

**Labor Market Trends and Career Academies in Hamilton County Schools:  
A Report to the Chattanooga Area Chamber of Commerce**

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## **Executive Summary**

As part of its 2006-2009 Business Plan, the Chattanooga Area Chamber of Commerce (CACC) established an initiative to create an industry standards-based academy system in the Hamilton County Department of Education. Supported by funding from the Ford Motor Company Fund, CACC has engaged the Community Research Council (CRC) to examine historical trends and current conditions in the local labor market with the goal of identifying where workforce needs might be met by the development of such high school level career academies. To accomplish this, CRC undertook the following tasks:

- A reorganization of industrial employment, industrial firm, and occupational categories into the USDOE Career Cluster framework
- An analysis of the *industrial employment growth* of career clusters and sub-sectors that comprise each cluster, including an assessment of the 10 highest- and lowest-growth sectors overall and in sub-sectors containing at least 1,000 employees
- An analysis of the *firm growth* of career clusters and sub-sectors that comprise each cluster, including an assessment of the 10 highest- and lowest-growth sectors overall and in sub-sectors containing at least 100 firms
- An analysis of the *occupational employment growth* of career clusters and sub-sectors that comprise each cluster, including an assessment of the 10 highest- and lowest-growth sectors overall and in sub-sectors containing at least 1,000 employees

It is important to note that industrial employment and firm data uses the firm as the unit of analysis and therefore counts employees/firms based on companies classified by industry. In contrast, occupational employment data uses specific occupations as the level of analysis, meaning that employees in a specific occupation are counted *across* industries – that is, across industries that depend on specific occupations for operations. So, in some cases, certain occupational categories may be growing while seemingly related industries are contracting.

This analysis is occurring at a time of dynamic change in the local, national and global labor market. If a similar analysis had been undertaken just a generation ago, historical trends would have suggested the need for workforce investment in manufacturing – an industry that has since lost almost 7,300 jobs in the region between 2000 and 2004<sup>1</sup> – and could not have possibly foreseen growth in employment in tourism or the rise of information technology occupations.

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<sup>1</sup> United States Department of Commerce, Bureau of the Census, County Business Patterns, Hamilton County 2000 and 2004.

An assessment of this type, therefore, needs to be based on three different sets of factors – historical (where we have been), prospective (where we are going), and aspirational (where we want to go). So, historical trends may suggest continuing workforce needs in those clusters that have seen the greatest growth in the last half-decade based on data collected by the Commerce and Labor Departments. Prospective needs can be identified through interviews with current, major local employers. Our aspirational goals, however, also have an effect on new workforce development needs – whether they involve bringing an automotive plant to Enterprise South or making Chattanooga a hub for design and technology employment, as suggested by some of the work by Angelou Economics as part of their assessment of the Central Business District.

All of this must be tempered by the larger global context. Even if history pointed to manufacturing, call centers and accounting as areas of past growth locally, we know that larger global forces are at work. For example, any effort to examine future local employment prospects needs to acknowledge the risk of outsourcing. Alan S. Blinder, Princeton economics professor and former Chair of the President’s Council of Economic Advisors, argues that “[T]hanks to electronic communications and globalization, the future is likely to see much more offshoring of jobs in impersonal services; that is, services that can be delivered electronically over long distance with little or no degradation of quality”. These jobs include both relatively low-skill jobs and jobs requiring high levels of education. However, jobs that require face-to-face contact with a customer or client are less susceptible to automation or offshoring. These personal services include occupations such as lawyers and surgeons as well as mechanics and janitors.<sup>2</sup>

National demographic shifts also have the potential to affect the local economy in the near term as the “baby boomer” generation reaches retirement age. In 2005 over one-third (33.5%) of Hamilton County’s population was over the age of 50, and almost one-fifth (19.2%) was over the age of 60. Nearly half (48.7%) of the county was 40 years of age or more<sup>3</sup>. While professional occupations have a disproportionate share of older workers (especially those requiring postgraduate degrees), the factors affecting individual retirement decisions are varied and inconsistent across occupations<sup>4</sup>. While such workers may stay in their jobs longer due to higher than average job satisfaction and salaries/benefits, earlier retirement may be seen in certain occupations with more lucrative pension and health benefits that offset other factors associated with maintaining employment. National labor force participation data from 2006, however, suggests a significant exodus from the workforce after the age of 65. While 64% of those between the

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<sup>2</sup> See Blinder, Alan, *Fear of Offshoring*, CEPS Working Paper No. 119 (December 2005) and Levy, Frank and Richard Murnane, “Got A Routine Job? Not for Long”, *The Washington Post*, 7/4/2004, p. B03.

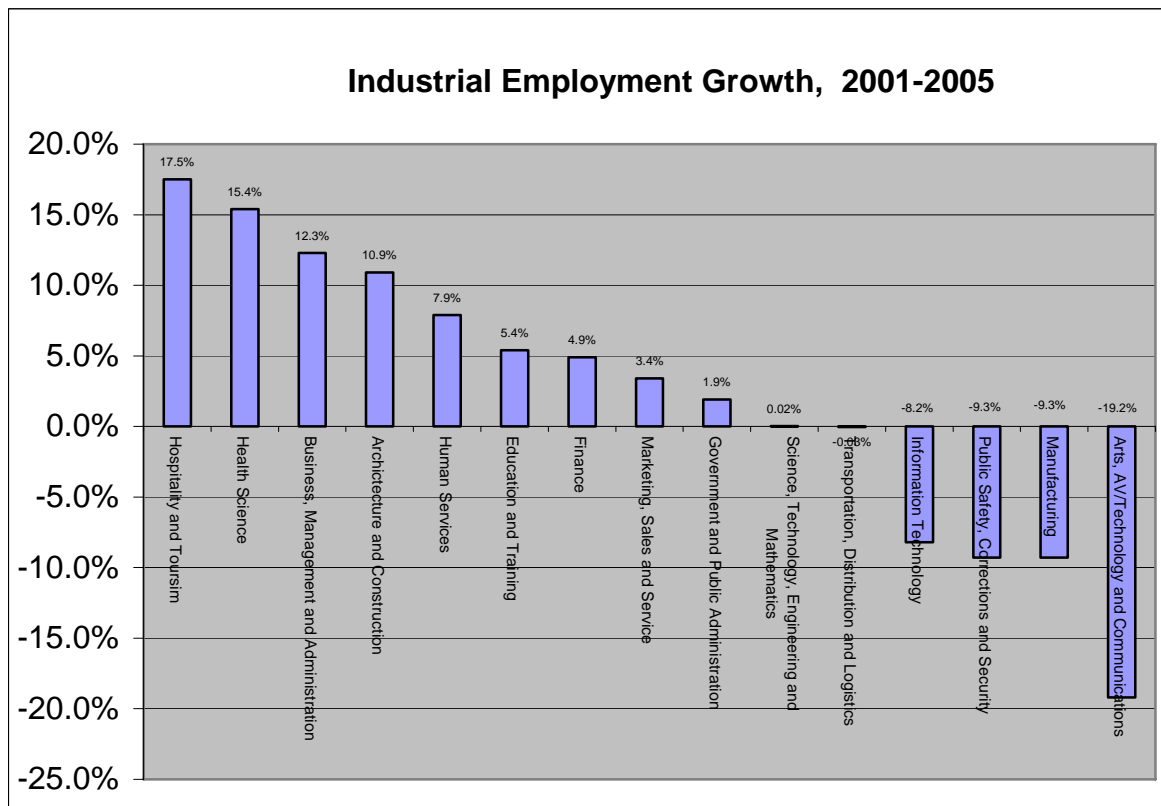
<sup>3</sup> United States Department of Commerce, Bureau of the Census, County Estimates by Demographic Characteristics, Hamilton County, 2005.

<sup>4</sup> See “Gauging the Labor Force Effects of Retiring Baby Boomers”, United States Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review* (July 2000).

ages of 55 and 64 were engaged in employment, labor force participation in the 65 to 69 age group was 31%. For those age 65 years or more, the labor force participation rate was 16%<sup>5</sup>. As the first wave of the “baby boomer” generation will be eligible for early retirement (at age 62) in 2008, it is likely that a significant number of workers will begin to exit the local labor market. The magnitude of the resulting labor shortage will depend upon the labor participation rates of the older demographic groups, the participation rates of the younger demographic groups just entering the labor market, and the capacity of the local education and training infrastructure to develop the skills required for demand occupations.

*Summary of Findings and Recommendations*

Between 2001 and 2005, industrial employment increased in nine career clusters. Four clusters experienced growth rates in excess of 10%: Hospitality and Tourism (17.5%), Health Science (15.4%), Business Management and Administration (12.3%) and Architecture and Construction (10.9%).

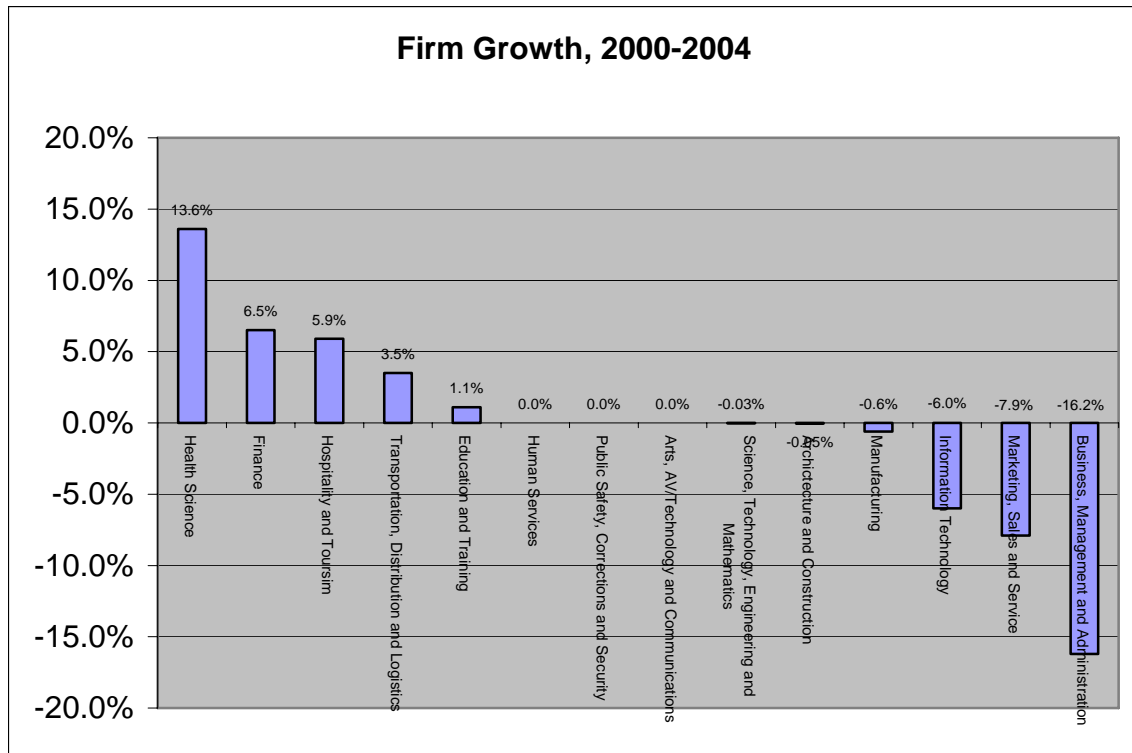


<sup>5</sup> United States Department of Labor, Bureau of Labor Statistics, *Labor Force Statistics from the Current Population Survey*, Civilian Labor Force Participation Rate, (4<sup>th</sup> Quarter, 2006).

Employment declined in four clusters: Arts, A/V Technology and Communications (-19.2%), Manufacturing (-9.3%), Public Safety, Corrections and Security (-9.3%) and Information Technology (-8.2%).

