

Connecticut's Industry Clusters



AEROSPACE

This cluster features three images: a satellite in space, a person working on a large cylindrical component in a workshop, and a fighter jet in flight.



MARITIME

This cluster features three images: a boat on a river, a person working on a green structure, and a red inflatable boat on the water.



SOFTWARE
&
INFORMATION
TECHNOLOGY

This cluster features three images: a person working at a computer workstation, a person working at a computer workstation, and a server room.



INSURANCE
&
FINANCIAL
SERVICES

This cluster features three images: a person working at a computer workstation, a person working at a computer workstation, and a person working at a computer workstation.



BIOSCIENCE

This cluster features three images: a person working at a computer workstation, a person working in a laboratory, and a person working in a laboratory.

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Introduction

Dr. Michael Porter (Harvard Business School) defines industry clusters as “geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region.” Porter extends work on supply-side economies of scale by arguing that clusters can also develop because (1) a sophisticated and demanding local consumer base positions the core industry to be competitive outside of the region, and (2) competition among firms can encourage the type of cooperation leading to innovation, rather than collusion. Porter argues against models of perfectly competitive markets and multinational corporations. Instead, he assumes geographic aggregation of vertical and horizontal production processes provides the economies of scale necessary for a sustainable creation of wealth in the region via increases in net exports.

Supply-driven Clusters

External economies of scale, that is, economies external to the firm, but, internal to an industry, result in reduced costs for local-area firms, giving rise to a particularly spatial dimension to reducing costs per-unit, known as Agglomeration Economies. The first source of agglomeration is access to a local skilled labor pool. The second source of agglomeration comes in the form of suppliers saving on transportation costs, as well as achieving economies of scale in their production processes. The final source of supply-driven agglomeration is the knowledge, or informational, spillovers arising from employees of competing firms having regular contact, either formally or informally.

Demand-driven Clusters

Porter asserts a local sophisticated and demanding consumer base positions the successful firm to expand outside the region. Additionally, he indicates that locally competitive firms can foster an environment of “cooperation and competition”, which results in innovations improving the input, production and distribution markets. This is the heart of Porter’s model of sustainable wealth creation, as the innovation should increase the net exporting potential of the firms.

This report defines Connecticut’s recognized nine clusters and associates specific industries classified under the North American Industry Classification System (NAICS) with the clusters. With the identification of the NAICS industries associated with each cluster, employment data was able to be developed and is shown in tables that provide overall State cluster employment figures, location quotient calculations, and historical and projected cluster employment and employment growth information. Industry cluster profiles have been developed, providing the definition of each cluster, the included industries, key employment statistics, and identifying the five most prominent skilled occupations in the cluster. The appendix presents the methodology used for associating the NAICS industries with each cluster.

Connecticut's Industry Clusters

The State of Connecticut has been active in the identification and support of the clusters located within its borders. In 1998, a task force of business leaders was established that identified the original six industry clusters within the State. Due to the research conducted by this task force, legislation was implemented in 1998 that led to Connecticut's Industry Cluster Initiative under the direction of the Department of Economic and Community Development. Since this time period, there have been a total of nine industry clusters identified and supported through seed money provided by various sources throughout Connecticut. The nine industry clusters are as follows (See following profile pages for industry cluster definitions):

- **Aerospace**
- **Agriculture**
- **Bioscience**
- **Insurance and Financial Services**
- **Maritime**
- **Metal Manufacturing**
- **Plastics**
- **Software and Information Technology**
- **Tourism**

The Department of Economic and Community Development, the Governor's Competitiveness Council, and the cluster organizations themselves (when there exists such an organization), help define these clusters. The definitions provided in the nine cluster profiles are the result of an examination of these sources and other information about clusters.

By analyzing these definitions, the particular industries of which each cluster is comprised were identified. For a detailed description of how this was done, please see the methodology at the end of this report. The NAICS industries that were correlated with each cluster definition are shown on pages 5-6.

Cluster Employment

In the cluster profiles that appear in this report, several perspectives of employment are shown for each of the industry clusters. These were made possible as a result of the identification of the NAICS industries they encompass. Included are the total cluster employment and its share of State employment, the relative concentration of cluster employment in Connecticut compared to the U.S., and several views of the most prominent skilled occupations used in the cluster industries.

Employment

The table below shows the total employment in each cluster within the State of Connecticut and the U.S., listed in descending order by the Connecticut percent of the U.S. employment levels. The employment figures are annual averages for the year 2003, the latest year for which U.S. employment at this level of industry detail is available.

Table 1

| Cluster | Connecticut Employment | United States Employment | Connecticut Percent of United States |
|--------------------------------|------------------------|--------------------------|--------------------------------------|
| Aerospace | 30,230 | 440,956 | 6.9 |
| Maritime | 10,802 | 485,617 | 2.2 |
| Insurance & Financial Services | 136,624 | 7,220,769 | 1.9 |
| Metal Manufacturing | 58,731 | 3,284,447 | 1.8 |
| Bioscience | 44,945 | 2,558,254 | 1.8 |
| Tourism | 67,404 | 4,879,532 | 1.4 |
| Software & Info. Technology | 36,635 | 3,050,343 | 1.2 |
| Plastics | 7,973 | 726,232 | 1.1 |
| Agriculture | 71,851 | 6,864,180 | 1.0 |
| TOTAL | 1,704,000 | 127,804,256 | 1.3 |

Employment in the nine clusters represented approximately twenty-seven percent of total State employment for 2003. There is no one individual cluster that comprises more than ten percent of total State employment. Table 2 shows the percentages listed in descending order.

Table 2

| Cluster | Connecticut Employment | Percent of Total State Employment |
|--------------------------------|------------------------|-----------------------------------|
| Insurance & Financial Services | 136,624 | 8.0 |
| Agriculture | 71,851 | 4.2 |
| Tourism | 67,404 | 4.0 |
| Metal Manufacturing | 58,731 | 3.5 |
| Bioscience | 44,945 | 2.6 |
| Software & Info. Technology | 36,635 | 2.2 |
| Aerospace | 30,230 | 1.8 |
| Maritime | 10,802 | 0.6 |
| Plastics | 7,973 | 0.5 |
| TOTAL | 1,704,000 | 100 |

As can be seen, the insurance and financial services cluster comprised 8.0% of total State employment in 2003, making it the largest of all nine clusters. However, a completely different picture is seen when examining the location quotient for each cluster.

Location Quotients

The location quotient (LQ) of employment identifies the relative concentration of employment in an area compared to a larger area. In this case, the industry cluster employment in Connecticut was compared to U.S. employment. It is calculated as the ratio of cluster employment in the State to total employment in the State, divided by the corresponding ratio for the United States. The LQ will take on one of three general values, between zero and one, equal to one, or greater than one. If the LQ is less than one, then it is interpreted that the particular cluster has a lower share of employment within the State than it has nationwide. When the LQ is greater than one, then the particular cluster has a higher share of employment within the State than in the U.S. When the LQ equals one, then the cluster's share of employment within the State is equal to that of the U.S.

When the LQ is greater than one, the cluster is typically thought to have a possible local specialization and competitive advantage. These clusters generally provide products and services to consumers outside of Connecticut and, in turn, return revenues (wealth) to the State. Table 3 below gives the LQ for the nine clusters for 2003 (the latest year for which US annual average data was available).

Table 3

| Cluster | LQ 2003 |
|-----------------------------|----------------|
| Aerospace | 5.20 |
| Maritime | 1.69 |
| Insurance & Financial Svcs. | 1.43 |
| Bioscience | 1.37 |
| Metal Manufacturing | 1.36 |
| Tourism | 0.97 |
| Software & Info. Technology | 0.91 |
| Plastics | 0.83 |
| Agriculture | 0.79 |

As can be seen in Table 3, five industry clusters have a higher concentration of employment within Connecticut than in the nation as a whole. Aerospace has the highest employment concentration in the State, with a LQ of 5.20. Tourism employment in Connecticut is about equal to that found in the U.S.

A different picture is seen when comparing the LQ's of Table 3 to the ratios in Table 2. As noted, the largest LQ was for the aerospace cluster; however, the largest percentage of State employment was in the insurance and financial services cluster. Therefore, the insurance and financial services industry provides greater employment than other clusters, but the aerospace cluster appears to be much more specialized in Connecticut (when compared to the U.S.) than other clusters. This difference between employment levels and relative concentrations in Connecticut is readily apparent with other examples. The agriculture cluster has the lowest LQ of 0.79; however, it has the next largest percentage of State employment of 4.2 percent, because of the inclusion of retail food and beverage stores in this cluster.



Industry Cluster Occupations

In the cluster profiles on the following pages, the primary occupations used in each cluster have been identified. There are four tables shown for each cluster. Each table identifies in different ways some of the occupations most commonly found within the cluster. The first table lists the top occupations in terms of their total employment in the cluster for the year 2002 (the base year used for the most recent projections). The second will show the top occupations in terms of their projected employment for 2012. The third and fourth tables show the top occupations in terms of changes between 2002 and 2012, with the third table showing the occupations expected to experience the greatest net growth and the fourth table identifying those with the fastest growth rates.

These employment figures are not directly comparable to the 2004 employment figures shown for each cluster because the occupational data is not available at the six-digit level of NAICS industry detail. It should be noted that there could be some over-estimation of employment for the occupations in the clusters. Due to the fact that the occupational data is not available at the six-digit level of NAICS industry detail, a broader NAICS four-digit industry group had to be used to produce these data. Also, the wages shown for the occupations depict the State's overall average wages, without limitation to an industry cluster.

Key Statistics

The Key Statistics table for each industry cluster identifies the number of employer units, number of jobs, average annual wage, and location quotient for the cluster as a whole. Employer units represent the most detailed economic unit for which data are reported to the CT Department of Labor by an employer. Usually a reporting unit is an individual establishment, but sometimes two or more establishments are reported as a single unit. Average annual wages are for all employees on the payrolls of the cluster industries, including executive management positions.

The table also identifies the change in these figures from 2000 to 2004 which, considering the recent recession, gives some indication of the economic strength of the cluster over this period.

Connecticut's Industry Clusters and Related Industries

Aerospace

| <u>NAICS</u> | <u>Description</u> |
|--------------|---|
| 3364 | Aerospace Product and Parts Manufacturing |

Agriculture

| <u>NAICS</u> | <u>Description</u> |
|--------------|--|
| 11 | Agriculture, Forestry, Fishing, and Hunting |
| 311 | Food Manufacturing |
| 312120 | Breweries |
| 312130 | Wineries |
| 312140 | Distilleries |
| 3122 | Tobacco Manufacturing |
| 3253 | Pesticide, Fertilizer, and other Agricultural Chemical Manufacturing |
| 4244 | Grocery and Related Product Wholesalers |
| 4245 | Farm Product Raw Material Merchant Wholesalers |
| 4248 | Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers |
| 424910 | Farm Supplies Merchant Wholesalers |
| 424930 | Nursery and Florist Merchant Wholesalers |
| 424940 | Tobacco and Tobacco Product Merchant Wholesalers |

Bioscience

| <u>NAICS</u> | <u>Description</u> |
|--------------|---|
| 3254 | Pharmaceutical and Medicine Manufacturing |
| 334510 | Electromedical and Electrotherapeutic Apparatus Manufacturing |
| 334516 | Analytical Laboratory Instrument Manufacturing |
| 334517 | Irradiation Apparatus Manufacturing |
| 3391 | Medical Equipment and Supplies Manufacturing |
| 423450 | Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers |
| 423460 | Ophthalmic Goods Merchant Wholesalers |
| 446110 | Pharmacies and Drug Stores |
| 446130 | Optical Goods Stores |
| 541710 | Research and Development in the Physical, Engineering, and Life Sciences |
| 6215 | Medical and Diagnostic Laboratories |

Insurance and Financial Services

| <u>NAICS</u> | <u>Description</u> |
|--------------|---|
| 522 | Credit Intermediation and Related Activities |
| 523 | Securities, Commodity Contracts, and Other Financial Investments and Related Activities |
| 524 | Insurance Carriers and Related Activities |
| 525 | Funds, Trusts, and Other Financial Vehicles |
| 531 | Real Estate |

Maritime

| <u>NAICS</u> | <u>Description</u> |
|--------------|---|
| 3366 | Ship and Boat Building |
| 4831 | Deep Sea, Coastal, and Great Lakes Water Transportation |
| 4832 | Inland Water Transportation |
| 4883 | Support Activities for Water Transportation |
| 4885 | Freight Transportation Arrangement |



Connecticut's Industry Clusters and Related Industries

Metal Manufacturing

| <u>NAICS</u> | <u>Description</u> |
|--------------|--|
| 331 | Primary Metal Manufacturing |
| 332 | Fabricated Metal Product Manufacturing |
| 333 | Machinery Manufacturing |
| 337124 | Metal Household Furniture Manufacturing |
| 33991 | Jewelry and Silverware Manufacturing |
| 423510 | Metal Service Centers and other Metal Merchant Wholesalers |

Plastics

| <u>NAICS</u> | <u>Description</u> |
|--------------|---|
| 325211 | Plastics Material and Resin Manufacturing |
| 3261 | Plastics Product Manufacturing |
| 326220 | Rubber and Plastics Hoses and Belting Manufacturing |

Software and Information Technology

| <u>NAICS</u> | <u>Description</u> |
|--------------|--|
| 3341 | Computer and Peripheral Equipment Manufacturing |
| 3344 | Semiconductor and other Electronic Component Manufacturing |
| 334611 | Software Reproducing |
| 334613 | Magnetic and Optical Recording Media Manufacturing |
| 423430 | Computer and Computer Peripheral Equipment and Software Merchant Wholesalers |
| 425110 | Business to Business Electronic Markets |
| 443120 | Computer and Software Stores (retail) |
| 454111 | Electronic Shopping |
| 454112 | Electronic Auctions |
| 5112 | Software Publishers |
| 518 | Internet Service Providers, Web Search Portals, and Data Processing Services |
| 5415 | Computer Systems Design and Related Services |
| 611420 | Computer Training |

Tourism

| <u>NAICS</u> | <u>Description</u> |
|--------------|--|
| 71 | Arts, Entertainment, and Recreation |
| 7211 | Traveler Accommodation |
| 7212 | RV (Recreational Vehicle) Parks and Recreational Camps |
| 481111 | Scheduled Passenger Air Transportation |
| 481211 | Nonscheduled Chartered Passenger Air Transportation |
| 482111 | Line-Haul Railroads |
| 487 | Scenic and Sightseeing Transportation |
| 532111 | Passenger Car Rental |
| 532292 | Recreational Goods Rental |
| 561510 | Travel Agencies |
| 561520 | Tour Operators |
| 561591 | Convention and Visitors Bureaus |
| 561599 | All Other Travel Arrangement and Reservation Services |

Connecticut's

INDUSTRY

CLUSTERS

AEROSPACE

Definition:

The aerospace product and parts manufacturing industry comprises establishments that are primarily engaged in one or more of the following: (1) manufacturing complete aircraft, missiles, or space vehicles; (2) manufacturing aerospace engines, propulsion units, auxiliary equipment or parts; (3) developing and making prototypes of aerospace products; (4) aircraft conversion (i.e, major modifications to systems); and (5) complete aircraft or propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft to original design specifications).

