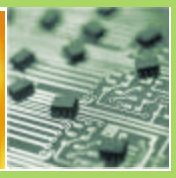
Global Economic Development Strategy

REPORT 2: TARGET INDUSTRY IDENTIFICATION & ANALYSIS

AngelouEconomics
technology-based economic development



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Presented to:

THE CITY OF MANCHESTER, NH

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REPORT 2:

Target Industry Identification & Analysis

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Introduction

The development of competitive clusters is one of the key generators of regional wealth. A cluster develops when businesses in interrelated industries choose to locate in close proximity to take advantage of a region's inherent advantages. These businesses then become interdependent on each other, enhance their operating environments, and ultimately become more competitive on the global landscape. When this happens, these businesses become the experts in their field. They become more profitable, grow faster, and pay higher wages. Beyond its clusters in traditional (low-paying) industries such as Retail and General Services, Manchester now has the opportunity to support several emerging clusters. The region as a whole supports high paying industries such as Semiconductors and Aerospace & Defense. This report recommends five clusters in which Manchester specifically can devote resources and energy to become a competitive location: ***Business/Financial Services, Defense/Advanced Security, Medical/Life Sciences, Aviation, and Software.*** This report describes AngelouEconomics' process in selecting these targets, and concludes with a detailed profile on each industry.

Manchester is in the enviable position of both being in close proximity to the Boston metropolitan area, and providing a high overall quality of life for its residents. Manchester residents work at a variety of companies and industries, and the area's business climate has proven favorable within the region. Manchester enjoys a variety of strengths that will give the area a competitive edge during recruitment efforts, including a reliable transportation infrastructure, and close proximity to the Port of Portsmouth, Boston and major international airports, and a growing young, creative-skilled workforce. The selection of target industries for Manchester is yet another indication of the city's ability to benefit from many diverse sectors of the regional economy.

Report Format

AngelouEconomics' first report, the *Community Assessment*, provided us with a picture of the factors influencing Manchester's strengths and challenges as a business location. This second report, *Target Industry Identification and Analysis,* seeks to highlight the unique characteristics of Manchester that affect the perception of the community, both in the eyes of corporate executives and the workforce that they seek. With the Manchester community "product" well-defined in the *Community Assessment*, we will outline our target industry selection process, and identify specific industries that Manchester should pursue.

This report contains three sections:

Review of the Community Assessment. AngelouEconomics recaps the key findings of the *Community Assessment* that are relevant to the target industry process.

Target Industry Selection. AngelouEconomics examines the strengths and weaknesses of the community and evaluates current industry clusters in the community. We specify which targets Manchester should ultimately pursue based on our selection methodology.

Target Recommendations. AngelouEconomics provides a national analysis of the selected targeted industries and defines specific niche targets. We outline wage, employment and growth data for each industry, as well as list the necessary requirements for recruitment.

As presented in the *Community Assessment* report, Manchester has an excellent foundation for pursuing new industries, and a strong argument to make to site selectors, company executives, and would-be entrepreneurs. Many strengths are apparent from our analysis: a growing population, a well-educated and technical labor force to draw from, excellent quality of life, reliable infrastructure, and a close proximity to Boston. Hurdles are relatively few, and can be overcome: rising cost of living, few incentives and an aging population.

With its many workforce and lifestyle strengths, Manchester must now determine which industries to target for local development. In this report, we will present an in-depth economic analysis (including industry specific information and cluster analysis) of the Manchester MSA that will provide new insight and guidance in target industry development. A strategy to capture new opportunities locally will require a clear understanding of the competitive landscape, as well as industry location trends. We will begin with a brief overview of the Community Assessment, highlighting key data points and characteristics of the community.

Workforce and Education

- In 2004, the Manchester metro area had an estimated 207,000 residents, a 19.2% increase from 1990.
- Unemployment is well below national, state, and regional averages at 3.7%.
- The average wage of $41,700 in Manchester is $4,000 above the US average, but it is still under that of Boston and Massachusetts.
- The fastest growing age demographic is the 45-64 year-old group, which is similar to the rest of the country.
- New Hampshire and Manchester have slightly higher levels of educational attainment (% of individuals with a bachelor's degree or higher) than the U.S., with the State at 29% and Manchester at 27%, compared to the U.S. at 25%.
- High school students' average total SAT score for the Manchester ISD is 1006, which is 37 points below the state average and 20 points below the U.S. average.
- Manchester boasts eleven colleges, universities, and technical schools in the area, with two Ivy League schools within a short drive.

Business Climate

- Manchester's location is a great asset for business relocation and expansion. The expanded transportation routes projects that are underway (i.e. the widening of I-93 from Manchester to the Massachusetts border, and the Manchester Airport Access Road) and proposals to improve rail transit (i.e. planning underway to extend rail service from Boston through Nashua and potentially Manchester) will further enhance Manchester's level of competitiveness.
- The Manchester region was among the Top 10 – "Best Small Metro Areas to Start and Grow a Business" (Inc. Magazine, 2004).
- New Hampshire is home to the 12th most active port in the northeast; Manchester is home to one of five foreign trade zone sites (FTZ 81). The state boasts two international airports, and the proximity to the International Trade Resource Center in Portsmouth is an additional asset for Manchester-based trade.

- New Hampshire ranks 6th out of the 50 states in the number of new companies started each year on a per capita basis.
- Venture capital funding in the region (New Hampshire & Massachusetts) is second only to Silicon Valley.
- The average wage per worker in Manchester is above the national average at $41,700. Average wages are 10% above the national average but 19% below the Boston average wage.

Sites and Infrastructure

- The City's New England locale, with its international airport, and its proximity to the Port of Portsmouth and Portsmouth's International Trade Resource Center, positions Manchester well for future growth in industries that will benefit from the globalization of markets and the economy.
- The Manchester Airport is the third largest cargo airport in New England, having handled 181 million pounds of freight in 2002. Private and corporate aircraft are served by the Airport's FBO, Wiggins Airways.
- Manchester has access to neighboring major metros via an extensive and reliable highway infrastructure.
- Office lease rates (at $16 per square foot), and industrial lease rates (at $6 per square foot) industrial, are below the Boston metro region, adding to Manchester's affordability.
- Manchester lacks adequate meeting and convention space, with the Radisson Hotel representing the only viable option.

Quality of Life

- Crime rates are low in the city. Manchester's crime rate is 2.44 crimes per 1,000 residents. This is below the U.S. average (4.12 per 1,000 residents) and the nearby Boston metro (2.92 per 1,000 residents). According to FBI statistics, New Hampshire has the lowest crime rate in the US. This is a terrific situation for continued business growth and development.
- Median household income in Manchester ($54,300) is above the U.S. ($45,600) and New Hampshire ($53,100), but below Boston ($59,800). Manchester's median household income grew 44% between 1990 and 2004, compared to the U.S., which grew at 51%.
- Median home values in Hillsborough County ($224,000) are comparable to New Hampshire ($208,000), but higher than national averages ($147,000). Home values are competitive when compared to New England's large metropolitan areas, such as Boston ($369,000).

The target industry clusters we have identified are based on a comprehensive review of Manchester and the surrounding region. To begin, we conducted an economic and demographic analysis of the area. The results of this analysis were presented in Report 1, the ***Community Assessment***. This analysis provided us with a picture of the factors influencing Manchester's strengths and challenges as a business location.

For this ***Target Industry & Analysis*** report, we conducted a cluster analysis of the Manchester MSA to determine the currently dominant industries in the area. These clusters were analyzed in regard to both national and regional growth trends. In addition, local assets that benefit each of the cluster's local development were also identified.

In addition to the data analysis of current industries, we traveled to the region and talked to public and private sector leaders in interviews and focus groups. We also analyzed a significant volume of community input received through the project's online survey of residents and businesses. Through the public input process, we gained a clear picture of the community's vision for the types of businesses desired in the region, as well as some of the strengths and challenges currently faced. These issues and this vision were factored in to the following target industry selection process.

Target Selection Process

"Site selection" is a broad term that describes a company's process of selecting a city for a new facility or the relocation of existing divisions. This process involves executives from several divisions within the company (such as Executive, Human Resources, Financial, Operation, Facilities Planning, and sometimes Marketing) and often involves a consultant or real estate broker. Site selection is not a scientific process, but does involve a system of measurements and calculations.

AngelouEconomics employs a combination of quantitative and qualitative analysis in selecting the best target industries for a community. The process is guided by the following four questions:

1. **What clusters currently exist locally, and are they growing?** Immediate and obvious candidates for targets are those that are experiencing growth within the community or surrounding communities. Industries that have a large presence but lack growth suggest that the region is losing its competitiveness in this industry. While the industry may be a candidate to target for a retention effort, a long-term decline calls for a close look at transitional opportunities into new industries that create jobs (e.g. textile workers transitioning into food processing).

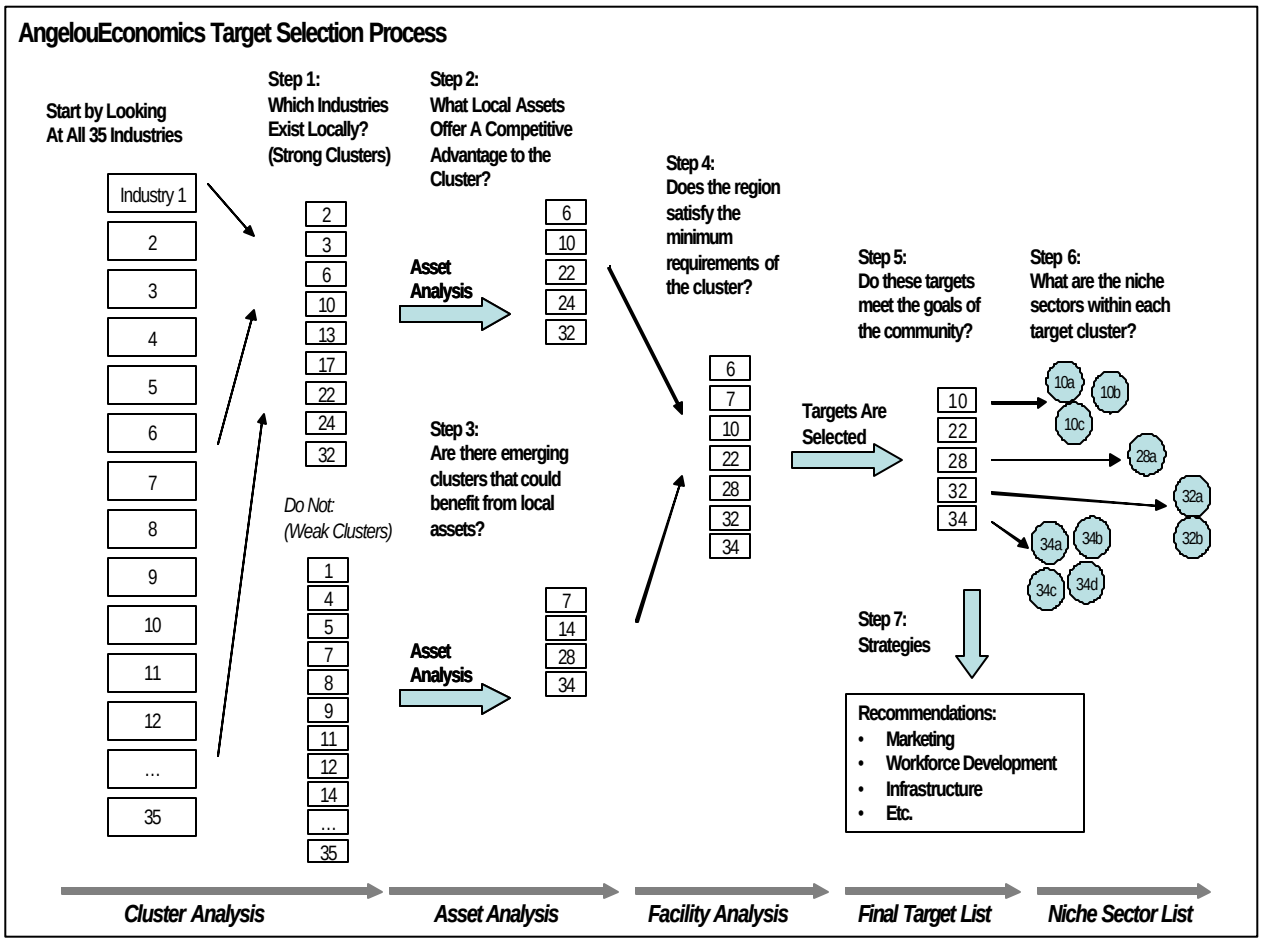
2. **Are current or emerging local clusters in industries that are growing nationally or undergoing geographic dislocation?** For those local clusters that have potential, are they growing nationally as well? While some industries are experiencing high growth rates, most U.S. industries are modest or stagnant in their growth. However, the dislocation of industries from one part of the country to another has been a long-standing opportunity for recruitment. Many industries undergo restructuring in order to be more competitive, or simply suffer a high rate of startup and failure.

3. **Are there local assets that give specific industries a competitive edge?** Communities are as unique as people. Each one has strengths that companies can leverage to create competitive advantages. These strengths can include such things as workforce skills, tax structure, infrastructure, and market proximity. Likewise, many companies have specific infrastructure and workforce minimum requirements, and

understanding whether the region can meet those requirements is crucial. For example, if the region lacks water and wastewater capacity or has overly stringent environmental regulations, then the community could be ruled out for food processing and semiconductor manufacturing. Understanding the needs of target companies is essential to recruiting them.

4. **Does the industry match community goals?** The most important criterion is often whether or not the industry matches the stated economic goals of the community. Some communities may want to avoid manufacturing businesses, or businesses that don't pay high enough wages. Sometimes lack of available land requires a more precise list of targets. Communities wanting to maintain a small-town appeal, for example, may target homegrown "soft" industries. Others wanting to transition into a more urban, metropolitan setting may focus more on larger office users. Industries that can survive locally will struggle to succeed without the backing of the populace and its elected officials. An aggressive marketing campaign and solid commitment by government to support a target can often overcome specific deficiencies or cost disadvantages.

In many ways, target industry selection is better described as **target industry "elimination"**. The follow chart shows AngelouEconomics' systematic process by which an industry is selected as a target:



Background on Industry Location Analysis

Traditionally, the growth of economies has been described in terms of a region's "basic" or "primary" industries. These industries typically export their goods or services outside the region, thereby supporting local industries such as retail, housing construction, and personal services through payroll and local purchases. Primary industries reflect an injection of outside money to the community and have a high economic impact; a typical primary business may create 2 additional jobs in the local economy for every 1 job at its facility.

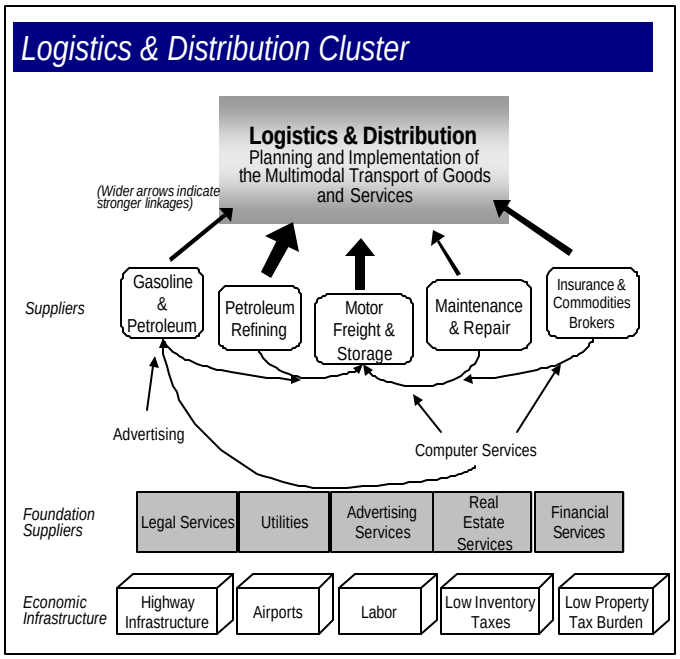
For this reason, communities across the country compete to recruit or retain these high-impact, primary businesses. Manufacturing is a good example of a primary industry, as most customers would be found throughout the U.S. or even internationally. With the manufacturing industry in decline and the increasingly global nature of business today, many more industries are increasingly "primary" in their make-up: distribution centers may serve a multi-state region, back office operations can serve a company's global network of employees, and custom software companies can build Internet applications that serve businesses anywhere in the world. Federal installations such as Army bases or federal research labs are clear examples of how government can be classified as a primary industry. High wage jobs are usually found at national or global companies that are enjoying growth.

While businesses are more global in nature today, rapid gains in technology, telecommunications, and markets continue to alter the location requirements of many companies. Often the speed of business drives corporate location decisions. The competition for top talent is now viewed to be the most important component of a successful company. Today's business environment requires that businesses continue to upgrade their technological capabilities while expanding the skills of the available workforce. Innovation and change is now a basic requirement for success.

Step 1: Overview of Manchester Clusters

What Clusters Exist Locally? What is Their Condition?

Clusters are highly integrated groups of businesses with strong vertical and horizontal linkages. "Vertical" linkages include the suppliers and customers in a region that combine to create a competitive business model. The tight relationship between auto manufacturers and their suppliers is a good example of this vertical relationship. "Horizontal" linkages include the relationships that competing companies have and the public sector institutions that support them. Workforce is the primary asset that passes through these horizontal linkages, as competing firms often hire away each other's workers (and learn from them) and also hire out of the same training programs or universities. The diagram to the right shows how these relationships exist within a cluster.



Historically, clusters gathered in specific regions of the U.S. due to natural advantages (e.g., natural resources and climate), cost factors (e.g., distance to market, labor costs), and existing transportation infrastructure. Today, companies are increasingly drawn to regions that can supply the unique workforce that they need. Universities and public sector institutions such as education and training facilities are now major drivers of regional economies. Clusters often mature when businesses expand their relationships with existing supplier firms in a region. As the clusters grow, additional supplier firms are attracted to the region, eventually creating a well-diversified "critical mass" of production, labor, and information.

