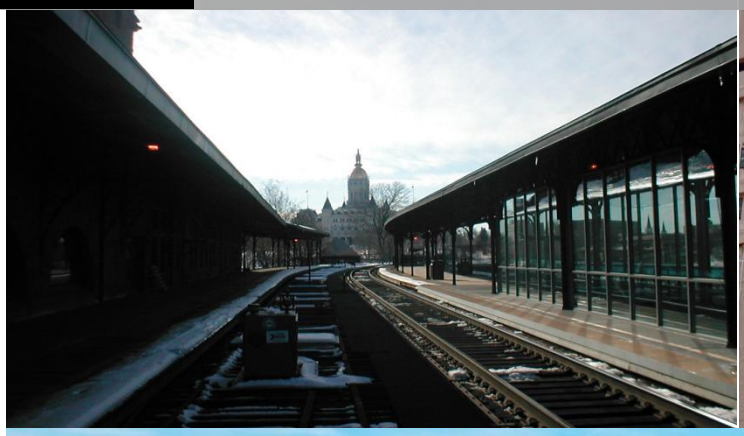
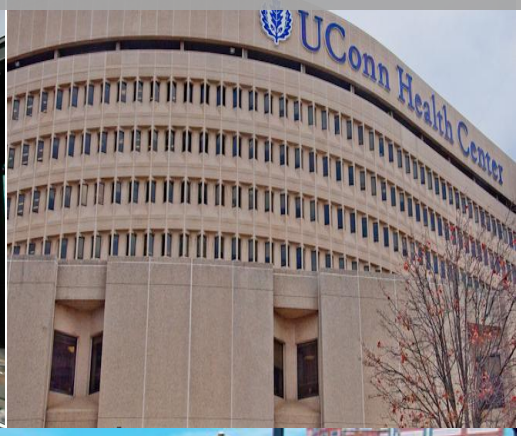
THE METRO HARTFORD REGION

MOVING THE REGION FORWARD





A Comprehensive Economic Development Strategy: Part III - Industry Analyses

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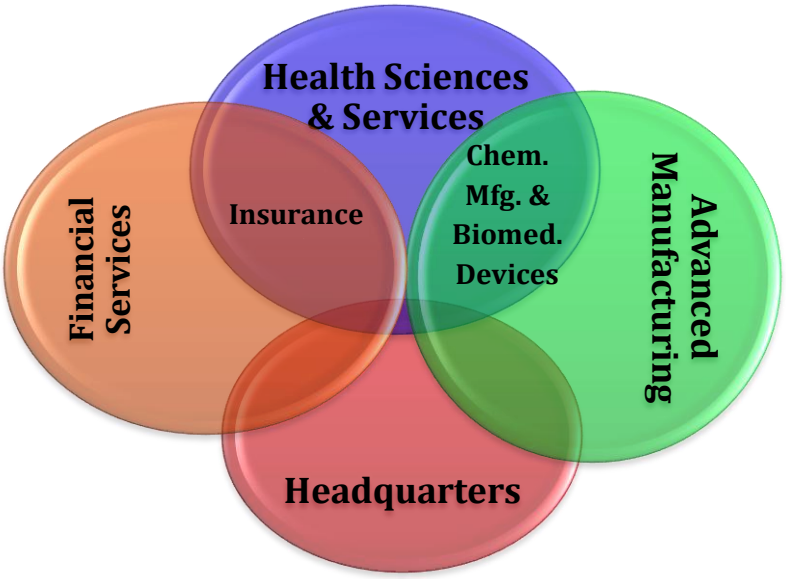
Overview

This section of the report provides additional analysis to support the CEDS regarding the unique features of its industry clusters. Funding for this section was generously provided by Connecticut Light & Power.

This section identifies the unique cluster strengths for the metro Hartford region based on an analysis that included: labor market data, industry data, a productivity analysis, the Cluster Mapping Project (from Michael Porter) findings, a geospatial location analysis, and other recent reports and findings completed for the region. Based on this analysis the figure below shows the four clusters that were identified as strengths for the region: Advanced Manufacturing, Financial Services, Health Sciences and Services, and Headquarters.



Importance of Clusters

Clusters are geographically concentrated sets of competing and complementary businesses that operate in similar markets. They are a geographic concentration of firms, suppliers, support services, specialized infrastructure, producers of related products, and specialized institutions (e.g., training programs and business associations) that arise in particular fields in specific locations. They are linked by buyer-supplier relationships and by their shared reliance on educational institutions, workforce dynamics and other resources. Businesses within clusters grow and develop through local collaboration and the exchange of information which then lends itself to an increase in productivity and efficiency. As a result, companies located in regions with strong clusters

experience higher growth in new business formation and start-up employment and contribute to start-up firm survival.[1]

There is strong evidence that globalization has made clusters more important due to its impact on increasing competition. A focus on clusters helps a region adapt to economic change. One dynamic helping this region recover jobs faster than other parts of the state and the U.S. after the last economic recession results from having strong clusters.

The metro Hartford region must adapt policies that foster and enhance the clusters that are strengths for the region and look to build synergies across regions with similar cluster strengths creating the effect of "super clusters." The next section shows the importance of these clusters on the regional economy. These clusters are traded sector industries which represent a group of industries that concentrate in particular regions that sell products and services outside of the region, across regions and often to other countries. They locate in a particular region based not on resources but on broader competitive considerations in contrast to local industries that primarily serve the local market and whose employment is evenly distributed across regions – such as retail or social services.

[1] Mercedes Delgado, Michael E. Porter, Scott Stern, "Clusters and entrepreneurship," *Journal of Economic Geography,* May 2010.

Clusters in the MetroHarford Region

Impact on the Regional Economy

Each cluster in the region generates a net influx of new dollars into the regional economy. These new dollars are the wages, profits, taxes and other types of activities. These net new dollars add wealth to the region and keep the local, non-traded industries thriving. Local growth and prosperity is dependent on the health and competitiveness of the industry clusters. The four clusters' share of regional economic activity is seen in Figure 1. As shown in the figure, these four clusters make up almost half of the economic activity of the region. Value added is a measure that is described as the increase in regional wealth. Gross inputs measure total purchases (goods and services) made by each industry in the region. Regional inputs measure the amount of the total gross that is purchased locally by the industries in the region.

Figure 1: Four Clusters' Share of Regional Economic Activity

	Total Regional Economy ($ mil)	Total for Four Clusters ($ mil)	Cluster % of Total
Industry Sales	$122,353	$58,319	48%
Value Added	$77,325	$33,126	43%
Employee Compensation	$40,462	$17,329	43%
Gross Inputs	$44,113	$24,577	56%
Regional Inputs	$23,858	$11,768	49%

Source: CERC analysis using 2010 IMPLAN input/output model for Hartford & Tolland Counties

Figure 2 shows the total share of sales each cluster brings to the region. As shown, Financial Services contributes the largest percentage of sales to the regional economy.

Figure 2: Cluster Regional Sales

	Total Sales ($ mil)	% of Region's Total Sales
Financial Services	$30,000	25%
Advanced Manufacturing	$18,000	15%
Headquarters	$2,000	2%
Health Sciences & Services	$10,000	8%
Health Services	$8,000	7%
Bioscience/Health Science	$2,000	2%
Med. Devices	$400	0.3%

Source: CERC analysis using 2010 IMPLAN input/output model for Hartford & Tolland Counties

Another way to look at the clusters and their impact on the regional economy is to look at their value added per worker as a measure of productivity.

As shown in the figure to the right, the value added of each employee in Financial Services is 2.2 times greater than the average for all industries in the region. All of the clusters have a higher value added except for Health Sciences & Services.

Figure 3: Cluster Value Added per Worker

	Value Added per Worker	Indexed to Total
Total for Regional Economy	$112,524	1.0
Financial Service	$247,937	2.2
Advanced Manufacturing	$157,500	1.4
Headquarters	$160,476	1.4
Health Sciences & Services	$80,279	0.7
Health Services	$74,034	0.7
Bioscience/Health Science	$194,924	1.7
Med. Devices	$153,203	1.4

Source: CERC analysis using 2010 IMPLAN input/output model for Hartford & Tolland Counties

The Health Sciences & Services cluster is lower in value added per worker because most of the employment within the cluster requires a lower level of skills and thus wages are lower. As the table shows, the industries within the Bioscience cluster have a value added per worker that is 1.7 times greater than the average for the region.

Regional Purchases by the Clusters

The clusters also contribute to the economy through the purchases they make locally, thus supporting other industries within the region. For example, in the aerospace manufacturing industry the larger companies such as Pratt & Whitney can purchase engine components from local manufacturing companies. The IMPLAN economic output model provides an analysis of the total gross purchases of goods and services for each cluster and also the amount that is purchased locally.

High Percentage of Local Purchases

All clusters within the region rely on the local purchase of goods and services from the Professional, Scientific, and Technical Services industry. In fact, 87 percent of the goods and services are purchased from local companies. This resulted in an estimated total of $1.9 billion purchased locally by the four clusters in 2010.

Figure 4: Professional, Scientific, & Technical Services Purchased Locally by the Clusters, 2010

Professional, Scientific, & Technical Services	Total Purchased Locally ($ in mill)	Local Purchases as % of Gross
Financial Services	$745	90%
Advanced Manufacturing	$615	82%
Health Sciences & Services	$354	87%
Headquarters	$189	92%
Total	$1,903	87%

Source: CERC analysis using 2010 IMPLAN input/output model for Hartford & Tolland Counties

Another industry on which the clusters in the area are reliant is the Warehousing and Storage industry. In 2010, the clusters purchased 98 percent of total gross purchases from local suppliers, contributing $56 million in sales. The Advanced Manufacturing cluster made $46 million, or 82 percent, of those purchases. This suggests that transportation and logistics are critical infrastructure components for the region's manufacturing cluster.

Figure 5: Warehousing and Storage Goods Purchased Locally by the Clusters, 2010

Warehousing and Storage	Total Purchased Locally ($ mil)
Financial Services	$2
Advanced Manufacturing	$46
Health Sciences & Services	$8
Headquarters	$0
Total	$56

Source: CERC analysis using 2010 IMPLAN input/output model for Hartford & Tolland Counties

These two industries – Professional, Scientific & Technical Services, and Warehousing and Storage – have the largest shares of local purchases and therefore are important to keep in the region for continued support of the regional clusters.

Low Percentage of Local Purchases

An industry in which the Bioscience cluster relies heavily on purchases outside the region is the Pharmaceutical and Medicine Manufacturing industry. In 2010, the Bioscience cluster purchased approximately $200 million from Pharmaceutical and Medicine Manufacturing industry but only $3 million of that was made from companies in the region. Further, the Health Services subcluster purchased approximately $230 million from that industry but only $10 million was purchased from local companies. **The Pharmaceutical and Medicine Manufacturing industry is an area that has the potential to grow in the region. There is a strong demand by the existing clusters for goods in this industry.** It confirms the need for the state strategy of investing in Jackson Laboratories and for the metro Hartford region to support its growth.

Financial Services Cluster

In 2010 the Financial Services cluster contributed $19 billion to the economy in total value added (represents the increase in total wealth to the region). The insurance industry represented 77 percent of total value added or approximately $15 billion as shown in Figure 6.

Figure 6: Financial Services Cluster Total Value Added and Sales, 2010

Financial Services Cluster - industries	Total Value Added ($ bil)	% of Cluster Value Added	Total Sales ($ bil)	% of Cluster Sales
Insurance carriers	$15.0	77%	$21.0	69%
Funds, trusts, and other financial vehicles	$1.8	9%	$3.0	11%
Monetary authorities & depository credit intermediation	$1.4	7%	$3.0	9%
Non depository credit intermediation	$0.9	5%	$1.5	6%
Securities, commodity contracts, investments	$0.4	2%	$1.7	5%
Total for Financial Services Cluster	$19.0		$30.0	

Source: IMPLAN input/output model 2010 data for Hartford & Tolland Counties

Not only is the insurance industry the largest contributor in sales and value added to the Financial Services cluster, but it is also the largest employer in the cluster employing more than 42,000 people, which is approximately 10 percent of the labor force. **The region's unique perspective is that it has a long-standing history of strength in the insurance industry and is known as the "Insurance Capital."** The headquarters of Aetna, Travelers, and The Hartford are currently in the region. As a result of the Governor's First Five Initiative, Cigna moved its headquarters from Philadelphia to Bloomfield. Although employment in the Insurance industry has decreased by approximately 4,000 jobs compared to ten years ago, the number of firms has increased by 100. This trend is a result of smaller firms spinning off from the larger firms and new innovative products being developed. This is also an indication of the expertise that exists in the region.

Take for example Silicon Valley. Many technology companies start in Silicon Valley. There are many factors that contribute to this phenomenon such as the proximity of several educational institutions but another contributing factor is that the banks and venture capitalists are familiar with tech start-ups and know how to evaluate and understand the business models. A similar phenomenon could be occurring in the metro Hartford region with the increasing number of insurance firms. Where spin offs are occurring from the larger firms and the region has the expertise and knowledge to judge the value of these companies.

However, just because the region has always had a strong Insurance industry presence does not mean it will necessarily continue. Two regions – Milwaukee and Des Moines – have shown positive compound annual growth rates over the past twelve years whereas the Hartford region has shown

an average decline. This trend has the potential to turn around with two state initiatives that were recently made – statutory changes expanding which captive insurance companies can be licensed and domiciled in Connecticut and the recruitment of Jackson Laboratories.