Cluster Industries:

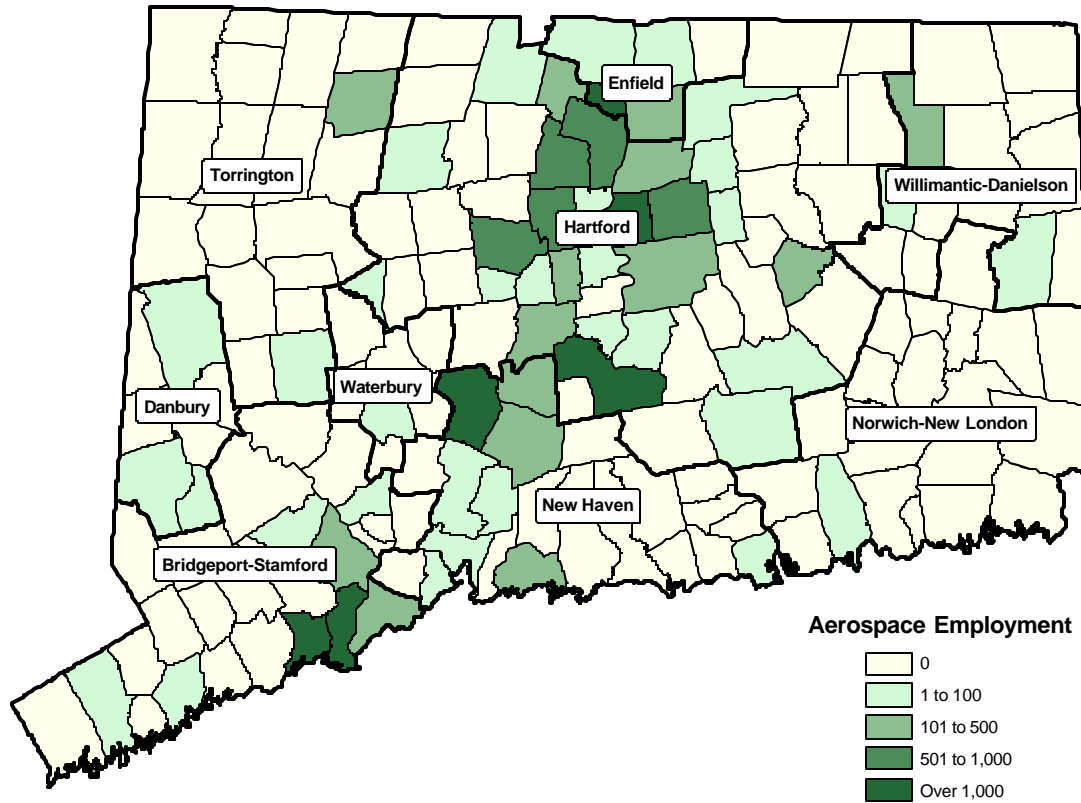
| NAICS | Description |
|-------|---|
| 3364 | Aerospace Product and Parts Manufacturing |

Key Statistics - 2004:

| | |
|--|-----------------|
| Employer Units | 150 |
| Net Change in Employer Units (2000-04) | -13 |
| Percent Change in Employer Units (2000-04) | -8.0% |
| Number of Jobs | 29,891 |
| Percentage of Total CT Employment | 1.8% |
| Net Change in Job Volume (2000-04) | -2,656 |
| Percent Change in Job Volume (2000-04) | -8.2% |
| Average Annual Wage | \$73,823 |
| Net Change in Wage (2000-04) | \$8,102 |
| Percent Change in Wage (2000-04) | 12.3% |
| Location Quotient (2003) | 5.20 |
| Percent Change from 2000 Location Quotient | 10.4% |

Top Industries - 2004:

| | |
|--|----------------------------|
| Aircraft Manufacturing | 100% of Cluster Jobs |
| Aircraft Engine and Engine Parts Manufacturing | |
| Other Aircraft Parts and Equipment Manufacturing | |

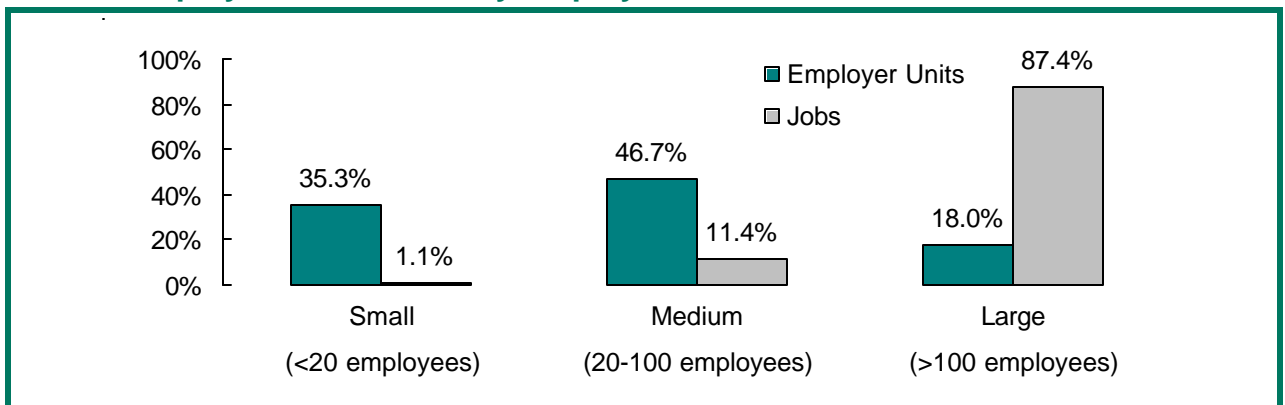


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|-------|---|----------|------------------|
| 3364 | Aerospace Product and Parts Manufacturing | 5.20 | 10.4 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

| Occupation | Annual Wage | Number of Jobs |
|---|-------------|----------------|
| Aerospace Engineers | \$73,350 | 3065 |
| Machinists | \$36,310 | 1570 |
| Industrial Engineers | \$66,780 | 935 |
| Aerospace Engineering & Operations Technicians | ----- | 901 |
| Mechanical Engineers | \$66,950 | 881 |
| Inspectors, Testers, Sorters, Samplers, & Weighers | \$33,280 | 874 |
| First-Line Supervisors/Managers of Production & Operating Workers | \$56,390 | 777 |
| Materials Engineers | ----- | 635 |
| Business Operations Specialists | \$58,240 | 578 |
| Purchasing Agents, Except Wholesale, Retail, and Farm Products | \$54,190 | 570 |

----- Wages for this occupation are not available.

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| Aerospace Engineers | 51 | 1.7 | 81 |
| Machinists | -333 | -21.2 | 37 |
| Industrial Engineers | 92 | 9.9 | 32 |
| Mechanical Engineers | 42 | 4.8 | 28 |
| Aerospace Engineering & Operations Technicians | 37 | 4.1 | 23 |
| Inspectors, Testers, Sorters, Samplers, and Weighers | -107 | -12.2 | 20 |
| Materials Engineers | 27 | 4.3 | 19 |
| First-Line Supervisors/Managers of Production & Operating Workers | -6 | -0.8 | 16 |
| Aircraft Structure, Surfaces, Rigging, and Systems Assemblers | -4 | -0.7 | 15 |
| Business Operations Specialists | 49 | 8.5 | 15 |



AEROSPACE



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Industrial Engineers | 92 | 9.8 | 32 |
| Aerospace Engineers | 51 | 1.7 | 81 |
| Business Operations Specialists | 49 | 8.5 | 15 |
| Mechanical Engineers | 42 | 4.8 | 28 |
| Aerospace Engineering & Operations Technicians | 37 | 4.1 | 23 |
| Materials Engineers | 27 | 4.3 | 19 |
| Computer Software Engineers, Systems Software | 27 | 12.6 | 5 |
| Network Systems & Data Communications Analysts | 26 | 25.5 | 4 |
| Avionics Technicians | 23 | 11.4 | 7 |
| Sales Representatives, Wholesale & Mfg., Tech. & Scientific Products | 23 | 18.2 | 6 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Network Systems and Data Communications Analysts | 26 | 25.5 | 4 |
| Sales Representatives, Wholesale and Mfg., Tech. & Scientific Products | 23 | 18.3 | 6 |
| Electrical and Electronic Engineering Technicians | 20 | 13.2 | 5 |
| Computer Software Engineers, Systems Software | 27 | 12.6 | 5 |
| Avionics Technicians | 23 | 11.4 | 7 |
| Industrial Engineers | 92 | 9.8 | 32 |
| Environmental Scientists & Specialists, Including Health | 5 | 9.1 | 1 |
| Electricians | 13 | 9.0 | 4 |
| Business Operations Specialists | 49 | 8.5 | 15 |
| Computer and Information Systems Managers | 9 | 7.9 | 3 |

AGRICULTURE

Definition:

The Department of Economic and Community Development has stated that the agriculture cluster is composed of “producers of dairy products, eggs, mushrooms, fruits and vegetables, tobacco, wine and forestry products, and includes aquaculture, nurseries, greenhouses and florists.” Other establishments in this sector may include farms, ranches, dairies, and orchards. A farm may consist of a single tract of land or a number of separate tracts which may be held under different tenures. For example, one tract may be owned by the farm operator and another rented. It may be operated by the operator alone or with the assistance of members of the household or hired employees, or it may be operated by a partnership, corporation, or other type of organization.

Cluster Industries:

| NAICS | Description |
|--------|--|
| 11 | Agriculture, Forestry, Fishing, and Hunting |
| 311 | Food Manufacturing |
| 312120 | Breweries |
| 312130 | Wineries |
| 312140 | Distilleries |
| 3122 | Tobacco Manufacturing |
| 3253 | Pesticide, Fertilizer, and other Agricultural Chemical Manufacturing |
| 4244 | Grocery and Related Product Wholesalers |
| 4245 | Farm Product Raw Material Merchant Wholesalers |
| 4248 | Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers |
| 424910 | Farm Supplies Merchant Wholesalers |
| 424930 | Nursery and Florist Merchant Wholesalers |
| 424940 | Tobacco and Tobacco Product Merchant Wholesalers |
| 445 | Food and Beverage Stores |
| 453110 | Florists |

Key Statistics - 2004:

| | |
|--|-----------------|
| Employer Units | 3,743 |
| Net Change in Employer Units (2000-04) | -79 |
| Percent Change in Employer Units (2000-04) | -2.1% |
| Number of Jobs | 71,501 |
| Percentage of Total CT Employment | 4.4% |
| Net Change in Job Volume (2000-04) | -2,522 |
| Percent Change in Job Volume (2000-04) | -3.4% |
| Average Annual Wage | \$31,698 |
| Net Change in Wage (2000-04) | \$3,045 |
| Percent Change in Wage (2000-04) | 10.6% |
| Location Quotient (2003) | 0.79 |
| Percent Change from 2000 Location Quotient | 1.1% |

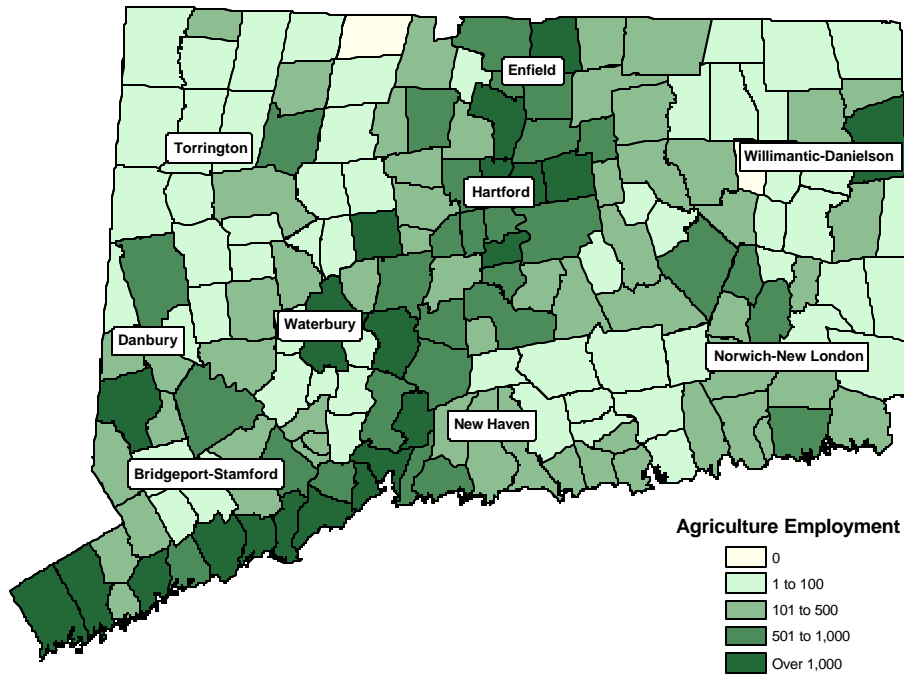
Top 5 Industries - 2004:

Supermarkets and Other Grocery Stores
 General Line Grocery Merchant Wholesalers
 Beer, Wine, and Liquor Stores
 Nursery and Tree Production
 Other Grocery Product Merchant Wholesalers

67.2% of
 Cluster
 Jobs

Cluster Employment by Labor Market Area - 2004:

AGRICULTURE

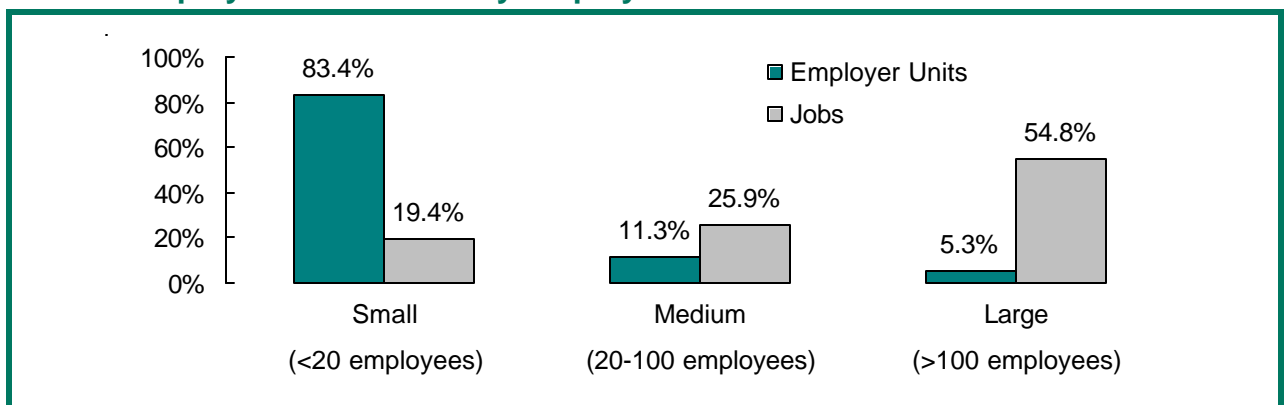


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|--------|--|----------|------------------|
| 312140 | Distilleries | 6.98 | 1.1 |
| 4248 | Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers | 1.18 | 90.4 |
| 445 | Food and Beverage Stores | 1.17 | -0.5 |
| 4244 | Grocery and Related Product Wholesalers | 1.04 | 0.2 |
| 453110 | Florists | 1.00 | -1.7 |
| 424930 | Flower, Nursery Stock, and Florists' Supplies Merchant Wholesalers | 0.68 | 4.0 |
| 424940 | Tobacco and Tobacco Product Merchant Wholesalers | 0.59 | -6.6 |
| 3122 | Tobacco Manufacturing | 0.38 | 15.1 |
| 311 | Food Manufacturing | 0.36 | 0.6 |
| 11 | Agriculture, Forestry, Fishing and Hunting | 0.36 | 10.7 |
| 3253 | Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing | 0.12 | 22.0 |
| 424910 | Farm Supplies Merchant Wholesalers | 0.17 | 19.5 |
| 312130 | Wineries | 0.09 | 18.7 |
| 312120 | Breweries | 0.01 | 77.3 |
| 4245 | Farm Product Raw Material Merchant Wholesalers | 0.01 | 76.4 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

| Occupation | Annual Wage | Number of Jobs |
|---|-------------|----------------|
| Farmworkers and Laborers, Crop, Nursery, and Greenhouse | \$19,060 | 2915 |
| Farm, Ranch, and Other Agricultural Managers | \$65,660 | 1101 |
| Packaging and Filling Machine Operators and Tenders | \$25,020 | 772 |
| Packers and Packagers, Hand | \$20,350 | 730 |
| Team Assemblers | \$27,310 | 475 |
| Farming, Fishing, and Forestry Workers | \$28,570 | 405 |
| Laborers and Freight, Stock, and Material Movers, Hand | \$26,190 | 398 |
| Food Cooking Machine Operators and Tenders | \$23,920 | 396 |
| Bakers | \$25,440 | 379 |
| Food Batchmakers | \$27,200 | 307 |

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| Farmworkers and Laborers, Crop, Nursery, and Greenhouse | -3 | -0.1 | 83 |
| Packaging and Filling Machine Operators and Tenders | 61 | 7.9 | 21 |
| Farm, Ranch, and Other Agricultural Managers | -11 | -1.0 | 19 |
| First-Line Supervisors/Managers of Production and Operating Workers | 99 | 35.1 | 16 |
| Counter Attendants, Cafeteria, Food Concession, and Coffee Shop | -3 | -1.3 | 15 |
| Packers and Packagers, Hand | -141 | -19.3 | 14 |
| Laborers and Freight, Stock, and Material Movers, Hand | 13 | 3.3 | 14 |
| Cashiers | -24 | -9.3 | 13 |
| Team Assemblers | -62 | -13.1 | 12 |
| Farming, Fishing, and Forestry Workers | 8 | 1.2 | 11 |



AGRICULTURE

AGRICULTURE



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| First-Line Supervisors/Managers of Production and Operating Workers | 99 | 35.1 | 16 |
| Packaging and Filling Machine Operators and Tenders | 61 | 7.9 | 21 |
| Fishers and Related Fishing Workers | 45 | 30.8 | 9 |
| Tree Trimmers and Pruners | 22 | 13.2 | 6 |
| Laborers and Freight, Stock, and Material Movers, Hand | 13 | 3.3 | 14 |
| Truck Drivers, Heavy and Tractor-Trailer | 13 | 6.1 | 5 |
| Farming, Fishing, and Forestry Workers | 8 | 1.2 | 11 |
| Industrial Truck and Tractor Operators | 7 | 3.6 | 4 |
| General and Operations Managers | 6 | 5.0 | 3 |
| Financial Managers | 6 | 15.8 | 1 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| First-Line Supervisors/Managers of Production and Operating Workers | 99 | 35.1 | 16 |
| Fishers and Related Fishing Workers | 45 | 30.8 | 9 |
| Tree Trimmers and Pruners | 22 | 13.2 | 6 |
| Cleaning, Washing, and Metal Pickling Equip. Operators and Tenders | 5 | 11.1 | 2 |
| Packaging and Filling Machine Operators and Tenders | 61 | 8.0 | 21 |
| Sales Representatives, Wholesale and Mfg., Tech. and Scientific Products | 4 | 7.1 | 2 |
| Truck Drivers, Heavy and Tractor-Trailer | 13 | 6.1 | 5 |
| Accountants and Auditors | 4 | 5.1 | 2 |
| General and Operations Managers | 6 | 5.0 | 3 |
| Food Processing Workers | 3 | 4.7 | 2 |

BIOSCIENCE

Definition:

This cluster is traditionally defined as those industries that are contained within the medical device, pharmaceutical, and biotechnology industries. Medical device companies are engaged in the research, testing, and production of goods that are utilized by various institutions that are involved with medical, biological, and various life-sciences research. Pharmaceutical organizations are primarily engaged in the research, testing, production, and distribution of various medicines; and biotechnology companies are those that are also involved with various life-sciences researchers that utilize very high technology related instruments. Any supplier, wholesaler, distribution facility, and support network that operates with only these related activities would be included with the Bioscience cluster.

Cluster Industries:

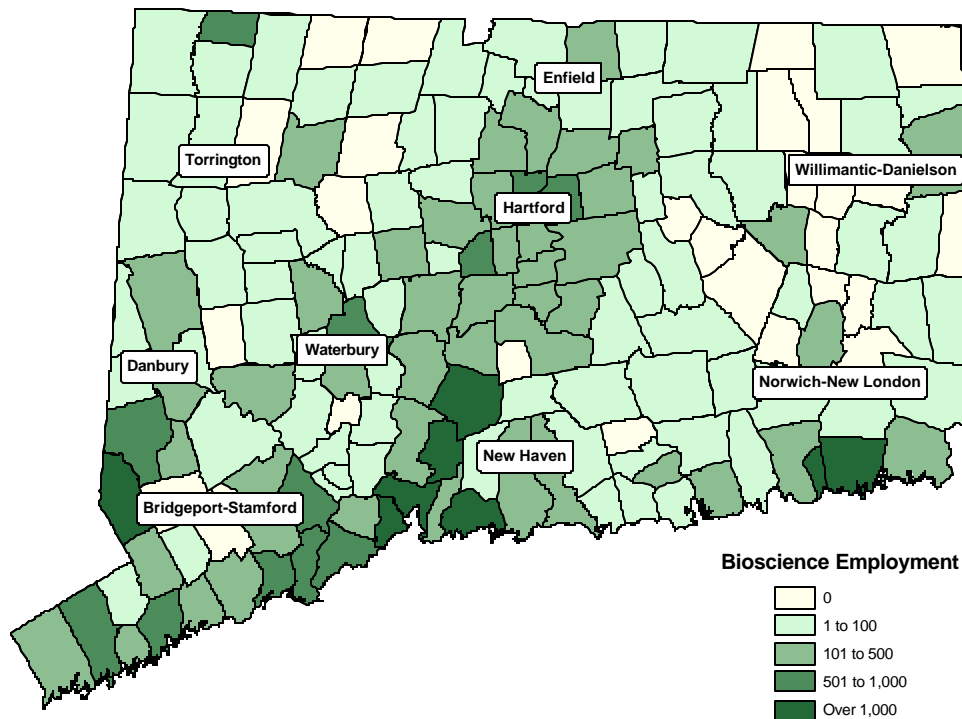
| NAICS | Description |
|--------|--|
| 3254 | Pharmaceutical and Medicine Manufacturing |
| 334510 | Electromedical and Electrotherapeutic Apparatus Manufacturing |
| 334516 | Analytical Laboratory Instrument Manufacturing |
| 334517 | Irradiation Apparatus Manufacturing |
| 3391 | Medical Equipment and Supplies Manufacturing |
| 423450 | Medical, Dental, and Hospital Equip. and Supplies Merchant Wholesalers |
| 423460 | Ophthalmic Goods Merchant Wholesalers |
| 446110 | Pharmacies and Drug Stores |
| 446130 | Optical Goods Stores |
| 541710 | Research and Dev. in the Physical, Engineering, and Life Sciences |
| 6215 | Medical and Diagnostic Laboratories |

Key Statistics - 2004:

| | |
|--|-----------------|
| Employer Units | 1,567 |
| Net Change in Employer Units (2000-04) | -41 |
| Percent Change in Employer Units (2000-04) | -2.5% |
| Number of Jobs | 40,887 |
| Percentage of Total CT Employment | 2.5% |
| Net Change in Job Volume (2000-04) | -1,594 |
| Percent Change in Job Volume (2000-04) | -3.8% |
| Average Annual Wage | \$64,259 |
| Net Change in Wage (2000-04) | \$5,268 |
| Percent Change in Wage (2000-04) | 8.9% |
| Location Quotient (2003) | 1.37 |
| Percent Change from 2000 Location Quotient | -3.0% |

Top 5 Industries - 2004:

| | |
|---|--------------------------------------|
| Pharmacies and Drug Stores | 75.3% of Cluster Jobs |
| Pharmaceutical Preparation Manufacturing | |
| Physical, Engineering and Biological Research and Development | |
| Surgical and Medical Instrument Manufacturing | |
| Medicinal and Botanical Manufacturing | |

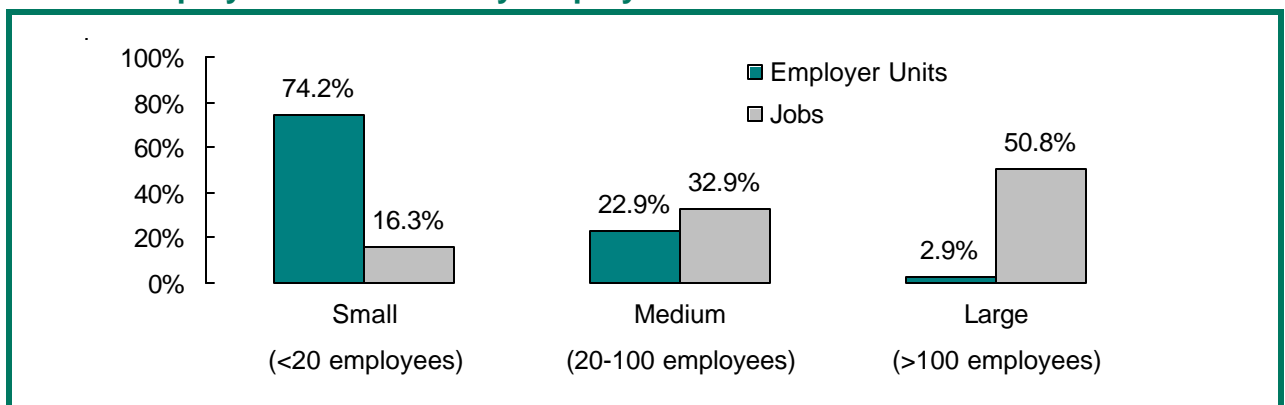


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|--------|--|----------|------------------|
| 334516 | Analytical Laboratory Instrument Manufacturing | 2.73 | 22.5 |
| 3254 | Pharmaceutical and Medicine Manufacturing | 2.62 | -7.4 |
| 3391 | Medical Equipment and Supplies Manufacturing | 1.76 | 6.9 |
| 446110 | Pharmacies and Drug Stores | 1.28 | 3.0 |
| 6215 | Medical and Diagnostic Laboratories | 1.22 | 14.3 |
| 446130 | Optical Goods Stores | 1.10 | -1.5 |
| 423450 | Medical, Dental, and Hospital Equip. and Supplies Merchant Wholesalers | 1.01 | 2.8 |
| 334517 | Irradiation Apparatus Manufacturing | 0.97 | 69.6 |
| 541710 | Research and Development in the Physical, Engineering, and Life Sciences | 0.78 | 8.0 |
| 334510 | Electromedical and Electrotherapeutic Apparatus Manufacturing | 0.73 | 40.0 |
| 423460 | Ophthalmic Goods Merchant Wholesalers | 0.62 | 37.6 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

| Occupation | Annual Wage | Number of Jobs |
|---|-------------|----------------|
| Medical Scientists, Except Epidemiologists | \$85,860 | 1372 |
| Biochemists and Biophysicists | ----- | 1250 |
| Chemists | \$63,740 | 805 |
| Executive Secretaries and Administrative Assistants | \$41,120 | 789 |
| Microbiologists | ----- | 753 |
| Structural Metal Fabricators and Fitters | ----- | 688 |
| Medical and Clinical Laboratory Technologists | \$50,920 | 588 |
| Management Analysts | \$80,180 | 563 |
| Healthcare Support Workers | \$29,920 | 546 |
| Natural Sciences Managers | \$126,850 | 534 |

----- Wages for this occupation are not available.

