industry Clusters



All high-performing clusters benefit from economic share (national trends), but unlike the current clusters, it is not the only advantage. All high-performing clusters enjoy local competitiveness, particularly in business services, but at least 1,000 jobs have been created in each cluster as a result.

What is noteworthy is that only business services enjoys an industry mix advantage, with manufacturing suffering a significant decrease compared to the others, similar to its pattern among the existing cluster.

The Bottom Line

The region should consider revisiting the five industry clusters of focus by either further defining sub-sectors within each cluster or by looking at alternative clusters entirely. In the examples above, the selected high-performing industries have better location quotients, better employment growth, and greater local competitiveness. While the exact mix of industries that comprise these new clusters can be debated, the data is illustrative of the need to hone in on more specific areas. This can prove helpful during a time when government resources are shrinking.

Alternatively, local leaders can revisit the Michael Porter report that identified other potential clusters including: education and knowledge creation, construction materials, metal manufacturing, and power generation. Workforce policy makers from Three Rivers and the entire Southwest Region should seek to understand these alternatives and entertain an open dialogue about revising the focus of cluster efforts.

Chapter 4: Developing a 21st Century Workforce Curriculum

The new economy and older industries are both changing the way that we think about occupations and the way that we work. As the nature of work changes, it is important that the local and regional education and training systems understand those changes and make necessary adjustments to their curriculum.

Referring back to the discussion of educational alignment, it is critically important that the region has a way to ensure that all job seekers receive training in the knowledge and skills that are essential to workforce success in the 21st Century. Those areas that are able to make these shifts faster and more efficiently will be true winners in the preparation, recruitment, and retention of a quality workforce.

Knowledge Requirements

Analysis of the region's top 25 occupations (based on multiple criteria including current employment, projected growth, and annual wage) indicate the following knowledge requirements¹² are in demand at a medium level or higher:

- **Administration and Management:** Knowledge of the principles and processes involved in business and organizational planning, coordination, and execution. This includes strategic planning, resource allocation, manpower modeling, leadership techniques, and production methods.
- **Clerical:** Knowledge of administrative and clerical procedures and systems such as word processing systems, filing and records management systems, stenography and transcription, forms design principles, and other office procedures and terminology.
- **Computers and Electronics:** Knowledge of electrical circuit boards, processors, chips, and computer hardware and software, including applications and programming.
- **Customer and Personal Service:** Knowledge of principles and processes for providing customer and personal services including needs assessment techniques, quality service standards, alternative delivery systems, and customer satisfaction evaluation techniques.
- **Education and Training:** Knowledge of instructional methods and training techniques including curriculum design principles, learning theory, group and individual teaching techniques, design of individual development plans, and test design principles.

¹² Using the O*NET occupational database designed by the U.S. Department of Labor

- **English Language:** Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
- **Mathematics:** Knowledge of numbers, their operations, interrelationships and applications including arithmetic, algebra, geometry, calculus, statistics, and their applications.
- **Psychology:** Knowledge of human behavior and performance, mental processes, psychological research methods, and the assessment and treatment of behavioral and affective disorders.

Additional knowledge requirements in demand at a medium level or higher for two or more of the region's five clusters are:

- **Economics and Accounting (Business and Finance):** Knowledge of economic and accounting principles and practices, the financial markets, banking, and the analysis and reporting of financial data.
- **Medicine and Dentistry (Health Care):** Knowledge of the information and techniques needed to diagnose and treat injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and interactions, and preventive health-care measures.
- **Production and Processing (Manufacturing):** Knowledge of inputs, outputs, raw materials, waste, quality control, costs, and techniques for maximizing the manufacture and distribution of goods.
- **Therapy and Counseling (Health Care):** Knowledge of information and techniques needed to rehabilitate physical and mental ailments, and to provide career guidance including alternative treatments, rehabilitation equipment and its proper use, and methods to evaluate treatment effects.

Skill Requirements for the Southwestern Pennsylvania Region

- **Active Learning:** Working with new material or information to grasp its implications.
- **Active Listening:** Listening to what other people are saying and asking questions as appropriate.
- **Critical Thinking:** Using logic and analysis to identify the strengths and weaknesses of different approaches.
- **Information Gathering:** Knowing how to find information and identifying essential information.
- **Monitoring:** Assessing how well one is doing when learning or doing something.
- **Problem Identification:** Identifying the nature of problems.