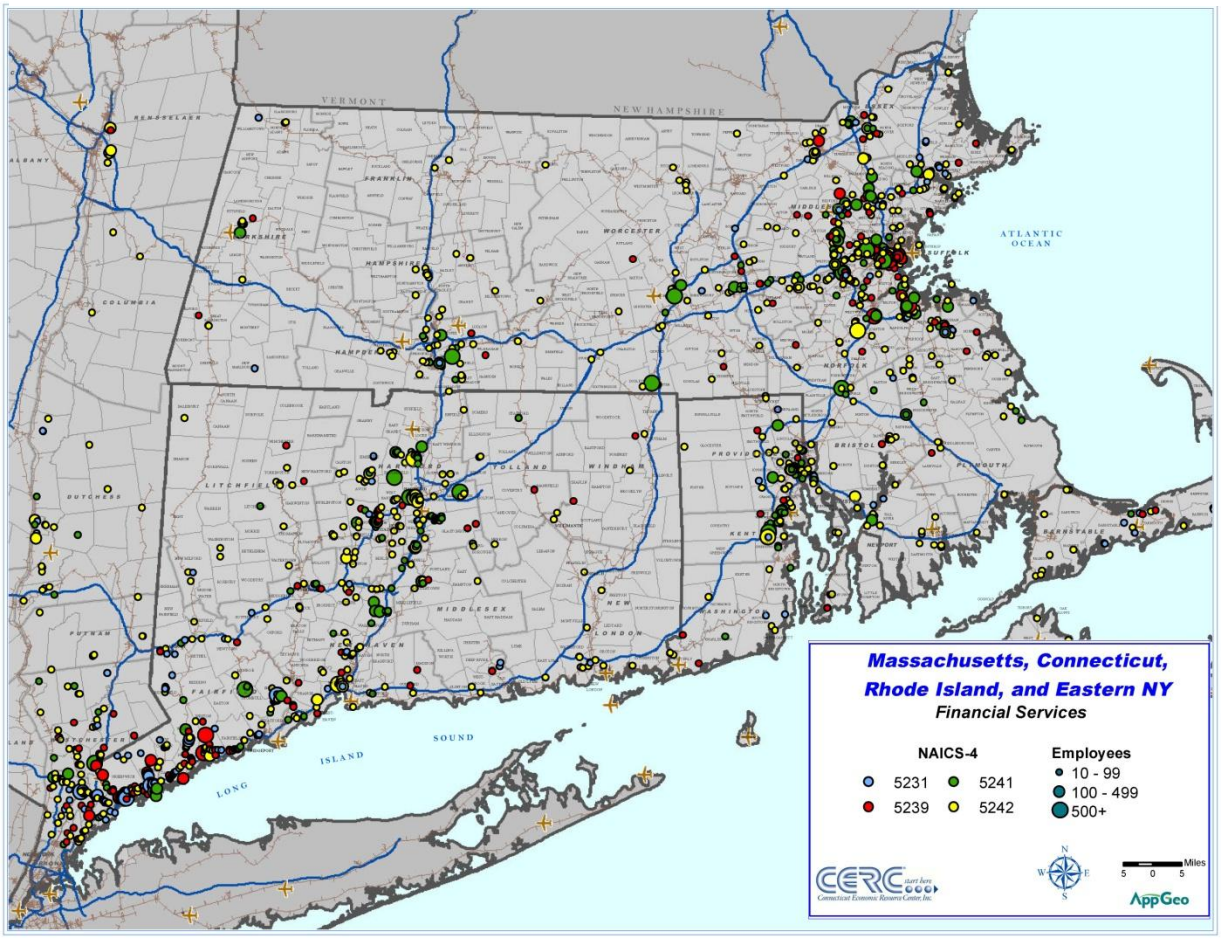
In 2008, the Legislature permitted captive insurance companies to be licensed and domiciled in Connecticut to transact life insurance, annuity, health insurance, and commercial risk insurance business. During the October 2011 Special Session, Public Act 11-140 was passed which revised and expanded the 2008 legislation and created three new subgroups of captives that could be domiciled in Connecticut (sponsored captive, special purpose financial captive, and branch captive) and expanded the types of insurance a captive may transact in the state. As of 2011, there were no captives domiciled in Connecticut but through these legislative changes it should open up opportunities for companies to expand in-state.

Further, the recent investment in Jackson Laboratories has the potential to provide the insurance companies located in the region with a competitive advantage. For example, if an insurance company knows a new invention will come to market in five years, it can work on pricing to get ahead of competition and also demand more from companies that have workers who might benefit from the new technology. Gaining insight prior to the product going to market with the latest technology means the companies have better access to information and a competitive edge.

Another industry within the Financial Services cluster that emerged as a new strength for the region through our quantitative research is the Securities, Commodity Contracts, and Investments industry. Over the past ten years, the number of firms has increased by 25 percent. Although the employment is small in the region (2,200) compared to Fairfield County (19,000), between 2005 and 2010 employment in the region grew by 8 percent whereas in the U.S. employment only grew by 1 percent. Given the proximity of the region to Fairfield County and the larger share in employment growth compared to the nation, this niche industry within Financial Services has the potential to grow if supported and promoted by the region.

By the fact that the region already has an industry cluster group – the Insurance and Financial Services Cluster group within the MetroHartford Alliance – a more rapid response to the needs of the businesses can occur.

Map 1: Financial Services Cluster



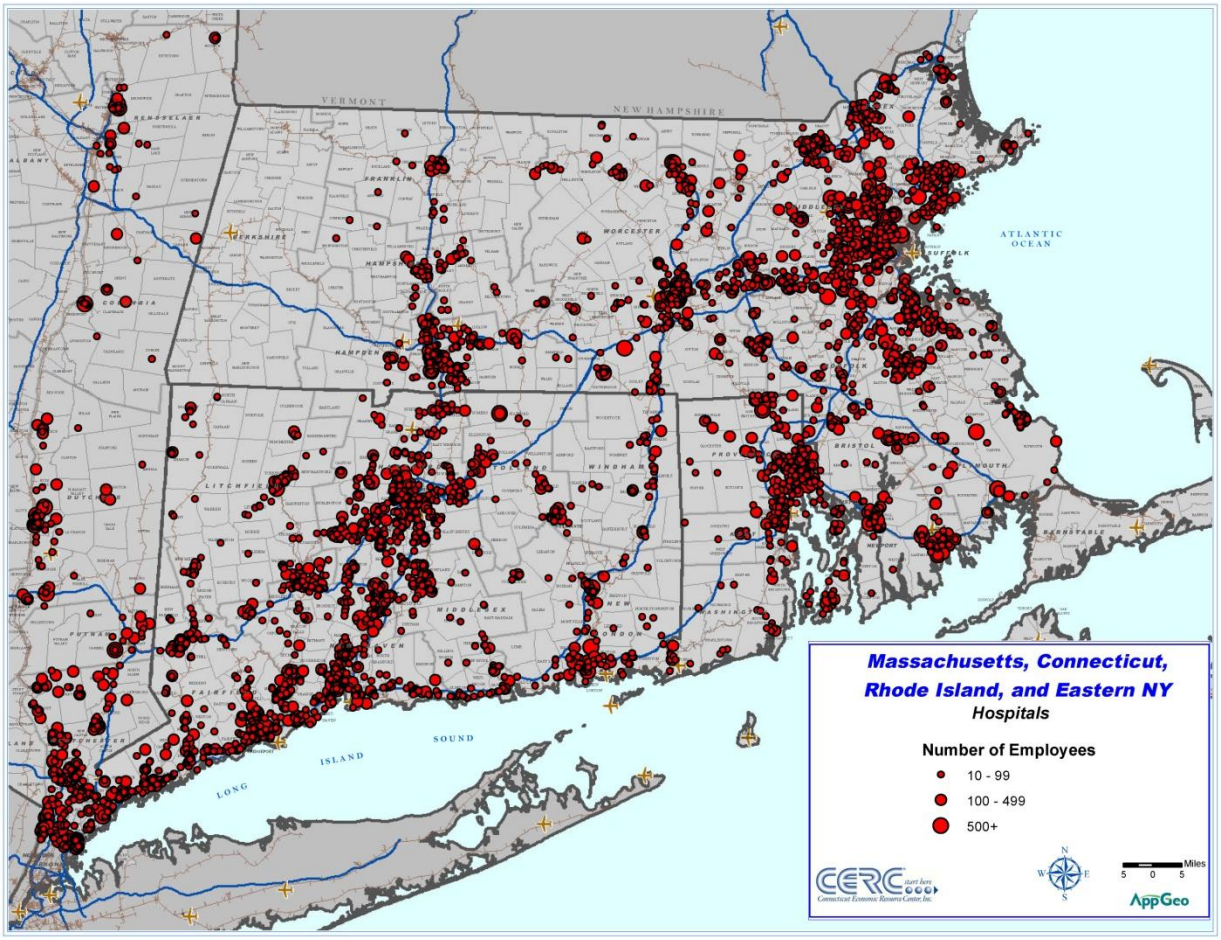
On the map, the NAICS codes of 524 represent the Insurance industry while 523 is the Securities and Commodities industry. The metro Hartford region's strength is Insurance. The Securities and Commodities industry is more concentrated in Fairfield County but still has a presence in the region.

Health Sciences & Services Cluster

The metro Hartford region is in a unique position, one that is unlike any other region in the nation. The investments being made in Jackson Laboratories; coupled with the state's strength in advanced manufacturing, particularly biomedical devices and research and development; state stem cell investments to the University of Connecticut Health Center of $18 million since 2006; and the relative concentration of insurance companies – creates a **complete market where personalized medicine and other health R&D products and services can be tested**.

The state's Bioscience Connecticut initiative launched in 2011 will link the state's bioscience and research facilities at UConn's Storrs campus, its Health Center in Farmington, and Yale University in New Haven. Several capital projects and program investments at the UConn Health Center will help position the region as a leader in biomedical research. Improving the research capabilities of the Health Center will help attract more researchers and are anticipated to double the federal research dollars flowing into the area. Various studies of research and development (R&D) spending undertaken by the National Academies of the Sciences, the Bureau of Economic Analysis, and others, suggest the research spending local multiplier may be in the range of 2.0. This means that for every federal dollar that flows into the area an additional two dollars is being invested in the local economy. Having robust research and development facilities is essential to growing the bioscience industry. It is through research and development and the attraction of the best scientists from which new ventures can spawn.

Map 2: Health Services - Hospitals



As shown in Figure 7, the Health Sciences & Services cluster is predominantly a service cluster with Bioscience/Health Sciences representing 12 percent of total value added to the region. The largest industry within the cluster is the health services sector which delivers the care – hospitals, ambulatory care services, and nursing and residential facilities. In 2010, the industry employed 62,000 people in the region representing 14 percent of private employment. Further, health services employment has increased each year over the past ten years and even during the latest recession.

Figure 7: Health Sciences & Services Cluster Total Value Added and Sales, 2010

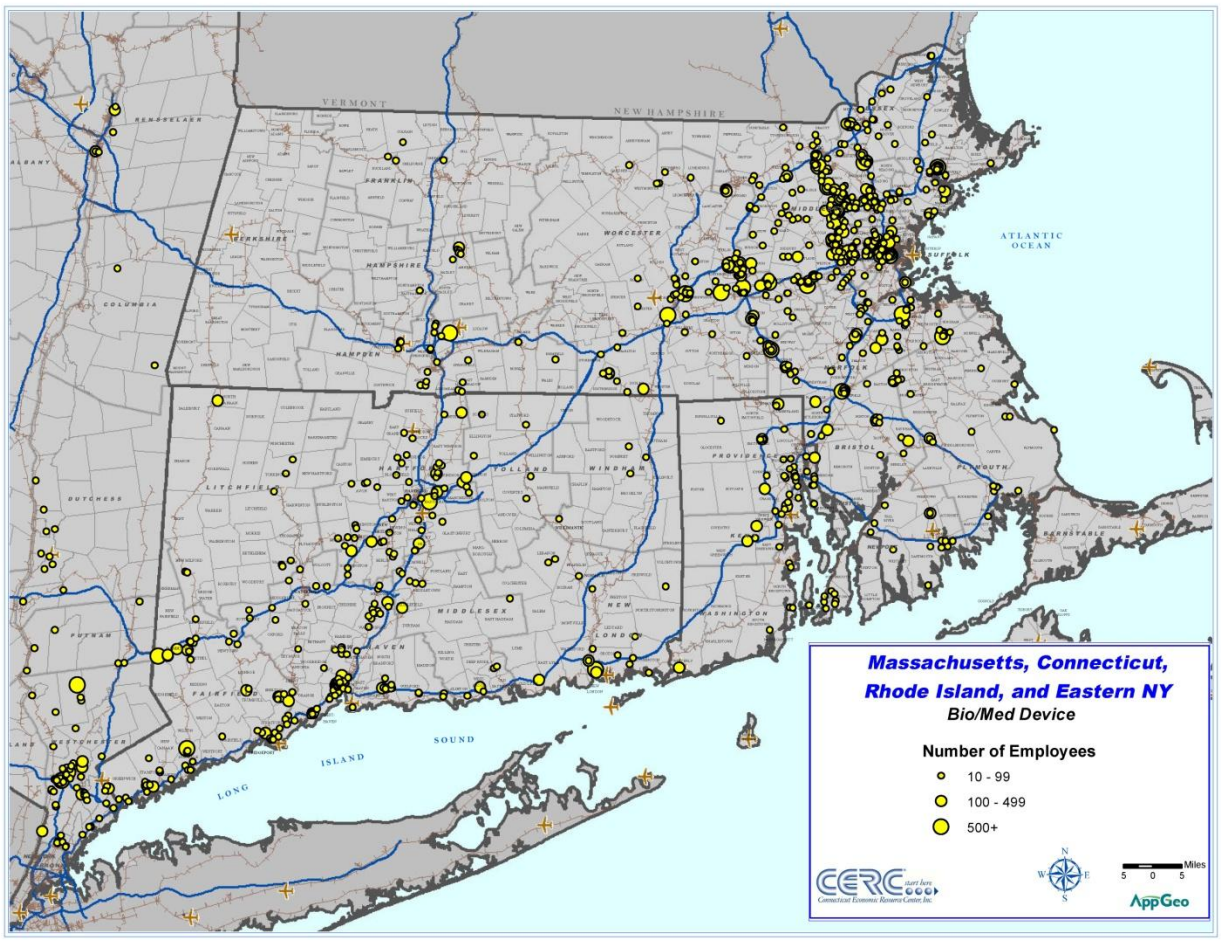
Health Science & Services Cluster – industries	Total Value Added ($ bil)	% of Cluster Value Added	Total Sales ($ bil)	% of Cluster Sales
Health Services	$5.1	88%	$7.9	83%
Physician Offices	$2.0		$2.9	
Private Hospitals	$1.5		$2.7	
Nursing & Residential care	$0.9		$1.3	
Medical & diagnostic labs	$0.4		$0.8	
Bioscience/Health Sciences	$0.7	12%	$1.7	17%
Pharmaceutical preparation	$0.3		$0.9	
Scientific R&D	$0.2		$0.3	
Medical device manufacturing	$0.2		$0.4	
Total for Health Science & Services	$5.8		$9.6	

Source: IMPLAN input/output model 2010 data for Hartford & Tolland Counties

The region also has a small but important medical device manufacturing cluster with a particular niche. Overall, the Hartford-West Hartford-East Hartford, CT metropolitan area ranks 85th in the country in terms of employment in the medical device cluster. However, when looking at specific industries within the medical device cluster the dental instruments and supplies industry ranks 17th in the nation. A couple of examples of the employers in the region include: Coburn Technologies, headquartered in South Windsor, is an ophthalmic goods manufacturer; and Pioneer Optics which designs and manufactures fiber optic devices located in Bloomfield.