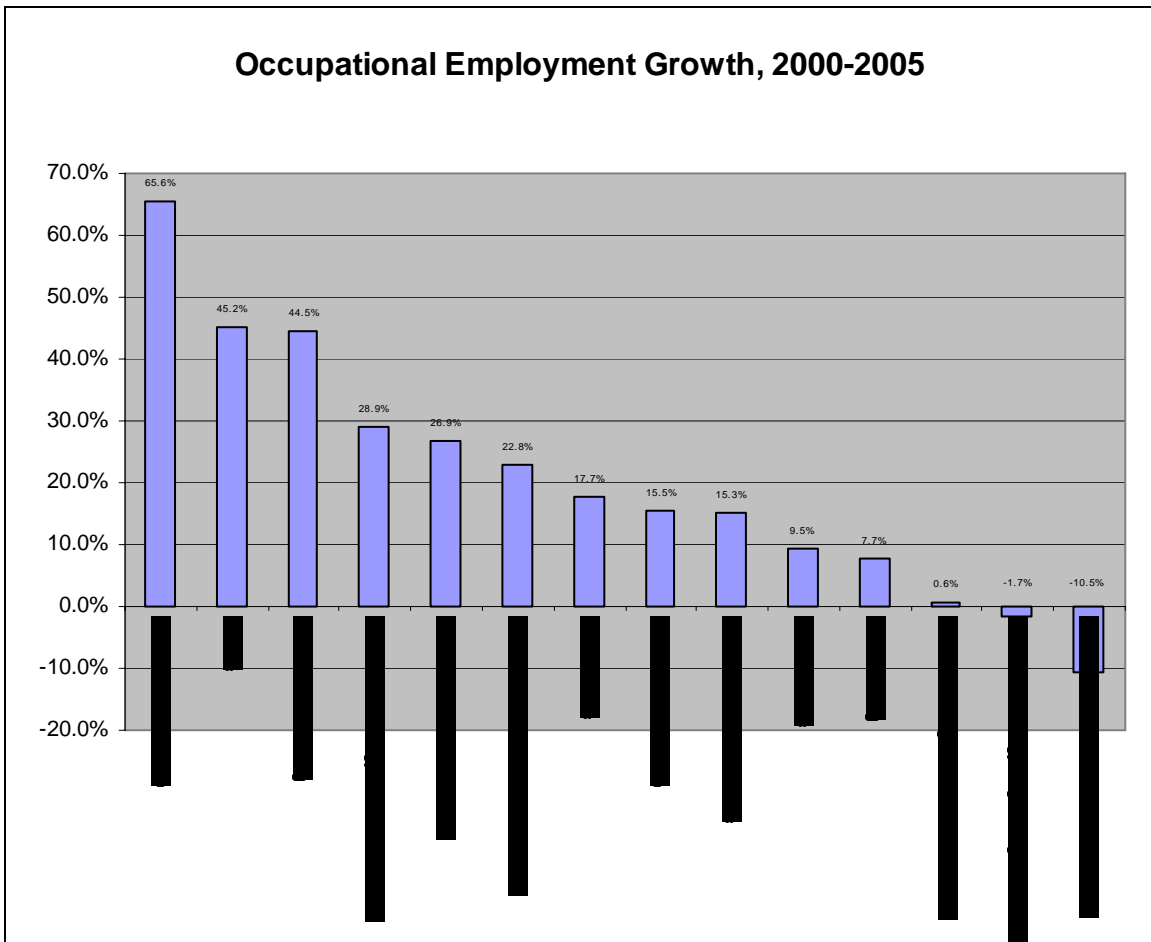
Five career clusters experienced an overall growth in number of firms between 2000 and 2004. While the number of firms within the Health Science career cluster grew at the highest rate (13.6%), Finance (6.5%) and Hospitality and Tourism (5.9%) both had firm growth rates in excess of 5%.

Overall firm growth was static or near static in six career clusters: Human Services; Public Safety, Corrections and Security; Arts, A/V Technology and Communications; Science, Technology, Engineering and Mathematics; Architecture and Construction; and Manufacturing. Three additional career clusters experienced an overall reduction of firms over this time period: Business, Management and Administration (-16.2%), Marketing, Sales and Service (-7.9%) and Information Technology (-6.0%).



Between 2000 and 2005, occupational employment in all but two career clusters increased. The highest rate of occupational employment growth occurred within the Information Technology career cluster (65.6%). Two career clusters experienced occupational employment growth rates in excess of 44%: Finance

(45.2%) and Education and Training (44.5%). Three additional career clusters grew at rates in excess of 22%: Arts, A/V Technology and Communications (28.9%), Architecture and Construction (26.9%), and Public Safety, Corrections and Security (22.8%).



Still three other career clusters experienced occupational employment growth within the 15-18% range: Health Science (17.7%), Hospitality and Tourism (15.5%), and Marketing, Sales and Service (15.3%). Human Services and Manufacturing occupations grew at 9.5% and 7.7%, respectively. Transportation, Distribution and Logistics (-10.5%) and Science, Technology, Engineering and Mathematics (-1.7%) declined.

**Table 1 – Industrial Employment, Industrial Firm and Occupational Employment Growth by Career Cluster**

<b>Career Cluster</b>	<b>Industrial Employment Growth, 2001-2005</b>	<b>Industrial Firm Growth, 2000-2004</b>	<b>Occupational Employment Growth, 2000-2005</b>
Hospitality and Tourism	17.5%	5.9%	15.5%
Health Science	15.4%	13.6%	17.7%
Business, Management and Administration	12.3%	-16.2%	0.6%
Architecture and Construction	10.9%	-0.05%	26.9%
Human Services	7.9%	0.0%	9.6%
Education and Training	5.4%	1.1%	44.5%
Finance	4.9%	6.5%	45.2%
Marketing, Sales and Service	3.4%	-7.9%	15.3%
Government and Public Administration	1.9%	N/A	N/A
Science, Technology, Engineering and Mathematics	0.02%	-0.03%	-1.7%
Transportation, Distribution and Logistics	-0.08%	3.5%	-10.5%
Information Technology	-6.2%	-6.0%	65.6%
Public Safety, Corrections and Security	-9.3%	0.0%	22.8%
Manufacturing	-9.3%	-0.6%	7.7%
Arts, AV/Technology and Communications	-19.2%	0.0%	28.9%

Four career clusters -- Hospitality and Tourism, Health Science, Education and Training and Finance -- had positive rates of increase across all three measures of growth. These clusters also reflect career areas where industrial employment growth is expected to be strong nationally through 2014.<sup>3</sup> Moreover, there are high concentrations of “personal service” jobs in each of these sectors.

**Table 2 – Projected National Employment Growth through 2014**

<b>Sector</b>	<b>Growth Rate</b>
Health Care	32.5%
Education	30.6%
Leisure and Hospitality	17.7%
Finance	8.3%

In the case of Health Care, employer interviews confirm growing demand and point to the need for greater supply. Critical labor shortages were cited with regard to a variety of positions such as *Long-Term Care Workers, Nurses, Speech Pathologists, Psychologists and Physical Therapists, Pharmacists/Pharmacy Technologists, Vascular Technologists, Laboratory Technologists, Surgical First Assistants and Imaging/Ultrasound Technologists.*

<sup>3</sup> U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook*, 2003.

The practical short-term effect of a limited labor pool in these career areas is that such positions commonly remain open for six months to one year, and are subject to high turnover rates due to a high degree of competition from organizations offering higher salaries and benefits for comparable positions. The long-term effects of these deficits are more significant in that the overall capacity of the health care system is compromised, eroding the quality of life for the entire region.

Other career clusters show signs of slowed growth regionally, but national growth trends suggest that investment in the development of such skill sets will be required to maintain regional competitiveness. The Information Technology Cluster, for example, has undergone regional reductions in industrial employment and in the number of firms – although cross-industry occupations in this cluster have grown by over 65%. Nationally, large employment increases by 2014 are expected within the Software Publishing (67.6%), Internet Publishing (43.5%) and Internet Service Provision (27.8%) industries.

Science, Technology, Engineering and Mathematics is another career cluster that has experienced recent stagnant growth locally, although it represents a career path requiring skills that will continue to be in high demand within the larger economy. For instance, employment in Professional, Scientific and Technical services is expected to grow by 28.4% through 2014 (an increase of 1.9 million jobs). High growth industries within this sector include Computer Systems Design and Related Services (38.5%) and Management, Scientific and Technical Consulting Services (60.5%).

Skills within these career paths are in high demand according to employers, which cited labor shortages in the Information Technology and Science, Technology, Engineering and Mathematics clusters. Specifically, employers cited deficits in computer operators and network administrators as well as a general shortage in basic computer skills. Additionally, multiple employers referenced unmet demand for specialized skills sets such as engineering, automotive/engine repair, and precision equipment repair.

Based on this assessment of regional and national factors as they relate to the future prospects for the Chattanooga Region's labor market, it is recommended that career academies within the Hamilton County Department of Education focus on the following clusters:

- **Information Technology**

While occupations in this cluster had the highest growth rate (65%) between 2000 and 2005, Chattanooga's major employers across industries suggested that such skills represented major gaps in their workforces. This cluster will remain important as long as large segments

of the economy are dependent upon the creation, organization, transmission and storage of highly complex information.

- **Finance**

While occupational employment grew by approximately 45% in the region between 2000 and 2005, employers across several industries cited skills gaps with respect to financial specialties.

- **Health Care**

Employment and firm growth in the Health Sciences career cluster grew at a rate of 15.4% and 13.6%, respectively. Such growth in this career cluster is occurring at a time in which major health care providers are expressing critical shortages in several health care specialties. Age-related demographic shifts and the primacy of Chattanooga as the health care hub for the region are additional contributing factors that make this cluster critical to the vitality of the region.

- **Science/Technology/Engineering/Mathematics**

The Science/Technology/Engineering/Mathematics career cluster experienced near-zero growth across all measures used in this study. However, employers in the region indicated a skills gap for this cluster and demand for such skills is expected to grow in the region.

- **Architecture and Construction**

Occupational growth in this cluster was approximately 27% between 2000 and 2005. Continued physical development in the region is dependent upon the presence of a trained workforce in this area.

- **Hospitality and Tourism**

Reflecting Chattanooga's role as a tourism center, relatively high growth rates for this cluster were found across all measures used in this study. Given the strength of the tourism sector in the region, the career academy model has the potential to prepare students for both entry-level positions and college programs that lead to long-term careers in the industry.

- **Education and Training**

Occupational employment within the Education and Training career cluster grew by 44.5% overall, although the number of secondary school teachers declined by 23.5%. Local employers cited a shortage of secondary teachers in specializations such as math, science and

information technology. Local employers also cited shortages in postsecondary specialties such as nursing, information technology and engineering.

## **Methodology**

### *Labor Market Trend Analysis*

The UDOE Career Cluster framework contains sixteen career categories that are organized based on requisite skill and education levels, and are established as follows:

- Agriculture, Food and Natural Resources
- Architecture and Construction
- Arts, A/V Technology and Communications
- Business, Management and Administration
- Education and Training
- Finance
- Government and Public Administration
- Health Science
- Hospitality and Tourism
- Human Services
- Information Technology
- Law, Public Safety and Security
- Manufacturing
- Marketing, Sales and Service
- Science, Technology, Engineering and Mathematics
- Transportation, Distribution and Logistics

Using this framework, CRC disaggregated employment and occupational data from United States Department of Commerce (USDOC) datasets and reorganized this data according the USDOE Career Cluster framework. Datasets that were utilized in this study included:

- United States Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2001-2005
- United States Department of Commerce, Bureau of the Census, County Business Patterns Firm Data, 2000-2004
- United States Department of Labor, Bureau of Labor Statistics, Metropolitan Area Occupational Employment and Wage Estimates, Occupational Employment Statistics Survey, 2000-2005.

While the amount of information within each dataset was robust, several limitations in availability should be noted:

- For each dataset, the optimal time frame for analysis was determined to be from the year 2000 to the most recent year available.
- 2005 was the most recent year available for each dataset with the exception of the County Business Patterns Firm data (2004 was the most recent year of availability for this dataset).
- 2000 was the base year for each dataset with the exception of the Quarterly Census of Employment and Wages (QCEW). QCEW transitioned from the Standard Industrial Classification (SIC) framework to the North American Industry Classification System (NAICS) structure in 2001. To maintain consistency, 2001 was established as the base year for the analysis of industrial employment.
- The industrial employment and firm growth analyses were conducted by applying NAICS data to the USDOE Career Cluster framework. NAICS data at the three-digit level of aggregation was applied to this framework when it allowed for sufficient detail in the classification of industry/employment types. When sufficient detail was not available at the three-digit level, the four-digit level of aggregation was applied.
- In some cases, data was unavailable at either the three- or four-digit level of aggregation or in either the base or terminal years of analysis (or both). Sub-sectors with missing data in this regard were excluded.
- In some cases, data was unavailable for the base year of analysis, but was available for one or more following years (2002, 2003, etc.). Where data was available, data for following years was applied and footnoted in the text.
- A large amount of industrial employment (BLS) and firm (Census Bureau) data was unavailable at the three- and four-digit levels of aggregation for Catoosa, Dade, Marion, Sequatchie and Walker Counties. For these analyses, Hamilton County was utilized as the geographic unit of analysis (Hamilton County accounts for approximately 80% of all jobs in the Chattanooga Metropolitan Statistical Area [MSA]). The occupational employment analysis was conducted at the MSA level.

Growth rates were calculated using the established base and terminal years, unless otherwise noted.

## Community Research Council

### *Employer Interviews*

Human resources directors from the Chattanooga region's 25 largest employers (based on 2006 employment) were contacted for in-depth interviews covering a range of topics with respect to organizational workforce development issues. Organizations that agreed to an interview are as follows:

- Alstom Power
- Chattanooga State Technical Community College
- City of Chattanooga
- Erlanger Health Systems
- Hamilton County Department of Education
- McKee Foods Corporation
- Memorial Health Care System
- Olan Mills, Inc
- Orange Grove Center, Inc.
- Parkridge Medical Center
- Pilgrim's Pride Corporation
- Propex Fabrics
- Roper Corporation
- Tennessee Valley Authority
- United States Postal Service
- University of Tennessee at Chattanooga
- Unum
- US Xpress Enterprises, Inc.

Collectively, these employers represent approximately 34,000 employees in various locations across the region, although the vast majority of their regional workforce is located within Hamilton County.<sup>6</sup>

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<sup>6</sup> CRC also made repeated – though unsuccessful – efforts to schedule interviews with the following firms: Blue Cross/Blue Shield of Tennessee, Covenant Transport, CIGNA Healthcare, Hutcheson Medical Center, Hamilton County Government, Astec, Inc., and Tecumseh Products Company,

**Analysis of Industrial Employment Trends**<sup>7</sup>

Between 2001 and 2005, employment within the *Architecture and Construction* career cluster grew at a rate of 10.9%. Several sub-sectors had higher growth rates, including Construction of Buildings (16.8%), Heavy and Civil Engineering and Construction (21.4%), and Services to Buildings and Dwellings (17.7%). Specialized Design Services was the only sub-sector in which jobs declined between 2001 and 2005.