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| Biochemists and Biophysicists | 369 | 29.5 | 76 |
| Medical Scientists, Except Epidemiologists | 408 | 29.7 | 65 |
| Chemists | 229 | 28.5 | 49 |
| Microbiologists | 219 | 29.1 | 45 |
| Structural Metal Fabricators and Fitters | 83 | 12.1 | 24 |
| Executive Secretaries and Administrative Assistants | 59 | 7.5 | 21 |
| Biological Technicians | 111 | 22.2 | 20 |
| Natural Sciences Managers | 89 | 16.7 | 19 |
| Medical and Clinical Laboratory Technologists | 23 | 3.9 | 18 |
| Life, Physical, and Social Science Technicians | 51 | 10.5 | 17 |



BIOSCIENCE



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| Medical Scientists, Except Epidemiologists | 408 | 29.7 | 65 |
| Biochemists and Biophysicists | 369 | 29.5 | 76 |
| Chemists | 229 | 28.5 | 49 |
| Microbiologists | 219 | 29.1 | 45 |
| Biological Technicians | 111 | 22.2 | 20 |
| Computer Systems Analysts | 109 | 32.1 | 15 |
| Business Operations Specialists | 108 | 32.2 | 17 |
| Natural Sciences Managers | 89 | 16.7 | 19 |
| Management Analysts | 89 | 15.8 | 17 |
| First-Line Supervisors/Managers of Production and Operating Workers | 86 | 21.5 | 17 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|-------------|-----------------|
| Network Systems and Data Communications Analysts | 18 | 46.2 | 2 |
| Materials Scientists | 21 | 37.5 | 4 |
| Database Administrators | 34 | 34.3 | 4 |
| Desktop Publishers | 16 | 34.0 | 3 |
| Business Operations Specialists | 108 | 32.2 | 17 |
| Chemical Technicians | 76 | 32.2 | 13 |
| Computer Systems Analysts | 109 | 32.1 | 15 |
| Public Relations Specialists | 12 | 30.8 | 2 |
| Computer Software Engineers, Systems Software | 26 | 29.9 | 3 |
| Medical Scientists, Except Epidemiologists | 408 | 29.7 | 65 |

INSURANCE & FINANCIAL SERVICES

Definition:

The insurance and financial services sector has been defined to encompass establishments primarily engaged in financial transactions; that is, transactions involving the creation, liquidation, change in ownership of financial assets; or in facilitating financial transactions. Financial industries are extensive users of electronic means for facilitating the verification of financial balances, authorizing transactions, transferring funds to and from transactors' accounts, notifying banks (or credit card issuers) of the individual transactions, and providing daily summaries. Since these transaction processing activities are integral to the production of insurance and financial services, establishments that principally provide a financial transaction processing service are classified with this sector.

Cluster Industries:

| NAICS | Description |
|-------|--|
| 522 | Credit Intermediation and Related Activities |
| 523 | Securities, Commodity Contracts, and other Fin. Investments & Related Activities |
| 524 | Insurance Carriers and Related Activities |
| 525 | Funds, Trusts, and Other Financial Vehicles |
| 531 | Real Estate |

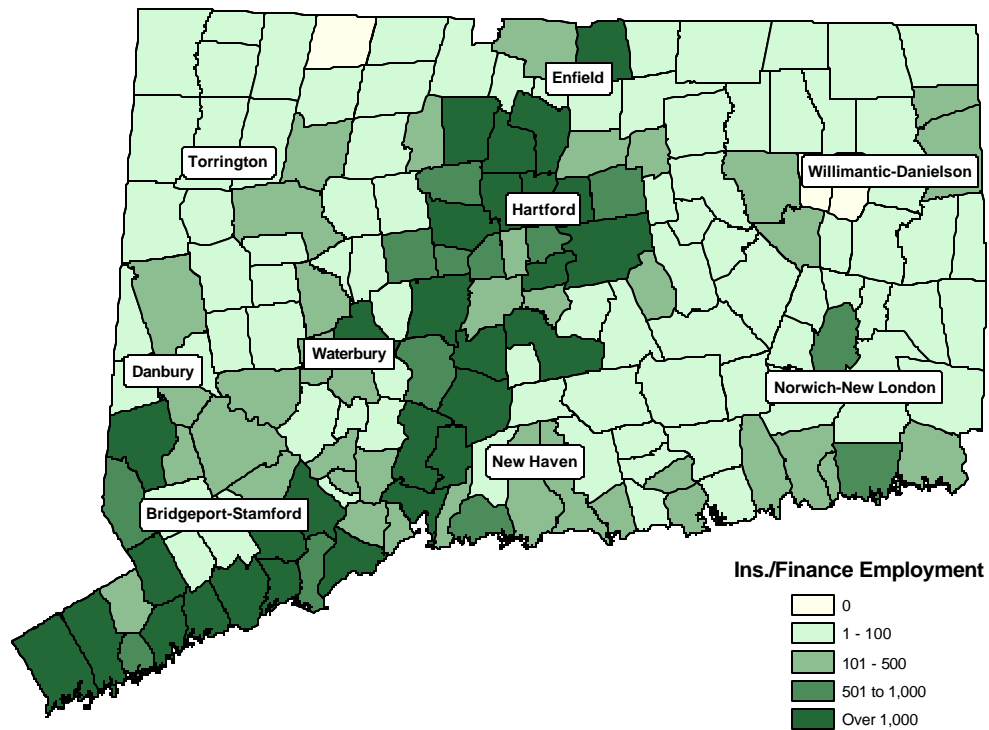
Key Statistics - 2004:

| | |
|--|------------------|
| Employer Units | 9,672 |
| Net Change in Employer Units (2000-04) | 691 |
| Percent Change in Employer Units (2000-04) | 7.7% |
| Number of Jobs | 133,851 |
| Percentage of Total CT Employment | 8.2% |
| Net Change in Job Volume (2000-04) | -969 |
| Percent Change in Job Volume (2000-04) | -0.7% |
| Average Annual Wage | \$111,302 |
| Net Change in Wage (2000-04) | \$25,558 |
| Percent Change in Wage (2000-04) | 29.8% |
| Location Quotient (2003) | 1.43 |
| Percent Change from 2000 Location Quotient ... | -2.7% |

Top 5 Industries - 2004:

| | |
|---------------------------------------|--------------------------------------|
| Direct Life Insurance Carriers | 52.1% of Cluster Jobs |
| Direct Property and Casualty Insurers | |
| Savings Institutions | |
| Insurance Agencies and Brokerages | |
| Commercial Banking | |

Cluster Employment by Labor Market Area - 2004: INSURANCE & FINANCIAL SERVICES

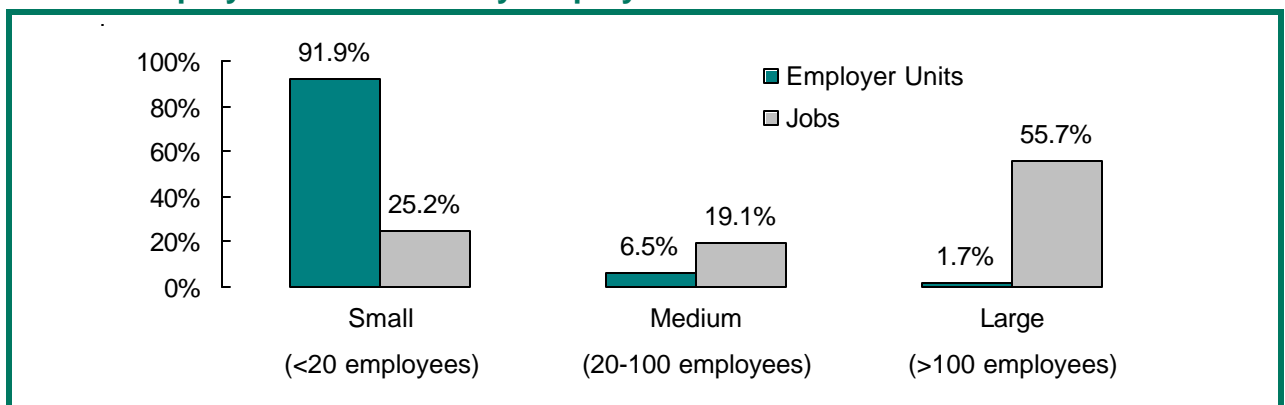


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|-------|--|----------|------------------|
| 525 | Funds, Trusts, and Other Financial Vehicles | 4.22 | 11.9 |
| 524 | Insurance Carriers and Related Activities | 2.40 | 0.7 |
| 523 | Securities, Commodity Contracts, and Other Fin. Investments and Related Activities | 1.74 | 17.4 |
| 522 | Credit Intermediation and Related Activities | 0.88 | -8.6 |
| 531 | Real Estate | 0.71 | -8.8 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

| Occupation | Annual Wage | Number of Jobs |
|--|-------------|----------------|
| Customer Service Representatives | \$32,870 | 12054 |
| Insurance Claims and Policy Processing Clerks | \$35,150 | 6092 |
| Insurance Sales Agents | \$65,360 | 5996 |
| Office Clerks, General | \$27,580 | 5857 |
| Securities, Commodities, and Financial Services Sales Agents | \$129,650 | 5691 |
| Tellers | \$25,030 | 5445 |
| Claims Adjusters, Examiners, and Investigators | \$50,270 | 5119 |
| Executive Secretaries and Administrative Assistants | \$41,120 | 4833 |
| First-Line Supervisors/Managers of Office and Admin. Support Workers | \$48,430 | 4684 |
| Financial Managers | \$111,940 | 4011 |

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Customer Service Representatives | 1561 | 13.0 | 335 |
| Tellers | 59 | 1.1 | 274 |
| Securities, Commodities, and Financial Services Sales Agents | 1860 | 32.7 | 251 |
| Insurance Sales Agents | 33 | 0.6 | 147 |
| Office Clerks, General | -270 | -4.6 | 130 |
| Claims Adjusters, Examiners, and Investigators | 440 | 8.6 | 107 |
| Financial Managers | 469 | 11.7 | 104 |
| Financial Analysts | 574 | 18.3 | 104 |
| First-Line Supervisors/Managers of Office and Admin. Support Workers | -206 | -4.4 | 101 |
| Insurance Claims and Policy Processing Clerks | -195 | -3.2 | 98 |



INSURANCE & FINANCIAL SERVICES



INSURANCE & FINANCIAL SERVICES



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Securities, Commodities, and Financial Services Sales Agents | 1860 | 32.7 | 251 |
| Customer Service Representatives | 1561 | 13.0 | 335 |
| Personal Financial Advisors | 698 | 50.7 | 88 |
| Financial Analysts | 574 | 18.3 | 104 |
| Computer Systems Analysts | 499 | 15.9 | 85 |
| Financial Managers | 469 | 11.7 | 104 |
| Claims Adjusters, Examiners, and Investigators | 440 | 8.7 | 107 |
| Business Operations Specialists | 416 | 18.1 | 81 |
| Accountants and Auditors | 384 | 12.5 | 96 |
| Loan Officers | 360 | 17.2 | 70 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|-------------|-----------------|
| Personal Financial Advisors | 698 | 50.7 | 88 |
| Securities, Commodities, and Financial Services Sales Agents | 1860 | 32.7 | 251 |
| Network Systems and Data Communications Analysts | 220 | 31.1 | 30 |
| First-Line Supervisors/Managers of Retail Sales Workers | 62 | 30.5 | 10 |
| Sales Managers | 220 | 30.1 | 36 |
| Database Administrators | 81 | 27.7 | 11 |
| First-Line Supervisors/Managers of Non-Retail Sales Workers | 180 | 26.8 | 31 |
| Economists | 12 | 26.1 | 3 |
| Chief Executives | 150 | 22.7 | 27 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | 17 | 22.3 | 3 |

MARITIME

Definition:

The industries involved in water transportation, the manufacturing and servicing of maritime components and vessels, particular recreational facilities, and commercial fishing are all major components of the maritime cluster. The ship and boat building industry comprises establishments primarily engaged in operating shipyards or boatyards. Activities of shipyards include the construction of ships, their repair, conversion and alterations, the production of prefabricated ship and barge sections, and specialized services, such as ship scaling. Industries in the water transportation subsector provide water transportation of passengers and cargo using water craft, such as ships, barges, and boats. The freight transportation arrangement industry comprises of establishments primarily engaged in arranging transportation of freight between shippers and carriers.

Cluster Industries:

| NAICS | Description |
|-------|---|
| 3366 | Ship and Boat Building |
| 4831 | Deep Sea, Coastal, and Great Lakes Water Transportation |
| 4832 | Inland Water Transportation |
| 4883 | Support Activities for Water Transportation |
| 4885 | Freight Transportation Arrangement |

Key Statistics - 2004:

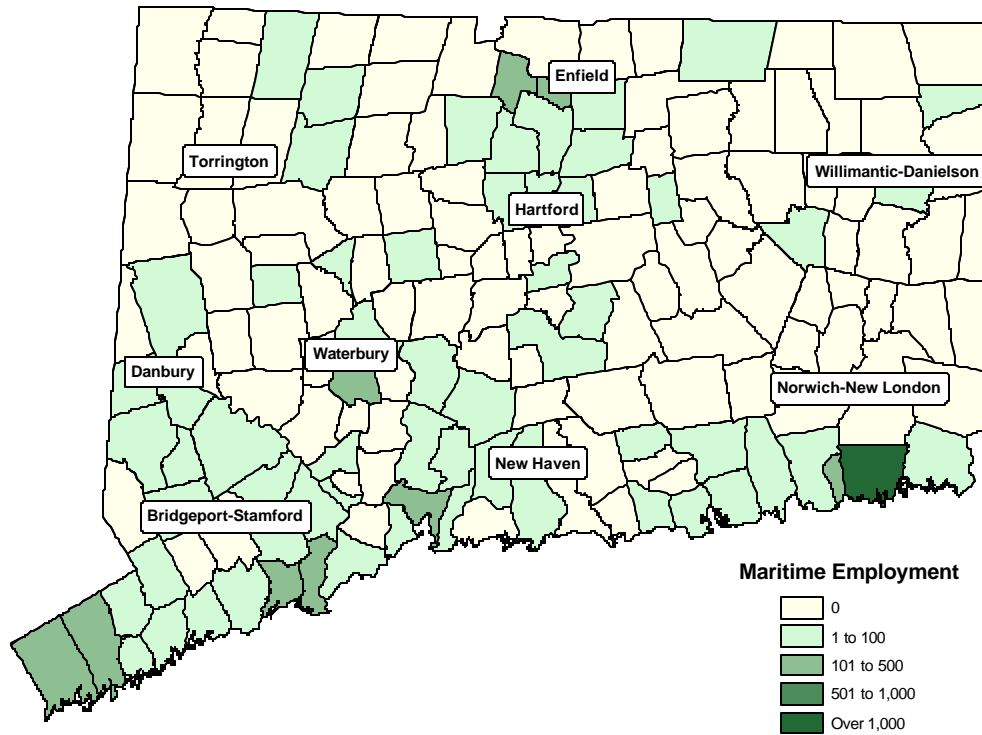
| | |
|--|-----------------|
| Employer Units | 248 |
| Net Change in Employer Units (2000-04) | -20 |
| Percent Change in Employer Units (2000-04) ... | -7.5% |
| Number of Jobs | 10,974 |
| Percentage of Total CT Employment | 0.7% |
| Net Change in Job Volume (2000-04) | 825 |
| Percent Change in Job Volume (2000-04) | 8.1% |
| Average Annual Wage | \$75,243 |
| Net Change in Wage (2000-04) | \$17,203 |
| Percent Change in Wage (2000-04) | 29.6% |
| Location Quotient (2003) | 1.69 |
| Percent Change from 2000 Location Quotient . | 14.5% |

Top 5 Industries - 2004:

| | |
|--|--------------------------------------|
| Ship Building and Repairing | 93.3% of Cluster Jobs |
| Freight Transportation Arrangement | |
| Deep Sea Freight Transportation | |
| Coastal and Great Lakes Freight Transportation | |
| Marine Cargo Handling | |

