

# Regional Growth Opportunities: Select Industry Clusters in Fort Collins



**R&M Resource Development**

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# EXECUTIVE SUMMARY

Nestled along side the Cache La Poudre River at the foothills of the Rocky Mountains, Fort Collins is home to about 137,200 residents. Colorado State University is the city's largest employer and is Colorado's second largest public university, enrolling 25,000 students each academic year.

Fort Collins began as a hub for agricultural production, namely sugar beet manufacturing. As its population has grown, especially into the latter half of the 20th century, the city has shifted its focus from an agriculture-based economy to a high-tech economy.

Employment in Fort Collins has increased an average of 0.6% per year from 2001 to 2005, compared to an average annual increase of 0.0% throughout the United States. Even during the recession that struck throughout the United States from 2001 to 2003, employment growth in Fort Collins remained stronger than the rest of the country.

The challenge for the community is how to retain the young, educated work force that attracts larger companies while maintaining a unique identity and managing growth. A major step in crafting a region's economic development strategy focuses on what types of industries to target for growth and retention.

This study is based on the concept of industry clusters. Industry clusters are geographic concentrations of interconnected companies and institutions in a particular field. Ideally, clusters also include the institutions and professional organizations that provide research assistance and support to the industry.

This study identifies six industry clusters that present strong opportunities for the future growth and vitality of Fort Collins. Four of these clusters were selected for analysis in this study; the other two clusters are the subject of other research efforts. Once key clusters were identified, further research compared industry employment concentration in Fort Collins to the national economy and to 50 metropolitan areas of comparable size to Fort

Collins. Study data examined the period from 2001 to 2005.

Where concentration of an industry is greater than the national economy, it is presumed that the production of goods and services is more than sufficient to meet local demand, and is therefore exported – either physically or financially. Where industries are highly concentrated it is presumed that a high degree of specialization among firms exists, a feature of competitive industry clusters. The industries selected for analysis in this study include:

- ◆ Agricultural Technology
- ◆ Computer and Electronics Manufacturing
- ◆ Information Technology/Software
- ◆ Uniquely Fort Collins

Although detailed information is not included in this study, it is important to recognize that active efforts are already underway surrounding the growth and development of the Bioscience and the Clean Energy clusters in Fort Collins.

## Agricultural Technology

The Agricultural Technology (Agri-Tech) industry cluster includes firms that utilize distinct technology to improve efficiency in the agricultural and cattle production process. The Agri-Tech cluster recognizes the inter-relationship between crop and animal agricultural production and new, innovative technological advances that can be used in the fields.

- ◆ 90 companies employing about 1,600 workers
- ◆ Employment growth averaged 1.0% per year
- ◆ Fort Collins ranks third in employment concentration, third in absolute employment
- ◆ Average wage of \$36,600 equals the average wage for all industries in Larimer County
- ◆ Key companies include CSU Veterinary Teaching Hospital, Ranchway Inc. and XY Inc.

## Computer and Electronics Manufacturing

The Computer and Electronics Manufacturing cluster in Fort Collins houses several large international businesses as well as a large number of small, independent businesses that bring innovation

# EXECUTIVE SUMMARY

continued

and growth to the industry. However, the industry has been quite turbulent in recent years.

- ◆ 100 companies employing about 6,200 workers
- ◆ Employment has declined 4.4% per year
- ◆ 8% of companies employ more than 100 workers
- ◆ Fort Collins ranks first in employment concentration, first in absolute employment
- ◆ Average wage of \$78,000 higher than all industry average of \$36,600 in Larimer County
- ◆ Key companies include Hewlett Packard, Intel Corp., Agilent Technologies, RPM Technology

## Information Technology/Software

Information Technology/Software promises to be one of the high growth industries into the future. IT/Software entrepreneurs are drawn to the area's attractive quality of life, along with potential synergies with CSU.

- ◆ 175 companies employing about 2,300 workers
- ◆ Employment declined 0.6% per year from 2001 to 2005, but increased in 2004 and 2005
- ◆ Fort Collins ranks second in employment concentration, second in absolute employment
- ◆ Industry dominated by small business with 82% of the companies employing less than 10 people
- ◆ Average wage of \$60,200 higher than all industry average of \$36,600 in Larimer County
- ◆ Key companies include New Century Software, Red Hen Systems, Managed Business Solutions

## Uniquely Fort Collins

The Uniquely Fort Collins (Unique) industry cluster includes businesses whose products and operations contribute to the eclectic, innovative, and high quality of life in Fort Collins. This industry includes three subclusters: Artistic and Cultural Entertainment; Recreational and Retail Activities; and Hospitality.

- ◆ 400 companies employing about 7,150 workers
- ◆ Employment growth averaged 0.5% per year
- ◆ Fort Collins ranks third in employment concentration, fourth in absolute employment

- ◆ Average wage of \$20,100 lower than all industry average of \$36,600 in Larimer County
- ◆ Representative companies include New Belgium Brewery, Bas Bleu Theater, Perennial Gardner

## Opportunities for Future Growth

One of the goals of this study is to recommend specific actions the City of Fort Collins can take to enhance its capacity to sustain job opportunities through the development of viable industry clusters. Recommendations are offered at three levels.

### *General Business Environment*

About two dozen recommendations are presented in order to guide continuing economic and community development efforts. These recommendations acknowledge recent improvements to the City's development review process and improved City-to-business relations while offering suggestions on a broad array of topics ranging from tourism generation to preservation of commercial corridors.

### *Cluster Capacity Enhancements*

Another two dozen recommendations focus on the basic underpinnings of a successful cluster that generally include:

- ◆ An active University/research and development/knowledge and leadership base
- ◆ A critical mass of collaborative/competitive companies
- ◆ Access to entrepreneurial support
- ◆ A skilled workforce
- ◆ Institutional and facility support

### *Specific Cluster Recommendations*

The Uniquely Fort Collins cluster already has a core of activity on which to build. The other three clusters may have all the requisite attributes, but none of them have been organized for the purpose of cluster development and promotion. Therefore, specific recommendations range from fostering synergies among the clusters to enhancing the roles that the City, business leaders, and the education system play in the development of these clusters.

# INTRODUCTION

Nestled along side the Cache La Poudre River at the foothills of the Rocky Mountains, Fort Collins is home to about 137,200 residents. Colorado State University is the city's largest employer and is Colorado's second largest public university, enrolling 25,000 students each academic year.

Fort Collins began as a hub for agricultural production, namely sugar beet manufacturing. As its population has grown, especially into the latter half of the 20th century, the city has shifted its focus from an agriculture-based economy to a high-tech economy. The challenge is how to retain the young, educated work force that attracts larger companies while maintaining a unique identity and managing growth. Based on an analysis of the Quarterly Census of Employment and Wages (QCEW) data, employment in Fort Collins has increased an average of 0.6% per year from 2001 to 2005, compared to an average annual increase of 0.0% throughout the United States.

Even during the recession that struck throughout the United States from 2001 to 2003, employment growth in Fort Collins remained stronger than the rest of the country. In that period, employment growth in Fort Collins decreased only 0.4%, compared to a national employment decrease of 1.0%. While raw agricultural production is no longer as important to the Fort Collins economy as it once had been, the industry has influenced the new direction of the town's economy and plays a support role for many new industries. Most generally, the agricultural heritage of Fort Collins keeps it grounded with a small town feel, adding to the quality of life enjoyed by residents. Today, a diversity of industries, some of which are the topic of this report, form the economic base of Fort Collins.

A major step in crafting a region's economic development strategy focuses on what types of industries to target for growth and retention. Industry targets may be chosen to meet varying community goals ranging from diversifying the economic base to increasing the average wage to utilizing natural and labor resources more fully. A

community's economic development efforts should focus on those industries in which the community has clear competitive advantages. Further, selected industries need to be economically, environmentally, and socially acceptable to the community.

This study is based on the concept of industry clusters, which are geographic concentrations of interconnected companies and institutions in a particular field. These industry clusters drive wealth creation within a region, primarily through the export of goods and services. An industry cluster may consist of industries that share the same or similar workforce, factors of production or infrastructure. It may also be defined by the production of similar outputs, complementary output, or other interdependent relations. Ideally, clusters also include the institutions and professional organizations that provide research assistance and support to the industry.

This study explores four key industry clusters currently operating in Fort Collins. How many industry clusters should be pursued as targets? The answer to this question depends upon the community's priorities, resources, political will, and the current level of economic diversity.

First, target industry efforts require manpower and financial resources to conduct a wide variety of economic development activities ranging from business retention visits to exhibiting at trade shows to recruitment missions. Financial and personnel resources may limit the number of clusters actively pursued.

Second, a successful target industry program requires the involvement and support of business leaders already operating in the industry cluster within the community. Their input is essential to better understand the strengths and weaknesses of the existing industry cluster as well as the prospects for growth. The industry clusters pursued as targets may be dictated by the availability and willingness of these "community bishops."

Finally, the current composition of the economic base needs to be considered. Economic development

# INTRODUCTION

continued

goals may range from bolstering the employment base of one sector to increasing employment in a number of sectors in order to enhance the diversity of the economic base. These goals are not mutually exclusive; the desired outcome is to bring or maintain the balance of the local economy. The decision of which industry clusters to actively pursue needs to consider the community's goals for industry specialization and economic diversification.

Targeting industries based on the idea of industry clusters provides focus to an economic development program in four key areas. First, an understanding of existing industry strengths helps to create an identifiable regional image and message, improving marketing programs. Second, retention campaigns can be focused on protecting existing industries and resources. Third, recruitment strategies can be focused on cluster companies and their suppliers or service providers. Finally, cluster analysis may identify industries that the community does not currently have a strong concentration in but also present unique, new opportunities for developing the regional economy.

This study includes the following for each of the key industry clusters:

- ◆ Description
- ◆ National outlook
- ◆ Fort Collins cluster profile
- ◆ Competitive Position

## Methodology

This research effort uses a cluster methodology similar to that developed by Michael E. Porter, Professor of Business Administration at the Harvard Business School. According to Porter, "Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition."<sup>1</sup> Clusters

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<sup>1</sup> Michael E. Porter, "Clusters and the New Economics of Competition," *Harvard Business Review*, November-December 1998.

typically include private companies operating in a given industry, suppliers to these companies, governmental institutions involved in the industry, universities and other educational settings, and relevant trade associations.

Given the global nature of today's economy, company location may be expected to be of diminished importance. However, cluster methodology shows that the opposite is true. According to Porter, "What happens inside companies is important, but clusters reveal that the immediate business environment outside companies plays a vital role as well." The enduring competitive advantages in a global economy are often heavily local, arising from concentrations of highly specialized skills and knowledge, institutions, rivals, related businesses, and sophisticated customers.

Clusters continually evolve as new companies and industries emerge or decline. They can maintain competitive strength for decades or lose their competitive edge due to both external and internal forces. Because industries ebb and flow in strength, it is important to examine industry clusters historically to understand how to support and promote the cluster.

Many of the industries discussed in this report are the topic of national reports and rankings. In some cases, the employment figures or rankings presented in this report may be contrary to other studies. This may be due to the definition of the cluster (as defined by groupings of industry classification codes), the data source, the time period of the data, and/or the geographic definitions.

The industry cluster definitions used in this report were developed based on the economic structure of Fort Collins and current economic conventions. Business and employment growth in the industry clusters from 2001 through 2005 is examined to determine industry strength.

Industry clusters for Fort Collins were identified through the examination of employment concentration data. Measurement of major Fort Collins employment concentration levels at the four-

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continued

digit Standard Industrial Classification (SIC) and corresponding North American Industry Classification System (NAICS) code level provided an indication of the strength of major industries.<sup>2</sup> Further research compared four-digit SIC industry employment concentration in Fort Collins to the national economy. Where concentration of an industry is greater than the national economy, it is presumed that the production of goods and services is more than sufficient to meet local demand, and is therefore exported – either physically or financially. Where concentration of an industry is greater at the Fort Collins level than the national average, it is presumed that a high degree of specialization among firms exists, a characteristic of competitive industry clusters.

Detailed six-digit NAICS industry categories, displaying a high degree of concentration, were aggregated into groups of related businesses to form clusters. The identification of these clusters was important to gain an understanding of the composition of the economic base. In addition, a few industry clusters were included that may represent potential industries that could be developed in the region. The eight industry clusters on the following page include those that are either currently operating in Fort Collins and have high employment concentrations or represent potential clusters for the city.

## Fort Collins Industry Clusters

It was decided that four of the stated clusters would be chosen for further analysis. As a guide for

narrowing the list of eight industry clusters to four, an industry cluster ranking analysis was developed based on qualitative input as well as quantitative measures. To begin the ranking analysis, various criteria were ranked according to its importance to the economic development goals of the community. Based on the input received from over 50 business leaders representing six different committees or organizations, the following weights were assigned to varying economic development goals:<sup>3</sup>

Community Goal	Weight
Grow and retain existing businesses	15.1%
High employment multiplier effects	11.7%
Opportunities for collaboration between the City, local businesses and higher education	11.3%
Attract revenue from customers residing outside of the area	11.0%
Strong projected long-term (3 or more years) job growth rates	10.7%
Environmentally friendly	10.4%
High average annual salary	9.7%
Opportunities for diversifying the economic base	9.1%
Existing strong community leadership base	6.8%
Strong projected short-term (1-2 year) job growth rates	4.1%

<sup>2</sup> The North American Industry Classification System (NAICS) is an industry classification system that groups establishments based on the activities in which they are primarily engaged. NAICS uses a six-digit coding system to identify 1,170 industries and their placement in the hierarchical structure of 20 sectors. The NAICS system was introduced in 1997 as a replacement for the Standard Industrial Classification (SIC) system that has been used in the United States since 1938 and was last revised in 1987. Economic data using the NAICS system is slowly replacing data based on the SIC system.

<sup>3</sup> Members of the following committees or organizations participated in the ranking exercise: Fort Collins Economic Lead Team; Economic Vitality and Sustainability Action Group (EVSAG); City of Fort Collins Management Staff; Northern Colorado EDC Board of Directors; Fort Collins Area Chamber of Commerce Legislative Committee; Fort Collins Sustainability Group.

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## INITIAL CLUSTER IDENTIFICATION

Industry Cluster	Existing or Potential	Cluster Description
Agricultural Technology	Existing	Businesses involved in enhancing plant, crop, fish, and animal production using technological processes. This cluster also includes veterinary sciences businesses. (Currently: 1,574 employees, 88 businesses)
Beverages	Existing	Businesses involved in the production of beverages, including fruit juices, milk, soda, water bottling, malt beverages and wineries. At this time, the cluster in Fort Collins only includes companies producing malt beverages. (Currently: 907 employees, 4 businesses)
Bioscience	Emerging	Establishments involved in the research and production of (1) medical instruments and devices and (2) pharmaceuticals and biotechnology. (Currently: 580 employees, 19 businesses)
Clean Energy	Emerging	Businesses producing renewable energy products and conducting research and development related to increasing the production of renewable energy. (Currently: 480 employees, 60 businesses)
Computer & Electronics Manufacturing	Existing	Businesses involved in the research and production of computers and computer peripheral equipment, including the development and production of semiconductors. (Currently: 6,191 employees, 103 businesses)
Information Technology/Software	Existing	Businesses providing custom computer programming services, prepackaged software, computer integrated systems design and other computer related services. (Currently: 2,257 employees, 173 businesses)
Specialty Construction	Existing	Businesses involved in providing specialized construction services, ranging from glass contractors to concrete and masonry work, custom windows and doors, and interior design services. (Currently: 3,850 employees, 400 businesses)
Uniquely Fort Collins	Emerging	Businesses that are unique to Fort Collins including specialty food and goods sales and production, specialty restaurants, arts and entertainment establishments, and companies specializing in recreation and outdoor products and adventures. (Currently: 7,146 employees, 399 businesses)

Using a combination of qualitative and quantitative data, the eight industry clusters were then ranked according to each criterion and, using the above weights, the clusters that best met the community's goals were identified. In addition, the final selection also considered whether other studies related to the industry cluster have recently been completed or are currently underway. In this manner, it became possible for Fort Collins to gain significant market intelligence on a broad array of industries.

The four selected clusters offer strong growth potential and/or a high degree of employment concentration. While some industry clusters exhibited strong employment concentrations but slow or no employment growth in recent years, it

was decided there is value in recognizing large employment sectors of the local economy. These industry clusters are important to study and understand in order to target business support and retention efforts.

The following table presents the ranking results and selection notes regarding whether the cluster was selected for further analysis in this study. A full list of the NAICS and corresponding SIC codes used to define each of the four selected clusters are included in Appendix A.



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continued

## FORT COLLINS INDUSTRY CLUSTER RANKING RESULTS

Rank	Industry Cluster	Selection Notes
#1	Uniquely Fort Collins	<i>Selected for current cluster analysis.</i> Fort Collins is home to a variety of unique businesses that create the personality of the region. A focus on this industry cluster may help to enhance the quality of life for existing residents and help to attract additional visitors to the region.
#2	Computer & Electronics Manufacturing	<i>Selected for current cluster analysis.</i> Fort Collins has recently been successful in attracting and growing companies related to this industry. Given the significant existing concentration, it is important to develop strategies for future growth and retention of this cluster.
#3	Bioscience	<i>Selected - other study or industry effort underway.</i> This emerging cluster presents significant growth opportunities for Fort Collins. However, there is an on-going initiative called the Larimer County Bioscience Initiative that has already developed a detailed strategic plan for growing Bioscience in Northern Colorado. We recommend that Fort Collins continue to play an active role in this Bioscience initiative. For additional information on this effort, see Appendix D.
#4	Beverages	<i>Not selected-cluster elements incorporated into Uniquely Fort Collins cluster.</i> While this cluster represents a strong existing concentration of employment, the employment base exists due to the presence of three companies. Instead, the breweries are incorporated into the Uniquely Fort Collins cluster.
#5	Information Technology/Software	<i>Selected for current cluster analysis.</i> The cluster represents one of the strongest future growth industries throughout the United States. This cluster tends to be very entrepreneurial and is dominated by small businesses. It is important to develop strategies for future growth and retention of this cluster.
#6	Agricultural Technology	<i>Selected for current cluster analysis.</i> This cluster represents strong collaborative opportunities between the City, local businesses, and higher education. There exists a strong base of nationally acclaimed companies and research upon which to build.
#7	Clean Energy	<i>Selected - other study or industry effort underway.</i> This emerging cluster presents significant growth opportunities for Fort Collins. However, there is an on-going collaborative initiative by Colorado State University, NCEDC, Fort Collins Area Chamber of Commerce, Poudre School District, Larimer County and private enterprise that is already developing a strategic plan for developing the Clean Energy Cluster. We recommend that Fort Collins continue to play an active role in this Clean Energy initiative. For additional information on this effort, see Appendix E.
#8	Specialty Construction	<i>Not selected – subject for potential future research.</i> While this is a strong existing cluster in Fort Collins, the growth and contraction of this industry tends to be directly related to the general business cycle. While the importance of this industry needs to be recognized, the development of specific industry growth strategies is lower priority.

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Community leaders and business professionals in each of the four selected industry clusters participated in focus group sessions conducted by Development Research Partners and R&M Resource Development in July 2006. In addition, one-on-one meetings with business leaders and city staff were conducted in August 2006. A list of the companies that participated in these discussions is included in Appendix B. These discussions assisted in gaining additional insights into Fort Collins businesses operating in each cluster. While the information gathered during the focus group meetings provides valuable insight into the industry clusters, the information is not meant to be comprehensive or all-inclusive, representing the opinions of a few businesses in the industry cluster.

## Geography

The employment concentration for each industry cluster in Fort Collins is ranked and compared to the industry cluster employment concentration in each of 50 comparable metropolitan areas (25 larger than and 25 smaller than Fort Collins, based on number of employees). Generally, Fort Collins “competes” with these metro areas for company expansions and relocations; however, some industry clusters compete with smaller or larger communities that have strong competitive positions.

# INDUSTRY CLUSTERS

Six Fort Collins industry clusters offer strong growth potential and/or a high degree of employment concentration. Four of these were selected for this study based on the industry cluster research and a cluster ranking exercise. The two not selected are also critical to the health and vitality of the Fort Collins economy, but extensive research is being conducted through other sources. See Appendix D for additional information on the Bioscience cluster and Appendix E for Clean Energy cluster information.

The four industry clusters included in this study are listed below in alphabetical order. The Uniquely Fort Collins industry cluster is divided into three distinct subclusters that are examined as one consolidated industry cluster.

- ◆ Agricultural Technology
- ◆ Computer and Electronics Manufacturing
- ◆ Information Technology/Software
- ◆ Uniquely Fort Collins
  - Arts and Culture
  - Hospitality
  - Retail and Recreation

A key idea in the development of industry clusters is to focus on “basic” industries, or industries that attract new dollars into the region. Each of the four clusters includes some basic components. The manufacturing industry is consistently regarded as a primary, basic industry. Additionally, Agricultural Technology provides pharmaceutical and biological manufactured products and services on an international level. Information Technology/Software is increasingly regarded as a basic industry for many regions to the extent that the services delivered by the IT companies are provided to customers outside of the region. Finally, the Uniquely Fort Collins cluster attracts funds from tourism, as well as providing food and beverage products to outside consumers.

While each of the four clusters will be presented individually and discretely, it should be recognized that inter-relationships exist between the four industry clusters and many other industries. Whether it is the use of similar machinery, technologies, skilled workers, suppliers, clients, or infrastructure, many connections between the clusters exist.

# AGRICULTURAL TECHNOLOGY

## Description

The Agricultural Technology (Agri-Tech) industry cluster includes firms that utilize distinct technology to improve efficiency in the agricultural production process. This cluster includes botanical businesses that supervise greenhouse production of plants or crops, as well as those that specialize in research into disease and pest control for crops. This cluster also includes businesses engaged in livestock care and production, including veterinary services, feed production, and genetic research. The industry is defined twelve six-digit North American Industry Classification System (NAICS) codes, or by five four-digit, four six-digit and 11 eight-digit Standard Industrial Classification (SIC) codes.

## National Outlook

There are currently 946,900 workers employed in 77,000 businesses in the Agri-Tech industry in the U.S. The number of businesses in the industry increased between 2001 and 2005, adding 12,900 firms at an average growth rate of 4.7% per year. Employment increased as well at a rate of about 2.2% per year, adding 78,800 employees in the same period.

The agriculture industry plays a pivotal role in our economy and our lives. While it remains one of the nation's most important industries, advances in technology allow us to produce these products more efficiently, resulting in fewer resources required to produce the same output. The Agri-Tech industry is the result of these advancements, combining high-tech operations with the agricultural process.

The scope of the Agri-Tech cluster is very broad, resulting in a mixed outlook across the industry. Current advancements in biological Agri-Tech, including genetically modifying plants or animals and pharmaceutical manufacturing, are increasing crop yields and decreasing susceptibility to disease. This technology will continue to grow our country's agricultural exports, especially to larger developing countries such as India and China. Other sectors of the industry such as veterinary services or testing

laboratories will be supplemental to the more primary sectors of the industry, but will continue to experience increases in employment and revenue.

This cluster has many opportunities to agglomerate with other industries and sectors. The synergy with biotechnology is already being realized, mainly in pharmaceutical production and laboratory research. The federal government has recently invested many resources into the Agri-Tech industry in investigating bio-terrorism risks. In addition, many software programs have been developed to aid farmers in the production process, from timing advanced irrigation systems to supplying produce over the Internet.

## Fort Collins Cluster Profile

Fort Collins has long been an epicenter of the Agri-Tech industry due to its deep cultural heritage in agricultural sciences. Fort Collins' involvement in sugar beet farming and research, a source of ethanol as a clean fuel substitute, and its continued focus on genetic development of plants and animals will influence growth in the region's industry cluster, and will continue to drive national growth and innovation within the industry as well.

The Agri-Tech industry in Fort Collins draws significant federal funding to the area. The US Department of Agriculture has a very strong presence in Fort Collins, operating the National Seed Storage Laboratory and the National Center for Genetic Resources Preservation, a seed storage facility under the U.S. Department of Agriculture, referred to as the "Fort Knox for seeds."<sup>4</sup> This facility is only one of several businesses that mark the bio-technical and genetic research occurring within Fort Collins' Agri-Tech cluster.

The Fort Collins Agri-Tech cluster has a strong relationship with Colorado State University as well. Much of the innovative research into disease resistant crops is being conducted at Colorado State

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<sup>4</sup> Paul Tolme, "National Treasure." *National Wildlife Magazine*, 43, no. 4 (2005).

# AGRICULTURAL TECHNOLOGY

continued

## AVERAGE ANNUAL GROWTH, 2001-2005 Fort Collins and the United States Agricultural Technology Cluster

	Number of Businesses	Employment
<b>Cluster</b>		
Fort Collins	5.9%	1.0%
United States	4.7%	2.2%
<b>All Industries</b>		
Fort Collins	1.9%	0.6%
United States	1.7%	0.0%

Sources: U.S. Bureau of Labor Statistics and CO Department of Labor & Employment, Quarterly Census of Employment & Wages.

University. In recent years, this technology has been in high demand as the possibility of an attack on the nation's food sources is a primary concern of national security.

Other innovative companies in the Agri-Tech cluster include XY Inc., which developed technology that allows scientists to distinguish between X- and Y-chromosomes, resulting in the world's first sex-selected calf and foal.<sup>5</sup> Fort Collins also boasts a USDA sugar beet research center as well as substantial investment in breeding disease-resistant sugar beet varieties. Sugar beets are a source of ethanol, a clean energy substitute for crude oil that has already been adopted by General Motors.

Fort Collins ranks third overall out of 50 U.S. Metro Areas of comparable size to Fort Collins in employment concentration for the Agri-Tech industry cluster, and third for absolute employment. Below are examples of Agri-Tech businesses located in Fort Collins:

- ◆ Air Resource Specialists
- ◆ Cargill Inc.
- ◆ CSU Veterinary Teaching Hospital
- ◆ Gully Greenhouse Inc.

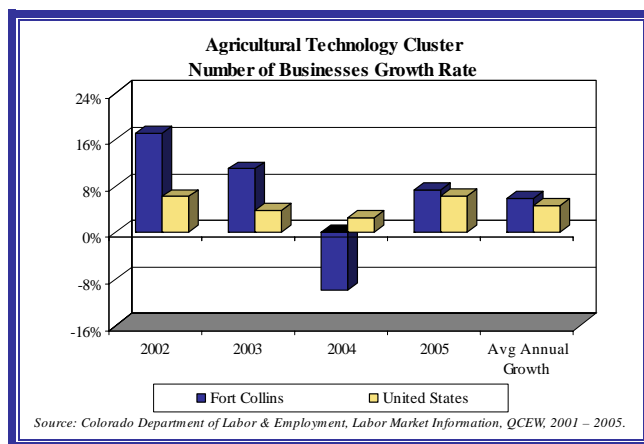
<sup>5</sup> Dan Christopherson, "The Urge to Converge." *Bioscience Colorado*, (2005): 17-18.

- ◆ Heska
- ◆ P.R. Pharmaceuticals
- ◆ Ranchway Inc.
- ◆ U.S. Department of Agriculture
- ◆ XY Inc.

At 1.0%, the average annual employment growth rate in Fort Collins for the Agri-Tech cluster between 2001 and 2005 was weaker than the national growth rate for the cluster of 2.2%. Still, cluster employment growth in Fort Collins was above the average annual employment growth rate for all industries in Fort Collins of 0.8%

## Businesses

About 88 Agri-Tech businesses were located in Fort Collins in 2005. The number of businesses grew 5.9% per year from 70 in 2001 to 88 in 2005, compared to a 4.7% average annual increase nationally for this cluster. Detailed business and employment data for each industry cluster for the four-year period from 2001 to 2005 is provided in Appendix C.



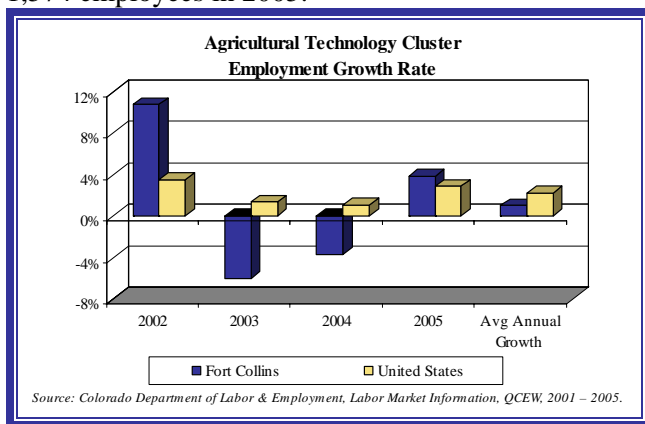
About 65% of Agri-Tech businesses employ less than 10 people compared to 71% of all businesses that employ less than 10 people in Fort Collins. About 3.4% of the Agri-Tech businesses employ over 100 workers compared to 2.1% for all Fort Collins businesses.

# AGRICULTURAL TECHNOLOGY

continued

## Employment

The Agri-Tech cluster employed about 1,574 employees in Fort Collins in 2005. Employment in this cluster encompasses about 1.9% of Fort Collins' total employment, compared to about 0.7% nationally. Employment in this cluster has grown about 1.0% per year, netting 63 new jobs between 2001 and 2005, from 1,511 employees in 2001 to 1,574 employees in 2005.



Veterinary Services is the largest sector by employment, with about 59% of industry jobs in 2005. Nursery and Tree Production and Testing Laboratories are the next largest sectors, employing about 10% of industry jobs each.

## Wages

Total industry cluster wages paid was \$57.6 million in 2005. The average annual wage paid to all cluster employees was \$36,600, compared to \$52,300 for all United States cluster jobs.

### OCCUPATIONAL SALARIES Fort Collins Agricultural Technology Cluster

Occupation	Average Annual Salary
Animal Scientists	\$67,650
Soil and Plant Scientists	\$47,740
Food Scientists and Technologists	\$62,010
Veterinary Assistants and	\$23,520
Laboratory Animal Caretakers	

Source: U.S. Bureau of Labor Statistics, 2005.

## Competitive Position

Of the 50 comparable metropolitan areas to Fort Collins, Fort Collins has the third strongest employment concentration and the third highest absolute employment in the Agri-Tech industry cluster. The top ten metropolitan areas in the Agri-Tech cluster by employment concentration are listed on the following page.

