

# 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 server room, and a person working at a computer workstation.



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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**July 2005**



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# Table of Contents

<b>INTRODUCTION</b> .....	<b>i</b>
---------------------------	----------

<b>Connecticut's Industry Clusters</b> .....	<b>1</b>
--	----------

<b>Cluster Employment Data (CT and U.S.)</b> .....	<b>2</b>
--	----------

<b>Location Quotients</b> .....	<b>3</b>
---------------------------------	----------

<b>Industry Cluster Occupations</b> .....	<b>4</b>
---	----------

<b>Connecticut's Industry Clusters and their Component Industries</b> .....	<b>5-6</b>
---	------------

## **INDUSTRY CLUSTER PROFILES**

<b>Aerospace</b> .....	<b>7-10</b>
------------------------	-------------

<b>Agriculture</b> .....	<b>11-14</b>
--------------------------	--------------

<b>Bioscience</b> .....	<b>15-18</b>
-------------------------	--------------

<b>Insurance and Financial Services</b> .....	<b>19-22</b>
---	--------------

<b>Maritime</b> .....	<b>23-26</b>
-----------------------	--------------

<b>Metal Manufacturing</b> .....	<b>27-30</b>
----------------------------------	--------------

<b>Plastics</b> .....	<b>31-34</b>
-----------------------	--------------

<b>Software and Information Technology</b> .....	<b>35-38</b>
--	--------------

<b>Tourism</b> .....	<b>39-42</b>
----------------------	--------------

## **APPENDIX A**

<b>About Industry Clusters</b> .....	<b>43-44</b>
--------------------------------------	--------------

## **APPENDIX B**

<b>Methodology</b> .....	<b>45-47</b>
--------------------------	--------------

# 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
<b>TOTAL</b>	<b>1,704,000</b>	<b>127,804,256</b>	<b>1.3</b>

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
<b>TOTAL</b>	<b>1,704,000</b>	<b>100</b>

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**

<b>Cluster</b>	<b>LQ 2003</b>
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:

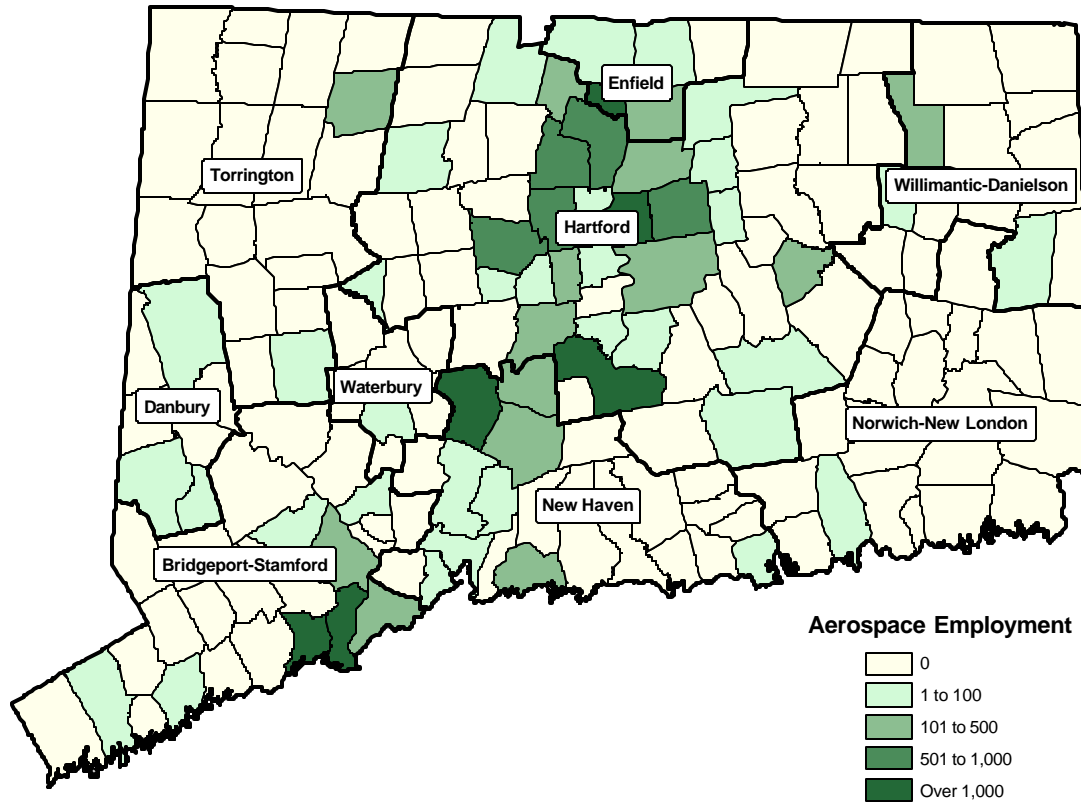
NAICS	Description
3364	Aerospace Product and Parts Manufacturing

## Key Statistics - 2004:

<b>Employer Units</b> .....	<b>150</b>
Net Change in Employer Units (2000-04) .....	-13
Percent Change in Employer Units (2000-04) .....	-8.0%
<b>Number of Jobs</b> .....	<b>29,891</b>
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%
<b>Average Annual Wage</b> .....	<b>\$73,823</b>
Net Change in Wage (2000-04) .....	\$8,102
Percent Change in Wage (2000-04) .....	12.3%
<b>Location Quotient (2003)</b> .....	<b>5.20</b>
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	

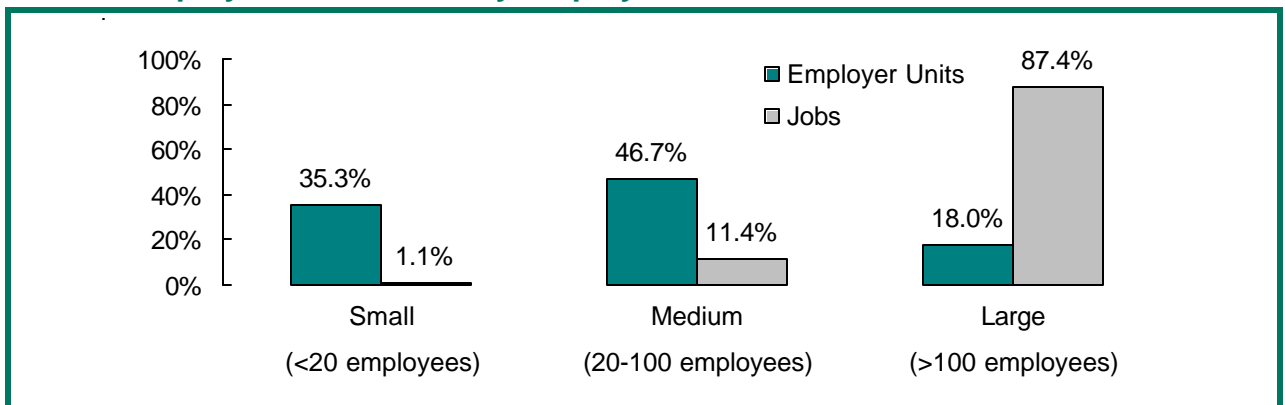


Cluster Employment Concentrations in Connecticut:

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:

<b>Employer Units</b> .....	<b>3,743</b>
Net Change in Employer Units (2000-04) .....	-79
Percent Change in Employer Units (2000-04) .....	-2.1%
<b>Number of Jobs</b> .....	<b>71,501</b>
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%
<b>Average Annual Wage</b> .....	<b>\$31,698</b>
Net Change in Wage (2000-04) .....	\$3,045
Percent Change in Wage (2000-04) .....	10.6%
<b>Location Quotient (2003)</b> .....	<b>0.79</b>
Percent Change from 2000 Location Quotient .....	1.1%

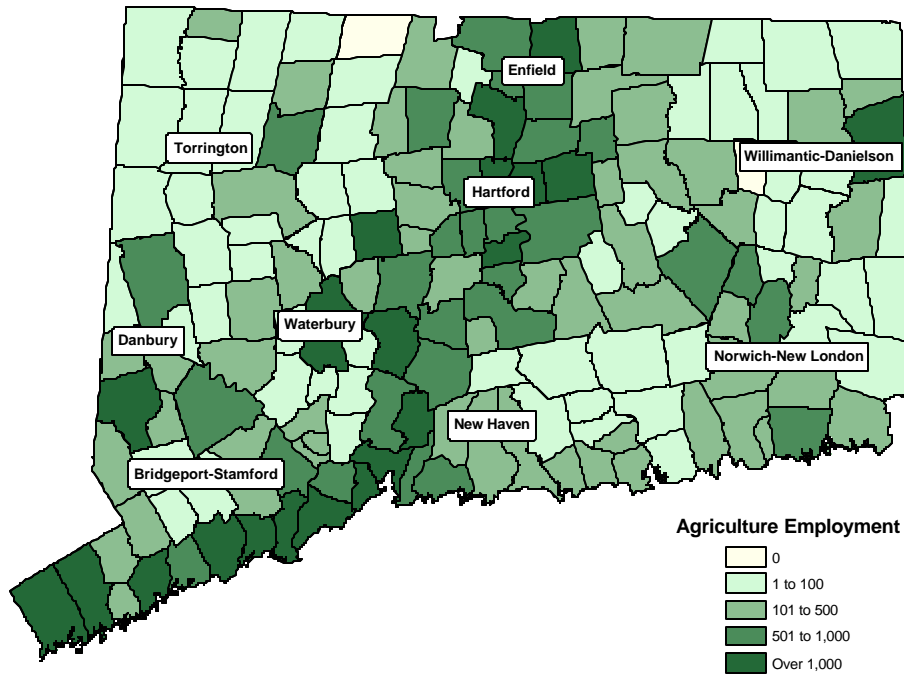
## Top 5 Industries - 2004:

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

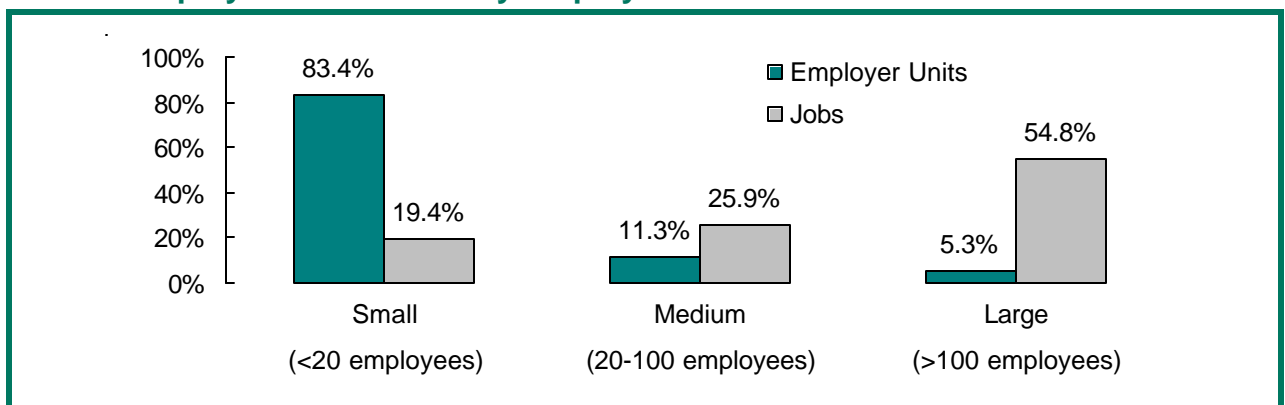


## Cluster Employment Concentrations in Connecticut:

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



## 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:

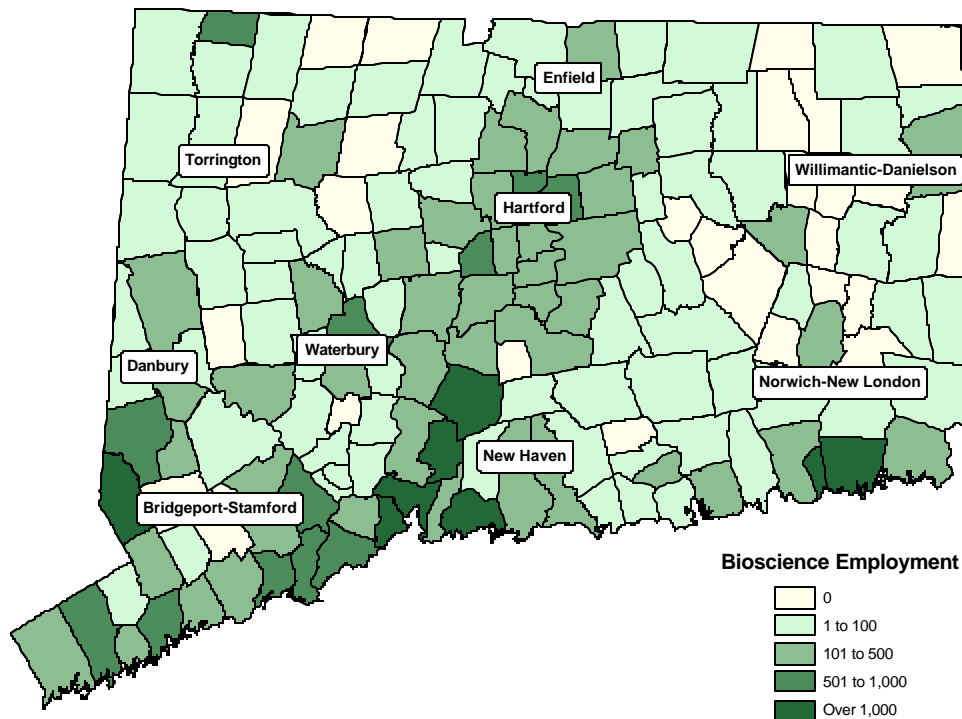
NAICS	Description
3254	Pharmaceutical and Medicine Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334516	Analytical Laboratory Instrument Manufacturing
334517	Irradiation Apparatus Manufacturing
3391	Medical Equipment and Supplies Manufacturing
423450	Medical, Dental, 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:

<b>Employer Units</b> .....	<b>1,567</b>
Net Change in Employer Units (2000-04) .....	-41
Percent Change in Employer Units (2000-04) .....	-2.5%
<b>Number of Jobs</b> .....	<b>40,887</b>
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%
<b>Average Annual Wage</b> .....	<b>\$64,259</b>
Net Change in Wage (2000-04) .....	\$5,268
Percent Change in Wage (2000-04) .....	8.9%
<b>Location Quotient (2003)</b> .....	<b>1.37</b>
Percent Change from 2000 Location Quotient .....	-3.0%

## Top 5 Industries - 2004:

Pharmacies and Drug Stores	<b>75.3% of Cluster Jobs</b>
Pharmaceutical Preparation Manufacturing	
Physical, Engineering and Biological Research and Development	
Surgical and Medical Instrument Manufacturing	
Medicinal and Botanical Manufacturing	

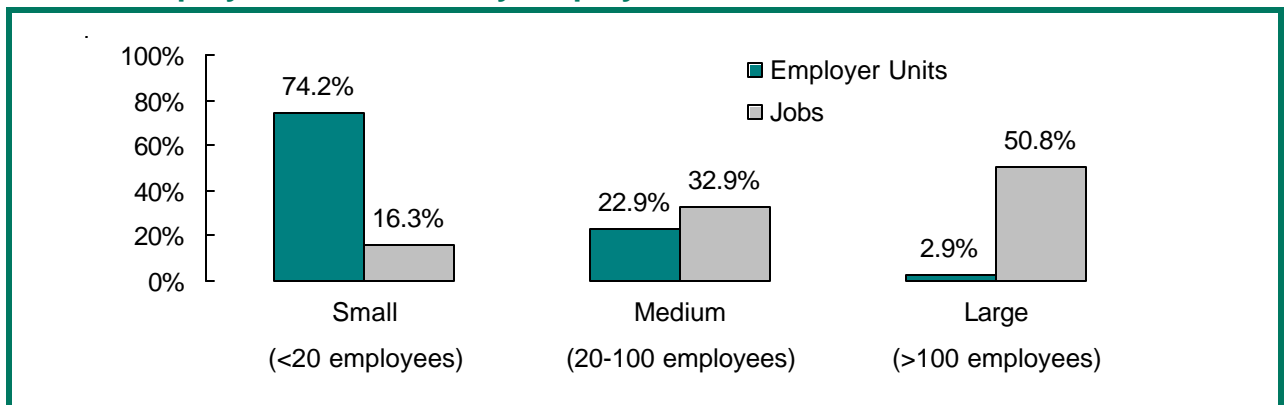


Cluster Employment Concentrations in Connecticut:

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	<b>76</b>
Medical Scientists, Except Epidemiologists	408	29.7	<b>65</b>
Chemists	229	28.5	<b>49</b>
Microbiologists	219	29.1	<b>45</b>
Structural Metal Fabricators and Fitters	83	12.1	<b>24</b>
Executive Secretaries and Administrative Assistants	59	7.5	<b>21</b>
Biological Technicians	111	22.2	<b>20</b>
Natural Sciences Managers	89	16.7	<b>19</b>
Medical and Clinical Laboratory Technologists	23	3.9	<b>18</b>
Life, Physical, and Social Science Technicians	51	10.5	<b>17</b>



## BIOSCIENCE





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

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

**Top Cluster Occupations - FASTEST GROWING, 2002-2012:**

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

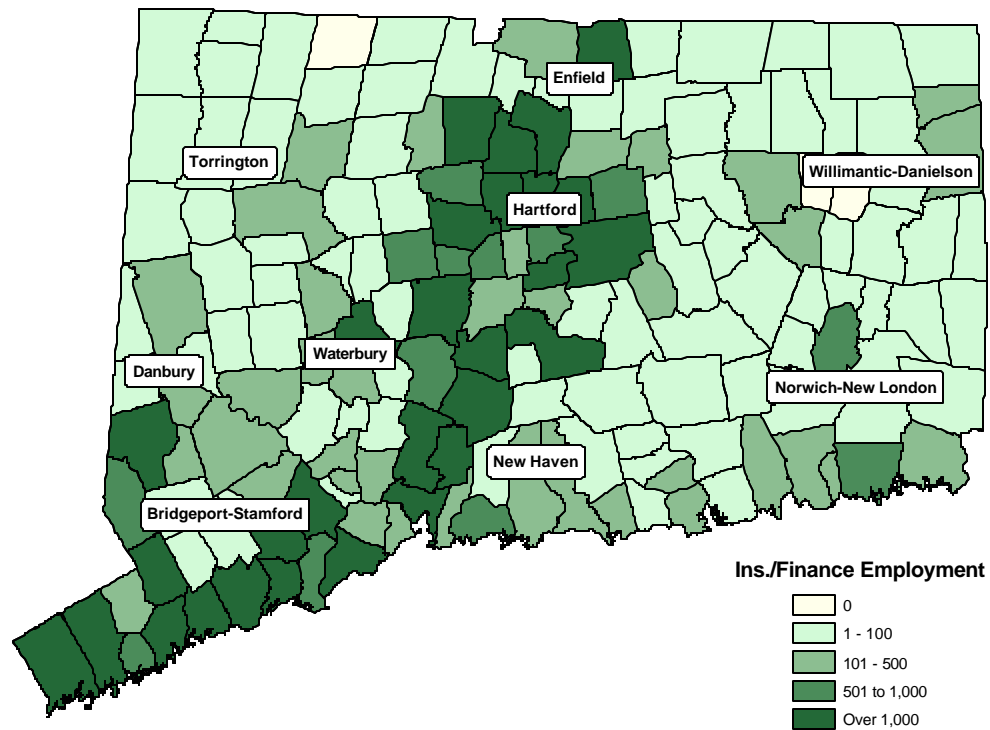
## Key Statistics - 2004:

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

## Top 5 Industries - 2004:

Direct Life Insurance Carriers	<b>52.1% of Cluster Jobs</b>
Direct Property and Casualty Insurers	
Savings Institutions	
Insurance Agencies and Brokerages	
Commercial Banking	

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

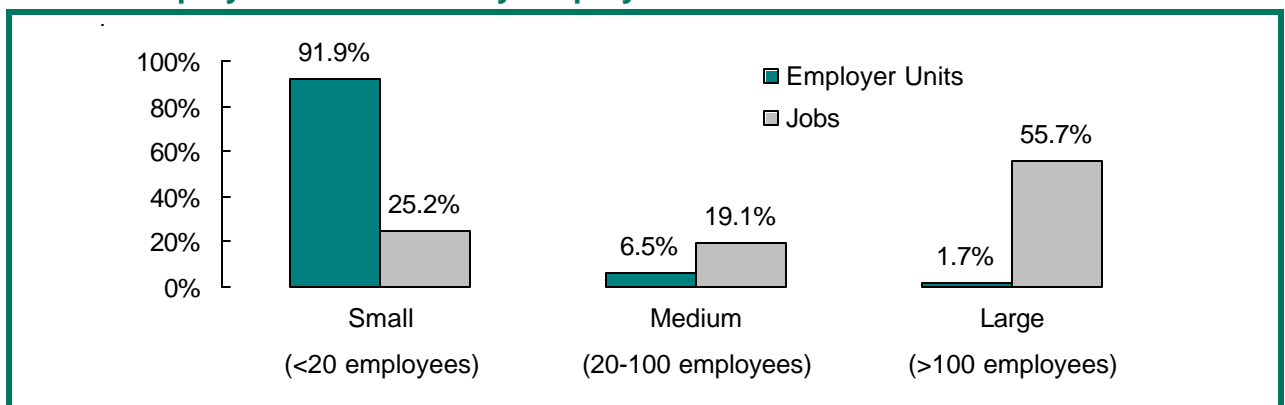


### Cluster Employment Concentrations in Connecticut:

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	<b>1860</b>	32.7	251
Customer Service Representatives	<b>1561</b>	13.0	335
Personal Financial Advisors	<b>698</b>	50.7	88
Financial Analysts	<b>574</b>	18.3	104
Computer Systems Analysts	<b>499</b>	15.9	85
Financial Managers	<b>469</b>	11.7	104
Claims Adjusters, Examiners, and Investigators	<b>440</b>	8.7	107
Business Operations Specialists	<b>416</b>	18.1	81
Accountants and Auditors	<b>384</b>	12.5	96
Loan Officers	<b>360</b>	17.2	70

### Top Cluster Occupations - FASTEST GROWING, 2002-2012:

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

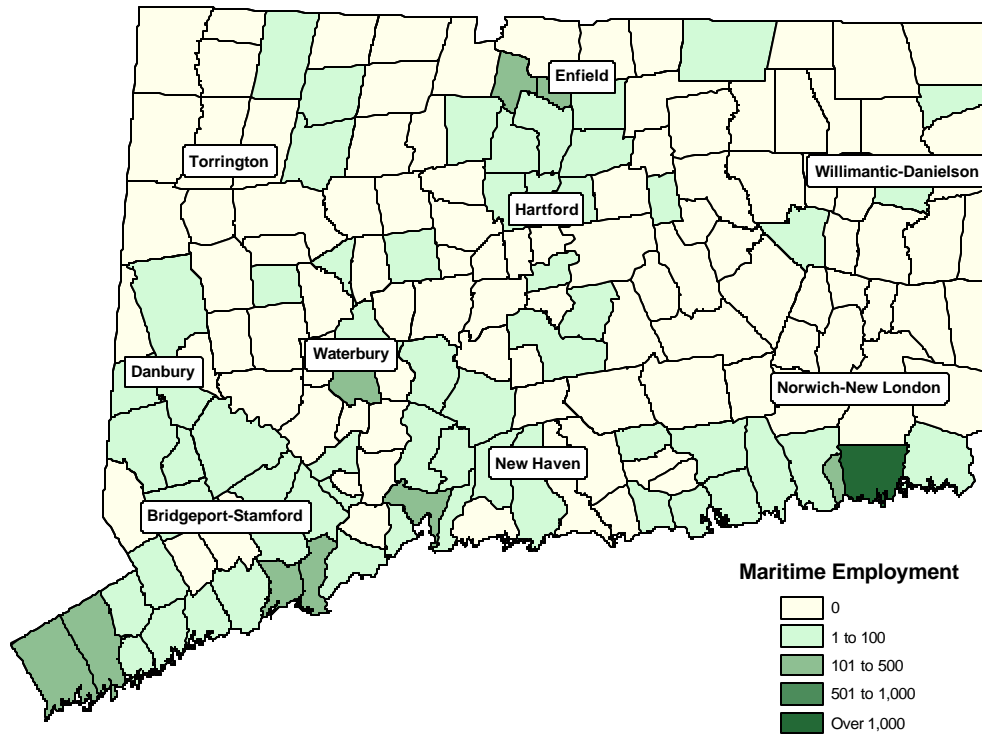
<b>Employer Units</b> .....	<b>248</b>
Net Change in Employer Units (2000-04) .....	-20
Percent Change in Employer Units (2000-04) ...	-7.5%
<b>Number of Jobs</b> .....	<b>10,974</b>
Percentage of Total CT Employment .....	0.7%
Net Change in Job Volume (2000-04) .....	825
Percent Change in Job Volume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

## Top 5 Industries - 2004:

Ship Building and Repairing	<b>93.3% of Cluster Jobs</b>
Freight Transportation Arrangement	
Deep Sea Freight Transportation	
Coastal and Great Lakes Freight Transportation	
Marine Cargo Handling	