Cluster Employment by Labor Market Area - 2004:

MARITIME

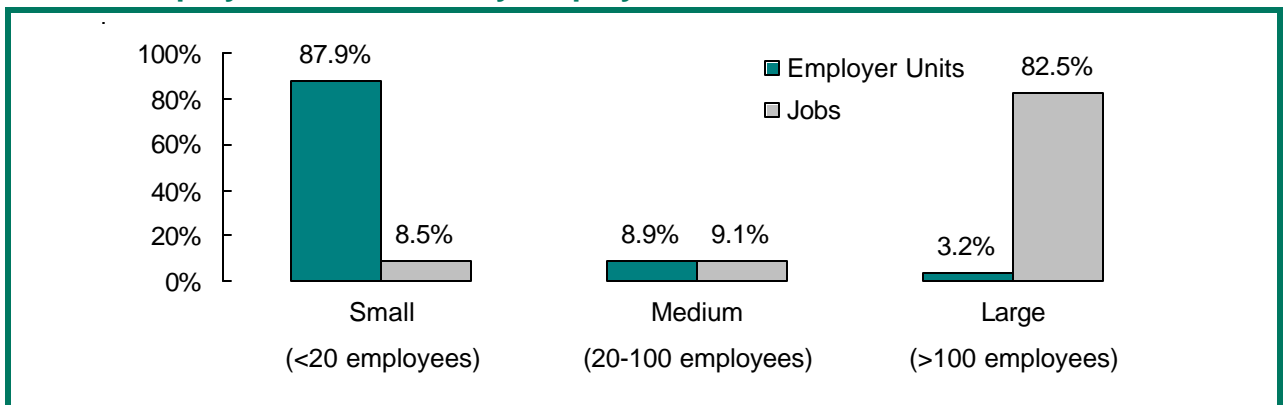


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|-------|---|----------|------------------|
| 3366 | Ship and Boat Building | 3.46 | 18.6 |
| 4831 | Deep Sea, Coastal, and Great Lakes Water Transportation | 2.08 | 14.0 |
| 4885 | Freight Transportation Arrangement | 0.74 | 18.8 |
| 4883 | Support Activities for Water Transportation | 0.40 | 5.5 |
| 4832 | Inland Water Transportation | 0.28 | 11.5 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:

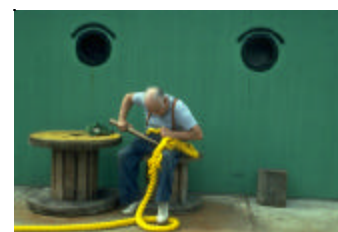


Top Cluster Occupations, 2002:

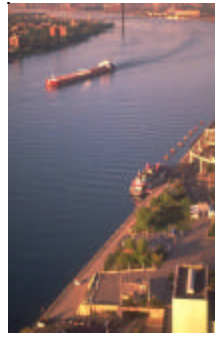
| Occupation | Annual Wage | Number of Jobs |
|---|-------------|----------------|
| Mechanical Engineers | \$66,950 | 1313 |
| Mechanical Drafters | \$46,140 | 783 |
| First-Line Supervisors/Managers of Production and Operating Workers | \$56,390 | 397 |
| Mechanical Engineering Technicians | \$43,800 | 333 |
| Engineering Managers | \$103,980 | 320 |
| Plumbers, Pipefitters, and Steamfitters | \$46,370 | 309 |
| Production, Planning, and Expediting Clerks | \$40,070 | 249 |
| Machinists | \$36,310 | 224 |
| Carpenters | \$42,980 | 214 |
| Cargo and Freight Agents | \$50,220 | 206 |

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| Mechanical Engineers | 61 | 4.7 | 42 |
| Mechanical Drafters | -7 | -0.9 | 22 |
| Mechanical Engineering Technicians | 89 | 26.7 | 16 |
| Cargo and Freight Agents | 63 | 30.6 | 11 |
| Plumbers, Pipefitters, and Steamfitters | 41 | 13.3 | 11 |
| Engineering Managers | 43 | 13.4 | 11 |
| Production, Planning, and Expediting Clerks | 36 | 14.5 | 10 |
| Sailors and Marine Oilers | 35 | 22.3 | 9 |
| Machinists | 40 | 17.9 | 9 |
| First-Line Supervisors/Managers of Production and Operating Workers | 5 | 1.3 | 9 |



MARITIME



MARITIME



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Mechanical Engineering Technicians | 89 | 26.7 | 16 |
| Cargo and Freight Agents | 63 | 30.6 | 11 |
| Mechanical Engineers | 61 | 4.7 | 42 |
| Sales and Related Workers | 57 | 50.4 | 8 |
| Truck Drivers, Heavy and Tractor-Trailer | 54 | 63.5 | 7 |
| Drafters, Engineering, and Mapping Technicians | 48 | 34.5 | 8 |
| Bookkeeping, Accounting, and Auditing Clerks | 47 | 23.7 | 8 |
| Engineering Managers | 43 | 13.4 | 11 |
| Plumbers, Pipefitters, and Steamfitters | 41 | 13.3 | 11 |
| Machinists | 40 | 17.9 | 9 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Truck Drivers, Heavy and Tractor-Trailer | 54 | 63.5 | 7 |
| Securities, Commodities, and Financial Services Sales Agents | 25 | 55.6 | 3 |
| Sales and Related Workers | 57 | 50.4 | 8 |
| Transportation, Storage, and Distribution Managers | 22 | 44.0 | 3 |
| Industrial Truck and Tractor Operators | 25 | 37.3 | 4 |
| Business Operations Specialists | 34 | 35.1 | 5 |
| Customer Service Representatives | 28 | 34.6 | 4 |
| Drafters, Engineering, and Mapping Technicians | 48 | 34.5 | 8 |
| Office Clerks, General | 34 | 34.3 | 6 |
| Reservation and Transportation Ticket Agents and Travel Clerks | 31 | 34.1 | 5 |

METAL MANUFACTURING

Definition:

Industries in the metal manufacturing subsector smelt and/or refine ferrous and nonferrous metals from ore, pig, or scrap. Establishments may manufacture metal alloys and superalloys by introducing other chemical elements to pure metals. The output of smelting and refining, usually in ingot form, is used in rolling, drawing and extruding operations to make sheet, strip, bar, rod, or wire, and in molten form to make castings and other basic metal products. Industries in the fabricated metal products manufacturing subsector transform metal into intermediate or end products, other than machinery, computers and electronics, and metal furniture. Key fabricated metal manufacturing processes are forging, stamping, bending, forming, and machining, used to shape individual pieces of metal; welding and assembling.

Cluster Industries:

| NAICS | Description |
|--------|--|
| 331 | Primary Metal Manufacturing |
| 332 | Fabricated Metal Product Manufacturing |
| 333 | Machinery Manufacturing |
| 337124 | Metal Household Furniture Manufacturing |
| 33991 | Jewelry and Silverware Manufacturing |
| 423510 | Metal Service Centers and other Metal Merchant Wholesalers |

Key Statistics - 2004:

| | |
|---|-----------------|
| Employer Units | 2,244 |
| Net Change in Employer Units (2000-04) | -226 |
| Percent Change in Employer Units (2000-04) | -9.1% |
| Number of Jobs | 58,869 |
| Percentage of Total CT Employment | 3.6% |
| Net Change in Job Volume (2000-04) | -13,837 |
| Percent Change in Job Volume (2000-04) | -19.0% |
| Average Annual Wage | \$55,440 |
| Net Change in Wage (2000-04) | \$7,699 |
| Percent Change in Wage (2000-04) | 16.1% |
| Location Quotient (2003) | 1.36 |
| Percent Change from 2000 Location Quotient | 1.3% |

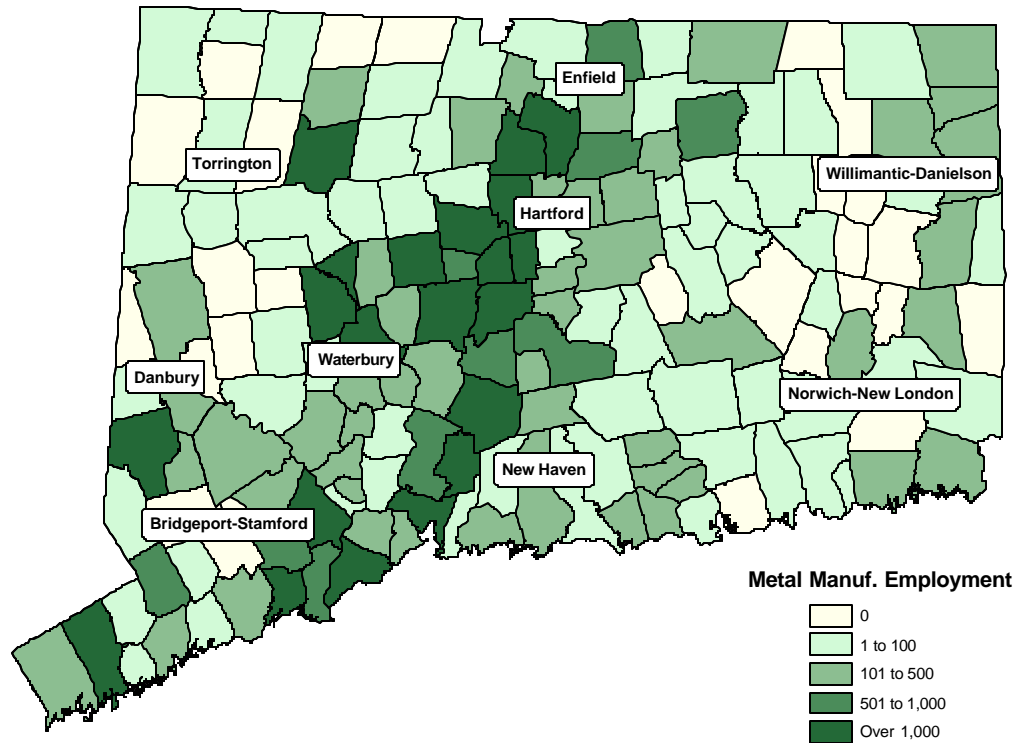
Top 5 Industries - 2004:

Machine Shops
 Metal Stamping
 Office Machinery Manufacturing
 Precision Turned Product Manufacturing
 Hardware Manufacturing

28.0% of
 Cluster
 Jobs

Cluster Employment by Labor Market Area - 2004:

METAL MANUFACTURING

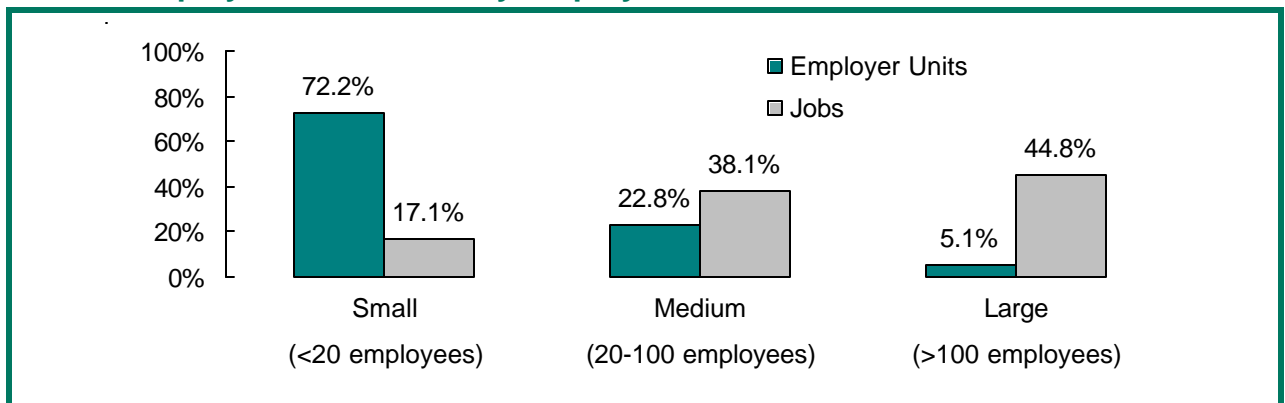


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|--------|--|----------|------------------|
| 332 | Fabricated Metal Product Manufacturing | 1.70 | 0.0 |
| 333 | Machinery Manufacturing | 1.23 | 1.1 |
| 33991 | Jewelry and Silverware Manufacturing | 0.96 | 9.1 |
| 423510 | Metal Service Centers and Other Metal Merchant Wholesalers | 0.85 | 15.5 |
| 331 | Primary Metal Manufacturing | 0.78 | -2.8 |
| 337124 | Metal Household Furniture Manufacturing | 0.14 | 89.7 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

| Occupation | Annual Wage | Number of Jobs |
|--|-------------|----------------|
| Machinists | \$36,310 | 3991 |
| Team Assemblers | \$27,310 | 3314 |
| Cutting, Punching, and Press Machine Setters, Operators, and Tenders | \$29,870 | 2777 |
| First-Line Supervisors/Managers of Production and Operating Workers | \$56,390 | 2482 |
| Tool and Die Makers | \$46,700 | 1795 |
| Inspectors, Testers, Sorters, Samplers, and Weighers | \$33,280 | 1732 |
| Grinding, Lapping, Polishing, & Buffing Machine Tool Setters, Operators, & Tenders | \$29,460 | 1390 |
| Shipping, Receiving, and Traffic Clerks | \$28,480 | 1273 |
| Mechanical Engineers | \$66,950 | 1128 |
| Assemblers and Fabricators | \$23,920 | 1113 |

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Machinists | -601 | -15.1 | 93 |
| Team Assemblers | -713 | -21.5 | 86 |
| Cutting, Punching, and Press Machine Setters, Operators, and Tenders | -438 | -15.8 | 64 |
| First-Line Supervisors/Managers of Production and Operating Workers | -181 | -7.3 | 52 |
| Tool and Die Makers | -317 | -17.7 | 40 |
| Inspectors, Testers, Sorters, Samplers, and Weighers | -207 | -12.0 | 39 |
| Mechanical Engineers | -168 | -14.9 | 31 |
| Welders, Cutters, Solderers, and Brazers | -109 | -10.4 | 30 |
| Assemblers and Fabricators | -259 | -23.3 | 29 |
| Laborers and Freight, Stock, and Material Movers, Hand | -243 | -27.6 | 29 |



METAL MANUFACTURING



METAL MANUFACTURING



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Business Operations Specialists | 13.9 | 6.5 | 5 |
| Network Systems and Data Communications Analysts | 8 | 22.5 | 1 |
| Computer Systems Analysts | 6 | 7.8 | 2 |
| Computer Software Engineers, Applications | 3 | 2.0 | 4 |
| Electricians | 3 | 1.7 | 4 |
| Aircraft Mechanics and Service Technicians | 2 | 1.8 | 1 |
| Environmental Science and Protection Technicians, Including Health | 2 | 15.4 | 1 |
| Environmental Engineers | 1 | 10.0 | 1 |
| Aerospace Engineers | 1 | 2.2 | 1 |
| Aircraft Structure, Surfaces, Rigging, and Systems Assemblers | 1 | 6.7 | 2 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Computer Systems Analysts | 8 | 7.8 | 2 |
| Business Operations Specialists | 13 | 6.5 | 5 |
| Computer Software Engineers, Applications | 6 | 2.0 | 4 |
| Aircraft Mechanics and Service Technicians | 3 | 1.8 | 4 |
| Electricians | 3 | 1.7 | 4 |
| Computer Software Engineers, Systems Software | 1 | 0.7 | 2 |
| Drafters, Engineering, and Mapping Technicians | -1 | -1.2 | 2 |
| Management Analysts | -2 | -1.4 | 2 |
| Sales Managers | -6 | -2.7 | 4 |
| Network and Computer Systems Administrators | -3 | -3.2 | 1 |

PLASTICS

Definition:

Industries in the plastics and rubber products manufacturing subsector make goods by processing plastics materials and raw rubber. The core technology employed by establishments in this subsector is that of plastics or rubber product production. Plastics and rubber are combined in the same subsector because plastics are increasingly being used as a substitute for rubber. Many manufacturing activities use plastics or rubber, for example, in the manufacturing of footwear, or furniture. Typically, the production process of these products involves more than one material. In these cases, technologies that allow disparate materials to be formed and combined are of central importance in describing the manufacturing activity.

