

# **Southeast Iowa Pilot Regional Cluster Analysis**



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## Southeast Iowa Pilot Regional Cluster Analysis

### Introduction

Maintaining and growing industry clusters has become a focus for economic development professionals, elected officials and policy makers around the nation. A review of the academic and economic development practitioner literature provides a variety of definitions for industry clusters. In the context of this regional cluster analysis, an appropriate definition for an industry cluster is from Michael Enright (1996) who defines an industry cluster as “a set of industries related through buyer-supplier and supplier-buyer relationships, or by common technologies, common buyers or distribution channels or common labor pools” (p 191).

The Iowa Department of Economic Development in 2000 released *Iowa Target Industry Cluster Analysis*, a study completed by SRI International, which identified three major industry clusters for the state of Iowa: advanced manufacturing, life sciences and information solutions. As the State of Iowa has focused much of its economic development strategy upon an industry cluster approach, many rural communities across Iowa have questioned how their rural areas fit within the State’s cluster concept and how they can benefit from this approach.

In 2002, the Community Vitality Center (CVC) funded the Institute for Decision Making (IDM) at the University of Northern Iowa to undertake a research project to assist Iowa communities and regions to better determine how the communities’ and regions’ economic base ties into industry clusters that have been identified for the State of Iowa. The pilot project involves three regions in rural Iowa. The pilot regions were identified based on input and feedback from the Iowa Department of Economic Development, Iowa Workforce Development, Iowa State University’s Department of Economics, the Iowa Area Development Group and MidAmerican Energy. In addition, each of the regions had one or more economic development organizations that already had a long-term working relationship with IDM staff.

### Methodology and Framework

#### A Framework for Regional Cluster Analysis

As part of this project, IDM staff has worked closely with Dr. Ken Brown, Associate Professor, in UNI’s Department of Economics, to identify the most relevant literature and approaches for identifying industry clusters at a sub-regional level. IDM felt it was important that the methodology implemented provided local economic development organizations with useful information about the nature and scope of the industry cluster presence in their area, which they could utilize to shape their economic development strategies. After reviewing much of the literature on industry clusters, it was determined that a national industry cluster template framework initially developed by Edward J. Feser at the University of North Carolina and Edward M. Bergman at the University of Austria, and then enhanced and expanded by Feser and Jun Koo, could be replicated for regions in Iowa.

In their initial analysis, Feser and Bergman identified 28 “benchmark value-chain clusters” by conducting a statistical analysis of the *Benchmark Input-Output Accounts of the United States* to identify the trading patterns and technological similarities between industry sectors (see Feser and Bergman, 2000). Value-chain clusters are groups of industries in similar product chains, such as final market

producers and their suppliers, or for non-manufacturing industries, groups of industries that utilize similar labor pools, such as banking and advertising. Fesser and Koo enhanced the benchmark value-chain clusters by expanding the statistical analysis to include the *U.S. Staffing Patterns Matrix* and detailed occupational characteristics data from the U.S. Department of Labor, which led to the additional identification of eight “technology value-chain clusters” focusing on high-tech businesses (see Fesser and Koo, 2001). The benchmark value-chain clusters are detailed in appendix A and the technology clusters are detailed in appendix B.

Fesser and Koo also identified 17 “benchmark labor clusters” by analyzing the *Staff Patterns Matrix* along with data from the Occupational Information Network (ONET), which is a matrix that identifies the knowledge and skills required for over 1,100 occupations. The benchmark labor skills ranged from “low skill, non-durable manufacturing” to “information processing” to “health services.” Each benchmark labor cluster consists of industries with similar labor skill demands (see Fesser and Koo, 2001). The benchmark labor clusters are detailed in appendix C.

The advantage of using this framework is that the benchmark value-chain clusters and technology benchmark clusters provide a set of industry clusters based on buyer-supplier linkages of industries. Benchmark labor clusters provide a set of industry clusters based on the utilization of similar workforce skills by industries. For each of the three cluster templates (benchmark value-chain clusters, technology clusters and benchmark labor clusters) the industries within each cluster are identified at the four-digit Standard Industrial Classification (SIC). Data was not available in the North American Industry Classification System (NAICS), which is replacing the SIC code system. It is important to keep in mind that many of the industrial sectors have a presence in more than one cluster. An example relevant to Southeast Iowa is that truck trailer manufacturers (SIC 3715) are in both the metalworking and industrial machinery cluster and the motor vehicle manufacturing cluster.

### **Data for Analysis**

To apply the cluster template framework and conduct regional cluster analysis for the Southeast Iowa Region required IDM to acquire state and county level employment and wage data at the 4-digit SIC Code level from the Minnesota IMPLAN Group (MIG). This data was required since there was no available government data for many industry sectors at the county level, and to a lesser extent at the state level, due to federal data suppression requirements that protect the identity of businesses. MIG uses statistical modeling to estimate employment and wages for all industries present within a specific county. In order to examine cluster trends, IDM obtained data for 1990 and 2000 (the latest data available).

The IMPLAN data was then aggregated into the various benchmark value-chain clusters, technology benchmark clusters and benchmark labor clusters to determine the level of cluster presence in the region. What follows below is an analysis of that data for the Southeast Iowa Region to determine what clusters have a presence in the region and how the region compares at the U.S. level and Iowa statewide.

### **Geography of the Southeast Iowa Region**

The Southeast Iowa Region consists of three Iowa counties: Des Moines, Henry and Lee counties (see Map 1). This region had a population of just over 100,000 in the 2000 Census (100,739). The majority of the region’s population, 57.3 percent, reside in four communities: Burlington (26,839), Keokuk (11,427), Fort Madison (10,715) and Mount Pleasant (8,751). The geography of the Southeast Iowa

Region was determined based on the nature of the functional economies of the major communities in three counties and for practical reasons since the economic development organizations in the three counties have developed collaborative working relationships in recent years. To confirm the scope of the geography for this pilot project several different data sources were reviewed including the Burlington/West Burlington Laborshed Study, the Keokuk Laborshed Study and the Fort Madison Laborshed Study; all completed by IDM, 2000 Census data on worker commuting, research completed by David Swenson and Liesl Eathington with the Department of Economics at Iowa State University and commuting data from Mount Pleasant employers mapped by IDM. Updated laborshed maps developed by Iowa Workforce Development for the four communities were also reviewed.



In addition, IDM staff had discussions with Dennis Hinkle, Vice President of Economic Development for the Burlington/West Burlington Area Chamber of Commerce, Jennifer Daly, Executive Vice President of the Mount Pleasant Area Development Commission, Tim Gobble, Executive Director with the Fort Madison Economic Development Corporation and Lowell Junkins, Executive Director of the Lee County Economic Development Group about the pilot project and the geographic scope of the region. Based on the review of available data and the discussions with local economic development professionals in the region, it was determined that the three counties should be the basis for the Southeast Iowa Region. Map 1 illustrates the pilot study's regional geography.

### Benchmark Value-Chain Clusters

As described previously, the 28 benchmark value-chain clusters are based on buyer-supplier linkages of industries. Table 1 provides a breakdown of employment and employment concentrations of the benchmark value-chain clusters for the Southeast Iowa Region, Iowa and the United States. The table is sorted by total employment in the Southeast Iowa Region in year 2000. Not all clusters have a presence in this three-county region. The metalworking and industrial machinery cluster had the largest number of employees in 2000, with over 6,700 employees. The motor vehicle manufacturing and construction materials clusters each had employment levels well over 3,000.

**Table 1**  
**Southeast Iowa Region**  
**Benchmark Value-Chain Clusters**  
**Employment Change and Location Quotients**

Cluster	<i><b>Employment</b></i>							
	% Change			Location Quotients				
	SE IA 2000	SE IA '90-'00	IA '90- '00	US '90- '00	SE IA 2000	SE IA '90-'00	IA 2000	IA '90- '00
Metalworking and industrial machinery .....	6,724	-0.3%	-0.1%	0.6%	3.0	0.33	1.67	0.19
Motor vehicle manufacturing .....	3,715	-0.3%	0.0%	1.4%	3.0	0.11	1.16	0.05
Construction materials .....	3,297	0.4%	0.3%	1.2%	2.2	0.28	1.11	0.11
Hospitals, labs and specialized medical services .....	2,435	0.5%	0.3%	3.5%	0.8	-0.07	0.82	-0.12
Information technology and instruments .....	2,426	0.6%	0.0%	2.7%	1.2	-0.01	0.68	-0.06
Chemicals and plastics .....	2,158	-0.5%	0.1%	1.2%	1.8	0.07	0.97	0.08
Transportation, shipping and logistics .....	1,705	0.5%	0.2%	2.8%	1.2	-0.03	1.06	-0.08
Printing and publishing .....	1,563	-0.5%	0.2%	3.4%	0.7	-0.13	0.93	-0.12
Canned and bottled beverages .....	1,085	0.3%	-0.4%	-1.6%	13.4	4.37	4.37	1.14
Packaged food products .....	955	-0.6%	-0.1%	0.1%	1.4	0.17	2.33	0.35
Aerospace .....	893	-0.9%	-0.2%	-5.1%	2.9	1.36	1.35	0.67
Banking and advertising .....	875	0.3%	0.1%	1.2%	0.6	0.07	0.91	0.07
Primary nonferrous metals .....	762	-0.4%	0.3%	0.8%	3.1	0.26	1.16	0.15
Aluminum .....	400	0.8%	0.2%	-2.9%	5.3	2.34	1.90	0.74
Fabricated textiles .....	349	-0.9%	0.0%	-3.5%	0.7	0.28	0.63	0.26
Wood products and furniture .....	334	-0.9%	0.7%	0.6%	0.8	0.04	1.32	0.23
Boat building .....	214	-0.7%	-1.9%	0.3%	2.4	0.24	0.68	-0.03
Legal services .....	151	-0.3%	-0.1%	1.0%	0.4	0.03	0.59	0.05
Securities and insurance .....	110	1.2%	0.3%	2.1%	0.1	0.02	1.25	0.01
Stone, clay and glass products .....	8	NA	-1.7%	-1.3%	0.1	0.06	1.24	0.16
Apparel .....	4	14.9%	-1.1%	-4.6%	0.0	0.01	0.28	0.12
Food oil mills .....	4	0.0%	0.3%	-1.0%	0.3	0.09	4.65	1.24
Petroleum products .....	3	0.0%	0.9%	-2.1%	0.1	0.02	0.36	0.14
Jewelry .....	0	NA	1.2%	-2.4%	0.0	0.00	0.03	0.01
Leather goods .....	0	NA	-0.3%	-6.7%	0.0	0.00	0.59	0.34
Pharmaceuticals .....	0	NA	0.3%	2.7%	0.0	0.00	0.65	-0.04
Platemaking and typesetting .....	0	NA	0.1%	-1.8%	0.0	0.00	1.27	0.40

Data source: U.S. Bureau of Labor Statistics ES-202 files (from Minnesota IMPLAN Group, Inc). The tobacco products cluster has been left out. SE IA = the Southeast Iowa Region.

Of the 23 value-chain clusters with a presence in the Southeast Iowa Region, ten clusters experienced growth in employment from 1990 to 2000. Eleven clusters experienced a decline in employment and two clusters experienced no employment change. At the national level and at the state level, for the same 23 clusters, only seven clusters had a decline in employment over the decade of the 1990s. Employment trends in the Southeast Iowa Region did not mirror U.S. or state trends. Several of the clusters in the Southeast Iowa Region grew in employment while those clusters declined at the national level (apparel, aluminum and canned and bottled beverages) or at the state level (apparel, canned and bottled beverages, primary nonferrous metals, and stone, clay and glass products). However, nine clusters had increases in employment at the national level while employment declined in the Southeast



Iowa Region: metalworking and industrial machinery, motor vehicle manufacturing, chemicals and plastics, printing and publishing, packaged food products, primary nonferrous metals, wood products and furniture, boat building and legal services. Four clusters had employment increases at the state level but declined in the Southeast Iowa Region: chemical and plastics, printing and publishing, primary nonferrous metals and wood products and furniture.

Table 2 compares wage and employment data for each of the value-chain clusters at the national level, state level and Southeast Iowa level for 1990 and 2000.

**Table 2**  
**Southeast Iowa Region**  
**Benchmark Value-Chain Clusters - Employment and Average Wages**

Cluster	Employment					Average Wage			
	2000	% Change				2000	% Change		
		SE IA Per Estab.	IA '90-'00	US '90-'00			SE IA '90-'00	IA '90-'00	US '90-'00
Metalworking and industrial machinery .....	6,724	96.1	-0.3%	-0.1%	0.6%	39,541	0.3%	0.4%	4.1%
Motor vehicle manufacturing.....	3,715	148.6	-0.3%	0.0%	1.4%	34,827	1.0%	0.5%	4.6%
Construction materials .....	3,297	58.9	0.4%	0.3%	1.2%	40,749	0.4%	0.4%	5.1%
Hospitals, labs, and specialized medical services .	2,435	26.2	0.5%	0.3%	3.5%	27,572	0.4%	0.6%	8.1%
Information technology and instruments .....	2,426	62.2	0.6%	0.0%	2.7%	38,323	0.6%	0.6%	10.2%
Chemicals and plastics.....	2,158	27.3	-0.5%	0.1%	1.2%	32,456	0.8%	0.6%	4.1%
Transportation, shipping, and logistics .....	1,705	11.9	0.5%	0.2%	2.8%	31,502	0.5%	0.4%	3.4%
Printing and publishing.....	1,563	18.0	-0.5%	0.2%	3.4%	31,117	0.8%	0.7%	8.7%
Canned and bottled beverages .....	1,085	108.5	0.3%	-0.4%	-1.6%	49,630	-0.3%	0.5%	6.2%
Packaged food products .....	955	95.5	-0.6%	-0.1%	0.1%	29,613	0.4%	0.3%	4.2%
Aerospace .....	893	223.3	-0.9%	-0.2%	-5.1%	32,595	0.8%	0.4%	5.2%
Banking and advertising .....	875	8.5	0.3%	0.1%	1.2%	31,801	1.0%	0.6%	10.3%
Primary nonferrous metals.....	762	50.8	-0.4%	0.3%	0.8%	33,694	0.0%	0.1%	4.0%
Aluminum.....	400	133.3	0.8%	0.2%	-2.9%	47,017	0.0%	0.3%	4.0%
Fabricated textiles.....	349	43.6	-0.9%	0.0%	-3.5%	34,427	1.1%	0.2%	5.9%
Wood products and furniture .....	334	13.9	-0.9%	0.7%	0.6%	30,861	-0.1%	0.4%	3.5%
Boat building .....	214	107.0	-0.7%	-1.9%	0.3%	73,817	-0.3%	2.0%	4.0%
Legal services .....	151	2.8	-0.3%	-0.1%	1.0%	21,942	0.4%	0.9%	5.0%
Securities and insurance.....	110	2.2	1.2%	0.3%	2.1%	20,955	0.8%	0.5%	8.1%
Stone, clay, and glass products .....	8	4.0	NA	-1.7%	-1.3%	23,805	NA	0.4%	4.4%
Apparel .....	4	2.0	14.9%	-1.1%	-4.6%	20,582	1.5%	0.1%	5.3%
Food oil mills.....	4	4.0	0.0%	0.3%	-1.0%	42,494	-0.3%	0.4%	4.1%
Petroleum products .....	3	3.0	0.0%	0.9%	-2.1%	21,153	1.1%	0.1%	5.3%
Jewelry.....	0	NA	NA	1.2%	-2.4%	NA	NA	0.2%	6.8%
Leather goods .....	0	NA	NA	-0.3%	-6.7%	NA	NA	0.4%	6.6%
Pharmaceuticals .....	0	0.0	NA	0.3%	2.7%	NA	NA	0.6%	4.3%
Platemaking and typesetting .....	0	NA	NA	0.1%	-1.8%	NA	NA	1.1%	10.2%

Data source: U.S. Bureau of Labor Statistics ES-202 files (from Minnesota IMPLAN Group, Inc). The tobacco products cluster has been left out. SE IA = the Southeast Iowa Region.

**Table 3**  
**Benchmark Value-Chain Clusters**  
**Average Wages – U.S., Iowa and Southeast Iowa Region**

Cluster	U.S.			Iowa			Southeast Iowa Region		
	Average Wage		% Chg	Average Wage		% Chg	Average Wage		% Chg
	1990	2000	'90-'00	1990	2000	'90-'00	1990	2000	'90-'00
Metalworking and industrial machinery	29,114	41,192	4.1%	37,261	38,880	0.4%	38,206	39,541	0.3%
Motor vehicle manufacturing	30,082	43,859	4.6%	32,758	34,284	0.5%	31,429	34,827	1.0%
Construction materials	28,703	43,416	5.1%	33,873	35,300	0.4%	39,199	40,749	0.4%
Hospitals, labs and specialized medical services	26,639	48,194	8.1%	29,221	31,073	0.6%	26,434	27,572	0.4%
Information technology and instruments	36,003	72,579	10.2%	38,959	41,180	0.6%	36,099	38,323	0.6%
Chemicals and plastics	29,979	42,372	4.1%	32,930	34,938	0.6%	29,911	32,456	0.8%
Transportation, shipping and logistics	27,515	36,805	3.4%	29,386	30,482	0.4%	30,078	31,502	0.5%
Printing and publishing	31,867	59,668	8.7%	35,207	37,632	0.7%	28,801	31,117	0.8%
Canned and bottled beverages	33,613	54,468	6.2%	45,778	48,304	0.5%	50,990	49,630	-0.3%
Packaged food products	24,283	34,361	4.2%	30,665	31,559	0.3%	28,553	29,613	0.4%
Aerospace	39,302	59,570	5.2%	47,569	49,278	0.4%	30,182	32,595	0.8%
Banking and advertising	30,759	62,451	10.3%	35,754	37,860	0.6%	28,894	31,801	1.0%
Primary nonferrous metals	27,708	38,688	4.0%	31,261	31,683	0.1%	33,635	33,694	0.0%
Aluminum	38,195	53,580	4.0%	59,012	60,681	0.3%	46,825	47,017	0.0%
Fabricated textiles	17,729	28,165	5.9%	25,753	26,255	0.2%	30,989	34,427	1.1%
Wood products and furniture	24,879	33,692	3.5%	28,780	29,901	0.4%	31,017	30,861	-0.1%
Boat building	31,395	43,837	4.0%	45,445	55,490	2.0%	75,944	73,817	-0.3%
Legal services	39,997	59,969	5.0%	35,727	38,958	0.9%	21,132	21,942	0.4%
Securities and insurance	29,722	53,939	8.1%	42,045	44,206	0.5%	19,422	20,955	0.8%
Stone, clay and glass products	37,168	53,442	4.4%	47,193	49,239	0.4%	NA	23,805	NA
Apparel	17,841	27,364	5.3%	22,061	22,237	0.1%	17,796	20,582	1.5%
Food oil mills	29,395	41,474	4.1%	36,039	37,655	0.4%	43,990	42,494	-0.3%
Petroleum products	42,659	65,121	5.3%	34,827	35,283	0.1%	18,911	21,153	1.1%
Jewelry	17,439	29,344	6.8%	19,013	19,477	0.2%	NA	NA	NA
Leather goods	40,054	66,364	6.6%	25,493	26,595	0.4%	NA	NA	NA
Pharmaceuticals	24,349	34,935	4.3%	40,565	45,120	0.6%	NA	NA	NA
Platemaking and typesetting	43,202	87,128	10.2%	35,500	37,801	1.1%	NA	NA	NA

Data source: U.S. Bureau of Labor Statistics ES-202 files (from Minnesota IMPLAN Group, Inc). The tobacco products cluster has been left out. SE IA = the Southeast Iowa Region.

Table 3 shows that the boat building industry cluster had the highest average wage in 2000 for the Southeast Iowa Region, however that cluster was one of four clusters in the region that experienced a decline in its annual average wage from 1990 to 2000. No value-chain clusters at the state and national levels experienced a decline in wages over the decade of the 1990s. Of the clusters with a significant employment presence in 2000, only three clusters (motor vehicle manufacturing, banking and advertising and fabricated textiles) had wage growth of one percent or higher. This is considerably different from the wage growth percentages for the clusters at the national level where every cluster experienced an annual percentage increase in wages in 2000 over 1990, with the highest annual percentage being 10.3 percent for the banking and advertising cluster and the lowest being 3.5 percent for the wood products and furniture cluster. Wage growth at the state level, though positive, did not have rates high as at the U.S. level.