- **Reading Comprehension:** Understanding written sentences and paragraphs in work-related documents.
- **Speaking:** Talking to others to effectively convey information.
- **Writing:** Communicating effectively with others in writing as indicated by the needs of the audience.

“New Economy” Skill Standards

While O*NET helps to identify key knowledge and skill characteristics of all of the top occupations, it is also important to understand the knowledge and skill standards of the new economy. One of the best definitions of these is provided by the Northwest Center for Emerging Technologies (NWCET) and the report *Building a Foundation for Tomorrow*¹³ published in 2000. Originally intended to serve as the framework for the nation’s information technology career cluster, these crosscutting skills represent an excellent view for all new economy industries, and perhaps the economy as a whole.

NWCET Employability Skills

Employers are often quoted by workforce professionals as saying, “just give me someone with basic skills and I’ll train them myself.” Yet, employers are vague about their definition of basic skills, and more than one employer means more than one definition. Workforce professionals will also agree to disagree about what is meant by basic skills. More often than not, employers are looking for people who have the right attitude, have a good “work ethic,” are good team players, and like to learn.

- **Communication Skills** include communication with team members, supervisors and subordinates, customers and clients, and between different groups in a manner that is timely and appropriate, etc.
- **Organizational Skills** include the ability to identify and define tasks, track milestones, recognize when a project timeline is running into problems and to take appropriate action, etc.
- **Team Contribution and Leadership** includes the ability to work with team members with different backgrounds and diverse communication styles, the ability to take on different team roles, the ability to read the team as a whole and individually, etc.
- **Professionalism** includes good work ethics, particularly showing up on time, understanding and following company procedures, relating to coworkers and customers with respect, etc.

¹³ Project developed in part by the National Science Foundation. Partners included Microsoft, The Boeing Company, American Association of Community Colleges, American Electronics Association, Educational Development Center, Department of Commerce, and Department of Labor, in addition to many others.

- **Critical Thinking and Decision Making** includes correctly analyzing situations, understanding tradeoffs, making good recommendations, making the right choices, etc.
- **Customer Relations** includes the ability to solicit and listen to feedback, and to effectively address customer issues and concerns.
- **Self-Directed and Continuous Learning** includes the need for employees to continuously engage in self-assessment against the technological landscape of skills and knowledge, and to take proactive steps toward enrolling in continuous training for their trade.

NWCET Cross-Sector Core Skill Areas

- **Project Management** includes activities such as defining the scope of the project; identifying stakeholders, developing task lists, estimating time requirements, evaluating project requirements, tracking milestones, securing needed resources, reporting progress, and many others.
- **Task Management** includes developing time and activity plans to achieve objectives, coordinating and implementing work processes and procedures, and monitoring and analyzing processes and procedures, and maintaining status reports, etc.
- **Problem-Solving / Troubleshooting** includes defining the problem, performing analysis to identify the cause(s), identifying and testing possible solutions, developing and implementing a resolution plan, and evaluating the problem solving process and outcomes, etc.

NWCET Core Curriculum

- **Analytical Skills and Problem Solving** includes hypotheses development and design, statistical analysis, business environment skills, etc.
- **Business Organization and Environment** includes principles of accounting, professional development, computer trends in business and society, etc.
- **Coordination and Communication Skills** includes customer relations, project management, communication, teamwork, written communication, etc.
- **Project and Process Flow Skills** includes analysis and synthesis, project documentation, proposal writing, quality assurance, research, user testing and validation, etc.
- **Core Computer Software and Hardware Skills** includes database applications, email, hardware installation and configuration, Internet, network technologies, presentation software, principles of programming, software installation and configuration, spreadsheet applications, Windows environment, word processing, etc.
- **Core Field of Study Skills** (not included in NWCET definition but added by author) includes field-specific skills; i.e., special trades for a general contractor, culinary arts

for a chef, therapy and counseling for a psychologist, product inspection for manufacturing, etc.

Putting the “Customer” into the (Customer) Service Economy:

As the nation and regional economies continue to transform from manufacturing to service economies, the need to focus on the customer has become increasingly vital. A service economy is reliant on the ability for workers to properly relate to and communicate with internal and external clients.