AngelouEconomics has created 35 cluster definitions that achieve a much higher level of detail than the standard classification of the 10 major industries (manufacturing, services, etc.). This methodology categorizes businesses according to their final product and how these products are related to each other and integrated along the vertical supply chain. The results are a more accurate and detailed examination of industries than the broad method used currently by the Census. The new NAICS system is an improvement on how businesses are classified, but clusters will still be found across various NAICS codes and major industries.

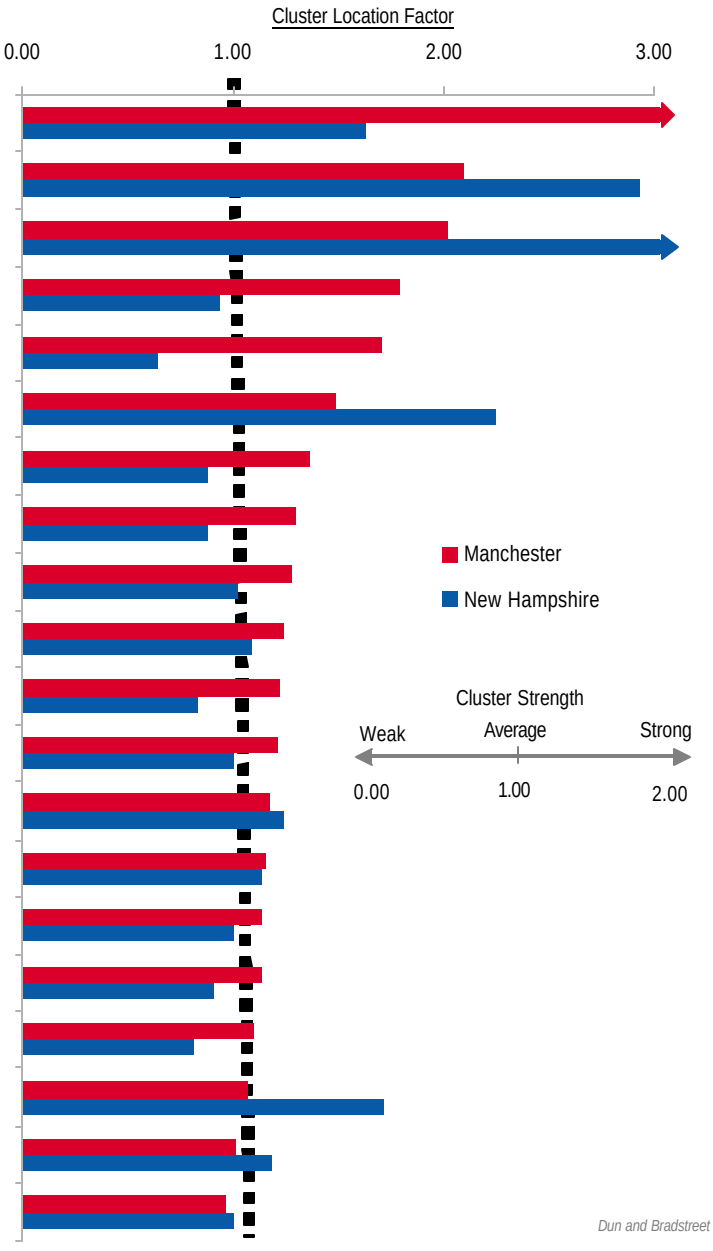
To assess the strength of a cluster in a regional economy, AngelouEconomics has calculated location factors (or quotients) for each cluster. These factors are calculated by comparing the cluster's share of total local employment to the cluster's national share. This location quotient will yield a value generally between 0 and 2, where a result of "1" demonstrates that the cluster commands an average (expected) share of the local economy. Cluster location factors greater than 2 indicate a strong cluster agglomeration, while those less than .5 indicate extremely weak clusters.

The following table shows the cluster location factors for Manchester and New Hampshire:

TOP 20 MANCHESTER INDUSTRY CLUSTERS, 2005

Manchester MSA and New Hampshire

Cluster	Manchester MSA	New Hampshire
Semiconductors	5.64	1.63
Electronics	2.10	2.93
Aerospace & Defense	2.02	3.40
Apparel & Textiles	1.79	0.93
Communication Services	1.70	0.64
Industrial Machinery	1.49	2.25
Financial Services	1.37	0.88
Consumer Goods	1.30	0.88
Housing & Construction	1.28	1.02
Utilities	1.24	1.09
Business & Prof. Svcs.	1.22	0.84
General Services	1.21	1.00
Software & IT Svcs.	1.17	1.24
Communication Equipment	1.15	1.13
Chemicals & Plastics	1.13	1.00
Civic Enterprises	1.13	0.91
Wholesale	1.10	0.82
Industrial Supplies	1.07	1.71
Retail	1.01	1.18
Eat/Drink	0.96	1.00



Dun and Bradstreet

Manchester enjoys key cluster strength in:

Semiconductors
This industry has experienced incredible gains in Manchester since 1998, climbing from an employment base of just 45 to 1100. As this industry continues to grow, it will cultivate a high-knowledge labor force with above average wages. This is a key primary industry because it requires a multitude of service industries to support operations and exports a high dollar value a products, bring significant amounts of capital to the region.

Electronics
Manchester's established cluster in the electronics industry is driven by the presence of Osram Sylvania (650 employees), Sanmina Corporation (399 employees), and Electropac, Inc. (156 employees). This industry employs a mix of workers, ranging from electrical engineers for design and line workers for assembly. Overall the industry pays high wages and generally exports goods outside of the region, bringing wealth to the region. Since 1998, Manchester has experienced employment growth in this industry of 28%.

Aerospace & Defense
Like the semiconductor industry, aerospace & defense is a coveted primary industry that employs highly educated and highly paid individuals. Although Manchester has experienced negative growth since 1998 (-24%), the future looks bright. The DoD has increased spending in each of the past five years and has plans to continue the increase through 2011.

Apparel & Textiles
With added cost pressures, businesses in this cluster are quickly leaving the U.S. for lower wage environments in other countries. Since 1998, Manchester has lost 3% of this sector's employment, far less than the national attrition rate. This trend is projected to continue over the next decade at the local and national level.

Communication Services
This industry generally provides local and long distance telephone service, as well as high-speed data and video services to businesses and home consumers. The industry requires a moderately well educated workforce and pays wages on par with the U.S. average. Verizon Communications represents the lion's share of the Communication Services cluster, which has experienced tremendous growth since 1998 (219%). Verizon Communication is also the second largest non-manufacturing employer in Manchester.

Industrial Machinery
The industrial machinery industry makes large scale tools like saws, drills, and presses for use across a variety of manufacturing sectors. This industry employs a mix of skilled laborers to manufacture precision equipment and line workers for basic assembly. This industry has enjoyed significant growth in Manchester from 1998 to 2005. Employment jumped from 359 to 777, a gain of 122%.

Financial Services
This cluster is anchored by the headquarters of two the region's largest commercial banks, as well as other national branch offices. Banknorth (1,153 employees), Citizens Bank (1,225 employees), and Bank of America (425 employees) represent the largest employers in this cluster. This industry requires an educated workforce and a reliable infrastructure to meet utility and transportation needs. Growth has been moderate in the financial services industry in Manchester, with gains of only 3% from 1998 to 2005.

Consumer Goods
Many of the businesses that make up this cluster provide consumer goods, ranging from toys and sporting goods to household furniture and paper products. Because of this, businesses in this cluster tend to mainly serve the local populace. However, Manchester has added strength in this cluster largely due to the growing population.

Housing & Construction
Manchester, along with many other eastern communities, has experienced a boom in its residential home construction industry. Although, this cluster supports a large proportion of local jobs, this industry is largely driven by growth in the local populace and does not export goods outside the region. Because of this, it is not considered a primary industry. The growth of this industry will be organic, supported from within by growth in population and income levels throughout the region.

The entire **state of New Hampshire** also has strong clusters in:

- **Aerospace & Defense**
- **Electronics**
- **Industrial Machinery**
- **Industrial Supplies**
- **Semiconductors**

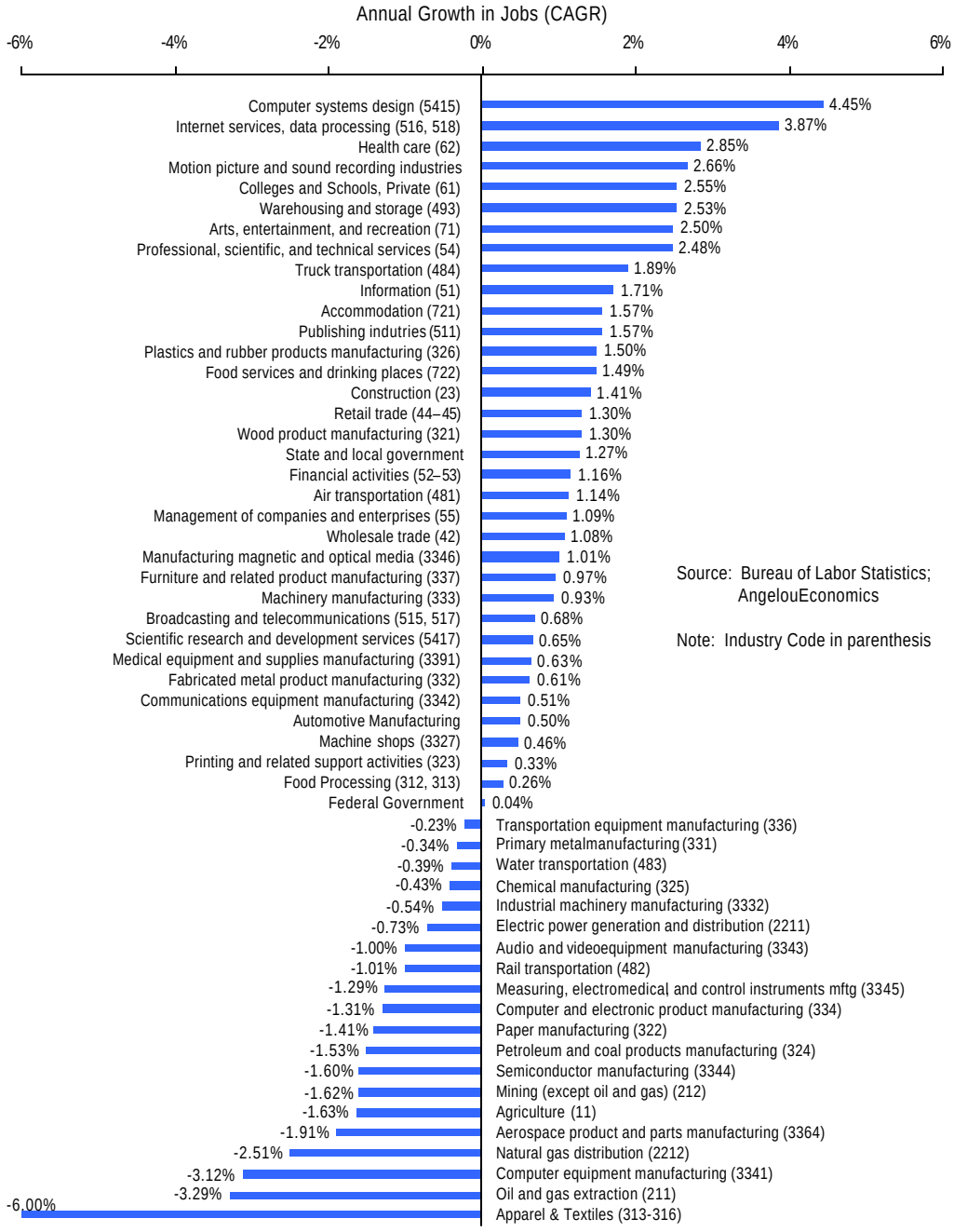
As mentioned previously, local cluster strength does not automatically mean that it should be targeted for growth. National growth trends must be examined, as well as the region's relative competitiveness in each cluster. We assess these factors on the following pages.

Step 2: National Cluster Growth

Which industries are growing nationally, or are relocating in the U.S.?

In general, communities should target industries that are growing, although targets can still include low growth or negative growth targets as well. The following chart shows the anticipated growth trends for specific industries and clusters:

U.S. Industry Employment Forecast
2002 – 2012



Technology sectors such as those relating to the use of computers and networks promise a high level of growth over the next 10 years. Productivity improvements continue to be felt in traditional companies that adopt new computer technologies. The highest rates of growth will be found in design and service sectors such as **Computer Systems Design** (4.5% per year), **Internet Services and Data Processing** (3.9%), and **Packaged Software Publishers, not custom** (5.3%)**. Electronics**, **Semiconductor**, and **Computer Manufacturers** will shed jobs as more and more production is moved to low cost facilities overseas.

Health Care will be a high growth industry, as the aging U.S. population becomes the dominant demographic story over the next 20 years. By 2010, nearly 15% of the population will be seniors 65+, a period in one's life where nearly half of health care expenditures occur. The senior population will be growing four times faster than the overall U.S. population by 2015. In 1950, there were 16 workers per retiree; today, the ratio is less than four to one, and by 2030, it will be two to one. With this massive demographic shift occurring, an estimated 4.4 million jobs will be created in the health care industry in the next 10 years, with residential and elderly care receiving the highest rates of growth. **Medical Instruments** and **Scientific R&D** will experience modest growth. **Biotechnology** and **Pharmaceuticals** are expected to see strong employment in the near and long term.

The steady growth of the overall U.S. population will drive the growth of industries that supply, feed, house and entertain us. Distribution of consumer goods will experience high growth: **Warehousing and Storage** (2.5% per year), **Truck Transportation** (1.9%), **Couriers and Messengers**, including overnight freight (3.5%), and **Wholesalers** (1.8%). **Entertainment and tourism** industries will see high growth, and end-sales industries such as **Retail Trade** and **Restaurants** will see moderate growth. The **Construction** industry tracks well with overall economic growth, and is expected to experience modest growth.

Local and State Government will see job growth of 1.3%, slightly higher than total population growth (1%), as urbanization continues and federal jobs are kept flat. Increasing wealth in the U.S. will require a larger **Financial Services** sector, which will also grow slightly faster than the population.

Manufacturing industries overall can expect continued job losses in the future due to continued technological improvements in the manufacturing process, large scale operations moving overseas, and for some, overall declines in final demand. Smaller, niche-manufacturing sectors will see modest growth: **Machinery**, **Wood Products**, **Fabricated Metal**, **Machine Shops**, **Printing**, and **Food Processing**. Other sectors that will see falling job levels are **Agriculture**, **Oil and Gas Extraction and Refining, Chemicals, Mining**, **Apparel Manufacturing**, **Aerospace**, and **Rail Transportation**.

Which clusters are getting stronger in Manchester?

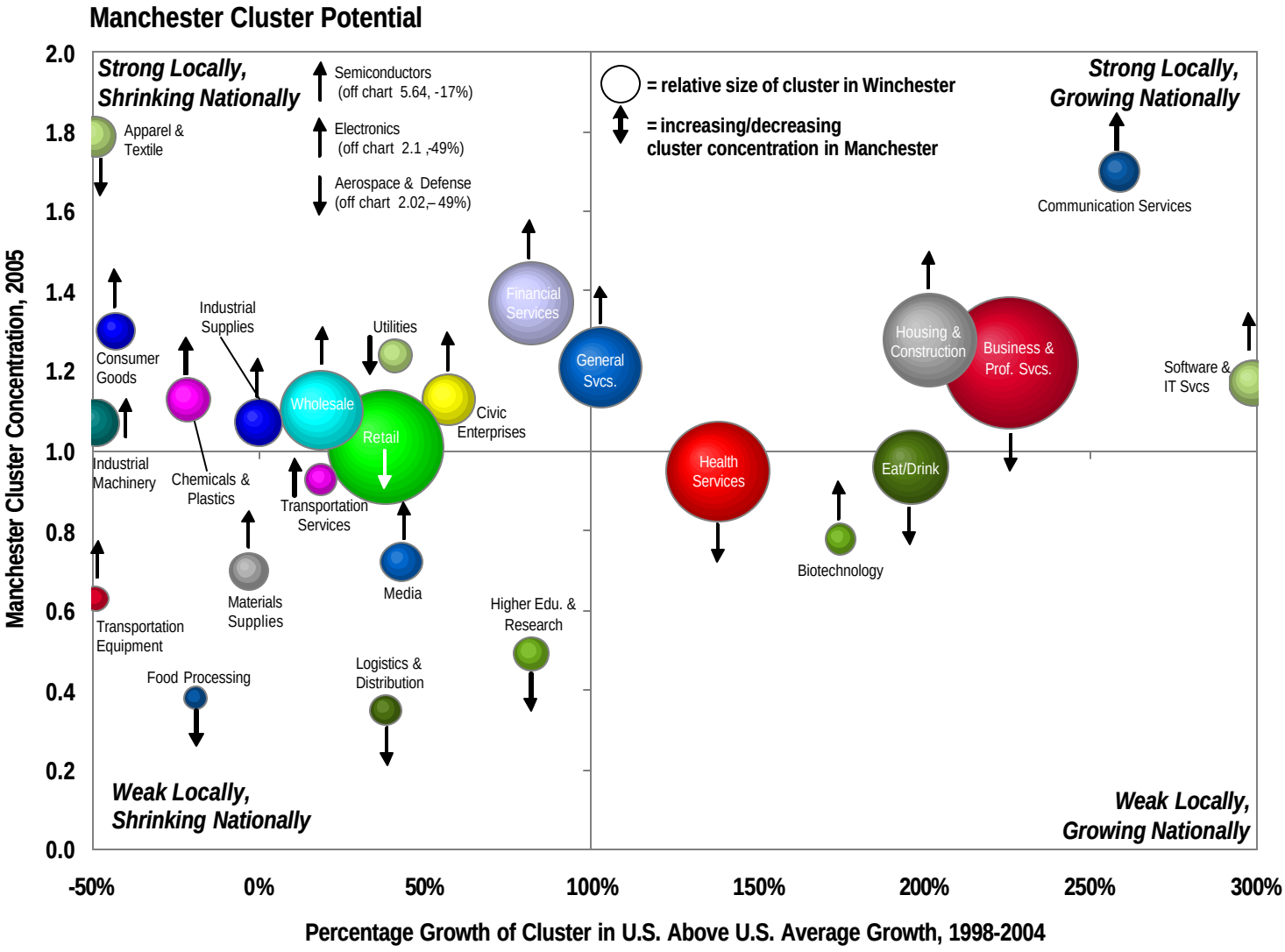
Target selection must identify existing, strong clusters in the region, but also consider how clusters are gaining strength locally.