## Locational Attributes

Identifying factors important to Agricultural Technology industry businesses as they make location decisions can provide insight into how the industry cluster can grow through retention and expansion efforts. The Agri-Tech industry cluster relies on the following locational attributes to operate a successful business:

- ◆ Agricultural-based economy, in the vicinity of agricultural operations
- ◆ Access to a university system
- ◆ Low labor costs
- ◆ High concentration of high-tech workers and businesses

With advances in information technologies, physical location is not as crucial in maintaining a strong customer base and supply chain. Many Agri-Tech businesses already located in Fort Collins supply their products on a national or international level, keeping operations in Fort Collins due to the high quality of life. Lower land costs, monetary incentives and/or subsidies and an able workforce attract new Agri-Tech businesses.

## Industry Cluster Insights

Many opportunities and challenges for each industry cluster became apparent in the focus group discussions and throughout the research process. The following opportunities and challenges discussion provides insight into growing the Agricultural Technology industry cluster in Fort Collins.

## TEN HIGHEST EMPLOYMENT CONCENTRATIONS Metro Areas Agricultural Technology Cluster

	Metro Area	Cluster Employment	Employment Concentration	Number of Businesses	Business Concentration
1	Killeen-Temple, TX	2,285	2.7%	60	0.5%
2	Bryan-College Station, TX	2,131	2.6%	76	1.1%
<b>3</b>	<b>Fort Collins-Loveland, CO</b>	<b>1,574</b>	<b>1.9%</b>	<b>88</b>	<b>1.8%</b>
4	Ocala, FL	1,308	1.6%	204	1.5%
5	Yolo, CA	997	1.4%	62	0.9%
6	San Luis Obispo-Paso Robles, CA	1,249	1.3%	117	0.8%
7	Tyler, TX	935	1.1%	82	0.8%
8	Bellingham, WA	550	0.8%	103	0.9%
9	Benton Harbor, MI	547	0.7%	89	0.9%
10	Olympia, WA	589	0.7%	120	1.0%
	<i>United States</i>	<i>946,892</i>	<i>0.7%</i>	<i>77,024</i>	<i>0.9%</i>

Sources: Colorado Department of Labor & Employment, Labor Market Information, QCEW; Dun & Bradstreet, Marketplace, July-Sept. 2005.

### Industry Cluster Opportunities

*Connection to Colorado State University* – CSU plays an important role in this cluster, supplying research opportunities and new labor. Business leaders of this cluster recommend continuous collaboration as Agri-Tech is one of the key areas of research at CSU.

*Good Transportation System* – Transportation in Fort Collins and the surrounding area is adequate for the cluster’s needs. The highway system to and from Denver and Denver International Airport is convenient, and the railroad that bisects the city is necessary to bring crops into the region.

*Quality of Life* – Fort Collins is attractive to employers and employees because of the active outdoor lifestyle enjoyed by residents, quality schools, and balance between large city amenities and small town comfort. Maintaining this is recommended as a top priority, as quality of life was emphasized as a key reason business leaders located to and remain in Fort Collins.

### Industry Cluster Challenges

*High Land Costs* – Higher land costs are a major deterrent to initial or additional land purchases. Fort

Collins and the surrounding areas run the risk of following in the footsteps of California, where commercial livestock facilities are able to sell their land by the square foot for incredibly high prices and locate elsewhere.

*Reliability of Labor Force* – Many Agri-Tech businesses rely on dependable and affordable labor, but expressed grievances that such workers are difficult to find and retain in Fort Collins. While many business owners take advantage of government programs to import labor, such programs are costly and somewhat business unfriendly.

*Lack of Value Placed on Agri-Tech Operations* – Farming and the agricultural community have retained little or no social value as urban development has shifted to focus on high-tech businesses. This makes it difficult to retain a labor force, gain support for industry initiatives, and to expand the industry. Collaboration with the Information Technology/Software and Clean Energy groups, for example, should be highlighted to emphasize the importance this cluster plays in the local economy.

# AGRICULTURAL TECHNOLOGY

continued

## Opportunities for Growth

The Agri-Tech cluster recognizes the inter-relationship between crop and animal agricultural production and new, innovative technological advances that can be used in the fields. Further, this cluster recognizes the important heritage of the region.

The Recommendations section near the end of this report provides some general suggestions for enhancing cluster capacity and improving the general business environment. In addition, the following idea is presented as an opportunity for growing this cluster in Fort Collins.

### *Synergies with Other Clusters*

Agri-Tech lends itself to agglomeration with Bioscience, Clean Energy, and Information Technology/Software. The opportunities for overlap

are numerous, ranging from responding to bioterrorism threats to isolating the ideal time to plant and locate crops to developing disease-resistant crops. It may be in these areas of overlap where the greatest opportunities for high-skill, high-wage Agri-Tech jobs are found.

- ◆ For the near term, pursue support for this cluster as an adjunct, or part of, the Bioscience, Clean Energy, and Information Technology/Software clusters. This will allow the City to optimize the return on its efforts and avoid redundancy.

## AGRICULTURAL TECHNOLOGY CLUSTER DEFINITION

NAICS	NAICS Description	SIC	SIC Description
111419	Food Crops Grown Under Cover	0182	Food crops grown under cover
111421	Nursery and Tree Production	0181	Ornamental Floricultural and Nursery Products
111422	Floriculture Production	0181	Ornamental Floricultural and Nursery Products
115112	Soil Preparation, Planting, and Cultivating	0711	Soil Preparation services
115210	Support Activities for Animal Production	0751-04	Livestock Reproduction Services
115210	Support Activities for Animal Production	0751-9905	Vaccinating Services, Livestock
115210	Support Activities for Animal Production	0752-00	Animal Specialty Services
115210	Support Activities for Animal Production	0752-01	Animal Breeding Services
115210	Support Activities for Animal Production	0752-99	Animal Specialty Services, NEC
311119	Prepared Feed and Feed Ingredients, except for Cats and Dogs, except slaughtering Animals for Pet Food	2048-9907	Feed supplements
311119	Prepared Feed and Feed Ingredients, except for Cats and Dogs, except slaughtering Animals for Pet Food	2048-9911	Livestock feeds
325412	Pharmaceutical Preparation Manufacturing (Veterinary)	2834-9911	Veterinary Pharmaceutical Preparations
325414	Biological Product (except diagnostic) Manufacturing (Veterinary)	2836-9901	Veterinary Biological Products
541380	Testing Laboratories	8734-9908	Seed Testing Laboratory
541380	Testing Laboratories	8734-9909	Soil Analysis
541690	Horticulture Services	0781-0100	Horticulture services
541710	R&D Physical, Engineering, and life Sciences	8731-0101	Agricultural research
541710	R&D Physical, Engineering, and life Sciences	8731-0302	Environmental research
541940	Veterinary services	0741	Veterinary Services for Livestock
541940	Veterinary services	0742	Veterinary services for Animal Specialties
541940	Veterinary Services	8734-9910	Veterinary Testing



# COMPUTER AND ELECTRONICS MANUFACTURING

## Description

The Computer and Electronics Manufacturing industry cluster consists of firms involved in the production of computers and computer peripheral equipment, including the development and production of semiconductors. This cluster also includes businesses involved in researching and consulting on computer and electronics manufacturing. This industry is defined by 19 six-digit NAICS codes, or by 15 four-digit and six eight-digit SIC codes.

## National Outlook

There are currently 1.5 million workers employed in about 69,500 businesses in the Computer and Electronics Manufacturing industry cluster nationally. The number of businesses has been increasing since 2001 but at a decreasing rate between 2001 and 2004, after which growth rates have increased. A net 2,153 businesses have been added to the cluster since 2001 at an average growth rate of 0.8% yearly. National cluster employment decreased about 19.1% from 2001-2005 from 1.9 million workers in 2001 to 1.5 million workers in 2005, an average decline of 5.2% per year.

The Computer and Electronics Manufacturing sector has a history of innovation and technological progression that continually demands a high percentage of educated and highly technical employees as well as a strong production base. Still, total employment is expected to decline between 2005 and 2014. This is due in part to the increase in labor efficiency due to supplementary labor such as robotic equipment, as well as in part to the outsourcing of some industry professions to other countries.

The Computer and Electronics Manufacturing industry is very entrepreneurial in nature. New firms are often started by current industry professionals in order to develop a new product or innovation. As industry employment concentrates in smaller firms as opposed to large firms that are more likely to engage in outsourcing, the downward trend in

employment could soften. Currently, a majority of the industry's jobs are in businesses with 250 workers or more.

Production is not expected to experience the same downturn as employment. New computer-related technologies such as digital cameras, media capable cellular telephones, and innovations in computers will continue to steadily increase consumer demand. The advent of clean energy systems will drastically increase production within the industry, as computer-related products are central to many key aspects of clean energy production (such as computer chips in hybrid cars).

## Fort Collins Cluster Profile

A highly educated population, a strong entrepreneurial spirit and the presence of many multi-national companies support an innovative and extensive Computer and Electronics Manufacturing industry cluster. This basic industry brings ample resources into the region and is convergent with several other clusters, providing opportunities for expansion and advancement across Fort Collins.

The Computer and Electronics Manufacturing industry cluster has the potential to enhance collaborative relationships with CSU and the innovations being currently researched. CSU hosts the Industrial Advisory Board, a resource for local industry businesses to recruit students directly trained in their scope of work, and to familiarize themselves with current research opportunities. With many high tech jobs being moved overseas, some industry experts expect the United States to focus on the project management and design aspects of the industry. It is helpful for businesses within the Computer and Electronics Manufacturing industry to align themselves with local universities to have access to the most qualified workers.

As of 2000, 22% of Colorado's computer manufacturing employees worked in Larimer

# COMPUTER AND ELECTRONICS MANUFACTURING

continued

County.<sup>6</sup> By 2005, this figure was up to nearly one third. Fort Collins hosts several large computer manufacturing firms, including Hewlett Packard, Advanced Energy Industries, and Agilent Technologies. Fort Collins is also home to a technology small business incubator, nurturing the growth of small businesses in the region. The Fort Collins business incubator estimates that about 80% of incubated companies will survive the first three years of operations, compared to 35% of non-incubated firms.

While a strong concentration of the computer manufacturing industry exists in Fort Collins, the industry has been subject to downsizing of many large employers. Celestica, for example, closed its plant operations in 2006, subjecting 800 employees to layoffs. As a result, Fort Collins has become a hub for smaller operations, often begun by former employees of the larger employers. These small companies are more stable, are at less risk of outsourcing, and foster innovation in the industry.

## AVERAGE ANNUAL GROWTH, 2001-2005 Fort Collins and the United States Computer and Electronics Manufacturing Cluster

Cluster	Number of Businesses	Employment
Fort Collins	2.6%	-4.4%
United States	0.8%	-5.2%
<b>All Industries</b>		
Fort Collins	1.9%	0.6%
United States	1.7%	0.0%

Sources: U.S. Bureau of Labor Statistics and CO Department of Labor & Employment, *Quarterly Census of Employment & Wages*.

Fort Collins ranks first out of 50 U.S. metro areas of comparable size to Fort Collins in employment concentration for the Computer and Electronics

<sup>6</sup> State of Colorado, "Region Two Overview." [http://www.state.co.us/oed/bus\\_fin/IndStudy/Region2.pdf](http://www.state.co.us/oed/bus_fin/IndStudy/Region2.pdf) (accessed May, 2006).

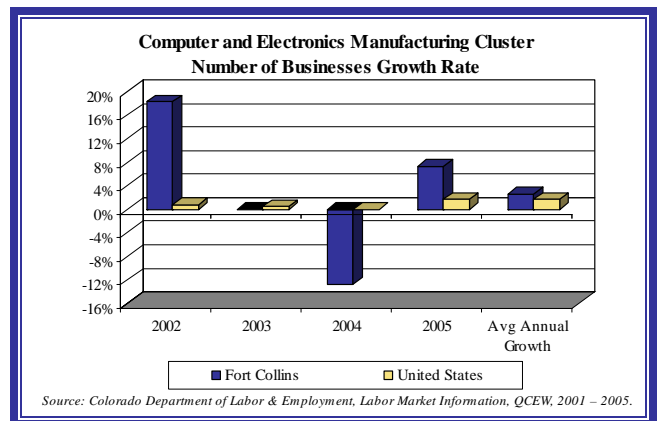
Manufacturing industry cluster, and first in absolute employment. Some large industry employers in Fort Collins include:

- ◆ Advanced Energy industries
- ◆ Advanced Micro Devices Inc.
- ◆ Agilent Technologies
- ◆ Avago Technologies
- ◆ Hewlett Packard Company
- ◆ Intel Corporation
- ◆ LSI Logic Corporation
- ◆ National Semiconductor Corp.
- ◆ RPM Technology

The average annual employment decline of 4.4% for the Fort Collins Computer and Electronics Manufacturing industry cluster, though negative, is less severe than the average industry decline rate of 5.3% for the United States.

### Businesses

About 103 Computer Manufacturing businesses were located in Fort Collins in 2005. The number of businesses increased 10.8% overall from 93 in 2001, at an average growth rate of 2.6% per year. Detailed business and employment data for each industry cluster for the four-year period from 2001 to 2005 is provided in Appendix C.



This industry cluster has a strong concentration of large businesses. About 7.8% of the cluster businesses in Fort Collins have more than 100 employees compared to the all industry average of 2.1%. On the other hand, the Computer and

# COMPUTER AND ELECTRONICS MANUFACTURING

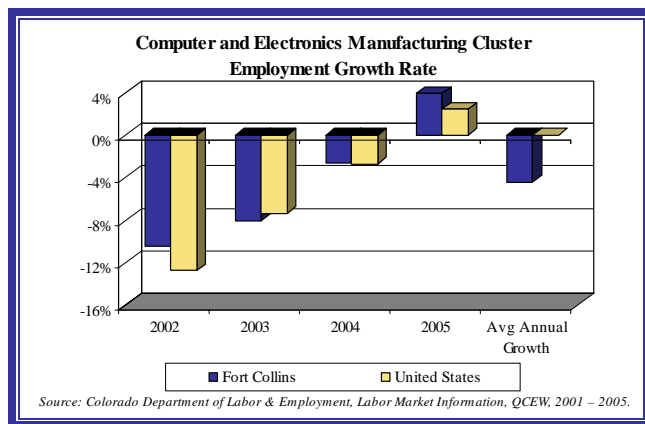
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Electronics Manufacturing cluster has a smaller than average share of businesses with fewer than 10 employees, but this is likely to change due to the entrepreneurial friendly climate in Fort Collins and continued closures or downsizing of larger companies. About 54.4% of Fort Collins Computer and Electronics Manufacturing businesses employ less than 10 people, compared to 70.5% of all businesses in Fort Collins.

## Employment

The Computer and Electronics Manufacturing cluster employed about 6,191 workers in Fort Collins in 2005. Fort Collins has one of the strongest employment concentrations of Computer and Electronics Manufacturing in the state, representing 7.6% of the employment base. Colorado employment concentration is 0.9% whereas this industry represents 1.2% of the national employment base. Employment in this cluster has declined by about 4.4% per year, losing 1,231 net jobs between 2001 and 2005, dropping from 7,422 employees in 2001 to 6,191 employees in 2005.

Electronic Computer Manufacturing is the largest sector by employment, employing about 60% of industry jobs in 2005. Engineering Services and Printed Circuit Assembly are the next largest sectors, employing about 20% and 11% of industry jobs respectively.



## Wages

Total industry cluster wages paid was \$495.0 million in 2005. The average wage paid to cluster employees was \$78,000, compared to \$70,200 for all United States cluster employment.

## OCCUPATIONAL SALARIES

### Fort Collins

#### Computer and Electronics Manufacturing Cluster

Occupation	Average Annual Salary
Computer Hardware Engineers	\$95,480
Electro-Mechanical Technicians	\$44,740
Electronics Engineers	\$75,830
Electrical and Electronic Equipment Assemblers	\$26,100

Source: U.S. Bureau of Labor Statistics, 2005.

## Competitive Position

Of the 50 comparable metropolitan areas to Fort Collins, Fort Collins has the strongest employment concentration and the highest absolute employment in the Computer and Electronics Manufacturing industry cluster. The top ten metropolitan areas in the Computer and Electronics Manufacturing cluster by employment concentration are listed on the following page.

## Locational Attributes

Identifying factors important to Computer and Electronics Manufacturing industry businesses as they make location decisions can provide insight into how the industry cluster can grow through retention and expansion efforts. The Computer and Electronics Manufacturing industry cluster relies on the following locational attributes to operate a successful business:

- ◆ High Quality of Life
- ◆ Interaction with a University System
- ◆ Availability of high technology workforce

With advances in information technologies, physical location is not as crucial in maintaining a strong customer base and supply chain. Many Computer

# COMPUTER AND ELECTRONICS MANUFACTURING

continued

## TEN HIGHEST EMPLOYMENT CONCENTRATIONS Metro Areas Computer and Electronics Manufacturing Cluster

	Metro Area	Cluster Employment	Employment Concentration	Number of Businesses	Business Concentration
1	Fort Collins, CO	6,191	7.6%	103	2.1%
2	Nashua, NH	5,284	5.9%	147	1.5%
3	Eau Claire, WI	2,655	3.7%	27	0.4%
4	Johnstown, PA	1,860	2.4%	25	0.3%
5	Manchester, NH	2,130	2.3%	104	0.9%
6	Danbury, CT	1,949	2.3%	85	0.6%
7	Columbia, MO	1,227	1.8%	24	0.4%
8	Dutchess County, NY	1,419	1.6%	65	0.5%
9	Sioux Falls, SD	1,363	1.5%	27	0.3%
10	Benton Harbor, MI	975	1.3%	26	0.3%
	<i>United States</i>	<i>1,534,826</i>	<i>1.2%</i>	<i>70,197</i>	<i>0.8%</i>

Sources: Colorado Department of Labor & Employment, Labor Market Information, QCEW; Dun & Bradstreet, Marketplace, July-Sept. 2005.

and Electronics Manufacturing businesses already located in Fort Collins supply their products on a national or international level, retaining operations in Fort Collins due to the high quality of life. Lower land costs, monetary incentives and/or subsidies and an able workforce attract new Computer and Electronics Manufacturing businesses.

### Industry Cluster Insights

Many opportunities and challenges for each industry cluster became apparent in the focus group discussions and throughout the research process. The following opportunities and challenges discussion provides insight into growing the Computer and Electronics Manufacturing industry cluster in Fort Collins.

### *Industry Cluster Opportunities*

*Connection to Colorado State University* – CSU plays an important role in this cluster, supplying research opportunities and new labor. Business leaders in this cluster recommend continuous collaboration as computer engineering is one of the key areas of research at CSU.

*Good Transportation System*—Transportation in Fort Collins is adequate for the cluster’s needs. The highway system to and from Denver and Denver International Airport is convenient, allowing businesses owners to travel easily to clients outside the region.

*Workforce* – The Fort Collins workforce provides a highly educated labor base with industry specific skills and a good work ethic. Continued collaboration with CSU, especially in keeping current research relevant to local industry and innovations, will yield a stronger workforce, and will help to retain the labor force.

*Quality of Life* –Fort Collins is attractive to employers and employees because of the active outdoor lifestyle enjoyed by residents, quality schools, and balance between large city amenities and small town comfort. Maintaining this is recommended as a top priority, as quality of life was emphasized as a key reason business leaders located to and remain in Fort Collins.

### *Industry Cluster Challenges*

*Overseas Development* – Client requirements and labor costs have driven many Computer and

Electronics Manufacturing businesses to seek production facilities overseas. It is likely that this trend will continue as businesses attempt to contain production costs.

*Out of State Decision Makers* – As many of the businesses in this industry cluster are branches of national companies, expansion and relocation decisions are often made by individuals not located in Colorado. It may be harder to persuade company executives that are not familiar with the unique amenities Colorado has to offer to expand operations in the Fort Collins area.

## Opportunities for Growth

The Computer and Electronics Manufacturing cluster is part of the larger manufacturing industry, a primary industry that brings many new dollars into Fort Collins. This cluster in Fort Collins houses several large international businesses as well as a large number of small, independent businesses that bring innovation and growth to the industry.

This industry represents a large part of the Fort Collins economic base, so it is particularly important to track changes. The problem, however, is that the industry has been quite turbulent in recent years.

The Recommendations section near the end of this report provides some general suggestions for enhancing cluster capacity and improving the general business environment. In addition, the following ideas are presented as opportunities for growing this cluster in Fort Collins.

### *Inaugural Effort*

The Computer and Electronics Manufacturing cluster has not been organized yet in Northern Colorado, although an active association exists to serve this cluster on a statewide basis (the Colorado Chapter of the American Electronics Association, or AEA).

- ◆ The City can and should play a lead role in initiating regional cluster development, in collaboration with CSU, Front Range

Community College, AEA, NCEDC, FCTI and other organizations as appropriate.

### *Partnership with the University*

Several opportunities exist for greater collaboration between private industry within this cluster and CSU. Active involvement in university research and utilization of students' skills are areas to be improved upon.

### *Need for Niche Markets*

Greater specialization in the Computer and Electronics Manufacturing cluster in Fort Collins may better serve the industry in the long run.

### *Collaborate with Economic Development Allies*

The Computer and Electronics Manufacturing industry is one of the industries tagged for retention efforts by the Metro Denver Economic Development Corp. It is recommended that Fort Collins pursue opportunities for retaining and growing this industry in collaboration with other economic development efforts such as those underway through the Metro Denver EDC and the NCEDC.

### *Synergy with Information Technology/Software*

The Information Technology industry may be thought of as including two distinct but inter-related segments – software and hardware. As high technology companies grow and merge, the lines between the hardware and software segments of the industry are blurred. There are opportunities for this industry to collaborate with cluster efforts related to the Information Technology/Software cluster.

# COMPUTER AND ELECTRONICS MANUFACTURING

continued

## COMPUTER AND ELECTRONICS MANUFACTURING CLUSTER DEFINITION

NAICS	NAICS Description	SIC	SIC Description
333295	Semiconductor Machinery Manufacturing	3559-9927	Semiconductor Machinery Manufacturing
334111	Electronic Computer Manufacturing	3571	Electronic Computers
334112	Computer Storage Device Manufacturing	3572	Computer Storage Devices
334112	Computer Storage Device Manufacturing	3575	Computer Terminals
334119	Other Computer Peripheral Equipment Manufacturing	3577	Computer Peripheral Equipment, NEC
334119	Other Computer Peripheral Equipment Manufacturing	3578	Calculating and Accounting Equipment
334411	Electron Tube Manufacturing	3671	Electron Tubes
334412	Bare Printed Circuit Board Manufacturing	3672	Printed Circuit Boards
334413	Semiconductor and Related Device Manufacturing	3674	Semiconductors and Related Devices
334414	Electronic Capacitor Manufacturing	3675	Electronic Capacitors
334415	Electronic Resistor Manufacturing	3676	Electronic Resistors
334416	Electronic Coils, Transformers, and Other Inductors	3677	Electronic Coils and Transformers
334417	Electronic Connector Manufacturing	3678	Electronic Connectors
334418	Printed Circuit Assembly (Electronic Assembly)	3679	Electronic Components, NEC
334419	Other Electronic Component Manufacturing	3679	Electronic Components, NEC
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals-Semiconductor Test Equipment	3825	Instruments to Measure Electricity
334613	Magnetic and Optical Recording Media Manufacturing	3695	Magnetic and Optical Recording Media
335999	All Other Misc. Electrical Equipment and Component Manufacturing	3699	Electrical Equipment and Supplies, NEC
541330	Engineering Services	8711-0202	Mechanical Engineering
541330	Engineering Services	8711-9903	Consulting Engineering
541330	Engineering Services	8711-9905	Electrical or Electronic Engineering
541330	Engineering Services	8711-9906	Energy Conservation Engineering
541710	Research & Development in the Physical, Engineering, & Life Sciences	8731-0203	Commercial Physical Research, Computer Hardware Development

# INFORMATION TECHNOLOGY/SOFTWARE

## Description

The Information Technology/Software (IT/Software) industry cluster consists of those companies involved in computer services, including computer programming services, software development, data processing, Internet service and computer facilities management. IT Professionals may be found in all industries but this industry cluster includes only those employees working for IT/Software companies. This cluster is defined by nine six-digit NAICS codes or by eight four-digit SIC codes.

## National Outlook

There are 1.8 million people employed in 180,200 businesses in the IT/Software industry cluster in the United States. The IT/Software cluster experienced rapid growth in the 1990s, reaching its apex about 2001, but declined sharply in 2002. The industry continued to decrease through 2004 but at a less drastic rate, followed by a slight increase in employment growth in 2005. During the four-year period from 2001 to 2005, total employment in this industry cluster decreased an average of 4.7% per year while the number of businesses decreased less than one percent per year. This could be due to the entrepreneurial nature of the industry; as larger companies close or downsize, armed with their acquired knowledge, industry individuals begin their own smaller operations to develop a new product or innovate an old one.

Many software development businesses are outsourcing a significant portion of their operations to foreign countries. Software businesses can hire developers in countries such as Canada, China, India, and Russia for a fraction of the domestic cost. The United States will continue to be a world leader in this industry, but employment domestically will be trained towards project management, while production jobs will move overseas. As the industry becomes more diffused into smaller companies, it will become more stable, as the entrepreneurial operations are less likely to move abroad.

While software demand has slowed, there are several areas presenting growth opportunities in the IT/Software industry. The White House has continually expressed the importance information technology plays in maintaining an efficient and effective homeland protection program. Recently, the White House launched an “Expanded Electronic Management” program aimed at more efficiently linking the government’s agencies with each other and with its citizens. Currently, the federal government invests over \$50 billion per year in Info-Tech and related programs. Additionally, The Institute of Electrical and Electronics Engineers-United State of America (IEEE-USA) has spearheaded an effort to utilize information technology in the protection of critical infrastructure. IT/Software provides significant means of identifying and authenticating personnel, detecting adversarial threats, mitigating consequences of disruption of critical infrastructure utilities, and maintaining surveillance and protection of such structures.

Additionally, The Sarbanes-Oxley Act of 2002 (Sarbanes-Oxley) mandated a number of reforms to improve corporate responsibility, enhance financial disclosures, and combat corporate accounting fraud. Sarbanes-Oxley is a new set of laws that dramatically changes the way companies audit and report their financial data to the investment community and the Securities and Exchange Commission. Demand for software to assist companies in complying with the financial documentation and reporting requirements of Sarbanes-Oxley has skyrocketed. Demand for software applications that help companies handle the paperwork and business processes required to comply with the Sarbanes-Oxley financial reporting regulations will continue to drive new growth in the IT/Software industry cluster.

Open-source software is beginning to put pricing pressures on traditional software suppliers. Open-source software provides the user with access to the source code, giving the user the ability to modify the code and software program. The modified software

can be distributed and reproduced for free or minimal fees.

Demand for software and information technology related to heightened security needs will also drive the growth of the IT/Software industry cluster. Both software security applications that protect computer systems and the larger security issues of homeland security will contribute to IT/Software demand.

While growth in IT/Software industry cluster will be tempered by slower business spending, growth opportunities exist in Sarbanes-Oxley, open-source and security software applications.

## Fort Collins Cluster Profile

While not the largest industry cluster, the Information Technology industry cluster has shown healthy growth rates during the last couple of years. This industry cluster provides a new opportunity to diversify the economic base of the region.

The IT/Software cluster in Fort Collins offers many opportunities for collaboration with federal and state government. Fort Collins is a Geographical Information Systems (GIS) hub in Northern Colorado. Technology developed by Fort Collins' IT/Software businesses is used at top levels of government and military.

A relationship between the IT/Software industry cluster and Colorado State University is not well developed. With many high tech jobs being moved overseas, the United States will focus on the project management and design aspect of the IT/Software industry. It is important for businesses within the industry to align themselves with local universities to have access to the most highly qualified workers.

### AVERAGE ANNUAL GROWTH, 2001-2005 Fort Collins and the United States Information Technology/Software Cluster

	Number of Businesses	Employment
<b>Cluster</b>		
Fort Collins	5.1%	-0.6%
United States	-0.2%	-4.7%
<b>All Industries</b>		
Fort Collins	1.9%	0.6%
United States	1.7%	0.0%

Sources: U.S. Bureau of Labor Statistics and CO Department of Labor & Employment, Quarterly Census of Employment & Wages.

Fort Collins ranks second out of 50 comparable metropolitan areas in the country for the IT/Software industry cluster in terms of employment concentration. Below are examples of major Information Technology businesses located in the Fort Collins:

- ◆ Center Partners
- ◆ Indicative Software
- ◆ Information Technology Experts, Inc. (ITX)
- ◆ Managed Business Solutions
- ◆ New Century Software Inc.
- ◆ Red Hen Systems
- ◆ Synergetics
- ◆ Wind 2 Software

### Businesses

About 173 IT/Software businesses were located in Fort Collins in 2005. The number of businesses grew 5.1% per year from 142 businesses in 2001 to 173 in 2005 compared to a 0.2% average annual decrease nationally in this industry cluster. Detailed business and employment data for each industry cluster for the four-year period from 2001 to 2005 is provided in Appendix C.

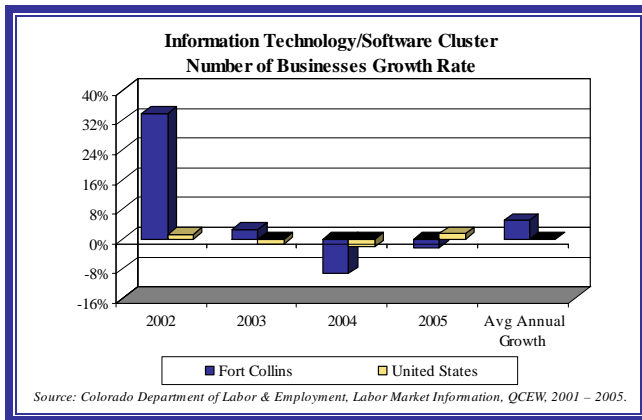
This industry cluster has an above average share of small businesses, indicating the entrepreneurial nature of this industry. About 82% of Information Technology/Software businesses employ less than 10 people compared to 71% of all businesses that



# INFORMATION TECHNOLOGY/SOFTWARE

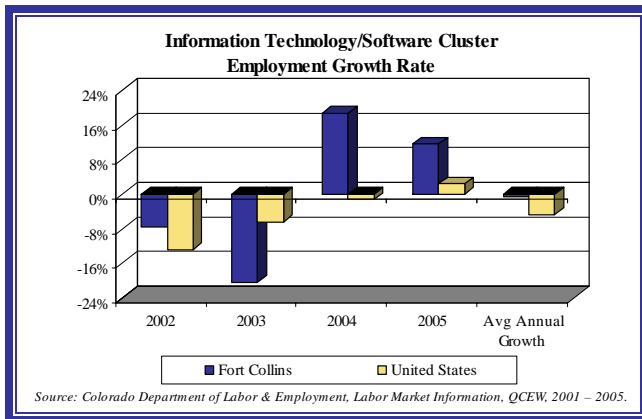
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employ less than 10 people in Fort Collins. Only 1.2% of the Information Technology/Software businesses employ over 100 workers compared to 2.1% for all Fort Collins businesses.