Cluster Industries:

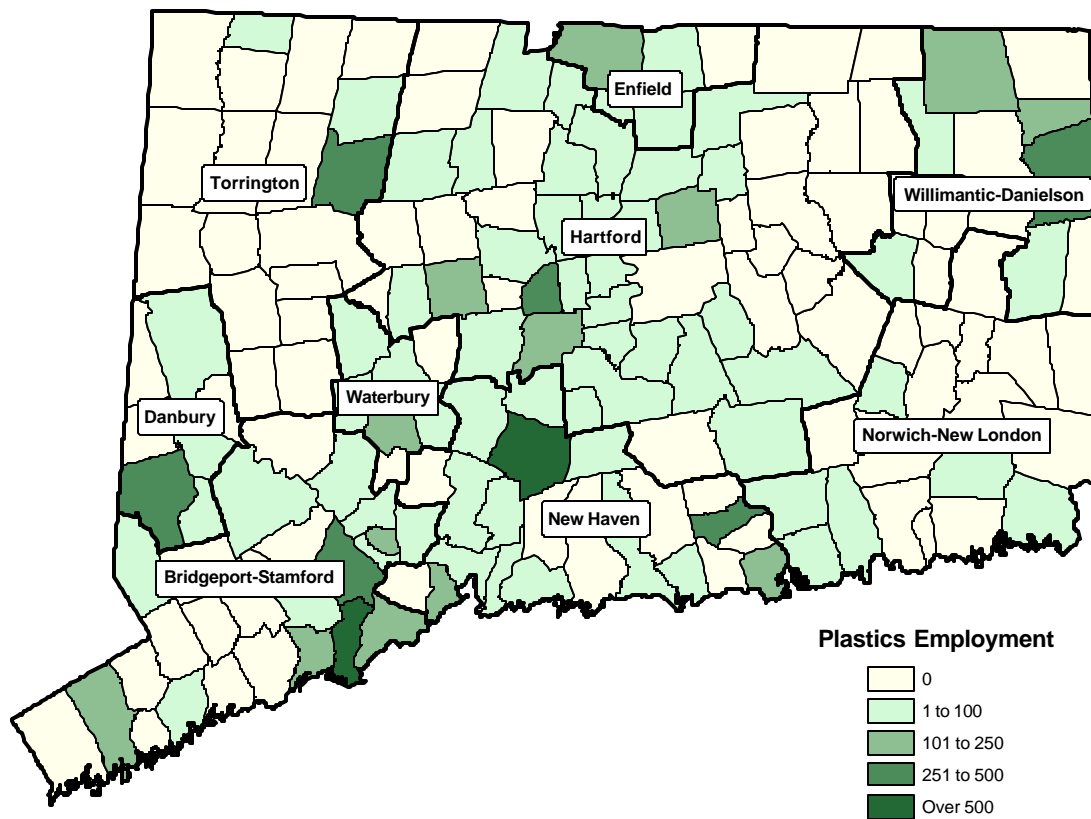
| NAICS | Description |
|--------|---|
| 325211 | Plastics Material and Resin Manufacturing |
| 3261 | Plastics Product Manufacturing |
| 326220 | Rubber and Plastics Hoses and Belting Manufacturing |

Key Statistics - 2004:

| | |
|--|-----------------|
| Employer Units | 213 |
| Net Change in Employer Units (2000-04) | -20 |
| Percent Change in Employer Units (2000-04) ... | -8.6% |
| Number of Jobs | 7,585 |
| Percentage of Total CT Employment | 0.5% |
| Net Change in Job Volume (2000-04) | -864 |
| Percent Change in Job Volume (2000-04) | -10.2% |
| Average Annual Wage | \$47,981 |
| Net Change in Wage (2000-04) | \$5,306 |
| Percent Change in Wage (2000-04) | 12.4% |
| Location Quotient (2003) | 0.83 |
| Percent Change from 2000 Location Quotient . | 10.7% |

Top 5 Industries - 2004:

| | |
|--|--------------------------------------|
| Plastics Material and Resin Manufacturing | 80.3% of Cluster Jobs |
| Nonpackaging Plastics Film and Sheet Manufacturing | |
| Plastics Bottle Manufacturing | |
| Plastics Plumbing Fixture Manufacturing | |
| All Other Plastics Product Manufacturing | |

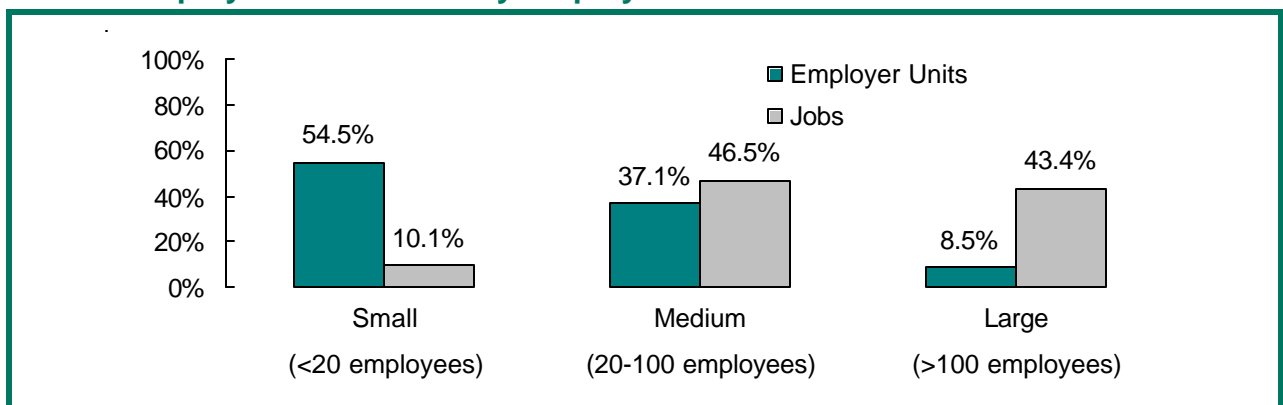


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|--------|---|----------|------------------|
| 325211 | Plastics Material and Resin Manufacturing | 1.19 | 10.7 |
| 3261 | Plastics Product Manufacturing | 0.81 | -1.3 |
| 326220 | Rubber and Plastics Hoses and Belting Manufacturing | 0.55 | -2.6 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

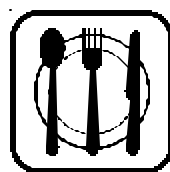
| Occupation | Annual Wage | Number of Jobs |
|--|-------------|----------------|
| Molding, Coremaking, & Casting Machine Setters, Operators, & Tenders | \$27,110 | 824 |
| Team Assemblers | \$27,310 | 467 |
| Packers and Packagers, Hand | \$20,350 | 422 |
| First-Line Supervisors/Managers of Production and Operating Workers | \$56,390 | 328 |
| Computer-Controlled Machine Tool Operators | \$36,450 | 252 |
| Inspectors, Testers, Sorters, Samplers, and Weighers | \$33,280 | 251 |
| Cutting, Punching, & Press Machine Setters, Operators, and Tenders | \$29,870 | 230 |
| Packaging and Filling Machine Operators and Tenders | \$25,020 | 198 |
| Laborers and Freight, Stock, and Material Movers, Hand | \$26,190 | 172 |
| Shipping, Receiving, and Traffic Clerks | \$28,480 | 164 |

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

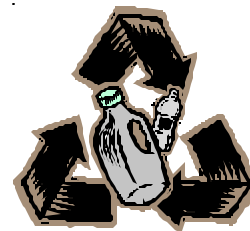
| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Molding, Coremaking, & Casting Machine Setters, Operators, & Tenders | -77 | -9.3 | 20 |
| Team Assemblers | -90 | -19.3 | 12 |
| Packers and Packagers, Hand | -53 | -12.6 | 8 |
| First-Line Supervisors/Managers of Production and Operating Workers | 2 | 0.6 | 7 |
| Inspectors, Testers, Sorters, Samplers, and Weighers | -32 | -12.8 | 6 |
| Laborers and Freight, Stock, and Material Movers, Hand | -29 | -16.9 | 6 |
| Cutting, Punching, & Press Machine Setters, Operators, and Tenders | -21 | -9.1 | 5 |
| Computer-Controlled Machine Tool Operators | -15 | -6.0 | 4 |
| Packaging and Filling Machine Operators and Tenders | 2 | 1.0 | 4 |
| Helpers - Production Workers | -12 | -9.2 | 4 |



PLASTICS



PLASTICS



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| First-Line Supervisors/Managers of Production and Operating Workers | 2 | 0.6 | 7 |
| Chemical Technicians | 2 | 9.5 | 1 |
| Packaging and Filling Machine Operators and Tenders | 2 | 1.0 | 4 |
| Coating, Painting, and Spraying Machine Setters, Operators, and Tenders | 2 | 1.7 | 3 |
| Business Operations Specialists | 2 | 20.0 | 0 |
| Maintenance and Repair Workers, General | 2 | 1.6 | 3 |
| Sales Representatives, Wholesale & Mfg., Excl. Tech. & Sci. Products | 2 | 2.1 | 3 |
| Truck Drivers, Heavy and Tractor-Trailer | 2 | 7.7 | 1 |
| Sales Managers | 2 | 9.1 | 1 |
| Chemical Equipment Operators and Tenders | 1 | 8.3 | 0 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|------------|-----------------|
| Sales Representatives, Wholesale and Mfg., Excl. Tech. & Sci. Products | 2 | 2.1 | 3 |
| Cutters and Trimmers, Hand | 1 | 1.7 | 1 |
| Coating, Painting, and Spraying Machine Setters, Operators, and Tenders | 2 | 1.7 | 3 |
| Maintenance and Repair Workers, General | 2 | 1.6 | 3 |
| Customer Service Representatives | 1 | 1.5 | 1 |
| Industrial Production Managers | 1 | 1.1 | 2 |
| Packaging and Filling Machine Operators and Tenders | 2 | 1.0 | 4 |
| First-Line Supervisors/Managers of Production and Operating Workers | 2 | 0.6 | 7 |
| Cutting and Slicing Machine Setters, Operators, and Tenders | 0 | 0.0 | 1 |
| Separating, Filtering, Clarifying, Precipitating, & Still Machine Setters, Operators, and Tenders | 0 | 0.0 | 2 |

SOFTWARE & INFORMATION TECHNOLOGY

Definition:

The representative organization for this cluster has defined the long-term goal of this cluster as to strengthen the Internet, e-commerce, and software companies in Connecticut. From this goal, one can infer that the cluster is defined as those industries that supply, manufacture, utilize, and distribute software, telecommunications infrastructure and networking hardware, and Internet-only related commerce. Internet-only related commerce does not include brick-and-mortar companies that have the option of purchasing items through an on-line web site. This only includes such companies as e-Bay or Amazon.com, for those brick-and-mortar institutions are most likely classified in separate industries, and to count them as being a part of this cluster would be to highly overestimate the true employment situation.

Cluster Industries:

| NAICS | Description |
|--------|--|
| 3341 | Computer and Peripheral Equipment Manufacturing |
| 3344 | Semiconductor and other Electronic Component Manufacturing |
| 334611 | Software Reproducing |
| 334613 | Magnetic and Optical Recording Media Manufacturing |
| 423430 | Computer and Computer Peripheral Equipment and Software Merchant Wholesalers |
| 425110 | Business to Business Electronic Markets |
| 443120 | Computer and Software Stores (retail) |
| 454111 | Electronic Shopping |
| 454112 | Electronic Auctions |
| 5112 | Software Publishers |
| 518 | Internet Service Providers, Web Search Portals, & Data Processing Svcs. |
| 5415 | Computer Systems Design and Related Services |
| 611420 | Computer Training |

Key Statistics - 2004:

| | |
|---|-----------------|
| Employer Units | 3,502 |
| Net Change in Employer Units (2000-04) | -758 |
| Percent Change in Employer Units (2000-04) . | -17.8% |
| Number of Jobs | 35,036 |
| Percentage of Total CT Employment | 2.1% |
| Net Change in Job Volume (2000-04) | -11,951 |
| Percent Change in Job Volume (2000-04) | -25.4% |
| Average Annual Wage | \$80,576 |
| Net Change in Wage (2000-04) | -\$6,218 |
| Percent Change in Wage (2000-04) | -7.2% |
| Location Quotient (2003) | 0.91 |
| Percent Change from 2000 Location Quotient .. | -3.5% |