The map below shows the location of biomedical device manufactures in the state and the surrounding regions. Even though the largest concentration of manufacturers is in the metro-Boston area, the biomedical device industry has a presence in Connecticut that extends along I-91 down into New Haven through Hartford and up to Springfield, MA. There is even a presence along I-84 from Danbury to Hartford.

Map 3: Health Sciences - Biod/Med Device



One critical next step for the region is to convene a cluster group focused on Health Sciences and Services that can promote the region and its assets in this industry.

Advanced Manufacturing Cluster

The Advanced Manufacturing cluster is composed of industries involved in the design and manufacture of aerospace engines, vehicles, turbines; research and development for biotech, life science and aerospace companies; medical devices; pharmaceuticals; electrical equipment and metal.

Figure 8 shows the industries within the advanced manufacturing cluster that produced the highest value added and sales for the region. The entire Advanced Manufacturing cluster had approximately $18 billion in sales and contributed approximately $7 billion in value added to the regional economy in 2010. As can be seen from the table, aerospace manufacturing is an important asset to the region's economy.

Figure 8: Advanced Manufacturing Cluster Total Value Added and Sales, 2010

Advanced Manufacturing Cluster - industries	Total Value Added ($ bil)	% of Cluster Value Added	Total Sales ($ bil)	% of Cluster Sales
Aircraft engine and parts manufact.	$2.6	37%	$7.4	41%
Turbine & turbine generator set units manufact.	$0.6	9%	$1.2	6%
Pharmaceutical preparation manufact.	$0.3	4%	$0.9	5%
Aircraft manufact.	$0.3	4%	$0.7	4%
Machine shops	$0.2	3%	$0.4	2%
Total for Advanced Manufacturing	$7.1		$18.2	

Source: IMPLAN input/output model 2010 data for Hartford & Tolland Counties

Aerospace Manufacturing – "Aerospace Alley"

The region is home to a robust aerospace cluster - a geographic concentration of firms, suppliers, support services, specialized infrastructure, producers of related products, and specialized institutions. The region serves as the headquarters for Pratt & Whitney which produces aerospace engines and Hamilton Sundstrand which has one focus on aerospace vehicles. However, outside the region but within the state of Connecticut are General Electric and Sikorsky. The region is also home to hundreds of small to medium sized manufacturers that serve as the supply chain for these major corporations.

Further, the region has two specialized institutions focused in whole or in part on the aerospace industry – the Aerospace Components Manufacturers (ACM) and the Connecticut Center for Advanced Technology (CCAT). ACM is a network of independent aerospace companies that collectively offer broader capabilities than as individual companies- helping to serve the major aircraft suppliers. As one of its core functions, CCAT provides services for small and medium sized manufacturers in the aerospace and defense manufacturing industries. **The location of mature aerospace companies, specialized institutions, and cross-industry synergies with the Health Services & Sciences cluster give the metro Hartford region a unique and competitive edge related to other areas of the country.**

Growth for the region: Pratt & Whitney's Geared Turbofan (GTF), their newest engine, has greater fuel efficiency and is quieter than other fans in this market. As a result, the GTF engine will enter service on the Mitsubishi Regional Jet and the Bombardier C-Series in 2013-2014, and on the Airbus A320neo in 2015. It will also be used by Russia's Irkut Corporation for its MC-21 commercial airplane. **In seven years Pratt & Whitney has gone from no new narrow body airplanes and no customers to four airplanes and 2,000 engines on firm and option order. – *Mark Sullivan (CASE Bulletin, Spring 2012)***

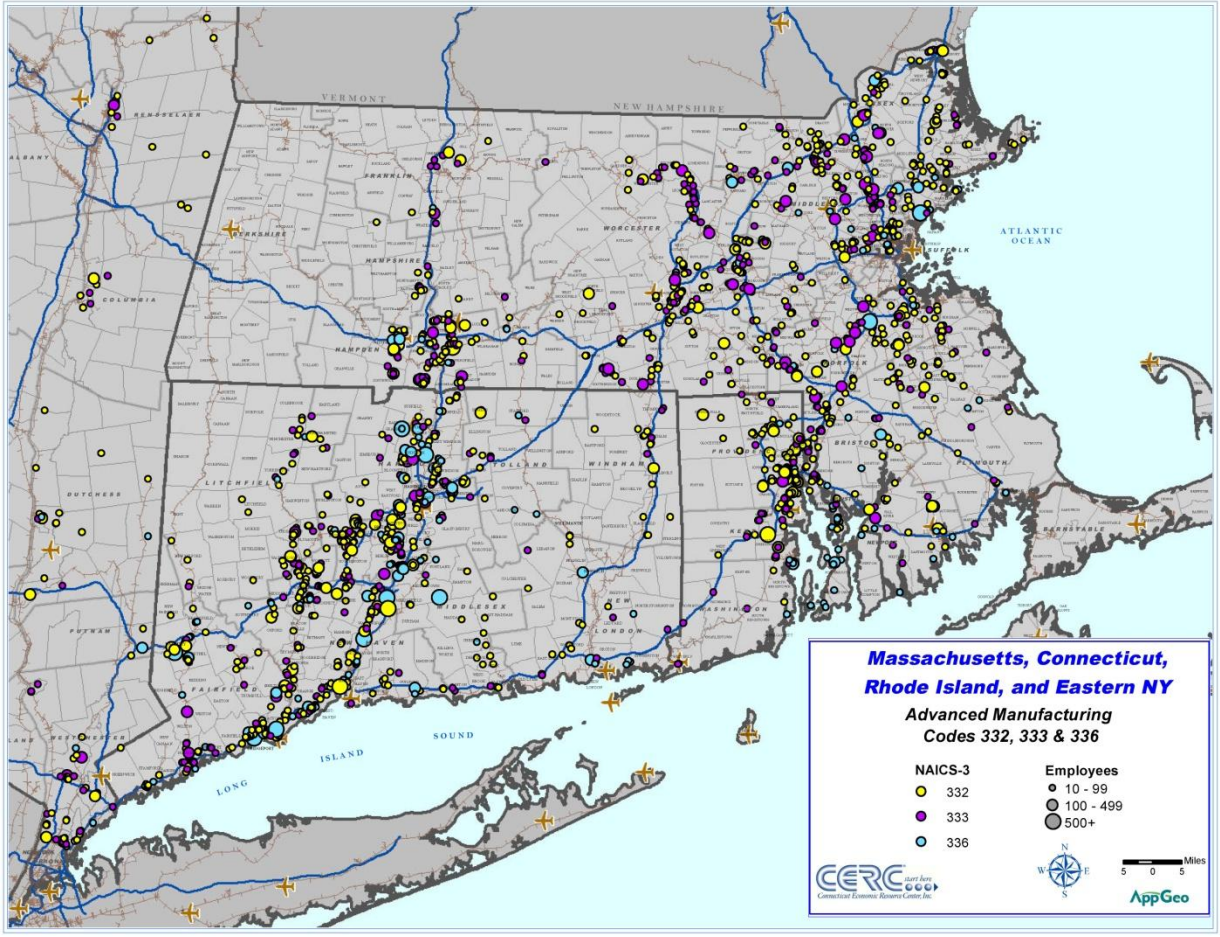
Regional Synergies - The region ranks 3rd in the country for employment in the Aerospace Engines

subcluster, 7th for the Aerospace Vehicles cluster, and 1st for Turbine and Turbine Generators. Further, there are cross-region synergies for these subclusters when considering strengths in nearby regions. For example, the Bridgeport/Stamford/Norwalk metropolitan statistical area (MSA) ranks 6th in employment and adding the employment of the metro Hartford region raises the rank to 5th for the two areas. When looking at the Aerospace Engines subcluster, the region would rank 1st for employment in the nation if combined with the Springfield MSA which is currently 9th in the country.

Since businesses do not factor in regional boundaries when making location decisions, it is important for the region to partner with adjacent regions when making policy decisions for the aerospace cluster. By partnering, the regions have the potential to maximize growth through the promotion of an even larger more concentrated cluster area.

As shown on the map below, the metro Hartford region is home to several large transportation equipment manufacturers (336) such as the Barnes Group and Kaman Aerospace Corporation and also some smaller fabricated metal manufacturers (332). Although difficult to discern, there are several mid-to-large sized Machinery manufacturers (333) in the region including United Technologies and Carrier Corporation along with more than 60 small firms.

Map 4: Advanced Manufacturing

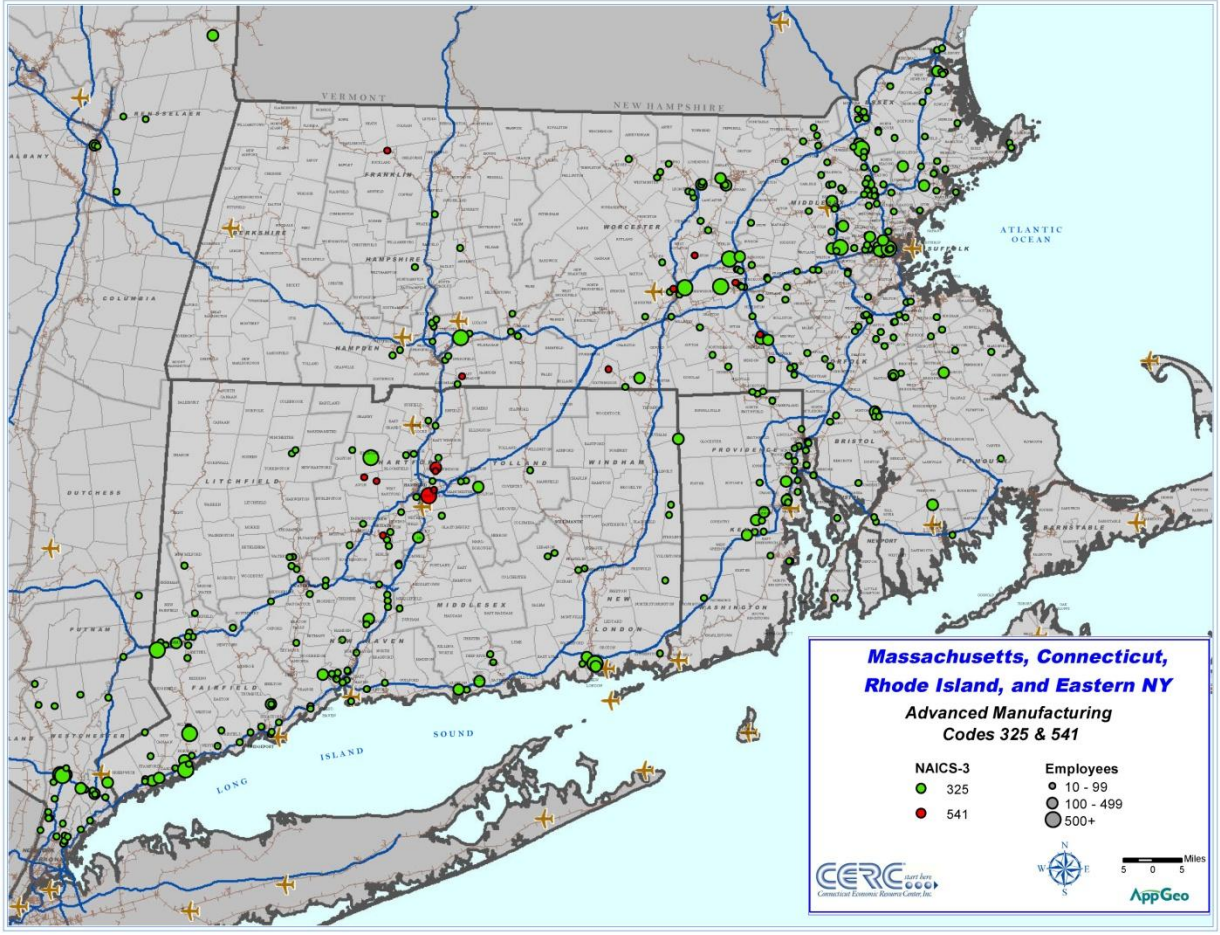


Chemical Manufacturing & Biomedical Device Manufacturing

Based on the segmentation analysis, the Chemical Manufacturing industry sector was identified as an emerging strength for the region. While the location quotient, or relative employment concentration, for the region is small (2010 LQ=0.43) it increased since 2005. Similarly, while the United States was losing employment in this sector the region had a slight increase in employment. This industry also commands a high average annual wage ranking in the top ten in the region – in 2010 the average annual wage was $87,692. Two of the major employers in the area include: Henkel Corporation in Rocky Hill; and Ensign-Bickford Industries in Simsbury. Chemical manufacturing encompasses portions of the bioscience industry which is a strength not only for the metro Hartford region but also for the I-91 corridor region.

The map below shows the location of companies in the Chemical Manufacturing industry (NAICS 325) and Professional and Technical Services (541) which includes Research and Development.