## Employment

The IT/Software industry cluster employed about 2,257 people in Fort Collins in 2005. Employment in this industry cluster comprises about 2.8% of Fort Collins’ total employment base, compared to a 1.4% concentration nationally. The average annual decline in employment of 0.6% between 2001 and 2005 for IT/Software in Fort Collins was better than the national annual average rate of decline of 4.7% for this industry cluster. Although this industry has declined since 2001, growth was quite strong in 2004 and 2005. Therefore, there is optimism that the worst is over for this industry and that growth will solidify in the coming years.



The Web Search Portals category is the largest sector by employment, with about 51% of industry jobs in 2005. Computer Facilities Management and Internet Service Providers are the next largest sectors, employing about 20% and 12% of industry jobs respectively.

## Wages

Total industry cluster payroll in Fort Collins was \$135.9 million in 2005. The average annual wage for employees in the Information Technology/Software industry cluster in the Fort Collins was \$60,200 in 2005 compared to \$79,100 nationally for this industry cluster.

## OCCUPATIONAL SALARIES

### Fort Collins

#### Information Technology/Software Cluster

Occupation	Average Annual Salary
Computer programmers	\$62,970
Computer software engineers, systems software	\$82,790
Computer software engineers, Applications	\$77,080
Database administrators	\$66,390

Source: U.S. Bureau of Labor Statistics, 2005.

## TEN HIGHEST EMPLOYMENT CONCENTRATIONS Metro Areas Information Technology/Software Cluster

	Metro Area	Cluster Employment	Employment Concentration	Number of Businesses	Business Concentration
1	Nashua, NH	4,865	5.4%	430	4.3%
2	<b>Fort Collins, CO</b>	<b>2,257</b>	<b>2.8%</b>	173	<b>3.5%</b>
3	Manchester, NH	2,225	2.4%	265	2.4%
4	Champaign-Urbana, IL	1,753	2.2%	155	1.9%
5	Fargo-Moorhead, ND-MN	1,710	1.9%	99	1.0%
6	Charlottesville, VA	1,513	1.9%	139	1.7%
7	Danbury, CT	1,629	1.9%	320	2.2%
8	Cedar Rapids, IA	1,333	1.5%	147	1.5%
9	Olympia, WA	1,197	1.5%	213	1.8%
10	Sioux Falls, SD	1,197	1.3%	105	1.1%
	<i>United States</i>	<i>1,795,978</i>	<i>1.4%</i>	<i>180,235</i>	<i>2.1%</i>

Sources: Colorado Department of Labor & Employment, Labor Market Information, QCEW; Dun & Bradstreet, Marketplace, July-Sept. 2005.

### Competitive Position

Of the 50 comparable metropolitan areas to Fort Collins, Fort Collins has the second strongest employment concentration and the second highest absolute employment in the industry cluster. The top ten metropolitan areas in the IT/Software cluster by employment concentration are listed above.

### Locational Attributes

Identifying factors important to Information Technology/Software industry businesses as they make location decision can provide insight into how the industry cluster can grow through retention and expansion efforts. The IT/Software industry cluster relies on the following locational attributes to operate successful businesses:

- ◆ Access to skilled labor
- ◆ High quality of life
- ◆ Proximity to revenue-generating customer base
- ◆ Convenient access to a major airport

With advances in information technologies, physical location is not as crucial in maintaining a strong customer base and supply chain. Many IT/Software businesses already located in Fort Collins supply their products on a national or international level,

retaining operations in Fort Collins due to the high quality of life. Synergies with other IT/Software businesses throughout the Front Range of Colorado, access to a skilled workforce, convenient access to a major airport, and competitive operating costs attract new IT/Software companies.

### Industry Cluster Insights

Many opportunities and challenges for each industry cluster became apparent in the focus group discussions and throughout the research process. The following opportunities and challenges discussion provides insight into growing the Information Technology/Software industry cluster in Fort Collins.

### Industry Cluster Opportunities

*Project Management Role* – With more software development going overseas, United States Information Technology businesses can fill a project management role, providing applications, requirement and specification experts who understand the software and information technology solutions. Information Technology businesses are becoming “brain trusts,” providing the design and thought leadership, while actual development is being done in “less expensive” labor markets.

*New Technologies* – New technologies like wireless Internet and radio frequency identification (RFID) are providing new opportunities for businesses in the Information Technology industry cluster.

*Easy Entry for Business Start-Ups* – There is a low cost for entry into the software development business. The cost for individuals to leave a big company and go out on their own is relatively low, with start-up companies generally needing only a computer. Start-up software companies thrive on creativity and innovation.

*Mergers and Acquisitions* – An active merger and acquisition business environment across the nation increases the need for Information Technology services.

*Quality of Life* – Fort Collins is attractive to employers and employees because of the active outdoor lifestyle enjoyed by residents, quality schools, and balance between large city amenities and small town comfort. Maintaining this is recommended as a top priority, as quality of life was emphasized as a key reason business leaders located to and remain in Fort Collins.

### *Industry Cluster Challenges*

*Overseas Development* – Client requirements and labor costs have driven many Information Technology businesses to seek software developers overseas. While a software developer in the United States may be paid \$60,000 a year, a similar worker in India or China requires less than \$20,000 a year in wages.

*In-House Information Technology* – Smaller Information Technology consulting businesses are faced with the challenge of large businesses creating an in-house information technology department. In-house information technology departments reduce the amount of work available for smaller Information Technology consulting businesses. Still, larger in-house departments hire Information Technology workers creating additional jobs.

*Cost of Business* -- Fort Collins is perceived as having a high cost of business including such factors as high land costs, taxes, and the lack of incentive programs. This perception may make Fort Collins less attractive to new businesses.

### Opportunities for Growth

While not a large sector in Fort Collins, IT/Software promises to be one of the high growth industries into the future. The IT/Software entrepreneurs are drawn to the area's attractive quality of life, along with potential synergies with CSU.

The Recommendations section near the end of this report provides some general suggestions for enhancing cluster capacity and improving the general business environment. In addition, the following ideas are presented as opportunities for growing this cluster in Fort Collins.

### *Inaugural Effort*

The IT/Software cluster has not been organized yet in Northern Colorado, although an active association exists to serve this cluster on a statewide basis (The Colorado Software and Internet Association, or CSIA).

- ◆ The City can and should play a lead role in initiating regional cluster development, in collaboration with CSU, FRCC, CSIA, NCEDC, FCTI, and other organizations as appropriate.

### *Business to Business Collaboration*

This industry presents significant opportunities for businesses to collaborate on given projects. If given an opportunity to meet and discuss current research and project needs, new ideas and collaborations are likely to develop.

### *Small Business Programs*

Software/IT tends to be entrepreneurial, so programs designed to assist small businesses may be particularly useful for this industry.

# INFORMATION TECHNOLOGY/SOFTWARE

continued

## INFORMATION TECHNOLOGY/SOFTWARE CLUSTER DEFINITION

<b>NAICS</b>	<b>NAICS Description</b>	<b>SIC</b>	<b>SIC Description</b>
334611	Software Reproducing	7372	Prepackaged software
511210	Software Publishers	7372	Prepackaged software
518111	Internet Service Providers	7375	Information retrieval services (on-line services)
518112	Web Search Portals	8999	Services, NEC (internet web search portals)
518210	Data Processing, Hosting & Related Services	7374	Data processing
541511	Custom Computer Programming Services	7371	Custom computer programming services
541512	Computer Systems Design Services (pt)	7373	Computer integrated systems design
541513	Computer facilities management services	7376	Computer facilities management
541519	Other Computer Related Services	7379	Computer related services NEC

# UNIQUELY FORT COLLINS

## Description

The Uniquely Fort Collins (Unique) industry cluster includes businesses whose products and operations contribute to the eclectic, innovative, and high quality of life in Fort Collins. To better understand this cluster, it has been split into three subclusters. The Artistic and Cultural Entertainment subcluster includes firms involved in the production, sales, and education of performance and visual arts, as well as museums, historical sites, and zoos or botanical gardens. The second subcluster, Recreational and Retail Activities, includes retail boutiques with less than 10 employees, sports and recreational activities, and production facilities with consumer interaction (i.e. brewery tours). The third subcluster, Hospitality, includes independent full-service restaurants and traveler accommodations. The full cluster is comprised of 47 six-digit NAICS codes or 39 four-digit, two six-digit, and three eight-digit SIC codes.

## National Outlook

There are 9.7 million people employed in 689,700 businesses in the Unique industry cluster in the United States. This does not include sectors that would be unique to other metro areas, but is based on the same industry definition as used in Fort Collins. The Unique cluster will differ from one city to another based on the natural and constructed amenities of the region. Specific to Fort Collins, in addition to general cultural businesses, the microbreweries and independent fine foods manufacturing, both of which offer tours, are highlighted, as well as the outdoor recreational opportunities provided by the nearby mountains and rivers. Elsewhere, local ski resorts, pro-sports teams, or water activities would be included in a town's unique cluster based on their proximity and importance to the community. This cluster, divided into three subclusters, poses as both a basic and non-basic industry. Tourism-related sectors in the arts and culture and the recreational and retail subclusters attract visitors to a region while enhancing the quality of life for current residents.

The hospitality subcluster may add to the eclectic lifestyle of a region with ethnic foods or historical accommodations, but also serves the needs of visitors.

Many existing industries rely on the Unique cluster to attract new businesses, employees, or clients. Unique businesses increase the quality of life of a region. In addition to providing fun or cultural activities, they tend to attract jobs. Regions with high quality of life indexes tend to be hubs for high-tech firms, especially entrepreneurial operations, whose physical location does not necessarily determine their consumer base.

Although the Unique cluster experienced a decline in employment as a result of the 2001 recession, the decline was not drastic. By restricting the retail sector to include only companies with less than 10 employees, the instability of major retailers affected by the recession is not a factor. Employment is expected to increase in this cluster nationally.

## Fort Collins Cluster Profile

Fort Collins is an eclectic cultural and recreational center in Northern Colorado. Fort Collins residents enjoy an active outdoor lifestyle, enjoying the 20 miles of trails within the city and the many parks and rivers nearby. The town has numerous independent restaurants and the most microbreweries per capita in the state of Colorado, including New Belgium brewery, the third largest microbrewery in the United States.

Most of the Unique cluster businesses are located in the northern part of Fort Collins, with a high concentration in the Old Town area. The City has already taken measures to enhance the vitality of the Old Town district, especially relating to the Unique cluster. Preserving a strong downtown area enhances the quality of life enjoyed by the City's residents and business community.

In addition to local government and organizations, there is a large presence of federal and state facilities that maintain and improve the aesthetic quality of

# UNIQUELY FORT COLLINS

continued

Fort Collins and the active lifestyle that many of the city's residents enjoy.

One of the larger entities is the National Park Service, which maintains the Roosevelt National Forest and works closely with CSU to train students and increase environmental awareness. CSU and Front Range Community College are heavily reliant on the Unique cluster to attract students and faculty to the region. The unique atmosphere of Fort Collins, its vicinity to the mountains, and its eclectic lifestyle help draw over 27,500 students to the two schools each year.

### AVERAGE ANNUAL GROWTH, 2001-2005 Fort Collins and the United States Uniquely Fort Collins Cluster

	Number of Businesses	Employment
<b>Cluster</b>		
Fort Collins	1.0%	0.5%
United States	0.9%	0.8%
<b>All Industries</b>		
Fort Collins	1.9%	0.6%
United States	1.7%	0.0%

Sources: U.S. Bureau of Labor Statistics and CO Department of Labor & Employment, Quarterly Census of Employment & Wages.

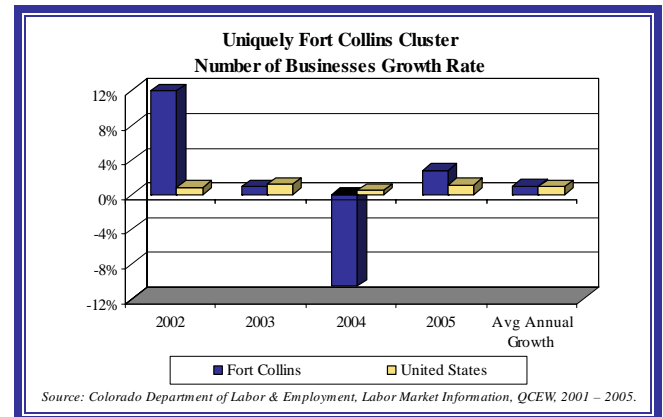
Fort Collins ranks third out of 50 U.S. metro areas of comparable size to Fort Collins in employment concentration for the Unique industry cluster, and fourth for absolute employment. Some of the Unique cluster businesses located in Fort Collins include:

- ◆ Anheuser Busch
- ◆ Bas Bleu Theater
- ◆ Bisetti's Italian Restaurant
- ◆ CooperSmith Brewing Co
- ◆ Fort Collins Brewery
- ◆ Jax Outdoor Gear
- ◆ Mountain Whitewater Descents
- ◆ New Belgium Brewery
- ◆ O'Dell's
- ◆ The Perennial Gardner
- ◆ Sense of Place

The average annual employment growth rate of 0.5% between 2001 and 2005 for the Unique cluster in Fort Collins was slightly less than the national employment growth rate of 0.8% per year for this industry cluster. Industry cluster employment growth in Fort Collins was also below the average annual employment growth rate for all industries of 0.6% during the same period.

### Businesses

Nearly 400 Unique businesses were located in Fort Collins in 2005. The number of businesses grew 1.0% per year from 384 businesses in 2001 to 399 in 2005 compared to a 0.9% average annual increase nationally in this industry cluster. Detailed business and employment data for each industry cluster for the four-year period from 2001 to 2005 is provided in Appendix C.



About 64% of Uniquely Fort Collins businesses employ less than 10 people compared to 71% of all businesses that employ less than 10 people in Fort Collins. On the other hand, only 1.5% of the Unique businesses employ over 100 workers compared to 2.1% for all businesses.

# UNIQUELY FORT COLLINS

continued

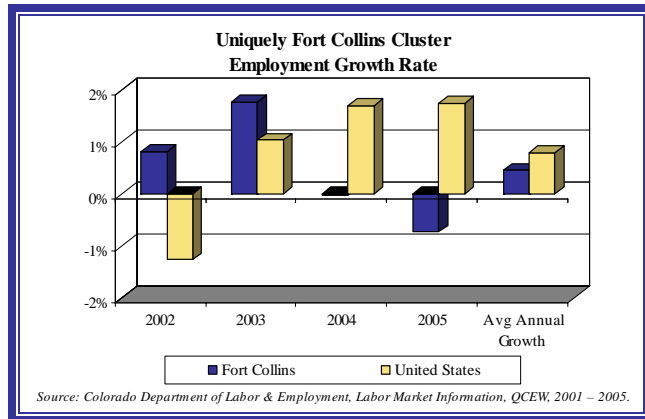
## Employment

### SUBCLUSTER EMPLOYMENT Fort Collins Uniquely Fort Collins Cluster

Subcluster	Establishments	Employment
Artistic & Cultural	35	327
Entertainment		
Recreation & Retail	153	4,494
Hospitality	211	2,325

Source: Colorado Department of Labor & Employment, Labor Market Information, QCEW, 2005.

The Uniquely Fort Collins industry cluster employed about 7,146 people in Fort Collins in 2005. Employment in this industry cluster comprises about 8.8% of Fort Collins' total employment base compared to a 7.5% concentration nationally. Employment in the Uniquely Fort Collins industry cluster has increased an average of 0.5% per year from 7,018 employees in 2001 to 7,146 in 2005, compared to a 0.8% average increase nationally.



Full Service Restaurants is the largest sector by employment in the Unique cluster and in the Hospitality subcluster with about 55% of cluster jobs and 87% of subcluster jobs in 2005. Breweries is the largest sector in the Retail and Recreation subcluster, employing 39% of subcluster jobs. Fine Art Schools is the largest sector in the Arts and Culture subcluster, employing 29% of subcluster jobs.

## Wages

Total industry cluster payroll in Fort Collins was \$143.6 million in 2005. The average annual wage for employees in the Unique industry cluster in Fort Collins was \$20,100 in 2005 compared to \$19,100 nationally for this industry cluster.

### OCCUPATIONAL SALARIES Fort Collins Uniquely Fort Collins Cluster

Occupation	Average Annual Salary
Retail Salespersons	\$22,300
Chefs and Head Cooks	\$38,400
Writers and Authors	\$46,840
Arts, Design, Entertainment, Sports, and Media	\$37,710

Source: U.S. Bureau of Labor Statistics, 2005.

## Competitive Position

Of the 50 comparable metropolitan areas to Fort Collins, Fort Collins has the third strongest employment concentration and the fourth highest absolute employment in the Uniquely Fort Collins industry cluster. The top ten metropolitan areas in the Uniquely Fort Collins cluster by employment concentration are listed on the following page.

## Locational Attributes

Identifying factors important to Unique businesses as they make location decision can provide insight into how the industry cluster can grow through retention and expansion efforts. The Unique cluster relies on the following locational attributes to operate successful businesses:

- ◆ Outdoor lifestyle
- ◆ High quality of life
- ◆ Proximity to revenue-generating customer base

## Industry Cluster Insights

Many opportunities and challenges for each industry cluster became apparent in the focus group discussions and throughout the research process. The

# UNIQUELY FORT COLLINS

continued

following opportunities and challenges discussion provides insight into growing the Unique cluster in Fort Collins.

## Industry Cluster Opportunities

*Connection to Higher Education* – 27,500 students are enrolled in Colorado State University and Front Range Community College, supplying research facilities, a large labor force, and a large consumer base to local industries. The Uniquely Fort Collins cluster attracts students and professors to the University, and further collaboration should be encouraged by both parties.

*Inter-Industry Support* – The Uniquely Fort Collins cluster attracts potential employees, new businesses, and new clients to the region, while visitors to other clusters support the Unique cluster. Cross marketing of amenities, both internally and externally, would help to spread the word about the array of attractions found in the area.

*Quality of Life* – Fort Collins is attractive to employers and employees because of the active outdoor lifestyle enjoyed by residents, quality schools, and balance between large city amenities

and small town comfort. Maintaining this is recommended as a top priority, as quality of life was emphasized as a key reason business leaders located to and remain in Fort Collins.

## Industry Cluster Challenges

*Lack of Knowledge* – Many Fort Collins residents are unaware of the businesses involved in the cluster and the cultural amenities they offer. One research report indicated that a majority of residents in the Harmony Road corridor have never heard of the Lincoln Center in Old Town. Efforts should be made to expand the Uniquely Fort Collins cluster into southern parts of the city while advertising established cluster businesses to unknowing residents.

*Identity* – Fort Collins has yet to develop a direct and marketable identity, leaving potential visitors unaware of what to find in the City.

## Opportunities for Growth

It is important for a community to offer a variety of amenities to its residents and businesses. This enhancement of the quality of life of the area helps

### TEN HIGHEST EMPLOYMENT CONCENTRATIONS

#### Metro Areas

#### Uniquely Fort Collins Cluster

	Metro Area	Cluster Employment	Employment Concentration	Number of Businesses	Business Concentration
1	Santa Fe, NM	8,258	10.0%	1,195	12.2%
2	Galveston-Texas City, TX	8,807	9.3%	1,462	11.0%
<b>3</b>	<b>Fort Collins, CO</b>	<b>7,146</b>	<b>8.9%</b>	<b>399</b>	<b>8.1%</b>
4	Panama City, FL	6,064	8.7%	794	9.3%
5	San Luis Obispo-Atascadero-Paso Robles, CA	7,555	7.9%	1,587	11.0%
6	Charlottesville, VA	6,174	7.7%	704	8.5%
7	Bellingham, WA	4,025	5.9%	976	8.4%
8	Fayetteville, NC	4,831	5.8%	838	8.2%
9	Chico-Paradise, CA	3,905	5.8%	912	8.7%
10	Brownsville-Harlingen-San Benito, TX	5,237	5.6%	1,113	10.4%
	<i>United States</i>	<i>9,718,534</i>	<i>7.5%</i>	<i>689,659</i>	<i>8.1%</i>

Sources: Colorado Department of Labor & Employment, Labor Market Information, QCEW; Dun & Bradstreet, Marketplace, July-Sept. 2005.



to attract and retain a viable labor force, brings visitors into the community, and helps to create a sense of place for residents.

The Recommendations section near the end of this report provides some general suggestions for enhancing cluster capacity and improving the general business environment. In addition, the following ideas are presented as opportunities for growing this cluster in Fort Collins.

### *Cluster Status*

There already exists in Fort Collins a healthy core of associations emphasizing this cluster or downtown retail and cultural health. The City's support for these groups and their activities is well documented and serves to render the needed information relative to support for the Uniquely Fort Collins cluster.

- ◆ What the City can do is to publicly acknowledge this cluster's status and importance to the community, and encourage linkages between downtown cluster businesses and those from other parts of the community.

### *Downtown jobs base*

While the Unique cluster is certainly not limited to downtown, most of this cluster's businesses are located in the City's downtown area. The vitality of this cluster, then, can be enhanced by increasing the

numbers of people who either live or work downtown.

- ◆ Pursue a significant employer (or employers) for downtown Fort Collins locations, using the Downtown Development Authority, Enterprise Zone, and other means at the City's disposal. Develop and publicize an enhanced, performance-based incentive package for primary employers who choose a downtown location. Pursue reputable private developers who specialize in downtown environments to assemble and potentially redevelop properties to be attractive to employers.

### *Retail Leakage*

While retail businesses form only a part of the Unique cluster, attractive retail amenities certainly help to draw visitors to a region, or encourage residents to do their shopping locally – in which case they may be more likely to patronize businesses in the Unique cluster. Therefore, retail leakage – the loss of shopping revenues to retail sites outside the City – is cause for concern.

- ◆ Continue to monitor retail leakage on a regular basis, in order to identify opportunities for unique retail development or underserved consumer bases, and to support public and private efforts to redevelop aging retail sites.

# UNIQUELY FORT COLLINS

continued

## UNIQUELY FORT COLLINS CLUSTER DEFINITION

NAICS	NAICS Description	SIC	SIC Description
<i>Artistic and Cultural Entertainment</i>			
453920	Art Dealers	5999-1601	Misc. Retail Stores, NEC (Art Dealers)
453920	Art Gallery	7999-9901	Art Gallery, Commercial
611610	Fine Arts Schools	7911	Dance Studies, Schools, and Halls (Dance instructors Professional and Other Dance Schools)
611610	Fine Arts Schools	8299	Schools and Educational Services, NEC (Art, Drama, and Music Schools)
711110	Theater Companies & Dinner Theaters	5812	Eating Places (Dinner Theaters)
711110	Theater Companies & Dinner Theaters	7922	Theatrical Producers (Except Motion Pictures) and Misc. Theatrical Services (Theater Cos., Opera Cos.)
711120	Dance Companies	7922	Theatrical Producers (Except Motion Pictures) and Misc. Theatrical Services (Ballet and Dance Cos.)
711130	Musical Groups and Artists	7929	Bands, Orchestras, Actors, and Entertainment Groups (Musical Groups and Artists or Orchestras)
711190	Other Performing Arts Companies	7929	Bands, Orchestras, Actors, and Entertainment Groups (Musical Groups and Artists or Orchestras)
711310	Promoters of Performing Arts with Facilities	6512-03	Operators of Nonresidential Buildings (Stadium and Arena Owners)
711310	Promoters of Performing Arts With Facilities	7922	Theatrical Producers (Except Motion Pictures) and Theater Operators
711310	Promoters of Performing Arts With Facilities	7941	Professional Sports Clubs and Promoters
711310	Promoters of Performing Arts With Facilities	7999	Amusement and Recreation Services, NEC (State Fairs, etc. With facilities)
711320	Promoters of Performing Arts Without Facilities	7922	Theatrical Producers (Except Motion Pictures) and Theater Operators
711320	Promoters of Performing Arts Without Facilities	7941	Professional Sports Clubs and Promoters
711320	Promoters of Performing Arts Without Facilities	7999	Amusement and Recreation Services, NEC (State Fairs, etc. W/O Facilities)
711510	Independent Artists, Writers, & Performers	7699	Repair Shops and Related Services, NEC (Taxidermists and Antique Repair and Restoration, Except Antique Car Restoration)
711510	Independent Artists, Writers, & Performers	7819	Services Allied to Motion Picture Production (Film Directors and Related Motion Picture Production Services, Independent)
711510	Independent Artists, Writers, & Performers	7922	Theatrical Producers (Except Motion Picture) and Misc. Theatrical Services
711510	Independent Artists, Writers, & Performers	7929	Bands, Orchestras, Actors, and Entertainment Groups (Actors and Actresses)
711510	Independent Artists, Writers, & Performers	8999	Services, NEC (Authors, Artists, and Related Technical Services, Independent)
712110	Museums	8412	Museums and Art Galleries (Except Historic and Heritage Sites)
712120	Historical Sites	8412	Museums and Art Galleries (Historic, Heritage Sites)
712130	Zoos and Botanical Gardens	8422	Arboreta and Botanical or Zoological Gardens (Except Nature Parks or Reserves)
712190	Nature Parks and Other Similar Institutions	7999	Amusement and Recreation Services, NEC

# UNIQUELY FORT COLLINS

continued

<i>Recreational And Retail Activities</i>			
311330	Convectional Manufacturing from Purchased Chocolate *	5441-9903	Candy, Nut, and Confectionary Stores (Chocolate Candy Stores, Preparing on Premises) *
311513	Cheese Manufacturing *	2022	Natural, Processed, and Imitation Cheese *
311811	Retail Bakeries *	5461	Retail Bakeries (Bread, Cake, and Related Products Baked and Sold on Premises)
312120	Breweries *	2082	Malt Beverages (Except Malt Extract) *
442110	Furniture Stores **	5712	Furniture Stores (exc. Custom Furniture, Cabinets) **
442299	All Other Home Furnishing Store s**	5719	Misc. Home Furnishing Stores (exc. Pottery and Crafts Made & Sold on Site, Window Furnishings) **
442299	All Other Home Furnishing Stores **	7699	Repair Shops and Related Services **
448110	Men's Clothing Stores **	5611	Men's and Boys' Clothing and Accessory Stores **
448120	Women's Clothing Stores **	5621	Women's Clothing Stores **
448130	Children's and Infants' Clothing Stores **	5641	Children's and Infants' Wear Stores **
448140	Families Clothing Stores **	5651	Family Clothing Stores **
448150	Clothing Accessories Stores **	5611	Men's and Boys' Clothing and Accessory Stores **
448150	Clothing Accessories Stores **	5632	Women's Accessory and Specialty Stores **
448150	Clothing Accessories Stores **	5699	Misc. Apparel and Accessory Stores **
448190	Other Clothing Stores **	5699	Misc. Apparel and Accessory Stores **
448210	Shoe Stores **	5661	Shoe Stores **
448310	Jewelry Stores **	5944	Jewelry Stores **
448320	Luggage and Leather Stores **	5948	Luggage and Leather Goods Stores **
451110	Sporting Goods Stores **	5941	Sporting Good Stores and Bicycle Shops
451120	Hobby, Toy, and Game Stores **	5945	Hobby, Toy and Game Stores **
451130	Sewing, Needlework and Piece Good Stores **	5949	Sewing, Needlework, and Piece Good Stores **
451140	Musical Instruments & Supplies **	5736	Musical Instrument Stores **
451211	Book Stores **	5942	Book Stores **
451220	Prerecorded Tape, Compact Disc and Record Stores **	5735	Record and Prerecorded Tape Stores **
452990	Other General Merchandise Stores **	5399	Misc. General Merchandise Stores **
453110	Florists **	5992	Florists **
453210	Office Supplies & Stationary Stores **	5943	Stationary Stores **
453220	Gift, Novelty, and Souvenir Stores **	5947	Gift, Novelty, and Souvenir Stores **
453310	Used Merchandise Stores*	5932	Used Merchandise Stores (Except Pawn Shops) **
561520	Tour Operators	7999-76	Tour Operators
611620	Sports and Recreation Instruction	7999	Operators of Nonresidential Bldgs (Stadiums, Arenas)
713990	All Other Amusement and Rec. Industries	7999	Amusement and Recreation Services, NEC (No Organized Camping, Food Service, etc.)
721214	Recreational and Vacation Camps (Except Campgrounds)	7032	Sporting and Recreational Camps and Organized Outdoor Adventure Retreats
<i>Hospitality</i>			
721110	Hotels and Motels (Except Casino Hotels)	7011	Hotels and Motels (Except Casino Hotels)
721191	Bed and Breakfast Inns	7011	Hotels and Motels (Bed and Breakfast Inns)
721199	All Other Traveler Accommodations	7011	Hotels and Motels (Except Hotels, Motels and Bed and Breakfast Inns)
722110	Full-Service Restaurants	5812	Eating places (Full Service Restaurants)

\*Includes businesses with customer interactions (i.e. tours) \*\*Includes businesses with ten employees or less

# RECOMMENDATIONS

## SWOT Analysis

An important step in creating recommended action items regarding industry cluster growth is the understanding of the region's opportunities and challenges. This can be accomplished through a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. Part of this SWOT analysis is found in each cluster section, in the discussion of each industry cluster's competitive advantages.

The 2004 SWOT analysis included in the *Economic Vitality and Sustainability Action Group: Report and Recommendations* plan is believed to be, with a few exceptions, comprehensive and accurate. In the interests of continuity, and to avoid redundancy, this analysis is included in Appendix F. Based on the research and analysis conducted as a part of this study, we recommend the following additions to the EVSAG SWOT analysis:

### Strengths

- ◆ New “pro-business” attitude toward business and economic development
- ◆ Strong sense of community identity/pride
- ◆ Perception – Agricultural base keeps Fort Collins “grounded” and “real”
- ◆ SBA designation of Fort Collins as the #1 city for small business
- ◆ Land available for development/redevelopment

### Weaknesses

- ◆ Aging shopping facilities (chronological and brand aging) and attendant erosion of sales tax revenue
- ◆ Limited transportation options
- ◆ Congestion of north-south arterials
- ◆ Lack of late hour mass transit
- ◆ Geography of downtown Fort Collins – perception that is it “too far” from south side of the city
- ◆ 12-year anticipated window to reach growth management boundaries

### Threats

- ◆ Continued reliance in Colorado on sales tax revenue / retail competition and life cycles
- ◆ Higher education funding and potential for “migration” away from central campuses (e.g. CU's larger presence in Denver than Boulder)
- ◆ Colorado's loss of status as a manufacturing location (globalization, productivity driving down job numbers, cost basis)
- ◆ Continued competition and parochialism within Larimer County

### Opportunities

- ◆ High-profile alignment of community job creation and sustainability goals (e.g. Aligning City policies and processes to promote both high standards and user-friendliness/efficiency)
- ◆ Leverage other business and economic development groups to take better advantage of collaboration opportunities
- ◆ I-70 congestion an opportunity for increased tourism from Denver, northern Colorado, and southern Wyoming communities
- ◆ Potential to leverage/encourage entrepreneurial activity

## Intent of the Recommendations

The goal of this section is not to make sweeping strategic recommendations across the full spectrum of City functions, but to focus on specific actions the City of Fort Collins can take to *enhance its capacity to sustain job opportunity through the development of viable industry clusters*, especially the four clusters explored herein. It is recommended that this report be used in conjunction with the reports and industry efforts of the two additional industry clusters operating in Fort Collins, namely Bioscience and Clean Energy. As mentioned previously, detailed information for these two clusters is not included in this study as these clusters are already the subject of active, on-going industry efforts. See Appendix D and Appendix E for additional information. Nevertheless, in recognition of the importance of these two clusters to the City of Fort

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Collins, recommendations are included that pertain to *general cluster sustainability and development* – i.e., things the City of Fort Collins can do to promote cluster development in general. This report also includes recommendations pertaining to *specific clusters* – i.e., tasks that will benefit one cluster but may have limited relevance for another.

