County of Kern
Community and Economic
Development Department

Economic Development
Strategy

Final Report

April 2005
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County of Kern
Community and Economic Development Department

Economic Development Strategy
Final Report
April 2005

Prepared for:
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This report is dedicated to the memory of James (“Jim”) King. Jim was a leader, thinker and mentor who was passionate about the economic future of California’s rural areas. Jim was a member of the project team until his untimely passing in August 2004.
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<td>ACORE</td>
<td>American Council on Renewable Energy</td>
</tr>
<tr>
<td>AFB</td>
<td>Air Force Base</td>
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<td>AFT</td>
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1. **Introduction: Mission and Objectives of the Kern County Economic Development Strategy**

The purpose of an economic development strategy is to guide decisions that will achieve the long-term economic stability of the County. That means finding ways to manage the major challenges of the day by strengthening existing industries in the County, providing demonstrable career opportunities for young people, accommodating changing demographics, effectively planning for the rapid population growth, its land use and air quality impacts and otherwise promoting sustainable economic well-being. This strategy is specifically designed to guide economic development activities in Kern County over the next five years but in doing so also raises issues that will affect the County for the next several generations. Kern County is at an important juncture where decisions made today will lead Kern County towards dramatically different outcomes. The purpose of this strategy is to begin framing those challenges and start the process of designing their solutions.

This strategy proposes directions for the development of the Kern County economy in the years to come. The strategy recommends particular industries on which to focus economic development activities. The strategy proposes new programs from workforce development to business attraction and retention. And, this strategy also proposes a new way of collaborating that will make the County more effective and capable of solving the challenges before it while intelligently seizing the opportunities around it.

This strategy is intended to enable all those promoting the County’s economic development to coordinate their efforts and focus their resources on the same priorities. The result should be greater effectiveness on the part of government agencies, educational providers, chambers, interest groups, the private sector and individual citizens in promoting the County’s economic development.

This strategy is an important step for the County and its recommendations reflect many months of collaborative work and dialogue with stakeholders across the County—from Lost Hills to Boron and from Maricopa to Ridgecrest. Nonetheless, the strategy is an initial step. The major next step begins with the implementation of key recommendations and with the development of a collaborative culture between County industries and the public sector. Further, specific areas discussed in the strategy were beyond the scope for this report and will require additional analysis to fully develop. These areas include an analysis of the air quality carrying capacity for Kern County and the appropriate mix of industries and land uses which will allow the County to remain within that capacity.

1.1. **Rules for Economic Success**

Kern County has for several years been using a “cluster-based economic development” approach in its economic strategy. This approach is grounded in decades of experience and is currently being implemented in hundreds of communities throughout the world. The cluster-based approach recognizes that economic development builds from a community’s strengths and that successful economies focus on improving the quality of what they produce and the inputs needed for that, not just on reducing their costs relative to competitors. The ICF Consulting strategy process has maintained and refined the existing cluster-based approach.
The ICF approach has identified several rules for the success of a strategy. These rules have informed the analysis and recommendations in this document. These rules are:

- **Recognize economic growth at a regional level - focus on the entire County:** Businesses are no longer as concerned about which city or jurisdiction they are in. Instead they care about a general environment where they locate and what advantages they can draw from local inputs—from skills to innovation to transportation to quality of life. Moreover, everything we do within our individual communities has an impact on the broader region and County in which we live. Challenges such as air and water quality, congestion and farmland preservation reach across jurisdictional boundaries and require broad-based solutions.

- **Grow the County's industry clusters – the drivers of our economy:** Our economic performance is driven by our “portfolio” of industry clusters. Clusters are groups of related businesses who export products and services from the County (bringing in new dollars), their suppliers as well as the public and private providers of economic inputs, such as trained workers, innovation, financing, transportation as well as business climate. Clusters grow and change over time. Competitive clusters generate high value-added jobs whose multipliers (salaries and expenditures within the County) create other jobs. A healthy economy has a diverse portfolio of competitive and newly emerging clusters. Cluster needs and actions exert an important impact on the surrounding region’s performance—prosperity, disparity and sustainability. These clusters are what our County “does for a living” and bring net new revenue into our communities by exporting goods and services beyond our communities’ boundaries. Identifying our clusters is based on understanding our economic niche and how our economy links with larger regional economies (such as Southern California and the San Joaquin Valley).

- **Build the local advantages that support clusters:** Clusters only take shape and grow in regions where they can find advantages for their operations—the more responsive to their needs, the better. This is why technology-driven clusters tend to be locate close to sources of skilled workers and innovation—as well as close to each other—so they can take advantage of similar workforce and infrastructure. An economy that is able to create advantages in workforce preparation, in supplying finance, transportation, energy and water, efficient regulation and administration and provide a high quality of life will form, expand and attract more companies around specific clusters. Building and adapting local advantages for clusters is the core of a sustainable and prosperous economy.

- **Collaborate to achieve ongoing economic growth:** Economic strategy requires thinking beyond traditional industry and community boundaries. Learning how to work collaboratively across community and jurisdictional boundaries will be necessary to solve shared competitiveness challenges. High performing economies around the world have achieved their status because their communities, businesses and institutions have built a collaborative culture. A collaborative culture is an environment in which all stakeholders are open to change and are willing to negotiate trade-offs and constructive agreements with one another—they get things done, often in creative ways. A collaborative economic culture enables businesses, governments and organizations to work together, to commit to new ways of doing business and to make investments that will have a mutually beneficial pay off. Learning and applying collaborative practices is the key to building the advantages that will help form and grow clusters and achieve a sustainable and prosperous economy.