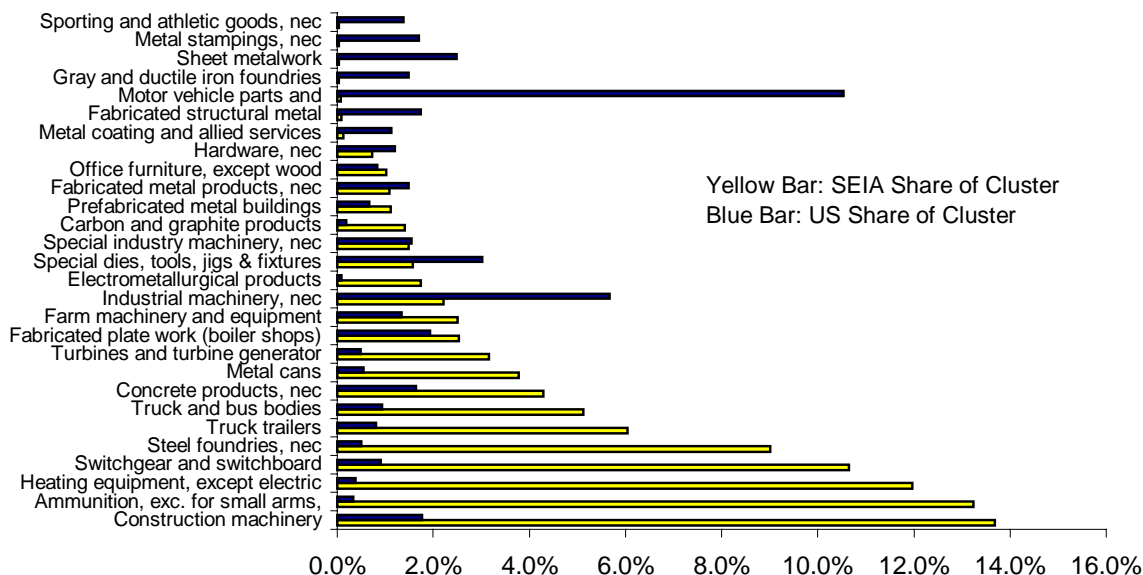
Table 3 also shows that in 2000 the boat building cluster was only one of two clusters in the Southeast Iowa Region of any size which had wages higher than the cluster's national average. All of region's clusters which had significant employment had average wages below the clusters' national averages. Nine clusters in the region did have annual average wages in 2000 that were higher than the clusters' statewide averages. The composition of the industries within each cluster at the regional, state and national levels have a significant impact on employment and wage levels of that cluster. For most clusters at the regional level, it is likely that several key industries have a dominant influence on the cluster's make-up at the regional level. To examine this further, a more detailed analysis is performed below of the five value-chain clusters which have the largest employment in the Southeast Iowa Region: metalworking and industrial machinery cluster, motor vehicle manufacturing cluster, construction materials cluster, hospitals, labs and specialized medical services cluster and information technology and instruments cluster.

### **Metalworking and Industrial Machinery Cluster**

The metalworking and industrial machinery cluster in the Southeast Iowa Region in 2000 consisted of 70 establishments and over 6,700 employees. Its annual payroll was nearly \$266 million. The cluster paid an average annual wage of \$39,541. The cluster's average wage increased by 0.3 percent annually since 1990. The cluster's average wage at the U.S. level in 2000 was \$41,192 and had a compounded annual growth rate of over 3.5 percent over its 1990 wage level. Statewide, the cluster had an average annual wage of \$38,880 and an annual growth rate of 0.4 percent. Employment in the cluster in Southeast Iowa decreased by 217 from 1990 to 2000.

Figure 1 illustrates the distribution of employment by industry in the cluster for the Southeast Iowa Region and the U.S. The construction machinery industry (SIC 3531), the ammunition industry (SIC 3483), the heating equipment manufacturing industry (SIC 3433) and the switchgear and switchboard apparatus industry (SIC 3613) were the largest employers in the cluster in Southeast Iowa. The largest employers in the cluster at the national level were the motor vehicle parts industry (SIC 3714), the industrial machinery industry (SIC 3599), the special dies, tools, jigs and fixtures industry (SIC 3544) and the blast furnace and steel mills industry (SIC 3312). The two largest industries in this cluster at the statewide level were the farm machinery equipment industry and the construction machinery industry. According to Dun and Bradstreet the largest employers in the metalworking and industrial machinery cluster include Case Corporation, Pipemaster Corporation, Tuthill Energy Systems, Silgan Containers Corporation, Heatilator, Keokuk Steel Castings and General Electric. It should be noted that Blue Bird Midwest has closed its operations in Mt. Pleasant, which did account for roughly 5 percent of the cluster's employment in 2000.

**Figure 1**  
**Metalworking and Industrial Machinery Cluster Industry Mix**



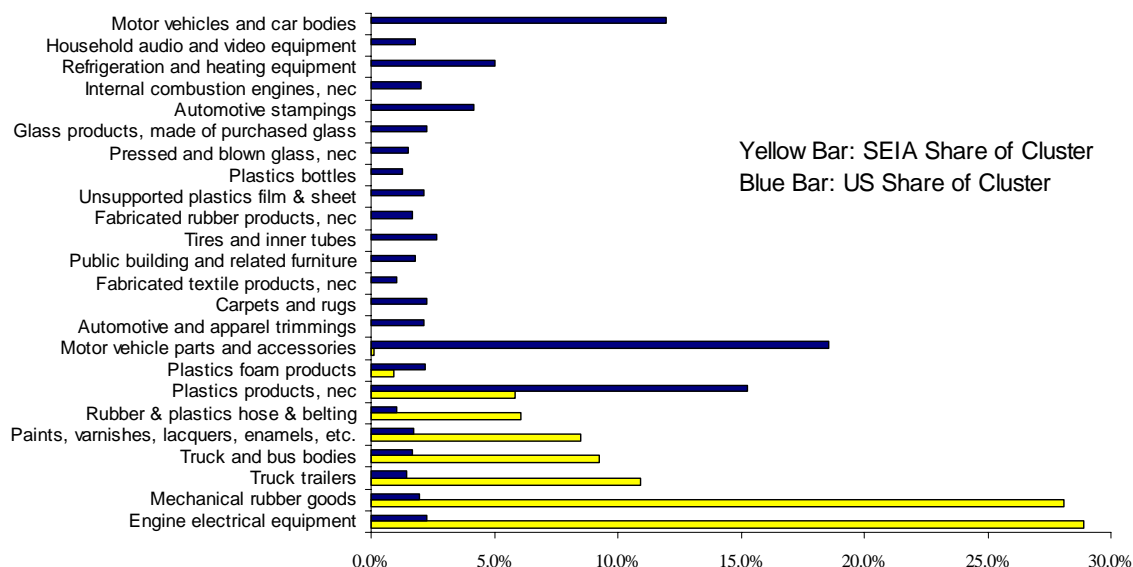
### **Motor Vehicle Manufacturing Cluster**

The motor vehicle manufacturing cluster had the second highest employment levels in 2000 in Southeast Iowa with over 3,700 workers and a payroll over \$120 million. Employment in this cluster has decreased since 1990 by an annual rate of 0.3 percent. The average annual wage in 2000 for this cluster was \$34,827 for the Southeast Iowa Region, \$43,859 nationwide and \$37,984 statewide. In 1990, the Southeast Iowa Region had an annual average wage that was higher than the national average. The cluster at the national level experienced a compounded annual wage growth rate of 3.84 percent while the region only experienced a 1.00 percent growth rate, but was higher than the cluster's statewide annual wage growth rate which was 0.5 percent.

Figure 2 shows that employment in the Southeast Iowa Region in this cluster is highly concentrated in two industries, engine electrical equipment (SIC 3694) and mechanical rubber goods (SIC 3061). Several other industries also have large employment numbers, which include the truck trailer industry (SIC 3715), the truck and bus bodies industry (SIC 3713), the paints, varnishes, lacquers, enamels industry (SIC 2851) and the rubber and plastics hose and belting industry (SIC 3052). It should be noted that several of these industries have had recent layoffs or plant closings in the region, including the closing of the Blue Bird Midwest operations in Mt. Pleasant, which accounted for over 9 percent of the cluster's employment. The metalworking and industrial machinery industry cluster and the motor vehicle manufacturing industry cluster have significant industry overlap in the region, which is illustrated when the largest employers for the motor vehicle manufacturing industry cluster is examined: Federal-Mogul Corporation, PPG Industries, Inc, DuPont, Goodyear Tire & Rubber Co., Nypro Iowa, Inc, and Paragon Products/Lomont Molding (Source: Dun & Bradstreet, 2003).

For this cluster at the national level, the largest share of employment is in the motor vehicle parts and accessories industry (SIC 3714), the plastics products, n.e.c. industry (SIC 3089) and the motor vehicles and car bodies industry (SIC 3711).

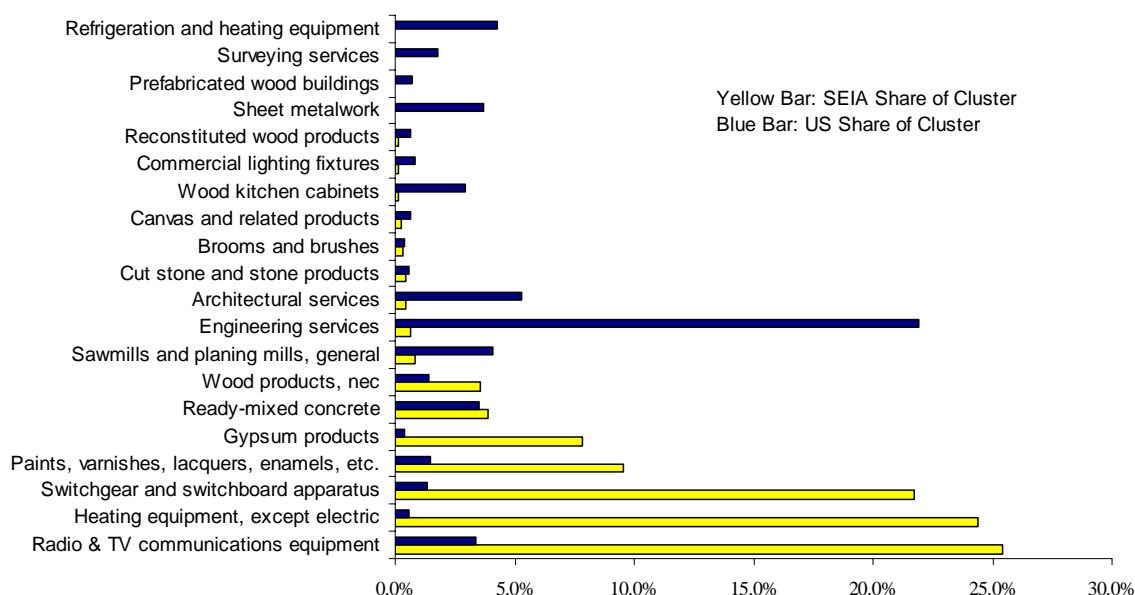
**Figure 2 - Motor Vehicle Manufacturing Cluster Industry Mix**



The significant difference in the annual average wage for the cluster at the Southeast Iowa Region level and at the U.S. level is attributable to the wage levels of the industries with a large employment presence in the region. In 2000, only the truck trailers industry (SIC 3715) and the rubber and plastics hose and belting industry (SIC 3052) had average annual wages that were higher than the U.S. annual average for their industry.

### **Construction Materials Cluster**

The construction materials cluster in the Southeast Iowa Region gained in employment since 1990, with employment in 2000 at just under 3,300 workers and employment in 1990 at 3,155. The cluster had 56 establishments in 2000, up from 52 in 1990. The major employers in this cluster include a range of industries in electronics and more traditional building/construction products industries. The industries with the highest employment in 2000 were the radio & tv communications equipment industry (SIC 3663), heating equipment industry (SIC 3433), switchgear and switchboard apparatus industry (SIC 3613), the paints, varnishes, lacquers and enamels industry (SIC 2851) and the gypsum products industry (SIC 3275). Figure 3 compares the employment distribution for the cluster in the region and nationwide.

**Figure 3 - Construction Materials Cluster Industry Mix**

At the national level, employment in this cluster is dominated by the engineering services (SIC 8711) and architectural services (SIC 8712) industries, followed by the refrigeration and heating equipment industry (SIC 3585), the sawmills and planing mills industry (SIC 2421) and the sheet metalwork industry (SIC 3444). The significance of the engineering and architectural services industries at the national level provides some explanation of the difference in the annual average wage in 2000 between the Southeast Iowa Region (\$40,749) and the U.S. (\$43,416). The average annual wage for this cluster statewide in 2000 was below the region's average (\$35,300)

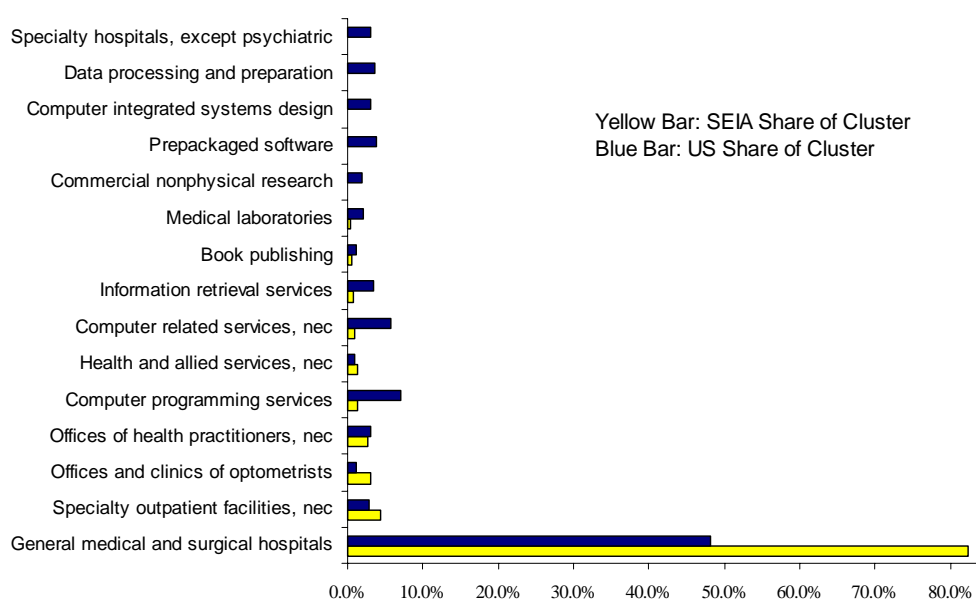
The wage differences are even larger between the Southeast Iowa Region and the U.S. level for several individual industries within this industry cluster. The radio and TV communications equipment industry had an annual average wage of \$68,736 for the U.S. in 2000 while the industry in the Southeast Iowa Region the industry had an average wage of \$39,455. An obvious explanation for such a drastic difference is that the types of occupations that are concentrated in the Southeast Iowa Region are on the low-value end of the industry's wage scales. The facilities located in the region are manufacturing establishments and not research and development, and product development facilities, which have higher wage occupations.

On the flip side, the other largest employing industry in this cluster in the Southeast Iowa Region was the heating equipment industry (SIC 3433) which had a annual average wage of \$35,645, which was nearly the same as the cluster's U.S. average. The switchgear and switchboard apparatus industry in Southeast Iowa had a 2000 average annual wage of \$55,727 that was well above the U.S. average of \$49,499. According to Dun & Bradstreet the major employers in the Southeast Iowa Region for this cluster include General Electric, Motorola, Heatilator, Du Pont and US Gypsum Company.

### **Hospitals, Labs and Specialized Medical Services Cluster**

As Figure 4 shows, the hospitals, labs and specialized medical services cluster is dominated at the U.S. level, the state level and at the Southeast Iowa level by general medical and surgical hospitals (SIC 8062). This industry has over 82 percent of the cluster's employment in the Southeast Iowa Region, while it has just over 48 percent of the employment at the U.S. level and 57.4 percent at the state level. In Southeast Iowa, several medical centers have a dominant influence, such as the Great River Medical Center in West Burlington, Fort Madison Community Hospital, Henry County Health Center in Mount Pleasant and Keokuk Area Hospital.

**Figure 4 - Hospitals, Labs and Specialized Medical Services Cluster  
Industry Mix**



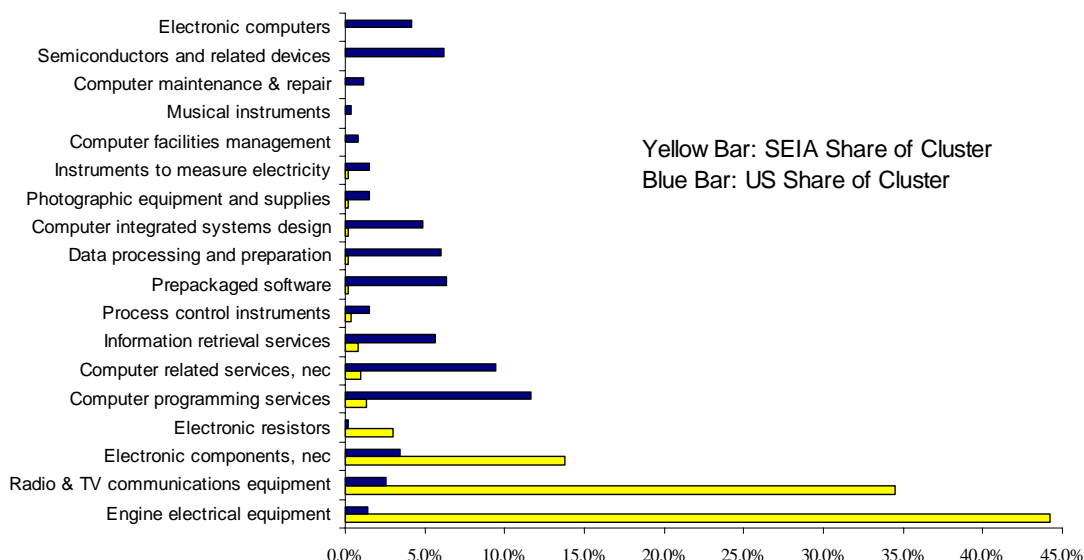
There is a considerable difference between the cluster's average annual wage in 2000 for the Southeast Iowa Region (\$27,572) and Iowa (\$31,073) compared to the U.S. (\$48,194). The wage differences are most dramatic in several industries which have only a small presence in the Southeast Iowa Region but do have some influence in the cluster at the national level. These industries include the health and allied services industry (SIC 8099), the computer related services industry (SIC 7379) and the information retrieval services industry (SIC 7379). Each of these industries had average annual wage rates at the national level in 2000 that were well above the Southeast Iowa Region. Once again the types of occupations within the industry that are present in the region are the determining factor for wage levels.

### **Information Technology and Instruments**

Three industries have a dominant presence in the information technology and instruments cluster in the Southeast Iowa Region (see Figure 5). This cluster consisted of 2,426 jobs in 2000 with over 44 percent of them being in the engine electrical equipment industry (SIC 3694). Another third of the jobs (34.5 percent) were in the radio and TV communications equipment industry (SIC 3663) and another 13.8 percent were in the electronic components industry (SIC 3679). The industries which had the highest employment levels in this cluster at the national level are all computer related: computer programming

services (SIC 7371), computer related services (SIC 7379), prepackaged software (SIC 7372), semiconductors and related devices (SIC 3674) and data processing and preparation (SIC 7374).