**Table 3 – 2001-05 Industrial Employment Growth, Architecture and Construction**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Construction of Buildings	236	1,966	2,297	16.8%
Heavy and Civil Engineering Construction	237	760	923	21.4%
Specialty Trade Contractors	238	5,383	5,690	5.7%
Architectural, Engineering and Related Services	5413	1,337	1,401	4.8%
Specialized Design Services	5414	133	127	-4.5%
Services to Buildings and Dwellings	5617	2,723	3,205	17.7%
<b>Total</b>		<b>12,302</b>	<b>13,643</b>	<b>10.9%</b>

Overall, *Arts, A/V Technology and Communications* jobs declined by more than 19% between 2001 and 2005. Only one sub-sector (Broadcasting) experienced job growth over this time period. Two sub-sectors, Performing Arts Companies and Telecommunications, lost 57% and 46.3% of jobs, respectively.

**Table 4 – 2001-05 Industrial Employment Growth, Arts, A/V Technology and Communications**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Publishing Industries	511	694	613	-11.7%
Motion Picture and Sound Recording Industries	512	241	206	-14.5%
Broadcasting	515	835	894	7.1%
Telecommunications	517	605	325	-46.3%
Performing Arts, Spectator Sports and Related Industries	711	408	325	-20.3%
Performing Arts Companies	7111	300	129	-57.0%
		<b>3,083</b>	<b>2,492</b>	<b>-19.2%</b>

<sup>7</sup> United States Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2001-2005. Sector/Subsector Definitions can be found at <http://www.census.gov/epcd/naics02/naicod02.htm>.

Employment within the *Business, Management and Administration* career cluster grew at an overall rate of 12.3% between 2001 and 2005. Jobs in the Facilities and Support Services sub-sector grew by more than 118%. Three additional sub-sectors had employment growth rates over 20% (Management of Companies and Enterprises, Office Administrative Services and Other Support Services). Employment Services grew the least of all sub-sectors in this career cluster (3.6%).

**Table 5 – 2001-05 Industrial Employment Growth, Business, Management and Administration**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Management of Companies and Enterprises	5511	3,147	3,836	21.9%
Office Administrative Services	5611	145	180	24.1%
Facilities Support Services	5612	113	247	118.6%
Employment Services	5613	5,140	5,326	3.6%
Business Support Services	5614	993	1,106	11.4%
Other Support Services	5619	176	213	21.0%
		<b>9,714</b>	<b>10,908</b>	<b>12.3%</b>

Between 2000 and 2005, employment within the *Education and Training* career cluster grew by 5.4%. Only one sub-sector, Technical and Trade Schools, experienced a reduction in jobs over this time period (-13.6%). Of the remaining sub-sectors, employment in Other Schools and Instruction increased at the highest rate (29.2%), while jobs in Business Schools and Computer and Management Training and Elementary and Secondary Schools increased at 3.3% and 4.8%, respectively.

**Table 6 – 2001-05 Industrial Employment Growth, Education and Training**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Elementary and Secondary Schools	6111	1,772	1,857	4.8%
Business Schools and Computer and Management Training	6114	60	62	3.3%
Technical and Trade Schools	6115	125	108	-13.6%
Other Schools and Instruction	6116	154	199	29.2%
		<b>2,111</b>	<b>2,226</b>	<b>5.4%</b>

Overall, employment within the *Finance* career cluster grew 4.9% between 2001 and 2005. The highest growth rates over this time period occurred in the Funds, Trusts and Other Financial Vehicles (20.2%) and Real Estate sub-sectors. Two sub-sectors experienced job reductions: Accounting, Tax Preparation,

Bookkeeping and Payroll Services employment decreased by 16.7%, while jobs in the Rental and Leasing services sub-sector decreased by 3.4%.

**Table 7 – 2001-05 Industrial Employment Growth, Finance**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Credit Intermediation and Related Activities	522	2,295	2,562	11.6%
Securities, Commodity Contracts and Other Financial Investments	523	514	564	9.7%
Insurance Carriers and Related Activities	524	9,443	9,835	4.2%
Funds, Trusts and Other Financial Vehicles	525	84	101	20.2%
Real Estate	531	1,588	1,884	18.6%
Rental and Leasing Services	532	771	745	-3.4%
Accounting, Tax Preparation, Bookkeeping and Payroll Services	5412	1,272	1,060	-16.7%
		<b>15,967</b>	<b>16,751</b>	<b>4.9%</b>

The *Government and Public Administration* career cluster grew at an overall rate of 1.9% between 2001 and 2005. Three sub-sectors within this cluster experienced job losses – Administration of Human Resource Programs (-8.8%), National Security and International Affairs (-17.4%), and Administration of Environmental Quality Programs (-15.4%).

**Table 8 – 2001-05 Industrial Employment Growth, Government and Public Administration**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Executive, Legislative and other General Government Support	921	3,657	3,668	0.3%
Justice, Public Order and Safety Activities	922	186	202	8.6%
Administration of Human Resource Programs	923	114	104	-8.8%
Administration of Environmental Quality Programs	924	13	11	-15.4%
Administration of Housing Programs, Urban Planning, Community Development	925	142	144	1.4%
Administration of Economic Programs	926	62	138	122.6%
National Security and International Affairs	928	69	57	-17.4%
		<b>4,243</b>	<b>4,324</b>	<b>1.9%</b>

Employment within the *Health Science* career cluster grew at an overall rate of 15.4% between 2001 and 2005. While the highest rate of job growth occurred within the Outpatient Care Centers sub-sector (75.3%), four additional sub-sectors experienced employment growth rates in excess of 19%: Community Care Facilities for the Elderly (19.3%), Offices of Physicians (24.2%), Other Ambulatory Health Care Services (30.1%), and Offices of Other Health Practitioners (31.3%). Job reductions over this time period occurred within the

Home Health Care Services (-0.9%) and General Medical and Surgical Hospitals (-12.6%) sub-sectors.

**Table 9 - 2001-05 Industrial Employment Growth, Health Science**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Offices of Physicians	6211	3,646	4,527	24.2%
Offices of Dentists	6212	1,017	1,064	4.6%
Offices of Other Health Practitioners	6213	1,008	1,323	31.3%
Outpatient Care Centers	6214	368	645	75.3%
Medical and Diagnostic Laboratories	6215	170	189	11.2%
Home Health Care Services	6216	1,301	1,289	-0.9%
Other Ambulatory Health Care Services	6219	379	493	30.1%
General Medical and Surgical Hospitals	6221	1,337	1,169	-12.6%
Nursing Care Facilities	6231	1,812	2,019	11.4%
Community Care Facilities for the Elderly	6233	513	612	19.3%
		<b>11,551</b>	<b>13,330</b>	<b>15.4%</b>

Overall, employment within the *Hospitality and Tourism* career cluster grew by 17.5% between 2001 and 2005. The Food Services and Drinking Places sub-sector experienced the highest rate of employment growth over this time period (20.3%), while the Museums, Historical Sites and Similar Institutions and the Amusement, Gambling and Recreation Industries sub-sectors grew by 12.2% and 10.3%, respectively. Only one sub-sector, Travel and Arrangement and Reservation Services, experienced a reduction in employment (-49.0%).

**Table 10 – 2001-05 Industrial Employment Growth, Hospitality and Tourism**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Museums, Historical Sites and Similar Institutions	712	589	661	12.2%
Amusement, Gambling and Recreation Industries	713	981	1,082	10.3%
Accommodation	721	1,524	1,645	7.9%
Food Services and Drinking Places	722	12,267	14,762	20.3%
Travel Arrangement and Reservation Services	5615	151	77	-49.0%
		<b>15,512</b>	<b>18,227</b>	<b>17.5%</b>

Jobs in the *Human Services* career cluster grew by 7.9% between 2001 and 2005. The highest rates of growth occurred in the Other Personal Services (71.5%) and Death Care Services (59.8%) sub-sectors. Employment in Personal Care Services also grew in excess of 32% (32.7%). Job reductions were

experienced in the Dry-cleaning and Laundry Services (-16.1%), Civil and Social Organizations (-5.6%) and Business, Professional, Labor, Political and Similar Organizations sub-sectors.

**Table 11 – 2001-05 Industrial Employment Growth, Human Services**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Social Assistance	624	1,992	2,116	6.2%
Personal Care Services	8121	508	674	32.7%
Death Care Services	8122	112	179	59.8%
Dry-cleaning and Laundry Services	8123	685	575	-16.1%
Other Personal Services (Pet Care, Photofinishing, Parking)	8129	207	355	71.5%
Religious Organizations	8131	80	84	5.0%
Grantmaking and Giving Services	8132	135	154	14.1%
Social Advocacy Organizations	8133	152	177	16.4%
Civic and Social Organizations	8134	696	657	-5.6%
Business, Professional, Labor, Political and Similar Organizations	8139	386	375	-2.8%
		<b>4,953</b>	<b>5,346</b>	<b>7.9%</b>

Overall, employment within the *Information Technology* career cluster declined at a rate of 8.2% between 2001 and 2005. Only one of the three sub-sectors within this cluster gained employment over this time period (Computer Systems Design and Related Services grew at a rate of 12.7%). Internet Service Providers and Web Search Portals and Data Processing, Hosting and Related Services declined at rates of 71.3% and 9.2%, respectively.

**Table 12 – 2001-05 Industrial Employment Growth, Information Technology<sup>8</sup>**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Internet Service Providers and Web Search Portals	5181	167	48	-71.3%
Data Processing, Hosting and Related Services	5182	337	306	-9.2%
Computer Systems Design and Related Services	5415	520	586	12.7%
		<b>1,024</b>	<b>940</b>	<b>-8.2%</b>

<sup>8</sup> Data was unavailable for two sub-sectors within the Information Technology career cluster: Software Publishers (NAICS 5112) and Internet Publishing and Broadcasting (NAICS 5161). 2001-2003 data was unavailable for Data Processing and Related Services (NAICS 5182). 2004-2005 data for employment and growth rate are presented for this sub-sector.

Overall, the *Public Safety, Corrections and Security* career cluster experienced a 9.3% reduction in jobs between 2001 and 2005. All job reductions occurred within the Investigation and Security Services sub-sector.

**Table 13 – 2001-05 Industrial Employment Growth, Public Safety, Corrections and Security**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Legal Services	5411	1,345	1,415	5.2%
Investigation and Security Services	5616	1,772	1,412	-20.3%
		<b>3,117</b>	<b>2,827</b>	<b>-9.3%</b>

Employment within the *Manufacturing* career cluster experienced an overall decline of 16.8% between 2001 and 2005. Some sub-sectors experienced job increases during this time period. Jobs in the Nonmetallic Mineral Product Manufacturing sub-sector grew by 70.5%, while Plastics and Rubber Products Manufacturing increased by 25.8%. Additionally, the Fabricated Metal Product Manufacturing and Printing and Related Support Activities sub-sectors grew by 14.8% and 9.5%, respectively.

**Table 14 – 2001-05 Industrial Employment Growth, Manufacturing**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Food Manufacturing	311	7,024	6,309	-10.2%
Beverage and Tobacco Product Manufacturing	312	534	430	-19.5%
Textile Mills	313	1,870	819	-56.2%
Textile Product Mills	314	282	255	-9.6%
Apparel Manufacturing	315	307	210	-31.6%
Leather and Allied Product Manufacturing	316	185	166	-10.3%
Wood Product Manufacturing	321	312	184	-41.0%
Paper Manufacturing	322	1,234	971	-21.3%
Printing and Related Support Activities	323	1,383	1,514	9.5%
Chemical Manufacturing	325	2,838	2,293	-19.2%
Plastics and Rubber Products Manufacturing	326	590	742	25.8%
Nonmetallic Mineral Product Manufacturing	327	692	1,180	70.5%
Primary Metal Manufacturing	331	2,952	867	-70.6%
Fabricated Metal Product Manufacturing	332	3,047	3,498	14.8%
Machinery Manufacturing	333	3,308	2,987	-9.7%
Computer and Electronic Product Manufacturing	334	694	573	-17.4%
Electrical Equipment, Appliance, and Component Manufacturing	335	556	381	-31.5%
Transportation Equipment Manufacturing	336	792	716	-9.6%
Furniture and Related Product Manufacturing	337	717	362	-49.5%
Miscellaneous Manufacturing	339	654	463	-29.2%
		<b>29,971</b>	<b>24,920</b>	<b>-16.8%</b>

Large job losses were experienced within the Primary Metal Manufacturing (-70.6%), Textile Mills (-56.2%), Furniture and Related Products Manufacturing (-49.5%), Wood Product Manufacturing (-41.0%), Apparel Manufacturing (-31.6%) and Electrical Equipment, Appliance and Component Manufacturing (-31.5%) sub-sectors.

Overall, employment within the *Marketing, Sales and Service* career cluster increased by 3.4% over the 2001-2005 time period. High rates of employment growth occurred within the Health and Personal Care Stores (58.8%), Wholesale Electronic Markets Agents and Brokers (27.4%), Miscellaneous Store Retailers (21.6%) and Electronics and Appliance Stores (21.6%) sub-sectors. All remaining sub-sectors experienced growth rates below 20%.