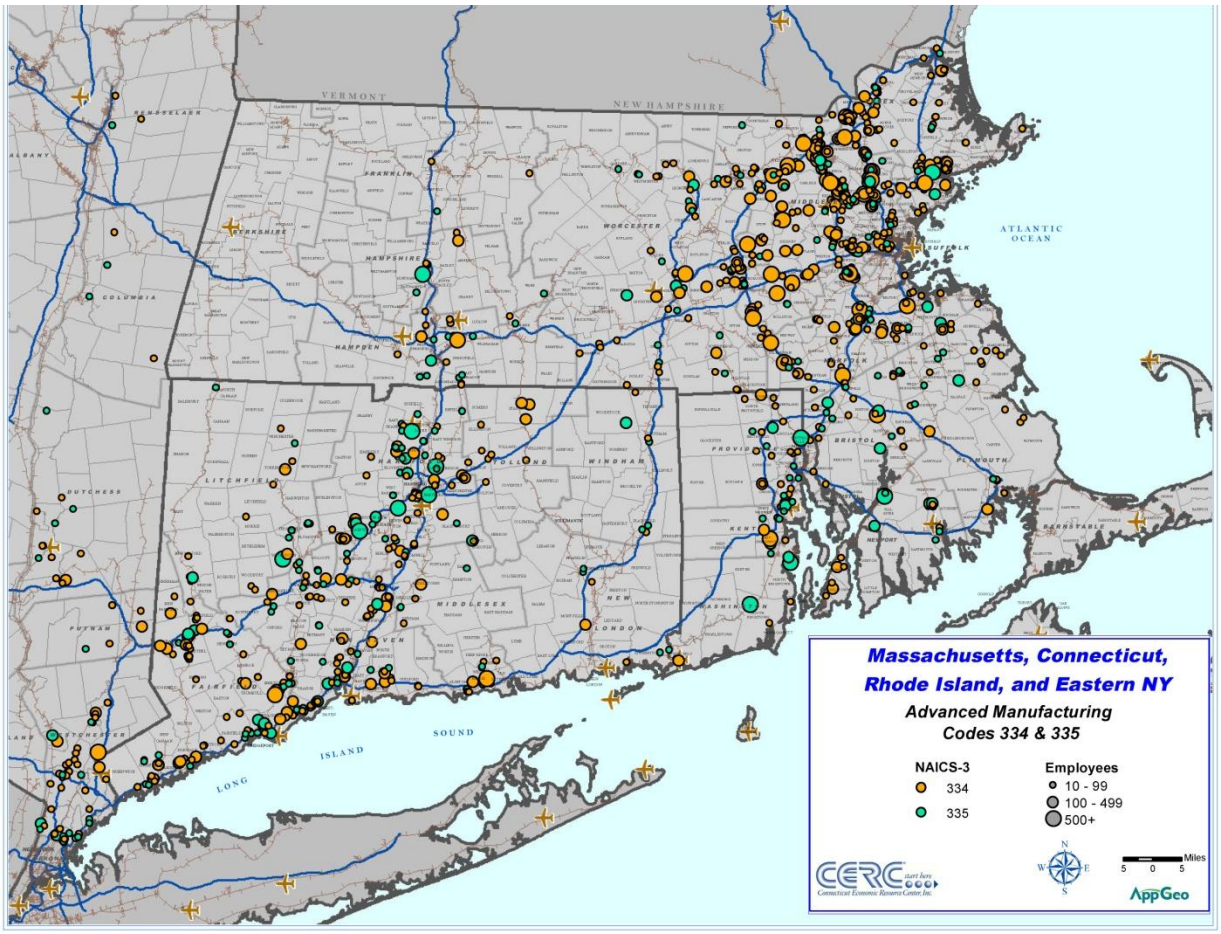
Map 5: Advanced Manufacturing - Chemical



Electrical and Computer Manufacturing

Both Electrical Equipment Manufacturing (334) and Computer & Electronic Product Manufacturing (335) fall under the cluster of Advanced Manufacturing. As shown in the map, the metro Hartford region has a larger number of businesses in Electrical than in Computer manufacturing which has a strong presence in the Greater Boston area. Based on Porter's Cluster Mapping Project, the Hartford MSA ranks 11th in the country for Electrical Equipment Manufacturing and has a location quotient of 3.3. The Providence-New Bedford-Fall River RI-MA MSA ranks 10th, just ahead of the metro Hartford region, presenting some opportunities for collaboration.

Map 6: Advanced Manufacturing - Electric Equipment and Computer & Electronic



Headquarters Cluster

Headquarters is the smallest of the clusters in the region in terms of value added and sales contributions to the economy. As shown in Figure 9, the cluster contributed approximately $2 billion in sales and approximately $1.4 billion in value added.

Figure 9: Headquarters Cluster Total Value Added and Sales, 2010

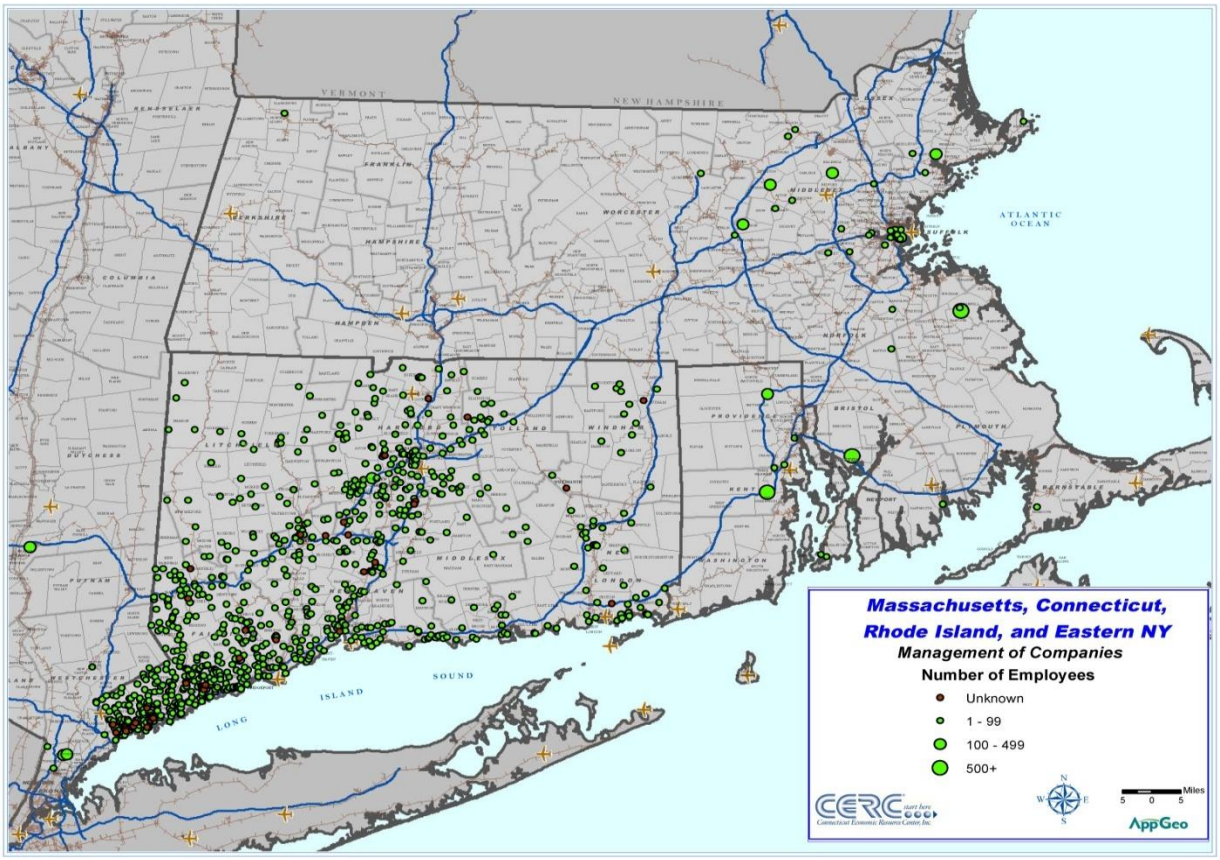
	Total Value Added ($ bil)	% of Cluster	Total Sales ($ bil)
Headquarters	$1.4	100%	$2

Source: IMPLAN input/output model 2010 data for Hartford & Tolland Counties

In 2010, the region had more than 8,500 employees in the Headquarters industry. Between 2005 and 2010, the region had a higher rate of employment growth than the nation – with an employment compound annual growth rate of 3.5% from 2003 to 2010. When looking at the productivity of the industry as measured by gross state product (GSP), the metropolitan area of Hartford-West Hartford-East Hartford in 2009 ranked 12th in the U.S. an increase in rank from 20th in 2002. Further, the compound annual growth rate in GSP was 12% over that same time period.

The map shows a **strong presence of the Headquarters industry in Connecticut that is not found in nearby bordering states**. Also shown on the map is the fact that Fairfield County is another area of the state with a high concentration in this industry. In 2009, the Bridgeport-Stamford area ranked 6th in the U.S for total gross state product attributable to this industry. What is also interesting is that majority of the companies are small, employing less than 99 people.

Map 7: Headquarters



Cluster Occupations

The Connecticut Department of Labor estimates employment by occupational grouping and industry for the state each quarter. The most recent estimates are for the second quarter of 2011. Using these estimates, an analysis was compiled estimating the number employed in each occupational group for the region based on the percentage employed in the clusters' industries in 2011. Only the occupational groups with an estimated employment of more than 1,000 are included.

The NAICS codes below correspond to the industries that were identified as strengths for the metro Hartford region.

NAICS code	Industry Description
325	Chemical Manufacturing
332	Fabricated Metals
333	Machinery Manufacturing
334	Computer & Electronic Product Manufacturing
335	Electrical Equipment Manufacturing
336	Transportation Equipment Manufacturing
523	Securities and Commodities
524	Insurance Carriers
551	Headquarters
621	Ambulatory Health Care Services
622	Hospitals
623	Nursing and Residential Care Facilities

The findings reveal, as shown in Figure 10, that many of the occupations that employ the greatest number of people in the metro Hartford region cut across all the clusters in the region. For example, all clusters in the region employ people in the following occupational groups: Business and Financial Operations; Management; Computer and Mathematical; Architecture & Engineering; and Office & Administrative Support. Installation, Maintenance, & Repair occupations also cut-across all the clusters except Financial Services.

Figure 10: Estimated Occupation Size in the Metro Hartford Region Clusters

Occupation	Estimated Metro Hartford Region Employment 2Q 2011	Metro Hartford Region Cluster Industries – that may employ these occupations	Average Wage (Connecticut)
Office and Administrative Support	32,000	All Naics codes	$37-54,000
Healthcare Practitioners and Technical	24,000	336, 524, 551, 621, 622, 623	$62-95,000
Production	20,000	325, 332, 333, 334, 335, 336, 551, 622, 623	$29-59,000
Business and Financial Operations	16,700	All Naics codes	$58-119,000
Management	14,600	All Naics codes	$80-175,000
Healthcare Support	14,000	621, 622, 623	$31-35,000
Computer and Mathematical	7,500	All Naics codes	$59-96,000
Architecture & Engineering	7,000	All Naics codes	$70-83,000
Sales & Related	5,800	All Naics codes except 623	$34-164,000
Community & Social Service	3,300	524, 551, 621, 622, 623	$38-60,000
Installation, Maintenance, & Repair	3,000	All Naics except 523 & 524	$45-60,000
Transportation & Material Moving	1,300	332, 333, 334, 335, 336, 551	$33-42,000
Personal Care & Service	1,300	622, 623	$33-35,000

Source: CT DOL

The fact that there are many overlaps by the clusters on particular skills and occupations in the workforce shows how the region's industries are interdependent. It is also a strength that the region can promote in attracting a skilled workforce. There are many opportunities for the workforce to move between industries within one region – Healthcare Practitioners and Technical occupations can be found in manufacturing, insurance, headquarters, and health service industries.

As the table above shows, many of the occupations cross industries. Below are the specific occupations within each of the occupation groups that employ the most people.

Management	Business and Financial Operations	Computer and Mathematical
Financial Managers	Claims Adjusters, Examiners, and Investigators	Computer Systems Analysts
Computer & Information Systems Mangers	Insurance Underwriters	Computer Support Specialists
General & Operations Managers	Management Analysts	Computer Software Engineers, Applications
Medical & Health Services Managers	Personal Financial Advisors	Computer Software Engineers, Systems Software
Engineering Managers	Financial Analysts	Computer Programmers
	Accountants & Auditors	
	Purchasing Agents, Except Wholesale, Retail, and Farm Products	
	Business Operations Specialists	
	Human resources, labor relations, and training specialists	
	Training and Development Specialists	
	Market Research Analysts	

Architecture & Engineering	Installation, Maintenance, & Repair	Production Occupations
Mechanical Engineers	General Maintenance and Repair workers	Machinists
Industrial Engineers	Aircraft Mechanics and Service Technicians	Team Assemblers
Aerospace Engineers		First-Line Supervisors/Managers of Production and Operating Workers
Mechanical Drafters		Inspectors, Testers, Sorters, Samplers, and Weighers
Electrical & Electronic Engineering Technicians		Electrical and Electronic Equipment Assemblers
Electrical Engineers		Computer-Controlled Machine Tool and Die Makers
		Welders, Cutters, Solderers, and Brazers
		Computer-Controlled Machine Tool Operators, Metal and Plastic

Industry Segmentation

As part of the 2012 CEDS report, a segmentation analysis was completed using industry data from the CT Department of Labor for the North Central Workforce Investment Area (NCWIA) since this area most closely mirrors the towns that comprise the metro Hartford region.[2]

The first step in the segmentation analysis is to identify the region's economic engines by assessing the relative concentration of a given industry's employment or output relative to the same ratio in the comparison region, which in this case is the U.S. This produces a concentration ratio, or location quotient, which is a ratio of the percentage of employment in an industry in a local economy to the percentage of employment in the industry in a larger reference economy.

In addition to evaluating location quotients, performing a shift-share analysis helps to determine local economic performance. This technique decomposes regional employment change into three components: a national growth effect, an industry mix effect, and a regional share effect. The sum of the three effects is the total employment change observed in the region. This analysis is used to develop a better understanding of the forces affecting local change, particularly as it relates to each industry's competitive share. If the competitive share component is positive, then the region's performance is not merely caused by national trends—a local advantage is helping the industry to succeed. Conversely, a negative regional share value suggests that there is a competitive weakness for that industry in the region.

Current Strengths:

1) Transit and ground passenger transport (school and employee bus transportation)
2) Broadcasting, except internet
3) Headquarters and enterprises
4) Social Assistance (day care and services for elderly)

Strengths with recent economic challenges:

1) Fabricated metal product manufacturing
2) Machinery manufacturing
3) Electrical equip. and appliance manufacturing
4) Transportation equipment manufacturing
5) ISPs, search portals, and data processing
6) Insurance

New Industry Strengths:

1) Heavy and civil engineering construction
2) Food manufacturing
3) Beverage and tobacco product manufacturing
4) Chemical manufacturing
5) Truck transportation
6) Motion picture & sound recording
7) Securities, commodity contracts, investments
8) Real estate

The charts on the next page provide more detail on economic trends experienced by the industries identified in the segmentation analysis.