Clusters can gain strength in two ways:

1. **Above-average growth nationally.** This will result in a larger cluster employment concentration in Manchester.

2. **An increasing cluster concentration ratio.** A growing cluster concentration in a region indicates that a cluster is capturing a larger share of new jobs in the U.S., suggesting an improvement in the region's attractiveness and competitiveness for the cluster.

We show these two forces in the following diagram:



The Role of Dislocating Industries

Most communities make the right choices to preserve their existing industry base, and when these industries are shrinking, communities make every effort to forestall job losses (e.g. communities in traditional manufacturing or facing base closures). We label these industries "Dislocating," as they are undergoing a basic restructuring in geography, technology, or markets.

At a national level, shrinking industries may still be an appropriate target for some communities if:

- **The industry is undergoing restructuring in order to be more competitive.** This often means that a company may relocate to another city, or may spinout divisions to more competitive locations. For example, the automotive industry is expected to create few net new jobs and have moderate growth rates nationally, but is migrating facilities from the Upper Midwest to the South.

- **The industry suffers a high rate of startup and failure.** While the U.S. South enjoyed many relocations from northern cities, most of the job growth occurred at companies that were founded in the South. As industries shrink in one region of the U.S., more competitive firms pop up and take market share. The success of financial services firms in the South and Midwest demonstrates the role that a competitive environment can play in an industry that suffers high churn.

- **Job loss is due primarily to technological investments, not declining revenue.** As some industries get more capital-intensive, they require fewer workers (such as the semiconductor industry), but their strategic value to a regional economy still grows (a higher economic job multiplier or higher local tax payments).

- **The region has a unique comparative advantage in a consolidating industry.** Due to declines in demand for their end product, or other economic pressures, some industries may be forced to consolidate operations into very select areas of the country. Even though the overall industry may be in decline, a desirable region may be able to have an almost monopolistic hold on the cluster.

The following sectors are considered "Dislocating" clusters (slow U.S. growth, but strong local strength) in Manchester that can be targets, but deserve caution. These industries will be difficult to grow because of national trends; however, there may be opportunities for restructuring and/or targeting emerging niche segments within the clusters:

- **Apparel & Textiles**
- **Industrial Machinery**
- **Consumer Goods**

Step 3. Competitive Asset Inventory

Are there local assets that give specific industries a competitive edge?

Manchester can provide a low cost alternative to larger metros on the east coast, with access to a growing semiconductor and electronics industry, a reliable transportation infrastructure, and a high quality of life. We evaluated the region's core assets for industry recruitment and expansion by grouping assets in three categories: **core strengths**, **competitive assets**, and **barriers**:

Core Strengths

Growing population - Manchester's population has experienced tremendous growth over the past fifteen years. In 2004, the Manchester MSA population was just over 200,000, an increase of 19% from 1990. A growing population is essential to many industries, as it provides a larger customer and employment base.

Transportation Infrastructure - Multiple interstates, a nearby port and a pending rail line provide Manchester with a competitive transportation infrastructure. New Hampshire's largest commercial airport is located in Manchester and provides domestic flights via several major airlines. The nearest large international airport is Boston Logan Airport and is only 60 miles away from Manchester. These will be strong selling points, as executives and consultants need access to airports that provide numerous flight options.

Location – One of Manchester's core strengths lies in its proximity to Boston**.** This provides the area with countless benefits, including access to research centers, venture capital, and a growing educated workforce.

Business Climate – New Hampshire's image as a place to do business is excellent, as the State ranks 14th in the 2004 "Small Business Survival Index". The overall business climate is considered ideal with a non-intrusive state government, moderate taxes, and a competitive cost structure. The Amoskeag Business Incubator, a joint venture between the Southern New Hampshire University School of Business and the City of Manchester, is representative of the mind set in Manchester. Through the provision of office space and technical assistance to new and small businesses, Manchester shows the willingness and desire support economic growth in the region.

Competitive Assets

Quality of life - Manchester offers a lifestyle conducive to raising a family, while a growing population is driving the growth of new amenities for young adults. The crime rate is remarkably low, despite the growth in population, and housing costs are affordable relative to the Boston metro.

Overall Tax Structure – New Hampshire state and local tax burden is the second lowest in the nation. According to the Tax Foundation, New Hampshire taxes equal 7.4% of income, below the national average of 10.1%. The state's tax structure is business friendly and includes no broad-base personal income tax, no general sales tax, no use tax, no inventory tax, no equipment/machine tax, and no capital gains tax.

Education – As the largest U.S. city north of Boston, Manchester has access to multiple colleges and technical schools within a short drive. The educational attainment level in Manchester and New Hampshire is above the national average, providing the city with a growing and qualified work force. However, Manchester's K-12 education system leaves room for improvement, as SAT scores and graduation rates are below state and national averages. Both metrics have seen improvement over the past several years.

Barriers

Low Unemployment Rate - The extremely low unemployment rate (3.7%) has the potential to make it difficult to find qualified employees. Employers will find it difficult to locate and retain workers across all segments of their business, including blue collar and white collar if the unemployment rate continues to fall.

Diversity - Manchester is not a very diverse city, which is not unusual for some Northeastern communities. Whites account for 91% of the area's population, but the other racial and ethnic groups are growing quickly.

Rising Cost of Living - The cost of living is relatively low for the area, but 12% above the national average. Costs are much less than the Boston metro though, and comparable to surrounding communities in New Hampshire. Housing costs are rising but remain below major metro prices. Grocery, transportation, and health costs are all above the national average.

Cost of Labor - The average wage in Manchester ($41,700) far exceeds the state ($37,300) and national ($37,800) averages. Employers will prefer lower wage rates to keep costs low and stay competitive. However, Manchester's wages rates are far below Massachusetts ($46,300) and the Boston MSA ($49,900).

Step 4. Do these targets meet the goals of the community?

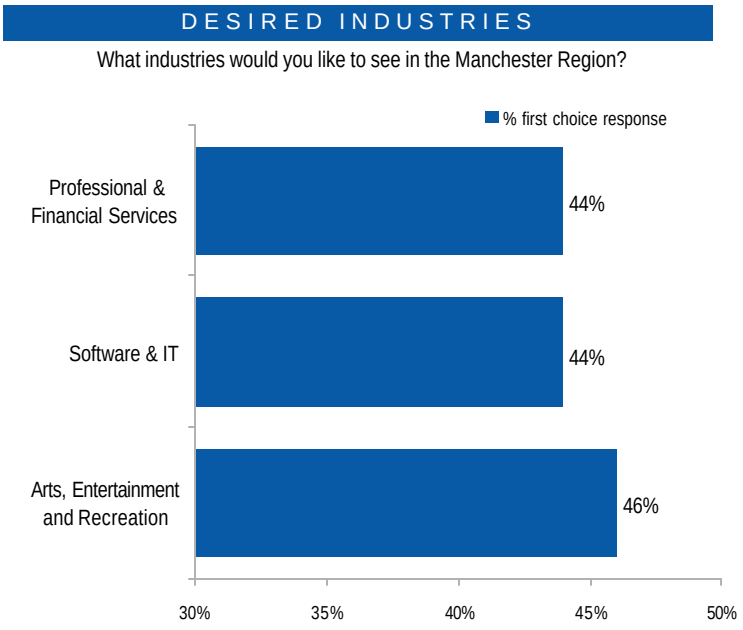
Public opinion and community input is as critical to the industry cluster selection process as data and asset analysis. The growth of industry clusters requires a community effort. Local government officials, economic developers, business leaders, and the general public must be united in their vision and enthusiastic in their support to grow regional representation in industry clusters that are unanimously viewed as desirable. This is particularly critical when a region lacks a strong local concentration in a targeted cluster. The lack of cluster concentration does not rule out an industry as a target, but it does indicate that community efforts have to be more focused and enhanced to successfully grow the desired industry locally.

During the course of our project, AE talked to many public and private sector leaders and community residents. Many of these represented key industries currently located in the region. Through this public input process, we received a great deal of information regarding the types of businesses that the residents of Manchester desire for the future of their community. Three overarching community goals were the most prominent:

- Industries that are "Good Corporate Citizens"
- Industries that are "Clean" and "Environmentally Sensitive"
- Industries that pay "Higher Wages" and employ "Higher Skilled Workers"

These three community goals all address the main challenges that Manchester is currently facing. The community wants **"Clean Industries"** because it understands the importance of preserving its high quality of life and environment. The region's natural beauty and scenic landscape is viewed by nearly all as the region's best asset. The community wants businesses that pay **"Higher Wages"** to begin to shift the imbalance that has existed in the prevalence of lower wage and income levels and a rising cost of living. Manchester has trailed the nation for some time, but with the recent upward trends in local cost of living, the situation is becoming even more dire. Businesses that require higher skill levels will pay higher wages. Citizens and community leaders also desire **"Good Corporate Citizens"** that will support and give back to the local community.

The types of industries selected by businesses in the online survey support the overarching goals of the community presented above. The chart at right shows the three top industries that business owners and senior managers would like to see expand in the Manchester region.

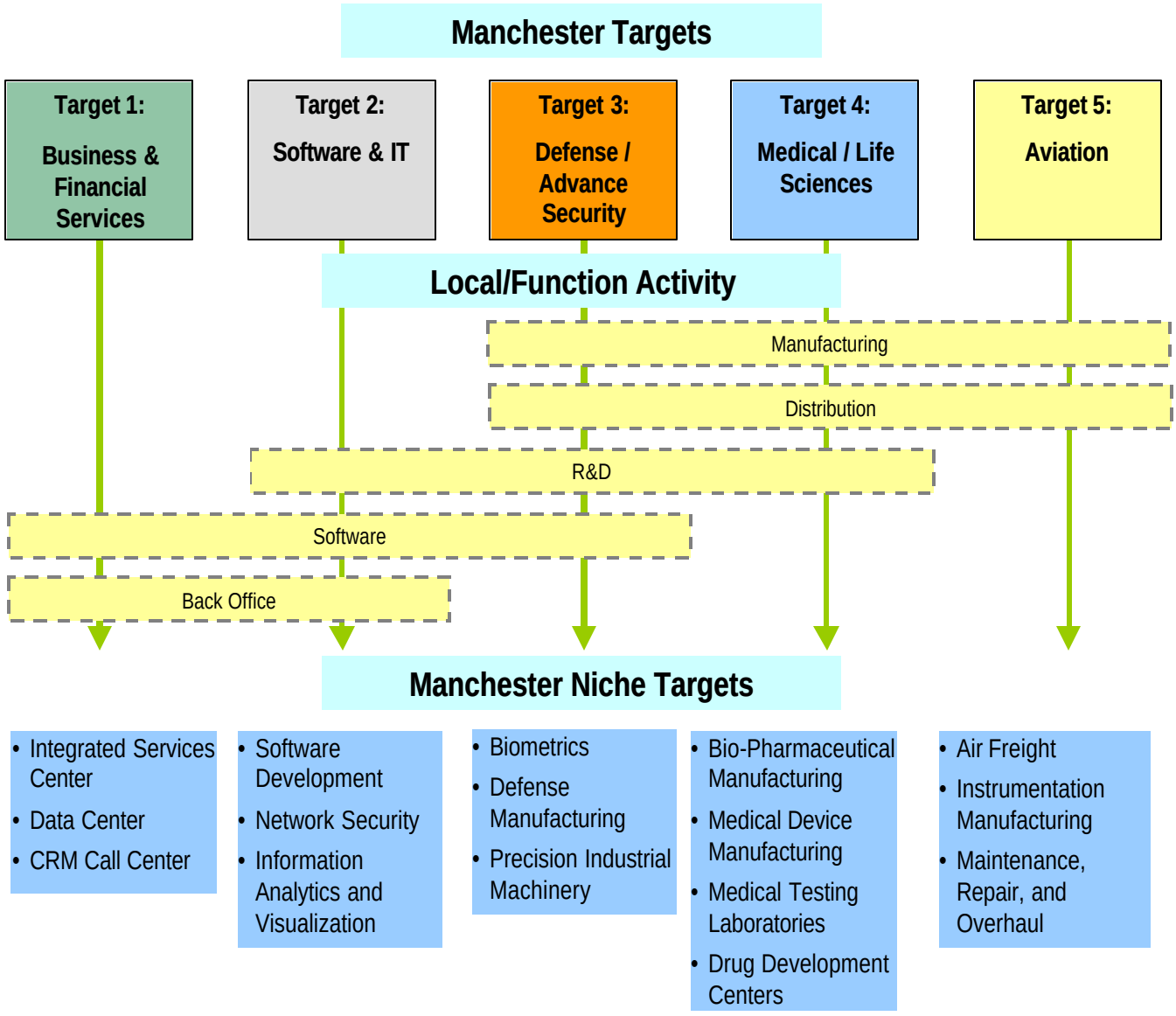


Combining the views and goals of the community with the industry clusters in which Manchester meets minimum industry requirements leads AE to the final list of target industry clusters. In our analysis, several industries of the below industry list are not considered primary targets; they are better classified as supporting larger clusters. While these support clusters can grow large enough that they are largely

export focused (e.g. Software in Silicon Valley), in Manchester they should be viewed mainly as supporting assets to grow the final targets. For example, Software & IT Services and Communication Services will support most industries, particularly Security & Defense, and Biosciences. Likewise, Financial and Business Services includes many of the back office functions that will serve the Transportation Equipment Manufacturing, Media, and Logistics industries. Higher Education and Research is an important asset to support the Biosciences, and Security & Defense clusters.

Recommended Target Industries

The following chart shows the resulting list of target industries for Manchester:



Within each of the industry categories above, the Niche Targets are the main sectors for which AngelouEconomics believes Manchester is uniquely positioned. The region should devote the majority of its attention and resources to these niche targets. However, AngelouEconomics does not recommend that these niche sectors be identified specifically as "targets." Clearly, this would yield too many targets, and the synergies between them would be lost. Grouping niche sectors within main heading "targets" can yield many positive results overall. Fewer, broader target headings allow:

- The community to band together around groups that they understand intuitively (e.g. "aviation" vs. "maintenance, repair, and overhaul")
- Local leaders to maintain a list that can be supported by all economic development organizations, while specific responsibilities will be spread out (i.e. universities focus on biometric technology development, while Manchester promotes the defense/advanced security industry)
- More visionary marketing campaigns to be created
- Leaders to prioritize the target list more efficiently
- Each main target to receive equal treatment, without being watered down by emerging, high risk targets

Each target is profiled in detail in the following pages.

We include the following information for each:

- A description of the industry sector
- An overview of industry trends
- A description of the location criteria for the industry for:
    - Economic conditions
    - Market/Geography
    - Structural Assets
    - Research and development
    - Workforce
- A review of Manchester's conditions to support the industry's growth
- Niche sectors that Manchester has the greatest ability to support

Industry Overview

The business services industry is comprised of back- office support operations including call centers, processing facilities, and data processing and storage. The market's fastest-growing segments are back office support for the financial services industry, third party software development, and outsourced information technology operations.

BUSINESS SERVICES

NAICS Definition

- 5182 Data Processing and Hosting
- 52232 Financial Transactions Processing
- 5416 Management & Technical Consulting Svcs.
- 5611 Office Administrative Services
- 5612 Facilities Support Services
- 5614 Business Support Services
- 56142 Call Centers

Employment

- 2.32 Million Employed - U.S. 2004

Wage Rates

- $52,000 Average Annual Wage - U.S. 2004

Location Criteria

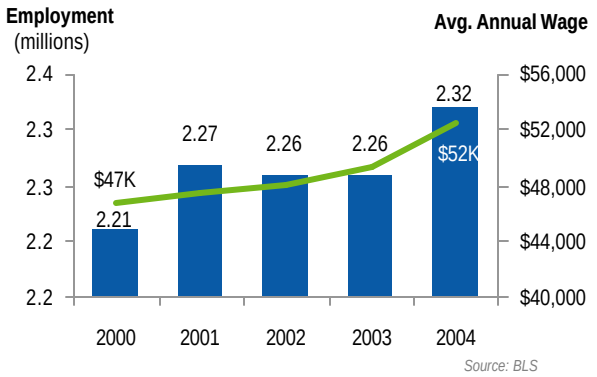
- Educated Workforce
- Reasonable Utility Rates
- Quality Office Space

Support staff in the financial services industry performs a variety of record-keeping duties. They track revenues coming into and leaving organizations as well as provide customer support. They provide payroll, procurement, and auditing services for their clients. The growing financial services and health care industries will require increasing levels of back office support. Both industries will continue to move these support functions off site or even outsource the operations to third party vendors. Citicorp recently announced the relocation of its core back-office support operations from Lower Manhattan to New Jersey. The fact that some back-office operations still exist in the high cost areas such as New York illustrates the potential for lower-cost communities to recruit these facilities.

Although the domestic call center industry struggled in 2004 and continues to struggle in 2005, financial services call centers have been a bright spot. Many call centers have closed as companies outsource or merge their call center services. Companies increasingly are outsourcing their call center services to offshore entities in countries with large, English-speaking populations. India is the most popular destination for call center outsourcing. Strong competition for call centers also comes from Canada, South Africa, Costa Rica, and the Philippines. The recent creation of the National Do Not Call List is a clear threat to the outbound call center industry, as fewer sales calls can be placed from within the United States. Financial service call centers have been less affected by these changes than the overall call center industry. They have a higher value add and have moved operations overseas with much more caution.