**Figure 5 - Information Technology and Instruments Cluster Industry Mix**



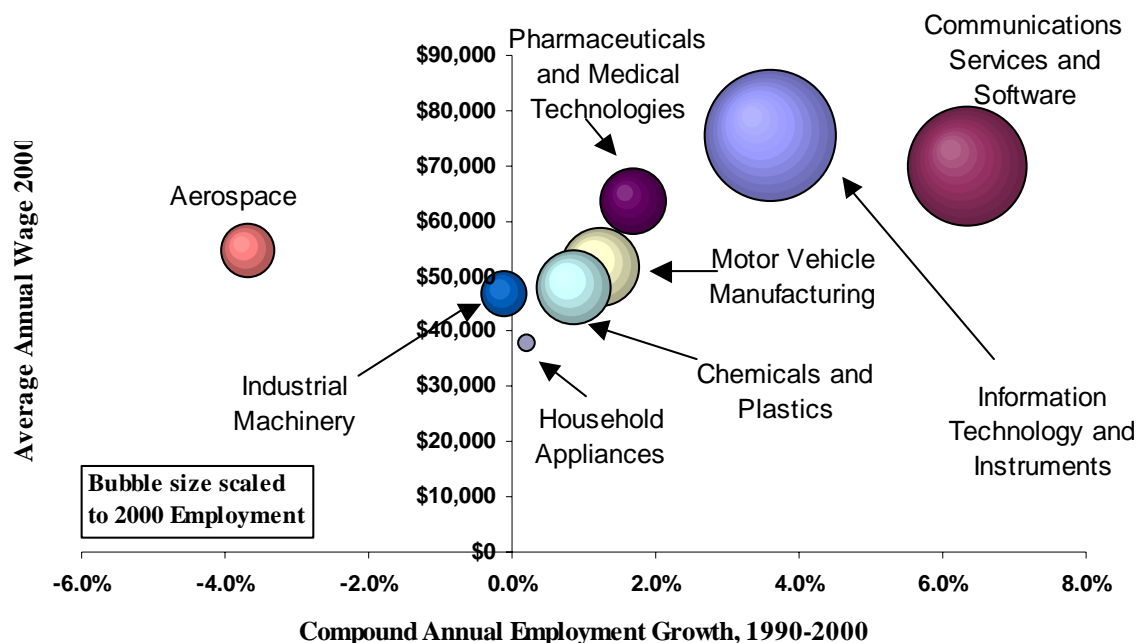
The information technology and instruments cluster did experience both employment growth and wage growth over the decade of the 1990s in the Southeast Iowa Region. The cluster had annual compounded wage growth of 0.6 percent in the region, while the cluster at the U.S. level had a rate of 7.26 percent. At the state level employment remained flat between 1990 and 2000. In 2000, the cluster had an annual average wage rate of \$38,323 in the region, \$41,180 statewide and \$72,579 at the national level. Compared to the other benchmark value-chain clusters in the Southeast Iowa Region, the information technology and instruments cluster had an annual wage rate that is on the higher end. Unfortunately, those industries, and the occupations that make up those industries, that are present in the region are not the high tech and high wage industries and occupations which have a strong influence at the national level.



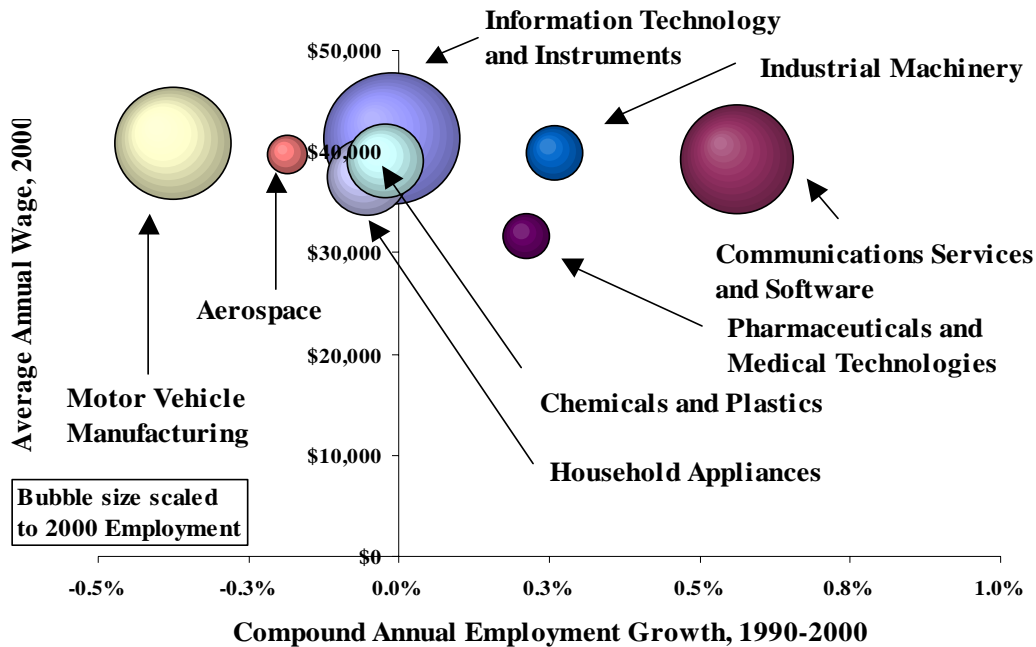
## Technology Benchmark Clusters

As described in the introduction of this report, the 8 benchmark technology clusters that are identified in this research were derived from a statistical analysis of the interaction between and the interdependence among high-technology industries. The high-tech industries analyzed were identified using research from the National Science Foundation and the Bureau of Labor Statistics (Feser, 2001). It should be noted that these technology-intensive clusters are not simply sub-sets of the 28 benchmark value-chain industry clusters. Table 4 provides summary data about the technology clusters for the U.S., Iowa and the Southeast Iowa Region. The analysis below will illustrate that employment presence within these clusters is very much concentrated in several industry sectors. Several large employers anchor these clusters' presence in the region and these industries locally have not experienced the same rate of growth that the cluster they are in experienced nationally. An illustration of these differences in growth rates can be seen in comparing Figures 6, 7 and 8 which compares each technology clusters growth rates and size against average wages in 2000.

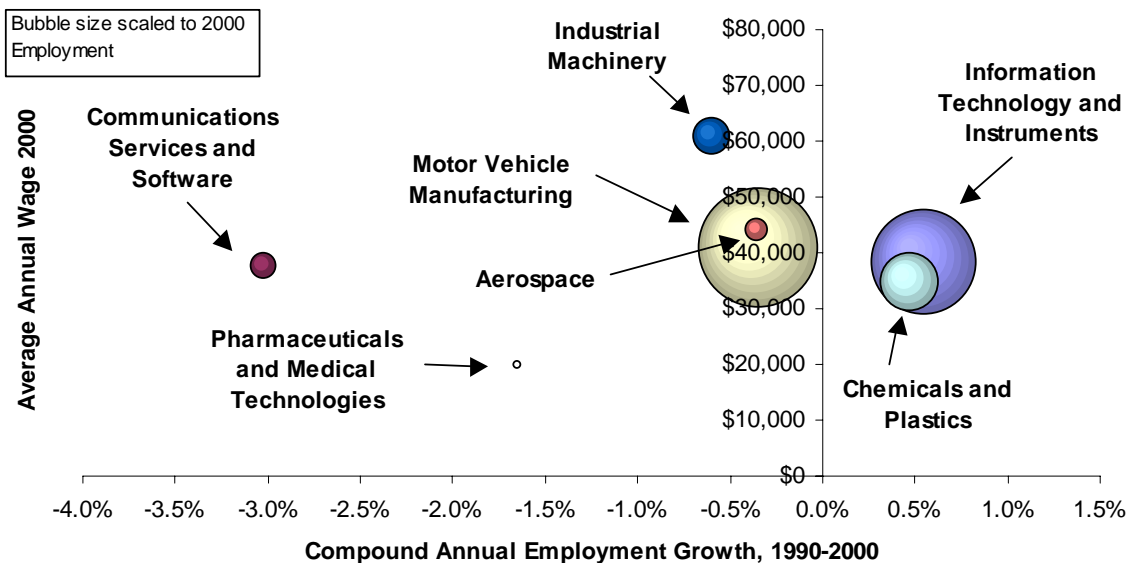
**Figure 6 - U.S. Technology Value-Chain Cluster Trends**



**Figure 7 - Iowa Technology Value-Chain Cluster Trends**



**Figure 8 - Southeast Iowa Benchmark Technology Cluster Trends**



At the U.S. level, all but two of the technology clusters experienced growth during the 1990s while only two of the clusters had growth in the Southeast Iowa Region. At the state level, all but three of the technology clusters experienced employment growth between 1990 and 2000.

**Table 4**  
**Southeast Iowa Region**  
**Benchmark Technology Clusters**

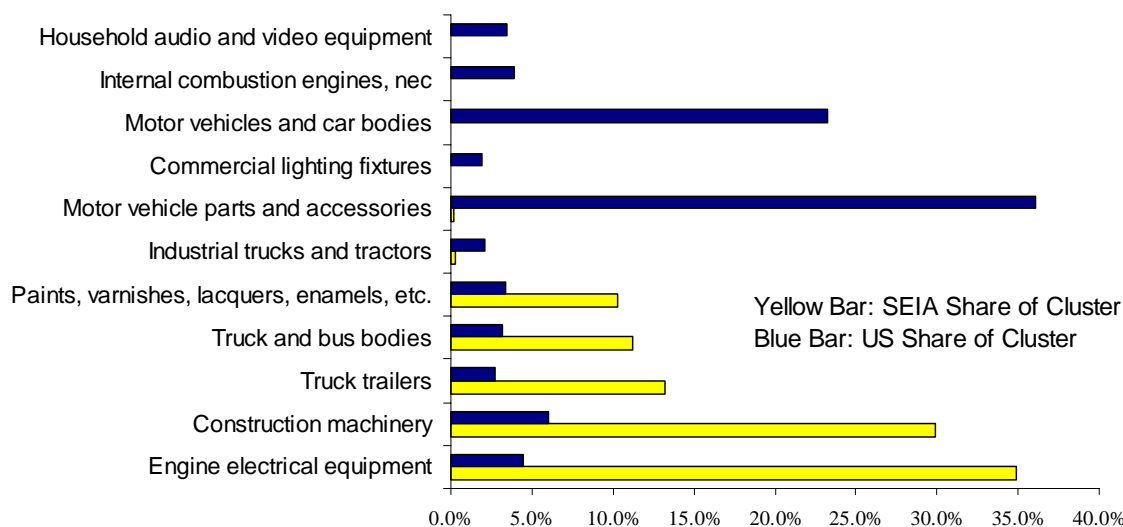
Description	Employment							Establish.		Payroll					
	2000	Per Etab.	CAGR			Location Quotient		2000	CAGR '90-'00	Average Wage - 2000			CAGR '90-'00		
			SE IA '90-'00	IA '90-'00	US '90-'00	2000	Chg '90-'00			SE IA	Iowa	US	SE IA	IA	US
Motor Vehicle Manufacturing .....	3,076	219.7	-0.3%	-0.4%	1.2%	4.7	0.2	14	0.7%	41,051	40,755	51,561	0.3%	0.4%	4.0%
Information Technology and Instruments.	2,416	69.0	0.6%	0.0%	3.6%	1.4	-0.1	35	0.3%	38,384	41,288	75,343	0.6%	0.6%	7.7%
Chemicals and Plastics .....	705	17.6	0.5%	0.0%	0.9%	1.2	0.2	40	1.1%	34,862	39,080	48,152	0.1%	0.5%	3.9%
Industrial Machinery .....	322	53.7	-0.6%	0.3%	-0.1%	1.4	0.2	6	1.8%	60,934	39,938	46,988	-0.4%	0.6%	4.5%
Communications Services and Software ..	139	2.7	-3.0%	0.6%	6.3%	0.1	-0.1	51	0.6%	37,899	39,202	69,973	0.6%	0.7%	6.5%
Aerospace.....	108	15.4	-0.4%	-0.2%	-3.7%	0.3	0.1	7	1.6%	44,318	39,682	54,517	-0.9%	0.4%	3.7%
Pharmaceuticals & Medical Technologies	11	1.4	-1.7%	0.2%	1.7%	0.0	0.0	8	2.9%	20,015	31,593	63,741	-1.6%	0.4%	6.0%
Household Appliances.....	0	NA	NA	-0.1%	0.2%	0.0	0.0	0	NA	NA	37,511	37,861	NA	-0.2%	3.6%

Data source: U.S. Bureau of Labor Statistics ES-202 files (from Minnesota IMPLAN Group, Inc). SE IA = the Southeast Iowa Region. CAGR = compound annual growth rate

### **Motor Vehicle Manufacturing Technology Cluster**

As Table 4 shows, the motor vehicle manufacturing technology cluster had the largest employment in the region, with just over 3,000 workers in 2000. This cluster experienced an annualized percentage decrease of 0.3 percent between 1990 to 2000 in the region, while at the U.S. level the cluster grew annually by 1.2 percent, yet statewide it declined at an annual rate of 0.4 percent. Despite the employment decline in the Southeast Iowa Region, the technology cluster still had an employment location quotient of 4.7 showing that it is over-represented compared to the U.S. averages. Figure 9 illustrates that employment in the motor vehicle manufacturing technology cluster in Southeast Iowa is concentrated in several industries

**Figure 9 - Motor Vehicle Manufacturing Technology Cluster Industry Mix**



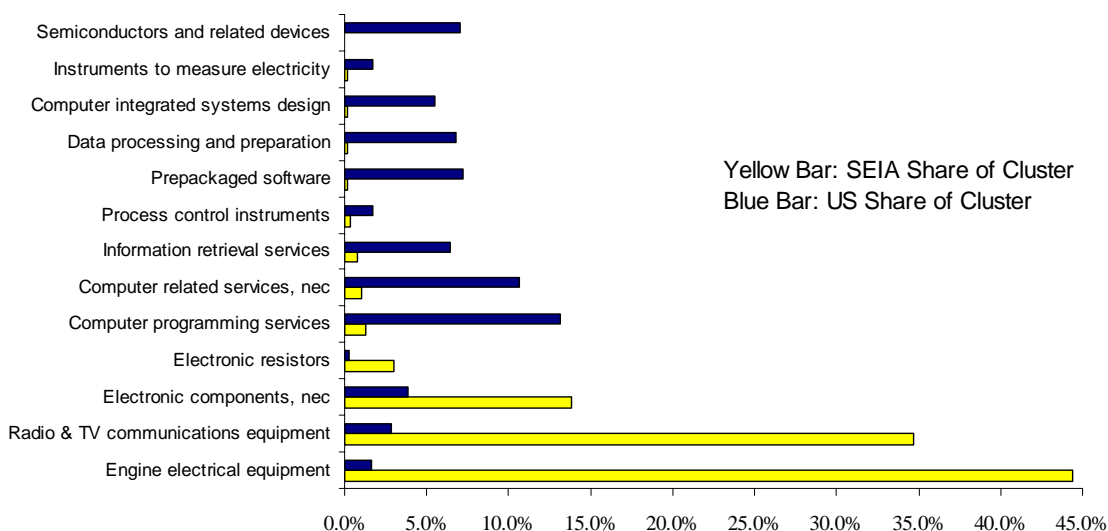
More than a third of the employment in the cluster is in the engine electrical equipment industry (SIC 3694), 34.9 percent. Roughly another 30 percent (29.9) of the employment is in the construction machinery industry (SIC 3551). Three other industries have at least a 10 percent-share of the employment in the cluster: truck trailers industry (SIC 3715), truck and bus bodies industry (SIC 3713) and the paints, varnishes, lacquers, enamels industry (SIC 2851). It must be noted that Blue Bird Midwest and Wabash Trailers have closed operations since 2000. Figure 9 shows that the automobile manufacturing industry dominates this technology cluster at the U.S. level, particularly the motor vehicle parts and accessories industry (SIC 3714) with over 36 percent of the cluster's employment, and the motor vehicles and car bodies industry (SIC 3711) with over 23 percent of the cluster's employment. Statewide the two largest industries were the construction machinery industry and motor vehicle parts and accessories industry. According to Dun & Bradstreet, the largest employers within this technology cluster in Southeast Iowa are Case Corporation, Federal-Mogul Corporation, Du Pont and Pipemaster Corporation.

The motor vehicle manufacturing technology cluster at the national level experienced a annual average wage increase of 4.0 percent during the decade of the 1990s, while for the Southeast Iowa Region that wage growth rate was 0.3 percent per year for the same time period and statewide the wage growth rate was 0.4 percent. In 2000, the cluster's average annual wage was \$41,051 in Southeast Iowa while at the U.S. level it was \$51,561 and at the Iowa level it was \$40,755.

### **Information Technology and Instruments Technology Cluster**

Not surprising, the information technology and instruments technology cluster had the second largest employment levels in Southeast Iowa in 2000, since the engine electrical equipment industry (SIC 3694) is also an industry sector in this cluster.

**Figure 10 - Information Technology and Instruments Technology Cluster  
Industry Mix**



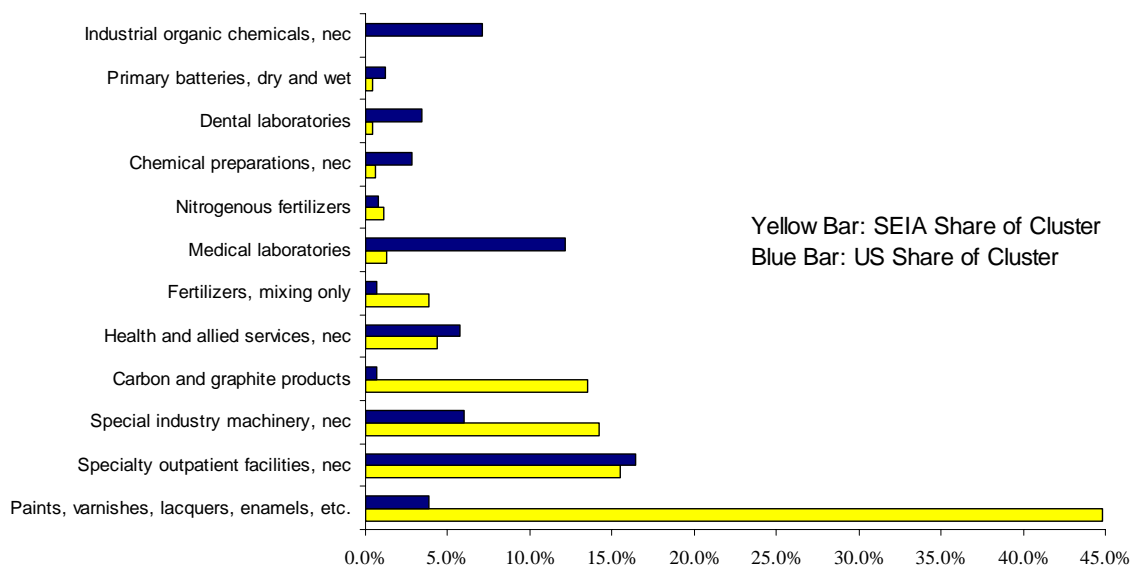
At the U.S. level and statewide level, this technology cluster had the largest employment levels of the eight technology clusters. The cluster also had the highest annual average wage in 2000 at the state

level (\$41,288) and at the U.S. level (\$75,343), which was almost twice the value of the technology cluster's average wage in the Southeast Iowa Region. In 1990, the Southeast Iowa Region had an annual average wage of \$36,130, Iowa had an annual average wage of \$38,969 and the U.S. had an annual average wage of \$35,874. During the 1990s the wages grew annually at 0.3 percent in the Southeast Iowa Region, 0.6 percent annually statewide and 7.7 percent annually at the U.S. level. The largest employers within this technology cluster in the region include Motorola, Federal-Mogul Corporation, Winegard Company and Precision Resistive Products (Dun & Bradstreet, 2003).

### **Chemical and Plastics Technology Cluster**

The chemical and plastics technology cluster is the only other technology cluster which has an employment level of any size in the Southeast Iowa Region. This cluster did experience growth between 1990 and 2000 in the Southeast Iowa Region and at the U.S. level, while employment levels remain stable statewide in Iowa. The cluster had an average annual wage in 2000 of \$34,862 in the region compared to \$48,152 at the U.S. level and \$39,090 statewide. In examining the industry sectors present in the cluster the overlap with the motor vehicle manufacturing technology cluster is evident with the paints, varnishes, lacquers, enamels industry (SIC 2851) being the largest employer. Figure 11 shows the employment distribution for this technology cluster for the U.S. and the Southeast Iowa Region.

**Figure 11 - Chemicals and Plastics Technology Cluster Industry Mix**



According to Dun & Bradstreet, the largest employers within this technology cluster in Southeast Iowa are Du Pont, Scotts Company, Hawkeye Group Inc, J&M Displays, Mepco, Woodlands Treatment Center and C S I Industrial Packaging.

## Benchmark Labor Clusters

Each of the 17 benchmark labor clusters consists of industries that utilize similar workforce skills and occupations. As described in the report's introduction, these industry clusters were identified through an analysis of data on the workforce staffing patterns of industries and data on the skills and knowledge requirements of occupations. An examination of the human capital of a region has become critical since the availability and quality of labor are considered critical site selection criteria for businesses.