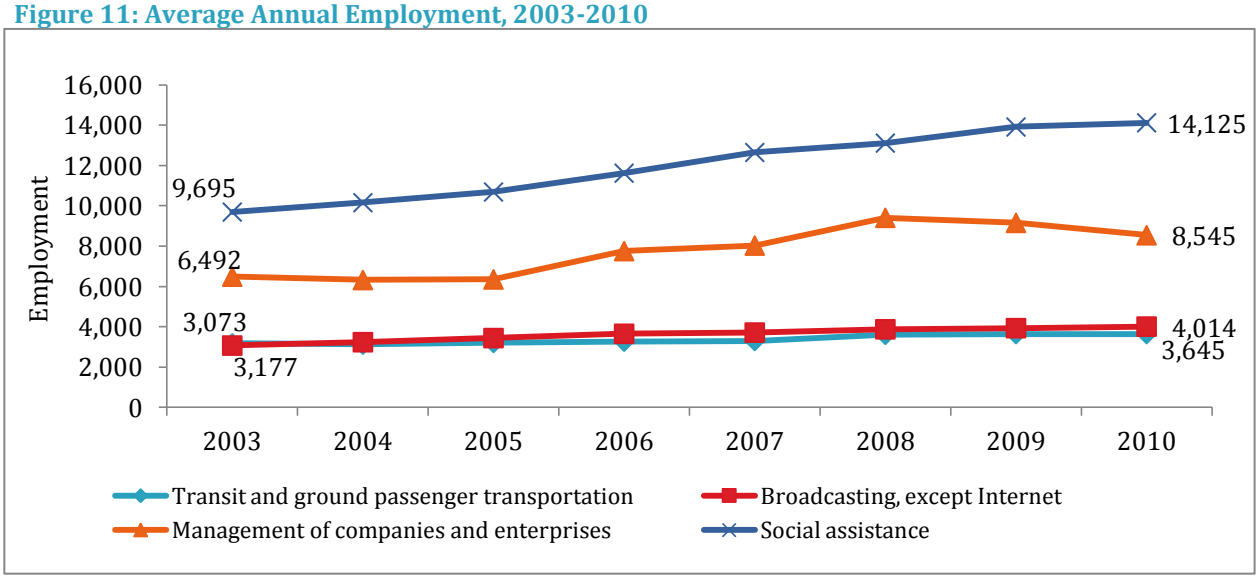
[2] Department of Labor data is available at the town, county, WIA region, and state level. Data at the town level often has numerous suppressions due to data security issues. Therefore, CERC compared the MetroHartford region to the NCWIA region and Hartford and Tolland counties. For the industry analysis, the NCWIA region was determined to be the closest match. The NCWIA includes an additional 7 towns not part of the MetroHartford region whereas the counties include an additional 12 towns. Neither the counties nor the NCWIA region include Cromwell. The seven additional towns include: Berlin, Bristol, Burlington, New Britain, Plainville, Plymouth, and Southington.

Current Strengths

The figures below show average annual employment and average annual wages from 2003 to 2010, in each of the industries identified as 'current strengths.' *Social assistance* has seen steady annual growth in employment for the entire 2003 to 2010 time period. *Headquarters and enterprises* had employment growth from 2005 to 2008 and then declined from 2008 to 2010 but still employs more than 8,500 people. B*roadcasting, except internet* and *transit and ground passenger transportation* have also had employment growth but just at a slower rate. All four industries had an increase in location quotients between 2005 and 2010.

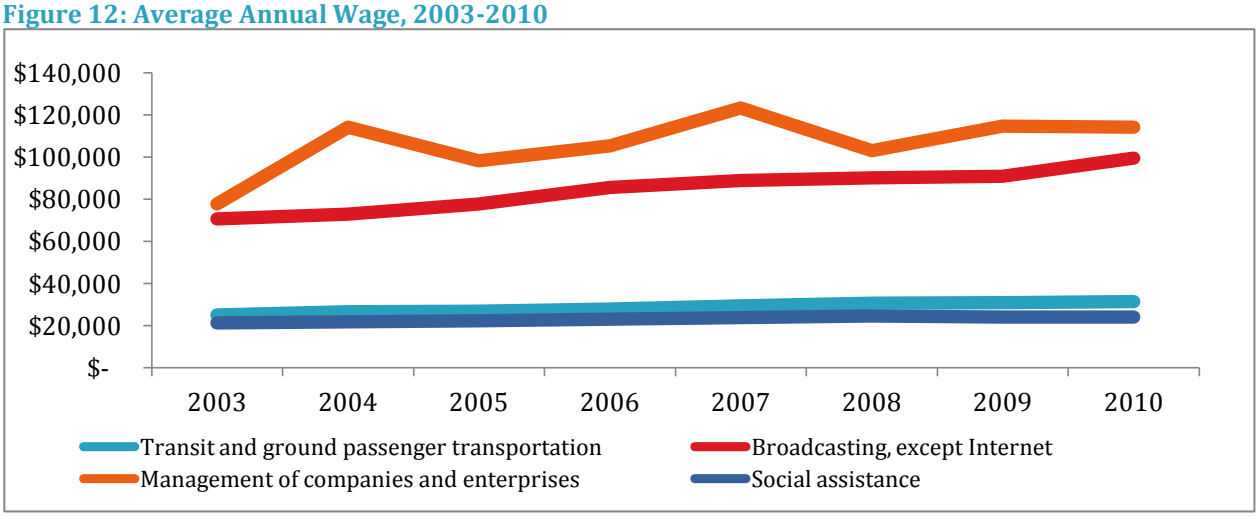
Both *transit and ground passenger and transportation* and *social assistance* are the type of industry in regional economies that is local. In these industries, employment is roughly proportional to the regional population. These industries provide local goods and services to the local market and compete only in a limited way with other regions.[3]

Figure 11: Average Annual Employment, 2003-2010



Source: CT Department of Labor, QCEW data for NCWIA

Figure 12: Average Annual Wage, 2003-2010



Source: CT Department of Labor, QCEW data for NCWIA

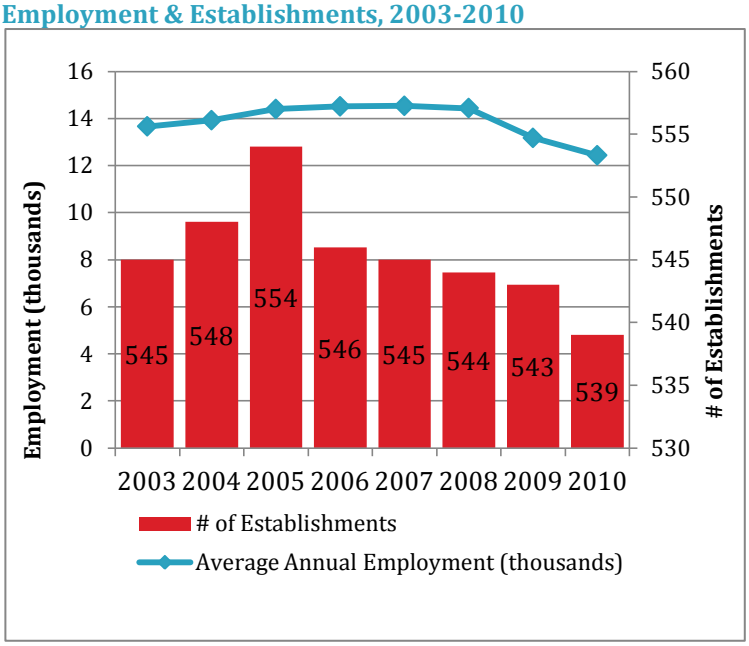
[3] Porter, Michael E., "The Economic Performance of Regions," Regional Studies, Vol 37.6&7, August/October 2003.

Strengths with recent economic challenges

The figures below show average annual employment and number of establishments from 2003 to 2010, in each of the industries identified as 'strengths for the region with recent economic challenges.'

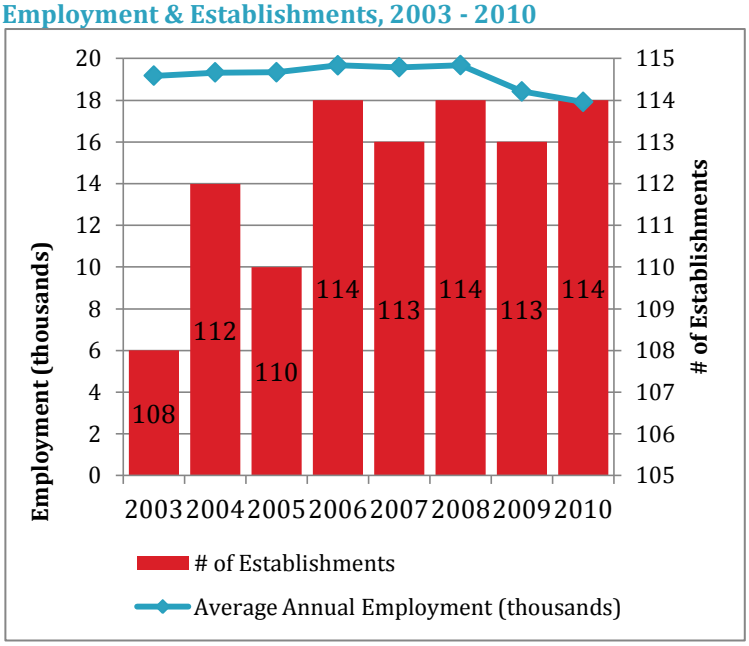
Fabricated metal and *Transportation Manufacturing* did not see much fluctuation in the number of establishments but had employment declines between 2008 and 2010. Despite these losses, both industries increased their location quotients since employment in the U.S. declined at a higher rate. For example, in 2005 almost 5 million people in the U.S. were employed in the fabricated metal product manufacturing industry but by 2010 only about 1.3 million were employed.

Figure 13: Fabricated Metal Product Manufacturing Employment & Establishments, 2003-2010



Source: CT Department of Labor, QCEW data for NCWIA

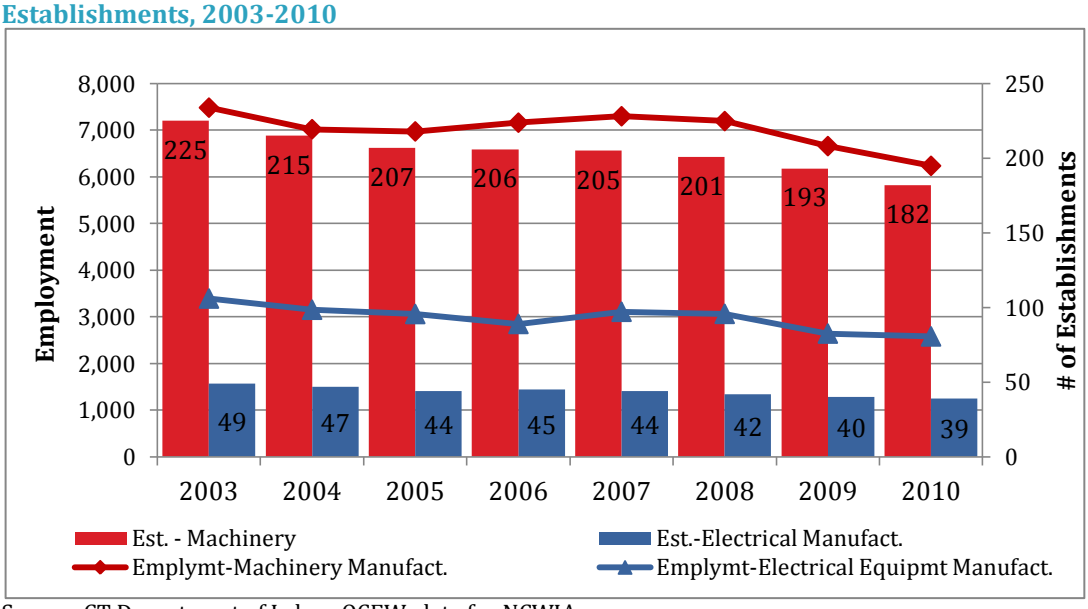
Figure 14:Transportation Equipment Manufacturing Employment & Establishments, 2003 - 2010



Source: CT Department of Labor, QCEW data for NCWIA

Between 2003 and 2010, *Machinery Manufacturing* lost about 40 establishments and also 1,250 jobs while *Electrical Equipment & Appliance Manufacturing* lost 10 establishments and approximately 800 jobs. Location quotients in these industries remained relatively stable.

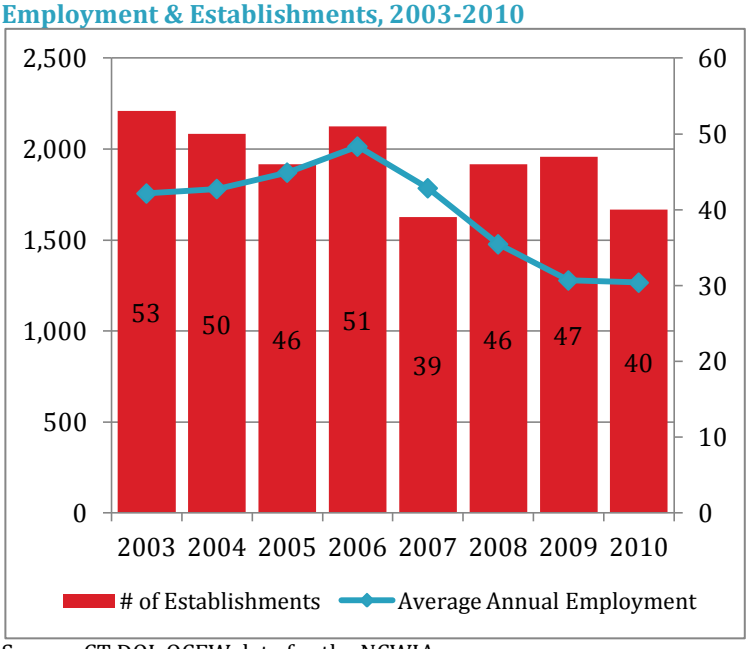
Figure 15: Electrical Equipment & Appliance & Machinery Manufacturing Employment & Establishments, 2003-2010



Source: CT Department of Labor, QCEW data for NCWIA

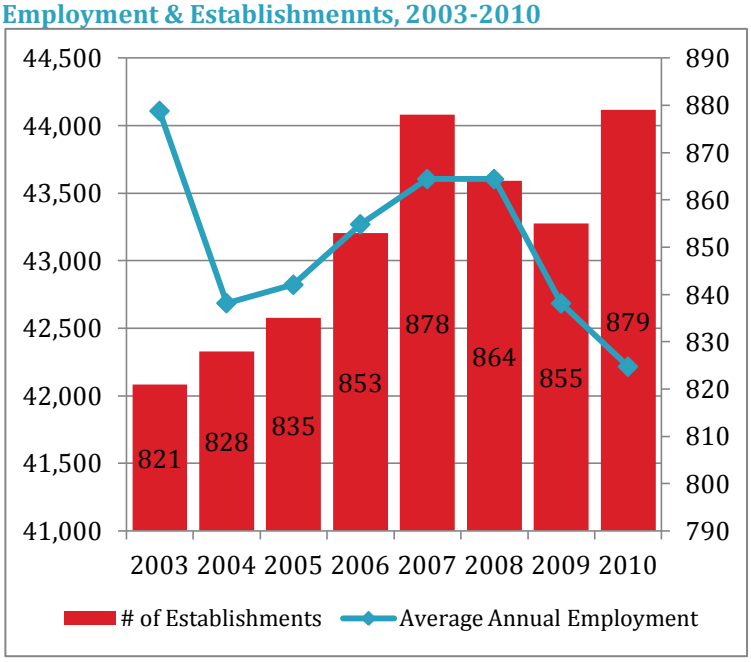
Two additional industries, that are not manufacturing, but experienced recent economic challenges are *ISPs, search portals and data processing* and *Insurance carriers and related activities.* The former industry lost approximately 800 jobs between 2006, prior to the recession, and 2010. Insurance, on the other hand, despite an increase in establishments between 2003 and 2004, lost more than 1,400 jobs, employment then rose until the recent recession, but not to the levels seen in 2003, and since then there has been annual declines in employment.