## Cluster Employment by Labor Market Area - 2004:

MARITIME

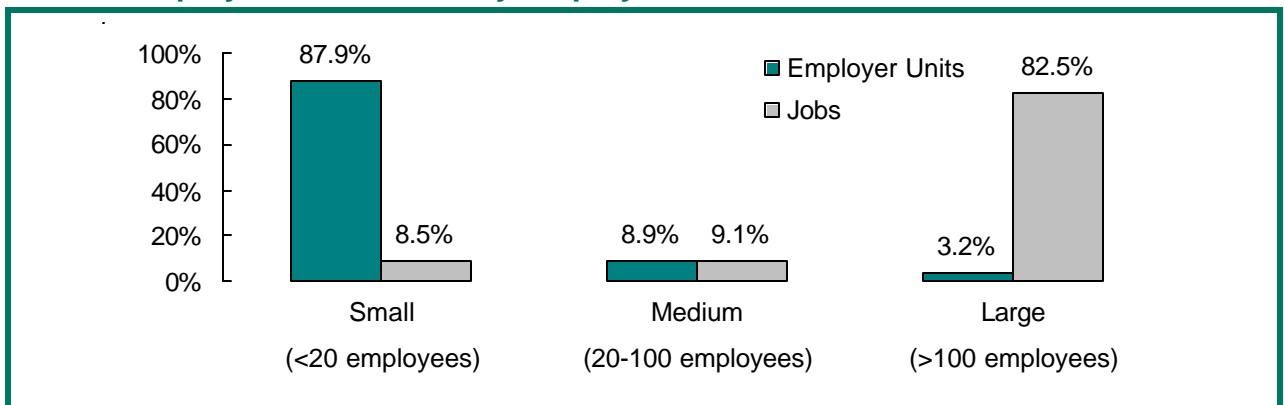


## Cluster Employment Concentrations in Connecticut:

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:

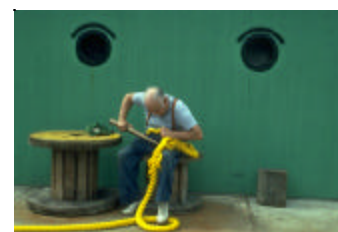


### Top Cluster Occupations, 2002:

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

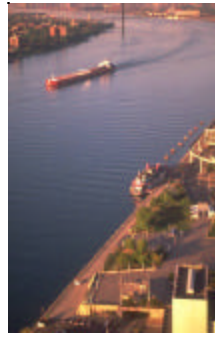
### Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

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:

<b>Employer Units</b> .....	<b>2,244</b>
Net Change in Employer Units (2000-04) .....	-226
Percent Change in Employer Units (2000-04) ....	-9.1%
<b>Number of Jobs</b> .....	<b>58,869</b>
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%
<b>Average Annual Wage</b> .....	<b>\$55,440</b>
Net Change in Wage (2000-04) .....	\$7,699
Percent Change in Wage (2000-04) .....	16.1%
<b>Location Quotient (2003)</b> .....	<b>1.36</b>
Percent Change from 2000 Location Quotient ....	1.3%

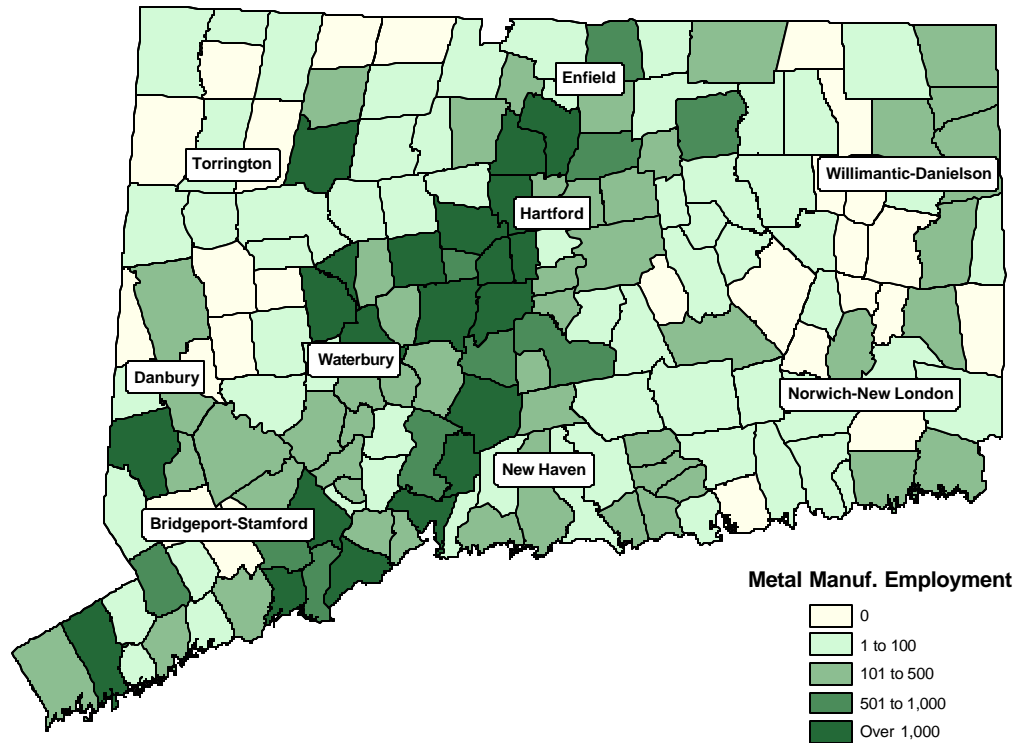
## Top 5 Industries - 2004:

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

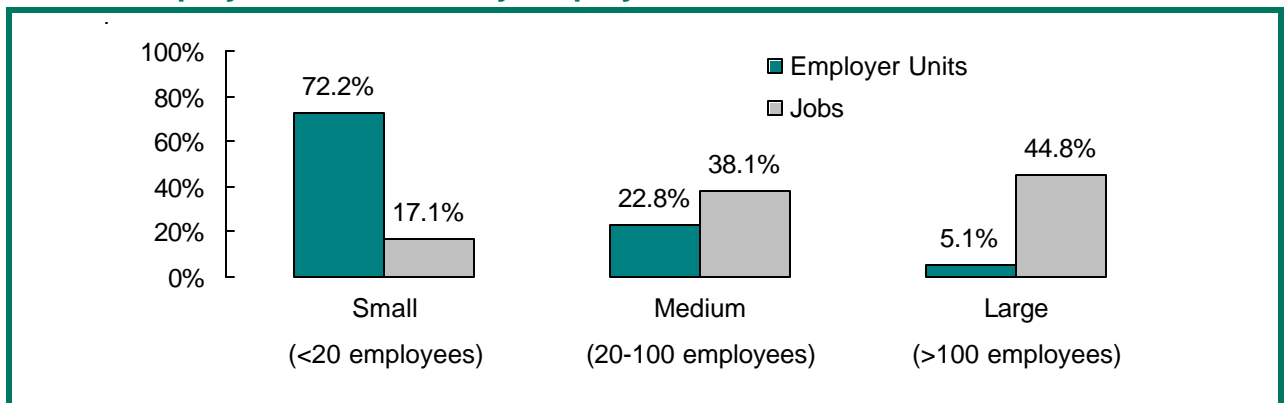


## Cluster Employment Concentrations in Connecticut:

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



## 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:

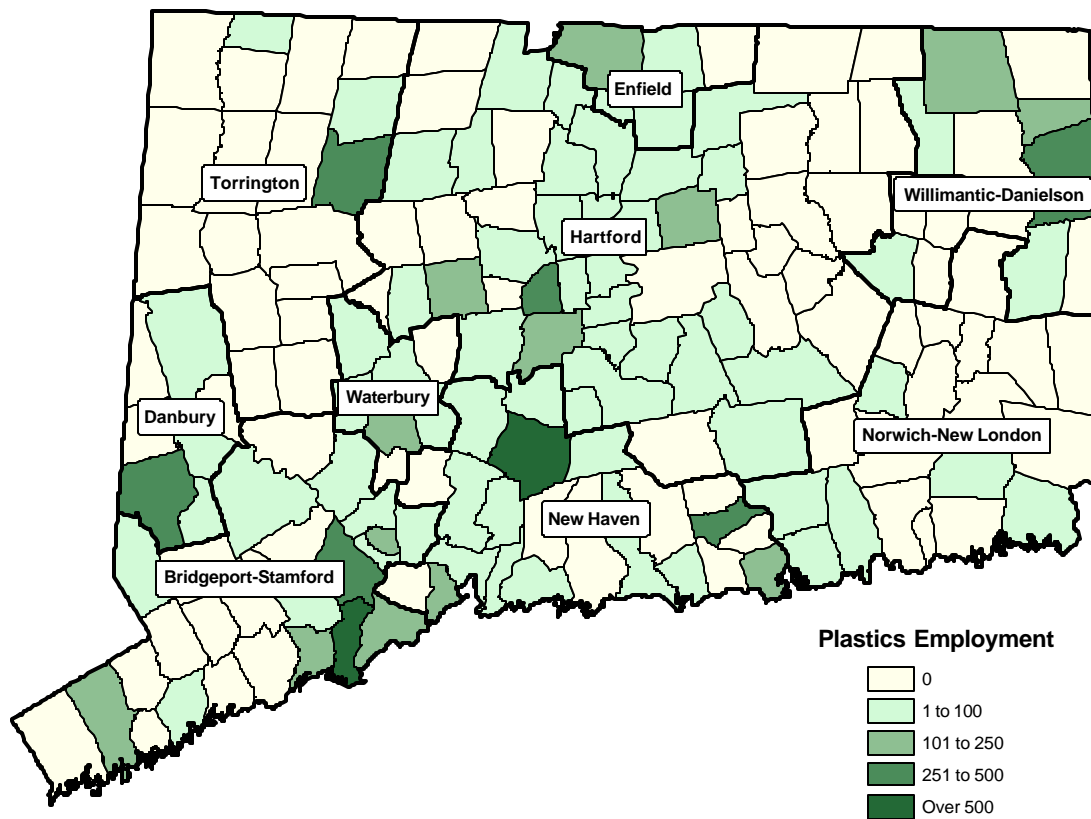
NAICS	Description
325211	Plastics Material and Resin Manufacturing
3261	Plastics Product Manufacturing
326220	Rubber and Plastics Hoses and Belting Manufacturing

## Key Statistics - 2004:

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

## Top 5 Industries - 2004:

Plastics Material and Resin Manufacturing	<b>80.3% of Cluster Jobs</b>
Nonpackaging Plastics Film and Sheet Manufacturing	
Plastics Bottle Manufacturing	
Plastics Plumbing Fixture Manufacturing	
All Other Plastics Product Manufacturing	

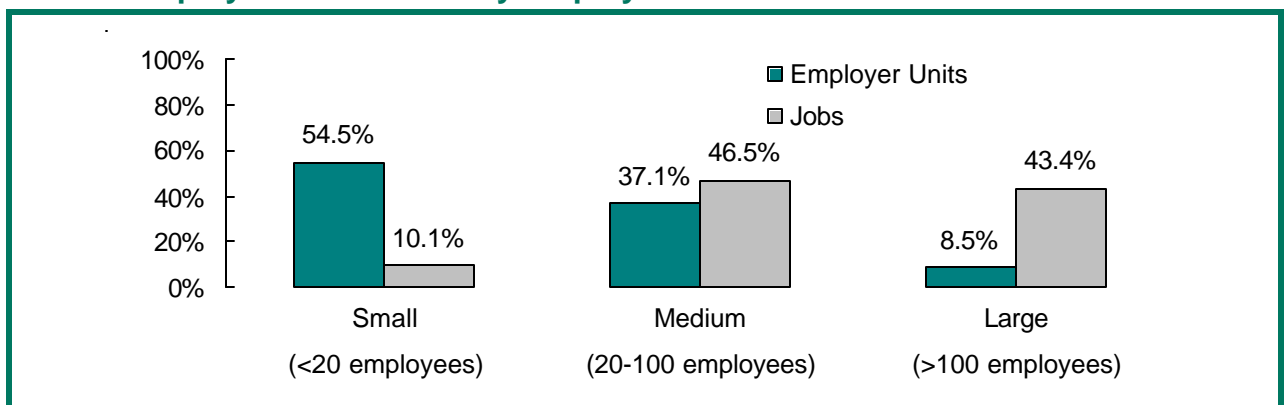


Cluster Employment Concentrations in Connecticut:

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

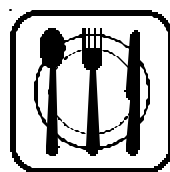
## Top Cluster Occupations - GREATEST DEMAND, 2002-2012:

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

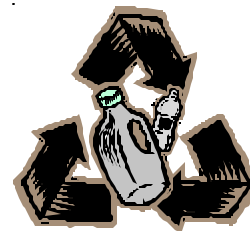


**PLASTICS**





## 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:

<b>Employer Units</b> .....	<b>3,502</b>
Net Change in Employer Units (2000-04) .....	-758
Percent Change in Employer Units (2000-04) ..	-17.8%
<b>Number of Jobs</b> .....	<b>35,036</b>
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%
<b>Average Annual Wage</b> .....	<b>\$80,576</b>
Net Change in Wage (2000-04) .....	-\$6,218
Percent Change in Wage (2000-04) .....	-7.2%
<b>Location Quotient (2003)</b> .....	<b>0.91</b>
Percent Change from 2000 Location Quotient ..	-3.5%

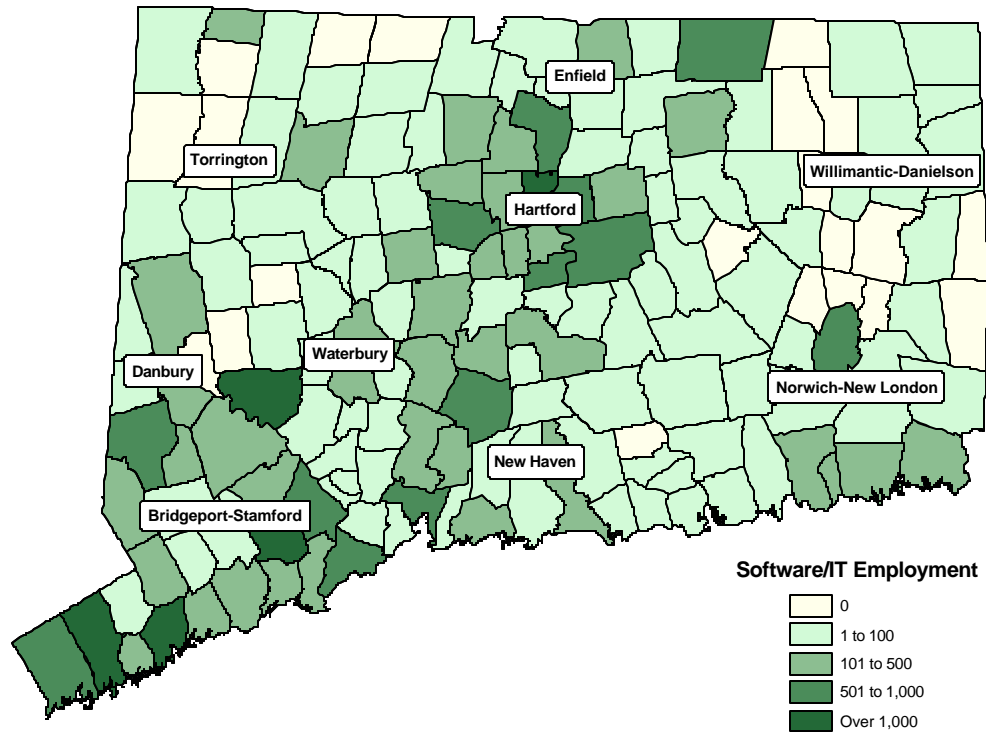
## Top 5 Industries - 2004:

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

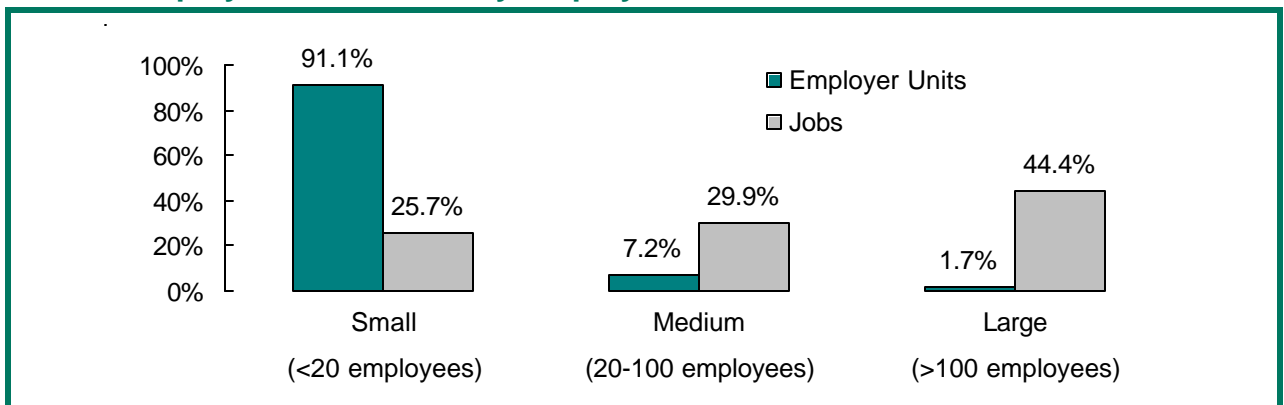


### Cluster Employment Concentrations in Connecticut:

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	<b>159</b>
Computer Software Engineers, Applications	1231	40.4	<b>153</b>
Computer Systems Analysts	927	44.4	<b>116</b>
Computer Programmers	342	11.3	<b>106</b>
Computer Support Specialists	586	29.4	<b>83</b>
Computer Software Engineers, Systems Software	609	53.9	<b>72</b>
Sales Representatives, Wholesale and Mfg., Tech. & Sci. Products	213	11.2	<b>71</b>
Computer and Information Systems Managers	393	40.6	<b>57</b>
General and Operations Managers	228	18.2	<b>46</b>
Customer Service Representatives	247	22.0	<b>41</b>



## SOFTWARE & INFORMATION TECHNOLOGY



## SOFTWARE & INFORMATION TECHNOLOGY



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

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

### Top Cluster Occupations - FASTEST GROWING, 2002-2012:

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

<b>Employer Units</b> .....	<b>2,759</b>
Net Change in Employer Units (2000-04) .....	62
Percent Change in Employer Units (2000-04) .....	2.3%
<b>Number of Jobs</b> .....	<b>62,469</b>
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%
<b>Average Annual Wage</b> .....	<b>\$28,241</b>
Net Change in Wage (2000-04) .....	\$2,499
Percent Change in Wage (2000-04) .....	9.7%
<b>Location Quotient (2003)</b> .....	<b>0.97</b>
Percent Change from 2000 Location Quotient .....	8.9%