**Table 15 - 2001-05 Industrial Employment Growth, Marketing, Sales and Service**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Merchant Wholesalers, Durable Goods	423	4,287	4,146	-3.3%
Merchant Wholesalers, Nondurable Goods	424	1,954	2,234	14.3%
Wholesale Electronic Markets Agents and Brokers	425	715	911	27.4%
Motor Vehicle Parts and Dealers	441	2,862	2,654	-7.3%
Furniture and Home Furnishings Stores	442	806	751	-6.8%
Electronics and Appliance Stores	443	573	697	21.6%
Building Material and Garden Equipment and Supplies Dealers	444	1,626	1,754	7.9%
Food and Beverage Stores	445	1,925	1,525	-20.8%
Health and Personal Care Stores	446	905	1,437	58.8%
Gasoline Stations	447	2,405	1,864	-22.5%
Clothing and Clothing Accessories Stores	448	4,674	5,248	12.3%
Sporting Goods, Hobby, Book, and Music Stores	451	748	689	-7.9%
General Merchandise Stores	452	3,992	4,427	10.9%
Miscellaneous Store Retailers	453	1,192	1,449	21.6%
Nonstore Retailers	454	929	750	-19.3%
Advertising and Related Services	5418	544	615	13.1%
		<b>30,137</b>	<b>31,151</b>	<b>3.4%</b>

The number of jobs in the *Science, Technology, Engineering and Mathematics* career cluster remained almost static over the 2001-2005 time period. Several sub-sectors, such as Management, Scientific and Consulting Services (77%), Scientific Research and Development Services (17.2%) and Remediation and

Other Waste Management Services (12.5%) experienced relatively high rates of growth.

High rates of job loss occurred within the Personal and Household Goods Repair and Maintenance (-58.0%), Waste Collection (-53.3%) and Waste Treatment and Disposal (-39.2%) sub-sectors.

**Table 16 – 2001-05 Industrial Employment Growth, Science Technology, Engineering and Mathematics**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Utilities	221	311	267	-14.1%
Management, Scientific and Technical Consulting Services	5416	265	469	77.0%
Scientific Research and Development Services	5417	186	218	17.2%
Other Professional, Scientific and Technical Services	5419	1,656	1,741	5.1%
Waste Collection	5621	30	14	-53.3%
Waste Treatment and Disposal	5622	240	146	-39.2%
Remediation and Other Waste Management Services	5629	80	90	12.5%
Automotive Repair and Maintenance	8111	1,129	1,096	-2.9%
Electronic and Precision Equipment Repair and Maintenance	8112	90	88	-2.2%
Commercial and Industrial Machinery and Equipment Repair and Maintenance	8113	413	445	7.7%
Personal and Household Goods Repair and Maintenance	8114	274	115	-58.0%
		<b>4,674</b>	<b>4,689</b>	<b>.02%</b>

Employment within the *Transportation, Distribution and Logistics* sub-sector also remained essentially static between 2001 and 2005. High-growth sub-sectors over this time period were Transit and Ground Passenger Transportation (44.0%), Support Activities for Transportation (42.6%) and Warehousing and Storage (23.7%). These gains were offset by job losses in the Truck Transportation sub-sector.

**Table 17 – 2001-05 Industrial Employment Growth,  
Transportation, Distribution and Logistics**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Truck Transportation <sup>9</sup>	484	14,357	13,834	-3.6%
Transit and Ground Passenger Transportation	485	257	370	44.0%
Support Activities for Transportation	488	256	365	42.6%
Couriers and Messengers	492	2,138	2,235	4.5%
Warehousing and Storage	493	671	830	23.7%
		<b>17,679</b>	<b>17,634</b>	<b>-.03%</b>

*Sub-Sector Assessment – Industrial Employment*

Between 2001 and 2005, Administration of Economic Programs had the highest growth rate of all sub-sectors examined in this study (122.6%). One additional sub-sector, Facilities and Support Services, grew at a rate in excess of 118% over this time period. The ten highest-growth sub-sectors grew at rates of 42.6% or more.

**Table 18 – Industrial Employment Change, 2001-05:  
Top Ten Growth NAICS Sub-Sectors**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth %
Administration of Economic Programs	926	62	138	122.6%
Facilities Support Services	5612	113	247	118.6%
Management, Scientific and Technical Consulting Services	5416	265	469	77.0%
Outpatient Care Centers	6214	368	645	75.3%
Other Personal Services (Pet Care, Photofinishing, Parking)	8129	207	355	71.5%
Nonmetallic Mineral Product Manufacturing	327	692	1,180	70.5%
Death Care Services	8122	112	179	59.8%
Health and Personal Care Stores	446	905	1,437	58.8%
Transit and Ground Passenger Transportation	485	257	370	44.0%
Support Activities for Transportation	488	256	365	42.6%

<sup>9</sup> While the NAICS framework generally classifies employment based on the location where the employment activity is physically performed, an exception exists with regard to Truck Transportation. Employment within this classification is counted in the location in which payroll for such positions are processed, even though such employment activity may take place in a different location.

Internet Service Providers and Web Search Portals experienced the highest rate of employment loss (-71.3%) between 2001 and 2005. All of the 10 with the greatest job declines over this time period experienced employment reductions of 41% or more.

**Table 19 – Industrial Employment Change, 2001-05:  
Top Ten Declining NAICS Sub-Sectors**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth %
Internet Service Providers and Web Search Portals	5181	167	48	-71.3%
Primary Metal Manufacturing	331	2,952	867	-70.6%
Personal and Household Goods Repair and Maintenance	8114	274	115	-58.0%
Performing Arts Companies	7111	300	129	-57.0%
Textile Mills	313	1,870	819	-56.2%
Waste Collection	5621	30	14	-53.3%
Furniture and Related Product Manufacturing	337	717	362	-49.5%
Travel Arrangement and Reservation Services	5615	151	77	-49.0%
Telecommunications	517	605	325	-46.3%
Wood Product Manufacturing	321	312	184	-41.0%

Of the sub-sectors with at least 1,000 employees during the base year of analysis, Offices of Other Health Practitioners experienced the highest rate of employment growth between 2001 and 2005. Among the top ten high-growth, high-employment sub-sectors, four additional sub-sectors grew at rates of 20.3% or more. All of the top ten sub-sectors had employment growth of 14.3% or more over this time period.

**Table 20 – Industrial Employment Change, 2001-05:  
Top Ten Highest NAICS Sub-Sectors  
(Base Year Employment of 1,000 or More)**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Offices of Other Health Practitioners	6213	1,008	1,323	31.3%
Offices of Physicians	6211	3,646	4,527	24.2%
Management of Companies and Enterprises	5511	3,147	3,836	21.9%
Miscellaneous Store Retailers	453	1,192	1,449	21.6%
Food Services and Drinking Places	722	12,267	14,762	20.3%
Real Estate	531	1,588	1,884	18.6%
Services to Buildings and Dwellings	5617	2,723	3,205	17.7%
Construction of Buildings	236	1,966	2,297	16.8%
Fabricated Metal Product Manufacturing	332	3,047	3,498	14.8%
Merchant Wholesalers, Non-durable Goods	424	1,954	2,234	14.3%

The highest rate of job loss among the ten sub-sectors with at least 1,000 employees occurred within Primary Metal Manufacturing (-70.6%). Textile Mills also experienced job losses at a rate of 56.2%. All of the sub-sectors in the bottom ten of job growth experienced job losses of 10.2% or more.

**Table 21 – Industrial Employment Change, 2001-05:  
Top Ten Declining NAICS Sub-Sectors  
(Base Year Employment of 1,000 or More)**

Sub-Sector	NAICS Code	2001 Employment	2005 Employment	Growth Rate
Primary Metal Manufacturing	331	2,952	867	-70.6%
Textile Mills	313	1,870	819	-56.2%
Gasoline Stations	447	2,405	1,864	-22.5%
Paper Manufacturing	322	1,234	971	-21.3%
Food and Beverage Stores	445	1,925	1,525	-20.8%
Investigation and Security Services	5616	1,772	1,412	-20.3%
Chemical Manufacturing	325	2,838	2,293	-19.2%
Accounting, Tax Preparation, Bookkeeping and Payroll Services	5412	1,272	1,060	-16.7%
General Medical and Surgical Hospitals	6221	1,337	1,169	-12.6%
Food Manufacturing	311	7,024	6,309	-10.2%

**Analysis of Industrial Firm Trends**<sup>10</sup>

Between 2000 and 2004, the number of firms within the *Architecture and Construction* career cluster declined by less than 1%. Heavy and Civil Engineering Construction grew at the highest rate(50%), while the Construction of Buildings and Specialty Trade Contractors sub-sectors saw reductions in the number of firms by 10.5% and 13.9%, respectively.

**Table 22 – 2000-2004 Firm Growth,  
Architecture and Construction**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Construction of Buildings	236	228	204	-10.5%
Heavy and Civil Engineering Construction	237	36	54	50.0%
Specialty Trade Contractors	238	483	416	-13.9%
Architectural, Engineering, and Related Services	5413	123	133	8.1%
Specialized Design Services	5414	24	26	8.3%
Services to Buildings and Dwellings	5617	169	176	4.1%
		<b>1,063</b>	<b>1,009</b>	<b>-.05</b>

<sup>10</sup> United States Department of Commerce, Bureau of the Census, County Business Patterns Firm Data, 2000-2004

The number of firms in the *Arts, A/V Technology and Communications* career cluster was static. While Broadcasting was the only sub-sector that experienced growth over this time period, offsetting reductions in the number of firms occurred in the Motion Picture and Sound Recording Industries (-10.0%), Telecommunications (-4.3%), and Performing Arts, Spectator Sports and Related Industries (-5.0%) sub-sectors.

**Table 23 – 2000-2004 Firm Growth, Arts, A/V Technology and Communications**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Publishing Industries (except Internet)	511	19	19	0.0%
Motion Picture and Sound Recording Industries	512	20	18	-10.0%
Broadcasting (except Internet)	515	20	26	30.0%
Telecommunications	517	69	66	-4.3%
Performing Arts, Spectator Sports, and Related Industries	711	20	19	-5.0%
		<b>148</b>	<b>148</b>	<b>0%</b>

Between 2000 and 2004, the number of firms within the *Business Management and Administration* career cluster decreased by 16.2%. Accordingly, most sub-sectors in this cluster experienced reductions in the number of firms over this time period. Reductions occurred in the Office Administrative Services (-58.2%), Facilities Support Services (-42.9%), Business Support Services (-14.3%), and Management of Companies and Enterprises (-8.8%) sub-sector. The number of firms grew in the Other Support Services (14.8%) and Employment Services (1.5%) sub-sectors.

**Table 24 – 2000-2004 Firm Growth, Business Management and Administration**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Management of Companies and Enterprises	5511	57	52	-8.8%
Office Administrative Services	5611	55	23	-58.2%
Facilities Support Services	5612	7	4	-42.9%
Employment Services	5613	65	66	1.5%
Business Support Services	5614	49	42	-14.3%
Other Support Services	5619	27	31	14.8%
		<b>260</b>	<b>218</b>	<b>-16.2%</b>

The number of firms in the *Education and Training* career cluster grew at a rate of 1.1% between 2000 and 2004. While the number of firms remained largely stable, Educational Support Services more than doubled its number of firms (growing from 6 to 13 firms), while Other Schools and Instruction lost a total of 9 firms over this time period.

**Table 25 – 2000-2004 Firm Growth,  
Education and Training**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Colleges, Universities, and Professional Schools	6113	4	5	25.0%
Business Schools and Computer and Management Training	6114	10	11	10.0%
Technical and Trade Schools	6115	12	12	0.0%
Other Schools and Instruction	6116	31	22	-29.0%
Educational Support Services	6117	6	13	116.7%
		<b>89</b>	<b>90</b>	<b>1.1%</b>

The *Finance* career cluster experienced an overall firm growth rate of 6.5% between 2000 and 2004. The highest rates of growth occurred in the Securities, Commodity Contract and Other Financial Investments (18.9%), Accounting, Tax Preparation, Bookkeeping and Payroll Services (16.2%), and Real Estate (12.8%) sub-sectors. The number of firms declined in Insurance Carriers and Related Activities (-7.5%) and Rental and Leasing Services (-3.8%) sub-sectors.

**Table 26 – 2000-2004 Firm Growth, Finance**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Credit Intermediation and Related Activities	522	302	327	8.3%
Securities, Commodity Contracts, and Other Financial Investments	523	74	88	18.9%
Insurance Carriers and Related Activities	524	226	209	-7.5%
Funds, Trusts, and Other Financial Vehicles	525	0	3	
Real Estate	531	227	256	12.8%
Rental and Leasing Services	532	104	100	-3.8%
Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	533	3	3	0.0%
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	5412	111	129	16.2%
		<b>1047</b>	<b>1115</b>	<b>6.5%</b>

The number of firms within the *Health Science* career cluster grew by 13.6% between 2000 and 2004. High rates of growth occurred in a number of sub-sectors. Other Ambulatory Health Care services grew from 4 to 15 firms over this time period (a 275% rate of growth). Home Health Care Services (53.8%), Specialty Hospitals (50.0%), Outpatient Care Centers (25.7%), and Other Residential Facilities experienced rates of firm growth in excess of 25%. In two sub-sectors in this cluster, General Medical and Surgical Hospitals (-12.5%) and Community Care Facilities for the Elderly (-4.5%), the number of firms declined.