At the U.S. level in 2000, the largest benchmark labor cluster was the health services labor cluster. This labor cluster at the U.S. level had an annual growth rate of 2.6 percent, which was one of the highest annual percentage growth rates behind the securities, information processing, and distribution, freight handling labor clusters. The health services labor cluster was also the largest labor cluster statewide in Iowa and had an annual growth rate of 0.3 percent. As Table 5 shows, the Southeast Iowa Region had seven benchmark labor clusters which had employment of 1,000 workers or more.

**Table 5**  
**Southeast Iowa Region**  
**Benchmark Labor Clusters**

Description	Employment								Payroll						
	CAGR – '90-'00						Loc. Quotient	Establish.		Average Wage - 2000			CAGR '90-'00		
	2000	Per Estab.	SE IA	Iowa	US	2000		Chg '90-'00	2000	CAGR '90-'00	SE IA	Iowa	US	SE IA	IA
Health Services .....	4,541	19.2	0.3%	0.3%	2.6%	1.1	0.0	237	0.1%	27,365	29,665	34,928	0.7%	0.4%	3.3%
Standardized Heavy Industry .....	3,977	128.3	-0.4%	0.1%	0.4%	2.5	0.3	31	1.0%	35,613	37,069	47,271	0.4%	0.3%	3.8%
Electronics, Measuring Devices .....	3,151	210.1	0.3%	-0.4%	-0.4%	3.2	0.8	15	0.7%	42,614	37,401	66,125	0.7%	0.7%	7.0%
Low Skill, Non-Durable Manufacturing .....	2,979	99.3	-0.6%	-0.1%	-1.4%	2.2	0.6	30	0.7%	38,322	38,270	33,710	0.4%	0.5%	4.3%
Distribution, Freight Handling .....	2,264	15.1	0.5%	0.2%	2.7%	1.5	0.0	150	0.5%	31,783	30,755	35,845	0.5%	0.4%	3.1%
Specialized Labor Intensive .....	1,491	42.6	-1.8%	0.0%	0.5%	1.5	0.0	35	0.0%	31,341	35,784	35,547	0.8%	0.3%	3.5%
Food and Tobacco Manufacturing .....	1,354	135.4	-0.4%	-0.4%	-0.6%	3.8	0.8	10	0.0%	43,761	41,846	43,456	0.1%	0.4%	4.0%
Telecomm and Banking .....	888	9.3	0.1%	0.2%	0.9%	0.5	0.1	96	-0.3%	28,666	38,450	49,122	0.1%	0.7%	5.5%
Low Skill, Misc. Manufacturing .....	770	22.6	0.1%	0.2%	0.2%	1.1	0.2	34	0.9%	28,737	28,614	33,161	-0.1%	0.2%	3.7%
High End Information/Business Services .....	709	8.4	0.0%	0.1%	0.6%	0.6	0.1	84	0.2%	23,389	33,864	50,280	0.5%	0.5%	4.5%
High Tech Machinery, Instruments.....	363	17.3	0.1%	0.0%	0.8%	1.0	0.1	21	1.6%	34,918	36,785	43,601	-0.5%	0.5%	3.9%
Information Processing .....	342	3.1	1.4%	0.7%	4.3%	0.2	0.0	109	0.4%	29,691	40,521	59,714	-0.1%	0.5%	6.7%
Chemicals, Pharmaceuticals.....	185	26.4	0.7%	-0.6%	-0.3%	0.6	0.2	7	1.6%	54,836	46,692	73,849	-0.3%	0.9%	6.0%
Securities .....	80	3.1	1.8%	0.4%	5.9%	0.2	-0.1	26	1.2%	82,149	72,278	147,281	4.5%	0.2%	8.6%
Science Intensive .....	57	2.1	-6.8%	0.1%	0.4%	0.1	0.0	27	1.2%	37,674	45,538	57,027	1.2%	0.4%	4.3%
Building Products.....	19	9.5	16.9%	0.5%	1.6%	0.1	0.1	2	7.2%	25,163	31,696	32,860	0.8%	0.4%	3.4%
Petroleum.....	0	NA	NA	-0.3%	-4.1%	0.0	0.0	0	NA	NA	43,690	59,958	NA	0.2%	4.1%

Data source: U.S. Bureau of Labor Statistics ES-202 files (from Minnesota IMPLAN Group, Inc). SE IA = the Southeast Iowa Region. CAGR = compound annual growth rate

### Health Services Labor Cluster

The health services labor cluster had the highest employment levels in 2000 for the three-county Southeast Iowa Region, with over 4,500 workers. Employment in the labor cluster in the region grew at an annual rate of 0.3 percent. The average annual wage in 2000 for this labor cluster was \$27,365, which was lower than the statewide average (\$29,665) and the U.S. average (\$34,928). The health services labor cluster did experience wage growth at all three levels, yet Iowa and the U.S. wage growth rates were significantly higher than the Southeast Iowa Region.



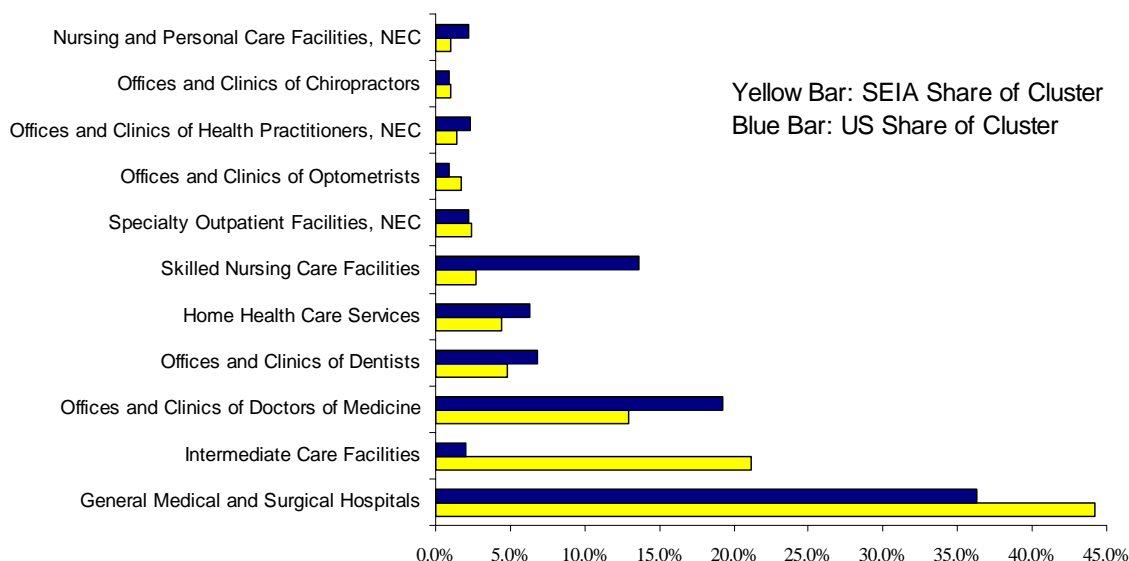
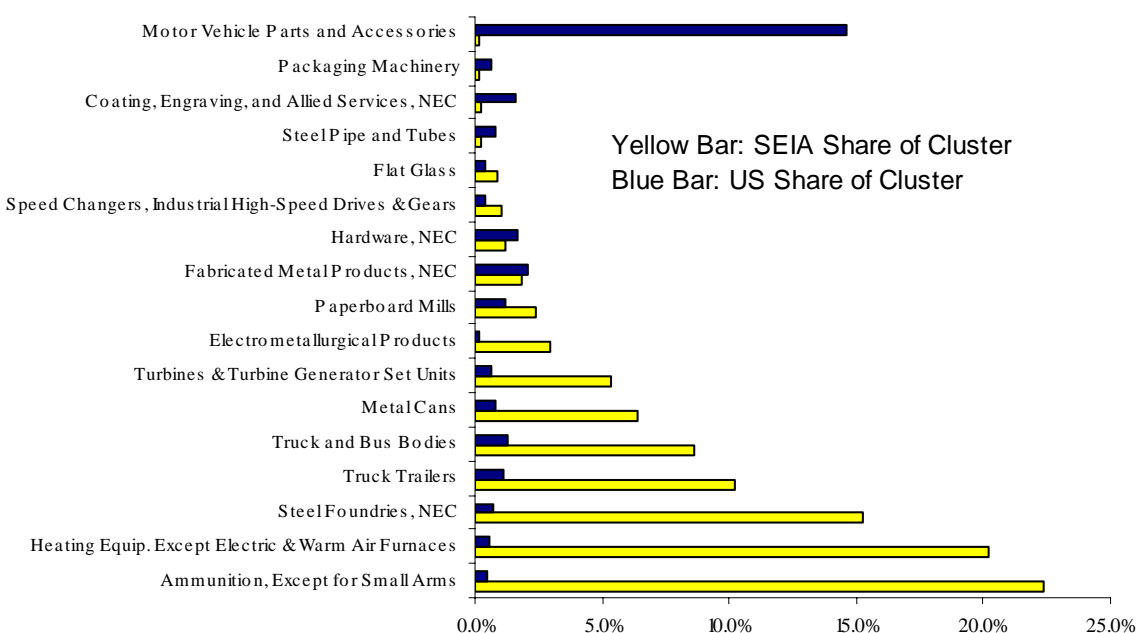
**Figure 12 - Health Services Cluster Industry Mix**

Figure 12 shows that in 2000 the general medical and surgical hospitals industry (SIC 8062) was the largest industry sector employer in the health services labor cluster in the Southeast Iowa Region and at the U.S. level (this sector was also the largest industry statewide in this labor cluster). This industry sector had close to half (44.2 percent) of the labor cluster's employment in the region, while it had more than one-third of the employment (36.3 percent) at the U.S. level. This is understandable since the region has four medical centers in the three counties. The next largest industry in Southeast Iowa is the intermediate care facilities industry (SIC 8052) with more than twenty percent of the employment (21.1 percent). The most common occupations in the general medical and surgical hospitals industry are registered nurses and nursing aides, orderlies and attendants. In the intermediate care facilities the most common occupations are nursing aides, orderlies and attendants and licensed practical nurses and licensed vocational nurses.

### **Standardized Heavy Industry Labor Cluster**

The second largest benchmark labor cluster in the Southeast Iowa Region is the standardized heavy industry labor cluster. Within this labor cluster in 2000, the major employment industry sectors were the ammunitions industry (SIC 3483), which includes American Ordnance, the Iowa Army Ammunition Plant, followed by the heating equipment industry (SIC 3433), the steel foundries industry (SIC 3325) and the truck trailers manufacturing industry (SIC 3715). Figure 13 illustrates the cluster's industry mix.

**Figure 13 - Standardized Heavy Industry Labor Cluster Industry Mix**

The average annual wage in 2000 in the Southeast Iowa Region for the labor cluster was \$35,613, \$47,271 at the U.S. level and \$37,069 statewide. Within the ammunitions industry the most common occupations include assemblers, inspectors, testers, sorters, samplers and weighers, and machinists. Assemblers are also the most common occupation in the heating equipment industry, followed by welders, cutters, solderers and brazers, and cutting, punching and press machine operators and setters.

### **Electronics, Measuring Devices Labor Cluster**

The electronics, measuring devices labor cluster had the third highest employment levels in 2000 in the Southeast Iowa Region. This labor cluster experienced employment growth between 1990 and 2000 in the region while it saw employment declines at the national level and the state level.

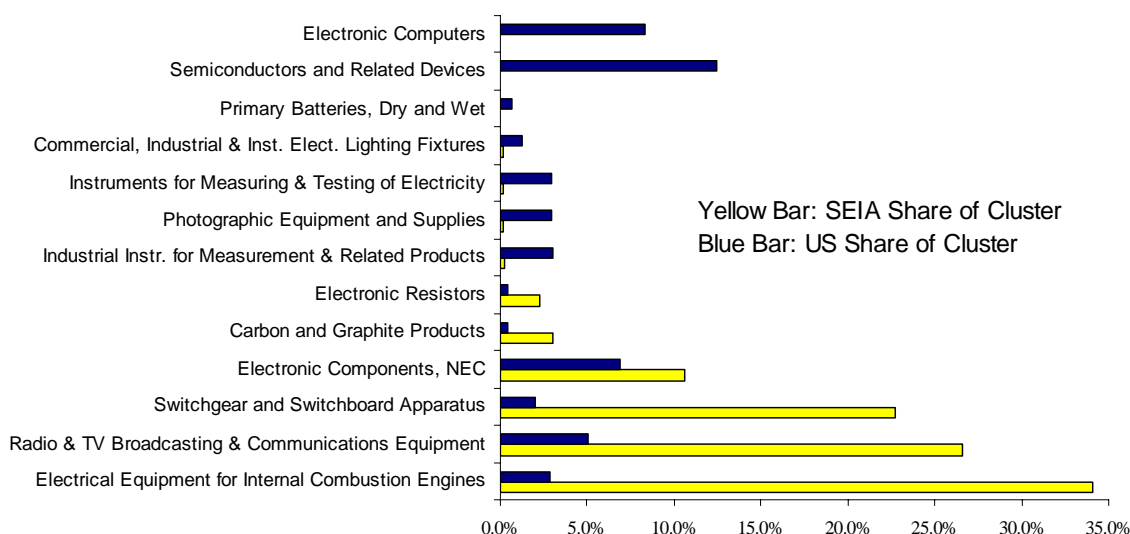
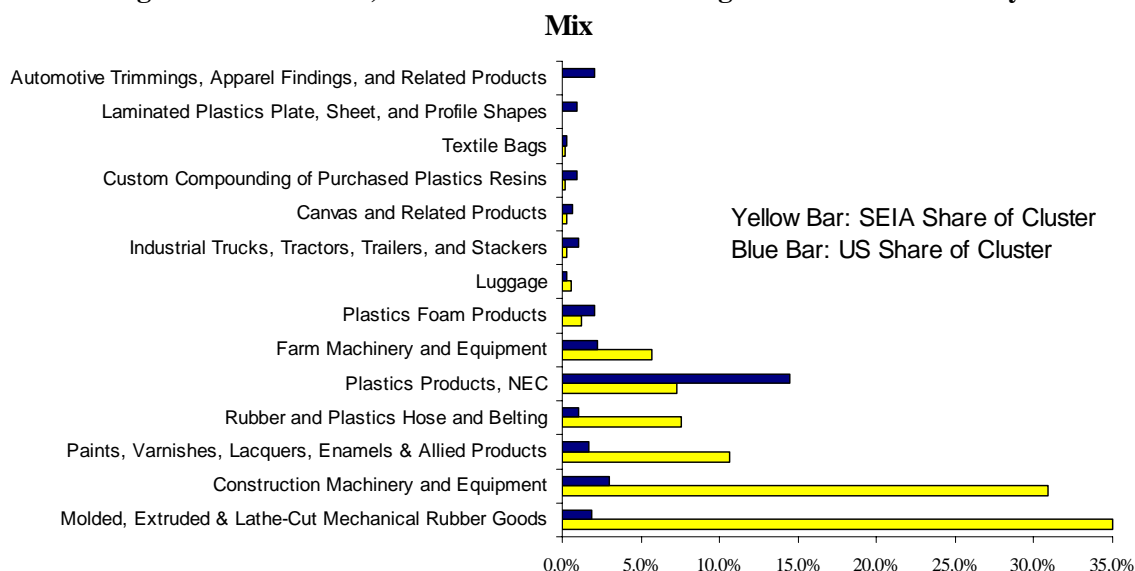
**Figure 14 - Electronics, Measuring Devices Labor Cluster Industry Mix**

Figure 14 shows that the electrical equipment for internal combustion engines industry (SIC 3694) has more than a third of the region's employment (34.1 percent) in this labor cluster. The radio and television broadcasting and communications equipment industry (SIC 3663) and the switchgear and switchboard apparatus industry (SIC 3613) also had a significant influence on the labor cluster's employment levels in 2000. The largest industry employer for this labor cluster at the U.S. level in 2000 was the semiconductors and related devices industry (SIC 3674). It should be noted that the semiconductor industry has experienced considerable contraction during the past several years.

The electronics, measuring devices labor cluster had an annual average wage in 2000 at the U.S. level (\$66,125) that was considerably higher than the labor cluster's average annual wage in the Southeast Iowa Region (\$42,614) and at the statewide level in Iowa (\$37,401). During the decade of the 1990s, the wages at the U.S. level grew by 7.0 percent annually while the wages in the region and statewide only grew at a fraction of that annual rate, 0.7 percent annually. The most common occupations in the electrical equipment industry are inspectors, testers, sorters, samplers and weighers, first-line production supervisors, maintenance and repair workers and engine machine operators. The communications equipment industry's most common occupations were also inspectors, testers, sorters, samplers and weighers, followed by electrical engineering technicians and assemblers.

### **Low Skill, Non-Durable Manufacturing Labor Cluster**

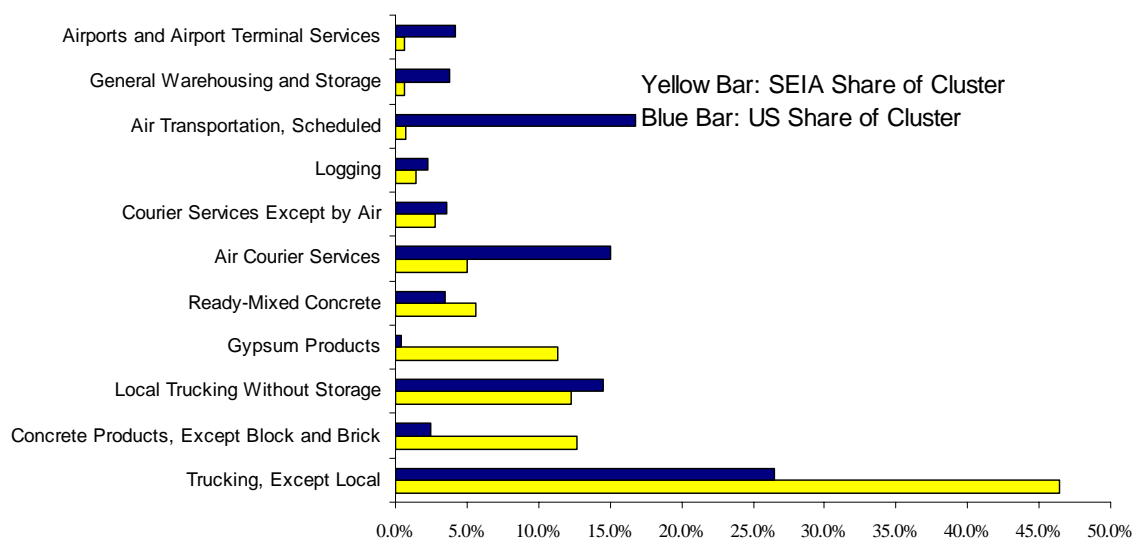
The low skill, non-durable manufacturing labor cluster had just under 3,000 employees in 2000 in the Southeast Iowa Region. Two industries dominate employment in the labor cluster within the region: the molded, extruded and lathe-cut mechanical rubber goods manufacturing industry (SIC 3061) and the construction machinery and equipment industry (SIC 3531). The major employers in the region in these two industries are Case Corporation and Pipemaster Corporation. The plastics products industry was the largest industry sector at the U.S. level in 2000. The farm machinery and equipment industry (SIC 3523) and the construction machinery and equipment industry were the two largest industry sectors in this cluster statewide.

**Figure 15 - Low Skill, Non-Durable Manufacturing Labor Cluster Industry**

The low skill, non-durable manufacturing labor cluster is one of only two benchmark labor clusters which had a higher annual average wage in the Southeast Iowa Region than at the U.S. level. The annual average wage in 2000 was \$38,322 in the region, \$33,710 at the U.S. level and \$38,270 statewide. Wages in this cluster grew annually by 4.3 percent at the U.S. level, 0.5 percent annually statewide in Iowa and 0.4 percent annually in the Southeast Iowa Region. The most common occupations in the fabricated rubber products industry are assemblers, inspectors, testers, sorters, samplers and weighers, first-line production supervisors, and molding and casting machine operators and setters. In the construction machinery industry the most common occupations are welders, cutters, solderers and brazers, assemblers and machinists.