Further, this report includes recommendations related to some basic business environment issues that are enhancing (or have the potential to enhance) Fort Collins' competitive advantage for job retention and creation. Recommendations related to these issued are included for two reasons: [1] even the most sophisticated cluster strategies will not produce the desired results if these basic issues are not successfully addressed; and [2] Fort Collins has made significant strides in many of these areas, and there is merit in calling attention to them *as a way to reaffirm their importance to the City's future sustainability efforts*.

Thus, the recommendations included are structured as follows:

- ◆ General Business Environment – pertaining to matters that affect all or a substantial majority of businesses in the City;
- ◆ Cluster Capacity Enhancements – pertaining to ways in which Fort Collins can help to support cluster formation in general; and
- ◆ Specific Cluster Strategies – pertaining specifically to the four clusters analyzed in this report.

## General Business Environment

### Development Review Process

Fort Collins is to be commended for taking aggressive action to align its high development standards with a reorganized and streamlined development review process. The City is already well underway with major improvements such as:

- ◆ The adoption of a more collaborative, integrated and transparent process that promotes effective and timely decision-making, thereby reducing

the cost associated with development/redevelopment and construction while ensuring that City development standards are met.

- ◆ The adoption of a higher standard of customer service among staff that come into direct contact with business, thereby reducing the likelihood of adversarial positioning.
- ◆ The establishment of a project management system that designates a single point of contact within the City to shepherd projects through the required process, rendering the process more user friendly and providing an opportunity for direct customer feedback.

Recent interviews with NCEDC and others indicate that the City's improvements are already yielding dividends and are beginning to recast Fort Collins' reputation among businesspeople and developers. For instance, it was reported that Intel's 2005 decision to expand in Fort Collins was due in part to the City's responsiveness on development review.

**1.1.0** Fort Collins should continue to place a high priority on continuous improvement in this area, as it is among the most important factors that has negatively influenced the City's reputation with business in the past. The City should continue to implement recommendations contained in the "Quality Improvement Plans for Development Review Process" report, also known as the "Zucker Report."

**1.1.1** The City is encouraged to publicize these improvements with the business community, and to continue engaging business and development interests in the reorganization process, in order to turn around any lingering negative perceptions.

**1.1.2** Lastly, the City should replicate the outreach to the development community on a regular basis to learn how additional enhancements to the process and City codes can be made.

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## Job Retention and Creation

*City/Business Relations.* City management has already established positive efforts to build strong business relationships through periodic high-level meetings with executives whose companies employ significant numbers of Fort Collins residents. It appears that information generated in meetings with major employers is already being used to inform public policy on matters affecting business and economic sustainability, and to promote the City's sustainability values in the private sector. Furthermore, the City's Economic Advisor's considerable outreach to individual companies is helping to establish that office as the primary contact for business services.

**1.2.0** The City should continue in this vein, as an important step in promoting public/private partnership and greater collaboration for the benefit of employers, city government, and Fort Collins residents.

*Regional Collaboration.* The City of Fort Collins has demonstrated its belief in regional economic development collaboration through, for example, its continued support of the Northern Colorado Economic Development Council (NCEDC) and its participation in that organization's Leadership 2010 initiative. As the regional public/private partnership for economic development in Larimer County, the NCEDC is strategically positioned to provide those critical economic development services that are best rendered at the regional level, including national marketing, some forms of research, business recruitment, lead management/prospect handling, and facilitating leadership and collaboration on region-wide issues (e.g., transportation and higher education funding). These efforts, if undertaken at a municipal level, would not only be cost-prohibitive but would also be less effective.

The NCEDC also stands as a key partner to Fort Collins and other Larimer County municipalities in the development and promotion of region-wide clusters. For example, NCEDC has already identified the Biosciences, Agri-Tech, Information

Technology/ Software and Clean Energy as being among its targets for job creation and capital investment in Larimer County. NCEDC's active engagement with the City in cluster support activities will better enable that organization to identify job growth potential within the clusters. Finally, NCEDC's sponsorship of a research economist at CSU enables the City of Fort Collins access to a valuable information resource for program and policy development, monitoring and implementation.

**1.2.1** It is recommended that Fort Collins provide continued support for the NCEDC, and to *leverage its involvement* in that organization to accomplish goals that a municipal government is not equipped to tackle alone.

**1.2.2** Furthermore, the City should recognize and leverage (where appropriate) the assets of the Metro Denver Economic Development Corp. (Metro Denver EDC), an organization the NCEDC has recently joined. There is ample evidence to suggest that, in the minds of site selection consultants and business leaders *outside* of Colorado, the Colorado Front Range from Denver to Fort Collins is increasingly viewed as a homogeneous metropolitan area. The Metro Denver EDC's significant assets and competencies make it a powerful ally, and the organization shares several target clusters with Fort Collins – namely, Bioscience, Energy, Information Technology/Software, Computer and Electronics Manufacturing, and Beverage Production. Selective partnerships with organizations such as NCEDC and Metro Denver EDC will allow Fort Collins to leverage its own assets for greater impact.

*Incentive Development.* Once again, this is an area where the City is already making progress, with the City's first municipal incentive policy now in the development stage. In a perfect world, incentives would not be needed; nonetheless, they are a competitive reality in the quest for jobs and capital investment. Because Colorado is no longer a low-

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cost alternative for companies and talented individuals, a prudent incentive policy may be considered a must-have, at least for very desirable job-creation projects. The key is to align Fort Collins' desire for high quality jobs and sustainability with the company's need for lower costs, and for the City's incentive policy to either level the playing field or provide some advantage to Fort Collins when compared with competing locations.

- 1.2.3** The formal adoption of an incentive policy based on job quality (e.g. wages, benefits, skill-building potential, or career path, capital investment per employee, etc.) is advised. To the extent possible, it should be performance-based (*i.e.*, the company must meet or agree to minimum job creation and/or capital investment requirements before accessing the incentive). It should also be *relevant or meaningful*, a characteristic that can be confirmed by talking with businesses and site consultants prior to implementation. Many job-creation projects have been lost because incentives placed on the table were not relevant or meaningful to the business in question.
- 1.2.4** Fort Collins should consider how its incentive policy might be used as a tool to encourage sustainability or proactive social and environmental policy among private-sector employers. Communities such as Boulder, CO and Berkeley, CA have successfully integrated such goals into their incentive policy, and in so doing have branded their communities as promoting sustainability. Such incentives offer a positive way to advance employment and sustainability goals simultaneously.
- 1.2.5** The City should rigorously evaluate the fiscal impacts of every economic development project using a credible economic impact model. In this way, the City will be assured an adequate return on its incentive investment.

## Marketing / Public & Media Relations

*Website Functionality and Presence.* The City's new website (<http://www.fcgov.com/business>) is expected to improve business communication. Once again, the City is to be commended for undertaking this wholesale website redesign, as it will establish identifiable "pathways" to information desired by specific audiences. *It cannot be overemphasized that a comprehensive, current, and user-friendly City website is an important tool in successful job creation and retention.* Studies suggest that private companies and site consultants routinely conduct up to 90 percent of their research about potential locations online, leaving an ever-shrinking window of opportunity for cities to impact location decisions through face-to-face negotiations and promotion. Among respondents to a recent economic development survey, 62 percent cited websites as the most effective marketing tool for communities.<sup>7</sup> It is imperative that Fort Collins' online presence be responsive to the information needs of potential employers of all sizes.

- 1.3.0** Once the new site is launched, the City should evaluate it regularly (at least every other year) for content and ease of use from the perspective of (at a minimum) local businesses needing information, site consultants or companies seeking potential expansion sites, and entrepreneurs looking for assistance with start-ups. The evaluation should also include visual and messaging consistency with the City's and the region's branding efforts. In addition, care should be taken that the website in fact drives readers to the appropriate resource(s) for their needs.

*Promotion to Companies in Target Clusters.* In the competition for high-tech job creation, it is important to note that Information Technology and Biotech/Life Sciences rank first and second, respectively, among targets identified by community

<sup>7</sup> "Survey Results: Economic Development Marketing Innovation and Best Practices Survey," Angelou Economics, May 2006.

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economic development organizations.<sup>8</sup> In order for Fort Collins to stand out in the crowd, then, its messages must be compelling, carefully researched, unflinchingly accurate, refined, and targeted at specific audiences. They must be delivered frequently and consistently across a strategic range of media and events.

This is an area where Fort Collins can leverage the assets and knowledge base of NCEDC and Metro Denver EDC, as both organizations have access to and significant experience dealing with decision-makers in several of the City's target clusters, especially IT/Software, Computer and Electronics Manufacturing, and Bioscience.

**1.3.1** It is recommended that the City collaborate with these organizations to augment its knowledge base and refine its marketing message through:

- ◆ cluster development activities (local, regional, statewide)
- ◆ conversations with local cluster companies or representatives
- ◆ information available from CSU faculty and staff engaged in cluster development
- ◆ information available from governmental or nonprofit institutions that deal with or impact the chosen clusters
- ◆ information drawn from other communities competing in the same clusters
- ◆ industry events (e.g., trade shows) and publications

*Communication.* The City's Economic Advisor is already reaching out – through group presentations and one-on-one meetings with business leaders – to explain and promote the City's economic development efforts to businesses and residents.

Following are some ways the City can strengthen these efforts:

- 1.3.2** Maintain funds in the City's budget to reprint and distribute news articles that demonstrate competitive advantage, or reinforce the City's brand. Third-party news stories are considered highly credible as opposed to stories generated in-house.
- 1.3.3** Use the City's utility mailings to distribute positive news about the local economy, the link between economic development and quality of life, or the City's efforts to align economic development and sustainability goals.
- 1.3.4** Create a pathway on the City's website that educates residents and job seekers about the City's target industries and local companies within them. Consider creating a page on the City's website that updates the community on job-creation projects from previous years (e.g. Intel one or two years *after* having occupied the former Celestica facility).
- 1.3.5** Use the website to provide hot-links to employers who are actively seeking job applicants, or create a bulletin board where local employers can post openings.
- 1.3.6** In all print, audio/visual and group communications, drive traffic to the City's website so that its reach and utilization are optimized.
- 1.3.7** A communication plan need not be elaborate, but it must advance the City's key messages to residents and to businesses. It must be pervasive and consistent. The City would be well advised to invest more heavily in resources to accomplish these communication objectives, either through:
  - ◆ dedicating staff internally (a minimum one half-time employee),
  - ◆ outsourcing to communications professionals (either free-lance or through an established PR/media relations firm),
  - or

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<sup>8</sup> Ibid.



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- ◆ A combination of both internal and outsourced talent.

**Branding.** The comprehensive branding exercise already underway with North Star and City allies is an important step in achieving a unified, adaptable theme and look to all of the City’s promotional endeavors. Once the brand is developed, the hard work of making it “stick” in the minds of Fort Collins’ target audiences (whether residents, businesses or visitors) will begin. Brands, in order to be effective, must be earned or at least accepted by the target audience. Brands that are heavily promoted but that do not reflect the *perceived reality* are doomed to failure.

**1.3.8** At all times the City should be conscious of living up to the new brand. Work to sustain the new brand *organically* – that is, consciously strive to reinforce the brand consistently over time through the City’s actions, characteristics and successes, simultaneous with any and all marketing efforts. Brand integrity will then be achieved and the brand will enjoy greater acceptance and longevity.

**Tourism Generation.** Not surprisingly, many of the focus group participants indicated that their eventual decision to settle in Fort Collins was precipitated by a visit to the Rocky Mountain region, and often to their attendance at CSU. While we have no hard data to back the assertion, it seems logical that a significant number of Fort Collins residents could make this claim – which merely emphasizes the importance of tourism to this region’s ability to attract talent, jobs, and capital investment.

Tourism development is a large and complex field, closely linked to economic development but requiring a distinct set of skills and information to implement. Increasingly, professionals in both fields are finding ways to collaborate for mutual benefit. For instance, some communities cross-reference their economic development recruitment databases with local tourism organizations’ visitor databases, in order to promote directly to visiting executives.

Ads for destination tourism sites today often include a message directed at employers, touting business climate as well as recreation.

**1.3.9** The City is encouraged to: [1] recognize the potential synergy between tourism and job creation/retention efforts; [2] leverage the talents and resources of the Uniquely Fort Collins cluster, neighboring communities such as Estes Park, and local/state tourism organizations; and [3] engage *all* of the cluster support groups in creative discussion about how to promote crossover between business and recreational visits.

## Infrastructure and Land Use

**Arterial Flow and Mass Transit.** Focus group participants frequently mentioned transportation issues as needing attention in and around Fort Collins – in particular, the Uniquely Fort Collins cluster representatives cited a desire for more mass transit alternatives and better north-south arterial capacity. Employers from the other three clusters tended to focus on proximity to Denver International Airport (DIA) as a key factor in quality of life and business environment, adding that I-25 congestion is problematic.

The City is already engaged in developing feasible alternatives to these situations, to the best of its ability given current limitations on funding. Such transportation issues are common to many communities comparable to Fort Collins, and certainly to metropolitan Denver as well. At the regional level, the long-term issue of I-25 congestion and transit links to Denver or DIA are, appropriately, being addressed by the North Front Range Metropolitan Planning Organization and by public/private groups such as the NCEDC’s Leadership 2010 council.

**1.4.0** As the City works to address local transportation issues (i.e. Citywide transit and arterials), it would be well to recognize their potential impacts on employers, and to seek input from local employers as well as

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residents on matters such as prioritization of proposed improvements and proposed funding strategies. In a state where business personal property tax is considered one of our most negative business climate factors, employers will be especially sensitive to any funding strategy that increases their tax burden disproportionately to the burden placed on residents.

*Wireless Internet access.* It is understood that telecommunications capacity and access are prerequisites to a positive business environment. The City is expected to achieve ubiquitous wireless access in the downtown area by the end of 2006.

**1.4.1** A logical next step would be to consider the feasibility of extending free wireless access throughout the city's employment and commercial corridors, educational facilities, and other areas frequented by businesspeople and entrepreneurs (such as the municipal airport, libraries and even parks).

*Housing Affordability.* Housing remains something of a double-edged sword for parts of Colorado. As first-tier business locations such as Silicon Valley become too expensive for even talented entry-level employees, companies are forced to look elsewhere – a situation that has benefited Colorado in the last two decades. More recently, however, the cost of housing throughout most of Front Range Colorado is of growing concern as the state competes for cost-sensitive job creation and retention projects. The lack of adequate affordable housing opportunities undermines family stability and creates a barrier to attract new businesses into the community. Despite the efforts of the Fort Collins city government, public agencies, the local housing authority, and coalition of housing providers, there is still much left to be done to ensure that families have a safe, affordable place to live. The City understands the significance of affordable housing in this community and approved the "Priority Affordable Housing Needs and Strategies Report" in 2004. The document provides a

strategy for addressing the affordable housing needs of all socio-economic groups in Fort Collins. This document has been helpful in guiding the City in the past to address long-term affordable housing needs. More recently, however, due to budgetary constraints coupled with the temporary change in market conditions that led to higher vacancy rates and excessive for-sale housing units on the market, the City's financial support for affordable housing has shrunk.

**1.4.2** The City is encouraged to make affordable housing a high priority. Adequate affordable housing enhances business expansion and a community's ability to attract and retain workers.

**1.4.3** The City is encouraged to restore funding for affordable housing in order to implement the affordable housing goals and address needs in the "Priority Affordable Housing Needs and Strategies Report." As the housing market continues to improve and tighten, the City should be proactive in avoiding the next affordable housing crisis that will make it difficult for businesses to maintain an adequate work force.

*Preservation of Commercial Corridors.* In order to grow in a sustainable way, many communities concern themselves with the balance of jobs to housing; Fort Collins is no exception. Portland, Oregon, for example, attempts to preserve and protect industrial sites through restrictions on rezoning, prohibitions on certain commercial/retail uses, site acquisition, and use of urban renewal areas. It is desirable to designate, zone and protect industrial and commercial land to ensure an adequate supply and an appropriate balance with housing, recreational, and other uses. The question of what is "adequate" for future needs can be difficult to answer, however.

**1.4.4** Fort Collins should approach this problem, at least in part, from a cluster perspective. That

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is, by developing a profile of current and projected land and facility needs in each of the target clusters. Such an analysis will likely identify ways in which facility needs are changing in some clusters, as past facility requirements are not necessarily an indicator of future needs in the rapidly changing world of high technology. There are at least two ways to generate useful information about cluster needs: First, some national real estate firms have developed sophisticated research capabilities and have begun to refine and map land and facility requirements for specific types of uses or industry sectors. Second, anecdotal information about such needs may be available from local cluster companies.

## Recommendations for Enhancing Cluster Capacity

The basic underpinnings of a successful cluster generally include:

- ◆ An active University/research and development/knowledge and leadership base
- ◆ A critical mass of collaborative/competitive companies
- ◆ Access to entrepreneurial support
- ◆ A skilled workforce
- ◆ Institutional and facility support

Fort Collins is fortunate to possess all of these prerequisites in some measure. Its proximity to metropolitan Denver and several major institutions of higher education amplify these strengths.

While a major trend in economic development for many years has been the focus on target industries or cluster development, there are varying degrees of the cluster approach. It is possible to take cluster emphasis overboard, with the risk of picking winners and losers among various industries and thus leaving a community vulnerable to volatility within and among industry sectors. Given Fort Collins' culture, the City's history with economic development, and the relative richness of cluster activity at CSU, we recommend an economic

development strategy that emphasizes enhancing the City's (and the region's) ability to help a variety of clusters grow and sustain themselves.

## Education and Research Assets

*Collaboration with CSU.* Leverage CSU's "superclusters" approach and the university's strengths to help drive or enhance the City's approach to cluster development in the following ways:

- 2.1.0** Seek to establish a strong collaborative relationship with CSU and economic development organizations such that each is assigned (and accepts) specific roles and responsibilities for cluster development. In his "Clusters of Innovation: Regional Foundations for U.S. Competitiveness," Harvard Professor Michael Porter offers a rational division of labor for cluster development among federal and state government, regional/local government, universities, cluster associations and individual firms (see excerpt, Appendix G).
- 2.1.1** Among City staff engaged in economic development and cluster activity, seek to broaden knowledge about CSU and its particular strengths in each of the City's target industry clusters – including its faculty, facilities, R&D capabilities, research grants, and innovators. At a minimum, seek to establish and maintain relationships with key faculty or staff at CSU who can provide this information as needed, thereby advancing opportunities for municipal/university collaboration. Again, the CSU research economist sponsored by NCEDC represents a valuable resource.
- 2.1.2** Recognize that clusters often overlap, offering opportunities for synergy. For example, CSU's federally supported research into infectious diseases is not limited to bioscience, but overlaps into Agri-Tech and Information Technology as well. Information

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sharing among clusters is important to achieving synergy.

*Higher Education Funding.* This is an issue of statewide importance and goes to the very heart of competitiveness for the State of Colorado and Fort Collins specifically.

- 2.1.3** Aggressively support efforts to maintain Colorado funding for higher education in general. Partner with CSU, FRCC, NCEDC, other communities, and other organizations to leverage success. Work with CSU to help that institution obtain needed infrastructure funding for research parks and maintenance.

## Collaborative Company Networks

*Cluster Affiliation/Advisory Groups.* Cluster advisory groups can play multiple roles and have significant benefits for:

- ◆ Advising the City on the cluster's needs for labor, education, infrastructure, facilities and institutional support
- ◆ Providing information on cluster trends in research, operations and new product development
- ◆ Networking and sharing of best practices, as a way to achieve creative synergy
- ◆ Conducting research that benefits cluster development

- 2.2.0** The City can and should provide leadership to launch collaborative efforts with educational institutions, professional associations and other Northern Colorado organizations such as NCEDC to establish cluster affiliation and advisory groups, with an idea that they will eventually become self-sustaining.

- 2.2.1** For each cluster, the City should designate a liaison, responsible for facilitating and attending industry gatherings, staying current with industry trends and needs, and informing City messaging, policy, and procedures accordingly.

- 2.2.2** Make cluster analysis and observation an ongoing priority within the City. Key to this understanding will be what helps to attract and retain talented workers in each cluster.

- 2.2.3** Finally, recognize that different clusters may behave differently or have unique requirements, and adapt the networking and information systems for each cluster accordingly.

*Industry Ambassadors.* There exists a veritable army of executives and entrepreneurs in Fort Collins who, as a matter of course, make presentations to audiences small and large throughout the U.S. and internationally. Any number of them may be in a position to incorporate a brief, positive message about Fort Collins in their presentations, and it is safe to assume that many would be willing to do so.

- 2.2.4** Where possible, enlist the aid of target industry CEOs and other executives to include a brief testimonial or promotional message about Fort Collins and Northern Colorado in their formal presentations and informal networking with other cluster representatives outside of Colorado. Give them a single PowerPoint slide to incorporate into presentations at will.

- 2.2.5** Enlist their cooperation in generating information about or introductions to vendors or suppliers whose presence in Fort Collins would enhance the cluster's synergy or improve their own competitive advantage.

## New Business Formation

*Online Referral Resource for Fundamentals.* An acknowledged key to improving success rates for start-ups and small businesses is help with fundamentals – business planning, financials and cash flow, operations, management of people and resources, and marketing among them. This is as true for the high-tech inventor/entrepreneur as for the owner of a coffee shop.

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**2.3.0** Provide an easily identified pathway via the City’s website for businesses and entrepreneurs to find direction and information about *all* available business assistance resources – an online directory with hotlinks. Consider establishing a page thereon for *private* contractors to small business to list their services (e.g., consultants in small business management, finance, business plan development, grant writers, etc.), with a mechanism for client feedback so that users of the site can access contractor references or rate their performance.

**2.3.1** Drive traffic to the website by promoting it through municipal and business communication channels, through educational institutions, and informal networks.

*Incubation.* Fort Collins established itself as a leader in entrepreneurial support many years ago with the establishment of the Fort Collins Technology Incubator. The FCTI has had demonstrable successes in the incubation of bioscience and software firms, and today has expanded (through the City’s generosity) to include physical incubator capacity. FCTI’s services are limited to those two sectors. It also appears the FCTI budget has been static at \$100,000 annually for many years, and the physical incubator space is fully occupied. The current incubator director indicates demand is at least double current capacity.

As incubation of new ventures is critical to the growth of clusters, we recommend the City pursue an aggressive strategy to expand the physical and virtual capacity of the FCTI.

**2.3.2** Assist the FCTI in obtaining new physical space suitable for incubation.

**2.3.3** Propose a re-evaluation of current and projected incubation needs encompassing all of Fort Collins’ target clusters.

**2.3.4** Increase the FCTI budget to an appropriate level as identified in the needs assessment. This may include increasing the City’s

budgetary support, leveraging increased support from affiliate organizations and possibly even authorizing an expanded funding base to include private donations.

**2.3.5** Extend incubator services to all of the target industry clusters.

## Workforce Development

*Employer/Job Seeker Links.* Focus group participants indicated they often have a hard time identifying candidates for internships and entry-level positions, even given the availability of outplacement services at CSU and other higher education institutions.

**2.4.0** Collaborate with FRCC and CSU to establish and host a local online bulletin board where job seekers, internship candidates, and employers can find one another or post information. Begin with postings of City jobs; eventually expand it to make it available to local Fort Collins employers. Drive traffic to the site through promotions in school outplacement/news services, Chamber of Commerce and other organizational outlets, and directly through local media. (Note: The City of Lincoln, Nebraska, has done an exemplary job of this; more detail can be viewed on that City’s website at <http://www.ci.lincoln.ne.us>).

*Attracting Young Talent.* University and community college students represent one of the richest sources of talent that is not yet committed to an established locale. Reaching out to students represents one way in which Fort Collins can enhance its talent pool while promoting a stronger link between higher education institutions and the community.

**2.4.1** Work with CSU, FRCC and local service providers (such as realtors and business associations) to make online information available to students about choosing to stay in Fort Collins after graduation. Include resources to help them find jobs, affordable

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continued

housing, day care, professional networks, and services such as financial or family planning. Structure the service to be hosted by the schools or a local business association, and include a hot-link to the City's website.

*Continued K-12 Excellence.* Fort Collins is known for superb K-12 educational amenities and results.

**2.4.2** Help to ensure performance remains high by encouraging business and education links in collaboration with the school district, higher education, business associations, and workforce development professionals. Work with these groups to: [a] develop and disseminate practical information for parents and guidance counselors on the types of skills and education required by employers in Fort Collins today and projected in the next decade; and [b] draw the link for students between achievement in the classroom and the ability to get a good job, whether in manufacturing or services.

## Institutional and Facility Support

*Agency and Nonprofit Support.* A region's cluster support network typically is enhanced by the presence of related governmental agencies and nonprofit organizations that afford access to funding, talent, information and support services. Fort Collins is home to many such organizations.

**2.5.0** With the help of cluster representatives and allies, identify those Federal, State, and nonprofit institutions that impact, assist, or otherwise influence cluster performance or development. Actively engage these organizations in cluster activities to leverage their knowledge base, resources, and communications networks.

*City Profile Within Clusters.* Company leaders may not always recognize or be aware that the municipality in which they are located is actively engaged in business support or economic development, or that government has that capacity.

**2.5.1** Set aside funds for cluster-related event hosting on a limited basis. Host at least one local or regional event annually in each of the City's highest priority clusters. For example, raise Fort Collins' visibility in a sector by hosting a main event for an association such as the Colorado Software and Internet Association (CSIA), or the American Electronics Association Colorado Chapter (AEA). Selectively pursue regional or national conferences within targeted industries, or host carefully selected events at conferences held in other locations. Use the sponsored events to bring attendees up to date on the City's enhancements and advantages for that sector.

## Recommendations for Specific Clusters

Only one of the four clusters analyzed in this report (the Uniquely Fort Collins cluster) is already active and self-sustaining in Fort Collins. The other three may have all the requisite attributes, but none of them have been organized for the purpose of cluster development and promotion. Therefore, it falls to the City of Fort Collins and its affiliates and allies to initiate cluster formation.

There are many resources put forward by various economic development and educational institutions that offer advice on how to build or initiate an industry cluster. One very good example is a 2002 guide published by the Wisconsin Department of Commerce. It offers specific steps in cluster formation and tips on how to engage private businesses in cluster formation, defining roles, responsibilities and cluster goals, how to manage meetings, etc. Following is a summary outline. The excerpt from this guide is included in this report as Appendix H.

### *Steps in Organizing an Industry Cluster*

- ◆ Initial Discussion with the Industry Champion(s)
  - Discuss high-level goals

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continued

- Address the champion's understanding of their role
- Clarify Facilitator/Staff role
- ◆ Planning the Industry Organizing Meeting
  - Decide on size/scope/goals of first meeting
  - Provide assistance in accessing names/contacts
  - Identify and invite representatives
  - Develop a motivational invitation letter/packet
- ◆ Convene the Organizing Meeting
  - Establish meeting objectives
  - Arrange speakers – orientation
  - Develop format for the meeting
- ◆ Developing the Cluster “Charter”
  - Catalog the key components of the cluster
  - Inventory the needs of the cluster companies
  - Map the interrelations among firms
  - Develop a vision of the cluster's future (next 10 years)

*Source: Wisconsin Department of Commerce, 2002.*

These guidelines provide an excellent starting point for organizing clusters. They should be looked upon as a tool that can be adapted to Fort Collins' cluster support infrastructure as staff and cluster leaders deem advisable.

The following recommendations for the specific clusters were included within the report chapter devoted to each cluster. These recommendations are repeated here so that all study recommendations exist in one location within the report.

## Agricultural Technology

*Synergies with Other Clusters.* Agri-Tech lends itself to agglomeration with Bioscience, Clean Energy, and Information Technology/Software. The opportunities for overlap are numerous, ranging from responding to bioterrorism threats to isolating the ideal time to plant and locate crops to developing disease-resistant crops. It may be in these areas of overlap where the greatest opportunities for high-skill, high-wage Agri-Tech jobs are found.

**3.1.0** For the near term, pursue support for this cluster as an adjunct, or part of, the Bioscience, Clean Energy, and Information Technology/Software clusters. This will allow the City to optimize the return on its efforts and avoid redundancy.

## Computer and Electronics Manufacturing

*Inaugural Effort.* The Computer and Electronics Manufacturing cluster has not been organized yet in Northern Colorado, although an active association exists to serve this cluster on a statewide basis (the Colorado Chapter of the American Electronics Association, or AEA).

**3.2.0** The City can and should play a lead role in initiating regional cluster development, in collaboration with CSU, Front Range Community College, AEA, NCEDC, FCTI and other organizations as appropriate.

*Partnership with the University.* Several opportunities exist for greater collaboration between private industry within this cluster and CSU. Active involvement in university research and utilization of students' skills are areas to be improved upon.

*Need for Niche Markets.* Greater specialization in the Computer and Electronics Manufacturing cluster in Fort Collins may better serve the industry in the long run.

*Collaborate with Economic Development Allies.* The Computer and Electronics Manufacturing industry is one of the industries tagged for retention efforts by the Metro Denver Economic Development

# RECOMMENDATIONS

continued

Corp. It is recommended that Fort Collins pursue opportunities for retaining and growing this industry in collaboration with other economic development efforts such as those underway through the Metro Denver EDC and the NCEDC.