BUSINESS SERVICES

EMPLOYMENT & AVERAGE WAGE, 2000-2004



Source: BLS

Third party software development is comprised of computer programming services, data processing, and information retrieval services. Demand for software is driven by efficiencies derived through computer automation or, in the case of the gaming industry, through entertainment value.

Industry Requirements

Economic Conditions

Industry firms desire locations where competition for labor is low and large campus tracts are available. Stability is a key goal throughout relocation decisions. Major expenses for the industry include employee training and establishing communications infrastructure. Turnover is common among industry support staff. Because the cost of telecom is high, it is important that real estate costs are competitive.

Market/ Geography

Business support organizations often look to non-metro and suburban communities when relocating. Although not necessary, a central time zone location will allow inbound service from both coasts and short flights to the entire U.S.

Structural Assets

Business Services and back office operations serve as hubs for many other vital functions. Therefore, it is essential that power, telecom, and other ISP services be reliable and affordable. These operations are light users of utilities, with the exception of power. Airport access is also vital for managers and executives in back office operations.

Research & Development

Universities serve the industry by providing a trained workforce. Some local software research can help firms stay competitive.

Workforce

Business Services requires a wide range of worker demographics. Data processing centers need a high percentage of college-educated employees with specific industry skills, while lower end business services occupations require minimal educational attainment. Financial service support centers require workers with high school diplomas and employees with some specialized accounting knowledge. Many mutual funds and brokerage call centers require college degrees and specific industry certifications.

Many companies seeking to lower their costs through back office services and business support services look to areas with high underemployment rates among younger demographics. Competitive wage rates are also very important.

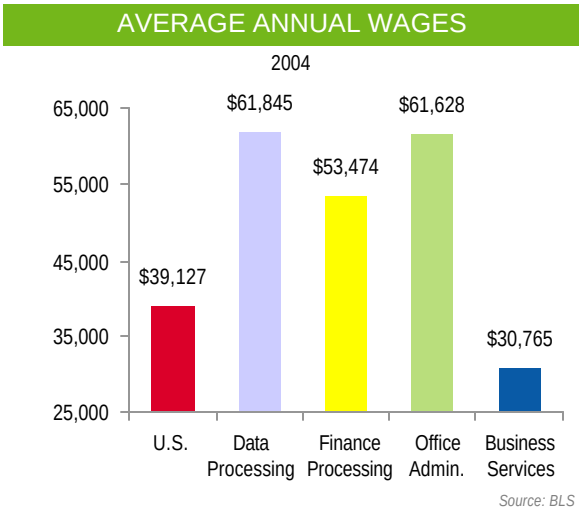
Occupational Breakdown of the Business Services Industry

OCC CODE	OCC TITLE	Ind. Emp. 2004	% of Ind.	LQ	02 - '04 Emp. Change	Nat. 10-Year Growth Forecast	% Jobs Requiring Bachelor's	Industry Specific Wage	National Occupational Wage	Wage Diff.
00-0000	Industry Total	2,326,480	100%	1.00	3%	15%	-	$45,526	$37,020	123%
43-4051	Customer service reps.	204,880	8%	5.14	7%	24%	21%	$25,867	$29,130	89%
41-9041	Telemarketers	173,260	7%	21.41	-2%	-5%	12%	$24,019	$23,490	102%
43-3011	Bill and account collectors	118,830	5%	13.54	19%	24%	19%	$27,030	$29,010	93%
13-1111	Management analysts	111,450	4%	13.58	1%	30%	77%	$86,596	$72,730	119%
43-9061	Office clerks, general	95,750	4%	1.63	0%	10%	17%	$24,194	$24,170	100%
43-1011	First-line supervisors of office support workers	73,000	3%	2.63	9%	7%	27%	$43,523	$43,990	99%
11-1021	General and operations managers	70,880	3%	2.05	-3%	18%	48%	$87,565	$92,010	95%
43-6011	exec. secretaries assistants	62,140	2%	2.22	9%	9%	16%	$37,791	$36,790	103%
43-3031	Bookkeeping, accounting, and auditing clerks	55,990	2%	1.60	7%	3%	16%	$31,355	$29,830	105%
13-2072	Loan officers	47,800	2%	8.69	88%	19%	50%	$65,145	$58,200	112%
43-9021	Data entry keyers	42,040	2%	6.80	-11%	-5%	14%	$22,947	$24,380	94%
43-6014	Secretaries, except legal, medical, and exec.	41,440	2%	1.21	-3%	-3%	16%	$26,910	$27,160	99%
15-1041	Computer support specialists	37,330	1%	3.88	0%	30%	42%	$39,727	$43,620	91%
13-2011	Accountants and auditors	36,550	1%	1.86	21%	20%	74%	$56,979	$56,880	100%
15-1021	Computer programmers	36,190	1%	4.45	-5%	15%	70%	$65,296	$65,910	99%
15-1051	Computer systems analysts	35,130	1%	3.64	6%	39%	62%	$68,563	$68,370	100%
43-3071	Tellers	33,520	1%	3.07	31%	9%	13%	$20,885	$21,420	98%
15-1031	Computer software engineers, applications	30,970	1%	3.69	48%	46%	81%	$77,509	$77,330	100%
43-4131	Loan interviewers and clerks	29,080	1%	7.05	63%	-14%	24%	$31,937	$30,680	104%
43-9071	Office machine operators, except computer	28,760	1%	15.01	8%	-5%	10%	$22,851	$24,610	93%
43-2011	Switchboard operators	26,980	1%	6.63	0%	0%	11%	$23,733	$22,490	106%
43-9051	Mail clerks and mail machine operators	26,950	1%	9.13	32%	-3%	7%	$21,784	$23,440	93%
15-1032	Computer systems software engineers	24,010	1%	3.83	69%	46%	81%	$76,334	$82,160	93%
43-4171	Receptionists and information clerks	23,320	1%	1.10	7%	30%	12%	$23,572	$22,690	104%
11-3031	Financial managers	21,140	1%	2.17	-11%	18%	61%	$94,165	$91,610	103%

Manchester Niche Targets

Integrated Services Center

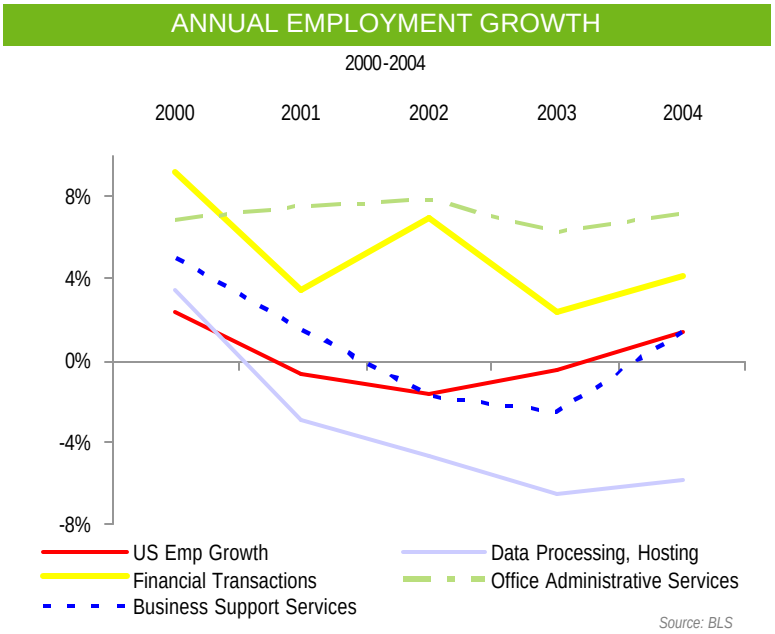
These facilities are generally large scale corporate operations including a wide variety of integrated back office operations. They typically include redundant large data centers for regional or headquarter operations, high value add call center component typically entailing customer relationship management, advanced technical support, and high dollar value sales, small to medium processing operations, and small to medium programming operations. These corporate campuses have excellent wages and long term prospects. Manchester is a greater distance from Boston than recent facility locations, but can still compete. An integrated services center provides a high visibility as well.



An integrated services center will be a low environmental impact facility. Air emissions, water consumption, wastewater discharge, and electricity usage will be low. Facilities will require large land tracts and impervious cover can be significant due to parking requirements for a large number of employees.

Data Centers

Data centers are operations that provide digital information storage for customers and corporate parents. They are composed of clusters of computers and network switching gears that allow efficient and highly reliable transfer of data. Excess capacity exists from the late 1990s build out, but many corporations have transitioned away from outsourcing data center management and are developing new centers. Data centers are high value operations, pay excellent wages, and are very low impact. Manchester meets most of the rigorous requirements of the industry; site selection for data centers is more technical than most projects. These facilities are increasing in importance and many are developed with small software development operations.



Data centers are also low environmental impact facilities. Air emissions, water consumption, and wastewater discharge are low. Facilities will not require much land and impervious cover should be limited. Electricity usage will be high as will security requirements.

Data centers are very important to any company and industry growth will continue. Employment growth is not assured however as operations continue to boost productivity.

CRM Call Centers

Strong competition for call centers is coming from offshore locales and is stunting domestic growth in the overall industry. However, call centers focused on customer relationship management (CRM), advanced technical support, or high dollar value sales are less affected by these changes and continue to locate new facilities in the U.S. These facilities are not subject to the same level of competitive pressure as low value-add call center operations. CRM is considered vital for high margin clients, and companies are concerned about potentially upsetting profitable relationships to save money. These operations are typically staffed by college-educated persons, many with further levels of certification. Cost savings realized from off shoring are inadequate given potential risks involved.

As with high tech firms, facilities are typically white-collar operations with above average wages. This segment of the business services sector also has low barriers to entry and employment growth is beginning to rebound.

CRM call centers are low environmental impact facilities. Air emissions, water consumption, wastewater discharge, and electricity usage will be low. Facilities can require large land tracts and impervious cover can be significant. CRM call centers are many firms main point of contact with customers and offshoring attempts were considered unsuccessful. Further automation is considered a greater threat to employment.

Why Target Business & Financial Services?

- ✓ **High growth, high wage industry**
- ✓ **Location trends highlight movement away from large metropolitan areas**
- ✓ **Opportunities for recent graduates and young professionals**
- ✓ **Ideal recruitment industry to further develop a high wage professional services cluster**

Manchester Strengths and Selling Points:

- **Infrastructure assets**
  1. Air access provided by Manchester Airport and Logan International Airport
  2. Advanced telecommunications service
- **Location and Business Environment**
  1. Boston Metro Access
  2. Low risk of natural disaster. This is a must for data storage facilities.
  3. Low crime rate, which is also essential for data storage locations (The crime rate per 1,000 persons is almost half of the U.S.)
- **Workforce and Education**
  1. Strong cluster in Financial Services (1.37) and Professional & Business Services (1.22)
  2. Large presence of Banking anchored by Banknorth (1,153 employees), Citizens Bank (1,225 employees), and Bank of America (425 employees)
  3. Southern New Hampshire University and University of New Hampshire provide a ready supply of young college grads, which is conducive to entry-level Business Services positions. (Manchester Educational Attainment of 29%)

Industry Overview

The software industry is comprised of computer programming services, prepackaged software, data processing, and information retrieval services. Demand for software is driven by efficiencies derived through computer automation and data management.

Software

NAICS Definition

511210 Software publishers
541511 Software analysis and design
541512 Computer Systems Design Services
541519 Other Computer Related Services

U.S. Employment & Wages 2004

Employment: 1.32 million
Average Wage: $81,000

Location Criteria

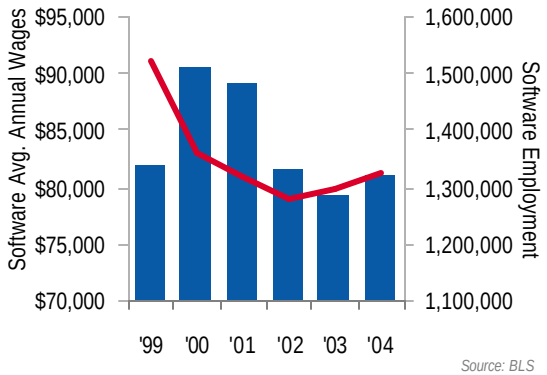
Educated workforce
Access to capital
Research Incubator
High tech cluster

Software firms have worldwide revenues in excess of $200 billion and account for over 2 million jobs worldwide. The U.S. software industry is experiencing positive growth after several difficult years following the bust. Employment and average wages increased in 2004 to $1.32 million and $81,000 respectively. Approximately half of revenue in the industry comes from software applications, development tools, with infrastructure software splitting the remaining market. Due to the low start-up costs associated with a software firm, many small companies exist, but are struggling to remain profitable as the growth of the revenue pool is not keeping pace with the growth of new firms. These smaller firms are particularly vulnerable to changes in the market, as they are generally very specialized within specific niches sectors. Larger firms supply a broad array of software solutions across a variety of industries, allowing them more insulation against shifts in the market. The industry is quickly maturing and many analysts forecast consolidation of these firms. Microsoft and IBM account for acquisitions of over $1 billion and Oracle acquired Peoplesoft through an 18-month hostile bid for $10.3 billion in January of 2005.

Potential areas of growth are in compliance software, open source software, security software, virus protection software, anti-spam software, and business intelligence software. There are several factors driving this growth. The recent corporate scandals and terrorist attacks, which had devastating effects on the financial markets, are forcing companies to adhere to stricter government regulations. These regulations require companies to implement software that provides immediate disclosure of events relevant to financial performance, maintain accurate records of electronic communication, and effectively detect any illegal activity.

SOFTWARE

U.S. EMPLOYMENT & WAGES 1999-2004



Source: BLS

Other major trends in the software industry include outsourcing programming duties to low cost regions, which mimics other mature industries, and the "open source" movement. China, India, and Russia have low cost computer scientists, ensuring further investment in these regions. The "open source" movement has gained momentum behind the Linux operating system. Open source refers to the practice of allowing free access to the building blocks of a computer

program, which in turn multiplies the number of programmers who can work on building solutions around that program.

INDUSTRY REQUIREMENTS

Economic Conditions

Software companies seek communities with a well-educated and creative workforce. Software employees are highly mobile and quality of life is especially important to attracting and retaining experienced technical workers especially during periods of growth.

Software and Internet companies' primary costs are computer and networking equipment, and employee salaries. The Internet makes software distribution very cheap and efficient so transportation costs are not an issue. Software firms pay high wages, employ highly skilled workers, and are extremely low impact operations and are highly coveted by communities.

Market/Geography

Software firms are located in nearly every city in the United States. Major centers for the software and Internet industry are Seattle, San Jose, Washington D.C., Boston, Austin, New York, Raleigh, and Boulder.

Structural Assets

Along with affordable office space, software firms require reliable utility service at low rates. Many industry firms will require access to a SONET ring and numerous T-1 lines. Software companies will also require high-end office space.

Research & Development

Due to the relatively low cost of computers, computer science development can occur nearly anywhere. Many significant developments are produced by hobbyists and entrepreneurs as well as by universities and corporations. Due to the large amount of proprietary information involved, software firms keep all R&D in house. Microsoft, for example, has never revealed the source code for its Windows operating system effectively suppressing any outside research.

Workforce

Software companies require computer scientists, computer engineers, and technicians. Software firms need for well-trained workers will drive them to areas where they can meet recruitment needs.