The emphasis on the customer is seen in a variety of places in the above knowledge, skills, and curriculum information, including customer and personal service as a critical knowledge requirement; active listening, information gathering, and speaking as critical skill requirements; and communication skills, professionalism, and customer relations as skill standards.

The importance of customer service simply cannot be understated. Most people will agree that they have received poor personal services “within the past 48 hours.” Yet, few areas across the country have entered into real discussion about the implications of this essential characteristic of the economy through new programs and courses offered by education and training providers, or even a basic integration of critical elements of customer service into existing programs and courses.

Regional leaders in Southwest Pennsylvania have begun to address customer service issues and implications, and efforts must continue to emphasize understanding what needs to be done and what is being done or planned to do in order to meet those needs. Emphasis should be placed on developing dedicated or concentrated programs in this area.

The Bottom Line

O*NET allows us to understand the importance and level of various occupational knowledge and skill characteristics. Using skill standards allows us to further identify and understand key skills in demand by employers in the workplace. What can be done with all of this knowledge and skills information? Two recommendations:

1. Assess current and future employees in O*NET skill sets or a similar framework. This information can then be used in a comparison between the supply and demand of these characteristics.
2. Pursue a course of action that provides an incentive for education and training providers to offer a comprehensive “21st Century Workforce Curriculum” that

focuses on all of the necessary elements of the knowledge and skill requirements and skill standards identified above, including customer service.

Immediate and unanimous acceptance of the curriculum recommended above is not necessary. Rather, local policy makers and education leaders must understand the need for this curriculum and then engage in discussions that lead to mutual agreement of what that curriculum needs to be. At that point, the information above can be used as a discussion starter that can be validated or edited.

Mapping Supply and Demand

The key component of the overall community audit project is to develop a permanent means by which to monitor the changes to the supply and demand of occupations and skills. In order to do so, an element of the overall project maps each and every adult, post-secondary, and vocational training program to a “career cluster” as defined by the U.S. Department of Education.

This effort involved cataloguing and mapping all of the adult, secondary, and vocational education and training programs into 22 occupational clusters as defined by the U.S. Department of Labor (demand) and 16 career clusters as defined by the U.S. Department of Education (supply); aligning occupational clusters and career clusters to create a crosswalk for comparison; validating the map with local training providers; revising the map based on a validation session and populating the map to get to final educational index scores.

For example, an index score for Finance positions in the region might indicate 2,000 new jobs in the next 10 years, but 4,500 students currently in the pipeline, indicating a potential surplus of up to 250%.

The educational index and mapping process takes into account the various occupational classifications and characteristics, including career clusters, occupational clusters, and the industry clusters already defined by the region. In order to accomplish the educational mapping and index portion of the project in a way that is usable from both a supply side (educational) and demand side (occupational), the occupations can be mapped to both career clusters of the U.S. Department of Education and the occupational clusters of the U.S. Department of Labor.

The educational index is not yet complete as issues identified during the validation session and the replication training are still being worked through. Meetings with additional stakeholders are needed to strengthen the information already contained in the index to make the results more reliable.

Sneak Peek: Cluster by Cluster Analysis

This report covers general findings as the first in a series of products. The next products will include the supply and demand educational index (outlined above) and a series of individual cluster reports. Individual cluster reports highlight recent labor market trends, staffing patterns, critical knowledge and skill requirements, employer roundtable comments¹⁴, and education and training data (excerpted from educational mapping.)

A sample of the data that will be contained in the individual reports is included below. Hospitality and Tourism is used as an example.

Cluster Sample: Hospitality and Tourism

Recent Labor Market Trends as shown in Chapter 3 of this report.

Staffing Patterns: Waiters and Waitresses, Retail Salespersons, Cashiers, Fast Food Workers, Food Preparation Workers are top five occupations based on current employment.

Occupational Pathways¹⁵: Restaurants and Food/Beverage Services; Lodging; Travel and Tourism; Recreation, Amusements and Attractions.

Critical Knowledge Requirements: Customer and Personal Service, Sales and Marketing, Mathematics, Economics and Accounting, Administration and Management.

Critical Skill Requirements: Problem Identification, Active Listening, Reading Comprehension, Coordination, and Speaking.