**Table 27 – 2000-2004 Firm Growth,  
Health Science**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Offices of Physicians	6211	301	336	11.6%
Offices of Dentists	6212	159	159	0.0%
Offices of Other Health Practitioners	6213	115	138	20.0%
Outpatient Care Centers	6214	35	44	25.7%
Medical and Diagnostic Laboratories	6215	11	13	18.2%
Home Health Care Services	6216	13	20	53.8%
Other Ambulatory Health Care Services	6219	4	15	275.0%
General Medical and Surgical Hospitals	6221	8	7	-12.5%
Psychiatric and Substance Abuse Hospitals	6222	3	4	33.3%
Specialty (except Psychiatric and Substance Abuse) Hospitals	6223	2	3	50.0%
Nursing Care Facilities	6231	13	16	23.1%
Residential Mental Retardation, Mental Health and Substance Abuse Facilities	6232	55	65	18.2%
Community Care Facilities for the Elderly	6233	22	21	-4.5%
Other Residential Care Facilities	6239	4	5	25.0%
		<b>745</b>	<b>846</b>	<b>13.6%</b>

Overall, the number of firms in the *Hospitality and Tourism* career cluster grew at a rate of 5.9% between 2000 and 2004. The highest rates of firm growth occurred within the Accommodation (30.8%) and Amusement, Gambling and Recreation Industries (10.1%) sub-sectors. These gains were offset by reductions in the number of firms in Travel Arrangement and Reservation Services (-34.6%) and Performing Arts, Spectator Sports and Related Industries (-5.0%), although the latter sub-sector only declined by one firm over this time period.

**Table 28 – 2000-2004 Firm Growth,  
Hospitality and Tourism**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Performing Arts, Spectator Sports, and Related Industries	711	20	19	-5.0%
Museums, Historical Sites, and Similar Institutions	712	12	12	0.0%
Amusement, Gambling, and Recreation Industries	713	79	87	10.1%
Accommodation	721	65	85	30.8%
Food Services and Drinking Places	722	606	636	5.0%
Travel Arrangement and Reservation Services	5615	26	17	-34.6%
		<b>808</b>	<b>856</b>	<b>5.9%</b>

Overall, the number of firms in the *Human Services* career cluster grew by less than 1% between 2000 and 2004. Some sub-sectors in this cluster, however, experienced relatively high rates of growth over this time period. The highest rates of firm growth occurred in Vocational Rehabilitation Services (100.0%), Social Advocacy Organizations (33.3%), Individual and Family Services (13.5%), and Grantmaking and Giving Services (13.0%). Three sub-sectors experienced reductions in the number of firms over this time period: Business, Professional, Labor, Political and Similar Organizations (-16.3%), Community Food and Housing and Emergency and Other Relief Services (-9.1%), and Child Day Care Services (-2.3%).

**Table 29 – 2000-2004 Firm Growth, Human Services**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Social Assistance	624	157	151	-3.9%
Religious Organizations	8131	337	338	0.3%
Grantmaking and Giving Services	8132	23	26	13.0%
Social Advocacy Organizations	8133	18	24	33.3%
Civic and Social Organizations	8134	40	44	10.0%
Business, Professional, Labor, Political, and Similar Organizations	8139	86	72	-16.3%
Individual and Family Services	6241	52	59	13.5%
Community Food and Housing, and Emergency and Other Relief Services	6242	11	10	-9.1%
Vocational Rehabilitation Services	6243	2	4	100.0%
Child Day Care Services	6244	86	84	-2.3%
		<b>812</b>	<b>812</b>	<b>0.0%</b>

Between 2000 and 2004, the number of firms within the *Information Technology* career cluster declined by 6.0%. This decline was driven in large part by a reduction in the number of firms within Software Publishers (a loss of two firms at a rate of -40%) and Computer Systems Design and Related Services (a loss of 9 firms at a rate of -11.4%). Data Processing, Hosting and Related Services and Internet Service Providers and Web Search Portals experienced a one-year increase in the number of firms at rates of 40.0% and 20.0%, respectively.

**Table 30 – 2000-2004 Firm Growth,  
Information Technology<sup>11</sup>**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Software Publishers	5112	5	3	-40.0%
Internet Publishing and Broadcasting	5161	1	1	0.0%
Internet Service Providers and Web Search Portals	5181	5	6	20.0%
Data Processing, Hosting and Related Services	5182	10	14	40.0%
Computer Systems Design and Related Services	5415	79	70	-11.4%
		<b>100</b>	<b>94</b>	<b>-6.0%</b>

The number of firms in the *Public Safety, Corrections and Security* career cluster overall was static. However, the number of firms within the Legal Services sub-sector increased by 8 (4.6%). This gain was offset by a corresponding decrease of 8 firms in the Investigation and Security Services sub-sector.

**Table 31 – 2000-2004 Firm Growth,  
Public Safety, Corrections and Security**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Legal Services	5411	175	183	4.6%
Investigation and Security Services	5616	41	33	-19.5%
		<b>216</b>	<b>216</b>	<b>0%</b>

The number of firms within the *Manufacturing* career cluster declined by .6% between 2000 and 2004. Petroleum and Coal Products Manufacturing (33.3%), Miscellaneous Manufacturing (33.3%), Furniture and Related Product Manufacturing (20.8%), and Textile Mills (14.3%) experienced high rates of firm growth over this time period. All remaining sub-sectors grew at rates of 13.6% or lower.

<sup>11</sup> 2000-2002 data was unavailable for Internet Publishing and Broadcasting (NAICS 5161), Internet Service Providers and Web Search Portals (NAICS 5181), and Data Processing, Hosting and Related Services (NAICS 5182). 2003-2004 data for firm count and growth rate are presented for these sub-sectors.

**Table 32 – 2000-2004 Firm Growth,  
Manufacturing**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Food Manufacturing	311	33	33	0.0%
Beverage and Tobacco Product Manufacturing	312	3	3	0.0%
Textile Mills	313	7	8	14.3%
Textile Product Mills	314	14	12	-14.3%
Apparel Manufacturing	315	11	10	-9.1%
Leather and Allied Product Manufacturing	316	7	6	-14.3%
Wood Product Manufacturing	321	9	7	-22.2%
Paper Manufacturing	322	15	10	-33.3%
Printing and Related Support Activities	323	67	61	-9.0%
Petroleum and Coal Products Manufacturing	324	3	4	33.3%
Chemical Manufacturing	325	34	38	11.8%
Plastics and Rubber Products Manufacturing	326	28	24	-14.3%
Nonmetallic Mineral Product Manufacturing	327	22	25	13.6%
Primary Metal Manufacturing	331	15	12	-20.0%
Fabricated Metal Product Manufacturing	332	91	98	7.7%
Machinery Manufacturing	333	38	34	-10.5%
Computer and Electronic Product Manufacturing	334	14	10	-28.6%
Electrical Equipment, Appliance, and Component Manufacturing	335	11	9	-18.2%
Transportation Equipment Manufacturing	336	13	11	-15.4%
Furniture and Related Product Manufacturing	337	24	29	20.8%
Miscellaneous Manufacturing	339	36	48	33.3%
		<b>495</b>	<b>492</b>	<b>-0.6%</b>

There were fewer firms in Paper Manufacturing (-33.3%), Computer and Electronic Product Manufacturing (-28.6%), Wood Product Manufacturing (-22.2%), Primary Metal Manufacturing (-20.0%) and Electrical Equipment, Appliance and Component Manufacturing (-18.2%).

Between 2000 and 2004, firms within the *Marketing, Sales and Service* career cluster decreased by 7.9%. This reduction was driven by decreases in the number of firms in the Wholesalers/Non-durable Goods (-27.8%), Furniture and Home Furnishings Stores (-18.8%), Wholesalers/Durable Goods (-15.2%) and Food and Beverage Stores (-12.8%) sub-sectors.

**Table 33 – 2000-2004 Firm Growth,  
Marketing, Sales and Service**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Merchant Wholesalers, Durable Goods	423	462	392	-15.2%
Merchant Wholesalers, Non-Durable Goods	424	194	140	-27.8%
Motor Vehicle and Parts Dealers	441	169	156	-7.7%
Furniture and Home Furnishings Stores	442	85	69	-18.8%
Electronics and Appliance Stores	443	61	64	4.9%
Building Material and Garden Equipment and Supplies Dealers	444	128	113	-11.7%
Food and Beverage Stores	445	156	136	-12.8%
Health and Personal Care Stores	446	127	114	-10.2%
Gasoline Stations	447	167	165	-1.2%
Clothing and Clothing Accessories Stores	448	216	217	0.5%
Sporting Goods, Hobby, Book, and Music Stores	451	98	87	-11.2%
General Merchandise Stores	452	67	72	7.5%
Miscellaneous Store Retailers	453	170	183	7.6%
Non-Store Retailers	454	52	63	21.2%
Advertising and Related Services	5418	53	58	9.4%
		<b>2,205</b>	<b>2,029</b>	<b>-7.9%</b>

High-growth sub-sectors in this cluster were Non-Store Retailers (21.2%), Advertising and Related Services (9.4%), Miscellaneous Store Retailers (7.6%) and General Merchandise Stores (7.5%). The remaining sub-sectors experienced firm growth rates of 4.9% or less.

**Table 34 – 2000-2004 Firm Growth,  
Science, Technology, Engineering and Mathematics**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Utilities	221	6	6	0.0%
Management, Scientific and Technical Consulting Services	5416	85	91	7.1%
Scientific Research and Development Services	5417	8	10	25.0%
Other Professional, Scientific and Technical Services	5419	67	77	14.9%
Waste Collection	5621	8	13	62.5%
Waste Treatment and Disposal	5622	3	3	0.0%
Remediation and Other Waste Management Services	5629	10	9	-10.0%
Automotive Repair and Maintenance	8111	195	188	-3.6%
Electronic and Precision Equipment Repair and Maintenance	8112	29	19	-34.5%
Commercial and Industrial Machinery and Equipment Repair and Maintenance	8113	38	34	-10.5%
Personal and Household Goods Repair and Maintenance	8114	38	29	-23.7%
		<b>487</b>	<b>479</b>	<b>-1.6%</b>

Overall, the firm growth rate in the *Science, Technology, Engineering and Mathematics* career cluster between 2000 and 2004 was -1.6%. Substantial reductions in the number of firms took place in the Electronic and Precision Equipment Repair and Maintenance (-34.5%), Personal and Household Goods Repair and Maintenance (-23.7%) and Commercial and Industrial Machinery and Equipment Repair and Maintenance (-10.5%) sub-sectors. Several sub-sectors, however, did experience firm growth including, Waste Collection (62.5%), Scientific Research and Development Services (25.0%) and Other Professional, Scientific and Technical Services (14.9%).

Between 2000 and 2004, firm growth in the *Transportation, Distribution and Logistics* career cluster was 3.5%. Only one sub-sector in this cluster experienced high firm growth over this time period (Warehousing and Storage – 155.6%). With the exception of Truck Transportation (8.3%), all remaining sub-sectors had either zero growth or reductions in the number of firms. There were fewer firms in the Scenic and Sightseeing Transportation (-40.0%), Transit and Ground Passenger Transportation (-38.5%), Couriers and Messengers (-19.0%), and Support Activities for Transportation (-17.6%) sub-sectors.

**Table 35 – 2000-2004 Firm Growth, Transportation, Distribution and Logistics**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Air Transportation	481	7	7	0.0%
Truck Transportation	484	109	118	8.3%
Transit and Ground Passenger Transportation	485	13	8	-38.5%
Pipeline Transportation	486	3	3	0.0%
Scenic and Sightseeing Transportation	487	5	3	-40.0%
Support Activities for Transportation	488	34	28	-17.6%
Couriers and Messengers	492	21	17	-19.0%
Warehousing and Storage	493	9	23	155.6%
		<b>201</b>	<b>208</b>	<b>3.5%</b>

*Sub-Sector Assessment – Firm Growth*

Between 2000 and 2004, the ten sub-sectors with the largest increases in firms had growth rates of 33.3% or more. The highest rate of firm growth occurred in Warehousing and Storage, which increased by 155.6%. Two additional sub-

sectors, Educational Support Services and Vocational Rehabilitation Services, grew at rates of 116.7% and 100%, respectively. Four other sub-sectors added firms at rates of 50% or more over this time period.

**Table 36 – Firm Growth Rate, 2000-04:  
Top Ten Growth Sub-Sectors**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Warehousing and Storage	493	9	23	155.6%
Educational Support Services	6117	6	13	116.7%
Vocational Rehabilitation Services	6243	2	4	100.0%
Waste Collection	5621	8	13	62.5%
Home Health Care Services	6216	13	20	53.8%
Heavy and Civil Engineering Construction	237	36	54	50.0%
Specialty (except Psychiatric and Substance Abuse) Hospitals	6223	2	3	50.0%
Wireless Telecommunications Carriers (except Satellite)	5172	17	25	47.1%
Data Processing, Hosting, and Related Services	5182	10	14	40.0%
Miscellaneous Manufacturing	339	36	48	33.3%

The ten sub-sectors with the highest rates of firm losses experienced reductions of 22.2% or more. Facilities and Support Services lost the highest percentage of firms (-42.9%), while the number of firms within the Software Publishers sub-sector decreased by 40%. Four additional sub-sectors experienced reductions in number of firms at rates of 33.3% or more.