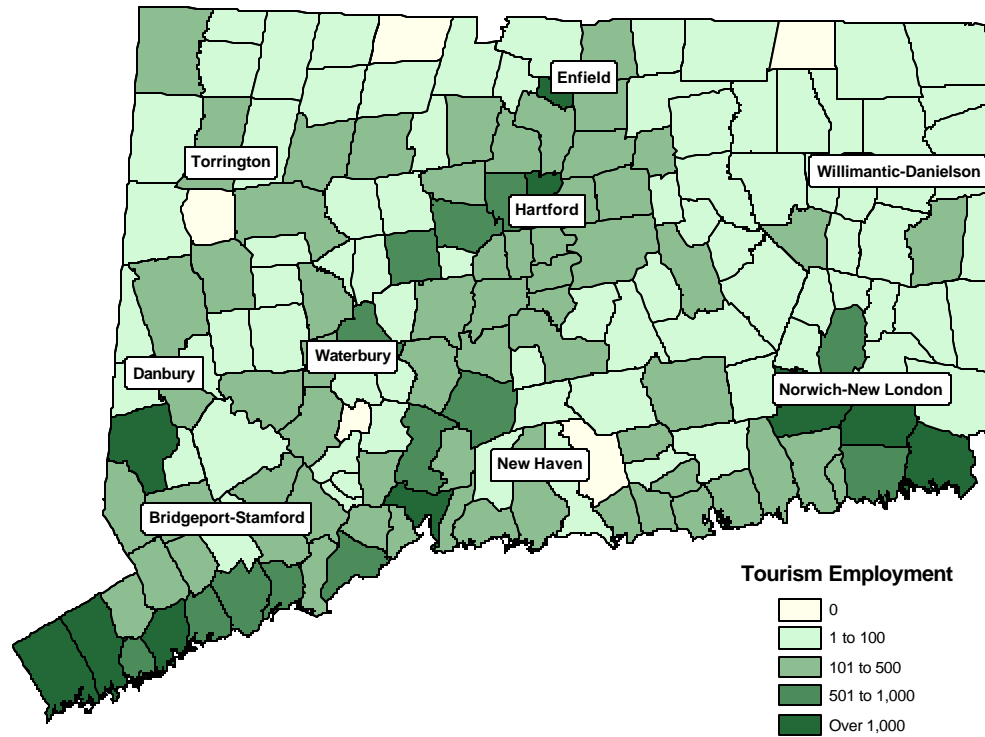
## Top 5 Industries - 2004:

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

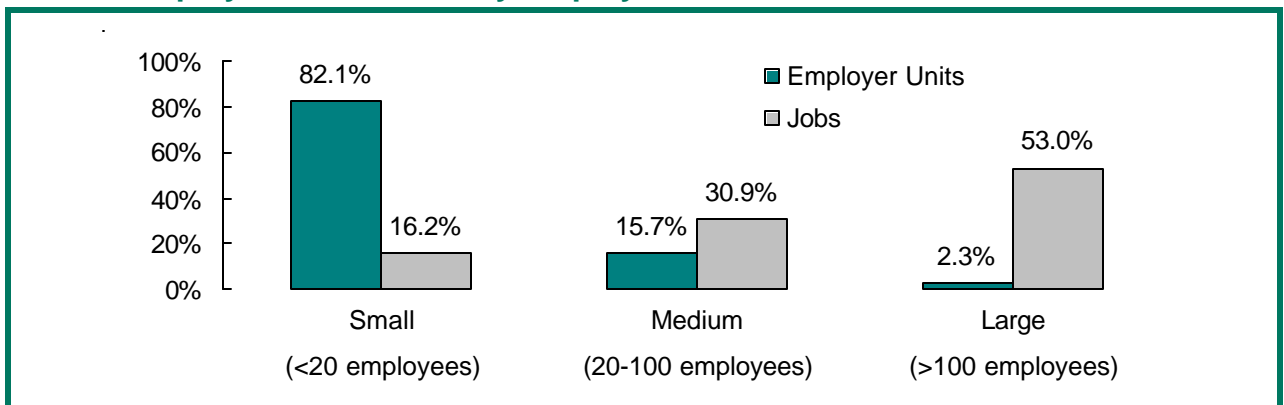


## Cluster Employment Concentrations in Connecticut:

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	<b>265</b>
Gaming Dealers	993	28.1	<b>211</b>
Maids and Housekeeping Cleaners	722	26.3	<b>130</b>
Amusement and Recreation Attendants	671	38.8	<b>117</b>
Gaming Change Persons and Booth Cashiers	402	28.9	<b>108</b>
Fitness Trainers and Aerobics Instructors	562	30.3	<b>99</b>
Hotel, Motel, and Resort Desk Clerks	421	34.1	<b>98</b>
Landscaping and Groundskeeping Workers	477	23.3	<b>92</b>
Gaming Workers	362	27.9	<b>76</b>
Janitors and Cleaners, Excl. Maids and Housekeeping Cleaners	385	21.6	<b>72</b>



## TOURISM





## TOURISM



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

Occupation	Net Increase	% Increase	Annual Openings
Gaming Dealers	<b>993</b>	28.1	211
Waiters and Waitresses	<b>728</b>	19.5	265
Maids and Housekeeping Cleaners	<b>722</b>	26.3	130
Amusement and Recreation Attendants	<b>671</b>	38.8	117
Fitness Trainers and Aerobics Instructors	<b>562</b>	30.3	99
Landscaping and Groundskeeping Workers	<b>477</b>	23.3	92
Hotel, Motel, and Resort Desk Clerks	<b>421</b>	34.1	98
Gaming Change Persons and Booth Cashiers	<b>402</b>	28.9	108
Janitors and Cleaners, Excl. Maids and Housekeeping Cleaners	<b>385</b>	21.6	72
Gaming Workers	<b>362</b>	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	<b>56.3</b>	29
Combined Food Preparation and Serving Workers, Incl. Fast Food	243	<b>51.5</b>	45
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	26	<b>41.9</b>	3
Self-Enrichment Education Teachers	120	<b>40.4</b>	16
Amusement and Recreation Attendants	671	<b>38.8</b>	117
Agents and Business Managers of Artists, Performers, and Athletes	35	<b>38.0</b>	5
Electricians	22	<b>37.9</b>	3
Actors	67	<b>37.2</b>	9
Maintenance and Repair Workers, General	285	<b>37.0</b>	43
Manicurists and Pedicurists	19	<b>36.5</b>	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 developed from data produced by the Connecticut Department of Labor's Office of Research, 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 compiled for each industry cluster from data developed by the Connecticut Department of Labor's Job Development Unit. 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.