Figure 16: ISPs, search portals, and data processing Employment & Establishments, 2003-2010



Source: CT DOL QCEW data for the NCWIA

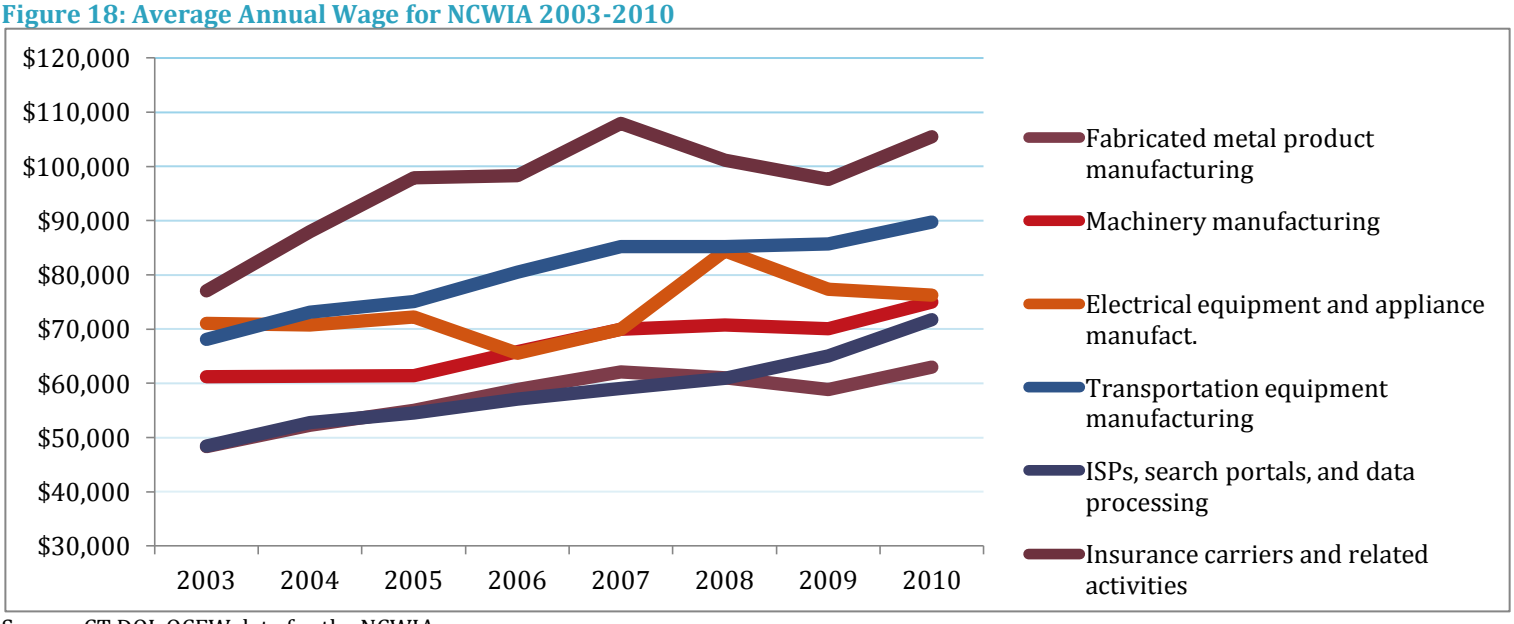
Figure 17: Insurance Carriers and Related activities Employment & Establishmennts, 2003-2010



Source: CT DOL QCEW data for the NCWIA

During the eight year period, from 2003 to 2010, the compound annual growth rates for the industries ranged from a low of 0.9% (Electrical Equipment) to a high of 5% (ISPs). The compound annual growth rate for Machinery manufacturing wages was 2.6% which is lower than the average annual inflation rate over that same time period.

Figure 18: Average Annual Wage for NCWIA 2003-2010



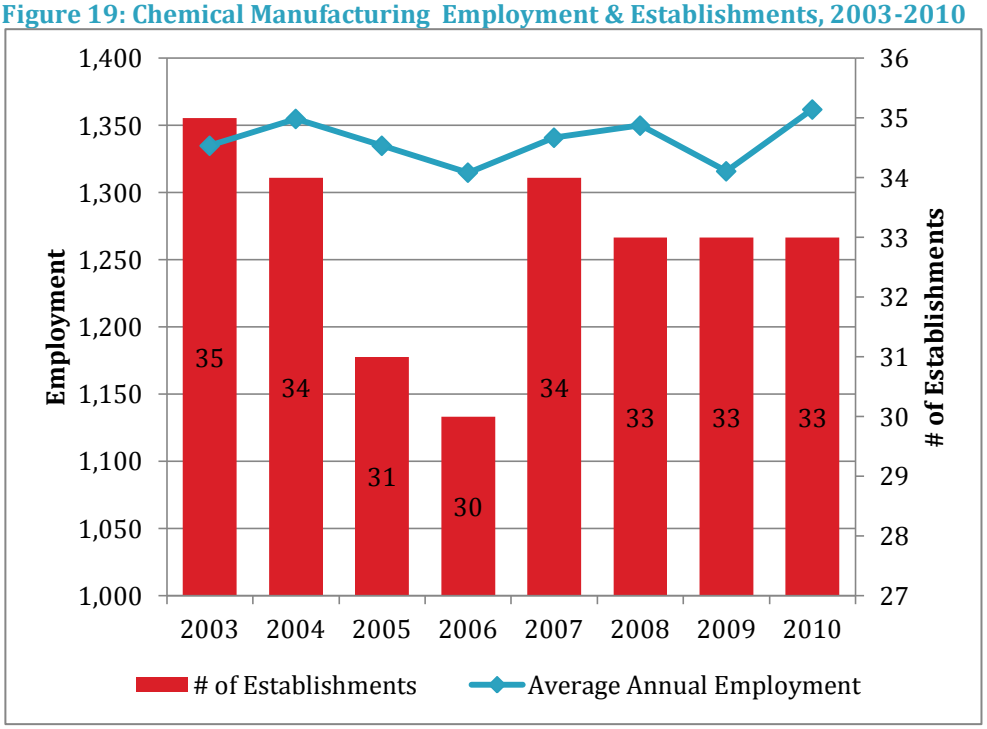
Source: CT DOL QCEW data for the NCWIA

Emerging Strengths

Based on the segmentation analysis, the Chemical Manufacturing industry sector was identified as an emerging strength for the region. While the location quotient for the region is small (2010 LQ=0.43) it increased since 2005. Similarly, while the United States was losing employment in this sector the region had a slight increase in employment. This industry also commands a high average annual wage ranking in the top ten in the region – in 2010 the average annual wage was $87,692.

Chemical manufacturing encompasses portions of the medical device industry which is a strength for the I-91 corridor region, which includes most of the NCWIA and the metro Hartford region. Therefore, chemical manufacturing is an important industry sector for the region with the possibility to grow.

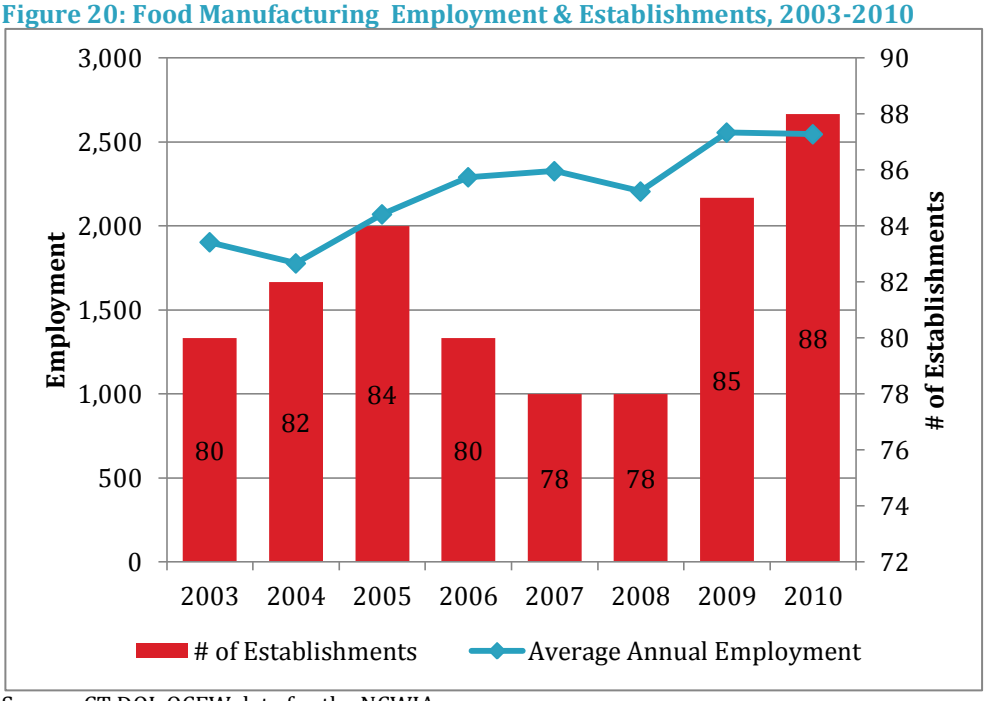
Figure 19: Chemical Manufacturing Employment & Establishments, 2003-2010



Source: CT DOL QCEW data for the NCWIA

Food manufacturing is also an industry sector with a small location quotient (2010 LQ=0.43) it appeared as emerging strength since employment has been on the rise in the region while declining in the United States. Between 2003 and 2010 the region added approximately 650 jobs or a 34% increase whereas U.S. employment declined by 2%. Furthermore, this industry increased employment during the recession while other industries were losing jobs.

Figure 20: Food Manufacturing Employment & Establishments, 2003-2010

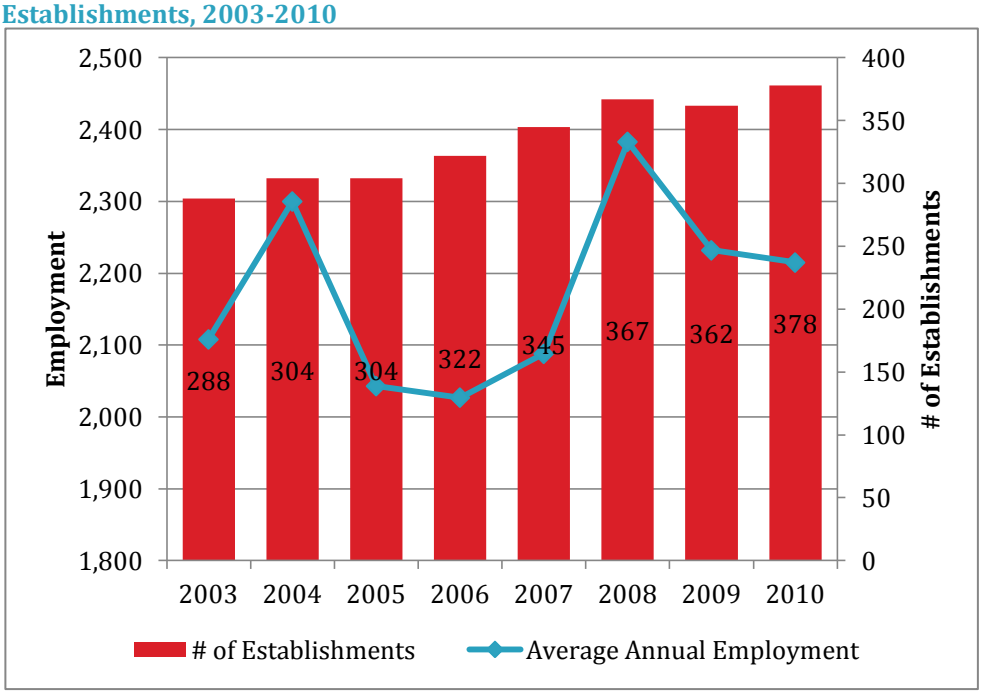


Source: CT DOL QCEW data for the NCWIA

Another emerging industry sector strength due to an increase in employment and at a rate faster than the U.S. is the *Securities, Commodity Contracts, and Investments* sector. This sector also has the highest average annual wage of all industry sectors in the region. In 2010, the average annual wage was $149,295.

As the economy rebounds, it will be important to see if the employment in this sector rebounds further increasing concentration in the region. Furthermore, if we look beyond the region and into Fairfield County, the potential for synergy and growth as a strong cluster exists.