### **Distribution, Freight Handling Labor Cluster**

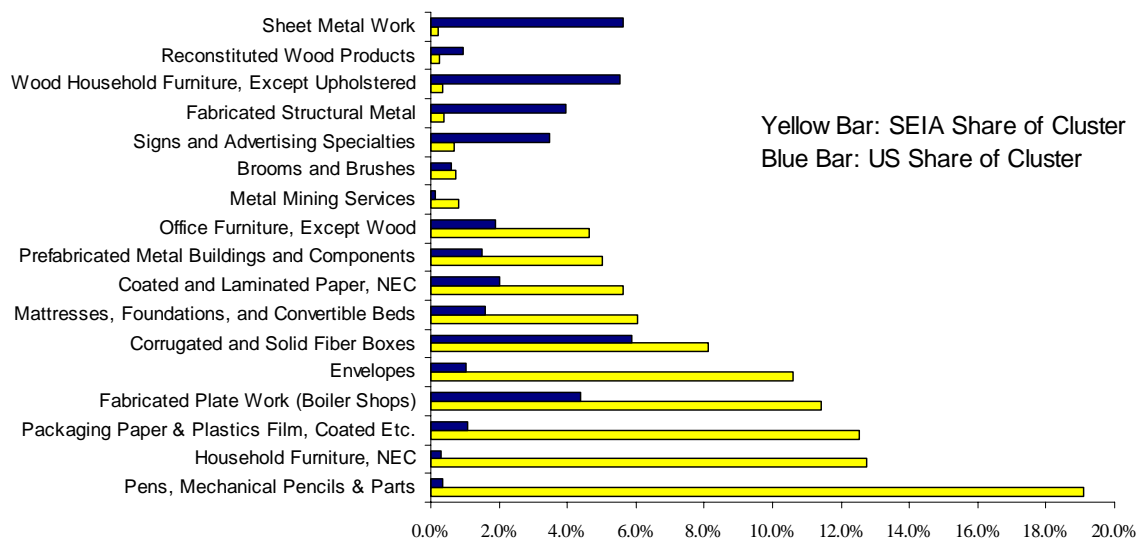
Employment in 2000 in the distribution, freight handling cluster in the Southeast Iowa Region was 2,264 in 2000, which was an increase since 1990. This labor cluster in the Southeast Iowa Region, and to a lesser extent at the U.S. level, is dominated by the trucking industry, which Figure 16 illustrates. In the Southeast Iowa Region, the non-local trucking industry (SIC 4213) had 46.4 percent of the labor clusters employment, while at the U.S. level the industry accounted for 26.5 percent of the labor clusters employment. This industry sector was also the largest employer in the cluster at the state level. The cluster grew at all three levels between 1990 and 2000 with the U.S. level having the highest percentage at 2.7 percent annually, followed by the Southeast Iowa Region (0.5 percent) and Iowa (0.2 percent).

**Figure 16 - Distribution, Freight Handling Labor Cluster Industry Mix**

The concrete products industry (SIC 3272), the local trucking industry (SIC 4212) and the gypsum products industry (SIC 3275) were the next largest employers in the cluster in the Southeast Iowa Region. The labor cluster's annual average wage in the region in 2000 (\$31,783) was several thousand dollars below the U.S. average for the labor cluster (\$35,547) and slightly above the statewide average (\$30,755). As would be expected, truck driving occupations are the most common in the trucking industry, heavy and tractor-trailer truck drivers and light or delivery services truck drivers. Heavy and tractor-trailer truck drivers are also the most common occupations in the concrete and gypsum industries, followed by material movers and laborers occupations.

### **Specialized Labor Intensive Labor Cluster**

The specialized labor intensive labor cluster in 2000 had an employment level which nearly topped 1,500 employees (1,491). Employment in this labor cluster in the Southeast Iowa Region declined between 1990 and 2000 by an annual rate of 1.8 percent while the labor cluster at the U.S. level had an annual growth rate of 0.5 percent. Cluster employment statewide remained flat. At the Southeast Iowa Region level, state level and the U.S. level, no one industry dominates the labor cluster. Five industry sectors in the region had an employment share in the labor cluster between ten and twenty percent, which Figure 17 illustrates. The largest employer in the Southeast Iowa Region is the pens, mechanical pencils and parts industry (SIC 3951), which consists of Sheaffer Pen. The household furniture industry (SIC 2519) and the packaging paper and plastics film industry (SIC 2671) are the next two largest industry employers.

**Figure 17 - Specialized Labor Intensive Labor Cluster Industry Mix**

In 2000 in the Southeast Iowa Region, the annual average wage for the specialized labor intensive labor cluster was \$31,341 while it was \$35,784 and \$35,547 for the cluster at the Iowa level and the U.S. level. The most common occupations in the pens and pencils industry are assemblers, first-line production supervisors and hand packers and packagers. In the household furniture industry the three most common occupations are assemblers, sewing machine operators and upholsters. Hand packers and packagers are also the most common occupations in the paper and packaging industry, followed by printing machine operators and production workers.

### **Food and Tobacco Manufacturing Labor Cluster**

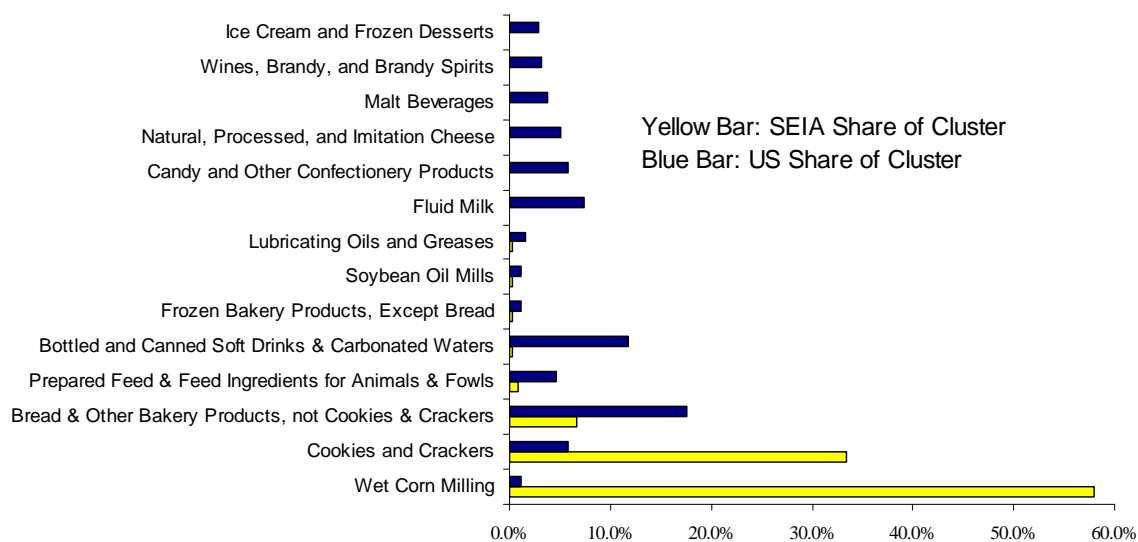
The food and tobacco manufacturing labor cluster is the last of the seven benchmark labor clusters in the Southeast Iowa Region which had employment over 1,000 in 2000. The labor cluster had an employment level of 1,354. Figure 18 shows that the wet corn milling industry (SIC 2046) and the cookies and crackers industry (SIC 2052) dominate this cluster in the region. The wet corn milling industry had 58.0 percent of the labor cluster's employment in the Southeast Iowa Region and the cookies and crackers industry had 33.5 percent of the region's employment. At the U.S. level, the bread and bakery products industry (SIC 2051) and bottled and canned soft drinks industry (2086) had the highest employment levels in 2000. Statewide the two largest industry sectors were the prepared animal and fowl feed and feed ingredients industry (SIC 2048) and wet corn milling. Employment in this labor cluster declined during the 1990s at all three levels.

The food and tobacco manufacturing labor cluster is the other benchmark labor cluster for which the Southeast Iowa Region had a higher annual average wage than the U.S. annual average wage, \$43,716 compared to \$43,456. The annual average wage at the state level was below the other two levels (\$41,846). Mixing and blending machine operators and tenders are the most common occupations in the grain milling industry. Other common occupations are industrial truck and tractor operators, first-line production supervisors and material movers and handlers. As would be expected, bakers are the most



common occupations in the bakery products industry, followed by hand packers and packagers, production workers, and packaging and filling machine operators and tenders.

**Figure 18 - Food & Tobacco Manufacturing Labor Cluster Industry Mix**



## Summary, Recommendations and Next Steps

### Summary

This report shows that the industrial base of the three-county Southeast Iowa Region has shifted since 1990 and continues to shift. The employment levels in many of the region's largest clusters declined between 1990 and 2000 and continues to shed employment with several plant closings or mass layoffs during the past year. These trends are counter to the clusters' activities at the U.S. level where only a few clusters, whether value-chain industry clusters, technology clusters or labor cluster, have experienced employment declines. Obviously, the current national recession has tempered employment levels. Statewide, Iowa has seen a mix of employment growth and decline depending on the specific cluster.

#### Benchmark Value-Chain Industry Clusters:

Of the benchmark value-chain clusters that have a significant presence, over 1,000 employees in the year 2000, in the Southeast Iowa Region, five of the nine had positive employment growth over the previous decade. The two largest value-chain industry clusters in the region were the metalworking and industrial machinery cluster, and the motor vehicle manufacturing industry cluster. However, both of these clusters had employment losses between 1990 and 2000 in the region and have continued to decline in employment since 2000. As Table 1 shows, most of the clusters which experienced employment growth and/or wage growth were at annual rates below national rates.

The information technology and instruments industry cluster had the highest annual growth rate in the Southeast Iowa Region with a rate of 0.6 percent per year, while at the U.S. level the cluster had an annual growth rate of 2.7 percent. At the U.S. level the fastest growing value-chain clusters were the hospitals, labs and specialized medical services cluster (3.5 percent annually), the printing and publishing industry cluster (3.4 percent annually) and the pharmaceuticals industry cluster (2.7 percent annually) in 2000. The first two of these value-chain clusters had a strong presence in the Southeast Iowa Region, while the pharmaceuticals industry cluster did not have a presence. The printing and publishing industry cluster grew at the U.S. level, and to a lesser extent statewide (0.2 percent growth annually), but employment in the industry cluster declined in the Southeast Iowa Region.

All but one of the Southeast Iowa Region's nine largest value-chain clusters experienced a growth in their average annual wages. The wage growth rates in the region did not keep pace with the wage growth rates at the U.S. level, but were similar to statewide growth rates.

#### Benchmark Technology Clusters

Only two of the eight benchmark technology clusters had employment above 1,000 in 2000 (the motor vehicle manufacturing technology cluster and the information technology and instruments technology cluster), yet since 2000 several industry sectors in these technology clusters have reduced employment levels. The information technology and instruments technology cluster and chemicals and plastics technology cluster were the only two of the technology clusters which experienced employment growth between 1990 and 2000 in the Southeast Iowa Region, while at the U.S. level only two technology clusters experienced employment losses (aerospace and industrial machinery).

The annual average wages in the Southeast Iowa Region for the technology clusters were well below the averages at the U.S. level, except for the industrial machinery technology cluster. As was discussed in the technology cluster section above, the types of occupations that are present in Southeast Iowa play a critical factor in the average wages paid. All of the technology clusters had significant annual growth rates for wages between 1990 and 2000, from a high of 7.7 percent annually to a low of 3.6 percent annually. In the Southeast Iowa Region the wage growth rates ranged from –1.6 percent annually to 0.6 percent annually.

### **Benchmark Labor Clusters**

Seven of the benchmark labor clusters in the Southeast Iowa Region had employment levels over 1,000. Three of the seven had employment growth between 1990 and 2000. For these same seven labor clusters at the U.S. level, only four clusters had employment growth during the same time period. For the labor clusters with any real measurable employment in the Southeast Iowa Region, the fastest growing labor cluster was the securities labor cluster which grew at 1.8 percent annually. The securities labor cluster also was the fastest growing labor cluster at the U.S. level with an annual rate of 5.9 percent. The securities labor cluster also had the highest annual average wage in the region (\$82,149), which was roughly \$65,000 below the labor cluster's average wage at the U.S. level (\$147,281). All but two of the labor clusters had a higher annual average wage at the U.S. level than the Southeast Iowa Region. The two exceptions were the food and tobacco manufacturing labor cluster and the low skill, non-durable manufacturing labor cluster.

### **Recommendations and Next Steps:**

Below are recommendations and next steps for the economic development organizations in the Southeast Iowa Region.

#### **1. Determine if Industry Linkages and Organizational Relationships Exist, or Could Exist, in the Region:**

##### **A. What industry linkages/relationships actually exist in the region?**

It is important to understand that the analysis that is completed in this study for the value-chain industry clusters and technology clusters is based on industry linkages and relationships that have been identified at the U.S. level. Therefore, it is important that additional fact finding is completed locally and regionally to determine if actual buyer-supplier relationships within the various clusters and industry sectors actually exist or could exist in the future. This input can be obtained from employers through existing industry/business surveys and interviews, focus groups or industry roundtables. It is important to find out who regional employers “buy from” and “sell to” in order to determine if there are important economic relationships within the region.

##### **B. What support organizations and programs are utilized by clusters?**

Also determine what support organizations are utilized by employers within the region and what additional needs employers have that could be addressed collectively through cluster-focused or industry-focused strategies. Programs being utilized could include workforce training or technology programs at Southeastern Community College or pollution prevention assistance through the Iowa Waste Reduction Center at the University of Northern Iowa.

Needs might include exporting assistance or process evaluations to assist with increasing productivity and competitiveness.

Any efforts to evaluate whether value-chain and technology relationships exist within the region will assist the local development organizations and support organizations gain a better understanding of the regional economy. A logical approach to gathering this information is to integrate the gathering activities into existing industry programming and business call programs that are undertaken by local economic development organizations or develop a joint effort regionally specifically for this effort.

## **2. Determine Potential Approaches for Business Development and Industry Recruitment:**

### **A. What industries could be targeted based on the value-chain clusters and the technology clusters?**

If proactive recruitments are being undertaken by economic development groups or are being considered, the analysis provided above should be a starting point for targeting. A key advantage of using the benchmark cluster framework is the ability to determine potential areas for growth in the region as industry gaps either within a value-chain cluster or technology cluster. For most of the value-chain clusters with a measurable presence in the Southeast Iowa Region, there are only a handful of industry sectors that have establishments within the region, so opportunities could exist for new industries which could compliment the existing industrial linkages in the region.

The motor vehicle manufacturing cluster and the printing and publishing cluster are two examples of where potential gaps might exist. In the motor vehicle manufacturing cluster in the Southeast Iowa Region over half of the employment is in two industry sectors: the engine electrical equipment industry (SIC 3694) and the mechanical rubber goods industry (SIC 3016). At the U.S. level in this cluster the two fastest growing sectors have been the plastics plumbing fixtures industry (SIC 3088) and the public building and related furniture industry (SIC 2531), neither of which are present in the Southeast Iowa Region.

The printing and publishing cluster has experienced growth at the U.S. and state levels but has declined in the Southeast Iowa Region. Growth sectors in the cluster include several computer service related industries such as information retrieval services (SIC 7375), computer related services, n.e.c. (SIC 7379) and computer programming services (SIC 7371), all of which have a limited presence in the region and statewide. However, there are several manufacturing sectors in this cluster that have experienced growth nationally that either have a presence in the region or statewide which might have potential: signs and advertising specialties (SIC 3993), paper coated and laminated packaging manufacturing (SIC 2671), plastic, laminated and coated bags manufacturing (SIC 2673) and periodical publishing and printing (SIC 2721).

### **B. What industries could be targeted based on the labor clusters?**

Another approach is to identify growth industries within the benchmark labor clusters which might find the region's existing labor pool as attractive, especially taking into account the job losses that have happened within the region over the past several years. An example of this is that the standardized heavy industry labor cluster declined in employment in the Southeast Iowa Region between 1990 and 2000 while it grew in Iowa statewide and nationally. Are there

industries within the this labor cluster that are growing nationally which would find the available labor in the Southeast Iowa Region attractive?

**C. Are there opportunities for entrepreneurs and existing employers within the region?**

The identification of gaps within a value-chain cluster, technology cluster or labor cluster could also provide opportunities for entrepreneurs and existing employers within the region to develop new products and enter new markets. Gaps might allow existing employers to diversify out of declining product lines or industries to new markets existing within the region and beyond.

**D. Market Regionally**

If the proactive recruitment of industry is going to focus on industry clusters, then regional marketing efforts should be considered where appropriate. Marketing regionally helps to better describe the regional economy and regional advantages. Regional marketing has also been a good first step toward broader regional economic development strategies for other regional efforts around the country. Any effort to market regionally will require close collaboration between the local economic development professionals and their boards, and local governments and elected officials. It will also require that all participating organizations have a clear understanding of the purpose of the marketing effort, the targets and the clear set of policies and procedures for funding and implementing the marketing effort.

**3. Determine if Cluster-based Economic Development Strategies are Appropriate:**

**A. Can economic development strategies be adjusted to focus on clusters and can we work regionally?**

Cluster-based economic development strategies require a focus on the needs of multiple firms and industries over a broader region than is typical for most community's economic development efforts. Implementation of cluster-based development strategies will likely require local economic development organizations to shift their programming and strategies to focus on maintaining and growing industry clusters in the region as opposed to a more narrow focus on just the needs of local individual firms. Local economic development groups will also be required to work more closely with other economic development groups and service providers within the region and beyond. Service providers will also likely need to adjust their programming to fit the needs of industry clusters.

As cluster-based economic development strategies are considered, it is important to determine if funding is available locally and regionally to undertake cluster efforts. In addition, the organizations and local governments providing funding must have a clear understanding of the region's cluster-based economic development strategies and how the funds will be used and how these uses could be different from previous efforts.

**B. How balanced should economic development strategies be between economic diversification and industry concentration in our region?**

One of the concerns often raised about cluster-based economic development strategies is that they do not promote economic diversification, but rather the concentration of industries. With over-concentration, a region's economy could be severely impacted if the industry or

industries experience a decline. The analysis above shows that in many of the industry clusters several industry sectors are dominant. An example is that in the information technology and instruments cluster, nearly 45 percent of the cluster's employment in 2000 was in the electrical engine equipment manufacturing industry.

If economic development efforts in the region do focus on the growth of these industry clusters, a balanced approach should be considered which allows for the leveraging of the region's existing industry linkages and clusters while still allowing for economic diversification. An approach to achieving such a balance is to focus both on the value-chain and technology clusters along with the labor clusters since each of the three benchmark cluster frameworks focus on different inputs.

#### **4. Determine the Needs of Businesses within the Clusters**

Whether a cluster-based approach is undertaken or not, it is important to identify the needs and issues of existing businesses within the region. If a cluster-based approach is advanced, then the gathering of this information and the implementation of actions and strategies to meet those needs should be shaped around the industry clusters where appropriate across the region. This will require cooperation among the various economic development organizations and support organizations within the region. An example could be a regional industry call program that gathers identical information for significant companies within a cluster. The same contact teams would make visits across the region so there is consistency of information gathering. Common needs within an industry cluster could include market research, technology and modernization assistance, specific workforce training, exporting assistance or research and development assistance. Other issues might cut across clusters, such as the need for housing or transportation and infrastructure enhancements, such as access to fiber optics or clean lab facilities.

#### **5. Continue Regional Communication and Cooperation**

Labor markets and economic relationships flow across city, county and state political lines, so therefore it is important to recognize and understand these relationships (see recommendation #1). It is important appropriate economic development efforts reflect these realities. Cluster-based economic development efforts typically require the implementation of strategies at a regional level whether the strategies focus on workforce development, technology and production enhancements for manufacturers or infrastructure development.

The Southeast Iowa Region of Des Moines, Henry and Lee Counties has developed a tradition of cooperation among its economic development organizations. These efforts should continue and be expanded where possible. As needs and opportunities are identified within the value-chain industry clusters, technology clusters and the labor clusters, it is likely the actions will need to be regional in focus to have significant impact on the future of the region.

#### **6. Benchmark Progress of the Clusters and Region**

It is important for an economic development organization and community to measure their success or lack of success. Traditional measures have included job growth, wage rates and taxable valuations. Measuring success for cluster-based economic efforts will require different measures that focus on the performance within a cluster, such as increased sales, profits, productivity, employment, and positive interaction among cluster firms. Obviously, some of these measures are



hard to measure or are not readily available. Therefore, proxy measures will need to be developed which can provide insights into the progress being made with cluster development.