### *Synergy with Information Technology/Software.*

The Information Technology industry may be thought of as including two distinct but inter-related segments – software and hardware. As high technology companies grow and merge, the lines between the hardware and software segments of the industry are blurred. There are opportunities for this industry to collaborate with cluster efforts related to the Information Technology/Software cluster.

### Information Technology/Software

*Inaugural Effort.* The IT/Software cluster has not been organized yet in Northern Colorado, although an active association exists to serve this cluster on a statewide basis (The Colorado Software and Internet Association, or CSIA).

**3.3.0** The City can and should play a lead role in initiating regional cluster development, in collaboration with CSU, FRCC, CSIA, NCEDC, FCTI, and other organizations as appropriate.

*Business to Business Collaboration.* This industry presents significant opportunities for businesses to collaborate on given projects. If given an opportunity to meet and discuss current research and project needs, new ideas and collaborations are likely to develop.

*Small Business Programs.* Software/IT tends to be entrepreneurial, so programs designed to assist small businesses may be particularly useful for this industry.

### Uniquely Fort Collins

*Cluster Status.* There already exists in Fort Collins a healthy core of associations emphasizing this cluster or downtown retail and cultural health. The City's support for these groups and their activities is well documented and serves to render the needed

information relative to support for the Uniquely Fort Collins cluster.

**3.4.0** What the City can do is to publicly acknowledge this cluster's status and importance to the community, and encourage linkages between downtown cluster businesses and those from other parts of the community.

*Downtown Jobs Base.* While the Unique cluster is certainly not limited to downtown, most of this cluster's businesses are located in the City's downtown area. The vitality of this cluster, then, can be enhanced by increasing the numbers of people who either live or work downtown.

**3.4.1** Pursue a significant employer (or employers) for downtown Fort Collins locations, using the Downtown Development Authority, Enterprise Zone, and other means at the City's disposal. Develop and publicize an enhanced, performance-based incentive package for primary employers who choose a downtown location. Pursue reputable private developers who specialize in downtown environments to assemble and potentially redevelop properties to be attractive to employers.

*Retail Leakage.* While retail businesses form only a part of the Unique cluster, attractive retail amenities certainly help to draw visitors to a region, or encourage residents to do their shopping locally – in which case they may be more likely to patronize businesses in the Unique cluster. Therefore, retail leakage – the loss of shopping revenues to retail sites outside the City – is cause for concern.

**3.4.2** Continue to monitor retail leakage on a regular basis, in order to identify opportunities for unique retail development or underserved consumer bases, and to support public and private efforts to redevelop aging retail sites.



# RECOMMENDATIONS

continued

## Implementation

To ensure that this report is useful and used, some advice on moving from study and planning to implementation is offered.

*Prioritization.* The first step in implementation is to assign priorities, given the City's human and financial resource capacity. Certainly not all of the recommendations herein can be implemented simultaneously, nor should they. City staff and leadership must agree on which recommendations are to be pursued and in what order of priority. Let priorities be driven by [a] those tasks that will have the greatest impact and [b] those where the necessary resources already exist within the City or can be readily leveraged. Include in the near term some tasks that are easily accomplished, as early successes will help to generate the support and momentum needed to accomplish more complex or difficult tasks.

*Periodic Evaluation.* Monitoring and evaluation are essential to any good economic development program. The City's Economic Advisor is currently developing an index of indicators for community sustainability and economic health. This is a very positive first step in establishing a sound basis for economic development policy, and for ensuring City programs remain responsive and accountable. Adoption and consistent use of such an index will also help to increase public awareness about the links between economic development and quality of life.

*Unified Support.* In establishing the Economic Advisor position and the economic development program, the City of Fort Collins has affirmed that economic development is an important part of the City's sustainability. The Mayor's and City Council's unified, ongoing, and vocal support for that philosophical concept, along with careful oversight and committed leadership, will be important to the ultimate success of this program.

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# APPENDIX A: CLUSTER DEFINITIONS

The following pages present the industry cluster definitions used in this report, including both the six-digit North American Industry Classification System (NAICS) codes and the corresponding four-, six-, or eight-digit Standard Industrial Classification (SIC) system codes. These definitions are also included in the section devoted to each industry cluster.

## APPENDIX A: CLUSTER DEFINITIONS

### Agricultural Technology

NAICS	NAICS Description	SIC	SIC Description
111419	Food Crops Grown Under Cover	0182	Food crops grown under cover
111421	Nursery and Tree Production	0181	Ornamental Floricultural and Nursery Products
111422	Floriculture Production	0181	Ornamental Floricultural and Nursery Products
115112	Soil Preparation, Planting, and Cultivating	0711	Soil Preparation services
115210	Support Activities for Animal Production	0751-04	Livestock Reproduction Services
115210	Support Activities for Animal Production	0751-9905	Vaccinating Services, Livestock
115210	Support Activities for Animal Production	0752-00	Animal Specialty Services
115210	Support Activities for Animal Production	0752-01	Animal Breeding Services
115210	Support Activities for Animal Production	0752-99	Animal Specialty Services, NEC
311119	Prepared Feed and Feed Ingredients, except for Cats and Dogs, except slaughtering Animals for Pet Food	2048-9907	Feed supplements
311119	Prepared Feed and Feed Ingredients, except for Cats and Dogs, except slaughtering Animals for Pet Food	2048-9911	Livestock feeds
325412	Pharmaceutical Preparation Manufacturing (Veterinary)	2834-9911	Veterinary Pharmaceutical Preparations
325414	Biological Product (except diagnostic) Manufacturing (Veterinary)	2836-9901	Veterinary Biological Products
541380	Testing Laboratories	8734-9908	Seed Testing Laboratory
541380	Testing Laboratories	8734-9909	Soil Analysis
541690	Horticulture Services	0781-0100	Horticulture services
541710	R&D Physical, Engineering, and life Sciences	8731-0101	Agricultural research
541710	R&D Physical, Engineering, and life Sciences	8731-0302	Environmental research
541940	Veterinary services	0741	Veterinary Services for Livestock
541940	Veterinary services	0742	Veterinary services for Animal Specialties
541940	Veterinary Services	8734-9910	Veterinary Testing

## APPENDIX A: CLUSTER DEFINITIONS

### Computer and Electronics Manufacturing

NAICS	NAICS Description	SIC	SIC Description
333295	Semiconductor Machinery Manufacturing	3559-9927	Semiconductor Machinery Manufacturing
334111	Electronic Computer Manufacturing	3571	Electronic Computers
334112	Computer Storage Device Manufacturing	3572	Computer Storage Devices
334113	Computer Storage Device Manufacturing	3575	Computer Terminals
334119	Other Computer Peripheral Equipment Manufacturing	3577	Computer Peripheral Equipment, NEC
334411	Electron Tube Manufacturing	3671	Electron Tubes
334412	Bare Printed Circuit Board Manufacturing	3672	Printed Circuit Boards
334413	Semiconductor and Related Device Manufacturing	3674	Semiconductors and Related Devices
334414	Electronic Capacitor Manufacturing	3675	Electronic Capacitors
334415	Electronic Resistor Manufacturing	3676	Electronic Resistors
334416	Electronic Coils, Transformers, and Other Inductors	3677	Electronic Coils and Transformers
334417	Electronic Connector Manufacturing	3678	Electronic Connectors
334418	Printed Circuit Assembly (Electronic Assembly)	3679	Electronic Components, NEC
334419	Other Electronic Component Manufacturing	3679	Electronic Components, NEC
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals-Semiconductor Test Equipment	3825	Instruments to Measure Electricity
334613	Magnetic & Optical Recording Media Mfg (pt)	3577	Computer peripheral equipment NEC
334613	Magnetic and Optical Recording Media Manufacturing	3695	Magnetic and Optical Recording Media
335999	All Other Misc. Electrical Equipment and Component Manufacturing	3699	Electrical Equipment and Supplies, NEC
541330	Engineering Services	8711-0202	Mechanical Engineering
541330	Engineering Services	8711-9903	Consulting Engineering
541330	Engineering Services	8711-9905	Electrical or Electronic Engineering
541330	Engineering Services	8711-9906	Energy Conservation Engineering
541710	Research & Development in the Physical, Engineering, & Life Sciences	8731-0203	Commercial Physical Research, Computer Hardware Development

## APPENDIX A: CLUSTER DEFINITIONS

### Information Technology

NAICS	NAICS Description	SIC	SIC Description
334611	Software Reproducing	7372	Prepackaged software
511210	Software Publishers	7372	Prepackaged software
518111	Internet Service Providers	7375	Information retrieval services (on-line services)
518112	Web Search Portals	8999	Services, NEC (internet web search portals)
518210	Data Processing, Hosting & Related Services	7374	Data processing
541511	Custom Computer Programming Services	7371	Custom computer programming services
541512	Computer Systems Design Services (pt)	7373	Computer integrated systems design
541513	Computer facilities management services	7376	Computer facilities management
541519	Other Computer Related Services	7379	Computer related services NEC

### Uniquely Fort Collins

NAICS	NAICS Description	SIC	SIC Description
<i>Artistic and Cultural Entertainment</i>			
453920	Art Dealers	5999-1601	Misc. Retail Stores, NEC (Art Dealers)
453920	Art Gallery	7999-9901	Art Gallery, Commercial
611610	Fine Arts Schools	7911	Dance Studies, Schools, and Halls (Dance instructors Professional and Other Dance Schools)
711110	Theater Companies & Dinner Theaters	5812	Eating Places (Dinner Theaters)
711110	Theater Companies & Dinner Theaters	7922	Theatrical Producers (Except Motion Pictures) and Misc. Theatrical Services (Theater Companies, Opera Companies)
711120	Dance Companies	7922	Theatrical Producers (Except Motion Pictures) and Misc. Theatrical Services (Ballet and Dance Companies)
711130	Musical Groups and Artists	7929	Bands, Orchestras, Actors, and Entertainment Groups (Musical Groups and Artists or Orchestras)
711110	Theater Companies & Dinner Theaters	5812	Eating Places (Dinner Theaters)
711110	Theater Companies & Dinner Theaters	7922	Theatrical Producers (Except Motion Pictures) and Misc. Theatrical Services (Theater Companies, Opera Companies)

## APPENDIX A: CLUSTER DEFINITIONS

### Uniquely Fort Collins (Con't)

NAICS	NAICS Description	SIC	SIC Description
<i>Artistic and Cultural Entertainment (Con't)</i>			
711120	Dance Companies	7922	Theatrical Producers (Except Motion Pictures) and Misc. Theatrical Services (Ballet and Dance Companies)
711130	Musical Groups and Artists	7929	Bands, Orchestras, Actors, and Entertainment Groups (Musical Groups and Artists or Orchestras)
711110	Theater Companies & Dinner Theaters	5812	Eating Places (Dinner Theaters)
711110	Theater Companies & Dinner Theaters	7922	Theatrical Producers (Except Motion Pictures) and Misc. Theatrical Services (Theater Companies, Opera Companies)
711190	Other Performing Arts Companies	7929	Bands, Orchestras, Actors, and Entertainment Groups (Musical Groups and Artists or Orchestras)
711310	Promoters of Performing Arts with Facilities	6512-03	Operators of Nonresidential Buildings (Stadium and Arena Owners)
711310	Promoters of Performing Arts With Facilities	7922	Theatrical Producers (Except Motion Pictures) and Theater Operators
711310	Promoters of Performing Arts With Facilities	7941	Professional Sports clubs and Promoters
711310	Promoters of Performing Arts With Facilities	7999	Amusement and Recreation Services, NEC (State Fairs, etc. With facilities)
711320	Promoters of Performing Arts Without Facilities	7922	Theatrical Producers (Except Motion Pictures) and Theater Operators
711320	Promoters of Performing Arts Without Facilities	7941	Professional Sports clubs and Promoters
711320	Promoters of Performing Arts Without Facilities	7999	Amusement and Recreation Services, NEC (State Fairs, etc. W/O Facilities)
711510	Independent Artists, Writers, & Performers	7699	Repair Shops and Related Services, NEC (Taxidermists and Antique Repair and Restoration, Except Antique Car Restoration)
711510	Independent Artists, Writers, & Performers	7819	Services Allied to Motion Picture Production (Film Directors and Related Motion Picture Production Services, Independent)
711510	Independent Artists, Writers, & Performers	7922	Theatrical Producers (Except Motion Picture) and Misc. Theatrical Services

## APPENDIX A: CLUSTER DEFINITIONS

### Uniquely Fort Collins (Con't)

NAICS	NAICS Description	SIC	SIC Description
711510	Independent Artists, Writers, & Performers	7929	Bands, Orchestras, Actors, and Entertainment Groups (Actors and Actresses)
711510	Independent Artists, Writers, & Performers	8999	Services, NEC (Authors, Artists, and Related Technical Services, Independent)
712110	Museums	8412	Museums and Art Galleries (Except Historic and Heritage Sites)
712120	Historical Sites	8412	Museums and Art Galleries (Historic and Heritage Sites)
712130	Zoos and Botanical Gardens	8422	Arboreta and Botanical or Zoological Gardens (Except Nature Parks or Reserves)
712190	Nature Parks and Other Similar Institutions	7999	Amusement and Recreation Services, NEC (Misc. Commercial Parks)
<b><i>Recreational And Retail Activities</i></b>			
311330	Convectional Manufacturing from Purchased Chocolate *	5441-9903	Candy, Nut, and Confectionary Stores (Chocolate Candy Stores, Preparing on Premises) *
311513	Cheese Manufacturing *	2022	Natural, Processed, and Imitation Cheese *
311811	Retail Bakeries *	5461	Retail Bakeries (Bread, Cake, and Related Products Baked and Sold on Premises)
312120	Breweries *	2082	Malt Beverages (Except Malt Extract) *
442110	Furniture Stores **	5712	Furniture Stores (Except Custom Furniture and Cabinets) **
442299	All Other Home Furnishing Store s**	5719	Misc. Home Furnishing Stores (Except Pottery and Crafts Made and Sold on Site and Window Furnishings) **
442299	All Other Home Furnishing Stores **	7699	Repair Shops and Related Services (Custom Pictures Framing) **
448110	Men's Clothing Stores **	5611	Men's and Boys' Clothing and Accessory Stores **
448120	Women's clothing Stores **	5621	Women's Clothing Stores **
448130	Children's and Infants' Clothing Stores **	5641	Children's and Infants' Wear Stores **
448140	Families clothing Stores **	5651	Family Clothing Stores **
448150	Clothing Accessories Stores **	5611	Men's and Boys' Clothing and Accessory Stores (Accessories) **
448150	Clothing Accessories Stores **	5632	Women's Accessory and Specialty Stores (Accessories) *
448150	Clothing Accessories Stores **	5699	Misc. Apparel and Accessory Stores (Accessories)



## APPENDIX A: CLUSTER DEFINITIONS

### Uniquely Fort Collins (Con't)

NAICS	NAICS Description	SIC	SIC Description
<b><i>Recreational And Retail Activities (Con't)</i></b>			
448190	Other clothing Stores **	5699	Misc. Apparel and Accessory Stores **
448210	Shoe Stores **	5661	Shoe Stores **
448310	Jewelry Stores **	5944	Jewelry Stores **
448320	Luggage and Leather Stores **	5948	Luggage and Leather Goods Stores **
451110	Sporting Goods Stores **	5941	Sporting Good Stores and Bicycle Shops
451120	Hobby, Toy, and Game Stores **	5945	Hobby, Toy and Game Stores **
451130	Sewing, Needlework and Piece Good Stores **	5949	Sewing, Needlework, and Piece Good Stores **
451140	Musical Instruments & Supplies **	5736	Musical Instrument Stores **
451211	Book Stores **	5942	Book Stores **
451220	Prerecorded Tape, Compact Disc and Record Stores **	5735	Record and Prerecorded Tape Stores **
452990	Other General Merchandise Stores **	5399	Misc. General Merchandise Stores **
453110	Florists **	5992	Florists **
453210	Office Supplies & Stationary Stores **	5943	Stationary Stores **
453220	Gift, Novelty, and Souvenir Stores **	5947	Gift, Novelty, and Souvenir Stores **
453310	Used Merchandise Stores**	5932	Used Merchandise Stores (Except Pawn Shops) **
561520	Tour Operators	7999-76	Tour Operators
611620	Sports and Recreation instruction	7999	Operators of Nonresidential Buildings (Stadium and Arena Owners)
713990	All Other Amusement and Rec. Industries	7999	Amusement and Recreation Services, NEC (No Organized Camping, Food Service, etc.)
721214	Recreational and Vacation Camps (Except Campgrounds)	7032	Sporting and Recreational Camps and Organized Outdoor Adventure Retreats (Trail Riding, While-Water Rafting, Hiking, etc.)
<b><i>Hospitality</i></b>			
721110	Hotels and Motels (Except Casino Hotels)	7011	Hotels and Motels (Except Casino Hotels)
721191	Bed and Breakfast Inns	7011	Hotels and Motels (Bed and Breakfast Inns)
721199	All Other Traveler Accommodations	7011	Hotels and Motels (Except Hotels, Motels and Bed and Breakfast Inns)
722110	Full-Service Restaurants	5812	Eating places (Full Service Restaurants)

\*Includes businesses with customer interactions (i.e. tours) \*\*Includes businesses with ten employees or less

# APPENDIX B: FOCUS GROUP PARTICIPANTS

The following companies participated in a focus group discussion or participated in a one-on-one discussion with staff or the consultants on this project. We thank them for taking the time to provide us with their views and suggestions.

## **Agricultural Technology**

Bath Nursery  
Cedar Creek Associates  
Fort Collins Wholesale Nursery  
ImuTek Laboratories Inc.  
Jim Sell Design Inc.  
Kaufman & Robinson Inc.  
Land Images  
Miller Ecological Consultants Inc.  
MWH Americas, Inc.  
Ranchway Feed  
XY Inc.

## **Computer and Electronics Manufacturing**

Directed Energy Inc.  
Hewlett Packard  
Sigma Instruments

## **Information Technology/Software**

C3 Technologies  
CEO Forum  
New Century Software  
Process Innovations Inc.  
Red Hen Systems  
RPM Technology  
TechniGraphic Systems, Inc.

## **Uniquely Fort Collins**

The Armstrong Hotel  
Bas Bleu Theatre Company Marriott Hotels  
Canyon Concert Ballet  
CooperSmith's Pub & Brewing  
Marriott Hotels  
MouCo Cheese Company  
The Mountain Shop/Poudre River Kayak & Canoe  
Mountain Whitewater Descents  
New Belgium Brewing

# APPENDIX C: DETAILED CLUSTER DATA

The following pages present the number of businesses and total employment for each of the industry clusters by NAICS code. Data is presented for the years 2001 and 2005, as well as average annual growth rates.

## APPENDIX C: DETAILED SECTOR DATA

NAICS	NAICS Description	2001		2005		2001-2005 Absolute Growth		2001-2005 Avg Annual Growth	
		Bus	Employ	Bus	Employ	Bus	Employ	Bus	Employ

### Agricultural Technology

<b>Total</b>		<b>70</b>	<b>1,511</b>	<b>88</b>	<b>1,574</b>	<b>25.7%</b>	<b>4.2%</b>	<b>5.89%</b>	<b>1.03%</b>
111419	Food Crops Grown Under Cover	0	0	2	15	0.0%	0.0%	0.0%	0.0%
111421	Nursery and Tree Production	8	143	7	153	-12.5%	7.0%	-3.3%	1.7%
111422	Floriculture Production	1	3	1	10	0.0%	233.3%	0.0%	35.1%
115112	Soil Preparation, Planting, and Cultivating	0	0	2	8	0.0%	0.0%	0.0%	0.0%
115210	Support Activities for Animal Production	3	11	5	19	66.7%	72.7%	13.6%	14.6%
311119	Prepared Feed and Feed Ingredients, except for Cats and Dogs, except slaughtering Animals for Pet Food	2	66	3	63	50.0%	-4.5%	10.7%	-1.2%
325412	Pharmaceutical Preparation Manufacturing (Veterinary)	1	7	3	63	200.0%	800.0%	31.6%	73.2%
325414	Biological Product (except diagnostic) Manufacturing (Veterinary)	2	200			-100.0%	-100.0%	-100.0%	-100.0%
541380	Testing Laboratories	0	0	7	150	0.0%	0.0%	0.0%	0.0%
541690	Horticulture Services	7	31	15	33	114.3%	6.5%	21.0%	1.6%
541710	R&D Physical, Engineering, and life Sciences	7	122	10	134	42.9%	9.8%	9.3%	2.4%
541940	Veterinary services	39	928	33	926	-15.4%	-0.2%	-4.1%	-0.1%

## APPENDIX C: DETAILED SECTOR DATA

NAICS	NAICS Description	2001		2005		2001-2005 Absolute Growth		2001-2005 Avg Annual Growth	
		Bus	Employ	Bus	Employ	Bus	Employ	Bus	Employ
<b>Computer Manufacturing</b>		<b>93</b>	<b>7,422</b>	<b>103</b>	<b>6,191</b>	<b>10.8%</b>	<b>-16.6%</b>	<b>2.6%</b>	<b>-4.4%</b>
333295	Semiconductor Machinery Manufacturing	0	0	1	6	0.0%	0.0%	0.0%	0.0%
334111	Electronic Computer Manufacturing	5	4,742	3	3,736	-40.0%	-21.2%	-12.0%	-5.8%
334112	Computer Storage Device Manufacturing	0	0	0	0	0.0%	0.0%	0.0%	0.0%
334413	Semiconductor and Related Device Manufacturing	0	0	0	0	0.0%	0.0%	0.0%	0.0%
334411	Electron Tube Manufacturing	1	9	0	0	-100.0%	-100.0%	-100.0%	-100.0%
334412	Bare Printed Circuit Board Manufacturing	1	1	1	119	0.0%	11800.0%	0.0%	230.3%
334413	Semiconductor and Related Device Manufacturing	2	252	2	189	0.0%	-25.0%	0.0%	-6.9%
334414	Electronic Capacitor Manufacturing	0	0	0	0	0.0%	0.0%	0.0%	0.0%
334415	Electronic Resistor Manufacturing	0	0	0	0	0.0%	0.0%	0.0%	0.0%
334416	Electronic Coils, Transformers, and Other Inductors	0	0	1	19	0.0%	0.0%	0.0%	0.0%
334417	Electronic Connector Manufacturing	0	0	0	0	0.0%	0.0%	0.0%	0.0%
334418	Printed Circuit Assembly (Electronic Assembly)	1	882	1	698	0.0%	-20.9%	0.0%	-5.7%
334419	Other Electronic Component Manufacturing	2	44	1	7	-50.0%	-84.1%	-15.9%	-36.8%
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals-Semiconductor Test Equipment	2	76	2	62	0.0%	-18.4%	0.0%	-5.0%
334613	Magnetic and Optical Recording Media Manufacturing	0	0	0	0	0.0%	0.0%	0.0%	0.0%

## APPENDIX C: DETAILED SECTOR DATA

NAICS	NAICS Description	2001		2005		2001-2005 Absolute Growth		2001-2005 Avg Annual Growth	
		Bus	Employ	Bus	Employ	Bus	Employ	Bus	Employ
<b>Computer Manufacturing (Con't)</b>									
335999	All Other Misc. Electrical Equipment and Component Manufacturing	3	227	2	45	-33.3%	-80.2%	-9.6%	-33.3%
541330	Engineering Services	74	1,175	84	1,264	13.5%	7.6%	3.2%	1.8%
541710	R&D in the Physical, Engineering, & Life Sciences	2	14	5	46	150.0%	228.6%	25.7%	34.6%

### Information Technology

<b>Total</b>		<b>142</b>	<b>2,313</b>	<b>173</b>	<b>2,257</b>	<b>21.8%</b>	<b>-2.4%</b>	<b>5.1%</b>	<b>-0.6%</b>
334611	Software Reproducing	3	43	1	5	-66.7%	-88.4%	-24.0%	-41.6%
511210	Software Publishers	26	177	25	206	-3.8%	16.4%	-1.0%	3.9%
518111	Internet Service Providers	4	41	2	51	-50.0%	24.4%	-15.9%	5.6%
518112	Web Search Portals	1	85	1	7	0.0%	-91.8%	0.0%	-46.4%
518210	Data Processing, Hosting & Related Services	4	67	8	100	100.0%	49.3%	18.9%	10.5%
541511	Custom Computer Programming Services	34	423	48	267	41.2%	-36.9%	9.0%	-10.9%
541512	Computer Systems Design Services (pt)	51	469	72	458	41.2%	-2.3%	9.0%	-0.6%
541513	Computer facilities management services	2	16	2	18	0.0%	12.5%	0.0%	3.0%
541519	Other Computer Related Services	17	992	14	1,145	-17.6%	15.4%	-4.7%	3.7%

## APPENDIX C: DETAILED SECTOR DATA

NAICS	NAICS Description	2001		2005		2001-2005 Absolute Growth		2001-2005 Avg Annual Growth	
		Bus	Employ	Bus	Employ	Bus	Employ	Bus	Employ
<b>Uniquely Fort Collins</b>									
<b>Total</b>		<b>385</b>	<b>7,018</b>	<b>399</b>	<b>7,146</b>	<b>3.6%</b>	<b>1.8%</b>	<b>0.9%</b>	<b>0.5%</b>
<i>Artistic and Cultural Entertainment</i>									
<b>Total</b>		<b>105</b>	<b>662</b>	<b>35</b>	<b>327</b>	<b>-66.7%</b>	<b>-50.6%</b>	<b>-24.0%</b>	<b>-16.2%</b>
453920	Art Gallery	13	74	6	27	-53.8%	-63.5%	-17.6%	-22.3%
611610	Fine Arts Schools	19	98	8	95	-57.9%	-3.1%	-19.4%	-0.8%
711110	Theater Companies & Dinner Theaters	1	8	3	52	200.0%	550.0%	31.6%	59.7%
711120	Dance Companies	7	19			-100.0%	-100.0%	-100.0%	-100.0%
711130	Musical Groups and Artists	4	25	1	5	-75.0%	-80.0%	-29.3%	-33.1%
711190	Other Performing Arts Companies	6	18			0.0%	0.0%	0.0%	0.0%
711310	Promoters of Performing Arts With Facilities	1	86	1	4	0.0%	0.0%	0.0%	0.0%
711320	Promoters of Performing Arts Without Facilities	8	48	2	7	-75.0%	-85.4%	-29.3%	-38.2%
711510	Independent Artists, Writers, & Performers	1	8	11	35	1000.0%	337.5%	82.1%	44.6%
712110	Museums	18	86	2	15	-88.9%	-82.6%	-42.3%	-35.4%
712120	Historical Sites	15	60			0.0%	0.0%	0.0%	0.0%
712130	Zoos and Botanical Gardens	5	26			0.0%	0.0%	0.0%	0.0%
712190	Nature Parks and Other Similar Institutions	7	106	1	87	0.0%	0.0%	0.0%	0.0%
<i>Recreational And Retail Activities</i>									
<b>Total</b>		<b>132</b>	<b>1,823</b>	<b>211</b>	<b>2,325</b>	<b>59.8%</b>	<b>27.5%</b>	<b>12.4%</b>	<b>6.3%</b>
311330	Convectional Manufacturing from Purchased Chocolate *	9	37	2	11	-77.8%	-70.3%	-31.3%	-26.2%
311513	Cheese Manufacturing *	6	114	2	17	-66.7%	-85.1%	-24.0%	-37.9%
311811	Retail Bakeries *	2	71	3	50	50.0%	-29.6%	10.7%	-8.4%
312120	Breweries *	1	3	5	907	400.0%	30133.3%	49.5%	317.0%

## APPENDIX C: DETAILED SECTOR DATA

NAICS	NAICS Description	2001		2005		2001-2005 Absolute Growth		2001-2005 Avg Annual Growth	
		Bus	Employ	Bus	Employ	Bus	Employ	Bus	Employ
<b>Uniquely Fort Collins (Con't)</b>									
<i>Recreational And Retail Activities (Con't)</i>									
442110	Furniture Stores **	2	5	17	103	750.0%	1960.0%	70.7%	113.0%
442299	Other Home Furnishing Stores**	0	0	11	40	0.0%	0.0%	0.0%	0.0%
448110	Men's Clothing Stores **	0	0	2	12	0.0%	0.0%	0.0%	0.0%
448120	Women's clothing Stores **	3	32	6	25	100.0%	-21.9%	18.9%	-6.0%
448130	Children's and Infants' Clothing Stores **	7	19	2	7	-71.4%	-63.2%	-26.9%	-22.1%
448140	Family Clothing Stores**	1	7	1	9	0.0%	28.6%	0.0%	6.5%
448150	Clothing Accessories Stores **	0	0	3	12	0.0%	0.0%	0.0%	0.0%
448190	Other clothing Stores **	0	0	12	40	0.0%	0.0%	0.0%	0.0%
448210	Shoe Stores **	0	0	11	61	0.0%	0.0%	0.0%	0.0%
448310	Jewelry Stores **	1	9	14	79	1300.0%	777.8%	93.4%	72.1%
448320	Luggage and Leather Stores **	1	8	1	4	0.0%	-50.0%	0.0%	-15.9%
451110	Sporting Goods Stores **	3	52	29	135	866.7%	159.6%	76.3%	26.9%
451120	Hobby, Toy, and Game Stores **	4	796	7	43	75.0%	-94.6%	15.0%	-51.8%
451130	Sewing, Needlework and Piece Good Stores **	16	72	4	19	-75.0%	-73.6%	-29.3%	-28.3%
451140	Musical Instruments & Supplies **	7	27	5	23	-28.6%	-14.8%	-8.1%	-3.9%
451211	Book Stores **	3	23	4	24	33.3%	4.3%	7.5%	1.1%
451220	Prerecorded Tape, Compact Disc and Record Stores **	4	13	2	8	-50.0%	-38.5%	-15.9%	-11.4%
452990	Other General Merchandise Stores **	1	5	4	109	300.0%	2080.0%	41.4%	116.1%
453110	Florists **	5	33	5	23	0.0%	-30.3%	0.0%	-8.6%
453210	Office Supplies & Stationary Stores **	2	11	2	3	0.0%	-72.7%	0.0%	-27.7%
453220	Gift, Novelty, and Souvenir Stores **	14	62	14	74	0.0%	19.4%	0.0%	4.5%
453310	Used Merchandise Stores*	14	77	13	59	-7.1%	-23.4%	-1.8%	-6.4%



## APPENDIX C: DETAILED SECTOR DATA

NAICS	NAICS Description	2001		2005		2001-2005 Absolute Growth		2001-2005 Avg Annual Growth	
		Bus	Employ	Bus	Employ	Bus	Employ	Bus	Employ

### Uniquely Fort Collins (Con't)

#### *Recreational And Retail Activities (Con't)*

561520	Tour Operators	1	8	5	22	400.0%	175.0%	49.5%	28.8%
611620	Sports and Recreation instruction	7	44	10	185	42.9%	320.5%	9.3%	43.2%
713990	All Other Amusement and Rec. Industries	16	288	13	214	-18.8%	-25.7%	-5.1%	-7.2%
721214	Recreational and Vacation Camps (Except Campgrounds)	2	7	2	7	0.0%	0.0%	0.0%	0.0%

#### *Hospitality*

<b>Total</b>		<b>148</b>	<b>4,533</b>	<b>153</b>	<b>4,494</b>	<b>3.4%</b>	<b>-0.9%</b>	<b>0.8%</b>	<b>-0.2%</b>
721110	Hotels and Motels (Except Casino Hotels)	22	558	21	577	-4.5%	3.4%	-1.2%	0.8%
721191	Bed and Breakfast Inns	1	7	1	4	0.0%	-42.9%	0.0%	-13.1%
721199	All Other Traveler Accommodations					0.0%	0.0%	0.0%	0.0%
722110	Full-Service Restaurants	125	3968	131	3913	4.8%	-1.4%	1.2%	-0.3%

*\*Includes businesses with customer interactions (i.e. tours)    \*\*Includes businesses with ten employees or less*

# APPENDIX D: BIOSCIENCE CLUSTER

The following report by the Larimer County Bioscience Initiative presents a detailed strategic plan for growing the Bioscience cluster in Northern Colorado. Additional information regarding the Larimer County Bioscience Initiative and the Bioscience industry in Colorado is available from the Colorado Bioscience Association, <http://www.cobioscience.com/index.htm>.