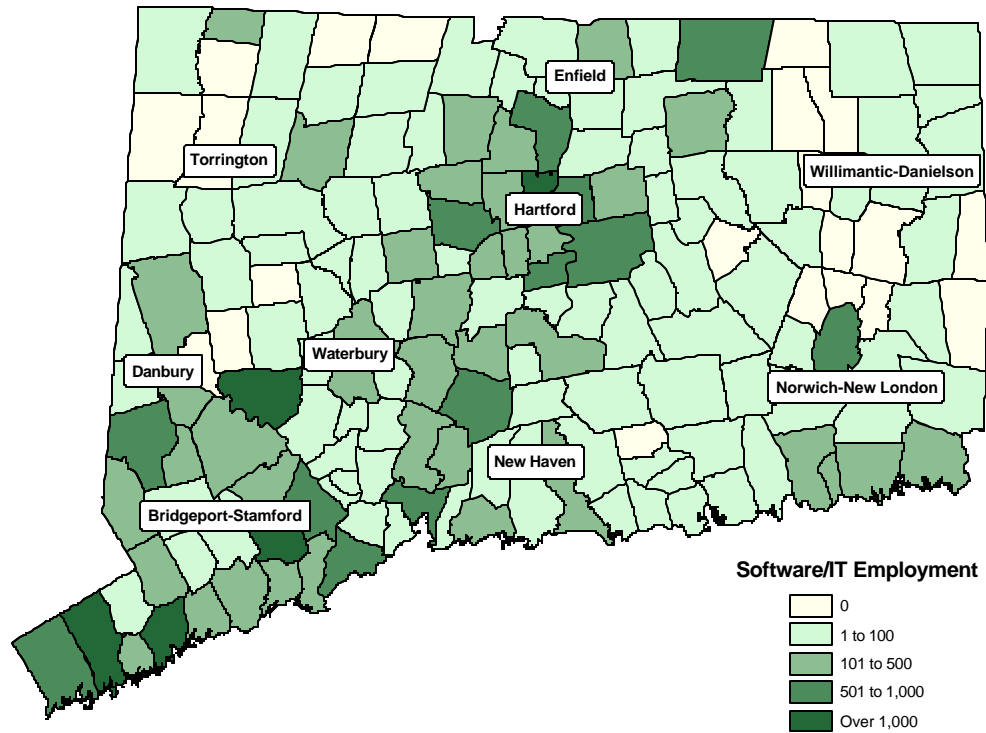
Top 5 Industries - 2004:

Computer Systems Design Services
 Custom Computer Programming Services
 Data Processing and Related Services
 Computer Facilities Management Services
 Computer and Software Stores

62.4% of
 Cluster
 Jobs

Cluster Employment by Labor Market Area - 2004:

SOFTWARE & INFO. TECHNOLOGY

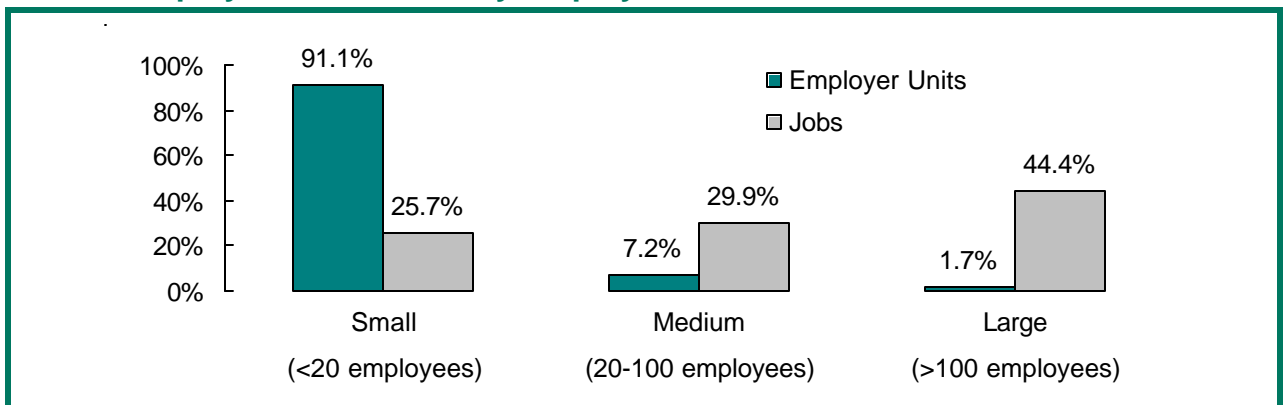


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|--------|---|----------|------------------|
| 454112 | Electronic Auctions | 5.48 | 49.7 |
| 454111 | Electronic Shopping | 1.86 | -8.3 |
| 5415 | Computer Systems Design and Related Services | 1.25 | -6.3 |
| 443120 | Computer and Software Stores | 0.91 | -6.8 |
| 611420 | Computer Training | 0.83 | 35.1 |
| 518 | Internet Service Providers, Web Search Portals, and Data Processing Svcs. | 0.82 | 0.7 |
| 3344 | Semiconductor & Other Electronic Component Manufacturing | 0.80 | 3.0 |
| 423430 | Computer & Computer Peripheral Equip. & Software Merchant Wholesalers | 0.58 | 20.1 |
| 334613 | Magnetic and Optical Recording Media Manufacturing | 0.55 | 8.2 |
| 5112 | Software Publishers | 0.53 | 18.5 |
| 425110 | Business to Business Electronic Markets | 0.52 | 5.9 |
| 3341 | Computer and Peripheral Equipment Manufacturing | 0.26 | 13.6 |
| 334611 | Software Reproducing | 0.03 | 88.5 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

| Occupation | Annual Wage | Number of Jobs |
|--|-------------|----------------|
| Sales Representatives, Wholesale and Mfg., Excl. Tech. & Sci. Products | \$70,590 | 4127 |
| Computer Software Engineers, Applications | \$74,820 | 3045 |
| Computer Programmers | \$72,520 | 3041 |
| Computer Systems Analysts | \$70,650 | 2089 |
| Computer Support Specialists | \$45,700 | 1995 |
| Sales Representatives, Wholesale and Mfg., Tech. & Sci. Products | \$79,750 | 1906 |
| General and Operations Managers | \$125,150 | 1252 |
| Computer Software Engineers, Systems Software | \$77,590 | 1130 |
| Customer Service Representatives | \$32,870 | 1123 |
| Electrical and Electronic Equipment Assemblers | \$26,900 | 1008 |

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Sales Representatives, Wholesale and Mfg., Excl. Tech. & Sci. Products | 511 | 12.4 | 159 |
| Computer Software Engineers, Applications | 1231 | 40.4 | 153 |
| Computer Systems Analysts | 927 | 44.4 | 116 |
| Computer Programmers | 342 | 11.3 | 106 |
| Computer Support Specialists | 586 | 29.4 | 83 |
| Computer Software Engineers, Systems Software | 609 | 53.9 | 72 |
| Sales Representatives, Wholesale and Mfg., Tech. & Sci. Products | 213 | 11.2 | 71 |
| Computer and Information Systems Managers | 393 | 40.6 | 57 |
| General and Operations Managers | 228 | 18.2 | 46 |
| Customer Service Representatives | 247 | 22.0 | 41 |



SOFTWARE & INFORMATION TECHNOLOGY



SOFTWARE & INFORMATION TECHNOLOGY



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Computer Software Engineers, Applications | 1231 | 40.4 | 153 |
| Computer Systems Analysts | 927 | 44.4 | 116 |
| Computer Software Engineers, Systems Software | 609 | 53.9 | 72 |
| Computer Support Specialists | 586 | 29.4 | 83 |
| Sales Representatives, Wholesale and Mfg., Excl. Tech. & Sci. Products | 511 | 12.4 | 159 |
| Computer and Information Systems Managers | 393 | 40.6 | 57 |
| Computer Programmers | 342 | 11.3 | 106 |
| Database Administrators | 313 | 43.7 | 39 |
| Network and Computer Systems Administrators | 285 | 37.3 | 37 |
| Customer Service Representatives | 247 | 22.0 | 41 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|-------------|-----------------|
| Network Systems and Data Communications Analysts | 231 | 58.5 | 28 |
| Computer Software Engineers, Systems Software | 609 | 53.9 | 72 |
| Surveying and Mapping Technicians | 33 | 45.2 | 6 |
| Computer Systems Analysts | 927 | 44.4 | 116 |
| Database Administrators | 313 | 43.7 | 39 |
| Management Analysts | 159 | 42.3 | 21 |
| Computer and Information Systems Managers | 393 | 40.6 | 57 |
| Computer Software Engineers, Applications | 1231 | 40.4 | 153 |
| Computer Specialists, All Other | 166 | 39.1 | 21 |
| Network and Computer Systems Administrators | 285 | 37.3 | 37 |

TOURISM

This subsector of the Arts, Entertainment, and Recreation sector comprises (1) establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) establishments that preserve and exhibit objects and sites of historical, cultural, or educational interest; and (3) establishments that operate facilities or provide services that enable patrons to participate in amusement or recreational activities, or pursue hobby, and leisure-time interests. Some establishments that provide such services are classified in other sectors (e.g. Accommodation - *hotels, resorts, casinos, etc.*; and Food Services and Drinking Places - *restaurants and night clubs providing live entertainment*). Establishments using transportation equipment to provide recreational and entertainment services, such as those operating sightseeing buses, are classified in the Scenic and Sightseeing Transportation sector.

Cluster Industries:

| NAICS | Description |
|--------|--|
| 71 | Arts, Entertainment, and Recreation |
| 7211 | Traveler Accommodation |
| 7212 | RV (Recreational Vehicle) Parks and Recreational Camps |
| 481111 | Scheduled Passenger Air Transportation |
| 481211 | Nonscheduled Chartered Passenger Air Transportation |
| 482111 | Line-Haul Railroads |
| 487 | Scenic and Sightseeing Transportation |
| 532111 | Passenger Car Rental |
| 532292 | Recreational Goods Rental |
| 561510 | Travel Agencies |
| 561520 | Tour Operators |
| 561591 | Convention and Visitors Bureaus |
| 561599 | All Other Travel Arrangement and Reservation Services |

Key Statistics - 2004:

| | |
|--|-----------------|
| Employer Units | 2,759 |
| Net Change in Employer Units (2000-04) | 62 |
| Percent Change in Employer Units (2000-04) | 2.3% |
| Number of Jobs | 62,469 |
| Percentage of Total CT Employment | 3.8% |
| Net Change in Job Volume (2000-04) | 3,593 |
| Percent Change in Job Volume (2000-04) | 6.1% |
| Average Annual Wage | \$28,241 |
| Net Change in Wage (2000-04) | \$2,499 |
| Percent Change in Wage (2000-04) | 9.7% |
| Location Quotient (2003) | 0.97 |
| Percent Change from 2000 Location Quotient | 8.9% |

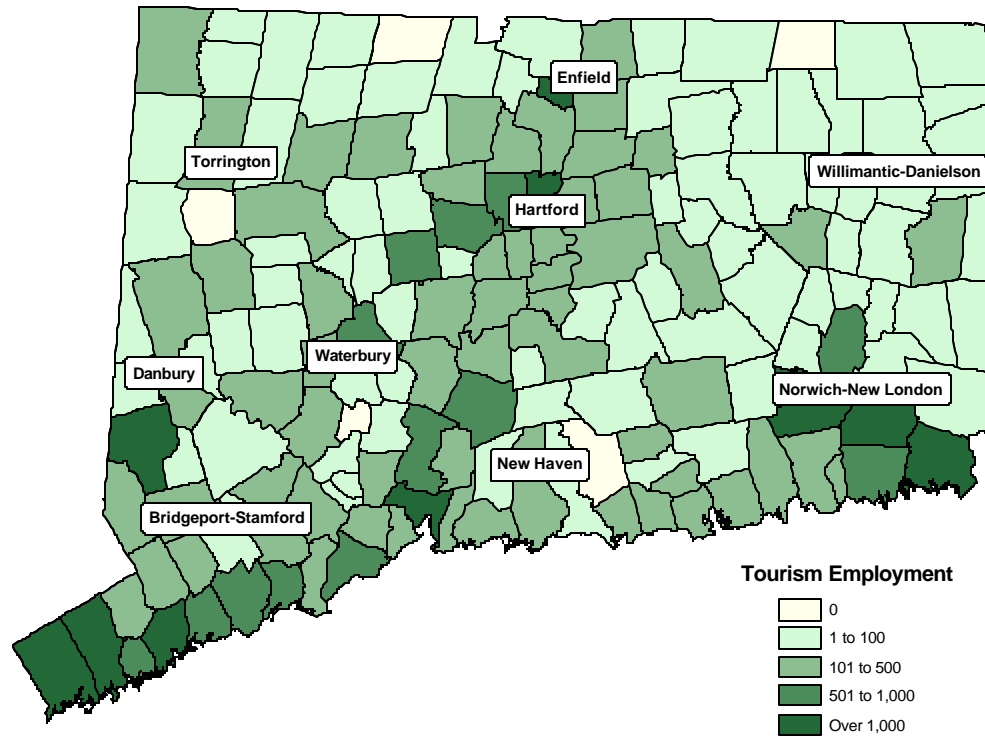
Top 5 Industries - 2004:

Casinos, except Casino Hotels
 Hotels and Motels, except Casino Hotels
 Fitness and Recreational Sports Centers
 Golf Courses and Country Clubs
 All Other Amusement and Recreation Industries

**73.6% of
Cluster
Jobs**

Cluster Employment by Labor Market Area - 2004:

TOURISM

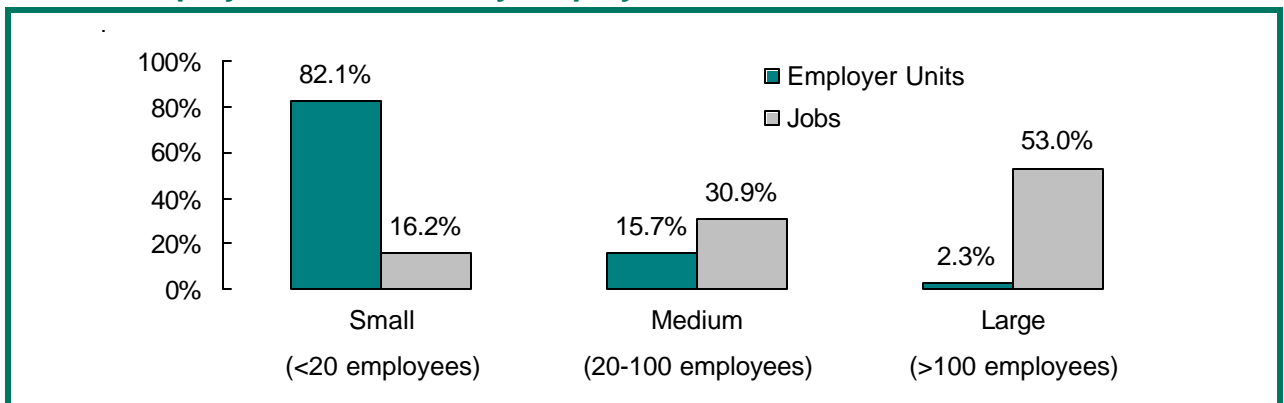


Cluster Employment Concentrations in Connecticut:

| NAICS | Industry | 2003 LQ* | % Change 2000-03 |
|--------|--|----------|------------------|
| 482111 | Line-Haul Railroads | 6.32 | 5.5 |
| 71 | Arts, Entertainment, and Recreation | 1.58 | 8.5 |
| 561520 | Tour Operators | 1.13 | -3.6 |
| 481211 | Nonscheduled Chartered Passenger Air Transportation | 1.13 | 70.9 |
| 7212 | RV (Recreational Vehicle) Parks and Recreational Camps | 1.11 | 7.3 |
| 561510 | Travel Agencies | 0.98 | 20.7 |
| 561591 | Convention and Visitors Bureaus | 0.90 | 1.3 |
| 532111 | Passenger Car Rental | 0.70 | 7.7 |
| 561599 | All Other Travel Arrangement and Reservation Services | 0.55 | -8.0 |
| 487 | Scenic and Sightseeing Transportation | 0.54 | 18.1 |
| 7211 | Traveler Accommodation | 0.46 | 1.1 |
| 481111 | Scheduled Passenger Air Transportation | 0.20 | 13.8 |
| 532292 | Recreational Goods Rental | 0.20 | 50.1 |

* LQ - Location Quotients relative to the U.S.