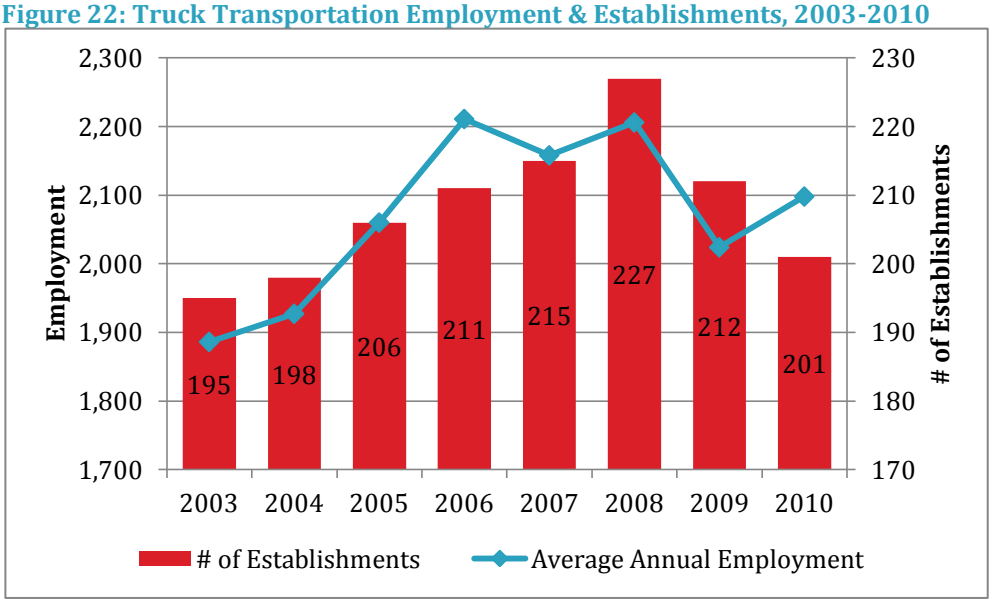
Figure 21: Securities,Commodity Contracts, Investments Employment & Establishments, 2003-2010



Source: CT DOL QCEW data for the NCWIA

Another emerging strength for the region is truck transportation. This is another industry where U.S. employment declined between 2005 and 2010 but the region's employment grew slightly, therefore gaining market share.

Figure 22: Truck Transportation Employment & Establishments, 2003-2010



Source: CT DOL QCEW data for the NCWIA

U.S. Cluster Mapping Project

Recently, the Institute for Strategy and Competitiveness (ISC) under the direction of Michael Porter at Harvard University established a U.S. Cluster Mapping project. The following is an analysis, based on this project which was made available by the Federal Economic Development Agency.

This project identified 41 traded clusters[4] with an average of 29 industries each covering the entire U.S. economy. Clusters are defined as an economic unit that involve a mix of manufacturing and services and combine industries in different parts of the traditional industrial classification system. Industries located in regions with strong clusters experience higher growth in new business formation and start-up employment and contribute to start-up firm survival.[5]

The purpose of the Cluster Mapping Project is to assemble a detailed picture of the location and performance of industries in the United States, with a special focus on the linkages or externalities across industries that give rise to clusters. Following is a summary of the clusters identified as strengths for the Hartford-West Hartford-East Hartford, CT metropolitan area.

The following traded clusters were identified as strengths for the Hartford -West Hartford-East Hartford, CT Metropolitan Area:

1. Financial Services (subcluster strength: Insurance);
2. Metal Manufacturing;
3. Aerospace Vehicles & Defense;
4. Aerospace Engines;
5. Power Generation and Transmission (subcluster strength: Turbines & Turbine Generators);
6. Lighting and Electrical Equipment (subcluster strengths: Switchgear, Metal Parts, and Electrical Parts);
7. Sporting, Recreational, and Children's Goods (subcluster strength: Games, Toys, Children's Vehicles);
8. Tobacco; and
9. Communications Equipment (subcluster strength: Specialty Office Machines)

Financial Services

Financial Services was identified as a cluster strength for the region which is led by the strength of the Insurance subcluster. The table below shows the top 10 regions in the U.S. for the Insurance subcluster. Although the Hartford/WH/EH region ranks 2nd in terms of the share of national employment, two regions –Milwaukee and Des Moines – have shown positive compound annual growth rates over the past twelve years whereas the Hartford region has shown an average decline

[4] A traded cluster is a group of industries which concentrate in particular regions that sell products and services across regions and often to other countries. They locate in a particular region based not on resources but on broader competitive considerations. in contrast to local industries that primarily serve the local market and whose employment is evenly distributed across regions – such as retail or social services.
[5] Mercedes Delgado, Michael E. Porter, Scott Stern, "Clusters and entrepreneurship," *Journal of Economic Geography,* May 2010.

over the same period. Furthermore, Des Moines' location quotient is higher than the Hartford region.

Figure 23: Insurance Subcluster

Insurance Subcluster							
Rank	**Region**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**	**Average wages (2009)**	**CAGR of average wages 1998-2009**
1	New York-Northern New Jersey-Long Island, NY-NJ-PA	45,227	10.0	-5.18	1.55	$128,164	8.84
2	Hartford-West Hartford-East Hartford, CT	17,969	4.0	-2.92	8.41	$181,983	10.71
3	Milwaukee-Waukesha-West Allis, WI	17,737	3.9	0.91	5.94	$39,562	-2.6
4	Los Angeles-Long Beach-Santa Ana, CA	16,804	3.7	-2.07	0.84	$70,251	1.37
5	Des Moines-West Des Moines, IA	15,226	3.4	2.48	13.58	$64,271	3.52
6	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	13,821	3.1	-6.66	1.41	$83,395	7.72
7	Chicago-Naperville-Joliet, IL-IN-WI	13,430	3.0	-4.16	0.87	$77,444	5.69
8	Minneapolis-St. Paul-Bloomington, MN-WI	12,710	2.8	-5.56	1.98	$76,557	5.73
9	Boston-Cambridge-Quincy, MA-NH	12,462	2.8	-3.54	1.4	$88,506	4.43
10	Dallas-Fort Worth-Arlington, TX	10,419	2.3	-0.61	1.03	$70,397	4.79

Advanced Manufacturing

The metro Hartford region has a diverse manufacturing base. Although employment has been on the decline, for many manufacturing industries productivity has risen. This means that although, employment decreases at a firm, the efficiency of the firm has been increasing thus adding value to the gross state product. The following manufacturing industries have seen positive compound annual growth rates since 2000: Fabricated Metal Manufacturing (0.5%), Chemical Manufacturing (4.6%), Transportation Equipment Manufacturing (4.6%), and Electrical Equipment (1.4%).

Within the metro Hartford region there are several components of advanced manufacturing. The noted strengths in the region are:

1. Aerospace Manufacturing (Engines and Vehicles)
2. Turbines & Turbine Generators
3. Metal Manufacturing
4. Lighting and Electrical Equipment
5. Chemical Manufacturing

Aerospace Engines is another industry cluster with regional strength (wage data not shown because of suppressions). In fact, the region has the highest location quotient in the country. However, the region over the last twelve years has had a declining employment rate where other parts of the United States have seen significant gains.

Figure 24: Aerospace Engines

Aerospace Engines					
Rank	**Region**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**
1	Phoenix-Mesa-Scottsdale, AZ	7,936	9.5	0.44	7.27
2	Cincinnati-Middletown, OH-KY-IN	7,500	9.0	-0.59	11.37
3	Hartford-West Hartford-East Hartford, CT	7,035	8.4	-6.35	17.84
4	Boston-Cambridge-Quincy, MA-NH	3,930	4.7	-1.96	2.39
5	Kansas City, MO-KS	3,760	4.5	60.97	5.77
6	Indianapolis-Carmel, IN	3,750	4.5	-0.55	6.75
7	Portland-South Portland-Biddeford, ME	2,500	3.0	2.98	15.49
8	New York-Northern New Jersey-Long Island, NY-NJ-PA	2,218	2.7	0.39	0.41
9	Springfield, MA	1,810	2.2	-0.56	10.11
10	Akron, OH	1,750	2.1	15.03	8.66

Another cluster where the Hartford region ranks in the top 20 in the country is the Aerospace Vehicles cluster. In terms of employment, the Hartford region ranks 7th but in terms of location quotient the region is 4th in the country. However, again this is another industry with declining employment growth rates over the past twelve years.

Figure 25: Aerospace Vehicles

Aerospace Vehicles					
Rank	**Region**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**
1	Seattle-Tacoma-Bellevue, WA	47,380	13.5	-6.29	10.43
2	Los Angeles-Long Beach-Santa Ana, CA	41,851	11.9	-7.68	2.71
3	Wichita, KS	35,000	10.0	0.36	43.52
4	Dallas-Fort Worth-Arlington, TX	30,733	8.8	-1.37	3.93

5	Tucson, AZ	18,100	5.2	6.22	19.09
6	Bridgeport-Stamford-Norwalk, CT	17,510	5.0	7.73	14.02
7	Hartford-West Hartford-East Hartford, CT	9,435	2.7	-2.21	5.69
8	Denver-Aurora, CO	8,260	2.4	0.11	2.53
9	St. Louis, MO-IL	8,208	2.3	-13.51	2.22
10	Atlanta-Sandy Springs-Marietta, GA	7,935	2.3	-0.49	1.25

Metal Manufacturing is another industry cluster where the Hartford region ranks in the top 20 in the United States in terms of employment. Although just making the list at 20th in 2009 employment, the Hartford region ranks 7th for the location quotient.

Figure 26: Metal Manufacturing

Metal Manufacturing							
Rank	**Region**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**	**Average wages (2009)**	**CAGR of average wages 1998-2009**
1	Chicago-Naperville-Joliet, IL-IN-WI	62,034	6.6	-4.91	1.93	$50,094	1.84
2	Los Angeles-Long Beach-Santa Ana, CA	45,931	4.9	-4.6	1.11	$42,112	2.22
3	Cleveland-Elyria-Mentor, OH	26,645	2.8	-4.03	3.61	$43,753	2.12
4	Detroit-Warren-Livonia, MI	24,387	2.6	-5.29	1.89	$50,211	2.52
5	Houston-Sugar Land-Baytown, TX	21,929	2.3	1.7	1.19	$48,835	2.66
6	Pittsburgh, PA	20,921	2.2	-4.42	2.44	$54,883	2.82
7	New York-Northern New Jersey-Long Island, NY-NJ-PA	20,203	2.1	-5.03	0.33	$44,681	1.91
8	Minneapolis-St. Paul-Bloomington, MN-WI	17,465	1.9	-2.92	1.31	$47,372	2.54
9	Milwaukee-Waukesha-West Allis, WI	16,586	1.8	-3.83	2.67	$43,425	1.17
10	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	13,673	1.5	-5.49	0.67	$52,537	2.63
~							
20	Hartford-West Hartford-East Hartford, CT	8,683	0.9	-3.27	1.95	$50,967	2.47

The Turbine & Turbine Generators Subcluster within the Power Generation and Transmission cluster is another strength for the Hartford region. The region ranks 1st in terms of 2009 employment and has shown a compound annual growth rate of almost 29 percent over the past 12 years.

Figure 27: Turbines & Turbine Generators

Turbines & Turbine Generators					
Rank	**Region –**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**
1	Hartford-West Hartford-East Hartford, CT	3,750	12.0	28.6	25.45
2	San Diego-Carlsbad-San Marcos, CA	3,750	12.0	0.0	12.29
3	Greenville-Mauldin-Easley, SC	3,750	12.0	7.2	53.97
4	San Jose-Sunnyvale-Santa Clara, CA	1,750	5.6	8.0	7.45
5	Albany-Schenectady-Troy, NY	1,750	5.6	-0.3	19.6
6	Houston-Sugar Land-Baytown, TX	1,712	5.5	-0.3	2.81
7	Charlotte-Gastonia-Concord, NC-SC	750	2.4	0.0	3.59
8	York-Hanover, PA	750	2.4	0.0	17.58
9	Grand Forks, ND-MN	750	2.4	48.1	68.45
10	Tulsa, OK	547	1.8	22.3	5.16

Lighting & Electrical Equipment is another strength for the region. The Hartford region ranks 11th for total employment in 2009.

Figure 28: Lighting & Electrical Equipment

Lighting & Electrical Equipment							
Rank	**Region –**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**	**Average wages (2009)**	**CAGR of average wages 1998-2009**
1	Chicago-Naperville-Joliet, IL-IN-WI	14,626	7.3	-7.43	2.14	$49,298	2.46
2	Los Angeles-Long Beach-Santa Ana, CA	10,272	5.1	-3.46	1.17	$46,863	3.88
3	New York-Northern New Jersey-Long Island, NY-NJ-PA	8,218	4.1	-6.56	0.64	$52,256	3.53

4	Reading, PA	8,140	4.1	3.93	32.25	$38,418	-0.57
5	Minneapolis-St. Paul-Bloomington, MN-WI	5,607	2.8	-2.38	1.97	$49,702	2.04
6	Houston-Sugar Land-Baytown, TX	5,306	2.7	3.45	1.36	$45,911	2.85
7	Milwaukee-Waukesha-West Allis, WI	4,480	2.2	-3.41	3.4	$46,818	2.81
8	St. Louis, MO-IL	4,060	2.0	-2.62	1.93	$40,825	1.27
9	Pittsburgh, PA	3,574	1.8	-1.94	1.96	$43,739	2.71
10	Providence-New Bedford-Fall River, RI-MA	3,336	1.7	-4.16	3.14	$38,806	3.64
11	Hartford-West Hartford-East Hartford, CT	3,144	1.6	-1.07	3.33	$49,453	2.61

Games, Toys, and Children's Vehicles is a sublcuster in the Sporting, Recreational, and Children's Goods cluster. The Hartford region ranks 2nd in total employment in the country just slightly behind Springfield, MA.

Figure 29: Games, Toys, and Children's Vehicles

Games, Toys, and Children's Vehicles					
Rank	**Region**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**
1	Springfield, MA	853	10.9	-6.32	50.63
2	Hartford-West Hartford-East Hartford, CT	750	9.5	-7.74	20.21
3	Los Angeles-Long Beach-Santa Ana, CA	623	7.9	-5.66	1.8
4	Akron, OH	375	4.8	-13.07	19.72
5	Las Vegas-Paradise, NV	375	4.8	2.96	7.16
6	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	375	4.8	2.24	2.2
7	Reno-Sparks, NV	375	4.8	39.03	31.5
8	Chicago-Naperville-Joliet, IL-IN-WI	247	3.1	-17.79	0.92
9	New York-Northern New Jersey-Long Island, NY-NJ-PA	237	3.0	-20.67	0.47
10	San Diego-Carlsbad-San Marcos, CA	192	2.4	10.82	2.5

Specialty Office Machines is a subcluster of the Communications Equipment cluster. In the table below, the Hartford region ranks 9th in terms of employment (twelve regions have equal employment totals). Although total employment is small, there could be potential with building the cluster since another region of the state – Bridgeport/Stamford/Norwalk—ties for first in total employment for the country.