**Table 37 – Firm Growth Rate, 2000-04:  
Top Ten Lowest-Growth Sub-Sectors**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Facilities Support Services	5612	7	4	-42.9%
Software Publishers	5112	5	3	-40.0%
Transit and Ground Passenger Transportation	485	13	8	-38.5%
Travel Arrangement and Reservation Services	5615	26	17	-34.6%
Electronic and Precision Equipment Repair and Maintenance	8112	29	19	-34.5%
Paper Manufacturing	322	15	10	-33.3%
Computer and Electronic Product Manufacturing	334	14	10	-28.6%
Merchant Wholesalers, Non-durable Goods	424	194	140	-27.8%
Personal and Household Goods Repair and Maintenance	8114	38	29	-23.7%
Wood Product Manufacturing	321	9	7	-22.2%

Among sub-sectors containing at least 100 firms, Offices of Other Health Practitioners had the greatest percentage increase in firms (20%). Three

additional sub-sectors grew at rates of 11.6% or more: Accounting, Tax Preparation, Bookkeeping and Payroll Services (16.2%), Real Estate (12.8%), and Offices of Physicians (11.6%). Of the remaining sub-sectors, firm growth rates ranged from 5% (Food Services and Drinking Places) to 8.3% (Credit Intermediation and Related Activities).

**Table 38 – Firm Growth Rate, 2000-04:  
Top Ten Growth Sub-Sectors  
(Sub-sectors with More than 100 Firms)**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Offices of Other Health Practitioners	6213	115	138	20.0%
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	5412	111	129	16.2%
Real Estate	531	227	256	12.8%
Offices of Physicians	6211	301	336	11.6%
Credit Intermediation and Related Activities	522	302	327	8.3%
Truck Transportation	484	109	118	8.3%
Architectural, Engineering, and Related Services	5413	123	133	8.1%
Miscellaneous Store Retailers	453	170	183	7.6%
Professional, Scientific, and Technical Services	541	725	777	7.2%
Food Services and Drinking Places	722	606	636	5.0%

The highest rate of firm loss among sub-sectors containing at least 100 firms occurred in Merchant Wholesalers of Non-durable goods (-27.8%). Three additional sub-sectors experienced reductions of 12.8% or more: Merchant Wholesalers of Durable Goods (-15.2%), Specialty Trade Contractors (-13.9%), and Food and Beverage Stores (-12.8%). Of the remaining sub-sectors, firm reduction rates ranged from -7.5% (Insurance Carriers and Related Activities) to -10.5% (Construction of Buildings).

**Table 39 – Firm Growth Rate, 2000-04:  
Top Ten Lowest-Growth Sub-Sectors  
(Sub-sectors with More than 100 Firms)**

Sub-sector	NAICS Code	2000 Firms	2004 Firms	Growth Rate
Merchant Wholesalers, Non-durable Goods	424	194	140	-27.8%
Merchant Wholesalers, Durable Goods	423	462	392	-15.2%
Specialty Trade Contractors	238	483	416	-13.9%
Food and Beverage Stores	445	156	136	-12.8%
Building Material and Garden Equipment and Supplies Dealers	444	128	113	-11.7%
Construction of Buildings	236	228	204	-10.5%
Health and Personal Care Stores	446	127	114	-10.2%
Building Material and Supplies Dealers	4441	108	97	-10.2%
Motor Vehicle and Parts Dealers	441	169	156	-7.7%
Insurance Carriers and Related Activities	524	226	209	-7.5%

**Analysis of Occupational Employment Trends<sup>12</sup>**

Overall, the *Architecture and Construction* career cluster experienced a job growth rate of 26.9% between 2000 and 2005. The number of jobs in the Cement Masons and Concrete Finishers occupational category tripled over this time period: other high-growth occupations were Landscaping and Groundskeeping Workers (110.7%), Building and Grounds Cleaning and Maintenance Occupations (61.9%), Highway Maintenance Workers (50.0%), Brickmasons and Blockmasons (47.4%), and Helpers – Electricians (40.0%).

**Table 40 – 2000-05 Occupational Employment Growth, Architecture and Construction**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Architects, except Landscape and Naval Surveyors	90	60	-33.3%
Architectural and Civil Drafters	110	210	90.9%
First-line Supervisors/Managers of Construction Trades and Extraction workers	840	820	-2.4%
Brickmasons and Blockmasons	190	280	47.4%
Carpenters	940	850	-9.6%
Cement Masons and Concrete Finishers	60	260	333.3%
Construction Laborers	1350	1090	-19.3%
Operating Engineers and Other Construction Equipment Operators	420	470	11.9%
Electricians	1530	1340	-12.4%
Painters, Construction and Maintenance	360	340	-5.6%
Pipelayers	180	70	-61.1%
Plumbers, Pipefitters, and Steamfitters	660	520	-21.2%
Roofers	190	70	-63.2%
Sheet Metal Workers	400	550	37.5%
Helpers—Electricians	150	210	40.0%
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	160	130	-18.8%
Highway Maintenance Workers	260	390	50.0%
Building and Grounds Cleaning and Maintenance Occupations	4,490	7,270	61.9%
First-line Supervisors/Managers of Housekeeping and Janitorial Workers	200	250	25.0%
First-line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping	80	190	137.5%
Janitors and Cleaners, except Maids and Housekeeping Cleaners	2,270	3,090	36.1%
Landscaping and Groundskeeping Workers	560	1,180	110.7%
	<b>15,540</b>	<b>19,720</b>	<b>26.9%</b>

Roofers (-63.2%), Pipelayers (-61.1%), Plumbers, Pipefitters, and Steamfitters (-21.2%), Construction Laborers (-19.3%) and Helpers – Pipelayers, Plumbers, Pipefitters and Steamfitters (-18.8%) all experienced significant declines in employment.

<sup>12</sup> United States Department of Labor, Bureau of Labor Statistics, Metropolitan Area Occupational Employment and Wage Estimates, Occupational Employment Statistics Survey, 2000-2005.

The *Arts, A/V Technology and Communications* career cluster experienced an overall growth rate of 28.9% between 2000 and 2005. The high-growth categories within this cluster were Editors (125%), Graphic Designers (106.7%), Producers and Directors (60%) and Public Relations Specialists (25.0%). Only two occupational categories had a reduction in employment over this time period: Camera Operators (-50.0%) and Floral Designers (-9.1%).

**Table 41 – 2000-05 Occupational Employment Growth, Arts, A/V Technology and Communications**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Commercial and Industrial Designers	50	50	0.0%
Floral Designers	110	100	-9.1%
Graphic Designers	150	310	106.7%
Producers and Directors	50	80	60.0%
Public Relations Specialists	120	150	25.0%
Editors	40	90	125.0%
Camera Operators, Television, Video, and Motion Picture	100	50	-50.0%
	<b>2,140</b>	<b>2,760</b>	<b>28.9%</b>

Overall, the *Business, Management and Administration* career cluster grew .6% between 2000 and 2005. Although this indicates that employment in this cluster was essentially static, some occupational categories did experience high rates of growth. These categories include Education Administrators – Preschool

**Table 42 – 2000-05 Occupational Employment Growth,  
Business, Management and Administration**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Chief Executives	840	960	14.3%
General and Operations Managers	4,490	4,810	7.1%
Advertising and Promotions Managers	150	140	-6.7%
Marketing Managers	260	260	0.0%
Sales Managers	550	1020	85.5%
Public Relations Managers	90	50	-44.4%
Administrative Services Managers	680	410	-39.7%
Computer and Information Systems Managers	260	500	92.3%
Financial Managers	940	1180	25.5%
Human Resources Managers, All Other	250	30	-88.0%
Industrial Production Managers	450	330	-26.7%
Purchasing Managers	250	140	-44.0%
Transportation, Storage, and Distribution Managers	290	160	-44.8%
Construction Managers	450	270	-40.0%
Education Administrators, Preschool and Child Care Centers	40	190	375.0%
Education Administrators, Elementary and Secondary School	190	240	26.3%
Engineering Managers	200	210	5.0%
Food Service Managers	770	490	-36.4%
Funeral Directors	50	60	20.0%
Medical and Health Services Managers	360	290	-19.4%
Postmasters and Mail Superintendents	30	30	0.0%
Property, Real Estate, and Community Association Managers	130	180	38.5%
Social and Community Service Managers	230	80	-65.2%
	<b>11,950</b>	<b>12,030</b>	<b>.6%</b>

and Child Care Centers (375%), Computer and Information Systems Managers (92.3%), Sales Managers (85.5%), and Property, Real Estate and Community Association Managers (38.5%).

The number of individuals employed as Human Resource Managers (-88.0%), Social and Community Service Managers (-65.2%), Transportation, Storage and Distribution Managers (-44.8%), Public Relations Managers (-44.4%), Purchasing Managers (-44.0%), Construction Managers (-40.0%), Administrative Services Managers (-39.7%), and Food Service Managers (-36.4%) declined significantly.

The number of *Education and Training* jobs grew by 44.5% from 2000 to 2005. High-growth occupations within this cluster were Instructional Coordinators (433.3%), Special Education Teachers, Secondary School (200.0%), Special Education Teachers, Middle School (150.0%), Kindergarten Teachers, except

Special Education (115.0%), Middle School Teachers, except Special and Vocational Education (85.7%), and Teacher Assistants (82.4%). Only two occupational categories, Secondary School Teachers, except Special and Vocational Education (-23.5%) and Computer Science Teachers, Postsecondary (-20.0%), experienced job losses over this time period.

**Table 43 – 2000-05 Occupational Employment Growth, Education and Training**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Business Teachers, Postsecondary	100	120	20.0%
Computer Science Teachers, Postsecondary	50	40	-20.0%
Mathematical Science Teachers, Postsecondary	80	90	12.5%
Health Specialties Teachers, Postsecondary	30	50	66.7%
Nursing Instructors and Teachers, Postsecondary	60	80	33.3%
English Language and Literature Teachers, Postsecondary	110	120	9.1%
Vocational Education Teachers, Postsecondary	90	120	33.3%
Preschool Teachers, Except Special Education	340	590	73.5%
Kindergarten Teachers, Except Special Education	200	430	115.0%
Elementary School Teachers, Except Special Education	1290	1640	27.1%
Middle School Teachers, Except Special and Vocational Education	630	1170	85.7%
Secondary School Teachers, Except Special and Vocational Education	1490	1140	-23.5%
Vocational Education Teachers, Secondary School	130	230	76.9%
Special Education Teachers, Preschool, Kindergarten, and Elementary school	190	340	78.9%
Special Education Teachers, Middle School	80	200	150.0%
Special Education Teachers, Secondary School	80	240	200.0%
Librarians	150	250	66.7%
Library Technicians	160	170	6.3%
Instructional Coordinators	60	320	433.3%
Teacher Assistants	910	1660	82.4%
	<b>6230</b>	<b>9000</b>	<b>44.5%</b>

Overall, the *Finance* career cluster grew at a rate of 45.2% between 2000 and 2004. Only two occupational categories, Compensation, Benefits and Job Analysis Specialists (-42.9%) and Accountants and Auditors (-10.9%), experienced job losses during this time period. Of the remaining categories, Management Analysts (511.1%), Financial Analysts (325%), Loan Officers (180.8%), and Employment, Recruitment and Placement Specialists had job growth in excess of 115%. Two additional categories, Purchasing Agents and Credit Analysts, had growth rates in the mid-60% range.

**Table 44 – 2000-05 Occupational Employment Growth,  
Finance**

<b>Occupational Title</b>	<b>2000 Employment</b>	<b>2005 Employment</b>	<b>Growth Rate</b>
Wholesale and Retail Buyers, Except Farm Products	80	140	75.0%
Purchasing Agents	260	440	69.2%
Compliance Officers	170	220	29.4%
Cost Estimators	280	300	7.1%
Employment, Recruitment, and Placement Specialists	190	410	115.8%
Compensation, Benefits, and Job Analysis Specialists	280	160	-42.9%
Training and Development Specialists	250	330	32.0%
Management Analysts	90	550	511.1%
Meeting and Convention Planners	40	40	0.0%
Accountants and Auditors	1,380	1,230	-10.9%
Credit Analysts	30	50	66.7%
Financial Analysts	80	340	325.0%
Loan Officers	260	730	180.8%
Tax Examiners, Collectors, and Revenue Agents	60	70	16.7%
	<b>3,450</b>	<b>5,010</b>	<b>45.2%</b>

Jobs in the *Health Science* career cluster grew by 17.7% between 2000 and 2005. Several occupational categories experienced high rates of job growth over this time period. High-growth occupations were Home Health Aides (509.5%), Pharmacy Aides (150%), Veterinary Assistants and Laboratory Animal Caretakers (142.9%), Veterinarians (125.0%), and Emergency Technicians and Paramedics (95.2%). Only a few categories had reductions in employment over this time period: Internists, General (-40.9%), Dental Hygienists (-21.2%), Medical Records and Health Information Technicians (-20.0%), and Medical and Clinical Laboratory Technicians (-10.3%).