**Building Northern Colorado's BioScience Future**  
A Strategic Plan By:  
Larimer County Bioscience Initiative

June 2005

**Sponsored By:**



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# BUILDING NORTHERN COLORADO'S BIOSCIENCE FUTURE

## INTRODUCTION

Larimer County has long been an important center for bioscience activity in Colorado. Research from Colorado State University (CSU) has been commercialized through local companies; larger companies have licensed technologies to new “spin-out” companies; serial entrepreneurs have created a legacy of start-up successes; and inventors have created new companies to manufacture, market, and distribute their products. This activity has been supported by the prominent science at CSU, a great quality of life, and a business climate favorable to entrepreneurs and inventors.

The stakeholders that convened to produce this plan had a belief that working from the current strengths of the bioscience industry and research activities in Larimer County, strategies could be identified that would encourage additional growth toward “critical mass” in the area. The group reviewed the State bioscience plan, *Colorado's Place in the Sun: A Bioscience Future (2003)*, and found a larger context for planning that could be used to investigate and develop a local plan. In fact, the State plan envisioned the unique strengths and opportunities of Northern Colorado as key assets in growing the industry in Colorado. Therefore, the Larimer County group started with the State strategies and action items and proceeded to identify ways to modify them to fit local opportunities, threats, weaknesses, and strengths. This plan is the result of that process.

Analysis documented in the 2003 plan indicated that although Colorado was not yet a “tier-one” state in the biosciences, Colorado was in a competitive position to grow to a level of critical mass typically found in the most notable top tier states. This analysis was supported by growth trends in Colorado related to research funding, bioscience company growth and creation, financing, and employment. The State plan concluded that executing a clearly articulated set of strategies and action items would increase the likelihood of success wherein:

“Colorado is the preeminent life science center for the Mountain Region, serving health care needs throughout the nation and around the world by virtue of its excellent research, education, and clinical institutions. Colorado has a vibrant cluster of bioscience companies that are developing technological solutions to address health care, environmental, agricultural and veterinary, and national security needs.”

Like the State as a whole, Larimer County is poised to be an important regional and national center for the biosciences. The plan presented here is the stakeholders' consensus on how to mobilize resources, coordinate actions, and identify long-term partnerships and leadership for this important effort.

## KEY SUCCESS FACTORS

The top ten bioscience clusters in the nation include San Diego, Boston, Raleigh-Durham, San Jose, Seattle-Bellevue, Washington DC, Philadelphia, San Francisco, Oakland and Los Angeles-Long Beach. In order to understand what is required to move a region forward in pursuit of a strong bioscience presence, an examination of the key success factors common to the strongest national clusters is essential. Identified success factors and Larimer County's status relative to each are discussed below.

### I. Engaged Universities with Active Leadership

A. Description— An outstanding set of research organizations is required to become serious about the biosciences. But it takes more than simply research stature. It requires the capability to engage industry, directly or indirectly, to convert this intellectual knowledge into economic activity. Of particular importance are programs to assure development of world-class research capability; willingness to negotiate with industry; an institutional commitment to a role in regional economic development; and presence of a technology commercialization infrastructure.

B. Fort Collins has a major asset in the leadership and research productivity in the biosciences at CSU. However, a demonstrated commitment and success in translating research into opportunities for local commercialization efforts is also essential. CSU is implementing major new initiatives to promote industry relationships and to increase technology transfer efforts. It is important to note that many of these changes will be difficult because of the historical and current reliance on basic science research funds (as compared to translational efforts), the reward systems in place for faculty inventors, and the current budget crisis within higher education in Colorado.

C. The single largest factor in building a successful bioscience cluster in Fort Collins is the extent to which the University serves as the major driver of new technologies and successfully develops partnerships with industry to create new products and services.

D. There are many strong programmatic areas at CSU expected to produce technologies which can be commercialized. Examples include: infectious disease, atmospheric science, chemistry, agriculture, veterinary medicine and biomedicine, engineering, and biosecurity. CSU will be challenged in meeting the resource investments in these areas and promoting their competitiveness; but a focus on these priorities is critical. Through these strengths, the Fort Collins "niche" in the bioscience industry will emerge.

## **II. An Active and Coordinated Industry**

A. Description—Success in building technology cluster requires extensive collaboration among individuals and institutions spanning a range of academic disciplines and institutions, diverse industrial sectors, and the diverse and somewhat incompatible cultures of industry, academic, and state and local government. In a few leading communities like Silicon Valley, this networking has occurred naturally. However, in the vast majority of American regions, mechanisms that encourage and support networking and collaboration need to be created.

B. The bioscience industry has a collaborative culture and it requires a variety of complex relationships to thrive. In most mature clusters, there are visible, sustained, and highly coordinated efforts that serve to convene the industry and its key partners on a regular basis. This has not existed in Fort Collins. Networking is more established for other technology sectors.

C. CSU has increased its efforts to include industry in colloquia, seminars, and other academic events. Similarly, the Colorado BioScience Association (CBSA) is working with local stakeholders to increase industry-focused events. The opening of a CBSA office in Fort Collins ensures a sustained effort for the industry and in cooperation the local business and academic community. Without a “critical mass” in Northern Colorado within the bioscience industry, these relationship development opportunities are essential. A great challenge is capturing the interest of the academic faculty in participating in industry-sponsored events.

D. A coordinated and networked industry will generate increased opportunities to influence major items of importance to the industry. For example, the bioscience industry naturally has an interest in the health and growth of the University, but this interest needs to be converted into action through coordinated efforts. The industry is uniquely able to articulate the connection between the health of Colorado’s research institutions and creation of new companies and jobs in the community.

## **III. Available Capital**

A. Description—Leading bioscience regions are home to venture capital (VC) communities that are committed to early-stage financing and to making significant local investment. Having VC funds with experience investing in bioscience companies is a necessity. It is also critical that sufficient private equity capital is available to build a pipeline of high quality bioscience startups for eventual venture capital funding. In other words, funding must be available for all stages of company formation and growth, from early stage proof of concept and prototype development to later stage product expansion and acquisition. Programs are necessary to address commercialization, pre-seed and seed financing gaps. Angel investors that understand the intricacies of bioscience startups are essential as are philanthropic and public entity financing.

An analysis of the bioscience funding situation in Northern Colorado reveals significant gaps:

B. Venture Capital Funding—The majority of Colorado VC firms are located in the Denver-Boulder region. It is not believed that the physical distance to Larimer County is a problem. A much greater concern is the mindset that prevails in the Denver-Boulder area regarding the dearth of quality startup companies in the Fort Collins region. Even the Fort Collins based VC firm has made the majority of its investments outside of Larimer County. While this “second rate” perception is strongly entrenched, several local startups are on the verge of gaining a national presence. A few local success stories could make an enormous difference in this misguided perception. Fortunately Colorado State University’s outstanding national reputation in a number of bioscience disciplines helps to build credibility for Northern Colorado.

Approximately 30 VC funds operate in Colorado and close to one-third invest in bioscience companies (Access Venture Partners, Boulder Ventures, Mobius Venture Capital, Murphee Venture Partners, Quest Capital Partnership, Roser Ventures, SAP Ventures, Sequel Venture Partners, Sutter Hill Ventures, and UV Partners). This is viewed as a healthy situation for the region.

At this time an experienced bioscience professional is attempting to raise investment capital in order to launch a venture capital fund that would be located in Fort Collins and support bioscience companies exclusively.

C. Angel Financing—Currently Larimer County does not have an angel network. That being said, there are many active angels in the region. Examples are numerous. Vista Ventures, a local VC firm, raised its initial round of financing largely from Fort Collins investors. A local bioscience startup has successfully raised close to \$12 million through private equity. The vast majority of investors in this company are local. Numerous IT companies successfully raised private equity funding as well. One can conclude that while there is no official angel network, there most certainly is an underground network which is fairly robust, given the limited population of the region.

The Northern Colorado Rockies Venture Club program is held twice a year in Fort Collins. These programs feature four entrepreneurs “pitching” their companies to investors in the audience. This program’s success of matching investors and entrepreneurs appears to be tied to national investing trends. In addition, CTEK Angels, an angel network in the Denver-Boulder area is available to Northern Colorado companies. Unfortunately success with this program has been limited for local startups.

In conclusion, the angel investment situation in Northern Colorado is probably healthier than is generally recognized. However, familiarity with investing in bioscience companies is quite limited in scope. Education is required.

D. Government Financing—The State of Colorado is poised to release a new \$50 million venture capital fund. The Colorado Venture Capital Authority is raising capital to build this fund by selling insurance premium tax credits. Forty percent, or \$20 million, of the fund is earmarked for life science and medical device companies. The State projects that the money will be ready for investment in April 2005.



Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) federal grant programs are available to companies conducting research in areas of interest to the federal government. With few exceptions, Phase I projects receive up to \$100,000 and Phase II as much as \$750,000. The aim of these programs is to encourage commercialization of research efforts. Numerous local entrepreneurs have successfully tapped SBIR/STTR grants, but more could be done with this valuable source of startup funding.

E. Colorado State University—the Colorado State University Research Foundation (CSURF) has a small proof of concept fund and the Business College has a likewise small fund for business plans. Both of these terrific new programs could use additional investment.

#### **IV. Talent Pool**

A. Description –Like any knowledge-based industry, bioscience companies need a supply of qualified, trained workers. To meet the demands of newly emerging fields, new curricula and programs need to be developed by educational institutions working in close partnership with the bioscience industry. In addition to having world-class researchers, successful bioscience regions have an adequate supply of management, sales, marketing, and regulatory personnel experienced in the biosciences.

B. Planning for and providing a talent pool for the bioscience industry is difficult. One of the biggest issues is maintaining a cadre of serial entrepreneurs in the community who are adept at creating early stage companies. Fort Collins lacks a critical mass of these people. Another challenge is anticipating the technical skills needs of bioscience companies. Most companies in Fort Collins are projected to be in the early stage through mid-size ranges. Companies that become large manufacturers will be the exception, rather than the rule. This creates a need for a highly skilled technical workforce for companies engaged in R&D, but which are also constantly “churning”.

C. Northern Colorado is fortunate to have several high quality community colleges that are interested in meeting the needs of bioscience companies through their training and education programs. For the most part, these are flexible institutions that are familiar with working directly with industry. Therefore, a regional planning process is required that will keep the community colleges in regular dialogue with an ever changing group of bioscience companies to anticipate and meet relatively short-term needs.

D. The quality of life in Northern Colorado is an advantage in recruiting serial entrepreneurs. However, the lack of critical mass of the industry poses a significant problem for these business people who need to know that their next opportunity will come from within the community and that they will not have to relocate. There is a small group of these entrepreneurs within the Fort Collins area and they need to be kept in the area by working with the University technology transfer office and others who can identify new opportunities as they arise. Cultivating this group of people and keeping them in the area will serve as a magnet for others as the demand increases.

## **V. Specialized Facilities & Equipment**

A. Description— Facility costs are among the most significant expenses of a new bioscience firm. These firms need access to wet lab space and specialized equipment. Since most bioscience firms initially lease space rather than purchase it, an available supply of facilities (such as privately developed multi-tenant buildings) offering space and equipment (such as incubators and accelerators) for bioscience companies is critical.

B. The common belief is the Fort Collins area lacks available lab space for private companies as well as other specialized facilities. In addition, access to specialized equipment poses a problem, especially for early stage companies. CSU facilities include core labs and animal facilities that could be accessed by bioscience companies under the appropriate conditions. There is sufficient space in the area for very early stage, pre-clinical companies. There is only one small CRO (Contract Research Organization) doing clinical testing in Fort Collins. A good working relationship between CSU and companies needing to access these services can distinguish Northern Colorado.

## **VI. Supportive Business Climate**

A. Description—The top bioscience regions in the nation offer a regulatory environment that actively encourages both starting and growing bioscience firms. Tax policies are in place that understand and support the long “time to market” for bioscience discoveries. Such favorable tax policies not only provide additional capital for emerging firms, but they also put bioscience companies on equal footing with more traditional industries such as manufacturing.

Frequently regions committed to growing bioscience clusters offer impressively large financial incentives (well beyond favorable tax regs) to entice established bio firms to their region. Hundreds of millions of dollars are designated for just that purpose by particularly aggressive regions.

Finally, strong bioscience regions enjoy established “names” or reputations around their key technologies.

A review of the business climate in Larimer County reveals the following:

B. Aggressive Economic Development Tools—Successfully recruiting large bioscience companies to the region is very challenging due to comparatively higher cost factors (such as Colorado’s business property tax) and the current lack of funding for meaningful incentive packages. Fortunately these negatives are not applicable to small or startup bioscience firms. As a result, Larimer County will be increasing its effort to nurture fledgling entrepreneurial bioscience companies, thereby embracing a “grow your own” strategy. On the flip side of the coin, because the current practice of offering incentives is so fiercely competitive, the Northern Colorado Economic Development Corporation (NCEDC) will be working diligently to help the County become more competitive in its bid to attract bioscience projects.

With respect to the “grow your own” strategy, there are currently gaps in the assistance available to bioscience startups. Most entrepreneurial assistance designed for tech-based startups has focused on Information Technology. This is the case because several Fortune 500 IT firms including Hewlett Packard, Agilent, and LSI Logic have enjoyed a strong presence in Northern Colorado for many years. Far less energy has been applied to assisting bioscience company formation for two key reasons. One, demand has not existed to any measurable degree (very few spin-offs from existing bioscience firms) and two, the region lacks a dedicated group of bioscience mentors with business experience to encourage and work with young companies.

In addition a gap exists for all tech-based startups between the basic services provided by the Small Business Development Center/Loveland Center for Business Development and the highly selective Fort Collins Technology Incubator. Programs developed to fill that gap, such as the Northern Colorado Idea lab have not fared well due to lack of financial support.

Finally, several excellent bioscience companies have grown up in Northern Colorado (Heska, Atrix, PR Pharmaceuticals). Today there is little concerted effort to retain these firms or assist them with their growth issues.

C. Strong Bioscience Reputation—While Northern Colorado, in fact Colorado, does not enjoy an overall strong bioscience image, there are a significant number successful medical device companies in the region.

Over the years the Centers for Disease Control have invested extensive federal funds into the Vector Borne Infectious Disease Laboratory which is located in Fort Collins. Currently this Lab is undergoing an expansion by a factor of three. In addition Colorado State University was awarded a Regional Biocontainment Laboratory in 2003. These expansions and awards have received an abundance of press thereby drawing attention to the area by bioscience professionals and firms.

Colorado State University is certainly the driver behind any national or international reputation Northern Colorado has for excellence in the biosciences. According to a report recently released by CSU's Office of Research and Information Technology, approximately one-third of CSU's research expenditures are in the biosciences. Outstanding programs/labs that bring attention to the area include: the Animal Reproduction and Biotechnology Laboratory, the Infectious Diseases Program, Radiological Health Sciences and Cancer Research, Orthopedic Bioengineering Research Laboratory and the well respected Veterinary Teaching Hospital.

D. Economic Development Initiative—Through collaborative partnerships, the NCEDC will help to create a positive marketing brand for the region. Specifically the NCEDC will help to host high-level media events and site selection tours aimed at bringing specific, compatible bioscience industries to northern Colorado. The organization will improve the region's understanding of key location criteria for these targeted industries. The NCEDC also plans to improve the ability of existing bioscience companies to expand.

Unfortunately Colorado has recently been the subject of significant negative press. National stories about football recruiting scandals, student deaths from alcohol consumption and controversial remarks by a university professor are having a very negative impact on how companies and individuals assess Colorado's long term desirability as a place to live and work. Perhaps more than ever before, it is imperative to embark on a national media campaign highlighting the region's strengths, which are plentiful.

## **VII. Patience & Long-Term Perspective**

As the saying goes, "Rome wasn't built in a day." That simple statement should be kept firmly in mind and bears frequent repeating while sewing the seeds to grow a significant bioscience presence in Northern Colorado.

The Information Technology industry set new records for "time to market" and in doing so replaced the concept of patience with an expectation for lightening quick product development and rapid, highly attractive returns. The IT bubble might have burst, but people are reluctant to step off of the speeding train. (Most have forgotten that the "train" started in the 1950s.)

Success in bioscience requires a different mindset. Many products require extensive testing and that testing is both time consuming and expensive. Investors, communities and economic development efforts must be patient with the bioscience timetable.

The drive to build the biosciences in Larimer County will fail if supporters are looking for a quick fix. A long-term commitment is essential to start, grow and attract young bioscience companies, to build a noteworthy entrepreneurial climate, to have open communication channels with the University and Federal Labs, and to hear the needs of existing local industry.

Embracing patience will pay handsome dividends down the road, including top paying jobs and a strong, diverse economy. As the Colorado Bioscience Plan states, "It requires a long-term effort—in short, a marathon team effort, not a single sprint runner." The strategies and tactics included in this plan reflect just such a marathon team effort.

## STRATEGIES & TACTICS

- I. Strategy One—Improve the availability of funding for bioscience companies, especially seed and early stage assistance.
  - A. Improve the visibility of successful Northern Colorado startup companies to the Denver-Boulder bioscience venture capital firms.
  - B. Provide encouragement/assistance to the existing effort that is raising funds for a locally based bioscience VC fund.
  - C. Investigate adding structure to the local underground angel network and provide educational programs for angels specifically interested in bioscience investments.
  - D. Host a program to introduce Colorado Venture Capital Fund representatives to Larimer County bioscience participants.
  - E. Establish regularly scheduled SBIR/STTR educational programs in the region. Locate a local mentor successful in securing these grants.
  - F. Support CSU College of Business and CSURF's efforts to grow their pre-venture funds.
  
- II. Strategy Two—Enhance the success rate of small/startup bioscience companies, and support the needs of existing firms in the region.
  - A. Build an entrepreneurial assistance program that seamlessly addresses the needs of pre-venture and startup bioscience interests in the region. This would involve developing a pool of bioscience mentors and filling the identified assistance gaps especially for the transition from technology to business.
  - B. Increase networking and education events to at least five programs in 2005.
  - C. Develop ongoing interaction with existing bioscience companies to assure that their local development needs are being met.
  - D. Support the development of an ombudsman position at the City of Fort Collins. This individual would be the single point of contact for all technology businesses wishing to build or expand facilities.
  - E. Communicate regularly with the City Council and Staff regarding the benefits of building a critical mass of bioscience companies in the region. Provide regular written bioscience updates. Request that the City of Fort Collins include support of the bioscience industry in its formal economic plan.

- F. Develop a single point of contact website to assist bioscience companies interested in moving to Northern Colorado. This website would link with other key websites, such as the City of Fort Collins, Larimer County, Colorado State University, local Chambers of Commerce, and the Northern Colorado Economic Development Corporation, Technology Incubator. The site would include resources for bioscience requirements, including local, state and federal.
  - G. Develop opportunities for biosciences companies to access core labs at CSU on a contractual basis. Make this availability well known to Front Range bioscience companies. Also, provide an inventory for technical/professional bioscience services in the region.
  - H. Work with local developers to keep them updated on the needs of the bioscience industry. Because the facilities for these companies are very expensive and rarely built on “spec”, it is important to provide developers with reliable and timely information to stay ahead of need without undue risk. Also, assist filling exited Heska labs with bioscience companies.
  - I. Develop a unique component of infrastructure for the bioscience industry to serve as a magnet and fill a void of services within the State. Examples include a GMP manufacturing facility.
  - J. Initiate a focus group of Northern Colorado’s community college stakeholders to develop an inventory of strengths and capabilities in bioscience.
  - K. Survey the regional bioscience industry to determine current and projected employment needs.
  - L. Convene a workshop with industry partners and educational representatives to discuss how to best match educational assets and industry needs.
- III. Strategy Three—Support Colorado State University’s critical role in the regional and statewide bioscience effort. This includes maximizing the commercialization of bioscience discoveries at the University.
- A. Develop a comprehensive strategy to inform the community about CSU’s research assets, their economic development impact, and their potential for new commercial activity.
  - B. Meet with regional legislators to inform them of the importance of CSU to the bioscience industry in the State.
  - C. Put the national spotlight on CSU’s excellence in bioscience research to attract additional bioscience industry to the region.

- D. Include a bioscience industry research park component in the CSU Foothills Campus master plan. Although it may not be developed soon, it will provide the “bank” of land necessary for significant growth of local companies and partnership with large companies.
  - E. Highlight CSU’s relationships with the bioscience industry in the University’s new economic development initiative. Address cultural issues and create new infrastructure to promote and maintain these relationships. As a new or revised economic model emerges to support the continued growth of CSU, the importance of funding from industry-supported research will be considered a significant area for growth.
  - F. Enhance communication between CSU, CSURF, CBSA and industry to address concerns of all parties regarding the technology transfer process and sponsored research.
  - G. Build a partnership with the University of Wyoming to increase the development of the bioscience industry in the area between Fort Collins and Laramie.
- IV. Strategy Four—Utilize the Northern Colorado Economic Development Corporation’s Leadership 2010 program that launches a five year plan to revitalize the region’s economy. (Details for the Leadership 2010 campaign [www.leadership2010.com](http://www.leadership2010.com).)
- A. Convene a group of entities, such as the Chamber of Commerce, Colorado State University, City of Fort Collins, Convention and Visitors’ Bureau, Larimer County Bioscience Initiative and others, to systematically develop and place positive stories in state and national media, on a continual basis.
  - B. Develop prudent incentive policies to help create high wage bioscience job opportunities.

## Strategies

### STRATEGY ONE:

Improve availability of funding for bioscience companies, especially seed & early stage.

### STRATEGY TWO:

Enhance the success rate of small/startup bioscience companies and support needs of existing firms in region.

## Tactics

**Tactic A:** Improve visibility of successful Northern Colorado startup companies to Denver/Boulder bioscience focused venture capital firms.

**Tactic B:** Provide encouragement/assistance to the existing effort that is raising funds for a locally based bioscience venture capital fund.

**Tactic C:** Investigate adding structure to local underground angel network & provide educational programs for angels interested in bioscience investments.

**Tactic D:** Host program to introduce Colorado Venture Capital Fund representatives to Larimer County bioscience participants.

**Tactic E:** Collaborate with others to establish regularly scheduled SBIR/STTR educational programs in the region. Locate a local mentor successful in securing these grants.

**Tactic F:** Support CSU College of Biz and CSURF's efforts to grow their pre-venture funds.

**Tactic A:** Build entrepreneurial assistance program that addresses needs of pre-venture & startup bioscience interests in region. Includes developing pool of bioscience mentors.

**Tactic B:** Increase networking/educational events to at least five programs per year.

**Tactic C:** Develop ongoing interaction with existing bioscience companies to assure that local development needs are being met

**Tactic D:** Support development of ombudsman position at City of Fort Collins. Individual would be single point of contact for tech businesses wishing to build or expand facilities.

**Tactic E:** Communicate regularly with City Council & Staff regarding benefits of building critical mass of bioscience companies in region. Provide regular written bioscience updates. Request that FC include support of bioscience industry in its formal economic plan.



**STRATEGY TWO (Continued):**

Enhance the success rate of small/startup bioscience companies and support needs of existing firms in region.

**Tactic F:** Develop single point of contact website to assist bioscience companies interested in moving to region. Site would link with key websites: City of FC, Larimer County, CSU, Chambers, NCEDC, Incubator. Site would include resources on bioscience requirements, including local, state & federal.

**Tactic G:** Develop opportunities for bioscience companies to access core labs at CSU on a contractual basis. Promote to all Front Range bioscience companies.

**Tactic G-1:** Develop inventory for technical/professional bioscience services in the region.

**Tactic H:** Work with local developers to keep them updated on needs of bioscience industry. Provide developers with reliable & timely information to stay ahead of need w/out undue risk. Assist filling exited Heska labs with bioscience companies.

**Tactic I:** Develop unique component of infrastructure for bioscience industry to serve as magnet & fill void of services within State, i.e. GMP manufacturing facility.

**Tactic J:** Initiate focus group of region's community college stakeholders to develop inventory of strengths & capabilities in bioscience.

**Tactic K:** Survey regional bioscience industry to determine current and projected employment needs.

**Tactic L:** Convene workshop with bioscience industry and educational representatives to determine how to best match educational assets & industry needs.

**STRATEGY THREE:**

Support CSU's critical role in regional/statewide bioscience effort – maximize commercialization of bioscience discoveries.

**Tactic A:** Develop comprehensive strategy to inform community about CSU's research assets, economic development impact, & potential for new commercial activity.

**Tactic B:** Meet with regional legislators to inform them of the importance of CSU to bioscience industry in the State.

**Tactic C:** Put national spotlight on CSU's excellence in bioscience research to attract additional bioscience industry to the region.

**STRATEGY THREE (Continued):**

Support CSU's critical role in regional/statewide bioscience effort – maximize commercialization of bioscience discoveries.

**Tactic D:** Include bioscience industry research park component in the CSU Foothills Campus master plan.

**Tactic E:** Highlight CSU's relationships with the bioscience industry in the University's new economic development initiative. Address cultural issues.

**Tactic F:** Enhance communication between CSU, CSURF, CBSA and industry to address opportunities regarding technology transfer and sponsored research.

**Tactic G:** Build partnership with the University of Wyoming to increase development of the bioscience market in the area between Fort Collins and Laramie.

**STRATEGY FOUR:**

Utilize NCEDC's 5 year Leadership 2010 program to revitalize local economy.

**Tactic A:** Convene entities such as Chambers, CSU, City of FC, Convention & Visitors' Bureau, Larimer County Bioscience Initiative and others to systematically develop & place positive stories in state and national media on a continual basis.

**Tactic B:** Develop prudent incentive policies to help create high wage bioscience job opportunities.

**LARIMER COUNTY BIOSCIENCE INITIATIVE  
ROSTER OF STRATEGIC PLAN PARTICIPANTS**

Paul Anderson	Paul Anderson Productions, Inc.
Bruce Biggi	CARTA Group
Denise Brown	Colorado BioScience Association
Richard Casey	RMC Biosciences, Inc.
David Cunningham	The Alternative Board
Ken Deines	Capital Funding Strategies
Ann Donoghue	PR Pharmaceuticals, Inc.
Hank Gardner	VPRIT Office, Colorado State University
Thom Gilligan	XY, Inc.
Kathleen Henry	Colorado State University Research Foundation
Cheryl Hite	EMD Biosciences
Paul Hudnut	Venture Development, Colorado State University
JJ Johnston	Northern Colorado Economic Development Corp.
Kathy Kregel	Fort Collins Technology Incubator
Jerald Kuiken	Chata
David May	Fort Collins Area Chamber of Commerce
Ian McLeod	Pulmonary Support Services
Sean Moriarty	QLT, USA
T.J. Scholand	Secure Piers, LLC
Dan Stinchcomb	Inviragen, LLC
Carol Talkington Verser	Heska Corporation
Eric Weber	Gonex, Inc./Burns Marketing

# APPENDIX E: CLEAN ENERGY CLUSTER

The following brochure by the Northern Colorado Clean Energy Cluster presents a general overview of the activities of the cluster. Additional information regarding the Northern Colorado Clean Energy Cluster is available from <http://www.nccleanenergy.com/about.html>. The City of Fort Collins has approved a resolution to participate in the formation and development of the Clean Energy Cluster. A copy of this resolution is also included in this appendix.

# NORTHERN COLORADO CLEAN ENERGY CLUSTER

## A STRATEGIC CHOICE

Members of the Northern Colorado Clean Energy Cluster (CEC) have made a strategic choice to grow our regional economy by addressing mounting global demand for clean energy technologies and services. The Cluster brings together CSU researchers, public, private, and not-for-profit agencies to find answers to pressing challenges. The Cluster is committed to benefiting the regional economy while addressing the growing global challenges of peak oil, climate change, energy security, energy costs, and environmental impacts.

Your local public institutions, together with private enterprise, are developing new clean energy technologies, bringing them from research to reality. Working together, members of the CEC will develop a strategic framework to support the necessary research and development of clean and renewable energy technologies, and to find ways to bring these technologies to the marketplace.



## ALREADY A LEADER

Northern Colorado is already a leader in many aspects of clean energy technology development and application. By forming partnerships in support of the cluster we are committed to making Northern Colorado a “go to” region for research and development of cutting-edge clean energy technologies. We are already working on solutions, such as smart grid technologies, bio fuels, solar energy, wind energy, cleaner and more efficient engines, as well as reducing emissions. Through the collaborative efforts of CEC members, we can assemble a robust clean energy team that builds on these and other emerging technologies to meet our larger goals.



## PARTNERING FOR SUCCESS

Uniquely positioned to form a regional cooperative effort, the Northern Colorado CEC will work to develop Northern Colorado as one of the most innovative regions in the country, and a national leader in finding ways to reduce energy use and air pollution, as well as conserve precious resources. Our partnerships add strength to this work already underway, creating a synergy that will take Northern Colorado into a national and international leadership role.

### Examples of this recognition include:

**CITY OF FORT COLLINS** – The City of Fort Collins was recently recognized by the Sierra Club as one of the front-runners in the nation in promoting clean and renewable energy technologies.

**COLORADO STATE UNIVERSITY** – CSU is recognized internationally for pioneering many clean and renewable energy technologies, including clean engine technologies, distributed energy and solar energy.