Cluster Employment and Jobs by Employer Size - December 2004:



Top Cluster Occupations, 2002:

| Occupation | Annual Wage | Number of Jobs |
|--|-------------|----------------|
| Waiters and Waitresses | \$18,030 | 3735 |
| Gaming Dealers | ----- | 3529 |
| Maids and Housekeeping Cleaners | \$20,570 | 2741 |
| Landscaping and Groundskeeping Workers | \$26,380 | 2048 |
| Fitness Trainers and Aerobics Instructors | \$39,820 | 1858 |
| Janitors and Cleaners, Excl. Maids and Housekeeping Cleaners | \$23,900 | 1784 |
| Amusement and Recreation Attendants | \$20,230 | 1730 |
| Travel Agents | \$33,260 | 1485 |
| Bartenders | \$18,550 | 1405 |
| Gaming Change Persons and Booth Cashiers | ----- | 1393 |

----- Wages for this occupation are not available.

Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Waiters and Waitresses | 728 | 19.5 | 265 |
| Gaming Dealers | 993 | 28.1 | 211 |
| Maids and Housekeeping Cleaners | 722 | 26.3 | 130 |
| Amusement and Recreation Attendants | 671 | 38.8 | 117 |
| Gaming Change Persons and Booth Cashiers | 402 | 28.9 | 108 |
| Fitness Trainers and Aerobics Instructors | 562 | 30.3 | 99 |
| Hotel, Motel, and Resort Desk Clerks | 421 | 34.1 | 98 |
| Landscaping and Groundskeeping Workers | 477 | 23.3 | 92 |
| Gaming Workers | 362 | 27.9 | 76 |
| Janitors and Cleaners, Excl. Maids and Housekeeping Cleaners | 385 | 21.6 | 72 |



TOURISM



TOURISM



Top Cluster Occupations - MOST NEW JOBS, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|--|--------------|------------|-----------------|
| Gaming Dealers | 993 | 28.1 | 211 |
| Waiters and Waitresses | 728 | 19.5 | 265 |
| Maids and Housekeeping Cleaners | 722 | 26.3 | 130 |
| Amusement and Recreation Attendants | 671 | 38.8 | 117 |
| Fitness Trainers and Aerobics Instructors | 562 | 30.3 | 99 |
| Landscaping and Groundskeeping Workers | 477 | 23.3 | 92 |
| Hotel, Motel, and Resort Desk Clerks | 421 | 34.1 | 98 |
| Gaming Change Persons and Booth Cashiers | 402 | 28.9 | 108 |
| Janitors and Cleaners, Excl. Maids and Housekeeping Cleaners | 385 | 21.6 | 72 |
| Gaming Workers | 362 | 27.9 | 76 |

Top Cluster Occupations - FASTEST GROWING, 2002-2012:

| Occupation | Net Increase | % Increase | Annual Openings |
|---|--------------|-------------|-----------------|
| Coin, Vending, and Amusement Machine Servicers and Repairers | 201 | 56.3 | 29 |
| Combined Food Preparation and Serving Workers, Incl. Fast Food | 243 | 51.5 | 45 |
| Heating, Air Conditioning, and Refrigeration Mechanics and Installers | 26 | 41.9 | 3 |
| Self-Enrichment Education Teachers | 120 | 40.4 | 16 |
| Amusement and Recreation Attendants | 671 | 38.8 | 117 |
| Agents and Business Managers of Artists, Performers, and Athletes | 35 | 38.0 | 5 |
| Electricians | 22 | 37.9 | 3 |
| Actors | 67 | 37.2 | 9 |
| Maintenance and Repair Workers, General | 285 | 37.0 | 43 |
| Manicurists and Pedicurists | 19 | 36.5 | 3 |

APPENDIX A

About Industry Clusters

Dr. Michael Porter (Harvard Business School) defines industry clusters as “*geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region.*” Others have cited Porter as saying that clusters are “geographically proximate groups of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities.” Porter extends work on supply-side economies of scale by arguing that clusters can also develop because: (1) a sophisticated and demanding local consumer base positions the core industry to be competitive outside of the region, and (2) competition among firms can encourage the type of cooperation leading to innovation. Most importantly, these ideas of Porter’s establish the counter-intuitive strategy for global expansion, that geographic aggregation of vertical and horizontal production processes can be more effective than multinational production processes.

Supply-driven Clusters

From Alfred Marshall on, economic theory, and particularly, the Regional and Urban literature, has focused more, though not exclusively, on the supply conditions that motivate firms in the same, or similar, industries to cluster in the same geographic location. External economies of scale, or economies external to the firm and internal to an industry, result in reduced costs for local-area firms. This gives rise to a particularly spatial dimension to reducing costs per-unit known as agglomeration economies. There are three principal sources of agglomeration economies identified in the literature: (1) a local skilled-labor pool; (2) specialized suppliers; and (3) information or knowledge spillovers.

The first of these sources of agglomeration is that of access to a local skilled labor pool. This localized pool of labor allows for agglomeration due to relatively lower labor costs and the ability to quickly hire employees in periods of rapidly increasing demand in the output markets. Labor costs are reduced due to two factors. The first is that of lower search and training costs of hiring new workers. With a localized pool of labor, the individual workers would have similar skill sets, and thus a firm would not have to expend large amounts of resources on training. The second factor that reduces labor costs is that of the wage paid to each worker. If firms were to locate at a relatively large distance from their labor base, then wages would need to be increased in proportion to the distance that the employee must travel in order to reach the firm’s destination.

The second source of agglomeration comes in the form of specialized suppliers. With many firms being located relatively close together, suppliers of the inputs to production will be able to provide for these firms at a relatively lower cost. This lower cost comes from a relatively large number of firms ordering supplies from relatively close suppliers. With suppliers receiving these orders, they would be able to reach a level of economies of scale that would allow per unit costs to decrease, thereby passing this lower per unit cost to their customer-firms. Since the suppliers are located close to the firms, transportation costs would be reduced. Again, suppliers would be able to pass this decreased cost to the firms.

The final source of agglomeration is that of knowledge, or informational, spillovers. These spillovers arise due to employees of geographically proximate, competing firms having contact, either formally, or informally, on a regular basis. These informal contacts facilitate the flow of tacit information. That is, pieces of information are exchanged. The more firms, and thus the more individuals in the informal network, the more complete the information is on current industry conditions. These informal contacts allow participants to remain abreast of the goings-on within their market, what new products are available to aid in the productivity of each worker, and other such knowledge. This increased access to knowledge will allow the workers of each firm to become more productive and offer a larger base for competition to arise.

All three of these sources of agglomeration would allow firms to reduce their input costs, reach external economies of scale, and bring these firms, geographically, together. The discussion of tacit information naturally leads to the consideration of the competitive environment among the firms located in the area, and the demand conditions fostered by such an environment. The discussion below now turns to Porter and his contributions to extending the firm-clustering idea beyond just the supply conditions, to focus on the competitive and demand conditions nurtured by the geographic clustering of firms in the same, or similar industries.

Demand-Driven Clusters

Supply-side economics does not provide a normative basis for much of the process of innovation. Product differentiation is an important component, whether the innovation improves the quality or functionality of the good demanded. To address this issue, Porter asserts that a sophisticated and demanding local consumer base positions the successful firm to expand outside the region. Additionally, he indicates that locally competitive firms can foster an environment of “cooperation and competition.” It is this environment that is the heart of Porter’s model of sustainable wealth creation, as the resulting innovation should increase the net exports of the firms.

A key component of these final sources of agglomeration are that competition may lead to cooperation in the form of the funding of infrastructure facilitating innovation, from which all benefit. Improvements from innovations in input (capital, labor and natural resource) markets, as well as distribution markets, allow all industry firms to become more competitive outside the local economy. Therefore, the economic effects of this cooperation materialize in the upstream or downstream part of the processes. Additionally, the additional knowledge base companies gain in clusters benefits the firms by increasing the demand for their products. These issues indicate the importance of clustering to foster the kind of innovations that allow firms to increase their levels of net exports.

APPENDIX B

Methodology

Data

In choosing which industrial codes were to be included in the various industry clusters within the state of Connecticut, the most recent version of the North American Industrial Classification System (NAICS) was utilized. The NAICS codes were implemented in order to replace the 1987 U.S. Standard Industrial Classification system. The NAICS codes were then revised and updated for the 2002 Economic Census that is conducted by the U.S. Bureau of the Census. This most recent industry classification system is the one utilized here. The data used in calculating the location quotients are the average monthly employment figures for 2003. The employment figures for the state of Connecticut were gathered from internal sources maintained by the Connecticut Department of Labor, and the U.S. employment figures were obtained from the U.S. Bureau of Labor Statistics. The employment figures used for the occupations are for the year 2002, the base year for the most recent set of projections, and 2012, the projection year. These were also gathered from internal sources maintained by the Connecticut Department of Labor. The occupational titles are those used within the Standard Occupational Classification (SOC) system.

Choosing the NAICS Industries

The industries were chosen through a four-stage process. Stage one consisted of the formation of a team of nine staff of the Connecticut Department of Labor's Office of Research, with each being assigned one of the nine industry clusters that are listed by the Connecticut Department of Economic and Community Development (DECD). Each individual then utilized his own knowledge of State industries, the NAICS classifications, and various other sources in order to develop an industry cluster profile based upon the NAICS codes. There was no uniform method to this development.

Stage two followed a process of comparison. Each industry cluster profile was then compared to those profiles that were developed by comparable studies around the United States. This was done in order to maintain some level of comparability and consistency. After conducting this comparison, a revision of the industry cluster profiles was completed. During this process, it was found that the clusters of various studies were, at times, defined differently than the way in which they were defined in Connecticut. Because of this, some codes that were in the profiles of other studies were not included within the profiles of this particular investigation, and vice versa.

Stage three followed a more uniform method. During this stage of the process, the industry clusters were verbally defined twice. The first verbal definitions were based upon qualitative economic theory and individual knowledge. The second set of definitions was based upon information gleaned from the DECD, the Governor's Competitiveness Council, and the representative cluster organizations. A second revision of the NAICS industries included in cluster profiles was implemented following the establishment of the final definitions.

One point is worth mentioning: Dr. Porter defined an industry cluster as being groupings of industries that are related. This can have a multitude of interpretations. It is possible to interpret this as having all related industries being grouped within a cluster (ex. 'logging' being included in the paper production industry cluster). The other extreme would be to include only those industries that conduct the same business within a cluster. The second revision of the cluster profiles maintained the former of the two. However, the related industries were not allowed to stray too far afield from the definitions given by the DECD, the Governor's Competitiveness Council, and the cluster representatives. For example, within the metal manufacturing industry, wholesalers were included. However, only wholesalers that dealt with purely metal manufactured products were included within the profile. As a result, there were many industries that were removed from the profiles in this revision, with some being placed in a category called Peripheral Industries, and the remainder being removed completely. The NAICS codes placed within the Peripheral Industries category were not included in any analyses.

During this revision process, the concept of mutual exclusivity was maintained. There is absolutely no replication of any NAICS code within any of the cluster profiles. This allows the employment figures gathered for the clusters to be summed by analysts and other data users without inflating the final metrics. Finally, one cannot choose NAICS codes based upon geographic proximity. This is dealt with and explained later.

During the first three stages of this process, very qualitative methods were utilized in choosing the NAICS codes that belonged in the industry cluster profiles. Precise methods and descriptive economic theory were used; however, there was no quantitative method of solidifying the choices made. During stage four of this process, more in-depth economic theory of clusters and quantitative methods were utilized in order to fortify and enhance the choices that were made for each profile.

In order to quantify these sources of agglomeration, employment concentrations were utilized. Using sources from the Connecticut Department of Labor, employment by labor market area (LMA) was obtained for each NAICS industry within the cluster profile. The industry employment was summed for all LMAs in order to obtain total State employment for the NAICS industry. The total employment of all NAICS industries in the cluster was then aggregated in order to obtain total cluster employment in the State. The total cluster employment for each LMA was then obtained. The latter was divided by the former, which yields the concentration of employment of each LMA relative to the total cluster employment in the State. These concentrations were then sorted from highest to lowest, and the top four LMA's in terms of employment concentration were obtained.

The top four LMA's of each NAICS industry were then compared to the top four LMA's for the cluster as a whole. As long as there was at least one LMA in the top four of a NAICS industry corresponding to the top four for the cluster as a whole, the NAICS code was chosen for inclusion within the industry cluster profile.

This process exhibits two of the three supply-side sources of agglomeration mentioned previously: *'access to a localized pool of labor and information spillovers.'* This is more readily seen through examining the definition of an LMA. An LMA is defined by the Bureau of Labor Statistics as *"an economically integrated geographic area within which individuals can reside and find employment within a reasonable distance or can readily change employment without changing their place of residence."* With residents residing within a reasonable distance of their place of work, it is readily apparent that firms are taking advantage of localized pools of labor. Individuals generally socialize with one another in events and areas in close proximity to their place of residence. This socialization allows for the knowledge spillovers that give rise to agglomeration.

Calculating Location Quotients

Location quotients (LQ's) are ratios that compare a local, or smaller economy, to a reference, or larger, economy. LQ's are used in order to examine whether or not there appears to be a local specialization within the smaller economy. Typically the LQ is used when comparing a state economy to that of the larger economy of the whole nation, which is the technique utilized within this particular investigation. For this analysis, LQ's were calculated for each cluster using the U.S. as a reference in order to see if Connecticut truly does have a specialization within that particular portion of the economy. In order to calculate these ratios, the following formula was used:

$$\text{LQ} = (e_i/n_t)/(E_i/N_t)$$

Where e_i is State employment in industry, i in time period t and n_t is total State employment in time period t . The capital letters E and N have the analogous interpretations at the country level as opposed to the State level.