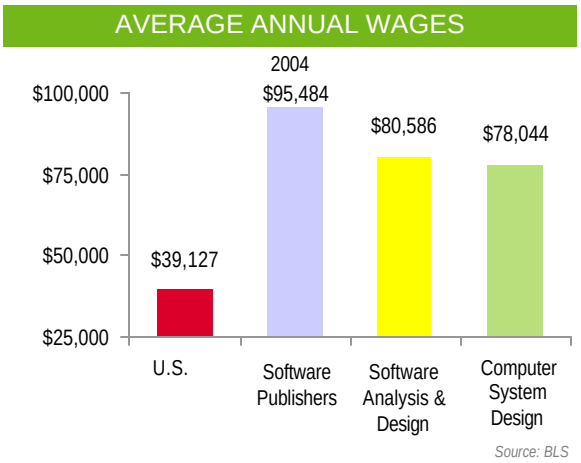
Occupational Breakdown of the Software Industry

OCC CODE	OCC TITLE	Ind. Emp. 2004	% of Ind.	LQ	02 - '04 Emp. Change	Nat. 10-Year Growth Forecast	% Jobs Requiring Bachelor's	Industry Specific Wage	National Occupational Wage	Wage Diff.
00-0000	Industry Total	1,365,540	100%	1.00	0%	15%	-	$70,502	$37,020	190%
15-1031	Computer software engineers, applications	169,930	12%	37.44	10%	25%	81%	$79,683	$77,330	103%
15-1021	Computer programmers	128,680	9%	29.30	-8%	19%	70%	$70,623	$65,910	107%
15-1032	Computer software engineers, systems software	106,400	8%	31.39	25%	15%	81%	$84,388	$82,160	103%
15-1041	Computer support specialists	100,140	7%	19.23	-2%	17%	42%	$47,149	$43,620	108%
15-1051	Computer systems analysts	95,340	7%	18.29	-9%	34%	62%	$72,922	$68,370	107%
11-3021	Computer and information systems managers	43,700	3%	15.33	4%	36%	70%	-	$98,260	-
15-1071	Network and computer systems admin.istrators	43,380	3%	15.70	2%	15%	50%	$67,135	$61,470	109%
43-4051	Customer service representatives	39,700	3%	1.84	6%	24%	21%	$34,288	$29,130	118%
11-1021	General and operations managers	37,230	3%	1.99	4%	17%	48%	-	$92,010	-
15-1081	Network systems and data communications anal	31,870	2%	17.67	24%	23%	58%	$66,863	$63,410	105%
41-4011	Sales representatives, wholesale and mftg., tech.	30,260	2%	7.51	15%	19%	48%	$77,927	$67,330	116%
13-1111	Management analysts	27,960	2%	6.30	4%	30%	77%	$77,734	$72,730	107%
43-9061	Office clerks, general	26,490	2%	0.84	21%	10%	17%	$27,383	$24,170	113%
43-6011	exec. secretaries assistants	24,550	2%	1.62	1%	9%	16%	$41,571	$36,790	113%
15-1099	Computer specialists, all other	18,860	1%	13.57	-	15%	62%	$59,960	$63,030	95%
43-3031	Bookkeeping, accounting, and auditing clerks	17,330	1%	0.92	11%	3%	16%	$33,470	$29,830	112%
15-1061	Database admin.istrators	15,240	1%	14.75	-7%	15%	67%	$71,034	$63,460	112%
13-2011	Accountants and auditors	15,220	1%	1.43	32%	20%	74%	$63,097	$56,880	111%
11-2021	Marketing managers	12,300	1%	6.50	14%	21%	67%	-	$96,680	-
17-2061	Computer hardware engineers	12,260	1%	15.39	20%	6%	69%	$82,011	$84,010	98%
19-3021	Market research analysts	12,040	1%	6.64	56%	23%	79%	$72,049	$62,990	114%
43-1011	First-line supervisors of office support workers	11,480	1%	0.77	-8%	26%	27%	$51,175	$43,990	116%
27-3042	tech. writers	10,890	1%	22.66	11%	27%	69%	$60,122	$56,650	106%
11-2022	Sales managers	10,880	1%	3.19	4%	31%	67%	-	$95,010	-
41-4012	Sales representatives, wholesale and mftg., exce	10,340	1%	0.70	-6%	19%	48%	$64,857	$53,900	120%

Manchester Niche Targets

Software Development Operations

Software development operations are integrated with programming, project management, and support all operating from the same location. While a large volume of programming work is performed at these facilities, the work is very high value-add and mostly customized. Aspects of the work flow can be outsourced, but the majority will remain. The federal market for software is large, expanding, and uniquely structured. The software program under development for the Army's Future Combat Systems is the largest software project ever undertaken. The industry is focused on custom applications development and IT infrastructure deployment, rather than product development for the consumer and corporate marketplace. Other technology centers are focused on consumers and the private sector. Federal work is more focused and stable, but still offers the benefits of any technology industry operation, high wages and growth.

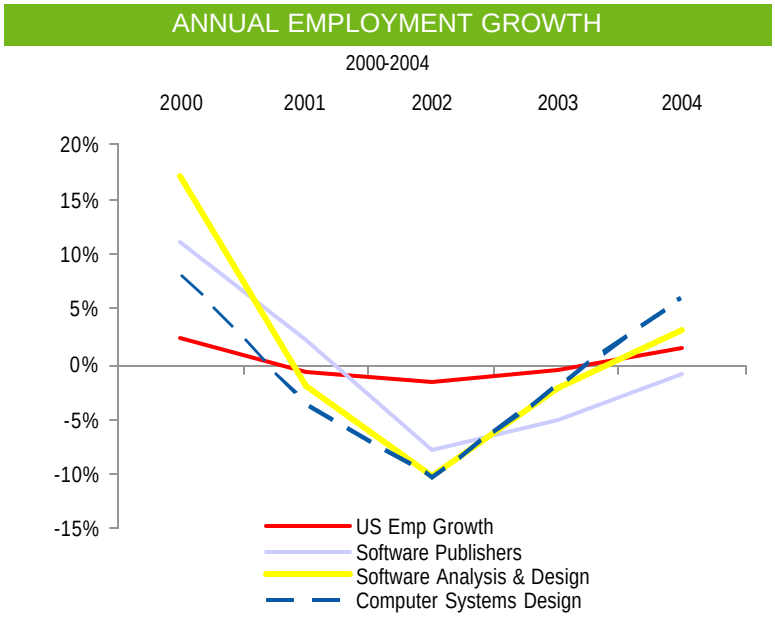


Software development will have a low infrastructure impact as facilities require small amounts of water and land, and produce limited air emissions and wastewater. Electricity usage can be low to moderate.

The software development industry continues to expand but competition from developing nations is significant. Most work offshored or lost to the foreign firms has been low value add, a trend expected to continue in the near-term.

Network Security

The need for increased computer and network security in the both the private and public sector is driving growth in the software industry. Computer crime and security affects virtually every business and person in the modern world. March 2004 figures from mi2g, a technology security firm, show that the NetSky virus alone caused between $35.8 billion and $43.8 billion in damages worldwide. Such viruses not only wreck the computers they infect, but also clog email systems around the globe.



Source: BLS

In the interest of national security, the Department of Homeland Security is promoting the research and development of software and technology that will protect information systems and databases, thereby adding additional fuel to a growing network security industry. The emphasis on network and data security is in combating terrorism, safe guarding sensitive information, and maintaining economic stability. The DHS is focusing on evolutionary improvements to current capabilities as well as the development of revolutionary new capabilities, which will drive demand in the network security market.

Software Information Analytics & Visualization

The practice of information analytics and visualization involves using computer software tools to assist in interpreting and analyzing vast amounts of data. Often referred to simply as visual analytics, it is defined as being the science of analytical reasoning facilitated by interactive visual interfaces. Visual analytics is used primarily to synthesize information, and derive insight from massive, dynamic, ambiguous, and often conflicting data. Some of the industry goals for visual analytics are to detect the expected and discover the unexpected, to provide timely, defensible, and understandable assessments, and to communicate assessments effectively for action.

Visual analytics has many realized and unrealized uses, but primarily it is being used for biology and national security purposes. Government agencies such as the CIA and NSA use visual analytics continuously in the interest of national security. Visual analytics is believed to be an integral part in our nation's fight against terrorism. Government agencies, including the Department of Homeland Security (DHS), rely heavily research and development of software for visual analytics.

Why Target Software & IT?

- ✓ **Average wage in Software is $95,000**
- ✓ **Average wage in Systems Design is $77,000**
- ✓ **Worldwide software revenues are expected to grow 6% in 2006 and 7% in 2007, reaching over $200 billion**
- ✓ **Employment growth is strong**
- ✓ **Widespread adoption of the internet, PCs, and gaming both domestically and abroad**

Manchester Strengths and Selling Points:

- **Infrastructure**
  1. Air access provided by Manchester Airport and Logan International Airport
  2. Advanced telecommunications service
- **Location and Business Climate**
  1. New Hampshire ranks 14th in the 2004 "Small Business Survival Index", providing a positive business climate for start-up software firms
  2. Proximity to Boston will provide access to a large supply of venture capital. (Approximately $460 million in 2005 for Software alone)
  3. The Amoskeag Business Incubator will nurture entrepreneurs
- **Workforce and Education**
  1. Strong cluster in Software & IT Services (1.17)
  2. Manchester MSA employs approximately 4,000 in Software and Computer Systems Design (NAICS: 5112, 5415 respectively)
  3. Ability to pull from regional labor pool, which offers a large software workforce

Industry Overview

The defense industry includes a wide-ranging group of individual industries targeting the same market, the Department of Defense (DoD) and its foreign equivalents. The DoD buys everything from desks to aircraft carriers, but due to its purchasing power also drives industrial development.

The U.S. security market is broad and includes market segments such as surveillance and monitoring, access control, biometrics, computer security, fire/burglar alarms, and home automation, just to name a few.

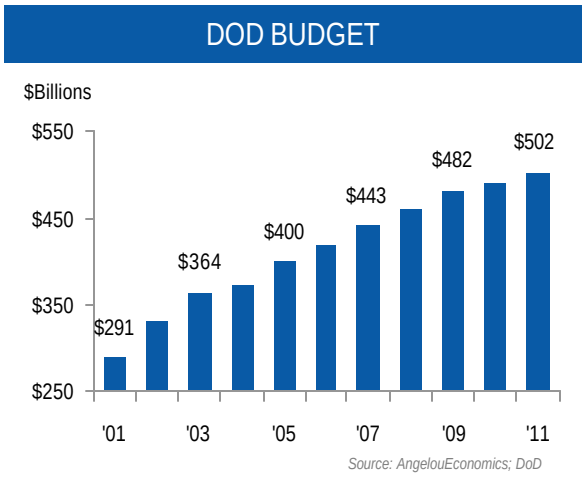
Industry Trends

The events of September 11th continue to produce the most significant changes in military and foreign policies since the end of the Cold War. President Bush's new strategic doctrine for the U.S., first revealed in June 2002 and formalized in a National Security Strategy (NSS) document published three months later, signaled an end to the Cold War doctrine of deterrence because it failed to prevent terrorist attacks. Instead, the Administration outlined a doctrine based on pre-emptive action against rogue states believed to be harboring terrorists, most notably Al-Qaeda, or developing weapons of mass destruction (WMD). Eliminating the threat posed by WMD in the hands of regimes opposed to the U.S. is a clear priority for the Bush administration.

These changes place the U.S. on almost permanent war footing. The new realities of the "war on terrorism" mean that the post-Cold War military strategy, which demanded that the U.S. be able to fight two regional wars at the same time, has been jettisoned. Keeping wars quick and focused on well-defined goals is not possible when an organization such as Al-Qaeda is estimated to have cells in as many as 60 countries. Further revision of military doctrine is likely to be seen in the immediate aftermath of the Iraq campaign in which U.S. forces were successful beyond expectations. Force transformation will continue apace in order to develop increasingly flexible force structures designed to counter emerging threats such as terrorism and WMD.

U.S. defense spending continues to rise with continuing military action abroad and an acceleration of planned research and procurement. The White House budget request for 2006 includes $419 billion for the Department of Defense (DoD), which does not include an additional $100 billion to pay for the wars in Iraq and Afghanistan or approximately $20 billion in nuclear weapons work performed by the Department of Energy.

The 2006 budget represents a staggering $128 billion increase in funding from the 2001 budget, a 44% increase. Defense spending growth will continue through at least 2011 when the DoD budget is expected to reach $502 billion. From 2001 to 2011 the 6% annual growth rate for DoD budgets represents nearly twice the growth rate of the overall economy.



The Administration's 2006 defense budget represents a continuation of the previously established priorities. Growth remains solid and, for the most part, changes to the prior budget plan are minimal. The budget does include $30 billion in cuts to major programs, including, as expected, the F/A-22 Raptor stealth multi-role fighter aircraft, Virginia-

class nuclear-powered attack submarine, and C-130J tactical transport aircraft. However, most of the funding cuts are in future years' budgets and could be changed or reversed.

The Defense Department spends over half its budget with outside private sector contractors, $230 billion last year. The DoD contracts with outside vendors for a wide variety of goods and services, with weapons procurement only accounting for 40%. DoD is a heavy purchaser of manufactured goods, purchasing nearly $100 billion worth in 2004. Spending in this industry is dominated by large-scale weapon platforms, but the DoD spent over $100 million on 19 of the 20 manufacturing sub-sectors, including everything from textiles to furniture.

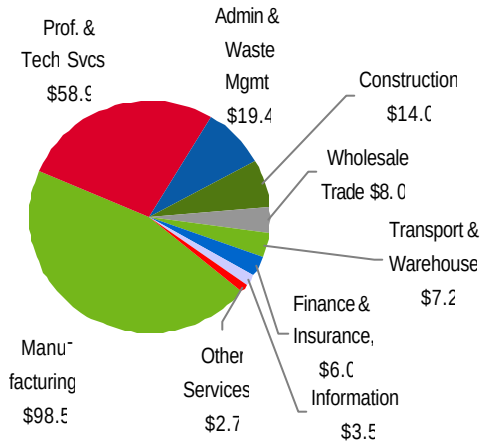
Professional, scientific, and technical services are the second largest recipients of DoD contracting, with $59 billion spent in 2004. Research and development in engineering and life sciences account for 40% of total spending and engineering services account for another 40%.

Advanced Security

The overall U.S. security market is a multi-billion-dollar industry with a double-digit growth rate. The industry is divided into three main end-use segments: **commercial, government,** and **residential.** The advanced security cluster is comprised of many technology-based occupations. Because national employment data is classified by functions such as software, IT, and engineering, it is difficult to determine the exact employment in the advanced security cluster. However, according to a Hallcrest report, it is estimated that there are 30,000 security companies worldwide. The chart on the next page approximates employment in the cluster using the NAICS codes most suitable for the cluster. Employment experienced a dip from 2000 to 2003. This decrease, however, is reflective of the general reduction in technology employment after the dot-com bust and not necessarily a reduction in advanced security employment.

DEFENSE PROCUREMENT TODAY

DOD PROCUREMENT SPENDING BREAKDOWN, 2004



ADVANCED SECURITY

NAICS Definition

334119	Biometrics system input device
3355999	Electrical Equipment Manufacturing
541380	Testing Laboratories
5417	Scientific Research and Development
56162	Security Systems Services
561612	Security Patrol Services

Industry Profile

- $23.4 billion in revenues

Wage Rates

- $25/hr - U.S.

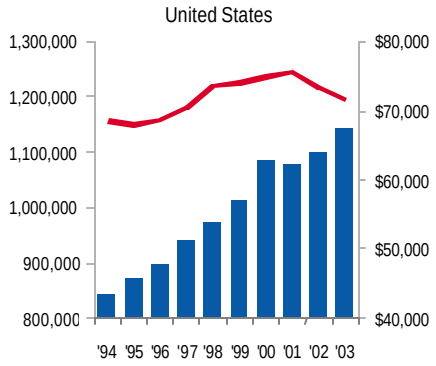
Location Criteria

- Educated workforce
- Research institutions
- High tech cluster

In fact, in 2003, the U.S. security market had record revenues of $35 billion. Industry consultants at the Freedonia Group expect revenues to more than double to over $48 billion by 2007. Revenue growth is predicted to be just as fast outside the United States. Western Europe and Japan are the largest markets outside the U.S., but East Asia, Latin America, and the Middle East have the strongest revenue growth. Estimates predict that the global security market will expand to over $100 billion in revenues.

Despite some merger activities, the Advanced Security industry still remains a highly fragmented industry populated by many small companies dispersed across the U.S. and the world. This industry is expected to experience clustering effects as these smaller companies co-locate to share resources, technologies, and labor to increase their collective competitiveness.

ADVANCED SECURITY, 1994-2003

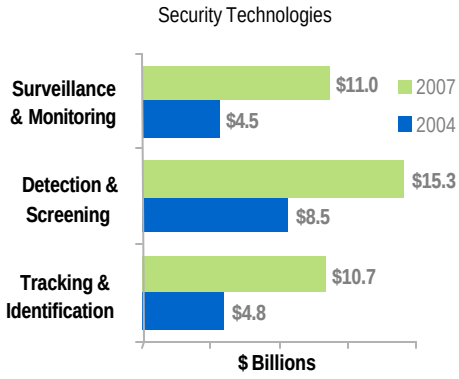


Source: AngelouEconomics;BLS

Commercial Security Market

Commercial security purchases will grow considerably from $14 billion in 2002 to $29 billion in 2009. A combination of decreasing prices and increased demand from industrial and utility users is driving this growth. The fastest growing commercial markets are health care and financial services due to an expanding elderly population, as well as increased crime and corporate fraud.

ADVANCED SECURITY, 2004-2007



Source: Morgan Keegan & Co.

Main technology applications in the commercial security market will be similar to those demanded by the government. Three major areas are:

- **Surveillance & Monitoring**, which includes *digital video surveillance, advanced sensors,* and *infrared systems*
- **Detection & Screening**, which includes *air, food, & water screening*, *bioterrorism*, *large baggage* and *container shipments*
- **Tracking & Identification**, which includes *biometrics* (finger, eye, face detection), *optics, tracking technology (Smart Cards)*

Government Security Market

Government spending on security increased dramatically in the aftermath of the 9/11 attacks. U.S. government administration and security spending is handled by the Department of Homeland Security (DHS). Terrorism fears are behind the increase in government spending as state and federal authorities attempt to secure the nation's vital facilities. While the government market is not the largest security market, it is the most advanced.

DHS spending to reached $41.4 billion in 2004 and projected to grow to $47.3 billion in 2005. Some of this spending will be earmarked to support ongoing operations at the department. However, it is expected that approximately 30% of these funds will flow to the private sector.

The main technology application sectors that are targeted by the Department of Homeland Security are:

1. Security and intelligence software
2. Explosives detection systems
3. Surveillance/border and perimeter security systems
4. Bio-terror: detection, diagnostics, treatment
5. Training and simulation systems
6. Access control / Biometrics
7. Data security

Residential Security Market

The residential security market is the smallest of the three main segments with 2002 sales of $1.7 billion. Growth is strong, though, and 2009 revenues are forecasted at $3.2 billion. The residential market is focused on home security systems and other relatively low-tech aspects of the security market.

Defense Manufacturing

Defense manufacturing includes all aspects of manufacturing, design, research and development, warehousing, and logistics related to federal defense projects. The Departments of Defense and Homeland Security are the industry's primary customers in addition to numerous export markets. Major industry sectors include vehicle manufacturing, arms manufacturing, and military logistics.

Defense Department spending reached $450 billion in 2004 and the department is the largest organization on Earth in terms of revenue and employment. The 2004 procurement budget reached a record $81 billion with large outlays for vehicle and aircraft manufacturing by both the Army and Air Force. Spending on research and development of new technologies and testing new equipment accounted for $64 billion. Spending on research and development is expected to increase faster than the overall defense budget and the procurement budget in the immediate future.

DEFENSE MANUFACTURING

NAICS Definition

336 Transportation Equipment Manufacturing
33612 Heavy Duty Truck Manufacturing
336992 Military Armored Vehicle and Tank Mftg
332993 Ammunition Manufacturing
332995 Ordnance and Accessories Manufacturing

Industry Profile

- $160 billion in revenues
- 350,000 employed - US

Wage Rates

- $26/hr - U.S.