Career Mobility: Understanding the progression from hotel desk clerk to hotel manager, from food preparation to food server, etc.

Employer Roundtable Comments¹⁶: Regional strengths include job shadowing and internships, weaknesses include career awareness of youth and public employment programs; high occupational demand for security guards, janitors and cleaners, maids, and management trainees; educational requirements are not the driving reason behind jobs being hard to fill in this industry.

¹⁴ Employer roundtables were held in each of the five cluster areas plus a sixth “all other” cluster. Employers were asked a series of questions including occupations that are chronically hard to fill; characteristics of hard to fill occupations including education levels; satisfaction with local workforce areas such as customized skills training and others; and recruitment and training trends.

¹⁵ Career Clusters Resources for Hospitality and Tourism, U.S. Department of Education

¹⁶ Roundtables were held for Hospitality and Tourism, Health Care, and “other”. For other clusters, other secondary research will be incorporated in order to gain employer perspective.

Appendix A

Cluster Definitions

Air Transportation

SIC 4500 inclusive (any four digit code starting with 45 included)

Financial Services

6036	Savings institutions, Not Federally Chartered
6111	Federal and Federally-Sponsored Credit Agencies
6159	Miscellaneous Business Credit Institutions
6211	Security Brokers, Dealers, and Flotation Companies
6282	Investment Advice
6289	Services Allied With the Exchange of Securities or Commodities, NEC
6311	Life Insurance
6324	Hospital and Medical Service Plans
6331	Fire, Marine, and Casualty Insurance
6411	Insurance Agents, Brokers, and Service
7323	Credit Reporting Services

Health Care

SIC 8000 Inclusive

Hospitality

4121	Taxicabs
4131	Intercity and Rural Bus Transportation
4141	Local Bus Charter Service
4142	Bus Charter Service, Except Local
4481	Deep Sea Transportation of Passengers, Except by Ferry
4482	Ferries
4489	Water Transportation of Passengers, NEC
4491	Marine Cargo Handling
4492	Towing and Tugboat Services
4493	Marinas
4499	Water Transportation Services, NEC
4512	Air Transportation, Scheduled
Hospitality (continued)	

4513	Air Courier Services
4522	Air Transportation, Nonscheduled
4581	Airports, Flying Fields, and Airport Terminal Services
4724	Travel Agencies
4725	Tour Operators
4729	Arrangement of Passenger Transportation, NEC
5311	Department Stores
5331	Variety Stores
5399	Miscellaneous General Merchandise Stores
5812	Eating and Drinking Places
5813	Drinking Places (Alcoholic Beverages)
5912	Drug Stores and Proprietary Stores
5921	Liquor Stores
5932	Used Merchandise Stores
5941	Sporting Goods Stores and Bicycle Shops
5942	Book Stores
5943	Stationery Stores
5944	Jewelry Stores
5945	Hobby, Toy, and Game Shops
5946	Camera and Photographic Supply Stores
5947	Gift, Novelty, and Souvenir Shops
5948	Luggage and Leather Goods Stores
5949	Sewing, Needlework, and Piece Goods Stores
5961	Catalog and Mail-Order Houses
5962	Automatic Merchandising Machine Operator
5963	Direct Selling Establishments
5983	Fuel Oil Dealers
5984	Liquefied Petroleum Gas (Bottled Gas) Dealers
5989	Fuel Dealers, NEC
5992	Florists
5993	Tobacco Stores and Stands
5994	News Dealers and Newsstands
5995	Optical Goods Stores
5999	Miscellaneous Retail Stores, NEC
7011	Hotels and Motels
7032	Sporting and Recreational Camps
7033	Recreational Vehicle Parks and Campsites
7513	Truck Rental and Leasing, Without Drivers
7514	Passenger Car Rental
Hospitality (continued)	

7515	Passenger Car Leasing
7519	Utility Trailer and Recreational Vehicle Rental
7832	Motion Picture Theaters, Except Drive-In
7833	Drive-In Motion Picture Theaters
7911	Dance Studios, Schools, and Halls
7922	Theatrical Producers (Except Motion Picture) and Miscellaneous Theatrical Services
7929	Bands, Orchestras, Actors, and Other Entertainers and Entertainment Groups
7933	Bowling Centers
7941	Professional Sports Clubs and Promoters
7948	Racing, Including Track Operations
7991	Physical Fitness Facilities
7992	Public Golf Courses
7993	Coin-Operated Amusement Devices
7996	Amusement Parks
7997	Membership Sports and Recreation Clubs
7999	Amusement and Recreation Services, NEC
8412	Museums and Art Galleries
8422	Arboreta and Botanical or Zoological Gardens