**ELECTRIC PROVIDERS** – Platte River Power Authority and the Fort Collins Utilities lead the nation in progressive clean energy policies including wind energy, hydrogen power fuels implementation, Climatewise, and other energy policies.

**POUDRE SCHOOL DISTRICT (PSD)** – PSD has recently received national awards for their progressive energy techniques and sustainable strategies at Fossil Ridge High School, Bacon Elementary, Zach

Elementary, and Kinard Junior High. Their efforts have been so popular they are hosting a regional conference in July on their strategies and buildings.

**PRIVATE BUSINESSES** – Companies such as Woodward, Advanced Energy, Mototron, Envirofit, and Spirae conduct business at an international scale and provide an avenue for implementation of new technologies

**ENTREPRENEURIAL SPIRIT** – Fort Collins ranks first in the nation in innovation and entrepreneurship. We have one the most educated workforces in the country and were recently ranked by the US Census Bureau as the most entrepreneurial city in the United States.



## ECONOMIC POTENTIAL

The global market for clean and/or renewable technologies is significant and growing rapidly. Emissions reduction and energy independence are driving countries, states and cities on a global scale to adopt legislation for clean and/or renewable technologies, as well as in creating targets for renewable energy utilization.

At present only 2.3 % of the US energy market is derived from renewable sources, and in Colorado this figure is less than 2%. However, the energy landscape is rapidly changing. Amendment 37 in Colorado has established a 10% renewable energy standard, and many other states are moving in similar directions.

The electric utility industry is over a \$200 billion industry annually in the United States (Energy Information Administration, 2004). Combined with other growing industries such as clean on-and-off highway vehicles, and energy reduction systems for buildings, the market potential is enormous. Considered at the global scale, the market is almost without limit.

With our international reputation in energy technologies, our existing research facilities, and our commitment to a better environment, Northern Colorado is uniquely positioned to build a clean energy industry and capture a portion of these domestic and global markets.

### WHAT YOU CAN EXPECT TO SEE FROM THE CLEAN ENERGY CLUSTER

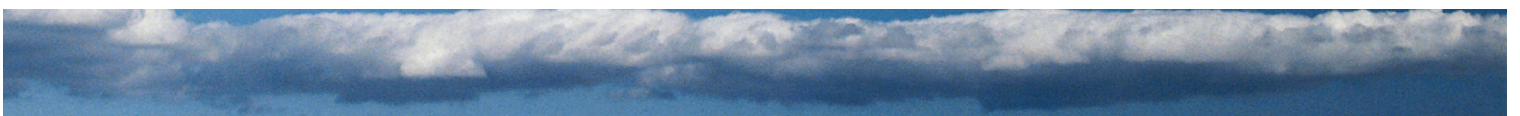
Over the next twelve months the CEC will focus on several new clean energy projects including:

- ✓An intelligent grid simulation demonstration project,
- ✓An algae-based biofuels project,
- ✓An emerging solar technology program, and
- ✓A working farms initiative based on increased use of wind energy and biofuels.

In addition, the CEC is looking to establish a "Think Tank" to increase collaboration and new product development and implementation.

In the coming years, the CEC will develop, test and implement new strategies to meet the global demand for clean and renewable energy sources. By working together, this collaboration will bring new products to market faster and create an environment for creativity that will yield better and more cost effective solutions.

**FOR MORE INFORMATION CALL: THE BRENDELE GROUP 970-207-0058 OR VISIT [WWW.NCCLEANENERGY.COM](http://WWW.NCCLEANENERGY.COM)**



# **AGENDA ITEM SUMMARY**

## **FORT COLLINS CITY COUNCIL**

**ITEM NUMBER: 21**

**DATE: March 21, 2006**

**STAFF: Greg Byrne  
Kathy Collier**

### **SUBJECT**

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Resolution 2006-037 Authorizing and Directing the City Manager to Join the Efforts of Colorado State University, the Northern Colorado Economic Development Corporation, the Fort Collins Area Chamber of Commerce, Poudre School District, Larimer County, and Private Enterprise in Developing a Clean Energy Cluster for Northern Colorado.

### **RECOMMENDATION**

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Staff recommends adoption of this Resolution.

### **EXECUTIVE SUMMARY**

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This Resolution authorizes and directs the City Manager to proceed on behalf of the City to participate in a Clean Energy Cluster formation and development, and to work with Colorado State University, Larimer County, Poudre School District, the Northern Colorado Economic Development Corporation, the Fort Collins Area Chamber of Commerce, and local business entities to develop the Cluster's strategic plan and to support the advancement of the plan as it is implemented.

### **BACKGROUND**

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The proposed Clean Energy Cluster is an interrelated group of businesses and organizations focused in the areas of renewable energy, energy efficiency, solar and wind energy, green building, fuel cells and other technologies with enough participants to attract outside economies.

In 2004, the Fort Collins Economic Vitality and Sustainability Group (EVSAG) recommended that certain business clusters be investigated as economic development strategies, naming several potential clusters under the umbrella of CLEAN ENERGY, including solar and wind energy, efficient energy technology, green building and energy utilization.

In 2005, the Fort Collins Area Chamber of Commerce Board of Directors and Northern Colorado Economic Development Corporation (NCEDC) hosted a focus group meeting of academic and business leaders in the clean energy field to explore the strength of the region's current assets in clean energy and gain advice on how to best advance the cluster. Focus group attendees agreed the region can support a strong cluster through:

- a progressive municipal-owned utility
- world class clean energy research programs at Colorado State University
- users employing clean energy technologies
- a highly trained workforce
- national recognition for innovation and entrepreneurship, among others.

As a result of the focus group, NCEDC, the Chamber, Colorado State University, Poudre School District, the City of Fort Collins, Larimer County and several Fort Collins businesses developing or adopting clean energy technologies are moving forward with an industry-led initiative facilitated by The Brendle Group, culminating in a written "Strategic Plan for Advancing Northern Colorado's Clean Energy Cluster".



RESOLUTION 2006-037  
OF THE COUNCIL OF THE CITY OF FORT COLLINS  
AUTHORIZING AND DIRECTING THE CITY MANAGER TO JOIN THE  
EFFORTS OF COLORADO STATE UNIVERSITY, THE NORTHERN  
COLORADO ECONOMIC DEVELOPMENT CORPORATION, THE FORT  
COLLINS AREA CHAMBER OF COMMERCE, POUUDRE SCHOOL DISTRICT,  
LARIMER COUNTY AND PRIVATE ENTERPRISE IN DEVELOPING A  
CLEAN ENERGY CLUSTER FOR NORTHERN COLORADO

WHEREAS, the City of Fort Collins (the "City") is dedicated to the improvement of the natural environment through continuing efforts to promote clean and renewable energy sources; and

WHEREAS, the strong working relationship between the City and Colorado State University ("CSU") provides an outstanding collaborative setting within which these two public entities can work together for the betterment of the environment and for an economically stable economy for the community and the region; and

WHEREAS, CSU has already gained international recognition for its research and development of cleaner engines, solar energy production, networked distributed energy, wind engineering and atmospheric sciences, and for its commitment to regional economic development that will have a global impact; and

WHEREAS, other regional public institutions such as Platte River Power Authority, Western Area Power Administration, Colorado Renewable Energy Society and the National Renewable Energy Laboratory have also exhibited nationally leading energy policies in such areas as solar energy, wind energy, biodiesel fuels, and geothermal heating; and

WHEREAS, the Governor of the State of Colorado, through Executive Order D 005 05, has directed a statewide initiative to order the greening of state government in Colorado, demonstrating a statewide commitment to reducing energy use in Colorado; and

WHEREAS, the Poudre School District has demonstrated a continuing commitment to energy reduction and healthy environments in nationally recognized schools such as Fossil Ridge High School, Bacon Elementary, Zach Elementary, and Kinard Junior High School; and

WHEREAS, private companies in Fort Collins and northern Colorado are also providing new research and development in clean and alternative energy sources; and

WHEREAS, the City was selected recently by the Sierra Club in 2005 as one of the four leading cities in the United States in the use of energy efficiency and renewable energy; and

WHEREAS, Fort Collins has a highly educated workforce capable of providing an intelligence pool of highly capable researchers able to enhance existing clean energy technologies and develop new clean energy strategies and products; and

WHEREAS, the City, CSU and private enterprise want to attract the best and brightest individuals to develop new and emerging clean and renewable energy technologies; and

WHEREAS, it is in the best interests of the City and Larimer County to develop primary employment that is economically stable; and

WHEREAS, it is in the best interests of the nation as a whole to develop clean and renewable energy sources; and

WHEREAS, nationwide attention is being paid to the concept of industry "clustering" as a means of furthering the economic health of local communities; and

WHEREAS, the clustering of related industries calls for a high degree of collaboration among individual businesses and public entities in the development, design, production, transfer of information and marketing of a particular kind of product in a single geographic location, on the theory that such entities can better further their industry objectives through such close interaction and collaboration; and

WHEREAS, the independent efforts of various public and private entities in the Northern Colorado region to advance commerce in the fields of renewable energy, energy efficiency, solar and wind energy, green building, fuel cells and other technologies make the region an ideal location for a "Clean Energy Cluster" that could attract additional economic activity and participation from outside the region ; and

WHEREAS, the Northern Colorado Economic Development Corporation and the Fort Collins Area Chamber of Commerce believe that Fort Collins and the Northern Colorado region have the attributes to foster a Clean Energy Cluster that will create new opportunities for primary employment; and

WHEREAS, an industry cluster focused on clean energy would also enable the City and the region to better advance their respective clean air goals and could attract state and federal funding to facilitate the further development of additional clean energy sources, much to the benefit of the region and the nation.

NOW THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS that the City Manager is hereby authorized and directed to participate on behalf of the City in the formation and development of a Clean Energy Cluster by working with Colorado State University, Larimer County, Poudre School District, the Northern Colorado Economic Development Corporation, the Fort Collins Area Chamber of Commerce, and local business entities to develop a Clean Energy Cluster strategic plan, and to support the advancement of such plan as it is implemented.

Passed and adopted at a regular meeting of the Council of the City of Fort Collins this 21st day of March, A.D. 2006.

---

Mayor

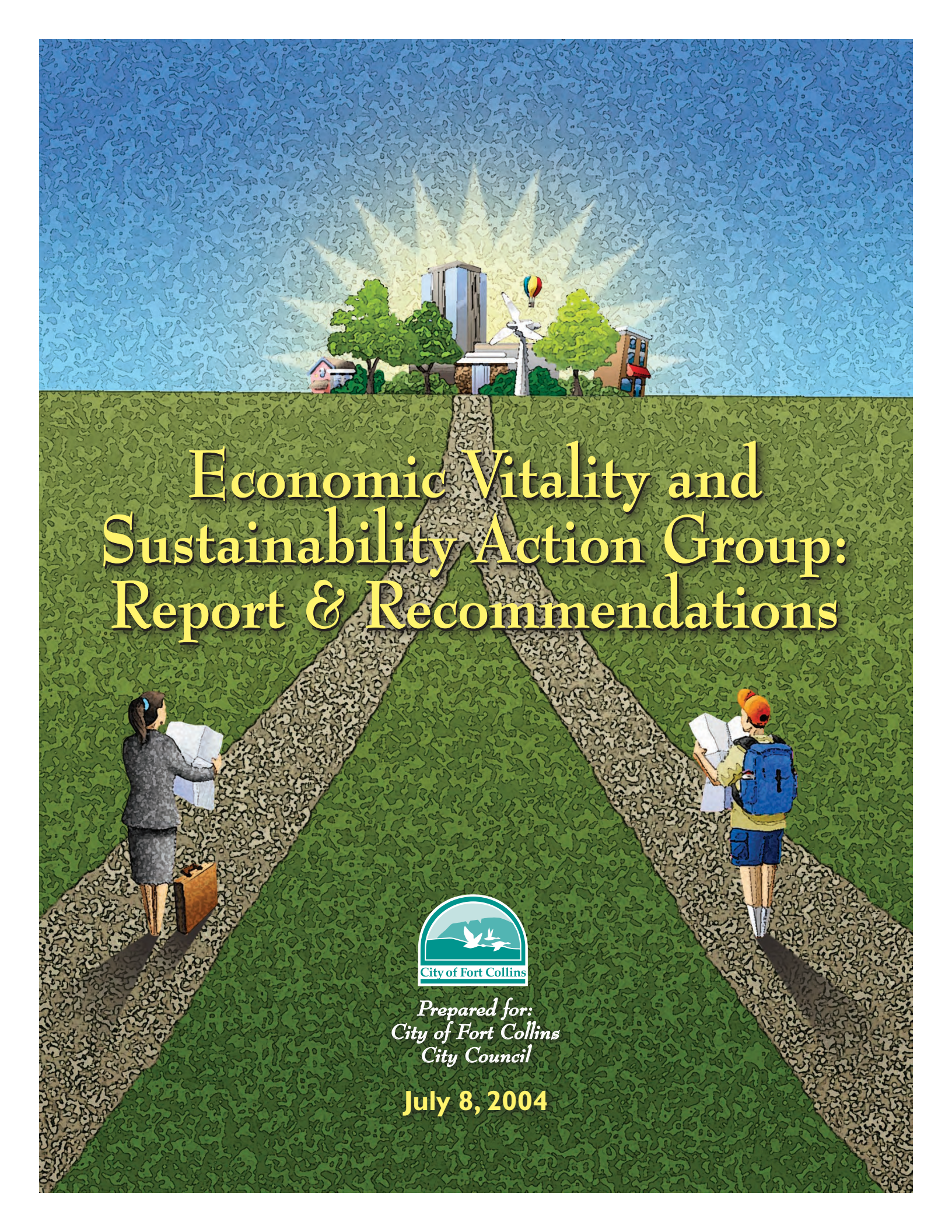
ATTEST:

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City Clerk

# APPENDIX F: EVSAG SWOT

The Economic Vitality and Sustainability Action Group (EVSAG) II was appointed by the Fort Collins City Council in February 2004 to develop a set of recommendations intended to address the economic vitality and sustainability of Fort Collins. Members were carefully selected to represent a broad and diverse range of community interests and perspectives. The group released a detailed report in July 2004 including strategies and recommendations for developing a sustainable economy, “The Economic Vitality and Sustainability Action Group: Report and Recommendations.” The SWOT analysis included in the report is included in this appendix. The complete report can be found at <http://fcgov.com/economicvitality/purpose2.php>.



# Economic Vitality and Sustainability Action Group: Report & Recommendations



*Prepared for:  
City of Fort Collins  
City Council*

**July 8, 2004**



## **City Council**

Ray Martinez, Mayor  
Bill Bertschy, Mayor Pro Tem  
Eric Hamrick  
Kurt Kastein  
David Roy  
Marty Tharp  
Karen Weitkunat

## **Economic Vitality and Sustainability Action Group Members**

Pat Brady  
Jim Butzek  
Ken Deines  
Bill Dieterich  
Mary Fischer  
Trudy Haines  
Rich Harter  
Paul Hudnut  
Tim Johnson  
Kim Jordan  
Stuart MacMillan  
Chadrick Martinez  
David Neenan  
Mary Robertson  
Linda Stanley  
David Wright  
Ellen Zibell

Council members Marty Tharp & Karen Weitkunat contributed to the outcome of this report by establishing an action group representing diverse and balanced community perspectives and by providing leadership guidance as needed.

## **City of Fort Collins Staff**

John F. Fischbach, City Manager  
Diane Jones, Deputy City Manager  
Darin Atteberry, Assistant City Manager  
Bruce Biggi, Economic Advisor  
Alan Krcmarik, Director of Finance  
Sherrie Temple, Assistant Director of Finance  
Kelly Barlow, Executive Administrative Assistant  
Brad Randall, Graphic Designer

## **Facilitators**

Jim Charlier, Charlier Associates, Inc.  
Tess Heffernan, City of Fort Collins Policy and Project Manager

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# Executive Summary

In February 2004 the Fort Collins City Council appointed a group of community representatives to develop a set of recommendations intended to address the economic vitality and sustainability of Fort Collins. Members of the “Economic Vitality and Sustainability Action Group” (EVSAG) were carefully selected to represent a broad and diverse range of community interests and perspectives.

The group met weekly for four months to address the tasks set forth by Council and to provide the following report. As discussion unfolded, four major themes, twenty corresponding strategies, and one-hundred twenty-nine tactics were developed for Council consideration. The detail of EVSAG discussions are contained in the body of this report. The major themes and strategies are summarized as follows:

## Theme A: Big Picture

This theme looks at those trends and mindsets that occur beyond the immediate Fort Collins area and affect our community nonetheless. Examples include the impact of federal and state programs, global economic impacts on primary jobs, or a declining quality of life. The “big picture” also includes consideration of changing cultural mindsets and evolving paradigm shifts such as “sustainability” that can dramatically influence our economic vitality over the long term.

- Strategy A1:** Diversify and broaden our economic sectors while actively strengthening our existing business sectors.
- Strategy A2:** Protect and nurture our economic engine by pursuing and developing mechanisms for stable, long term public funding.
- Strategy A3:** Enhance our social, cultural and environmental leading edge by implementing current City plans, developing additional community actions, and retaining our community’s extraordinary quality of life.

## Theme B: Immediate Threats

This theme addresses short term strategies needed to address several immediate areas of concern including declining revenues resulting from a diminishing federal, state, and local funding base, expanding community infrastructure service needs, and the resulting duty of providing more with less.

- Strategy B1:** Strive to protect and sustain higher education funding for Colorado State University and Front Range Community College.
- Strategy B2:** Address the perception that the City of Fort Collins is not business friendly by fostering a business friendly attitude that encourages economic vitality and community sustainability. Ensure that City departments and staff provide clear, accurate and consistent answers to business inquiries.
- Strategy B3:** Address under-funded public infrastructure throughout Fort Collins.
- Strategy B4:** Identify economic, environmental and social “good” growth principles. Address the perception that growth does not pay its own way by communicating the cost and benefit of development and the plans to cover these costs.
- Strategy B5:** Support existing business expansion and retention efforts and pursue strategies to encourage the retention and creation of high-paying jobs within our community.
- Strategy B6:** Retain and improve our identity as a “regional shopping destination” by actively protecting the commercial and retail value of Old Town and the Foothills Mall.
- Strategy B7:** Make our City government more efficient and prioritize how to spend City funds rather than primarily focusing on increasing revenues.



## **Theme C: Competitive Model**

This theme addresses the fact that we live and operate in a competitive model and should be prepared and willing to communicate our competitive advantage. In signaling the value of Fort Collins to others, we need to identify, define, build upon, and promote our uniqueness. Determining how to present and position our community will require that we know our competition and understand the means for truly distinguishing Fort Collins as a “World Class Community.”

- Strategy C1:** Actively commit to making Fort Collins a quality place to live by embracing the dynamic relationship of “quality of life” and “quality of opportunity” elements.
- Strategy C2:** Develop a community culture of tolerance, support, and acceptance, resulting in a community message that says “you are truly welcome here.”
- Strategy C3:** Foster our unique competitive advantage. Develop a compelling community branding that speaks to the “heart and soul” of Fort Collins.
- Strategy C4:** Communicate with the existing business community to better understand and address their changing needs and provide coordinated and readily available access to information that existing and emerging businesses can utilize.
- Strategy C5:** Challenge (and work with) CSU to become the core of our learning culture and excel as a source of innovation for future economic development in our community.

## **Theme D: Partnerships**

This theme recognizes that the City of Fort Collins alone cannot create an economically vital and sustainable community. For lasting economic vitality and sustainability we must draw multiple constituencies together to leverage our diminishing resources. We must seek to forge strong community partnerships with existing entities and emerging business clusters. Our citizens, business community, academic institutions, regional government bodies, and the community at large, must join in and support the process. As a beginning point the City should strive to identify and better understand our existing partnerships in order to avoid duplication, promote efficiency, improve the return on public investment and build stronger collaborations.

- Strategy D1:** Support and coordinate services devoted to our community’s small business and entrepreneurial activities. Create partnerships that will help entrepreneurs access capital, encourage our highly educated workforce to create new business, and foster stronger relationships with existing economic development entities.
- Strategy D2:** Conduct practical hands-on workshops designed to generate new business development by bridging the gap between research, technology transfer, and product development; and in doing so, forge an improved interaction between research, entrepreneurial, and business development activities in our community.
- Strategy D3:** Create partnerships between National Renewable Energy Lab (NREL), wind and solar institutes, green building programs, CSU Institute for the Built Environment, and similar entities that can, (a) capitalize on our brewing industry by finding a use for by-product output; (b) build partnerships between green building and non-profits to achieve affordable housing goals; and (c) improve the sustainability of our community while spurring new business development.
- Strategy D4:** Improve the partnering relationship between our community’s higher education (CSU, FRCC), K-12 education (PSD), public health education (PVHS), City of Fort Collins, and Larimer County government agencies by establishing regular “high level leadership” meeting activities to foster common economic vitality actions.
- Strategy D5:** Build partnerships to lead and expand upon our cultural and arts industry. Partner with developers to help build downtown cultural forums and facilities.

EVSAG members strongly encourage City Council to continue this process and provide the community leadership required to implement the strategies and recommendations contained in this report.

# Appendix A: SWOT Analysis

## Strengths

### Geographic location

- Poudre River
- Scenic beauty
- Good parks and recreation activities
- Recreational opportunities
- Open space
- Bike trails
- Proximity to DIA

### Knowledgeable/involved/informed community

- Educated workforce
- High internet usage and broadband
- Telecommuters
- Desirable community for seniors/retirees
- Large entrepreneurial population
- Presence of small business assistance resources (i.e. SBDC) and incubators
- Diversity in faith community and services they provide
- Diverse set of businesses
- Reasonable cost of labor
- Great micro loan program
- Presence of federal research, other facilities (i.e. CDC, NRCS, BLM)

### Active cultural community

- Emerging arts and cultural community
- Strength of historic downtown

### Great public services

- Strong healthcare
- Competent City staff
- Low cost of utilities
- Poudre Schools
- CSU and Front Range Community College presence
- Multi-modal transportation developing
- Wind Power program

## Challenges/Weaknesses

### Budget cuts to higher education

- Lack of higher education funding and facilities
- Failure of integration of higher education (CSU, FRCC) into community
- Technological transfer of CSU into business
- Lack of funding for tech transfer

### Higher cost of land and employment base

- Lack of good sites for businesses and industry
- Difficulty traveling around northern Colorado
- Land available for industry
- Affordable housing
- Percentage that people pay for living/homes
- Increasing number of retirees could shift job/housing balance

## **Jobs**

- Losing jobs
- A lot of low paying jobs
- Loss of existing primary jobs
- High percentage of government jobs

## **Dark Matter**

- Notion of corporate non- transparency, stakeholders are in the dark concerning corporate interests, know to only a few corporate elite

## **Competition between local governments for revenue**

- Neighboring communities commercial growth
- Other regions recruiting our retail, jobs
- Challenge to increase tax revenue
- Reliance on sales tax
- Over-reliance on retail
- Gallagher/TABOR – high business tax
- Lack of funding for transportation capital
- Appropriate role of government in economic development

## **Barriers to redevelopment within the City**

- Perception of City as anti-business
- Cumbersome/very difficult process for development

## **Global issues (i.e. massive deficit/interest)**

- Outsourcing issues
- Global off-shoring
- Health insurance for small business
- Failing in literacy

## **Infrastructure and environmental issues**

- Decrease in quality of life from population growth
- Decrease in environmental quality
- Traffic congestion
- Lack of agreement re: what to do with the Poudre River area
- Water supply
- Under utilizing existing resources

## **Lack of diversity**

- Lack of intellectual infrastructure for businesses
- Too high a percentage of our economy based on development/building
- Fear/lack of innovation in development
- Not knowing how and where to find information
- One daily newspaper in town
- Lack of organizational collaboration
- Lack of well-developed clusters
- Don't understand structural change in economy
- Early stage financing for "start ups"
- No wet lab space
- Vulnerability of downtown

## **Opportunities**

### **Branding Fort Collins**

- Tout environmental and parks and rec opportunities
- The Poudre River
- Promote downtown
- Focus on business clusters that make sense for Fort Collins
- Improve cultural climate and attract tourism
- Leadership in clean energy development (solar, clean engines emissions technology, water economy, fuel, hydrogen, etc.)
- New Belgium Brewery as a model for other businesses
- National recognition of our community's assets ("Best of" lists, other recognition)
- Model for a healthy community, supporting active lifestyles

### **Encourage redevelopment**

- Develop part of Old Town that are ripe for change

### **Create a culture of entrepreneurship in Fort Collins**

- Create a new economy of economic gardens
- Use environmental resources and combine with entrepreneur to create new kinds of businesses

### **Attract more business capital**

- Growth pays its own way for infrastructure

### **Leverage our resources better in and out of the community**

- Train our own and keep them here
- Determine how to use the bright people here in our community
- Create a business information clearinghouse
- Opportunity for retraining
- Build better bridges between educational community and business community
- Do creative partnerships with other communities, e.g. revenue sharing
- More public/private partnerships
- Educate community regarding economic issues
- Become a learning community
- Define what literacy means (read newspaper; understand software use)
- Set up sister city relationships and plan outsourcing partnerships to advance entrepreneurial center of Fort Collins

## **Threats**

### **Impacts of growth**

- Stress on infrastructure
- Undesirable growth in outlying areas
- Other cities aggressive, undesirable growth
- Environmental damage
- Limited water supply
- Excessive population growth
- If a way cannot be found to make urban growth boundary work
- Loss of uniqueness

### **Globalization**

- Inability to get primary jobs
- Global economic issues
- Entrepreneurs are mobile - they'll leave
- Value could be migrating out and our institutions can't address this

### **Shortfall of funding for public services and facilities**

- State and federal funding methods
- Loss of retail tax base
- Lack of funding for transportation
- Over and under retailing
- Financing of public/higher education

### **Attitudes**

- Institutions are not capable of making or getting ahead of structural changes
- Elitist attitude
- Paralysis through analysis
- Victim mentality
- Public perception that “they” are not part of the solution
- “Business as usual” mentality - need to break out and think of new opportunities
- Growing intolerance of different cultures, sex, race, creed, religion, and politics

# APPENDIX G: PORTER CLUSTERS

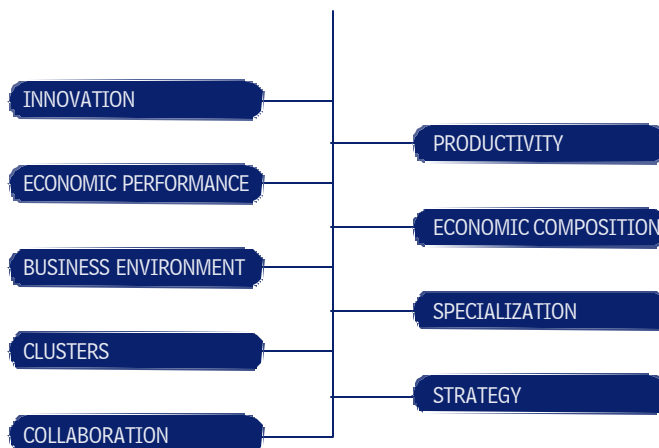
Professor Michael E. Porter of Harvard University is regarded by many as the expert on industry clusters. In his “Clusters of Innovation: Regional Foundations for U.S. Competitiveness,” Dr. Porter offers a rational division of labor for cluster development among federal and state government, regional/local government, universities, cluster associations and individual firms. An excerpt from this study is included in this appendix. The full report and numerous other publications by Dr. Porter may be found at the Harvard Business School, Institute for Strategy and Competitiveness, <http://www.isc.hbs.edu>.

Professor Michael E. Porter, Harvard University  
Monitor Group  
ontheFRONTIER  
Council on Competitiveness

## CLUSTERS of INNOVATION: Regional Foundations of U.S. Competitiveness



### CLUSTERS OF INNOVATION INITIATIVE



## The Development of Clusters

- **Clusters can be strengthened by increasing awareness of the cluster among local firms and organizations:** Not only must firms be aware of the presence of a local cluster, they must also get together and coordinate activities to improve the cluster's business environment. Acceptance of new companies is important if the cluster is to grow quickly and reach a critical mass.
- **New firm and cluster opportunities arise at the intersection of existing clusters:** Economic development strategies can leverage these opportunities to diversify a regional economy.
- **Anchor companies play a disproportionate role in seeding cluster development:** Anchor companies support cluster development by acting as magnets for other major companies; organizing other companies in the cluster for collective action; supporting projects that improve the local quality of life; and producing numerous spin-out companies, which strengthen key elements of the cluster.
- **Institutions for collaboration can significantly increase the success rate of start-up companies:** Cluster development depends in large part on generating new companies from within a region. Successful regions almost always have a hospitable environment for start-ups.

### Implications

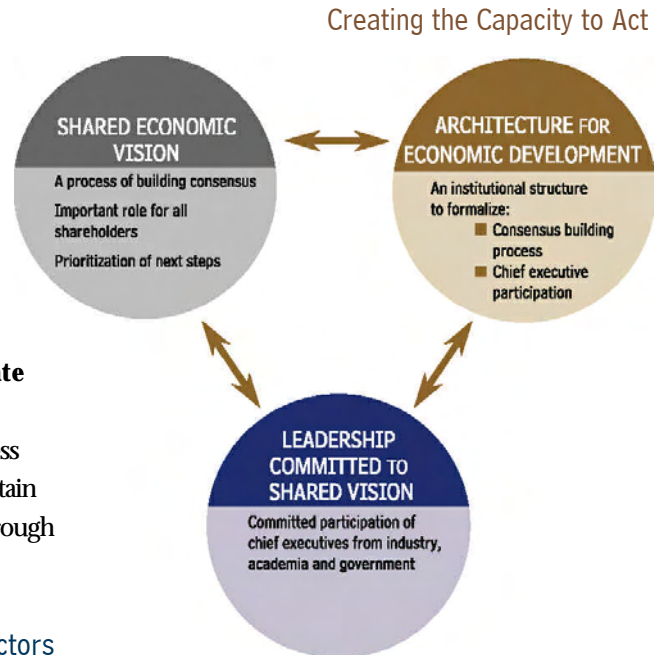
- **An explicit cluster development program:** Although chance events play a role in the formation and development of clusters, conscious efforts to raise cluster competitiveness and innovative capacity can meaningfully influence the trajectory of cluster development.
- **Recruiting for clusters:** Recruitment strategies at the regional level should target clusters in which the region has strength, or clusters which overlap with other clusters. This allows the region to market its unique assets rather than compete on subsidies. In recruiting efforts, regions should also identify gaps within clusters, and seek to attract companies to fill them.
- **Opportunities at the intersection of clusters:** Opportunities for growth often arise at the intersection of clusters where a region has strength.