Location Criteria

- Transportation infrastruture
- Existing military facilities/operations
- Manufacturing workforce
- Proximity to good technical training institutions

Industry Requirements

Economic Conditions

The industry's operating costs, while important, are not typically a concern for the industry. Many of the industry's largest clusters are located in high cost areas such as Southern California. But excessive wages and high costs of living are now driving these companies to search for more affordable locations. Next to labor, electricity is one of the largest recurring costs.

Market/Geography

For defense and security firms whose customers are federal governments and large corporations, local economic conditions are not typically a concern. Firms do not serve local markets and are more concerned with quality of life than an expanding local economy.

Structural Assets

Defense and security companies are the epitome of mission critical processes. Their mission is to secure the data and resources of business and government. Thus, they must be highly secure themselves. They need electricity that is beyond reliable. Sites must have a redundant power supply as well as an on-site generator. Travel times to the area should be reasonable with, at most, one-stop flight access to Washington D.C.

Research & Development

R&D in government data security has increased dramatically since the increased terrorist concerns following the September 11th attacks. Major research projects are funded by virtually every government defense agency including the Departments of Defense and Homeland Security, the National Institutes of Health, and all branches of the US military. Because the nature of the industry involves staying one step ahead of the nation's enemies, R&D will always be an important part of this industry.

Workforce

The defense and security industry needs a highly technical workforce. About one in four employees are in computer-related occupations, most notably software engineers, computer programmers, and computer systems analysts.

Occupational Breakdown of the Software Industry

OCC CODE	OCC TITLE	Ind. Emp. 2004	% of Ind.	LQ	02 - '04 Emp. Change	Nat. 10-Year Growth Forecast	% Jobs Requiring Bachelor's	Industry Specific Wage	National Occupational Wage	Wage Diff.
00-0000	Industry Total	1,365,540	100%	1.00	0%	15%	-	$70,502	$37,020	190%
15-1031	Computer software engineers, applications	169,930	12%	37.44	10%	25%	81%	$79,683	$77,330	103%
15-1021	Computer programmers	128,680	9%	29.30	-8%	19%	70%	$70,623	$65,910	107%
15-1032	Computer software engineers, systems software	106,400	8%	31.39	25%	15%	81%	$84,388	$82,160	103%
15-1041	Computer support specialists	100,140	7%	19.23	-2%	17%	42%	$47,149	$43,620	108%
15-1051	Computer systems analysts	95,340	7%	18.29	-9%	34%	62%	$72,922	$68,370	107%
11-3021	Computer and information systems managers	43,700	3%	15.33	4%	36%	70%	-	$98,260	-
15-1071	Network and computer systems admin.istrators	43,380	3%	15.70	2%	15%	50%	$67,135	$61,470	109%
43-4051	Customer service representatives	39,700	3%	1.84	6%	24%	21%	$34,288	$29,130	118%
11-1021	General and operations managers	37,230	3%	1.99	4%	17%	48%	-	$92,010	-
15-1081	Network systems and data communications anal	31,870	2%	17.67	24%	23%	58%	$66,863	$63,410	105%
41-4011	Sales representatives, wholesale and mftg., tech.	30,260	2%	7.51	15%	19%	48%	$77,927	$67,330	116%
13-1111	Management analysts	27,960	2%	6.30	4%	30%	77%	$77,734	$72,730	107%
43-9061	Office clerks, general	26,490	2%	0.84	21%	10%	17%	$27,383	$24,170	113%
43-6011	exec. secretaries assistants	24,550	2%	1.62	1%	9%	16%	$41,571	$36,790	113%
15-1099	Computer specialists, all other	18,860	1%	13.57	-	15%	62%	$59,960	$63,030	95%
43-3031	Bookkeeping, accounting, and auditing clerks	17,330	1%	0.92	11%	3%	16%	$33,470	$29,830	112%
15-1061	Database admin.istrators	15,240	1%	14.75	-7%	15%	67%	$71,034	$63,460	112%
13-2011	Accountants and auditors	15,220	1%	1.43	32%	20%	74%	$63,097	$56,880	111%
11-2021	Marketing managers	12,300	1%	6.50	14%	21%	67%	-	$96,680	-
17-2061	Computer hardware engineers	12,260	1%	15.39	20%	6%	69%	$82,011	$84,010	98%
19-3021	Market research analysts	12,040	1%	6.64	56%	23%	79%	$72,049	$62,990	114%
43-1011	First-line supervisors of office support workers	11,480	1%	0.77	-8%	26%	27%	$51,175	$43,990	116%
27-3042	tech. writers	10,890	1%	22.66	11%	27%	69%	$60,122	$56,650	106%
11-2022	Sales managers	10,880	1%	3.19	4%	31%	67%	-	$95,010	-
41-4012	Sales representatives, wholesale and mftg., exce	10,340	1%	0.70	-6%	19%	48%	$64,857	$53,900	120%

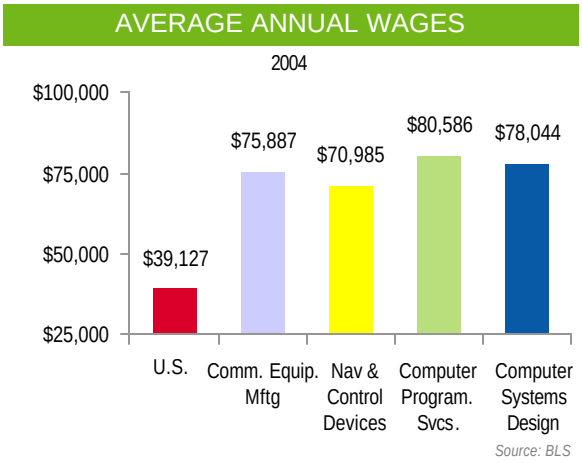
Workforce Continued

Occupational Breakdown of the Advanced mftg. Industry

OCC CODE	OCC TITLE	Ind. Emp. 2004	% of Ind.	LQ	02 - '04 Emp. Change	Nat. 10-Year Growth Forecast	% Jobs Requiring Bachelor's	Industry Specific Wage	National Occupational Wage	Wage Diff.
00-0000	Industry Total	1,940,990	100%	1.00	-6%	15%	-	$53,129	$37,020	144%
51-2022	Electrical and electronic equipment assemblers	101,300	5%	30.76	-21%	-18%	6%	$26,920	$26,270	102%
51-2092	Team assemblers	99,470	5%	5.43	-11%	-2%	5%	$25,849	$25,720	101%
51-9061	Inspectors, testers, samplers, and weighers	53,150	3%	7.08	-6%	5%	13%	$33,124	$31,210	106%
17-2011	Aerospace engineers	48,510	2%	43.48	0%	-5%	82%	$78,143	$80,460	97%
51-1011	First-line supervisors of production workers	47,610	2%	4.51	-7%	25%	12%	$53,242	$47,760	111%
15-1032	Computer software engineers, systems software	43,870	2%	9.11	10%	18%	81%	$86,660	$82,160	105%
15-1031	Computer software engineers, applications	41,280	2%	6.40	28%	27%	81%	$82,961	$77,330	107%
51-4041	Machinists	41,090	2%	7.51	2%	8%	4%	$36,590	$34,790	105%
17-2141	Mechanical engineers	40,480	2%	12.31	14%	5%	77%	$70,857	$68,460	104%
17-3023	Electrical and electronic engineering technicians	40,240	2%	14.88	-22%	10%	17%	$43,867	$47,130	93%
51-9141	Semiconductor processors	39,180	2%	58.20	-2%	-11%	8%	$29,852	$30,070	99%
17-2112	Industrial engineers	38,730	2%	14.61	17%	11%	68%	$70,376	$66,660	106%
11-9041	Engineering managers	36,110	2%	12.79	4%	9%	76%	$99,770	$102,600	97%
51-9081	Dental laboratory technicians	34,500	2%	51.13	5%	4%	14%	$33,130	$33,720	98%
17-2071	Electrical engineers	32,690	2%	14.55	3%	3%	80%	$76,945	$74,220	104%
17-2072	Electronics engineers, except computer	31,540	2%	15.36	-3%	9%	80%	$77,982	$77,450	101%
17-2061	Computer hardware engineers	29,420	2%	25.98	21%	6%	69%	$89,926	$84,010	107%
13-1023	Purchasing agents, except wholesale, and retail	28,760	1%	7.39	6%	22%	37%	$54,641	$51,180	107%
17-2199	Engineers, all other	25,170	1%	10.40	-	10%	77%	$80,530	$75,540	107%
43-6011	exec. secretaries assistants	24,870	1%	1.15	0%	9%	16%	$42,285	$36,790	115%
11-1021	General and operations managers	24,560	1%	0.92	-3%	11%	48%	-	$92,010	-
43-5071	Shipping, receiving, and traffic clerks	23,900	1%	2.11	-18%	3%	7%	$27,821	$25,850	108%
43-5061	Production, planning, and expediting clerks	23,510	1%	5.43	-3%	14%	28%	$40,701	$37,650	108%
51-2023	Electromechanical equipment assemblers	22,670	1%	29.13	-4%	-8%	6%	$27,732	$27,650	100%
41-4011	Sales representatives, wholesale and mftg., tech.	22,220	1%	3.88	19%	19%	48%	$71,254	$67,330	106%

Manchester Niche Targets

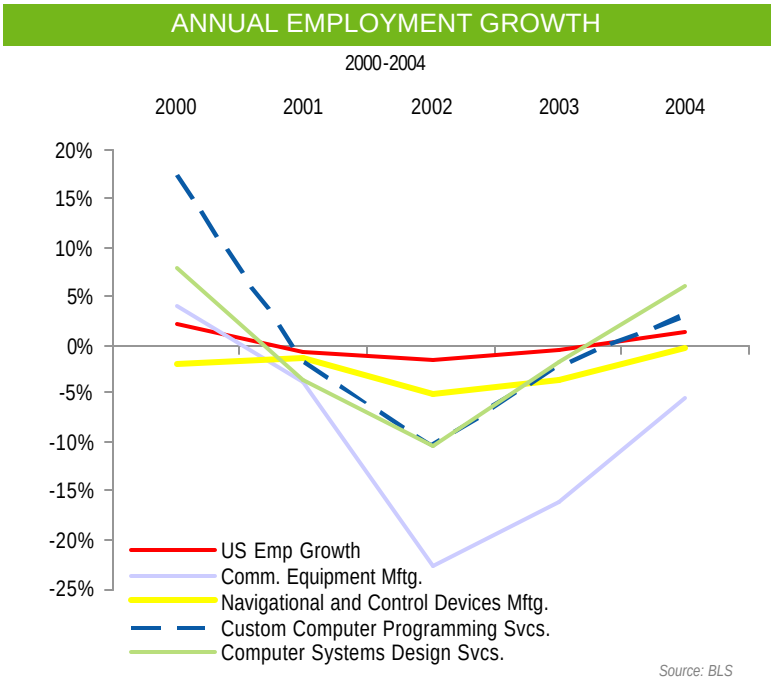
Biometrics



Biometrics involves automated methods of recognizing a person based on a physiological or behavioral characteristic. Measurements can include; face, fingerprints, handwriting, iris, retinal, and voice. Biometric technologies are becoming the foundation of an extensive collection of highly secure identification and personal verification solutions. Biometric systems have gained widespread adoption and revenues have grown significantly over the past five years. Industry revenues are forecast to reach $550 million by 2007 as government agencies and corporations move to tighten security. A recent expose on Los Alamos Labs revealed that thousands of electronic key cards had gone missing over the last few years, giving whoever found them potential access to the nation's top weapons lab. The fact electronic key cards and photo IDs can be stolen, lost, or replicated at one of the most secure facilities in the world underscores their inherent flaws.

The importance of securing the nations cargo has become paramount since 9/11. Problems with theft and insurance fraud had already focused research dollars to devising ways to secure cargo containers but the threat of terrorist attacks has brought increased federal spending. Everyday more than 17,000 cargo containers carrying 80% of U.S. imports enter a domestic seaport. Fewer than 2% of these cargo containers are inspected and all have the potential to house weapons or terrorists. Inspecting all of these containers would be nearly impossible and cost prohibitive. The only reasonable way to be sure of their contents is through advanced **cargo security** methods that monitor the cargo as it moves through the supply chain. Electronic seals, access controls, and RFID tags can alert shippers if a cargo container is tampered with, opened, or if it diverts from its intended course.

Defense / Security Manufacturing



Defense manufacturing is not as clear cut as other targets, focusing on the end-user rather than the producer. Defense and security represent a marketplace, communities will focus on the market, rather than the product. As the DoD transitions from a defensive focus to more mobile operations, the need for new products expands. The Pentagon is ordering fewer military specific tanks, ships, and aircrafts, instead choosing to focus on small scale solutions to issue specific problems. New defense manufacturing facilities will produce solider deployable Unmanned Aerial Vehicles (UAVs), advanced communications equipment, and nanotech heavy uniforms. The industry is increasingly concerned about operating costs and liability issues. Facility location trends indicate movement outside major metropolitan areas, but still maintaining access. Operations are also subject to intense federal scrutiny and federal inspections. While generic manufacturing has moved offshore, the risks are considered too high for many advanced drug therapies.

Defense manufacturing will have a moderate to significant infrastructure impact, similar to most manufacturing operations. Air emissions can be moderate and electricity usage above average.

Precision Industrial Machinery

The precision industrial machinery industry makes equipment that is used in the production and assembly of aircraft parts and components, as well as a variety of aerospace & defense products such as missiles, satellites, and navigation equipment. The proximity of these companies to a major aircraft manufacturer or aerospace firm is advantageous to reduce the cost of providing service and support for the machinery used in the manufacturing process.

Manufacturing related to aircraft and defense is less affected by competition from abroad than traditional manufacturing. Federal budgetary cycles are important, and with budgets under severe pressure defense cuts could be on the horizon. These cuts will affect large-scale development programs more than the small-scale programs identified as a target for Manchester.

Life Sciences / Business Services

As with defense manufacturing, opportunities in life sciences and business services will be focused on the end-user, rather than the industry overall. An opportunity exists to land relocating business services operations located in Maryland and Virginia. The DoD and DHS life sciences market is expanding rapidly and includes drug and vaccine research, testing, and production. There is an expanding market opportunity tied to the federal apparatus in D.C. Many companies will choose to locate facilities in the region to be near the end user.

Why Target Defense/ Advanced Security

- ✓ **Over 50% of the DoD budget goes to outside vendors, $231 billion contracted last year**
- ✓ **Rapidly growing $42 billion industry, 100% industry growth through 2009**
- ✓ **Opportunities for universities and small businesses**
- ✓ **Threat of terrorism is advancing the need for redundancy and geographic distribution of operations**
- ✓ **New global security threats are causing a major transformation in the organization and tactics of the U.S. military**
- ✓ **Average wages are above $70,000**

Manchester Strengths and Selling Points:

- **Infrastructure**
  1. Significant regional R&D strengths to pull from, including local universities and nearby Ivy League schools
  2. Reliable transportation infrastructure with access to rail, highways, and airports
- **Location and Business Environment**
  1. Northeast location provides proximity to decision makers at DoD and DHS
  2. State's tax structure is business friendly. New Hampshire taxes equal 7.4% of income, below the national average of 10.1%. The tax structure will encourage manufacturing operations
- **Workforce and Education**
  1. Strong Defense and Aerospace cluster (2.02) anchored by Rockwell and Vibro-Meter
  2. Strong Software & IT cluster (1.17)
  3. Cluster strength will provide a labor force with skills tailored specifically to Defense and Advanced Security

Biosciences & Medical Technology Industry Overview

LIFE SCIENCES

NAICS Definition

3254	Pharmaceutical and Medicine Manufacturing
339112	Surgical and Medical Instrument Manufacturing
339113	Surgical Appliance and Supplies Manufacturing
5417	Scientific Research and Development Services
6215	Medical and Diagnostic Laboratories

Employment

1.2 Million Employed - U.S. 2004

Wage Rates

$70,900 Average Annual Wage - U.S. 2004

Location Criteria

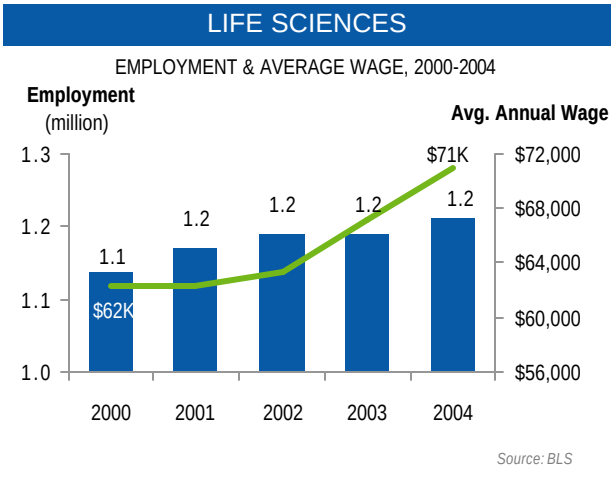
Educated Workforce
Access to Capital
Research Presence
Affordable Lab Space

Biosciences, as its name implies, combines biology with science. It applies knowledge of molecular, cellular, and genetic processes to real world products and services. It refers to scientific work related to genetic engineering for humans, animals and agriculture, environmental work, genetic data mining, and firms involved in the neurosciences and genome work.

In its strictest definition, bioscience includes companies involved in processes that require biological inputs, such as biopharmaceuticals, biological products, gene and protein therapy, tissue engineering, genetically modified crops, etc. However, it is common to expand the definition of the cluster to include related businesses in medical devices and pharmaceutical manufacturing. Even though these large industries do not necessarily utilize biological inputs (medical devices are closely associated with electronic manufacturing, and the pharmaceutical industry largely uses chemical inputs, not biological), they both serve the same end market, human health. The biosciences comprise a wide array of industry sectors that cut across a range of functions.