Information Technology

3570	Computer and Office Equipment
3650	Household Audio and Video Equipment
3660	Communications Equipment
3670	Electronics Components and Accessories
3810	Search, Detective, Navigation (etc.) Equipment
3820	Laboratory Apparatus Equipment
7370	Computer Services
4800	Communications

Manufacturing

SIC 2000 and 3000 Inclusive

Definition of Clusters Used in Comparisons of Current vs. High Performing

	Current Financial Services Cluster		High-Performing Financial Services Cluster
6010	Central Reserve Depository	6010	Central Reserve Depository
6020	Commercial Banks	6282	Investment Advice
6030	Savings Institutions	6300	Insurance Carriers
6060	Credit Unions	6700	Holding and Other Investment Offices
6080	Foreign Banks, Branches, Agencies		
6090	Functions Closely Related to Banking		
6110	Federal/Federally Sponsored Credit Institutions		
6140	Personal Credit Institutions		
6150	Business Credit Institutions		
6160	Mortgage Bankers and Brokers		
6210	Security Brokers and Dealers		
6220	Commodity Contracts Brokers, Dealers		
6230	Security and Commodity Exchanges		
6280	Security and Commodity Services		
6310	Life Insurance		
6320	Medical Service and Health Insurance		
6330	Fire, Marine, and Casualty Insurance		
6350	Surety Insurance		
6360	Title Insurance		
6370	Pension, Health, and Welfare Funds		
6390	Insurance Carriers, NEC		
6410	Insurance Agents, Brokers, and Service		
6510	Real Estate Operators and Lessors		
6530	Real Estate Agents and Managers		
6540	Title Abstract Offices		
6550	Subdividers and Developers		
6710	Holding Offices		
6720	Investment Offices		
6730	Trusts		
6790	Miscellaneous Investing		

	Current Health Services Cluster		High-Performing Health Services
3840	Medical Instruments and Supplies	8040	Offices of Other Health Professionals
5120	Drugs, Proprietarys, and Sundries	8059	Nursing and Personal Care Facilities
8010	Offices and Clinics of Medical Doctors	8360	Residential Care
8020	Offices and Clinics of Dentists		
8030	Offices of Osteopathic Physicians		
8040	Offices of Other Health Practitioners		
8050	Nursing and Care Facilities		
8060	Hospitals		
8070	Medical and Dental Laboratories		
8080	Home Health Care Services		
8090	Health and Allied Services, Not Elsewhere Classified		
8730	Research and Testing Services		
	Current Hospitality and Tourism Cluster		High-Performing Trade Cluster
4480	Water Transportation of Passengers	5030	Lumber and Construction Materials (wholesale)
4490	Water Transportation Services	5060	Electrical Goods (wholesale)
4720	Arrangement of Passenger Transportation	5087	Service Establishment Equipment and Supplies (wholesale)
5551	Boat Dealers	5110	Paper and Paper Products (wholesale)
5561	Recreational Vehicle Dealers	5169	Chemicals and Allied Products, Not Elsewhere Classified (wholesale)
5800	Eating and Drinking Places	5194	Tobacco and Tobacco Products
7010	Hotels and Motels	5460	Retail Bakeries
7020	Room and Boarding Houses	5610	Men's & Boys' Clothing Stores
7030	Camps and Recreational Vehicle Parks	5690	Miscellaneous Apparel and Apparel Accessory Stores
7389	Business Services, NEC	5713	Floor Covering Stores
7510	Automotive Dealers, No Drivers	5734	Computer and Computer Software Stores
7920	Producers, Orchestras, Entertainers	5735	Record and Prerecorded Tape Stores
7940	Commercial Sports	5920	Liquor Stores
7990	Miscellaneous Amusement Recreation Services		
8400	Museums, Botanical, Zoological Gardens		
8610	Business Associations		
8640	Civic and Social Associations		