**Table 45 – 2000-05 Occupational Employment Growth,  
Health Science**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Dietitians and Nutritionists	50	80	60.0%
Pharmacists	270	360	33.3%
Internists, General	220	130	-40.9%
Registered Nurses	4400	4450	1.1%
Physical Therapists	230	300	30.4%
Recreational Therapists	40	50	25.0%
Speech-Language Pathologists	80	110	37.5%
Veterinarians	40	90	125.0%
Medical and Clinical Laboratory Technologists	140	240	71.4%
Medical and Clinical Laboratory Technicians	390	350	-10.3%
Dental Hygienists	330	260	-21.2%
Radiologic Technologists and Technicians	300	320	6.7%
Emergency Medical Technicians and Paramedics	210	410	95.2%
Pharmacy Technicians	320	470	46.9%
Licensed Practical and Licensed Vocational Nurses	1300	1440	10.8%
Medical Records and Health Information Technicians	250	200	-20.0%
Opticians, Dispensing	100	120	20.0%
Occupational Health and Safety Specialists	40	40	0.0%
Home Health Aides	210	1280	509.5%
Nursing Aides, Orderlies, and Attendants	2150	2210	2.8%
Physical Therapist Assistants	180	200	11.1%
Physical Therapist Aides	110	140	27.3%
Dental Assistants	500	510	2.0%
Medical Transcriptionists	130	180	38.5%
Pharmacy Aides	60	150	150.0%
Veterinary Assistants and Laboratory Animal Caretakers	70	170	142.9%
	<b>12,120</b>	<b>14,260</b>	<b>17.7%</b>

Overall, the *Hospitality and Tourism* career cluster had a 15.5% increase in employment between 2000 and 2005. The highest rates of growth occurred in the Counter Attendants (110.6%), Food Preparation Workers (70.4%), Hotel, Motel and Resort Desk Clerks (48.0%), and Bartenders (46.2%) occupations. Of the remaining occupations, growth rates did not exceed 25.7%. Of the six occupations that experienced reductions over this time period, Food Preparation

and Serving Related Workers (-22%), Amusement and Recreation Attendants (-30.0%), and Ushers, Lobby Attendants and Ticket Takers (-10.0%) lost jobs at a rate of 10% or more.

**Table 46 – 2000-05 Occupational Employment Growth, Hospitality and Tourism**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Food Preparation Workers	980	1,670	70.4%
Bartenders	260	380	46.2%
Combined Food Preparation and Serving Workers, Including Fast Food Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	4,860	4,990	2.7%
Waiters and Waitresses	3100	3500	12.9%
Food Servers, Nonrestaurant	310	300	-3.2%
Dining Room and Cafeteria Attendants and Bartender Helpers	400	380	-5.0%
Dishwashers	700	880	25.7%
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	460	570	23.9%
Food Preparation and Serving Related Workers, All Other	450	350	-22.0%
Ushers, Lobby Attendants, and Ticket Takers	100	90	-10.0%
Amusement and Recreation Attendants	300	210	-30.0%
Recreation Workers	320	290	-9.4%
Hotel, Motel, and Resort Desk Clerks	250	370	48.0%
	<b>12,960</b>	<b>14,970</b>	<b>15.5%</b>

Employment within the *Human Services* Career Cluster grew at a rate of 9.5% between 2000 and 2005. Several occupations in this cluster grew at rates in excess of 40%: First-line Supervisors/Managers of Personal Service Workers (175.0%), Mental Health and Substance Abuse Social Workers (54.5%), Hairdressers, Hairstylists and Cosmetologists (43.9%), Health Educators (42.9%), and Child Care Workers (41.1%). Of the five occupations that experienced employment reductions over this time period, three declined by 41.7% or more: Non-Farm Animal Caretakers (-61.5%), Medical and Public Health Social Workers (-60.9%), and Social and Human Services Assistants (-41.7%).

**Table 47 – 2000-05 Occupational Employment Growth,  
Human Services**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Substance Abuse and Behavioral Disorder Counselors	70	80	14.3%
Educational, Vocational, and School Counselors	330	360	9.1%
Child, Family, and School Social Workers	320	350	9.4%
Medical and Public Health Social Workers	230	90	-60.9%
Mental Health and Substance Abuse Social Workers	220	340	54.5%
Health Educators	70	100	42.9%
Social and Human Service Assistants	360	210	-41.7%
Clergy	40	30	-25.0%
First-line Supervisors/Managers of Personal Service Workers	40	110	175.0%
Non-farm Animal Caretakers	130	50	-61.5%
Funeral Attendants	120	110	-8.3%
Hairdressers, Hairstylists, and Cosmetologists	410	590	43.9%
Child Care Workers	560	790	41.1%
Fitness Trainers and Aerobics Instructors	260	250	-3.8%
	<b>3,160</b>	<b>3,460</b>	<b>9.5%</b>

Overall, occupations within the *Information Technology* career cluster grew at a rate of 65.6% between 2000 and 2005. This high rate of aggregate growth was driven by employment growth within the occupations of Computer Software Engineers, Applications (350.0%), Network Systems and Data Communications Analysts (220.0%), Computer Programmers (67.3%), Computer Support Specialists (76.9%), and Network and Computer Systems Administrators (50.0%). Only one occupation, Database Administrators, experienced a reduction in employment (-20.0%) over this time period.

**Table 48 - 2000-05 Occupational Employment Growth,  
Information Technology**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Computer Programmers	550	920	67.3%
Computer Software Engineers, Applications	60	270	350.0%
Computer Support Specialists	390	690	76.9%
Computer Systems Analysts	520	670	28.8%
Database Administrators	100	80	-20.0%
Network and Computer Systems Administrators	160	240	50.0%
Network Systems and Data Communications Analysts	50	160	220.0%
	<b>1,830</b>	<b>3,030</b>	<b>65.6%</b>

Occupational Employment within the *Public Safety, Corrections and Security* career cluster grew at a rate of 22.8% between 2000 and 2005. Growth in this cluster was driven by employment increases in the Paralegals and Legal

Assistants (187.5%) occupational category. Two occupations, Correctional Officers and Jailers and Animal Control Workers, experienced employment reductions of 51.0% and 25.0%, respectively.

**Table 49 – 2000-05 Occupational Employment Growth, Public Safety, Corrections and Security**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Correctional Officers and Jailers	490	240	-51.0%
Animal Control Workers	40	30	-25.0%
Protective Service Workers, all Other	80	90	12.5%
Lawyers	600	730	21.7%
Paralegals and Legal Assistants	240	690	187.5%
	<b>1450</b>	<b>1780</b>	<b>22.8%</b>

Between 2000 and 2005, the occupations included in the *Manufacturing* career cluster increased by 7.7%. Several occupational categories experienced high rates of growth over this time period, including Extruding, Forming, Pressing, and Compacting Machine Setters, Operators and Tenders (433.3%), Bakers (245.5%), Tool and Die Makers (240%), Rolling Machine Setters, Operators, and Tenders, Metal and Plastic (125%), Multiple Machine Tool Setters, Operators and Tenders, Metal and Plastic (108.3%), and Helpers – Production Workers (106.5%).

Relatively high rates of job reduction occurred within several occupational categories, including Drilling and Boring Machine Tool Setters, Operators, and Tender, Metal and Plastic (-70%), Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators and Tenders, Metal and Plastic (-67.2%), Pressers, Textile, Garment, and Related Materials (-57.1%), Crushing, Grinding, and Polishing Machine Setters, Operators and Tenders (-54.5%), and Machinists (-50.3%).

**Table 50 – 2000-05 Occupational Employment Growth,  
Manufacturing**

<b>Occupational Title</b>	<b>2000 Employment</b>	<b>2005 Employment</b>	<b>Growth Rate</b>
First-line Supervisors/managers of Production and Operating Workers	1,590	1,590	0.0%
Electrical and Electronic Equipment Assemblers	220	180	-18.2%
Fiberglass Laminators and Fabricators	30	30	0.0%
Team Assemblers	1,960	3,570	82.1%
Bakers	110	380	245.5%
Computer-Controlled Machine Tool Operators, Metal and Plastic	110	120	9.1%
Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	40	90	125.0%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	790	590	-25.3%
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	100	30	-70.0%
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	580	190	-67.2%
Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	100	130	30.0%
Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	70	80	14.3%
Machinists	1,530	760	-50.3%
Metal-Refining Furnace Operators and Tenders	60	40	-33.3%
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	420	340	-19.0%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	240	500	108.3%
Tool and Die Makers	50	170	240.0%
Welders, Cutters, Solderers, and Brazers	1,030	930	-9.7%
Bindery Workers	170	140	-17.6%
Prepress Technicians and Workers	160	90	-43.8%
Printing Machine Operators	330	440	33.3%
Laundry and Dry-Cleaning Workers	350	320	-8.6%
Pressers, Textile, Garment, and Related Materials	210	90	-57.1%
Sewing Machine Operators	650	460	-29.2%
Cabinetmakers and Bench Carpenters	120	190	58.3%
Chemical Plant and System Operators	220	120	-45.5%
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	110	50	-54.5%
Mixing and Blending Machine Setters, Operators, and Tenders	300	480	60.0%
Cutting and Slicing Machine Setters, Operators, and Tenders	160	170	6.3%
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	60	320	433.3%
Inspectors, Testers, Sorters, Samplers, and Weighers	1,340	1,130	-15.7%
Jewelers and Precious Stone and Metal Workers	60	40	-33.3%
Dental Laboratory Technicians	90	90	0.0%
Packaging and Filling Machine Operators and Tenders	1,160	1,000	-13.8%
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	270	210	-22.2%
Painters, Transportation Equipment	30	40	33.3%
Painting, Coating, and Decorating Workers	50	50	0.0%
Paper Goods Machine Setters, Operators, and Tenders	340	320	-5.9%
Helpers—Production Workers	930	1,920	106.5%
	<b>16,140</b>	<b>17,390</b>	<b>7.7%</b>

Between 2000 and 2005, occupations within the *Marketing, Sales and Service* career cluster grew at a rate of 15.3% between 2000 and 2005. High growth rates in several categories contributed to this overall increase, including Real Estate Sales Agents (225.0%), Door-to-Door Sales Workers, News and Street Vendors, and Related Workers (200.0%), and Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (90.5%).

**Table 51 – 2000-05 Occupational Employment Growth, Marketing, Sales and Service**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
First-Line Supervisors/Managers of Retail Sales Workers	1,890	2,140	13.2%
First-Line Supervisors/Managers of Non-Retail Sales Workers	630	520	-17.5%
Cashiers	6,110	6,730	10.1%
Counter and Rental Clerks	650	530	-18.5%
Parts Salespersons	460	600	30.4%
Retail Salespersons	6,010	7,590	26.3%
Advertising Sales Agents	210	190	-9.5%
Securities, Commodities, and Financial Services Sales Agents	160	140	-12.5%
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	420	800	90.5%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	1,940	2,040	5.2%
Demonstrators and Product Promoters	50	30	-40.0%
Real Estate Sales Agents	40	130	225.0%
Sales Engineers	100	40	-60.0%
Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	30	90	200.0%
	<b>18,700</b>	<b>21,570</b>	<b>15.3%</b>

Several occupations experienced employment decreases over this time period: Sales Engineers (-60.0%), Demonstrators and Product Promoters (-40.0%), Counter and Rental Clerks (-18.5%), and First-Line Supervisors/Managers of Non-Retail Sales Workers (-17.5%).

Overall, employment within the *Science, Technology, Engineering and Mathematics* career cluster declined by 1.7% between 2000 and 2005. Declining categories over this time period include Civil Engineering Technicians (-77.3%), Drafters, All Other (-55.6%), Environmental Engineers (-28.6%), Electrical Engineers (-23.9%) and Industrial Engineers (-20.0%). These losses were offset by increases in employment within the Industrial Engineering Technicians (275.0%), Mechanical Engineering Technicians (100.0%), Mechanical Drafters (88.9%), and Electrical and Electronics Drafters (66.7%) occupational categories.

**Table 52 – 2000-05 Occupational Employment Growth, Science, Technology, Engineering and Mathematics**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Civil Engineers	190	190	0.0%
Electrical Engineers	460	350	-23.9%
Environmental Engineers	70	50	-28.6%
Industrial Engineers	250	200	-20.0%
Mechanical Engineers	310	430	38.7%
Electrical and Electronics Drafters	30	50	66.7%
Mechanical Drafters	90	170	88.9%
Drafters, All Other	90	40	-55.6%
Civil Engineering Technicians	220	50	-77.3%
Industrial Engineering Technicians	40	150	275.0%
Mechanical Engineering Technicians	40	80	100.0%
	<b>1790</b>	<b>1760</b>	<b>-1.7%</b>

The *Transportation, Distribution and Logistics* career cluster decreased by 10.5% in occupational employment between 2000 and 2005. This aggregate decrease is due to employment declines in the Stock Clerks and Order Filers (-21.7%), Postal Service Mail Sorters Processors and Processing Machine Operators (-19.0%), and Shipping, Receiving and Traffic Clerks (-15.8%) occupational categories. Several categories did, however, experience job increases during this time period. These occupations include: Production, Planning and Expediting Clerks (89.3%), Weighers, Measurers, Checkers and Samplers (33.3%), Couriers and Messengers (17.6%) and Postal Service Clerks (7.7%).

**Table 53 – 2000-05 Occupational Employment Growth, Transportation, Distribution and Logistics**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Couriers and Messengers	170	200	17.6%
Postal Service Clerks	130	140	7.7%
Postal Service Mail Carriers	520	520	0.0%
Postal Service Mail Sorters, Processors, and Processing Machine Operators	420	340	-19.0%
Production, Planning, and Expediting Clerks	280	530	89.3%
Shipping, Receiving, and Traffic Clerks	1390	1170	-15.8%
Stock Clerks and Order Fillers	2990	2340	-21.7%
Weighers, Measurers, Checkers, and Samplers,	90	120	33.3%
	<b>5990</b>	<b>5360</b>	<b>-10.5%</b>

*Sub-Sector Assessment – Occupational Employment*

Between 2000 and 2005, the ten highest-growth sub-sectors experienced occupational growth rates of 300% or more. The highest-growth sub-sector was Management Analysts, which increased by 511.1% over this time period. Four additional sub-sectors experienced growth rates of 433.3% or more: Home Health Aides (509.5%), Bus and Truck Mechanics and Diesel Engine Specialists (485%), Instructional Coordinators (433.3%), and Extruding, Forming, Pressing and Compacting Machine Setters (433.3%).