Using this broader definition, the biosciences serve three primary end markets: **Human Health / Medical, Agricultural, and Industrial.** Applications, devices, and therapeutics are supplied to these industries through a range of functions including *manufacturing, testing services,* and *research and development.*

No industry today offers so much hope to so many as does the biosciences industry. From genetic medicine to new industrial products, biotechnology has the potential to influence much in our daily lives. Consider the many future areas that biotechnology promises to touch: agriculture, energy, environmental, food processing, homeland security, biomanufacturing, biomedical, bioinformatics, and pharmaceuticals:



- **Homeland Security:** the U.S. government is demanding new biological detection agents and biometrics to detect and protect against chemical and terrorist attacks.

- **Energy:** Biofuels will help reduce our dependence on oil and improve the quality of our environment, while bringing new jobs to our agricultural states. Also, enzymes designed through biotechnology offer ways to eat away at our pollution while offering a new way to make plastics without petroleum-based chemicals.

- **Biomedical:** Including drug makers and medical device manufacturers, the biomedical market is the largest submarket under the biotech umbrella. According to a recent study, there are 14,000 biomedical firms in the U.S. that employ 730,000 individuals.

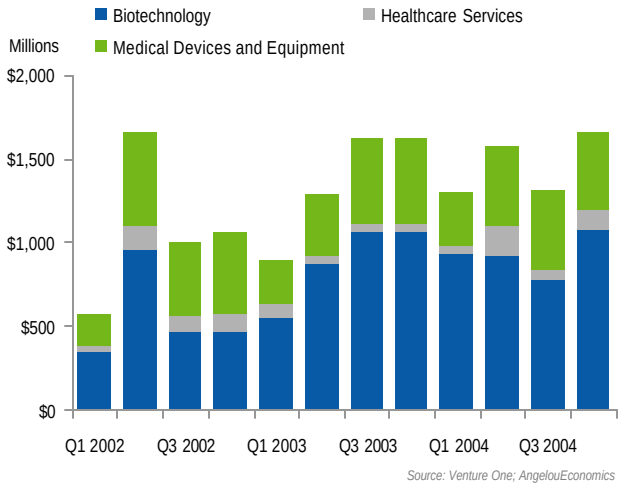
- **BioSourcing:** Biopharmaceutical manufacturing organizations provide outsourced manufacturing services to drug makers to scale up the production of drugs or biopharmaceuticals. Many drug discovery bioscience companies are small and do not have the financial means to support capital-intensive manufacturing equipment. For these companies, the ability to outsource production is critical.

- **AgriBusiness:** Agribusiness now uses biotechnology to modify agricultural feed stocks to be more productive. This could be an enhancement of crop productivity, resistance to disease, or a genetic modification for added human health benefits. Nutraceuticals is the use of food or agricultural inputs to provide health and medical benefits, including the prevention and treatment of disease. The agricultural and industrial bioscience markets comprise nearly 20% of total biotechnology employment.

- **Clinical testing:** New clinical testing organizations provide outsourced support to other biopharmaceutical companies, typically drug developers. The clinical testing organization can handle all or just certain stages in the clinical trial process that is mandated by the FDA for drug approval. This requires identifying and screening test subjects, performing testing in accordance with FDA procedures, and certification of results.

Although growth is slowing, the biosciences industry has experienced tremendous growth over the past five years. Employment in the cluster has expanded by nearly 70,000 jobs from 1999-2004. Average wages in the cluster have increased at an even more explosive rate. The average annual wage in the biosciences cluster grew by 25% since 1999 to $76,600 in 2004. Growth in this cluster is projected to continue. National employment projections indicate that this cluster will grow at a 13% higher rate than the average rate of employment across all industry sectors. The general aging of the U.S. population, coupled with higher disposable incomes is increasing the demand for life enhancing products.

Venture Capital Investment



Source: Venture One; AngelouEconomics

Because of these impressive growth projections and high average wages, competition for bioscience firms will be fierce, as almost every major metro includes it among its list of target industries. The Brookings Institute reports that out of 77 local and 36 state economic development agencies surveyed, 83% list biotechnology as one of their top two target industries. Biotech and health services, however, will likely experience growth in a broad cross-section of markets. There are opportunities for those communities that target specific bioscience niches and prepare themselves appropriately. Successful communities will be those that excel in research and are able connect that research with the business community to turn it into marketable products.

Recent trends point to a resurgence in venture capital investments in biosciences companies. Nearly $6 billion was invested in Biotechnology, Medical Devices, and Health Care companies in the last 4 quarters.

Industry Requirements

Economic Conditions

Firms usually have long and expensive Research and Development cycles that may prolong revenues for years. Due to large barriers to entry, a firm's success is highly dependent on entrepreneurial networks and long-term venture capital. Biotech firms and especially emerging ones face more competition for capital than in recent years. Time to market is critical. Marketable results generally take between 5 and 12 years. Many companies face enormous risks as they often are highly dependant upon a single drug or product that could fail or be tied up in a lengthy regulatory approval process by the F.D.A.

Market/ Geography

Biotechnology firms seek locations in highly vibrant and well-educated communities. Firms also desire a growing population that is large enough to support workforce needs in a growing industry. Biotech companies also desire an amount of diversity in the community as many of the industry's employees are from minority groups.

Structural Assets

Biotech firms have specific but feasible infrastructure needs, namely available "wet lab" space and reliable utilities. The typical biotech firm is relatively small and the majority of any capital investment will be tied up in equipment.

More important are the financial needs of the industry. Biotechnology is an industry in its infancy, still relatively small even after a decade of substantial growth. Today, less than 50 industry companies have over 1,000 employees and none rank among the top 25 employers in the largest biotech metros. Biotech firms need an established venture capital base that is familiar with the industry. Less than 1 out of every 1,000 biotech related patents produces a successful commercial innovation and even when they do it can take more than a decade to come to market. Therefore biotech firms need financial backers that understand the industry and have long-term funds available for investment. Many of the industry's largest firms, including industry leader Amgen, were initially funded with venture capital.

Research & Development

The large biotech firm is a rarity. Even in established markets, biotech firms are not considered large employers. Firms that specialize in research are generally no more than a small lab. These firms sell or license their marketable products to large vertically integrated powerhouses such as Merck and Pfizer. Thus, it is important to have large research organizations in the area. Small biotech firm's benefit greatly from a research hospital or other large research institutions, they are able to use lab space and instruments they night not be able to afford, license technology, and gain invaluable intelligence from industry peers. All of the largest biotech metros in the U.S. have both a large research university and research hospital.

Workforce

Attracting and retaining a quality workforce is more important in high tech fields such as biotech. Workers tend to be highly mobile; they are willing to venture into a community, but they are also easily swayed away. In an industry with high turnover, people tend to seek communities with numerous employment options. The typical bioscience firm has less than 50 employees and most are very well educated. Bioscience firms employ many life science PhDs, and will require an area research university with graduate life-sciences programs. The most concentrated occupational groups in the biosciences are those pertaining to life and physical science. Nearly all of these occupations require at least a bachelor's degree and many require at least a PhD.

Occupational Breakdown of the Pharmaceutical and Medical Devices mftg. Industry

OCC CODE	OCC TITLE	Ind. Emp. 2004	% of Ind.	LQ	02 - '04 Emp. Change	Nat. 10-Year Growth Forecast	% Jobs Requiring Bachelor's	Industry Specific Wage	National Occupational Wage	Wage Diff.
00-0000	Industry Total	588,820	100%	1.00	-2%	15%	-	$46,151	$37,020	125%
51-2092	Team assemblers	38,580	7%	6.95	-14%	-2%	5%	$24,391	$25,720	95%
51-9081	Dental laboratory technicians	34,500	6%	168.55	5%	4%	14%	$33,130	$33,720	98%
51-9111	Packaging and filling machine operators	25,870	4%	13.67	11%	21%	3%	$27,467	$24,110	114%
51-1011	First-line supervisors of production workers	17,010	3%	5.31	-7%	16%	12%	$52,419	$47,760	110%
51-9061	Inspectors, testers, sorters, and weighers	16,970	3%	7.45	0%	5%	13%	$32,221	$31,210	103%
19-2031	Chemists	14,640	2%	40.00	-1%	13%	94%	$62,155	$61,220	102%
19-1042	Medical scientists, except epidemiologists	10,350	2%	33.89	15%	16%	98%	$80,064	$68,730	116%
41-4011	Sales reps., wholesale and mftg., tech. products	10,250	2%	5.90	15%	19%	48%	$67,867	$67,330	101%
53-7064	Packers and packagers, hand	9,280	2%	2.32	22%	14%	4%	$21,450	$18,660	115%
49-9042	Maintenance and repair workers, general	8,940	2%	1.53	2%	16%	8%	$40,344	$32,060	126%
43-4051	Customer service reps.	8,800	1%	0.95	12%	24%	21%	$33,593	$29,130	115%
43-5071	Shipping, receiving, and traffic clerks	8,740	1%	2.55	-4%	3%	7%	$26,953	$25,850	104%
11-1021	General and operations managers	8,410	1%	1.04	-11%	14%	48%	-	$92,010	-
19-4021	Biological technicians	8,130	1%	29.63	25%	19%	59%	$40,393	$35,450	114%
53-7062	Laborers and freight, stock, and material movers	8,120	1%	0.74	9%	7%	4%	$26,324	$21,910	120%
43-6011	exec. secretaries assistants	8,050	1%	1.23	-3%	9%	16%	$41,182	$36,790	112%
51-9023	Mixing and blending machine setters, operators	7,950	1%	14.50	-3%	-7%	4%	$30,662	$29,240	105%
51-9083	Ophthalmic laboratory technicians	7,690	1%	66.48	-19%	9%	14%	$23,950	$25,620	93%
51-9011	Chemical equipment operators and tenders	7,590	1%	34.09	-19%	-4%	18%	$34,382	$39,390	87%
43-6014	Secretaries, except legal, medical, and exec.	6,870	1%	0.86	-4%	-3%	16%	$32,202	$27,160	119%
43-9061	Office clerks, general	6,850	1%	0.50	-5%	10%	17%	$25,995	$24,170	108%
43-5061	Production, planning, and expediting clerks	6,760	1%	5.14	16%	14%	28%	$38,314	$37,650	102%
51-2099	Assemblers and fabricators, all other	6,610	1%	5.54	-	0%	5%	$26,283	$29,410	89%
11-3051	Industrial production managers	6,450	1%	9.00	-12%	8%	40%	$87,328	$79,170	110%
51-9082	Medical appliance technicians	6,140	1%	132.55	-14%	16%	15%	$30,940	$31,600	98%

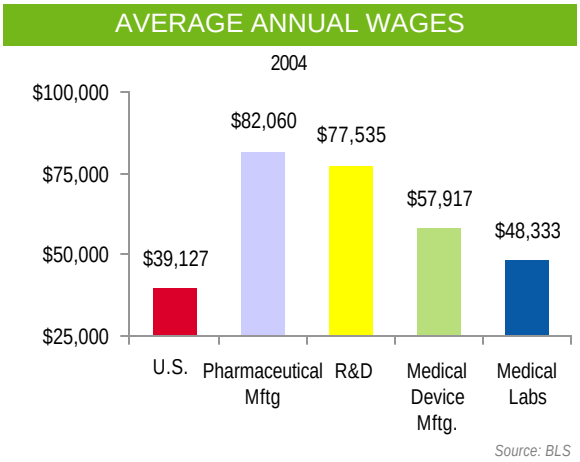
Occupational Breakdown of the Research & Development and Medical Laboratory Testing Industry

OCC CODE	OCC TITLE	Ind. Emp. 2004	% of Ind.	LQ	02 - '04 Emp. Change	Nat. 10-Year Growth Forecast	% Jobs Requiring Bachelor's	Industry Specific Wage	National Occupational Wage	Wage Diff.
00-0000	Industry Total	735,270	100%	1.00	4%	15%	-	$60,324	$37,020	163%
29-2011	Medical and clinical laboratory technologists	21,820	3%	25.14	-2%	19%	50%	$47,008	$46,600	101%
29-2012	Medical and clinical laboratory technicians	21,700	3%	26.68	9%	19%	50%	$31,083	$32,120	97%
43-6011	exec. secretaries assistants	20,960	3%	2.57	10%	9%	16%	$41,676	$36,790	113%
19-1042	Medical scientists, except epidemiologists	19,090	3%	50.06	5%	27%	98%	$72,638	$68,730	106%
31-9099	Healthcare support workers, all other	18,860	3%	18.00	-	27%	14%	$25,924	$26,250	99%
15-1032	Computer software engineers, systems software	18,030	2%	9.88	53%	4%	81%	$94,320	$82,160	115%
43-9061	Office clerks, general	16,450	2%	0.96	4%	10%	17%	$27,584	$24,170	114%
29-2034	Radiologic technologists and technicians	16,060	2%	15.79	26%	23%	24%	$47,884	$44,530	108%
11-1021	General and operations managers	15,100	2%	1.50	-3%	7%	48%	-	$92,010	-
19-4021	Biological technicians	14,870	2%	43.40	0%	19%	59%	$39,380	$35,450	111%
43-6014	Secretaries, except legal, medical, and exec.	12,280	2%	1.23	-5%	-3%	16%	$32,417	$27,160	119%
19-2031	Chemists	11,800	2%	25.82	-5%	13%	94%	$67,406	$61,220	110%
17-2141	Mechanical engineers	10,440	1%	8.38	56%	5%	77%	$76,260	$68,460	111%
15-1031	Computer software engineers, applications	10,280	1%	4.21	23%	23%	81%	$79,116	$77,330	102%
43-1011	First-line supervisors of office support workers	9,530	1%	1.18	14%	21%	27%	$48,794	$43,990	111%
15-1099	Computer specialists, all other	9,190	1%	12.28	-	37%	62%	$77,114	$63,030	122%
43-4051	Customer service reps.	9,190	1%	0.79	11%	24%	21%	$30,514	$29,130	105%
17-2199	Engineers, all other	8,470	1%	9.24	-	10%	77%	$83,330	$75,540	110%
43-4111	Interviewers, except eligibility and loan	8,250	1%	7.42	4%	28%	20%	$23,072	$24,770	93%
43-4171	Receptionists and information clerks	8,240	1%	1.34	17%	30%	12%	$25,156	$22,690	111%
17-2072	Electronics engineers, except computer	7,880	1%	10.13	63%	9%	80%	$90,060	$77,450	116%
11-9041	Engineering managers	7,730	1%	7.23	17%	9%	76%	-	$102,600	-
11-9199	Managers, all other	7,590	1%	3.73	-	6%	48%	$72,310	$81,700	89%
13-2011	Accountants and auditors	7,580	1%	1.33	17%	20%	74%	$61,491	$56,880	108%
11-9121	Natural sciences managers	7,390	1%	32.00	12%	11%	87%	$95,400	$95,800	100%
17-2112	Industrial engineers	7,330	1%	7.30	129%	11%	68%	$78,900	$66,660	118%

Manchester Niche Targets

Branded Bio-Pharmaceutical Manufacturing

This includes drug manufacturing ranging from solid dosage (tablet based medications) products produced by generic or contract manufacturers, to advanced drug therapies, sterile products, and branded products. The industry is increasingly concerned about operating costs and liability issues. Facility location trends indicate movement outside major metropolitan areas, but still maintaining access. Operations are also subject to intense federal scrutiny and federal inspections. While generic manufacturing has moved offshore, the risks are considered too high for many advanced drug therapies.



Drug manufacturing can have a moderate to large infrastructure and environmental impact, although it varies considerably by facility. Air emissions and utility usage can be above average.

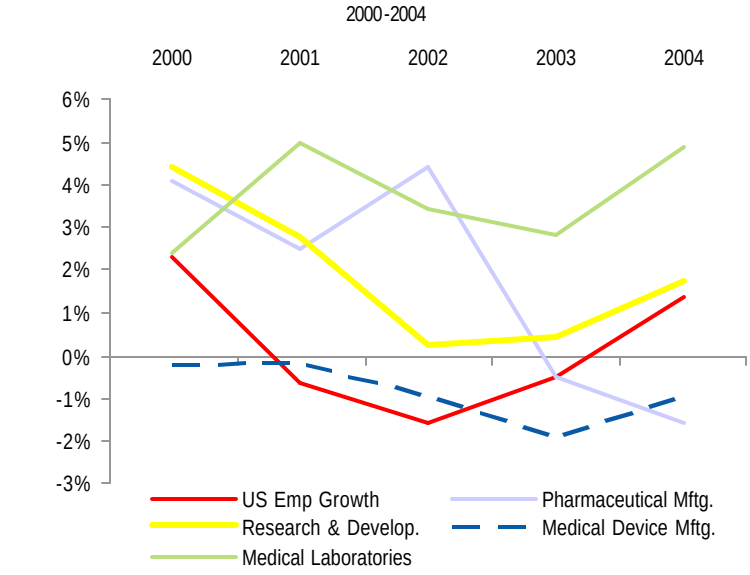
Drug manufacturing is an international competitive industry and as with many manufacturing operations the low value add segments of the industry are moving aboard. Operating costs and litigation fears are the primary drivers of international development. FDA regulations and continued productivity improvements ensures expansion of high value add manufacturing in the U.S.

Medical Device Manufacturing

Medical device firms design and manufacture surgical and diagnostic equipment for the health care field. Products range from CT Scan machines to operating instruments. As with most life science fields, medical device manufacturing is closely regulated, research intensive, and firms have comfortable operating margins. The industry is located in high cost locations such as California and Massachusetts.

Device manufacturing is low environmental impact but can require large electric inputs. Land requirements can be significant as well.

ANNUAL EMPLOYMENT GROWTH



Source: BLS

The medical device industry will benefit as the health care industry continues to expand. FDA regulations and continued productivity improvements ensures expansion of high value add manufacturing in the U.S.