	Current Information Technology Cluster		High-Performing Information Technology Cluster
3570	Computer and Office Equipment (manufacturing)	7213	Linen Supply
4810	Telephone Communication	7334	Photocopying and Duplication Services
4830	Radio and Television Advertising	7336	Commercial Art and Graphic Design
7370	Computer and Data Processing Services	7373	Computer Integrated Systems Design
		7374	Computer Processing and Data Preparation
		7384	Photofinishing Laboratories
		8620	Professional Organizations
		8712	Architectural Services
		8740	Management and Public Relations
	Current Manufacturing Cluster		High-Performing Manufacturing Cluster
2000	Food and Kindred Products	2030	Preserved Fruits and Vegetables
2100	Tobacco Products	2821	Plastics Materials & Synthetic Resins
2200	Textile Mill Products	3230	Products of Purchased Glass
2300	Apparel and Other Textile Products	3350	Nonferrous Rolling and Drawing
2400	Lumber and Wood Products, Except Furniture	3443	Fabricated Plate Work (boiler shops)
2500	Furniture and Fixtures	3479	Coating, Engraving, and Allied Services
2600	Paper and Allied Products	3589	Service Industry Machinery, Not Elsewhere Classified
2700	Printing and Publishing	3740	Railroad Equipment
2800	Chemicals and Allied Products	3823	Industrial Instruments for Measurement
2900	Petroleum and Coal Products	3840	Medical Instruments and Supplies
3000	Rubber and Miscellaneous Plastics Products	3993	Signs and Advertising Specialties
3100	Leather and Leather Products		
3200	Stone, Clay, and Glass Products		
3300	Primary Metal		
3400	Fabricated Metal		
3500	Industrial Machinery and Equipment		
3600	Electronic & Other Electric Equipment		
3700	Transportation Equipment		
3800	Instruments and Related Products		
3900	Miscellaneous Manufacturing		

Career Clusters

Agriculture, Food, and Natural Resources – Production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/services.

Architecture and Construction – Designing, planning, managing, building, and maintaining the built environment.

Arts, A/V Technology and Communications – Designing, producing, exhibiting, performing, writing, and publishing multimedia content including visual and performing arts and design, journalism, and entertainment services.

Business, Management, and Administration – Planning, organizing, directing, and evaluating business functions essential to efficient and productive business operations.

Education and Training – Planning, managing, and providing education and training services, and related learning support services.

Finance – Financial and investment planning, banking, insurance, and business financial management.

Government and Public Administration – Executing government functions at all levels (federal, state, and local) to include governance; national security; foreign service; planning; revenue and taxation; and regulation.

Health Science – Planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.

Hospitality and Tourism – Management, marketing, and operations of restaurants and other food services, lodging, attractions, recreation events and travel related services.

Human Services – Servicing families and human needs.

Information Technology – Design, development, support, and management of hardware, software, multimedia, and systems integration services.

Public Safety and Security – Planning, managing, and providing legal, public safety, protective services and homeland security, including professional and technical support services.

Manufacturing – Planning, managing and performing the processing of materials into intermediate or final products and related activities such as production planning and control, maintenance and manufacturing/process engineering.

Marketing, Sales, and Services – Planning, managing, and performing marketing activities to reach organizational objectives.

Science, Technology, Engineering, and Mathematics – Planning, managing, and providing scientific research and professional and technical services including laboratory and testing services, and research and development services.

Transportation, Distribution, and Logistics – Planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services such as transportation infrastructure planning and management, logistic services, mobile equipment and facility maintenance.

Standard Occupational Classifications

(Under the major headings used in Occupational Alignment on p.12)

Management, Professional, and Technical

- Architecture and Engineering
- Arts, Design, Entertainment, Sports, and Media
- Business and Financial Operations
- Community and Social Services
- Computer and Mathematical
- Education, Training, and Library
- Healthcare Practitioners and Support
- Legal
- Life, Physical, and Social Sciences
- Management

Sales and Office

- Office and Administrative
- Sales and Related

Services

- Building and Grounds Cleaning and Maintenance
- Food Preparation and Serving
- Healthcare Support
- Personal Care
- Protective Service

Production and Construction

- Construction and Extraction
- Installation, Maintenance, and Repair
- Production
- Transportation and Material Moving

Farming, Fishing, and Forestry

Not included due to small size