It is also useful to benchmark the region with the state, nation and other comparable regions to determine comparable progress over time.

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## Benchmark Value-Chain Industry Clusters

### Metalworking and Industrial Machinery

SIC	Description		
2514	Metal household furniture	3483	Ammunition, exc. for small arms, nec
2522	Office furniture, except wood	3484	Small arms
2542	Partitions and fixtures, except wood	3489	Ordnance and accessories, nec
2591	Drapery hardware & blinds & shades	3491	Industrial valves
2599	Furniture and fixtures, nec	3492	Fluid power valves & hose fittings
3053	Gaskets, packing and sealing devices	3493	Steel springs, except wire
3255	Clay refractories	3494	Valves and pipe fittings, nec
3272	Concrete products, nec	3495	Wire springs
3274	Lime	3496	Misc. fabricated wire products
3312	Blast furnaces and steel mills	3498	Fabricated pipe and fittings
3313	Electrometallurgical products	3499	Fabricated metal products, nec
3315	Steel wire and related products	3511	Turbines and turbine generator sets
3316	Cold finishing of steel shapes	3519	Internal combustion engines, nec
3317	Steel pipe and tubes	3523	Farm machinery and equipment
3321	Gray and ductile iron foundries	3524	Lawn and garden equipment
3322	Malleable iron foundries	3531	Construction machinery
3324	Steel investment foundries	3532	Mining machinery
3325	Steel foundries, nec	3533	Oil and gas field machinery
3398	Metal heat treating	3534	Elevators and moving stairways
3411	Metal cans	3535	Conveyors and conveying equipment
3412	Metal barrels, drums, and pails	3536	Hoists, cranes, and monorails
3421	Cutlery	3537	Industrial trucks and tractors
3423	Hand and edge tools, nec	3541	Machine tools, metal cutting types
3425	Saw blades and handsaws	3542	Machine tools, metal forming types
3429	Hardware, nec	3543	Industrial patterns
3431	Metal sanitary ware	3544	Special dies, tools, jigs & fixtures
3433	Heating equipment, except electric	3545	Machine tool accessories
3441	Fabricated structural metal	3546	Power-driven handtools
3442	Metal doors, sash, and trim	3547	Rolling mill machinery
3443	Fabricated plate work (boiler shops)	3548	Welding apparatus .
3444	Sheet metalwork	3549	Metalworking machinery, nec
3446	Architectural metal work	3552	Textile machinery
3448	Prefabricated metal buildings	3553	Woodworking machinery
3449	Miscellaneous metal work	3554	Paper industries machinery
3451	Screw machine products	3555	Printing trades machinery
3452	Bolts, nuts, rivets, and washers	3556	Food products machinery
3462	Iron and steel forgings	3559	Special industry machinery, nec
3465	Automotive stampings	3561	Pumps and pumping equipment
3466	Crowns and closures	3562	Ball and roller bearings
3469	Metal stampings, nec	3563	Air and gas compressors
3471	Plating and polishing	3564	Blowers and fans
3479	Metal coating and allied services	3565	Packaging machinery
		3566	Speed changers, drives, and gears
		3567	Industrial furnaces and ovens

3568	Power transmission equipment, nec
3569	General industrial machinery, nec
3581	Automatic vending machines
3582	Commercial laundry equipment
3585	Refrigeration and heating equipment
3586	Measuring and dispensing pumps
3589	Service industry machinery, nec
3592	Carburetors, pistons, rings, valves
3593	Fluid power cylinders & actuators
3594	Fluid power pumps and motors
3599	Industrial machinery, nec
3612	Transformers, except electronic
3613	Switchgear and switchboard apparatus
3621	Motors and generators
3624	Carbon and graphite products
3631	Household cooking equipment
3632	Household refrigerators and freezers
3633	Household laundry equipment
3634	Electric housewares and fans
3639	Household appliances, nec
3643	Current carrying wiring devices
3644	Noncurrent carrying wiring devices
3692	Primary batteries, dry and wet
3713	Truck and bus bodies
3714	Motor vehicle parts and accessories
3715	Truck trailers
3731	Ship building and repairing
3732	Boat building and repairing
3743	Railroad equipment
3751	Motorcycles, bicycles, and parts
3795	Tanks and tank components
3821	Laboratory apparatus and furniture
3949	Sporting and athletic goods, nec
3995	Burial caskets

2035	Pickles, sauces, and salad dressings
2037	Frozen fruits and vegetables
2038	Frozen specialties, nec
2043	Cereal breakfast foods
2044	Rice milling
2045	Prepared flour mixes and doughs
2051	Bread, cake, and related products
2052	Cookies and crackers
2053	Frozen bakery products, except bread
2061	Raw cane sugar
2062	Cane sugar refining
2063	Beet sugar
2064	Candy & other confectionaries
2066	Chocolate and cocoa products
2067	Chewing gum
2068	Salted and roasted nuts and seeds
2079	Edible fats and oils, nec
2082	Malt beverages
2084	Wines, brandy, and brandy spirits
2085	Distilled and blended liquors
2086	Bottled and canned soft drinks
2091	Canned and cured fish and seafoods
2092	Fresh or frozen prepared fish
2095	Roasted coffee
2096	Potato chips and similar snacks
2098	Macaroni and spaghetti
2099	Food preparations, nec
2676	Sanitary paper products
2861	Gum and wood chemicals
3262	Vitreous china table & kitchenware
3263	Semivitreous table & kitchenware
3556	Food products machinery
3565	Packaging machinery
3914	Silverware and plated ware

#### **Packaged Food Products**

SIC	Description
2011	Meat packing plants
2013	Sausages and other prepared meats
2015	Poultry slaughtering and processing
2021	Creamery butter
2022	Cheese, natural and processed
2023	Dry, condensed, evaporated products
2024	Ice cream and frozen desserts
2026	Fluid milk
2032	Canned specialties
2033	Canned fruits and vegetables
2034	Dehydrated fruits, vegetables, soups

#### **Construction Materials**

SIC	Description
2273	Carpets and rugs
2394	Canvas and related products
2421	Sawmills and planing mills, general
2426	Hardwood dimension & flooring mills
2429	Special product sawmills, nec
2431	Millwork
2434	Wood kitchen cabinets
2435	Hardwood veneer and plywood
2436	Softwood veneer and plywood
2439	Structural wood members, nec
2452	Prefabricated wood buildings

2491	Wood preserving
2493	Reconstituted wood products
2499	Wood products, nec
2541	Wood partitions and fixtures
2679	Converted paper products, nec
2851	Paints, varnishes, lacquers, enamels, etc.
2951	Asphalt paving mixtures and blocks
2952	Asphalt felts and coatings
3251	Brick and structural clay tile
3253	Ceramic wall and floor tile
3259	Structural clay products, nec
3261	Vitreous plumbing fixtures
3264	Porcelain electrical supplies
3271	Concrete block and brick
3273	Ready-mixed concrete
3275	Gypsum products
3281	Cut stone and stone products
3291	Abrasive products
3296	Mineral wool
3315	Steel wire and related products
3357	Nonferrous wiredrawing & insulating
3425	Saw blades and handsaws
3431	Metal sanitary ware
3432	Plumbing fixture fittings and trim
3433	Heating equipment, except electric
3442	Metal doors, sash, and trim
3444	Sheet metalwork
3449	Miscellaneous metal work
3491	Industrial valves
3492	Fluid power valves & hose fittings
3494	Valves and pipe fittings, nec
3495	Wire springs
3496	Misc. fabricated wire products
3498	Fabricated pipe and fittings
3561	Pumps and pumping equipment
3563	Air and gas compressors
3585	Refrigeration and heating equipment
3586	Measuring and dispensing pumps
3613	Switchgear and switchboard apparatus
3634	Electric housewares and fans
3639	Household appliances, nec
3643	Current-carrying wiring devices
3644	Noncurrent-carrying wiring devices
3645	Residential lighting fixtures
3646	Commercial lighting fixtures
3647	Vehicular lighting equipment
3648	Lighting equipment, nec
3663	Radio & TV communications equipment

3669	Communications equipment, nec
3699	Electrical equipment & supplies, nec
3799	Transportation equipment, nec
3822	Environmental controls
3851	Ophthalmic goods
3991	Brooms and brushes
3996	Hard surface floor coverings, nec
8711	Engineering services
8712	Architectural services
8713	Surveying services

#### Printing and Publishing

SIC	Description
2611	Pulp mills
2652	Setup paperboard boxes
2653	Corrugated and solid fiber boxes
2655	Fiber cans, drums & similar products
2656	Sanitary food containers
2657	Folding paperboard boxes
2671	Paper coated & laminated, packaging
2672	Paper coated and laminated, nec
2673	Bags: plastics, laminated, & coated
2674	Bags: uncoated paper & multiwall
2675	Die-cut paper and board
2676	Sanitary paper products
2677	Envelopes
2678	Stationery products
2679	Converted paper products, nec
2711	Newspapers: publishing, or pub. & printing
2721	Periodicals: publishing and printing
2731	Book publishing
2732	Book printing
2741	Miscellaneous publishing
2752	Commercial printing, lithographic
2754	Commercial printing, gravure
2759	Commercial printing, nec
2761	Manifold business forms
2771	Greeting cards
2782	Blankbooks and looseleaf binders
2789	Bookbinding and related work
2791	Typesetting
2796	Platemaking services
3275	Gypsum products
3861	Photographic equipment and supplies
3953	Marking devices
3955	Carbon paper and inked ribbons
3993	Signs and advertising specialties
3999	Manufacturing industries, nec

4812	Radiotelephone communications
4813	Telephone communications, exc. radio
4822	Telegraph & other message communications
4899	Communications services, nec
7371	Computer programming services
7372	Prepackaged software
7373	Computer integrated systems design
7374	Data processing and preparation
7375	Information retrieval services
7376	Computer facilities management
7377	Computer rental & leasing
7378	Computer maintenance & repair
7379	Computer related services, nec

### **Information Technology and Instruments**

SIC	Description
3471	Plating and polishing
3571	Electronic computers
3572	Computer storage devices
3575	Computer terminals
3577	Computer peripheral equipment, nec
3578	Calculating and accounting equipment
3579	Office machines, nec
3596	Scales and balances, exc. laboratory
3625	Relays and industrial controls
3629	Electrical industrial apparatus, nec
3651	Household audio and video equipment
3661	Telephone and telegraph apparatus
3663	Radio & TV communications equipment
3669	Communications equipment, nec
3672	Printed circuit boards
3674	Semiconductors and related devices
3675	Electronic capacitors
3676	Electronic resistors
3677	Electronic coils and transformers
3678	Electronic connectors
3679	Electronic components, nec
3694	Engine electrical equipment
3699	Electrical equipment & supplies, nec
3728	Aircraft parts and equipment, nec
3761	Guided missiles and space vehicles
3769	Space vehicle equipment, nec
3812	Search and navigation equipment
3821	Laboratory apparatus and furniture
3822	Environmental controls
3823	Process control instruments
3824	Fluid meters and counting devices
3825	Instruments to measure electricity

3826	Analytical instruments
3827	Optical instruments and lenses
3829	Measuring & controlling devices, nec
3841	Surgical and medical instruments
3844	X-ray apparatus and tubes
3845	Electromedical equipment
3861	Photographic equipment and supplies
3873	Watches, clocks, watchcases and parts
3931	Musical instruments
7371	Computer programming services
7372	Prepackaged software
7373	Computer integrated systems design
7374	Data processing and preparation
7375	Information retrieval services
7376	Computer facilities management
7377	Computer rental & leasing
7378	Computer maintenance & repair
7379	Computer related services, nec

### **Chemicals and Plastics**

SIC	Description
2087	Flavoring extracts and syrups, nec
2611	Pulp mills
2621	Paper mills
2631	Paperboard mills
2812	Alkalies and chlorine
2813	Industrial gases
2816	Inorganic pigments
2821	Plastics materials and resins
2822	Synthetic rubber
2823	Cellulosic manmade fibers
2824	Organic fibers, noncellulosic
2841	Soap and other detergents
2842	Polishes and sanitation goods
2843	Surface active agents
2851	Paints, varnishes, lacquers, enamels, etc.
2865	Cyclic crudes and intermediates
2869	Industrial organic chemicals, nec
2875	Fertilizers, mixing only
2879	Agricultural chemicals, nec
2891	Adhesives and sealants
2893	Printing ink
2899	Chemical preparations, nec
3011	Tires and inner tubes
3061	Mechanical rubber goods
3069	Fabricated rubber products, nec
3081	Unsupported plastics film & sheet
3082	Unsupported plastics profile shapes

3083	Laminated plastics plate & sheet
3084	Plastics pipe
3085	Plastics bottles
3086	Plastics foam products
3087	Custom compound purchased resins
3088	Plastics plumbing fixtures
3089	Plastics products, nec
3111	Leather tanning and finishing
3291	Abrasive products
3399	Primary metal products, nec
3559	Special industry machinery, nec
3692	Primary batteries, dry and wet
3996	Hard surface floor coverings, nec
8042	Offices and clinics of optometrists
8043	Offices and clinics of podiatrists
8049	Offices of health practitioners, nec
8071	Medical laboratories
8072	Dental laboratories
8092	Kidney dialysis centers
8093	Specialty outpatient facilities, nec
8099	Health and allied services, nec

#### Apparel

SIC	Description
2211	Broadwoven fabric mills, cotton
2221	Broadwoven fabric mills, manmade
2231	Broadwoven fabric mills, wool
2241	Narrow fabric and other smallwares mills
2251	Women's hosiery, except socks
2252	Hosiery, nec
2253	Knit outerwear mills
2254	Knit underwear mills
2257	Weft knit fabric mills
2258	Lace & warp knit fabric mills
2259	Knitting mills, nec
2261	Finishing plants, cotton
2262	Finishing plants, manmade
2269	Finishing plants, nec
2273	Carpets and rugs
2281	Yarn spinning mills
2282	Throwing and winding mills
2284	Thread mills
2296	Tire cord and fabrics
2297	Nonwoven fabrics
2298	Cordage and twine
2299	Textile goods, nec
2311	Men's and boys' suits, coats and overcoats
2321	Men's and boys' shirts

2322	Men's & boys' underwear and nightwear
2323	Men's and boys' neckwear
2325	Men's and boys' trousers and slacks
2326	Men's and boys' work clothing
2329	Men's and boys' clothing, nec
2331	Women's & misses' blouses & shirts
2335	Women's, junior's, & misses' dresses
2337	Women's and misses' suits and coats
2339	Women's and misses' outerwear, nec
2341	Women's and children's underwear
2342	Bras, girdles, and allied garments
2353	Hats, caps, and millinery
2361	Girls' & children's dresses, blouses
2369	Girls' and children's outerwear, nec
2371	Fur goods
2381	Fabric dress and work gloves
2384	Robes and dressing gowns
2385	Waterproof outerwear
2386	Leather and sheep-lined clothing
2387	Apparel belts
2389	Apparel and accessories, nec
2395	Pleating and stitching
2397	Schiff li machine embroideries
2824	Organic fibers, noncellulosic
3965	Fasteners, buttons, needles, & pins

#### Motor Vehicle Manufacturing

SIC	Description
2273	Carpets and rugs
2299	Textile goods, nec
2396	Automotive and apparel trimmings
2399	Fabricated textile products, nec
2531	Public building and related furniture
2599	Furniture and fixtures, nec
2851	Paints, varnishes, lacquers, enamels, etc.
2891	Adhesives and sealants
3011	Tires and inner tubes
3052	Rubber & plastics hose & belting
3061	Mechanical rubber goods
3069	Fabricated rubber products, nec
3081	Unsupported plastics film & sheet
3082	Unsupported plastics profile shapes
3083	Laminated plastics plate & sheet
3084	Plastics pipe
3085	Plastics bottles
3086	Plastics foam products
3087	Custom compound purchased resins
3088	Plastics plumbing fixtures



3089	Plastics products, nec
3142	House slippers
3211	Flat glass
3229	Pressed and blown glass, nec
3231	Glass products, made of purchased glass
3465	Automotive stampings
3493	Steel springs, except wire
3519	Internal combustion engines, nec
3524	Lawn and garden equipment
3585	Refrigeration and heating equipment
3592	Carburetors, pistons, rings, valves
3641	Electric lamps
3651	Household audio and video equipment
3694	Engine electrical equipment
3711	Motor vehicles and car bodies
3713	Truck and bus bodies
3714	Motor vehicle parts and accessories
3715	Truck trailers
3716	Motor homes

#### Fabricated Textiles

SIC	Description
2211	Broadwoven fabric mills, cotton
2221	Broadwoven fabric mills, manmade
2231	Broadwoven fabric mills, wool
2261	Finishing plants, cotton
2262	Finishing plants, manmade
2295	Coated fabrics, not rubberized
2311	Men's and boys' suits, coats and overcoats
2321	Men's and boys' shirts
2322	Men's & boys' underwear + nightwear
2323	Men's and boys' neckwear
2325	Men's and boys' trousers and slacks
2326	Men's and boys' work clothing
2329	Men's and boys' clothing, nec
2331	Women's & misses' blouses & shirts
2335	Women's, junior's, & misses' dresses
2337	Women's and misses' suits and coats
2339	Women's and misses' outerwear, nec
2341	Women's and children's underwear
2342	Bras, girdles, and allied garments
2353	Hats, caps, and millinery
2361	Girls' & children's dresses, blouses
2369	Girls' and children's outerwear, nec
2371	Fur goods
2381	Fabric dress and work gloves
2384	Robes and dressing gowns
2385	Waterproof outerwear

2386	Leather and sheep lined clothing
2387	Apparel belts
2389	Apparel and accessories, nec
2391	Curtains and draperies
2392	Housefurnishings, nec
2393	Textile bags
2394	Canvas and related products
2396	Automotive and apparel trimmings
2399	Fabricated textile products, nec
2512	Upholstered household furniture
2515	Mattresses and bedsprings
2823	Cellulosic manmade fibers
3021	Rubber and plastics footwear
3052	Rubber & plastics hose & belting
3161	Luggage
3172	Personal leather goods, nec
3842	Surgical appliances and supplies
3942	Dolls and stuffed toys
3965	Fasteners, buttons, needles, & pins
3995	Burial caskets

#### Stone, Clay and Glass Products

SIC	Description
2873	Nitrogenous fertilizers
2874	Phosphatic fertilizers
2911	Petroleum refining
3011	Tires and inner tubes
3241	Cement, hydraulic
3255	Clay refractories
3261	Vitreous plumbing fixtures
3262	Vitreous china table & kitchenware
3263	Semivitreous table & kitchenware
3264	Porcelain electrical supplies
3269	Pottery products, nec
3274	Lime
3295	Minerals, ground or treated
3297	Nonclay refractories
3299	Nonmetallic mineral products, nec
3629	Electrical industrial apparatus, nec

#### Wood Products and Furniture

SIC	Description
2411	Logging
2426	Hardwood dimension & flooring mills
2431	Millwork
2434	Wood kitchen cabinets
2439	Structural wood members, nec
2441	Nailed wood boxes and shook

2448	Wood pallets and skids
2449	Wood containers, nec
2451	Mobile homes
2452	Prefabricated wood buildings
2493	Reconstituted wood products
2499	Wood products, nec
2511	Wood household furniture
2517	Wood TV and radio cabinets
2521	Wood office furniture
2611	Pulp mills
2621	Paper mills
2631	Paperboard mills
2861	Gum and wood chemicals
3792	Travel trailers and campers
3931	Musical instruments

#### Primary Nonferrous Metals

SIC	Description
3321	Gray and ductile iron foundries
3322	Malleable iron foundries
3324	Steel investment foundries
3325	Steel foundries, nec
3331	Primary copper
3339	Primary nonferrous metals, nec
3351	Copper rolling and drawing
3356	Nonferrous rolling and drawing, nec
3363	Aluminum die-castings
3364	Nonferrous die-casting exc. aluminum
3365	Aluminum foundries
3366	Copper foundries
3369	Nonferrous foundries, nec
3399	Primary metal products, nec
3599	Industrial machinery, nec