Medical Testing Laboratories

These laboratories focus on testing and contain a light research component. They typically operate near medical universities and large health care systems. The industry is growing and expanding to new markets. The excellent local hospital and health care training programs make testing facilities an excellent match. Testing laboratories are generally low environmental impact operations but can use moderate amounts of water and wastewater relative to their size. Parking requirements can result in significant impervious cover. The medical testing industry will continue to expand with the overall health care market.

Testing laboratories are generally low environmental impact operations but can use moderate amounts of water and wastewater relative to their size. Parking requirements can result in significant impervious cover.

The medical testing industry will continue to expand with the overall healthcare market.

Drug Development Centers

Integrated drug development is confined to a dozen metropolitan areas with large medical schools and research universities. The opportunity for Manchester lies in attracting lower value-add operations in the middle of the research market. One major pharmaceutical firm has invested in mid-sized research centers focused on more mature research. Recent facilities operate similar to back office operations in the financial services field. These facilities are still medical research operations, but less closely tied to basic research at the university or federal lab level. The industry pays very high wages and has an above average clustering effect.

Research and development operations are low impact in general but can have above average water and wastewater requirements relative to their size.

As the health care industry continues to expand, medical research will expand. High drug prices in the U.S. relative to other nations ensure significant R&D funding. Numerous European drug firms have relocated to the U.S., a trend that is expected to continue.

Why Target Life Sciences and Medical Technology?

- ✓ **1.2 million employed including pharmaceutical and medical devices sectors**
- ✓ **Currently 200,000 employed in biotech research and will triple by 2012**
- ✓ **Average annual wage of $71,900**
- ✓ **An increasingly competitive target**
- ✓ **Health Care market is growing rapidly and an aging population will further drive that growth**

Manchester Strengths and Selling Points:

- **Infrastructure**

  1. Significant regional R&D strengths to pull from, including local universities and nearby Ivy League schools
  2. Adequate utility infrastructure and waste water availability to support pharmaceutical and research operations

- **Location and Business Environment**

  1. Proximity to Boston will provide access to a large supply of venture capital. (Approximately $525 million in 2005 for Biotechnology, and $185 million for Medical Devices)
  2. Manchester can provide a low cost alternative to the high cost locations where the majority of Life Sciences firms are located

- **Workforce and Education**

  1. Ability to pull from regional labor pool, which offers a large life sciences workforce
  2. Manchester's clusters in Business & Professional Services (1.22) and Chemicals & Plastics (1.13) will provide support for the Life Sciences Industry
  3. Manchester MSA employs approximately 600 in Scientific Research and Development Services (NAICS: 5417)

Industry Overview

Aviation is a broad industry that consists of civilian and military aircraft, space vehicles, missiles, freight transportation, and maintenance and repair. Aircraft suppliers provide parts and machinery for aircraft assembly and maintenance. These parts include engines, interior components, avionics, and aircraft hardware such as landing gear. These suppliers are important for both the assembly and maintenance of aircraft. The aircraft industry's customers include the military, commercial airlines, and general aviation.

AVIATION

NAICS Definition

3364	Aerospace Product and Parts Manufacturing
334511	Navigation, Guidance, Aeronautical Instr. Mftg.
481112	Scheduled Freight Air Transportation
481212	Chartered Freight Air Transportation
488190	Aircraft Maintenance and Repair

Employment

683 Thousand - U.S. 2004

Wage Rates

$68,600 Average Annual Wage - U.S. 2004

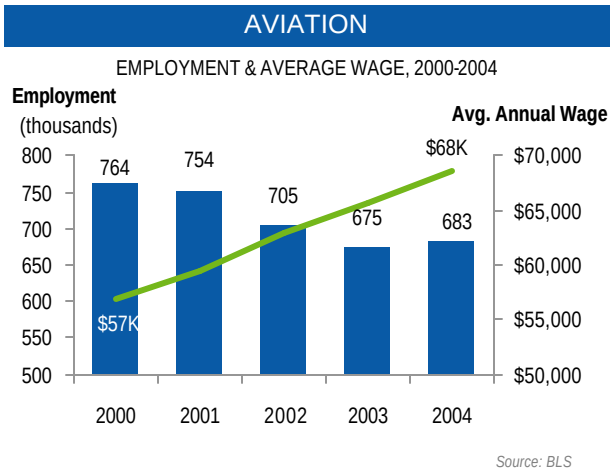
Location Criteria

Educated and Skilled Labor Force
Low Cost Business Climate
Proximity to a large, international airport
Excellent Transportation Infrastructure

The industry has suffered in recent years due to falling orders for new aircraft, but slight growth, as expected, returned in 2004. Aircraft industry employment fell for the fifth consecutive year in 2003, shedding over 30,000 jobs to end the year with 675,000 employees. A slight rebound in sales of 1% in 2004 brought the civilian and military aircraft total to $148 billion, according to the Aircraft Industries Association (AIA). The government is the largest customer segment of the aircraft industry (about 60% of all sales), and increased sales to the Pentagon are offsetting declines in the commercial aircraft market.

Despite a general decline in employment nationally, certain areas within the U.S. are expected to see increases. Specifically, the Aircraft Manufacturing sector is expected to demonstrate a gradual shift in geographic location to the southern U.S. like other manufacturing sectors in automotive and industrial machinery. The aircraft industry increasingly has to squeeze costs to improve its bottom line in the face of a general industry slump and heightened European manufacturing competition.

As of 2004 the aircraft industry employed 683,000 workers in the U.S. Despite a dip in employment, the industry's wages have continued to grow. Annual wages are well above the average national wage and are among the highest of any manufacturing sector. In 2004, the average annual wage of an aviation employee was nearly $70,000. Annual wages grew by 19% from 2000 to 2004.



The aircraft industry cluster is classified into the end markets served: *Civilian, Military, and Space Vehicle and Missiles.* The industry as a whole is expected to experience 7% revenue growth through 2006, with each sub sector expanding. The most notable expansion will be in the Civilian Aircraft sector, which will grow by 7% after a 32% decline from 1998 to 2003.

Industry Requirements

Economic Conditions

Aircraft parts manufacturing include large-scale, low margin operations whose profitability is greatly influenced by recurring costs. They are large users of electricity and natural gas and pay large amounts of property taxes. Any location decision will be heavily influenced by tax rates, utility costs, and prevailing wage rates. Due to the number and diversity of employees these operations are fiercely sought after and command large incentive packages.

However, niche component suppliers to these larger aircraft manufacturers are typically smaller operations that support fewer jobs. These firms typically cannot demand incentive packages and choose locations based on market proximity and workforce skills.

Market/ Geography

Proximity to a large, international airport is desirable, but small regional airports will still allow for flight service. Manufacturers seek locations with favorable weather for testing so schedules will be met. Maintenance, repair, and overhaul operations typically locate near major population centers, but outside of larger, costlier major metros.

Structural Assets

Aircraft and aircraft parts manufacturers are typically medium-to large-scale operations requiring a sizable tract of land. However, niche electronic, navigational, and component parts manufacturers usually require smaller flex industrial facilities. Facilities range in size from several thousand to millions of square feet. Any facility will require ample access to electricity, natural gas, water, and wastewater. An excellent transportation system, including both interstate and rail access, in addition to a commercial airport, will also be required. Port access sometimes is required to ship large subassemblies such as wings.

Air traffic congestion can be a major detriment to testing and getting the product in and out of the door. A land buffer or limit to residential growth nearby helps prevent public complaints of noise that could threaten future operations.

Research & Development

Research and Development is generally outsourced to design firms for the development of innovative aerospace parts and products. Supply Chain research is conducted by many universities and companies such as FedEx to increase efficiency for airfreight distribution.

Workforce

Semi-skilled and skilled workers are required for aircraft parts manufacturing, including many engineers and drafters. Mechanics and aircraft technicians will be needed for any maintenance facility. Skilled machinists are required to make parts that are not mass-produced. As with automotive suppliers, an aircraft manufacturing facility will desire both a four-year engineering university as well as a good technical college. Technical colleges should provide a strong aircraft program with courses in airframe and power plant technology.

Occupational Breakdown of the Aviation Industry

OCC CODE	OCC TITLE	Ind. Emp. 2004	% of Ind.	LQ	02 - '04 Emp. Change	Nat. 10-Year Growth Forecast	% Jobs Requiring Bachelor's	Industry Specific Wage	National Occupational Wage	Wage Diff.
00-0000	Industry Total*	1,512,270	100%	1.00	-5%	21%	-	$54,397	$37,020	147%
49-3011	Aircraft mechanics and service technicians	83,730	6%	62.87	-11%	11%	11%	$47,372	$47,190	100%
53-2011	Airline pilots, copilots, and flight engineers	71,520	5%	77.20	3%	18.5%	76%	$83,003	$129,620	64%
17-2011	Aerospace engineers	49,530	3%	56.98	0%	-5.2%	82%	$77,816	$80,460	97%
51-2022	Electrical and electronic equipment assemblers	28,100	2%	10.95	-7%	-18.3%	6%	$28,317	$26,270	108%
17-2141	Mechanical engineers	26,970	2%	10.53	34%	4.8%	77%	$72,290	$68,460	106%
17-2112	Industrial engineers	20,700	1%	10.02	25%	10.6%	68%	$68,634	$66,660	103%
43-5011	Cargo and freight agents	19,080	1%	23.09	56%	15.5%	13%	$32,410	$35,870	90%
11-9041	Engineering managers	18,300	1%	8.32	-2%	9.2%	76%	$95,678	$102,600	93%
17-2071	Electrical engineers	16,790	1%	9.59	2%	2.5%	80%	$75,698	$74,220	102%
17-3023	Electrical and electronic engineering technicians	15,740	1%	7.47	-7%	10%	17%	$44,838	$47,130	95%
51-2011	Aircraft structure, surfaces, rigging, and systems	15,710	1%	71.14	-27%	-9.4%	5%	$38,378	$37,470	102%
51-2023	Electromechanical equipment assemblers	13,760	1%	22.69	9%	-8.3%	6%	$28,015	$27,650	101%
17-2072	Electronics engineers, except computer	10,800	1%	6.75	-22%	9.4%	80%	$76,191	$77,450	98%
53-2012	Commercial pilots	10,350	1%	41.03	7%	14.9%	76%	$60,727	$62,290	97%
49-2091	Avionics technicians	10,120	1%	38.43	5%	3.4%	6%	$45,280	$44,460	102%
17-3026	Industrial engineering technicians	6,370	0%	7.91	-9%	8.7%	17%	$46,262	$47,080	98%
17-3021	Aerospace engineering and operations technicia	6,210	0%	56.82	-17%	1.5%	16%	$54,841	$54,040	101%
49-2094	Electrical and electronics repairers, commercial a	5,900	0%	7.01	-8%	10.4%	5%	$41,992	$42,910	98%
17-3027	Mechanical engineering technicians	4,560	0%	8.22	12%	11%	17%	$47,032	$45,050	104%
17-3024	Electro-mechanical technicians	3,280	0%	14.81	-26%	11.5%	17%	$42,040	$43,130	97%
53-2022	Airfield operations specialists	2,640	0%	46.50	-8%	17.2%	49%	$42,676	$42,050	101%
17-2131	Materials engineers	2,340	0%	9.38	25%	4.1%	70%	$73,096	$69,390	105%
49-2093	Electrical and electronics installers and repairers	1,770	0%	8.62	-13%	7.1%	6%	$46,049	$40,470	114%
51-2093	Timing device assemblers, adjusters, and calibrat	1,150	0%	30.93	-36%	-3%	5%	$31,200	$30,310	103%
17-3012	Electrical and electronics drafters	2,710	0%	6.59	-5%	0.7%	24%	$46,310	$46,760	99%

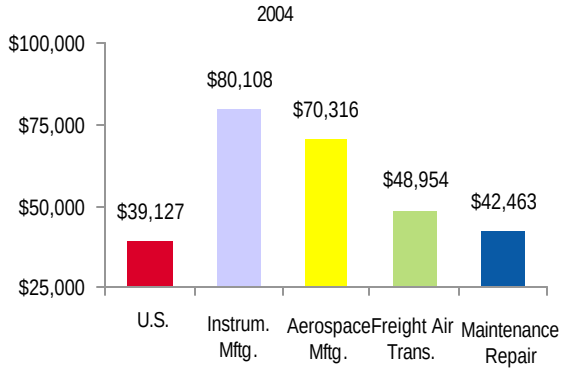
*Includes commercial airline services (flight attendants, baggage handlers, customer service representatives, booking agents, etc.)

Manchester Niche Targets

Air Freight

Manufacturer's desire to cut delivery times and maintain a competitive advantage, is driving growth in the air freight industry. Air freight provides an expedited and reliable method of transporting goods long distances. According to the U.S. Department of Transportation, air freight was the fastest growing cargo industry from 1993 to 2002. Over this time period, tonnage grew 46%, ton miles grew 64%, and the average value per ton jumped from $56,000 to $75,000. The total value of air freight shipments climbed from $395 billion in 1993 to $770 billion in 2002. While growth has been impressive, air freight's overall tons remains small in comparison to other shipment methods. Air freight's overall tons makes up less than one percent of the cargo transportation industry.

AVERAGE ANNUAL WAGES



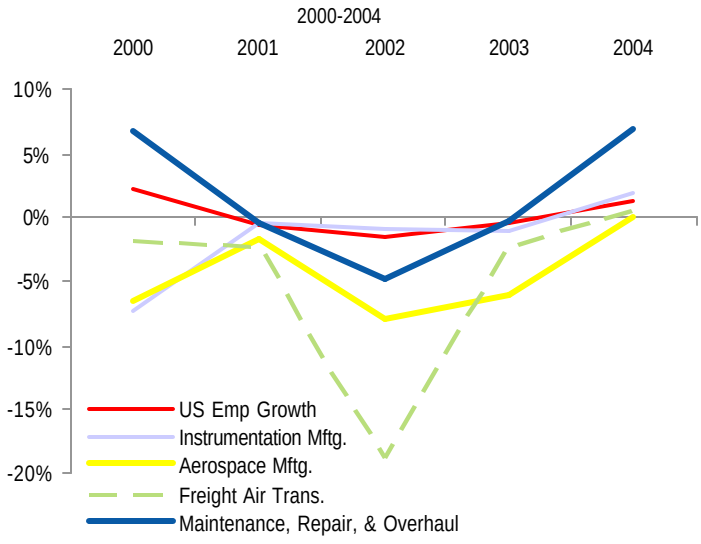
Source: BLS

Growth in air freight will also cultivate growth in truck transportation, as most air shipments begin and end by truck. As international trade increases, and costs are lowered, growth in this industry is expected to continue.

Instrumentation and Parts Manufacturing

This industry comprises of companies primarily engaged in manufacturing search, detection, navigation, guidance, aeronautical, and nautical systems and instruments. Examples of products include aircraft instruments, flight recorders, navigational instruments and systems, radar systems and equipment, and sonar systems and equipment. Typically, major OEMs such as Boeing performed the majority of construction and assembly. Only the manufacture of the engine and the advanced avionics (navigational controls, etc.) were outsourced. The industry has shifted, though, to streamline its supply chain much like that of the automotive industry. In this

ANNUAL EMPLOYMENT GROWTH



Source: BLS

new system, major suppliers all over the country and world build much of the aircraft in separate modules. These modules are all then shipped to the OEM facility for final assembly. This latter process is what is used by Airbus, and what Boeing is employing in the construction of its new 7E7 aircraft.

Maintenance, Repair, and Overhaul

A bright spot in the industry is the maintenance, repair, and overhaul (MRO) segment. The nearly $40 billion (MRO) landscape is also evolving rapidly and it is expected to grow by $11 billion over the next 5 years. MRO consists of independent service providers, airline technical services departments, and OEMs. Because of a tightening in the airline industry, large commercial airliners are striving to avoid large capital outlays for new aircraft purchases through improved maintenance and repair of their existing fleet. Civilian carriers and cargo companies are outsourcing their maintenance and repair. Revenues for MRO organizations are expected to grow over 5% per year over the next 3 years.

Why Target Aviation?

- ✓ **Average wage in Aerospace Manufacturing is $70,000**
- ✓ **Average wage in Maintenance, Repair and Overhaul is $42,000**
- ✓ **Employment growth is recovering**
- ✓ **Increasing DoD budget will drive growth in aerospace instrumentation and parts manufacturing**

Manchester Strengths and Selling Points:

- **Infrastructure**

  1. Presence of Manchester Airport and proximity to Logan International Airport
  2. More than $500 million invested in Manchester Airport over the last 10 years
  3. Reliable transportation infrastructure will support manufacturing operations

- **Location and Business Climate**

  1. Immediate access to a large population will support Air Freight (Boston, Majority of New Hampshire's population is within a half hour drive)
  2. Increasing passenger flow from Manchester Airport will support MRO (Over 4 million passengers in 2004, up from 2 million in 1999)

- **Workforce and Education**

  1. Strong cluster in Industrial Machinery (1.49) and Aerospace and Defense (2.02)
  2. Cluster strength suggests access to a large pool of mechanics, engineers, and avionics technicians
  3. The Manchester MSA employs almost 6,500 in Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS: 3364)

NEXT STEPS

This *Target Industry Identification and Analysis* report marks the completion of the assessment work, leading up to the Strategic Plan report, which is the next phase of this project. The analysis of target industries in this report will be used to develop recommendations in the *Strategic Plan,* specifically in areas of workforce development and marketing the city. Shortcomings found in the Community Assessment will also guide recommendations to better prepare Manchester for the future.

The Strategic Plan will, among other issues, address the following topics:

1. What are best strategies to promote these targets?
   - ✓ *Expansion, recruitment, start-up promotion*

2. What marketing efforts will be most effective?
   - ✓ *Sales message, brand identity, website, collateral, direct selling, conferences, etc.*

3. How should the economic development community organize to support these targets?
   - ✓ *E.D. organizations, chambers, municipalities*

4. What improvements to the community "product" will be required?
   - ✓ *Workforce development system, business climate, infrastructure, and quality of life factors*

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