## Creating and Implementing a Regional Strategy

- **Regions often encounter a common set of pitfalls:** Because no single nationwide policy will be entirely appropriate for every region, policy setting at the regional level is especially important.
- **Regions need to overcome transition points in the development of their economies:** Regional leaders encounter transitional challenges as they develop their economies. Addressing these challenges should be targets of regional economic development strategies.
- **Broad-based collaboration is needed for development strategies to succeed:** Successful regional economies benefit from the contributions of a wide array of organizations. Organizing for action entails arriving at consensus and creating the capacity for regions to implement development strategies.
- **A shared economic vision helps elicit broad support and coordinate activities:** To achieve good coordination among many diverse groups, a shared vision of common objectives and methods is vital.



- **Strong leadership is a necessary part of any successful economic development strategy:** Strong leadership committed to regional economic development is needed to ensure that companies, knowledge centers, governments, and collaborative institutions contribute to their full potential.
- **An overarching organization for economic development helps coordinate and routinize the process:** A formal organizational structure and process for working on economic issues helps maintain a consensus behind an economic strategy through periods of economic and political change.



## Action Agendas for the Public and Private Sectors

### FEDERAL GOVERNMENT

- Invest in the foundations of science and technology.
  - Increase federal funding of research at universities and other research centers.
  - Establish federal overhead recovery rules, and other policies, to encourage investment in universities' science and technology infrastructure.
  - Provide federal support for specialized training programs in science and engineering.
- Improve the innovation policy context.
  - Fortify intellectual property protection.
  - Strengthen and enforce anti-trust laws with a greater weight on innovation.
  - Reinforce federal tax incentives that encourage business investment in R&D and industry-university collaboration.
- Allocate federal resources to reinforce cluster development.
  - Distribute federal research funding through a system of peer-reviewed competitive grants in a way that fosters cluster development
  - Encourage locally-based federal agencies to communicate and coordinate with local business, institutions for collaboration, and educational and research centers based around clusters.
- Provide better data for measuring regional economic composition and performance.
  - Collect more up-to-date data down to the county level.
  - Collect measures of both economic performance and innovation.
- Encourage the development of regional economic development strategies that stress innovation.
- Provide federal matching funds for innovation-focused state and regional economic development strategies.

## **STATE GOVERNMENT**

- Invest in the foundations of science and technology.
  - Recognize the state government's important role in supporting R&D funding at state universities.
  - Establish and maintain high levels of state support for community colleges and specialized training centers.
  - Create a strong university or college presence in all major regions of the state.
- Sponsor state programs that encourage cluster development.
  - Build cluster thinking into research parks and incubators.
  - Organize state systems of higher education around local clusters.
- Focus business recruitment around strong clusters.
  - Coordinate activities with firms, universities, and training centers to recruit anchor companies to their region.
- Create regional dimension to state economic development strategy.
  - Encourage and assist regions to develop economic strategies.
  - Cultivate attitudes toward collaboration and sharing of information among firms, universities, training centers, labor, institutions for collaboration, and government.
- Improve information systems to regularly collect data and measure progress.

## **REGIONAL AND LOCAL GOVERNMENT**

- Strongly support K-12 education, and create strong standards and accountability.
- Upgrade core business infrastructure.
  - Transportation infrastructure.
  - Communications infrastructure.
  - Ensure specialized training programs are a high priority in any economic development strategy.
- Develop a regional strategy that involves all stakeholders.
  - Support regional benchmarking initiatives.
  - Encourage a common vision and collaboration among firms, universities, and training centers.
  - Work with firms, universities, institutions for collaboration, and state government to create an organizational structure to help implement a regional strategy.
- Encourage cluster development.
  - Establish research and industrial parks that encourage innovation-based competition.
  - Implement cluster-focused and innovation focused recruitment efforts.

## **UNIVERSITIES AND RESEARCH INSTITUTES**

- Recognize the important role of universities in regional economic development.
  - Take the lead on, and participate in, regional and cluster development efforts.
- Create and support technology transfer offices.
  - Work with firms and venture capital to streamline the technology transfer process.
  - Benchmark the commercialization of university-created intellectual property using measures that promote efficient dissemination of knowledge.
- Actively participate in cluster development efforts.
- Align university curricula and research to meet the needs of local clusters.

- Create cluster-specific institutions to support collaboration between academia and industry clusters.
- Work with local industry to create areas of excellence within universities that differentiate the university and complement local industry strengths.
- Integrate research and training efforts with the needs of local industry.
- Participate in the recruitment of companies.
- Support company start-up efforts by professors and students through mentorship, entrepreneurial education, and financing.

### **CLUSTER-SPECIFIC INSTITUTIONS FOR COLLABORATION**

- Promote cluster awareness.
- Engage in ongoing diagnosis of cluster's competitive position.
  - Compare position relative to other regional clusters.
  - Identify constraints, obstacles, and advantages.
- Develop training and management programs.
  - Provide programs through institutions for collaboration.
  - Coordinate with local institutions to provide programs.
- Actively participate with government in recruitment efforts.
  - Communicate with firms in clusters to identify gaps in the cluster and recruit accordingly.
- Widen institutional membership to include all cluster constituents.

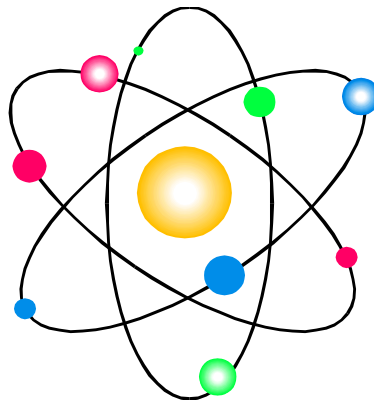
### **FIRMS**

- Recognize the importance of location to competitive advantage.
- Take an active role in improving competitive environment.
  - Consistently communicate your needs and desires (e.g., for talent, ideas, patents) to local universities, research institutes, and training centers.
- See their cluster as a competitive asset.
- Contribute actively to cluster development activities.
  - Actively participate in cluster activities to identify issues of common concern and opportunities for mutual gain (e.g., regulatory matters, new buyer needs, innovative supplier capabilities).
  - Support recruitment activities of local chambers and other regional economic development officials to bring in companies that will fill missing niches in the cluster (e.g., suppliers, services providers, competitors).
  - Contribute to programs that support new ventures (e.g., improving access to risk capital, mentoring programs, and specialized services) in order to build-out cluster.

# APPENDIX H: CLUSTER ORGANIZING GUIDE

The “Cluster Organizing Guide” by the Wisconsin Industry Cluster Initiative is a general “how-to” guide on organizing an industry cluster effort. This guide is included in this appendix and is also available from <http://commerce.wi.gov/BDdocs/BD-Cluster%20Organizing%20Guide>.

*Cluster  
Organizing  
Guide*



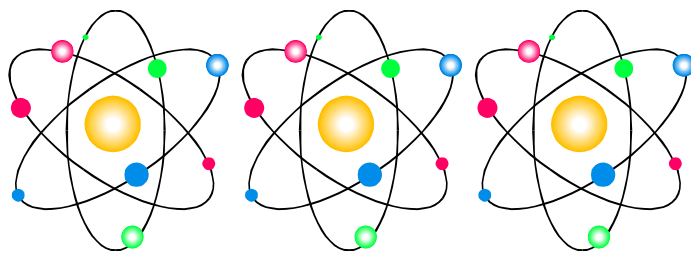
*Wisconsin Industry Cluster Initiative  
2002*

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## Introduction

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The key to innovation and competitiveness in a global economy is based on a region's ability to support and enhance the growth of interrelated industries that a particular region specializes in. This concentration of interrelated industries is often referred to as a cluster. Healthy clusters are a complex network of suppliers, services, support institutions, and producers concentrated in a particular region that drive innovation and thus, the creation of new products, new companies, and higher skilled/higher wage jobs.

- At its core, a cluster-based economic growth strategy is about focusing investment and energy at the industries where Wisconsin has a competitive or potential advantage over other regions.
- An effective strategy will require the state and regions to make choices about where to invest and where to develop partnerships between public, nonprofit, and private sector institutions to help these clusters grow.
- An effective cluster strategy is also primarily focused on industries that create higher skilled, higher wage jobs.

Pursuing an effective cluster strategy will require a new direction for economic development activity in Wisconsin. The focus will now be on supporting particular clusters in particular regions. It will require the state to make strategic decisions to align funding, programs, organizational structure, and partnerships to support regions and industries that are banding together to enhance the region's competitive advantage.

The decision to target public resources towards clusters cannot be made lightly. An industry cluster must invest the time and energy into developing a short and long-range plan for itself. This guide provides some basic guidance to develop such a plan.



This Guide was developed based on lessons learned by other states, regions and experts in the field of industry clusters. While there may be slightly different models for different industries or regions, there are some key components that can contribute to a healthy, successful cluster.

For additional resource tools, see the appendix list of resources used in the development of this guide.

---

## **A. Initial Discussion with the Industry Champion(s)**

---

This section provides some general guidelines for the first discussion between the champion and the facilitator about forming the cluster.

### **1. Discuss high level goals**

- a) What does the champion have in mind for this cluster project? Does he/she seem to have a good grasp of clusters?
- b) Provide informal overview on the benefits of clusters if needed.
- c) Clarify the exact industry that the champion is interested in forming – might it be a smaller sub-cluster (i.e. small engines vs. manufacturing) Help the champion define the cluster that would be meaningful.
- d) Use this opportunity to share information about trends and issues within the industry.

### **2. Address the Champion's understanding of their role**

- a) Are they willing to call the meeting and invite their colleagues
- b) How long are they willing to be the "champion?" (a one year commitment would be ideal, 6 months the minimum)
- c) Is the champion willing to include competitors, unions?
- d) What is the champion's firm able to provide for:
  - copying and postage
  - coffee, rolls, lunch for meetings
  - clerical support for above, i.e. nametags, registration, etc. – if so, get provide company contact
  - meeting room space and/or costs for facilities

### **3. Clarify Facilitator/Staff role – possible roles include**

- a) Assist with planning and convening meetings
- b) Arrange for speakers and/or provide overviews
- c) Serve as liaison to access names/contacts for invite lists and for background research profile on the industry
- d) Facilitate the meetings – clarify the role of the "facilitator" versus "chair" of the meeting
- e) Assist with writing up notes from the meeting, drafting strategic plan



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## **B. Planning the Industry Organizing Meeting**

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### **1. Decide on size/scope/goals of first meeting**

- a) Should you plan a *smaller pre-organizing meeting* of key companies  
This would serve as a group to brainstorm and plan the larger effort. This might assist the champion by involving other leaders to help plan the project. In effect, you might be informally creating what might become a “council” of leaders within the industry. The goals/objectives of this first meeting will be different than the larger inclusive meeting below.
- b) Or a *larger inclusive meeting*  
If the champion opts for starting with an “everyone come” approach, help him/her identify members that reflect the diversity in the cluster, keeping in mind that this is an inclusive vs. exclusive approach.

### **2. Provide assistance in accessing names/contacts**

- a) Use business databases at WMC, Commerce, DWD, etc.
- b) Develop and maintain database for the cluster.
- c) Strive for a majority, if not more, business representatives and try to monitor the ratio of public sector attendees to business sector.

### **3. Identify and invite representatives for the following:**

- a) Large, medium and small companies
- b) Final goods manufacturers
- c) Suppliers
- d) Raw materials suppliers
- e) Appropriate labor organizations
- f) Related (overlapping) cluster representatives
- g) Professional firms— law, accounting, marketing, engineering
- h) Specialty research organizations
- i) Educational representatives –University, Technical college, High School – vocational education
- j) Regional/state level economic development organizations, Chambers of Commerce
- k) Specialty regional organizations (i.e. tribes, inner city, neighbor state orgs.)

### **4. Develop a motivational invitation letter/packet**

- a) This will be the first thing many of the potential cluster participants see or hear about clusters and so should be compelling and geared towards their interests.
- b) Decide what to include as enclosures to this mailing, i.e. profile of the industry, examples of a cluster in the industry from another state/region?
- c) Coordinator can provide a fact sheet on clusters in a shell document.
- d) A market leading company champion(s) rather than an industry trade association should sign the invitation.

## **C. Convening the Organizing Meeting**

---

This section provides guidance on convening the first organizing meeting and contains options for both a small or large meeting.

### **1. Establish meeting objectives**

- a) Small pre-organizing meeting – possible objectives
  - Gain clear understanding of clusters and begin to understand potential benefits of clusters
  - Address any concerns or questions about the benefits – can be done in informal discussion format
  - Initial brainstorming of cluster needs – to be able to focus subsequent meetings
  - Identify other types of companies, suppliers and providers to include in next steps
- b) Larger inclusive meeting – possible objectives
  - Gain clear understanding of clusters and begin to understand potential benefits of clusters
  - Address concerns or questions – may need to bring in speaker that has experience with clusters and/or provide examples of successful efforts, especially for that industry if possible
  - Begin more detailed work on the overall “charge” to the cluster of cataloging key components and inventorying needs (described in section D below). (Note: Work on this may begin at the first meeting but it may also need to be planned for follow-up meetin(s).

### **2. Arrange speakers – orientation**

- a) How much education/orientation does the group need about its industry?
- b) How much education/orientation does the group need about clusters?
- c) Help the Champion manage the agenda if several people are asking to make a presentation.

### **3. Develop format for the meeting**

- a) How long? Will more than one initial meeting be scheduled?
- b) General speakers?
- c) Small group discussions? With or without facilitators?
  - If without, have clear instructions written down. If with, ensure that facilitators know the goals of the discussion.
- d) If small groups, do you want to ensure a mix of participants in each group, by nature of firm? Size? Or by geography?
- e) Assigned topics for small groups to brainstorm?
- f) Large group discussion? Establish specific topics to cover and methods to ensure participation and input from all. Have various methods, i.e. verbal, surveys, voting

## **D. Developing the Cluster “Charter”**

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Developing a “charter” for the cluster may occur at the first meeting but it may be the focus of follow-up meeting(s). This can also be described as a strategic plan for the cluster.

### **1. Catalog the key components of the cluster**

- a) Are there raw materials suppliers, grower/producer relationships
- b) Is this a service or product producing industry
- c) Where is this industry in terms of maturity? Solid foundation, transforming, emerging, declining?
- d) What are the key drivers in the industry, i.e. technology, outsourcing, supply chain management, foreign competition?
- e) Are there other industries that this industry is strongly connected to and/or dependent upon? I.e. biotech research and medical instruments. (See Attachment A of Massachusetts Select Clusters)
- f) Is there an active trade organization for the industry?
- g) Are there other organizations that provide research, a trade journal, etc.?

### **2. Inventory the needs of the cluster companies in areas such as:**

- (a) Availability of start-up capital
- (b) Support for spin-offs, entrepreneurial climate
- (c) Research and development capabilities
- (d) Availability of skilled labor
- (e) Training/education infrastructure
- (f) Energy, transportation and information infrastructure
- (g) Presence of market-leading companies
- (h) Entrepreneurial climate and innovation output, i.e. patents, establishment formation, venture capital investments, initial public offerings, and fast growth firms.
- (i) Business climate
- (j) Quality of life

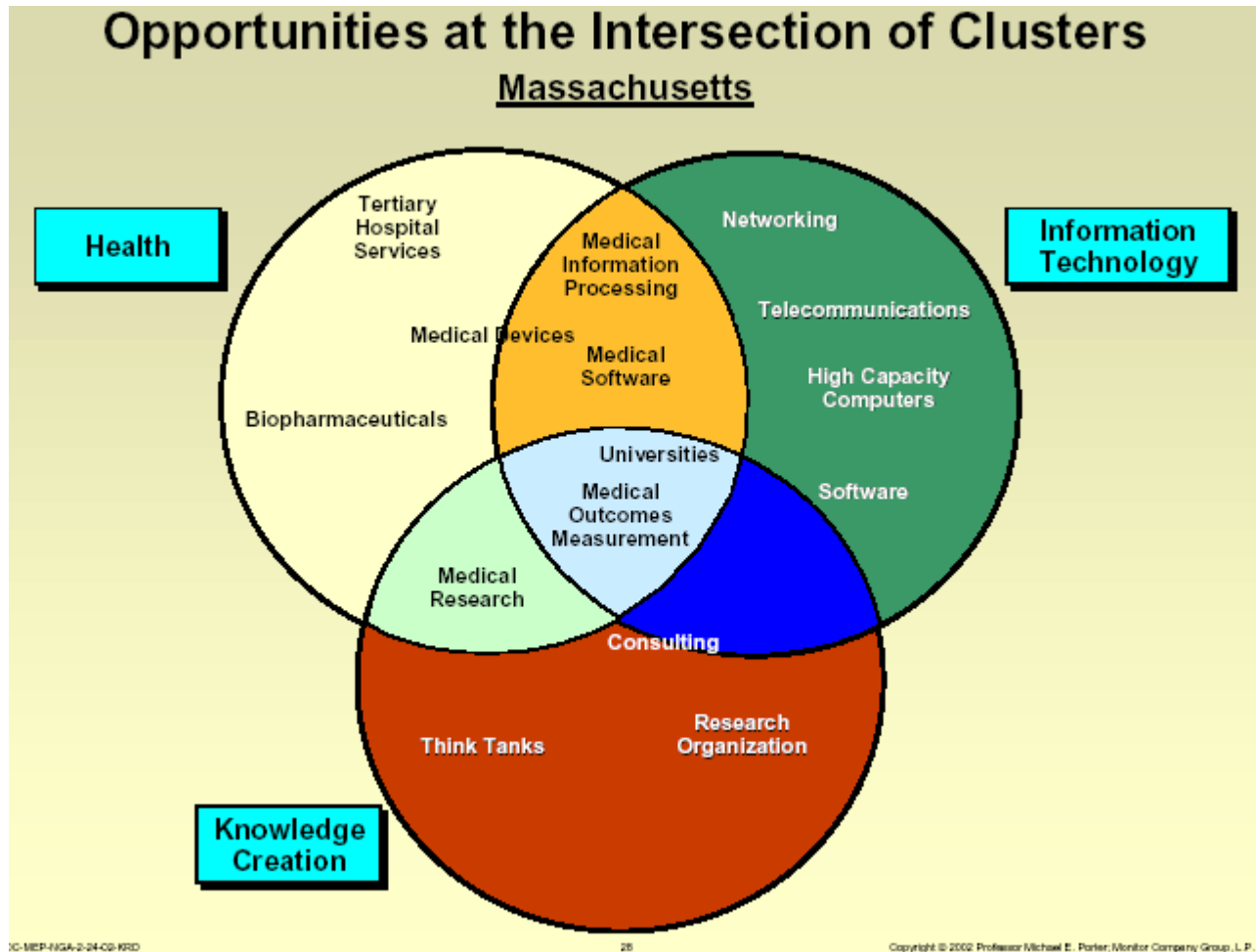
### **3. Map the interrelationships among firms**

- a) Use brainstorm-mapping techniques to gather data and perceived connections.
- b) Identify gaps in suppliers, raw materials suppliers, transportation methods, etc. where there is opportunity for growth to strengthen the cluster.
- c) Develop graphic method to display data that will be useful to the cluster and also help educate others about the cluster
  - Chart Examples - Attachments B, C, D include:
    - Arizona Aerospace
    - California Wine
    - New York’s Electronics

**4. Develop a vision of what the cluster can become over the next 10-20 years**

- a) Establish goals for growing the cluster in the desired direction such as:
  - expanding existing companies
  - starting new companies
  - and attracting outside companies
  
- b) Identify specific opportunities for more synergy within the cluster, possibly looking at a continuum that focuses on the following:
  - Co-inform
  - Co-learn
  - Co-market
  - Co-purchase
  - Co-produce
  
- c) Identify long term goals for specific economic foundations and proposed strategies
  - Foundations could include:
    - Capital
    - Innovation and entrepreneurship
    - Human resources
    - Information and communication infrastructure
    - Physical infrastructure
    - Quality if life
    - Tax and regulation
    - Technology
  - Strategies should include items for:
    - The firms within the cluster
    - Local, state and federal governments
    - Educational institutions

**Attachment 1 - Intersection of Clusters**



## Attachment 2 Chart Example

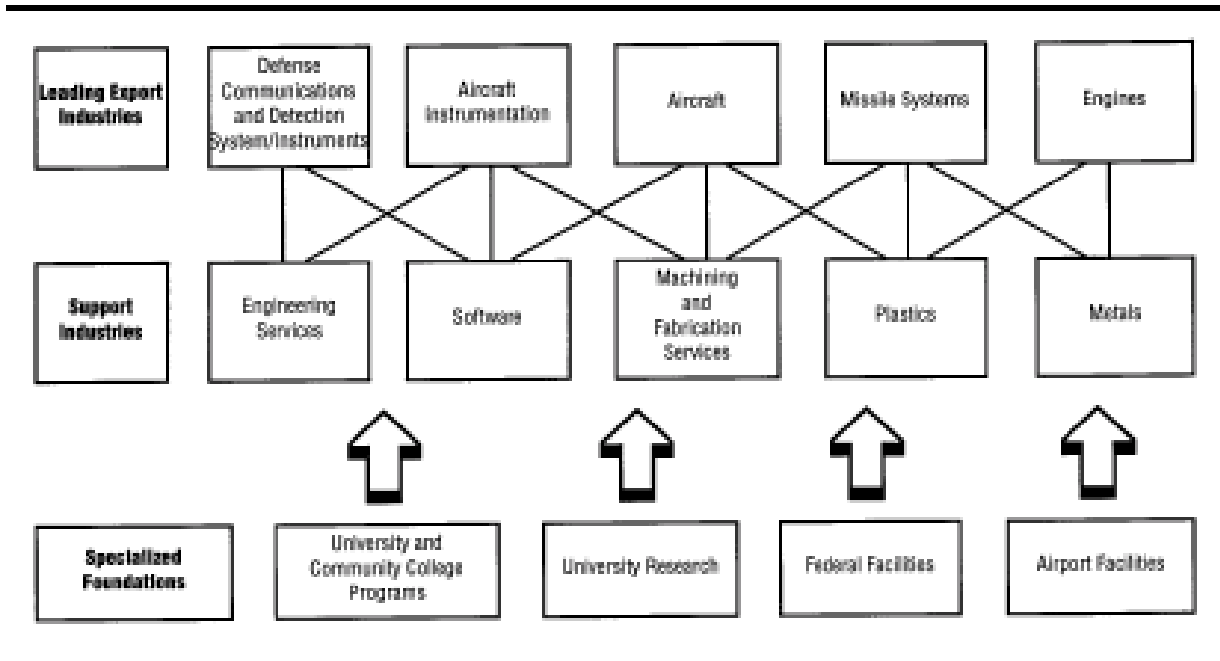
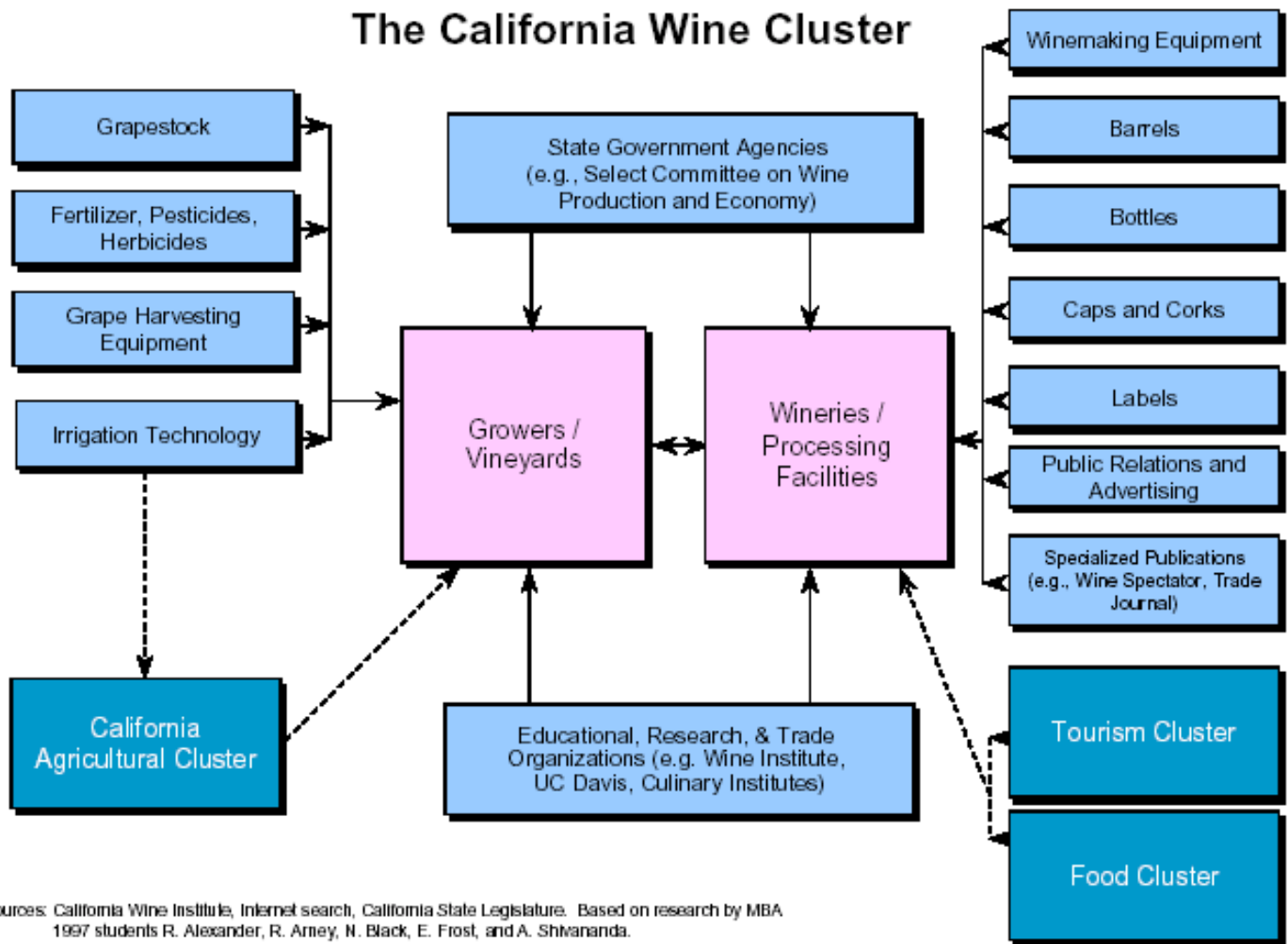


Figure 1: Aerospace Cluster Map

SOURCE: Arizona Strategic Plan for Economic Development.

**Attachment 3 Chart Example**



Sources: California Wine Institute, Internet search, California State Legislature. Based on research by MBA 1997 students R. Alexander, R. Arney, N. Black, E. Frost, and A. Shivananda.



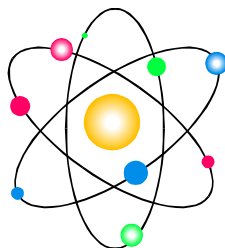


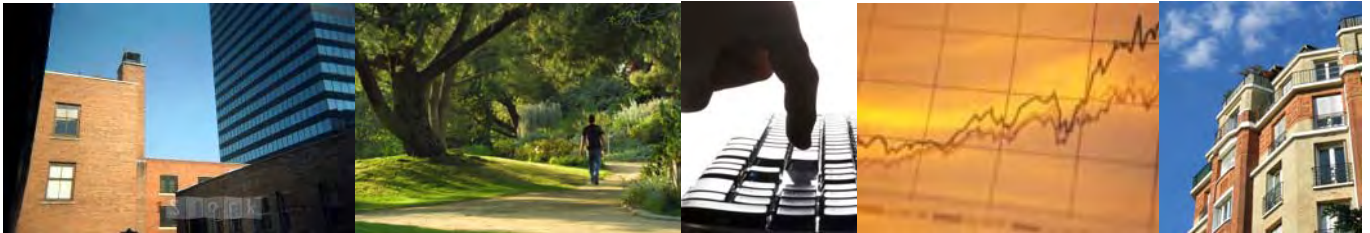
## F. Appendix

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The following resources were reviewed in the development of this guide.

- 1) **The Added Value of the Industry Cluster Approach to Economic Analysis, Strategy Development, and Service Delivery.** Mary Jo Waits, Arizona State University  
<http://www.nga.org/cda/files/ClusterWaits.pdf>
- 2) **Advantages and Disadvantages of Targeting Industry Clusters.** David L. Barkley and Mark S. Henry, Clemson University, Clemson, SC.  
[http://cherokee.agecon.clemson.edu/redrl\\_rpt3.pdf](http://cherokee.agecon.clemson.edu/redrl_rpt3.pdf)
- 3) **Backing into Clusters: Retrofitting Public Policies.** JFK School Symposium, Harvard University, March 2001. Stuart Rosenfeld, Regional Technology Strategies, Carrboro, NC  
<http://www.rtsinc.org/publications/Harvard4%20doc%20copy.pdf>
- 4) **Clusters of Innovation: Regional Foundations of US Competitiveness.** Michael Porter, Harvard University. Council on Competitiveness, 2001. To order go to:  
[http://www.compete.org/publications/clusters\\_reports.asp](http://www.compete.org/publications/clusters_reports.asp)
- 5) **A Governor's Guide to Cluster-Based Economic Development** – National Governor's Association - Lead Author Stuart Rosenfeld, Regional Technology Strategies, Carrboro, NC. [http://www.nga.org/center/divisions/1,1188,C\\_ISSUE\\_BRIEF^D\\_4063,00.html](http://www.nga.org/center/divisions/1,1188,C_ISSUE_BRIEF^D_4063,00.html)
- 6) **The Institute for Strategy and Competitiveness** – *Cluster Mapping Project* - Based at the Harvard Business School and led by Michael Porter.  
<http://www.isc.hbs.edu/index.html>
- 7) **Other State Cluster Programs**
  - **Arizona**  
<http://www.commerce.state.az.us/BusAttraction/Tech%20Industry%20Reports.html>
  - **Connecticut** <http://www.state.ct.us/eCd/Clusters/default.htm>
  - **Minnesota** – University of Minnesota-Hubert H. Humphrey Institute  
<http://www.hhh.umn.edu/centers/slp/edweb/example.htm>
  - **US Dept. of Commerce Links**  
[http://www.osec.doc.gov/eda/html/2b2\\_3\\_clusterbased\\_ed.htm](http://www.osec.doc.gov/eda/html/2b2_3_clusterbased_ed.htm)





*Economic and Demographic Research*

*Industry Studies*

*Fiscal and Economic Impact Analysis*

*Real Estate Economics*

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[www.DevelopmentResearch.net](http://www.DevelopmentResearch.net)  
303.991.0070