Figure 30: Specialty Office Machines

Specialty Office Machines					
Rank	**Region**	**Total employment (2009)**	**Share of National Employment (2009)**	**CAGR of employment 1998-2009**	**Location Quotient (2009)**
1	Durham, NC	1,750	26.8	0	136.55
2	Bridgeport-Stamford-Norwalk, CT	1,750	26.8	-6.69	75.26
3	Dallas-Fort Worth-Arlington, TX	750	11.5	-1.89	5.16
4	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	750	11.5	4.86	5.3
5	Chicago-Naperville-Joliet, IL-IN-WI	379	5.8	-6.78	1.69
6	Rochester, NY	248	3.8	-6.98	10.36
7	Tampa-St. Petersburg-Clearwater, FL	175	2.7	29.72	3.22
8	Memphis, TN-MS-AR	175	2.7	-12.39	5.9
9	Atlanta-Sandy Springs-Marietta, GA	60	0.9	-1.39	0.51
10	Tulsa, OK	60	0.9	-9.27	2.7
11	Hartford-West Hartford-East Hartford, CT	60	0.9	-1.39	1.94

Opportunities for Growth

This section looks at the analysis completed by the Cluster Mapping Project to see if there are additional opportunities for the metro Hartford region. First, this section examines clusters that had employment growth in the nation and how they fared in the metro Hartford region. Second, this section looks at clusters that were identified as strengths for the metro Hartford region but did not arise to the forefront of the analysis for this report.

Industries Growing in the Nation – How does the Metro Hartford Region Fare?

According to the analysis by The Cluster Mapping Project, the following seven clusters had the highest percentage change in shares of national employment growth in the nation between 1998 and 2009: Education and Knowledge Creation; Transportation and Logistics; Business Services; Oil and Gas Products and Services; Entertainment; Distribution Services; and Medical Devices. In fact, these were the only clusters with positive employment changes.

The next question is: how did the metro Hartford region fare in these clusters? If they are growing in the country, are they growing in the region? If not, why might this be happening? The figure below shows that four of the five clusters shrank in the region relative to other regions in the U.S. Only one cluster -- Transportation & Logistics – grew in its share of national employment.

Figure 31: Clusters growing in the nation and their presence in the metro Hartford region

Cluster	2002 Overall Metro Hartford Region Rank (total employment – out of 363)	2009 Overall Metro Hartford Region Rank (total employment- out of 363)	2009 Employment	% Change in Share of Nat'l Emp ('98-09)
Education & Knowledge Creation	43	56	10,328	-25%
Business Services	40	45	22,209	-17%
Distribution Services	41	50	7,197	-28%
Medical Devices	60	85	877	-31%
Transportation & Logistics	59	51	6,072	31%

However, employment is only one measurement of success. Some of the regions that top the list for all the clusters include Washington-Arlington-Alexandria DC, VA,MD; Boston; New York; Los Angeles; and Chicago. It will be impossible for the region to compete with these major metropolitan areas as they are more densely populated and have a different economic dynamic than the metro Hartford region. Further the latest employment information for this analysis is from 2009, which would not necessarily include the entire effects of the recession.

But with that being said, these were clusters that grew in the nation but not in the region which is disconcerting. The decrease in share of national employment of Education & Knowledge Creation is not a positive trend for the region particularly as more jobs require postsecondary education. The only subcluster within Education & Knowledge Creation that increased in rank was Lessors of Other Nonfinancial Intangible Assets which is patent related. Research Organizations, Educational Facilities and Institutions all decreased in share of national employment.

Business Services, although losing share in national employment, still employs a large number of people in the region and remains a key asset for the region. Medical Devices also decreased in share of national employment, yet when looking at the niche of dental instruments and supplies, the region rises to the rank of 16th.

Transportation & Logistics represents an emerging opportunity for the region. Of the five clusters that had employment growth in the nation, this cluster also had employment growth in the region, increasing its share of national employment. The two subclusters within this cluster that have the largest employment levels for the region are Air transportation and Transportation Arrangement and Warehousing. The recent legislative changes to designate the communities surrounding Bradley International Airport as part of a foreign trade zone will help grow this cluster.

Additional Clusters Showing Potential in the Region

The Hartford region ranks second in the nation for the cluster Games, Toys, and Children's Vehicles, ranking second behind Springfield, MA. Although employment is small (750 in 2009), Springfield's employment is also small – 853 in 2009. The cluster in general is not big but the presence of it in the area creates the potential for growth and cross-regional synergies. For example, the region may consider meeting with LEGO executives to determine what would make the area more attractive, or see if local colleges are producing a qualified pipeline of workers.

Another area that where the region ranks high is Specialty Office Machines which is a subcluster of the Communications Equipment cluster. The Hartford region ranks 9th in terms of employment (twelve regions have equal employment totals). Although total employment is small, there could be potential with building the cluster since another region of the state – Bridgeport/Stamford/Norwalk—ties for first in total employment for the country.

Pulling it All Together

Figure 24 below lists the industries identified as strengths for the region from the following sources: 2012 segmentation analysis, 2005 CEDS[6], ISC regional cluster mapping project, Millennium Project, and a qualitative assessment from information gleaned from the stakeholder interview process. The segmentation analysis, which looks at industries at the three-level NAICS codes, classifies the region's industry strengths into three categories: strength with recent economic challenge, current strength, and emerging strength.

The final column identifies the 2012 CEDS industry strengths (see Figure 24 which were selected based on the following criteria:

1) Noted as strengths in multiple assessments;
2) Are considered traded industries;
3) Have positive economic indicators;
4) The potential to grow;
5) Cluster strength in nearby regions presenting growth opportunities; and/or
6) Represent a large share of employment.

[6] The 2005 CEDS identified six industry clusters as strength's for the region. The following are a list of those industries: 1) Advanced Security and Defense Manufacturing; 2) Financial Services; 3) Biotechnology; 4) Logistics and Distribution; 5) Clean Energy; and 6) Health Services. Although these six industries were identified as cluster strengths for the region, no specific data for the region was provided. The employment data that was provided for each of the industries was statewide employment figures.

Figure 32: Analysis of Industries in the Metro Hartford Region for 2012 CEDS

	2012 Segmentation Analysis	2005 CEDS Industry Categorization	ISC Regional Cluster mapping 2009	Qualitative Assessment	Millennium Report	2012 CEDS
Strengths with Recent Economic Challenges	Insurance	Finance & Insurance	Financial Services	Financial Services	Financial Services	√
	Machinery Manufacturing		Metal Manufact. or Lighting & Electrical Equipmt	Advanced Manufacturing		√
	Electrical Equipment and Appliance Manufacturing	Advanced Security & Defense Manufacturing	Lighting & Electrical Equipment	Advanced Manufacturing		√
	Transportation Equipment Manufacturing	Advanced Security & Defense Manufacturing	Aerospace Engines	Advanced Manufacturing	Precision Manufacturing/Aerospace	√
	ISPs, Search Portals, and Data Processing	Finance & Insurance			Information Technology	
	Fabricated Metal Product Manufact.	Advanced Security & Defense Manufact.	Metal Manufacturing	Advanced Manufacturing		√
Current Strengths	Headquarters & Enterprises					√
	Broadcasting, except Internet					
	Transit & Ground Passenger Transport					
	Social Assistance					
			Power Generation & Transmission	Turbine Generators		√
			Specialty Office Machines			
			Games, Toys, Children's Vehicles			
Emerging	Food Manufacturing					
	Beverage and Tobacco Product Manufacturing		Tobacco			
	Heavy and Civil Engineering Construction					
	Chemical Manufacturing	Biotechnology		Advanced Manufact. (including med devices) & Biotech R&D	Health Care	√
	Truck Transport	Logistics & Dist.			Logistics	
	Motion Picture & Sound Recording					
	Securities, Commodity Contracts, Investmts		Financial Services	Financial Services		√
	Real Estate					

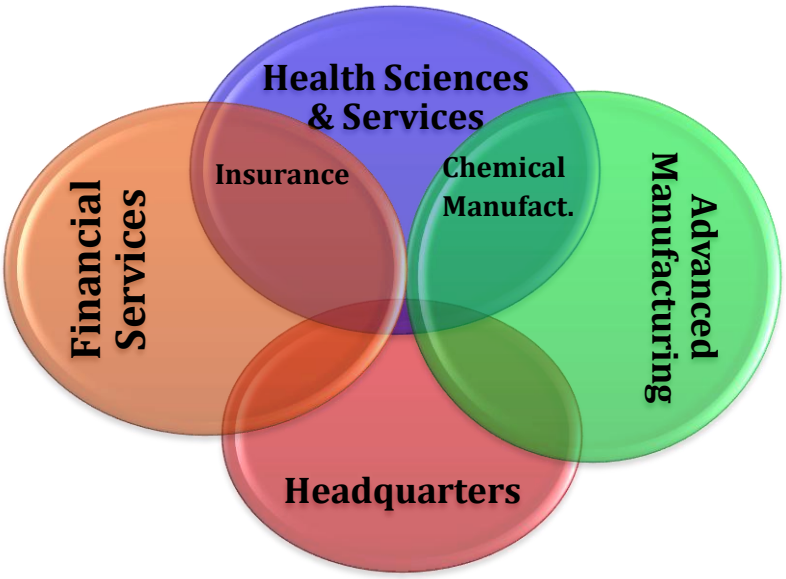
Figure 25 shows the four clusters and 8 subclusters that were identified as strengths for the metro Hartford region along with recent economic data. This analysis combines data from the Institute for Strategy and Competitiveness (ISC) – in green font-- and CERC's analysis of the CT Department of Labor industry data – in black font. Reading from left to right, the table lists the cluster and then the subclusters, if available, followed by employment, location quotients, compound annual growth rates (CAGR) of employment, subcluster rank in the U.S., if available, and either regional synergy or recent economic trends compared to the U.S. The regional synergy information notes whether the subclusters are identified as strengths in nearby regions and therefore the presence and strength of this industry extends beyond the boundaries of the metro Hartford region.

Figure 33: 2012 CEDS Industry Clusters for the Metro Hartford Region

Cluster Subcluster	2010 Employmt	Location quotient ICS or CERC	CAGR of employmt 1998-2009 or 2003 - 2010	U.S. Rank based on employmt	Regional synergy or regional economic trend compared to the U.S.
Financial Services					
Insurance *2009 data from ICS)*	42,216	8.4	-2.9	2nd	
Securities, Commodity, Invstmts	2,215	0.7	0.6		
Advanced Manufacturing					
Machinery Manufacturing	6,234	1.5	-2.3		
Electrical Equipment and Appliance Manufacturing	2,579	1.8	-3.4		
Fabricated metal product manufacturing	12,430	2.4	-1.2		Between 2005 & 2010, employment in the U.S. declined 74% whereas in the region it only dropped by 14%
Lighting & Electrical Equipment *(2009 data from ICS)*	3,144	3.3	-1.07	11th	Providence-New Bedford-Fall River, RI-MA ranks 10th and combining employment would mean the larger region would rank 5th
Transportation Equip Manufact.	17,916	3.3			Between 2205 & 2010,employment declined but at slower rate than the U.S.
Aerospace Engines (2009 data from ICS)	*7,035*	*17.8*	*-6.4*	*3rd*	Springfield, MA is ranked 9th and if you add employment for the two regions - the region would rank first for employment
Aerospace Vehicles (2009 data from ICS)	*9,435*	*5.7*	*-2.2*	*7th*	Bridgeport/Stamford/Norwalk ranks 6th in employment, if you add employment for the two regions – the region would rank 5th. The Bridgeport region had a positive CAGR for employment.
Turbine & Turbine Generators (2009 data from ICS)	*3,750*	*25.5*	*28.6*	*1st*	
Headquarters	8,545	1.13	3.5		metro Hartford region had higher rate of employment growth than U.S.
Biotech R&D					
Chemical Manufacturing	1,362	0.4	0.3		In the region this industry experienced 2% employment growth from 2005 to 2010 while in the U.S. employment declined 10%

Based on the previous analysis, Figure 34 shows the major clusters for the metro Hartford region. As shown in the figure, there exists overlap between the clusters. For example, Insurance is part of the Financial Services cluster but is also an important component of the Health Sciences and Services cluster and the two have important linkages in the region. Furthermore, Chemical Manufacturing is part of the Advanced Manufacturing cluster but in the region most of the companies are supporting bioscience and medical device companies. Finally, Headquarters has linkages with all the clusters in the region and is shown as connecting to each of the other three clusters in the region.

Figure 34: Metro Hartford Region Industry Clusters, 2012



Appendix A: *Methodology of the Cluster Mapping project*:

The raw data for the project are County Business Pattern data (excluding agriculture and government) on employment, establishments, and wages by four-digit Standard Industrial Classification (SIC) Code by U.S. County. In addition, U.S. patent by location of inventor are allocated to industries and clusters using a concordance of technology classifications with SIC codes. There are also confidentiality limitations, which mean that the actual data are not disclosed for every county and economic area in every industry. Various techniques are used to compensate for missing data.

Among traded industries, clusters are identified using the correlation of industry employment across geographic areas. The principle is that industries normally located together are those that are linked by some external economies. These industries, then, constitute a cluster.

Clusters are constructed using two approaches, which are then reconciled. First, select a prominent "core" industry in a field or part of the economy. Calculate the locational correlations of all other industries with the core. Those industries with statistically significant correlations with the core define the extent of the cluster. Second, calculate locational correlations between all pairs of industries in a general field and potentially related fields. Those set of industries with statistically significant and substantial inter-correlations among each other define the cluster.

In both cases some industries may have spurious correlations to a cluster because of the co-location of several strong clusters in the same geographical area. Spurious correlation is eliminated using Input-Output tables, industry definitions, and industry knowledge.

Note that a given industry can be part of more than one cluster. This sometime reflects overly broad industry definitions. However, it is also the case that there are multiple forms of externalities, and some industries are suppliers or customers of many other industries. Thus, overlapping clusters are expected and their overlaps are important economically.