#### Leather Goods

SIC	Description
3111	Leather tanning and finishing
3131	Boot and shoe cut stock and findings
3142	House slippers
3143	Men's footwear, except athletic
3144	Women's footwear, except athletic
3149	Footwear, except rubber, nec
3151	Leather gloves and mittens
3171	Women's handbags and purses
3172	Personal leather goods, nec
3199	Leather goods, not elsewhere classified

#### Tobacco Products

SIC	Description
2111	Cigarettes
2121	Cigars
2131	Chewing and smoking tobacco
2141	Tobacco stemming and redrying

#### Canned and Bottled Beverages

SIC	Description
2046	Wet corn milling
2047	Dog and cat food
2048	Prepared feeds, nec
2083	Malt
2087	Flavoring extracts and syrups, nec
2873	Nitrogenous fertilizers
2874	Phosphatic fertilizers
2875	Fertilizers, mixing only
2879	Agricultural chemicals, nec
3221	Class containers
3411	Metal cans

#### Fat Oil Mills

SIC	Description
2074	Cottonseed oil mills
2075	Soybean oil mills
2076	Vegetable oil mills, nec
2077	Animal and marine fats and oils
2079	Edible fats and oils, nec

#### Aerospace

SIC	Description
3463	Nonferrous forgings
3482	Small arms ammunition
3483	Ammunition, exc. for small arms, nec
3721	Aircraft
3724	Aircraft engines and engine parts
3728	Aircraft parts and equipment, nec
3761	Guided missiles and space vehicles
3764	Space propulsion units and parts
3769	Space vehicle equipment, nec
3812	Search and navigation equipment

#### Petroleum Products

SIC	Description
2895	Carbon black
2911	Petroleum refining
2951	Asphalt paving mixtures and blocks
2952	Asphalt felts and coatings
2992	Lubricating oils and greases

2999 Petroleum and coal products, nec

**Jewelry**

SIC Description

3339 Primary nonferrous metals, nec  
3911 Jewelry, precious metal  
3915 Jewelers' materials & lapidary work  
3961 Costume jewelry

**Boat Building**

SIC Description

3732 Boat building and repairing  
3543 Industrial patterns  
3541 Machine tools, metal cutting types  
3519 Internal combustion engines, nec  
3511 Turbines and turbine generator sets

**Aluminum**

SIC Description

2819 Industrial inorganic chemicals, nec  
3334 Primary aluminum  
3353 Aluminum sheet, plate, and foil  
3354 Aluminum extruded products  
3355 Aluminum rolling and drawing, nec  
3411 Metal cans  
3463 Nonferrous forgings  
3497 Metal foil and leaf

**Hospitals, Labs, Specialized Medical Services**

SIC Description

2731 Book publishing  
7371 Computer programming services  
7372 Prepackaged software  
7373 Computer integrated systems design  
7374 Data processing and preparation  
7375 Information retrieval services  
7376 Computer facilities management  
7377 Computer rental & leasing  
7378 Computer maintenance & repair  
7379 Computer related services, nec  
8042 Offices and clinics of optometrists  
8043 Offices and clinics of podiatrists  
8049 Offices of health practitioners, nec  
8062 General medical and surgical hospitals  
8063 Psychiatric hospitals  
8069 Specialty hospitals, except psychiatric  
8071 Medical laboratories  
8072 Dental laboratories

8092 Kidney dialysis centers

8093 Specialty outpatient facilities, nec

8099 Health and allied services, nec

8731 Commercial physical research

8732 Commercial nonphysical research

8734 Testing laboratories

**Platemaking and Typesetting**

SIC Description

2791 Typesetting  
2796 Platemaking services  
2893 Printing ink  
3555 Printing trades machinery

**Securities and Insurance**

SIC Description

6231 Security and commodity exchanges  
6282 Investment advice  
6289 Security and commodity exchange nec  
6311 life insurance  
6321 Accident and health insurance  
6324 Hospital and medical service plans  
6351 Surety insurance  
6361 Title insurance  
6371 Pension, health, and welfare funds  
6399 Insurance carriers, nec  
6531 Real estate agents and managers

**Banking and Advertising**

SIC Description

6011 Federal reserve banks  
6019 Central reserve depository institutions, nec  
6021 National commercial banks  
6022 State commercial banks  
6029 Commercial banks, nec  
6035 Savings institutions, Federally chartered  
6036 Savings institutions, not Federally chartered  
6061 Credit unions, Federally chartered  
6062 Credit unions, not Federally chartered  
6081 Branched and agencies of foreign banks  
6082 Foreign trade & intl. banking institutions  
6091 Nondeposit trust facilities  
6099 Functions related to depository banking, nec  
6111 Federal and Fed.-sponsored credit  
6141 Personal credit institutions  
6153 Short-term bus. credit institutions, exc. ag  
6159 Misc. business credit institutions  
6162 Mortgage bankers and loan correspondents

6163 Loan Brokers  
 6211 Security brokers, dealers, & flotation co  
 6221 Commodity contracts brokers and dealers  
 7311 Advertising agencies  
 7312 Outdoor advertising services  
 7313 Radio, TV, publisher representatives  
 7319 Advertising, nec

**Legal Services**

SIC Description  
 8111 Legal services

**Transportation, Shipping, & Logistics**

SIC Description  
 4212 Local Trucking without Storage  
 4213 Trucking, except local  
 4214 Local Trucking with Storage  
 4215 Courier Services, except Air  
 4221 Farm product warehousing and storage  
 4222 Refrigerated warehousing and storage  
 4225 General warehousing and storage  
 4226 Special warehousing and storage, nec  
 4231 Trucking terminal facilities  
 4311 U.S. Postal Service  
 4412 Deep sea foreign transportation of freight  
 4424 Deep sea domestic transportation of freight  
 4432 Freight trans. on Great Lakes - St. Lawrence

4449 Water transport of freight, nec  
 4481 Deep sea passenger trans., ex. ferry  
 4482 Ferries  
 4489 Water passenger transportation, nec  
 4491 Marine cargo handling  
 4492 Towing and tugboat service  
 4493 Marinas  
 4499 Water transportation services, nec  
 4512 Air transportation, scheduled  
 4513 Air courier services  
 4522 Air transportation, nonscheduled  
 4612 Crude petroleum pipelines  
 4613 Refined petroleum pipelines  
 4619 Pipelines, nec  
 4731 Freight transportation arrangement  
 4741 Rental of railroad cars  
 4783 Packing and crating  
 4785 Vehicle inspection and weighing services  
 4789 Transportation services, nec

**Pharmaceuticals**

SIC Description  
 2833 Medicinals and botanicals  
 2834 Pharmaceutical preparations  
 2835 Diagnostic substances  
 2836 Biological products exc. diagnostic

Source: Edward .J. Feser, Associate Professor, Department of City and Regional Planning, University of North Carolina – Chapel Hill (2003)

## Appendix B

## Benchmark Technology-Intensive Clusters

**Chemicals and Plastics**

SIC	Description
2812	Alkalies and chlorine
2813	Industrial gases
2816	Inorganic pigments
2821	Plastics materials and resins
2822	Synthetic rubber
2823	Cellulosic manmade fibers
2824	Organic fibers, noncellulosic
2841	Soap and other detergents
2842	Polishes and sanitation goods
2843	Surface active agents
2844	Toilet preparations
2851	Paints, varnishes, lacquers, enamels, etc.
2865	Cyclic crudes and intermediates
2869	Industrial organic chemicals, nec
2873	Nitrogenous fertilizers
2874	Phosphatic fertilizers
2875	Fertilizers, mixing only
2879	Agricultural chemicals, nec
2891	Adhesives and sealants
2893	Printing ink
2899	Chemical preparations, nec
3559	Special industry machinery, nec
3624	Carbon and graphite products
3692	Primary batteries, dry and wet
3843	Dental equipment and supplies
8071	Medical laboratories
8072	Dental laboratories
8092	Kidney dialysis centers
8093	Specialty outpatient facilities, nec
8099	Health and allied services, nec

**Information Technology and Instruments**

SIC	Description
3571	Electronic computers
3572	Computer storage devices
3575	Computer terminals
3577	Computer peripheral equipment, nec
3578	Calculating and accounting equipment
3579	Office machines, nec
3625	Relays and industrial controls
3629	Electrical industrial apparatus, nec
3631	Household cooking equipment

3643	Current-carrying wiring devices
3644	Noncurrent-carrying wiring devices
3661	Telephone and telegraph apparatus
3663	Radio & TV communications equipment
3669	Communications equipment, nec
3672	Printed circuit boards
3674	Semiconductors and related devices
3675	Electronic capacitors
3676	Electronic resistors
3677	Electronic coils and transformers
3678	Electronic connectors
3679	Electronic components, nec
3694	Engine electrical equipment
3699	Electrical equipment & supplies, nec
3812	Search and navigation equipment
3821	Laboratory apparatus and furniture
3822	Environmental controls
3823	Process control instruments
3824	Fluid meters and counting devices
3825	Instruments to measure electricity
3826	Analytical instruments
3827	Optical instruments and lenses
3829	Measuring & controlling devices, nec
3844	X-ray apparatus and tubes
3845	Electromedical equipment
7371	Computer programming services
7372	Prepackaged software
7373	Computer integrated systems design
7374	Data processing and preparation
7375	Information retrieval services
7379	Computer related services, nec

**Industrial Machinery**

SIC	Description
3511	Turbines and turbine generator sets
3532	Mining machinery
3535	Conveyors and conveying equipment
3536	Hoists, cranes, and monorails
3541	Machine tools, metal cutting types
3542	Machine tools, metal forming types
3546	Power-driven handtools
3547	Rolling mill machinery
3549	Metalworking machinery, nec
3553	Woodworking machinery

3555	Printing trades machinery	3761	Guided missiles and space vehicles
3556	Food products machinery	3764	Space propulsion units and parts
3559	Special industry machinery, nec	3769	Space vehicle equipment, nec
3561	Pumps and pumping equipment		
3563	Air and gas compressors		
3564	Blowers and fans		
3565	Packaging machinery		
3612	Transformers, except electronic		
3621	Motors and generators		
<b>Motor Vehicle Manufacturing</b>		<b>Household Appliances</b>	
SIC	Description	SIC	Description
2851	Paints, varnishes, lacquers, enamels, etc.	3632	Household refrigerators and freezers
2893	Printing ink	3633	Household laundry equipment
3519	Internal combustion engines, nec	3635	Household vacuum cleaners
3531	Construction machinery	3639	Household appliances, nec
3534	Elevators and moving stairways	3716	Motor homes
3537	Industrial trucks and tractors		
3548	Welding apparatus		
3641	Electric lamps		
3645	Residential lighting fixtures		
3646	Commercial lighting fixtures		
3647	Vehicular lighting equipment		
3648	Lighting equipment, nec		
3651	Household audio and video equipment		
3691	Storage batteries		
3694	Engine electrical equipment		
3711	Motor vehicles and car bodies		
3713	Truck and bus bodies		
3714	Motor vehicle parts and accessories		
3715	Truck trailers		
<b>Aerospace</b>		<b>Communications Services and Software</b>	
SIC	Description	SIC	Description
3544	Special dies, tools, jigs & fixtures	4899	Communications services, nec
3545	Machine tool accessories	7371	Computer programming services
3721	Aircraft	7372	Prepackaged software
3724	Aircraft engines and engine parts	7373	Computer integrated systems design
3728	Aircraft parts and equipment, nec	7374	Data processing and preparation
8734	Testing laboratories	7375	Information retrieval services
		7379	Computer related services, nec
		8711	Engineering services
		8712	Architectural services
		8713	Surveying services
		8731	Commercial physical research
		8732	Commercial nonphysical research
		8734	Testing laboratories
		<b>Pharmaceuticals and Medical Technologies</b>	
		SIC	Description
		2833	Medicinals and botanicals
		2834	Pharmaceutical preparations
		2835	Diagnostic substances
		2836	Biological products exc. diagnostic
		3634	Electric housewares and fans
		3841	Surgical and medical instruments
		3842	Surgical appliances and supplies
		8731	Commercial physical research
		8732	Commercial nonphysical research

Source: Edward .J. Feser, Associate Professor, Department of City and Regional Planning, University of North Carolina – Chapel Hill (2003)

## Appendix C

## Benchmark Labor Clusters

**Low Skill, Non-Durable Manufacturing**

2211 Broadwoven Fabric Mills, Cotton	2342 Brassieres, Girdles, and Allied Garments
2221 Broadwoven Fabric Mills, Manmade Fiber and Silk	2353 Hats, Caps, and Millinery
2231 Broadwoven Fabric Mills, Wool (Including Dyeing and Finishing)	2361 Girls', Children's, and Infants' Dresses, Blouses, and Shirts
2241 Narrow Fabric and Other Smallware Mills: Cotton, Wool, Silk, and Manmade Fiber	2369 Girls', Children's, and Infants' Outerwear, NEC
2251 Women's Full-Length and Knee-Length Hosiery, Except Socks	2371 Fur Goods
2252 Hosiery, NEC	2381 Dress and Work Gloves, Except Knit and All-Leather
2253 Knit Outerwear Mills	2384 Robes and Dressing Gowns
2254 Knit Underwear and Nightwear Mills	2385 Waterproof Outerwear
2257 Weft Knit Fabric Mills	2386 Leather and Sheep-Lined Clothing
2258 Lace and Warp Knit Fabric Mills	2387 Apparel Belts
2259 Knitting Mills, NEC	2389 Apparel and Accessories, NEC
2261 Finishers of Broadwoven Fabrics of Cotton	2391 Curtains and Draperies
2262 Finishers of Broadwoven Fabrics of Manmade Fiber and Silk	2392 Housefurnishings, Except Curtains and Draperies
2269 Finishers of Textiles, NEC	2393 Textile Bags
2273 Carpets and Rugs	2394 Canvas and Related Products
2281 Yarn Spinning Mills	2395 Pleating, Decorative and Novelty Stitching, and Tucking for the Trade
2282 Yarn Texturizing, Throwing, Twisting, and Winding Mills	2396 Automotive Trimmings, Apparel Findings, and Related Products
2284 Thread Mills	2397 Schiffli Machine Embroideries
2295 Coated Fabrics, Not Rubberized	2399 Fabricated Textile Products, NEC
2296 Tire Cord and Fabrics	2821 Plastics Material and Synthetic Resins, and Nonvulcanizable Elastomers
2297 Nonwoven Fabrics	2822 Synthetic Rubber
2298 Cordage and Twine	2823 Cellulosic Manmade Fibers
2299 Textile Goods, NEC	2824 Manmade Organic Fibers, Except Cellulosic
2311 Men's and Boys' Suits, Coats, and Overcoats	2851 Paints, Varnishes, Lacquers, Enamels, and Allied Products
2321 Men's and Boys' Shirts, Except Work Shirts	3021 Rubber and Plastics Footwear
2322 Men's and Boys' Underwear and Nightwear	3052 Rubber and Plastics Hose and Belting
2323 Men's and Boys' Neckwear	3053 Gaskets, Packing, and Sealing Devices
2325 Men's and Boys' Trousers and Slacks	3061 Molded, Extruded, and Lathe-Cut Mechanical Rubber Goods
2326 Men's and Boys' Work Clothing	3069 Fabricated Rubber Products, NEC
2329 Men's and Boys' Clothing, NEC	3081 Unsupported Plastics Film and Sheet
2331 Women's, Misses', and Juniors' Blouses and Shirts	3082 Unsupported Plastics Profile Shapes
2335 Women's, Misses', and Juniors' Dresses	3083 Laminated Plastics Plate, Sheet, and Profile Shapes
2337 Women's, Misses' and Juniors' Suits, Skirts, and Coats	3084 Plastics Pipe
2339 Women's, Misses', and Juniors' Outerwear, NEC	3085 Plastics Bottles
2341 Women's, Misses', Children's, and Infants' Underwear and Nightwear	3086 Plastics Foam Products
	3087 Custom Compounding of Purchased Plastics



Resins  
 3088 Plastics Plumbing Fixtures  
 3089 Plastics Products, NEC  
 3111 Leather Tanning and Finishing  
 3151 Leather Gloves and Mittens  
 3161 Luggage  
 3171 Women's Handbags and Purses  
 3172 Personal Leather Goods, Except Women's Handbags and Purses  
 3199 Leather Goods, NEC  
 3523 Farm Machinery and Equipment  
 3524 Lawn and Garden Tractors and Home Lawn and Garden Equipment  
 3531 Construction Machinery and Equipment  
 3532 Mining Machinery and Equipment, Except Oil and Gas Field Machinery and Equipment  
 3533 Oil and Gas Field Machinery and Equipment  
 3534 Elevators and Moving Stairways  
 3535 Conveyors and Conveying Equipment  
 3536 Overhead Traveling Cranes, Hoists, and Monorail Systems  
 3537 Industrial Trucks, Tractors, Trailers, and Stackers  
 3581 Automatic Vending Machines  
 3582 Commercial Laundry, Drycleaning, and Pressing Machines  
 3585 Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment  
 3586 Measuring and Dispensing Pumps  
 3589 Service Industry Machinery, NEC  
 3631 Household Cooking Equipment  
 3632 Household Refrigerators and Home and Farm Freezers  
 3633 Household Laundry Equipment  
 3634 Electric Housewares and Fans  
 3635 Household Vacuum Cleaners  
 3639 Household Appliances, NEC  
 3792 Travel Trailers and Campers  
 3795 Tanks and Tank Components  
 3799 Transportation Equipment, NEC  
 3911 Jewelry, Precious Metal  
 3914 Silverware, Plated Ware, and Stainless Steel Ware  
 3915 Jewelers' Findings and Materials, and Lapidary Work

#### Information Processing

4731 Arrangement of Transportation of Freight and Cargo  
 6311 Life Insurance

6321 Accident and Health Insurance  
 6324 Hospital and Medical Service Plans  
 6331 Fire, Marine, and Casualty Insurance  
 6351 Surety Insurance  
 6361 Title Insurance  
 6371 Pension, Health, and Welfare Funds  
 6399 Insurance Carriers, NEC  
 6531 Real Estate Agents and Managers  
 7371 Computer Programming Services  
 7372 Prepackaged Software  
 7373 Computer Integrated Systems Design  
 7374 Computer Processing and Data Preparation and Processing Services  
 7375 Information Retrieval Services  
 7376 Computer Facilities Management Services  
 7377 Computer Rental and Leasing  
 7378 Computer Maintenance and Repair  
 7379 Computer Related Services, NEC  
 8721 Accounting, Auditing, and Bookkeeping Services

#### Low Skill, Misc. Manufacturing

2011 Meat Packing Plants  
 2013 Sausages and Other Prepared Meats  
 2015 Poultry Slaughtering and Processing  
 2032 Canned Specialties  
 2033 Canned Fruits, Vegetables, Preserves, Jams, and Jellies  
 2034 Dried and Dehydrated Fruits, Vegetables, and Soup Mixes  
 2035 Pickled Fruits and Vegetables, Vegetable Sauces and Seasonings, and Salad Dressings  
 2037 Frozen Fruits, Fruit Juices, and Vegetables  
 2038 Frozen Specialties, NEC  
 2091 Canned and Cured Fish and Seafood  
 2092 Prepared Fresh or Frozen Fish and Seafoods  
 2095 Roasted Coffee  
 2096 Potato Chips, Corn Chips, and Similar Snacks  
 2097 Manufactured Ice  
 2098 Macaroni, Spaghetti, Vermicelli, and Noodles  
 2099 Food Preparations, NEC  
 2421 Sawmills and Planing Mills, General  
 2426 Hardwood Dimension and Flooring Mills  
 2429 Special Product Sawmills, NEC  
 2441 Nailed and Lock Corner Wood Boxes and Shook  
 2448 Wood Pallets and Skids  
 2449 Wood Containers, NEC

2499 Wood Products, NEC  
 2791 Typesetting  
 2796 Platemaking and Related Services  
 2841 Soaps and Other Detergents, Except Speciality Cleaners  
 2842 Speciality Cleaning, Polishing, and Sanitary Preparations  
 2843 Surface Active Agents, Finishing Agents, Sulfonated Oils, and Assistants  
 2844 Perfumes, Cosmetics, and Other Toilet Preparations  
 3142 House Slippers  
 3143 Men's Footwear, Except Athletic  
 3144 Women's Footwear, Except Athletic  
 3149 Footwear, Except Rubber, NEC  
 4412 Deep Sea Foreign Transportation of Freight  
 4424 Deep Sea Domestic Transportation of Freight  
 4432 Freight Transportation on the Great Lakes - St. Lawrence Seaway  
 4449 Water Transportation of Freight, NEC  
 4481 Deep Sea Transportation of Passengers, Except by Ferry  
 4482 Ferries  
 4489 Water Transportation of Passengers, NEC  
 4491 Marine Cargo Handling  
 4492 Towing and Tugboat Services  
 4493 Marinas  
 4499 Water Transportation Services, NEC  
 4783 Packing and Crating  
 4785 Fixed Facilities and Inspection and Weighing Services for Motor Vehicle Transportation  
 4789 Transportation Services, NEC