**Table 54 – Occupational Employment 2000-05:  
Top Ten Growth Sub-Sectors**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Management Analysts	90	550	511.1%
Home Health Aides	210	1,280	509.5%
Bus and Truck Mechanics and Diesel Engine Specialists	200	1,170	485.0%
Instructional Coordinators	60	320	433.3%
Extruding, Forming, Pressing, and Compacting Machine Setters	60	320	433.3%
Education Administrators, Preschool and Child Care Center/Program	40	190	375.0%
Computer Software Engineers, Applications	60	270	350.0%
Cement Masons and Concrete Finishers	60	260	333.3%
Financial Analysts	80	340	325.0%
Library Assistants, Clerical	30	120	300.0%

The ten sub-sectors with the highest rates of employment decline all had reduction rates of -60.9% or more. The largest decrease in employment occurred within Life, Physical, and Social Science Technicians, All Other (-94.8%). Three additional sub-sectors declined at rates of 70% or more: Human Resources Managers, All Other (-88%), Civil Engineering Technicians (-77.3%), and Drilling and Boring Machine Tool Setters, Operators and Tenders, Metal and Plastic (-70%). Occupational employment reduction rates for the remaining sub-sectors ranged from -60.9% (Medical and Public Health Social Workers) to -67.2% (Grinding, Lapping, Polishing, and Buffing Machine Tool Setters).

**Table 55 – Occupational Employment, 2000-05:  
Top Ten Lowest-Growth Sub-Sectors**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Life, Physical, and Social Science Technicians, All Other	580	30	-94.8%
Human Resources Managers, All Other	250	30	-88.0%
Civil Engineering Technicians	220	50	-77.3%
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	100	30	-70.0%
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters	580	190	-67.2%
Social and Community Service Managers	230	80	-65.2%
Roofers	190	70	-63.2%
Nonfarm Animal Caretakers	130	50	-61.5%
Pipelayers	180	70	-61.1%
Medical and Public Health Social Workers	230	90	-60.9%

Within the ten highest-growth occupational sub-sectors with at least 1,000 employees, Team Assemblers experienced the highest growth rate between 2000 and 2005 (82.1%). The remaining occupations in this group experienced growth rates between 13.2% (First-line Supervisors/Managers of Retail Sales Workers) and 38.3% (Data Entry Keyers).

**Table 56 – Occupational Employment, 2000-05:  
Top Ten Growth Sub-Sectors  
(Occupations with 1,000 or More Employees)**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Team Assemblers	1,960	3,570	82.1%
Data Entry Keyers	1,070	1,480	38.3%
Janitors and Cleaners, except Maids and Housekeeping Cleaners	2,270	3,090	36.1%
Bookkeeping, Accounting, and Auditing Clerks	2,010	2,590	28.9%
Elementary School Teachers, except Special Education	1,290	1,640	27.1%
Laborers and Freight, Stock, and Material Movers, Hand	3,400	4,310	26.8%
Retail Salespersons	6,010	7,590	26.3%
Office Clerks, General	3,830	4,750	24.0%
Maintenance and Repair Workers, General	2,280	2,660	16.7%
First-line Supervisors/Managers of Retail Sales Workers	1,890	2,140	13.2%

Between 2000 and 2005, occupational employment within the top ten declining sub-sectors ranged from -50.3% (Machinists) to -12.4% (Electricians). Three additional sub-sectors experienced employment reductions of 21.7% or more over this time period: Packers and Packagers, Hand (-42.6%), Secondary School Teachers (-23.5%), and Stock Clerks and Order Filers (-21.7%).

**Table 57 – Occupational Employment, 2000-05:  
Top Ten Lowest-Growth Sub-Sectors  
(Occupations with 1,000 or More Employees)**

Occupational Title	2000 Employment	2005 Employment	Growth Rate
Machinists	1,530	760	-50.3%
Packers and Packagers, Hand	4,010	2,300	-42.6%
Secondary School Teachers, except Special and Vocational Education	1,490	1,140	-23.5%
Stock Clerks and Order Fillers	2,990	2,340	-21.7%
Construction Laborers	1,350	1,090	-19.3%
Shipping, Receiving, and Traffic Clerks	1,390	1,170	-15.8%
Inspectors, Testers, Sorters, Samplers, and Weighers	1,340	1,130	-15.7%
Receptionists and Information Clerks	1,900	1,630	-14.2%
Packaging and Filling Machine Operators and Tenders	1,160	1,000	-13.8%
Electricians	1,530	1,340	-12.4%

### **Major Employer Workforce Needs**

Through in-depth interviews with major employers in the Chattanooga region, CRC was able to identify prospective workforce needs. The employers interviewed largely embraced the career academy concept, and felt that it had the potential to form a part of the solution that would lead to the elimination of major gaps in the regional workforce. However, virtually all firms viewed the best role for career academies as that of a college preparatory program in which students are provided information about certain career fields, develop career-specific skills and learn basic concepts essential for success. Employers did not view career academies as a replacement for two-year technical degrees or blocks of curriculum taught in four-year institutions. As such, career academies were viewed as the beginning of a long-term career path rather than a short-term employment program for graduating students.

### *Administrative/Professional Workforce Issues*

- Specialized administrative positions appear to be subject to competitive pressures originating from firms from both within and outside of the Chattanooga region. As a result, organizations with greater resource constraints are facing increasing difficulty in retaining the talent needed to successfully run the organization.

- A number of Chattanooga's largest employers cited shortages in such positions. As skills inherent in this type of position are normally applicable across industries, career academies that focus on such skills may be of general benefit to the region.
- Regional labor shortages within certain specialties in the health care industry are extremely pronounced and reach across virtually every major health care facility in the community. Significant shortages exist for *Pharmacists/Pharmacy Technologists, Vascular Technologists, Laboratory Technologists, Speech Therapists, Physical Therapists, Surgical First Assistants and Imaging/Ultrasound Technologists.*
- While employers indicate a recruiting capacity that is adequate, labor shortages are a result of a general skill shortage on a regional (and national) level. This shortage results in positions that remain vacant for extended periods of time. When such positions are filled, the risk of leaving the position to work for competitors offering higher salaries is ever-present.
- The limited capacity of regional education/training institutions coupled with impending demographic shifts will create a crisis in the health care delivery system unless a comprehensive local training and recruitment strategy is created and implemented.
- A marked deficit in engineers trained at the Bachelor's and Master's levels was evident in organizations that rely on such talent for their operations. The vitality of the Chattanooga region is dependent upon the capacity to train and attract engineers and other knowledge-based labor to the area. The employer interviews indicate that current capacity in this regard is not adequate.
- For certain employers, labor shortages in *engineering* specialties such as *metallurgy* have recently emerged due to retirement-related attrition. These positions remain unfilled for extended periods of time due to a limited applicant pool and low applicant skill level relative to the requirements of the position.
- Other highly specialized technical/professional positions such as *Food Scientist, Electrical Engineer, Drafter, Nuclear Scientist and Fossil Fuel Scientist* are in short supply nationally, making it difficult to recruit high-level applicants to the region.

*Trades/Skilled Professions Workforce Issues*

- A number of the employers interviewed indicated a shortage of available workers to fill the skilled trades professions. Such positions often require at least a two-year degree and on-the-job training after hiring. The community education/training system does not appear to have the capacity to meet the regional demand for labor in this occupational category.
- For some employers, trades positions such as *Machinists* and *Welders* are the most difficult to fill in the entire organization. For others, shortages in *Mechanics* and *Tractor/Trailer Repair Specialists* have direct, immediate implications for conducting day-to-day operations – and can thus significantly affect company “bottom lines”. Like professional/administrative positions, high mobility and competition from other firms contribute to high turnover rates. Less mobile positions such as *Power Plant Operators* have significantly lower turnover rates, although such positions can remain unfilled for substantial periods of time if the position is vacated.
- While unions normally play a major role in the training and retention of trades positions, they do not emphasize recruiting and therefore have not been entirely successful in helping to meet the workforce needs of Chattanooga’s largest employers.
- Skilled trades positions are often highly specialized and require extensive, industry-specific training on an ongoing basis before and after initial hire. It is this narrow specialization that contributes to regional labor shortage in these fields and the resulting difficulty in recruitment.

*Entry-Level Workforce Issues*

- *Basic Reading and Math:* Most employers interviewed cited a lack of basic math skills on the part of the entry-level labor pool. In the cases where a basic math test was given as a condition of hiring, high failure rates were cited.
- *“Soft” Skills:* Most employers interviewed indicated major “soft” skills gaps among entry-level employees. Skills such as timeliness, attendance and socialization were cited as absent in the entry-level labor pool, attributed largely to immaturity, generational attitudes and norms, and insufficient experience in meeting the requirements of stable employment.

## Community Research Council

- A number of organizations interviewed indicated little difficulty in finding an adequate supply of applicants for open entry-level positions. For most organizations, entry-level positions required at least a high school diploma or its equivalent, and were not otherwise screened in relation to social/work/life skills.
- While the pool of applicants for entry-level positions was found to be adequate according to the organizations interviewed, retention of entry-level employees was found to be extremely difficult. This was most commonly attributed to “soft skills” deficits.
- Based on employer interviews, the entry-level labor market appears to be subject to churning, where entry-level applicants are hired, serve one organization for a limited period of time and then quit (or are fired for violating company policy). The same employees are then hired by another organization, serve for a short time, and then move on to the next organization. This cycling behavior has the effect of increasing the supply of entry-level labor while steadily decreasing its quality. Over time, this phenomenon has the potential to erode the overall quality of the regional workforce.

### **Recommendations**

The results of the quantitative analysis and the employer interviews suggest several areas of concentration for career academies. A number of single-site academies currently exist within HCDE including academies addressing career paths such as technology and business systems, culinary arts and hospitality, engineering and construction technology, multimedia, information and technology, health careers and transportation/engineering/automotive. These recommendations suggest the potential for building on to some of the existing programs and creating new ones:

- **Information Technology**

Occupations in this cluster had the highest growth rate (65%) between 2000 and 2005. Additionally, Chattanooga’s major employers across industries suggested that such skills represented major gaps in their workforce. This indicates that, although technology firms have not increased employment in the region, such occupations are highly relevant across industries and will remain so as long as large segments of the economy are dependent upon the creation, organization, transmission and storage of highly complex information.

- **Finance**

While growth in both employment and the number of firms in the Finance career cluster was in the 5-6% range, occupational employment grew by approximately 45% in the region between 2000 and 2005. Like the Information Technology cluster, employers across several industries cited skills gaps with respect to financial specialties. Taken as a whole, this data indicates that occupations requiring this skill set are growing at high rates across industries in the region.

- **Health Care**

Employment and firm growth in the Health Sciences career cluster grew at a rate of 15.4% and 13.6%, respectively, and occupational employment in this cluster grew at a rate of 17.7% between 2000 and 2005. Growth in this career cluster is occurring at a time in which major health care providers are expressing critical shortages in several health care occupations including *Pharmacists/Pharmacy Technologists, Vascular Technologists, Laboratory Technologists, Speech Therapists, Physical Therapists, Surgical First Assistants* and *Imaging/Ultrasound Technologists*. Given age-related demographic shifts and the primacy of the Chattanooga region as the health care hub for a large portion of southeastern Tennessee and northern Georgia, this career cluster will continue to be important to the vitality of the region.

- **Science/Technology/Engineering/Mathematics**

In the Chattanooga region, the Science/Technology/Engineering/Mathematics career cluster experienced near-zero employment, firm and occupational growth over the time period(s) of analysis. But, employers in the region indicated a skills gap in specialized occupations within this cluster. Demand for such skills is expected to grow in the region, given continued expansion of energy, transportation and information infrastructure as well as the potential expansion of the SimCenter at the University of Tennessee at Chattanooga (UTC).

- **Architecture and Construction**

Occupational growth in this cluster was approximately 27% between 2000 and 2005. Continued physical development in the region is dependent upon the presence of a trained workforce in the area.

- **Hospitality and Tourism**

Reflecting Chattanooga's role as a tourism center, industrial employment in the Hospitality and Tourism career cluster grew at a higher rate (17.5%)

than any other cluster in the region between 2001 and 2005. Firms grew at a rate of approximately 6% between 2000 and 2004, while occupational employment growth between 2000 and 2005 was 15.5%. Given the strength of the tourism sector in the region, the career academy model has the potential to prepare students for both entry level positions and college programs that lead to long-term careers in the industry. Cornell's School of Hotel Administration<sup>13</sup> may provide a viable model in this respect in terms of curriculum formulation and career path development.

- **Education and Training**

Occupational employment within the Education and Training career cluster grew by 44.5% overall, although the number of secondary school teachers declined by 23.5%. Local employers cited a shortage of secondary teachers in specializations such as math, science information technology. Local employers also cited shortages in postsecondary specialties such as nursing, information technology and engineering, and expressed a frustration with the limited capacity of local educational institutions to produce an adequate number of graduates. This was particularly true within the Health Science and Science, Technology, Engineering and Mathematics Sectors. Area employers also highlighted teacher shortages in secondary education.

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<sup>13</sup> See <http://www.hotelschool.cornell.edu>.