**Standardized Heavy Industry**

2611 Pulp Mills  
 2621 Paper Mills  
 2631 Paperboard Mills  
 3131 Boot and Shoe Cut Stock and Findings  
 3211 Flat Glass  
 3221 Glass Containers  
 3229 Pressed and Blown Glass and Glassware, NEC  
 3231 Glass Products, Made of Purchased Glass  
 3312 Steel Works, Blast Furnaces (Including Coke Ovens), and Rolling Mills  
 3313 Electrometallurgical Products, Except Steel  
 3315 Steel Wiredrawing and Steel Nails and Spikes  
 3316 Cold-Rolled Steel Sheet, Strip, and Bars  
 3317 Steel Pipe and Tubes  
 3321 Gray and Ductile Iron Foundries

3322 Malleable Iron Foundries  
 3324 Steel Investment Foundries  
 3325 Steel Foundries, NEC  
 3331 Primary Smelting and Refining of Copper  
 3334 Primary Production of Aluminum  
 3339 Primary Smelting and Refining of Nonferrous Metals, Except Copper and Aluminum  
 3341 Secondary Smelting and Refining of Nonferrous Metals  
 3351 Rolling, Drawing, and Extruding of Copper  
 3353 Aluminum Sheet, Plate, and Foil  
 3354 Aluminum Extruded Products  
 3355 Aluminum Rolling and Drawing, NEC  
 3356 Rolling, Drawing, and Extruding of Nonferrous Metals, Except Copper and Aluminum  
 3357 Drawing and Insulating of Nonferrous Wire  
 3363 Aluminum Die-Castings  
 3364 Nonferrous Die-Castings, Except Aluminum  
 3365 Aluminum Foundries  
 3366 Copper Foundries  
 3369 Nonferrous Foundries, Except Aluminum and Copper  
 3411 Metal Cans  
 3412 Metal Shipping Barrels, Drums, Kegs, and Pails  
 3421 Cutlery  
 3423 Hand and Edge Tools, Except Machine Tools and Handsaws  
 3425 Saw Blades and Handsaws  
 3429 Hardware, NEC  
 3431 Enameled Iron and Metal Sanitary Ware  
 3432 Plumbing Fixture Fittings and Trim  
 3433 Heating Equipment, Except Electric and Warm Air Furnaces  
 3451 Screw Machine Products  
 3452 Bolts, Nuts, Screws, Rivets, and Washers  
 3462 Iron and Steel Forgings  
 3463 Nonferrous Forgings  
 3465 Automotive Stamping  
 3466 Crowns and Closures  
 3469 Metal Stamping, NEC  
 3471 Electroplating, Plating, Polishing, Anodizing, and Coloring  
 3479 Coating, Engraving, and Allied Services, NEC  
 3482 Small Arms Ammunition  
 3483 Ammunition, Except for Small Arms  
 3484 Small Arms  
 3489 Ordnance and Accessories, NEC  
 3491 Industrial Valves

3492 Fluid Power Valves and Hose Fittings  
3493 Steel Springs, Except Wire  
3494 Valves and Pipe Fittings, NEC  
3495 Wire Springs  
3496 Miscellaneous Fabricated Wire Products  
3497 Metal Foil and Leaf  
3498 Fabricated Pipe and Pipe Fittings  
3499 Fabricated Metal Products, NEC  
3511 Steam, Gas, and Hydraulic Turbines, and Turbine Generator Set Units  
3519 Internal Combustion Engines, NEC  
3561 Pumps and Pumping Equipment  
3562 Ball and Roller Bearings  
3563 Air and Gas Compressors  
3564 Industrial and Commercial Fans and Blowers and Air Purification Equipment  
3565 Packaging Machinery  
3566 Speed Changers, Industrial High-Speed Drives, and Gears  
3567 Industrial Process Furnaces and Ovens  
3568 Mechanical Power Transmission Equipment, NEC  
3569 General Industrial Machinery and Equipment, NEC  
3711 Motor Vehicles and Passenger Car Bodies  
3713 Truck and Bus Bodies  
3714 Motor Vehicle Parts and Accessories  
3715 Truck Trailers  
3716 Motor Homes  
3743 Railroad Equipment  
3841 Surgical and Medical Instruments and Apparatus  
3842 Orthopedic, Prosthetic, and Surgical Appliances and Supplies  
3843 Dental Equipment and Supplies  
3844 X-Ray Apparatus and Tubes and Related Irradiation Apparatus  
3845 Electromedical and Electrotherapeutic Apparatus  
3851 Ophthalmic Goods  
4311 United States Postal Service

**High End Information/Business Services**

2711 Newspapers: Publishing, or Publishing and Printing  
2721 Periodicals: Publishing, or Publishing and Printing  
2731 Books: Publishing, or Publishing and Printing  
2732 Book Printing  
2741 Miscellaneous Publishing

2752 Commercial Printing, Lithographic  
2754 Commercial Printing, Gravure  
2759 Commercial Printing, NEC  
7311 Advertising Agencies  
7312 Outdoor Advertising Services  
7313 Radio, Television, and Publishers' Advertising Representatives  
7319 Advertising, NEC  
8111 Legal Services

**Distribution, Freight Handling**

2411 Logging  
3271 Concrete Block and Brick  
3272 Concrete Products, Except Block and Brick  
3273 Ready-Mixed Concrete  
3274 Lime  
3275 Gypsum Products  
4212 Local Trucking Without Storage  
4213 Trucking, Except Local  
4214 Local Trucking with Storage  
4215 Courier Services Except by Air  
4221 Farm Product Warehousing and Storage  
4222 Refrigerated Warehousing and Storage  
4225 General Warehousing and Storage  
4226 Special Warehousing and Storage, NEC  
4231 Terminal and Joint Terminal Maintenance Facilities for Motor Freight Transportation  
4512 Air Transportation, Scheduled  
4513 Air Courier Services  
4522 Air Transportation, Nonscheduled  
4581 Airports, Flying Fields, and Airport Terminal Services

**Electronics, Measuring Devices**

3571 Electronic Computers  
3572 Computer Storage Devices  
3575 Computer Terminals  
3577 Computer Peripheral Equipment, NEC  
3578 Calculating and Accounting Machines, Except Electronic Computers  
3579 Office Machines, NEC  
3612 Power, Distribution, and Specialty Transformers  
3613 Switchgear and Switchboard Apparatus  
3621 Motors and Generators  
3624 Carbon and Graphite Products  
3625 Relays and Industrial Controls  
3629 Electrical Industrial Apparatus, NEC  
3641 Electric Lamp Bulbs and Tubes

3643 Current-Carrying Wiring Devices  
3644 Noncurrent-Carrying Wiring Devices  
3645 Residential Electric Lighting Fixtures  
3646 Commercial, Industrial, and Institutional Electric Lighting Fixtures  
3647 Vehicular Lighting Equipment  
3648 Lighting Equipment, NEC  
3651 Household Audio and Video Equipment  
3652 Phonograph Records and Prerecorded Audio Tapes and Disks  
3661 Telephone and Telegraph Apparatus  
3663 Radio and Television Broadcasting and Communications Equipment  
3669 Communications Equipment, NEC  
3671 Electron Tubes  
3672 Printed Circuit Boards  
3674 Semiconductors and Related Devices  
3675 Electronic Capacitors  
3676 Electronic Resistors  
3677 Electronic Coils, Transformers, and Other Inductors  
3678 Electronic Connectors  
3679 Electronic Components, NEC  
3691 Storage Batteries  
3692 Primary Batteries, Dry and Wet  
3694 Electrical Equipment for Internal Combustion Engines  
3695 Magnetic and Optical Recording Media  
3699 Electrical Machinery, Equipment, and Supplies, NEC  
3821 Laboratory Apparatus and Furniture  
3822 Automatic Controls for Regulating Residential and Commercial Environments and Appliances  
3823 Industrial Instruments for Measurement, Display, and Control of Process Variables; and Related Products  
3824 Totalizing Fluid Meters and Counting Devices  
3825 Instruments for Measuring and Testing of Electricity and Electrical Signals  
3826 Laboratory Analytical Instruments  
3827 Optical Instruments and Lenses  
3829 Measuring and Controlling Devices, NEC  
3861 Photographic Equipment and Supplies

**Chemicals, Pharmaceuticals**

2812 Alkalies and Chlorine  
2813 Industrial Gases  
2816 Inorganic Pigments  
2819 Industrial Inorganic Chemicals, NEC

2833 Medicinal Chemicals and Botanical Products  
2834 Pharmaceutical Preparations  
2835 In Vitro and In Vivo Diagnostic Substances  
2836 Biological Products, Except Diagnostic Substances  
2861 Gum and Wood Chemicals  
2865 Cyclic Organic Crudes and Intermediates, and Organic Dyes and Pigments  
2869 Industrial Organic Chemicals, NEC  
2873 Nitrogenous Fertilizers  
2874 Phosphatic Fertilizers  
2875 Fertilizers, Mixing Only  
2879 Pesticides and Agricultural Chemicals, NEC  
2891 Adhesives and Sealants  
2892 Explosives  
2893 Printing Ink  
2895 Carbon Black  
2899 Chemicals and Chemical Preparations, NEC

**Telecomm and Banking**

4812 Radiotelephone Communications  
4813 Telephone Communications, Except Radiotelephone  
6011 Federal Reserve Banks  
6019 Central Reserve Depository Institutions, NEC  
6021 National Commercial Banks  
6022 State Commercial Banks  
6029 Commercial Banks, NEC  
6035 Savings Institutions, Federally Chartered  
6036 Savings institutions, Not Federally Chartered  
6061 Credit Unions, Federally Chartered  
6062 Credit Unions, Not Federally Chartered  
6081 Branches and Agencies of Foreign Banks  
6082 Foreign Trade and International Banking Institutions  
6091 Nondeposit Trust Facilities  
6099 Functions Related to Deposit Banking, NEC  
6111 Federal and Federally-Sponsored Credit Agencies  
6141 Personal Credit Institutions  
6153 Short-Term Business Credit Institutions, Except Agricultural  
6159 Miscellaneous Business Credit Institutions  
6162 Mortgage Bankers and Loan Correspondents  
6163 Loan Brokers

**Science Intensive**

- 3761 Guided Missiles and Space Vehicles
- 3764 Guided Missile and Space Vehicle Propulsion Units and Propulsion Unit Parts
- 3769 Guided Missile Space Vehicle Parts and Auxiliary Equipment, NEC
- 3812 Search, Detection, Navigation, Guidance, Aeronautical, and Nautical Systems and Instruments
- 4822 Telegraph and Other Message Communications
- 4899 Communications Services, NEC
- 8711 Engineering Services
- 8712 Architectural Services
- 8713 Surveying Services
- 8731 Commercial Physical and Biological Research
- 8732 Commercial Economic, Sociological, and Educational Research
- 8733 Noncommercial Research Organizations
- 8734 Testing Laboratories

**High Tech Machinery, Instruments**

- 3541 Machine Tools, Metal Cutting Type
- 3542 Machine Tools, Metal Forming Type
- 3543 Industrial Patterns
- 3544 Special Dies and Tools, Die Sets, Jigs and Fixtures, and Industrial Molds
- 3545 Cutting Tools, Machine Tool Accessories, and Machinists' Precision Measuring Devices
- 3546 Power-Driven Handtools
- 3547 Rolling Mill Machinery and Equipment
- 3548 Electric and Gas Welding and Soldering Equipment
- 3549 Metalworking Machinery, NEC
- 3552 Textile Machinery
- 3553 Woodworking Machinery
- 3554 Paper Industries Machinery
- 3555 Printing Trades Machinery and Equipment
- 3556 Food Products Machinery
- 3559 Special Industry Machinery, NEC
- 3592 Carburetors, Pistons, Piston Rings, and Valves
- 3593 Fluid Power Cylinders and Actuators
- 3594 Fluid Power Pumps and Motors
- 3596 Scales and Balances, Except Laboratory
- 3599 Industrial and Commercial Machinery and Equipment, NEC
- 3931 Musical Instruments

**Petroleum**

- 2911 Petroleum Refining
- 3721 Aircraft
- 3724 Aircraft Engines and Engine Parts
- 3728 Aircraft Parts and Auxiliary Equipment, NEC
- 4612 Crude Petroleum Pipelines
- 4613 Refined Petroleum Pipelines
- 4619 Pipelines, NEC

**Health Services**

- 8011 Offices and Clinics of Doctors of Medicine
- 8021 Offices and Clinics of Dentists
- 8031 Offices and Clinics of Doctors of Osteopathy
- 8041 Offices and Clinics of Chiropractors
- 8042 Offices and Clinics of Optometrists
- 8043 Offices and Clinics of Podiatrists
- 8049 Offices and Clinics of Health Practitioners, NEC
- 8051 Skilled Nursing Care Facilities
- 8052 Intermediate Care Facilities
- 8059 Nursing and Personal Care Facilities, NEC
- 8062 General Medical and Surgical Hospitals
- 8063 Psychiatric Hospitals
- 8069 Specialty Hospitals, Except Psychiatric
- 8071 Medical Laboratories
- 8072 Dental Laboratories
- 8082 Home Health Care Services
- 8092 Kidney Dialysis Centers
- 8093 Specialty Outpatient Facilities, NEC
- 8099 Health and Allied Services, NEC

**Specialized Labor Intensive**

- 1081 Metal Mining Services
- 2451 Mobile Homes
- 2452 Prefabricated Wood Buildings and Components
- 2491 Wood Preserving
- 2493 Reconstituted Wood Products
- 2511 Wood Household Furniture, Except Upholstered
- 2512 Wood Household Furniture, Upholstered
- 2514 Metal Household Furniture
- 2515 Mattresses, Foundations, and Convertible Beds
- 2517 Wood Television, Radio, Phonograph and Sewing Machine Cabinets
- 2519 Household Furniture, NEC
- 2521 Wood Office Furniture
- 2522 Office Furniture, Except Wood
- 2531 Public Building and Related Furniture



2591 Drapery Hardware and Window Blinds and Shades  
 2599 Furniture and Fixtures, NEC  
 2652 Setup Paperboard Boxes  
 2653 Corrugated and Solid Fiber Boxes  
 2655 Fiber Cans, Tubes, Drums, and Similar Products  
 2656 Sanitary Food Containers, Except Folding  
 2657 Folding Paperboard Boxes, Including Sanitary  
 2671 Packaging Paper and Plastics Film, Coated and Laminated  
 2672 Coated and Laminated Paper, NEC  
 2673 Plastics, Foil, and Coated Paper Bags  
 2674 Uncoated Paper and Multiwall Bags  
 2675 Die-Cut Paper and Paperboard and Cardboard  
 2676 Sanitary Paper Products  
 2677 Envelopes  
 2678 Stationery, Tablets, and Related Products  
 2679 Converted Paper and Paperboard Products, NEC  
 2761 Manifold Business Forms  
 2771 Greeting Cards  
 2782 Blankbooks, Loose-leaf Binders and Devices  
 2789 Bookbinding and Related Work  
 3011 Tires and Inner Tubes  
 3398 Metal Heat Treating  
 3399 Primary Metal Products, NEC  
 3441 Fabricated Structural Metal  
 3442 Metal Doors, Sash, Frames, Molding, and Trim Manufacturing  
 3443 Fabricated Plate Work (Boiler Shops)  
 3444 Sheet Metal Work  
 3446 Architectural and Ornamental Metal Work  
 3448 Prefabricated Metal Buildings and Components  
 3449 Miscellaneous Structural Metal Work  
 3731 Ship Building and Repairing  
 3732 Boat Building and Repairing  
 3751 Motorcycles, Bicycles, and Parts  
 3873 Watches, Clocks, Clockwork Operated Devices and Parts  
 3942 Dolls and Stuffed Toys  
 3944 Games, Toys, and Children's Vehicles, Except Dolls and Bicycles  
 3949 Sporting and Athletic Goods, NEC  
 3951 Pens, Mechanical Pencils, and Parts  
 3952 Lead Pencils, Crayons, and Artist's Materials  
 3953 Marking Devices  
 3955 Carbon Paper and Inked Ribbons  
 3961 Costume Jewelry and Costume Novelties, Except Precious Metals

3965 Fasteners, Buttons, Needles, and Pins  
 3991 Brooms and Brushes  
 3993 Signs and Advertising Specialties  
 3995 Burial Caskets  
 3996 Linoleum, Asphalted-Felt-Base, and Other Hard Surface Floor Coverings, NEC  
 3999 Manufacturing Industries, NEC

#### **Food and Tobacco Manufacturing**

2021 Creamery Butter  
 2022 Natural, Processed, and Imitation Cheese  
 2023 Dry, Condensed, and Evaporated Dairy Products  
 2024 Ice Cream and Frozen Desserts  
 2026 Fluid Milk  
 2041 Flour and Other Grain Mill Products  
 2043 Cereal Breakfast Foods  
 2044 Rice Milling  
 2045 Prepared Flour Mixes and Doughs  
 2046 Wet Corn Milling  
 2047 Dog and Cat Food  
 2048 Prepared Feed and Feed Ingredients for Animals and Fowls, Except Dogs and Cats  
 2051 Bread and Other Bakery Products, Except Cookies and Crackers  
 2052 Cookies and Crackers  
 2053 Frozen Bakery Products, Except Bread  
 2061 Cane Sugar, Except Refining  
 2062 Cane Sugar Refining  
 2063 Beet Sugar  
 2064 Candy and Other Confectionery Products  
 2066 Chocolate and Cocoa Products  
 2067 Chewing Gum  
 2068 Salted and Roasted Nuts and Seeds  
 2074 Cottonseed Oil Mills  
 2075 Soybean Oil Mills  
 2076 Vegetable Oil Mills, Except Corn, Cottonseed, and Soybeans  
 2077 Animal and Marine Fats and Oils  
 2079 Shortening, Table Oils, Margarine, and Other Edible Fats and Oils, NEC  
 2082 Malt Beverages  
 2083 Malt  
 2084 Wines, Brandy, and Brandy Spirits  
 2085 Distilled and Blended Liquors  
 2086 Bottled and Canned Soft Drinks and Carbonated Waters  
 2087 Flavoring Extracts and Flavoring Syrups NEC  
 2111 Cigarettes

2121 Cigars  
2131 Chewing and Smoking Tobacco and Snuff  
2141 Tobacco Stemming and Redrying  
2992 Lubricating Oils and Greases  
2999 Products of Petroleum and Coal, NEC

**Securities**

6211 Security Brokers, Dealers, and Flotation Companies  
6221 Commodity Contracts Brokers and Dealers  
6231 Security and Commodity Exchanges  
6282 Investment Advice  
6289 Services Allied With the Exchange of Securities or Commodities, NEC

**Building Products**

2431 Millwork  
2434 Wood Kitchen Cabinets  
2435 Hardwood Veneer and Plywood  
2436 Softwood Veneer and Plywood  
2439 Structural Wood Members, NEC  
2541 Wood Office and Store Fixtures, Partitions,

Shelving, and Lockers

2542 Office and Store Fixtures, Partitions, Shelving, and Lockers, Except Wood  
3241 Cement, Hydraulic  
3251 Brick and Structural Clay Tile  
3253 Ceramic Wall and Floor Tile  
3255 Clay Refractories  
3259 Structural Clay Products, NEC  
3261 Vitreous China Plumbing Fixtures and China and Earthenware Fittings and Bathroom Accessories  
3262 Vitreous China Table and Kitchen Articles  
3263 Fine Earthenware (Whiteware) Table and Kitchen Articles  
3264 Porcelain Electrical Supplies  
3269 Pottery Products, NEC  
3281 Cut Stone and Stone Products  
3295 Minerals and Earths, Ground or Otherwise Treated  
3296 Mineral Wool  
3299 Nonmetallic Mineral Products, NEC

Source: Edward J. Feser, Associate Professor, Department of City and Regional Planning, University of North Carolina – Chapel Hill (2003)