Other approaches to economic development stress the importance of tax incentives and cost cutting as a strategy to lure businesses to a region or community. While this approach has been
successfully applied in specific cases, it is not always successful. In fact, many businesses which receive subsidies often do not last in the community for years into the future. This is due to several reasons. The most important is that subsidies do not ensure that the community provides other needs which are essential for a competitive business. These other factors include tailored training and skilled workers, industry-appropriate financing, and specialized infrastructure – all attributes of a well-functioning cluster economy and cluster-based strategy.

Rural areas, such as many parts of Kern, have been effectively applying the cluster approach. Yet, given the lack of agglomerations found in urban areas, the clustering notion is somewhat more complicated. Typically, rural areas develop clusters which take one of several forms:¹

- **Extensions of metropolitan clusters**: This occurs when there is a large economic region in relatively close proximity to the rural area. Often, particular services are pushed outside of the metropolitan region due to cost or overcrowding. In Kern, the transportation and logistics services, particularly in warehousing are a key example of this phenomenon. Major distribution centers are located in Kern because of its proximity to the Los Angeles market, in addition to its transportation and cost advantages.

- **Small “niche micro-clusters”**: This occurs when there is a particular set of skills or niche activities in the total area which often has historic roots. These clusters are small but can support the growth of other clusters. For example, a niche cluster in pottery manufacturing in rural North Carolina can support the growth of the rural region’s tourism. In Kern, the focus could be on artisan foods in an agri-tourism environment or even local artists producing goods for sale in small rural communities.

- **“Hub and Spoke Clusters”** This occurs when there are several large firms surrounded by a group of supplier firms. In Kern, the aerospace industry is the best example of one of these types of clusters where there is a larger entity (China Lake and Edwards Air Force Base) which is surrounded by a large number of supplier industries.

- **“Satellite platforms”**. This occurs when there is a large natural resource and an agglomeration of local branch plants. For Kern, this would be the oil and gas industry within the Energy and Chemicals cluster.

As demonstrated above, all of Kern County benefits when applying the cluster-based approach.

### 1.2. Goals of the Kern County Economic Strategy

The Kern County Economic Strategy, as a cluster-based strategy, will have three overarching goals. These goals reflect a summary of the values and desires expressed by participants throughout this process. They are goals which the County should apply to all its decisions and which the County should use to judge its success.

1.2.1. **Goal 1: Expand Jobs and Overall Prosperity**

Kern County’s high unemployment rate and low wages have been a historic challenge for the County. Any economic development strategy must strive to combat this through increasing the overall jobs throughout the County—particularly year-round employment in higher paying industries. This strategy proposes that growing the County’s clusters is the best way to increase the overall number of jobs. This is for two reasons. First, cluster industries in Kern are growing more quickly relative to the overall economy. Second, when cluster industries grow, their employees increase the demand for a wide range of goods and services in the County which results in overall job gains. (This impact is called a “multiplier effect”). In particular, the County should strengthen segments within the clusters with the greatest export potential. At the same time, the County should support the growth of its clusters into higher value-added activities which in turn will result in higher wages for its workforce. As the cluster industries grow, they will result in more jobs throughout the entire economy (through their multiplier impact) as employees in the clusters will require new goods and services. Finally, the County should forge greater linkages between Kern’s colleges and clusters to help promote the development of local innovations and increase workforce skills and use of technologies. Developing strong linkages between the clusters and the local educational providers is essential for ensuring the flow of well-educated and trained people into the clusters.

1.2.2. **Goal 2: Foster Inclusion and Increased Equity**

Economic growth sometimes results in increasing the disparities within a community. Some call this the creation of the “hourglass economy” where there are increasing jobs at the top and bottom ends of the economy. It is easy to recognize that with a reduced middle class, many local institutions — from social services to education — are strained. A healthy economy provides opportunities for people at multiple ends and decreases these disparities. Part of reducing disparities involves including aspects of the community that have historically not participated as directly in the benefits of growth. Kern County today has many elements of disparity which must be reduced to strengthen the overall economy. Kern has high levels of poverty and unemployment while many local industries pay low wages. As growth occurs, the County should ensure that existing residents have the skills to be able to secure jobs in the competitive clusters. The County should support industries with high quality jobs and solid wages that provide career ladder opportunities. Incentives should be targeted in such a way to benefit low and moderate income people and communities. Further, the County should encourage high adoption of technology among students and the workforce to ensure higher skilled and quality jobs come to and remain in Kern. Finally, the County should encourage greater collaboration between the public and private sectors to solve shared competitiveness challenges.

1.2.3. **Goal 3: Promote Sustainability and High Quality of Life**

Economic competitiveness is not simply a matter of job growth and opportunities. Competitiveness is also about ensuring that growth does not degrade the environment and quality of life. Sustainability here is understood to mean meeting the present needs of the population without compromising the ability of future generations to meet their needs. Kern County’s current growth patterns are threatening this sustainability, both economically and environmentally. The needs of the present population are for good jobs, adequate and affordable housing, available and healthy food, safe neighborhoods, accessible open space and a high quality of life. Current population growth is leading to the loss of agricultural lands which provide raw materials for some of Kern’s most competitive industries while sprawling land uses
are encroaching on industrial land and jobs, increasing congestion, worsening the air quality and destroying aspects of the open space which make Kern County a unique environment to live in. In order to ensure that future generations are able to achieve all of these goals in Kern County, there is a need to begin applying principles of sustainability today. These principles apply to land use planning as well as to the kinds of industries which are encouraged throughout the County. Some of the specific goals should be to manage growth in a way that limits the conflict between housing and jobs, preserves farmland, maintains open space and improves the quality of life throughout the County. In doing so, the County will sustain the rural natural environment which is essential to both retain the people who are there and continue to attract people who are seeking an alternative to the urban environments elsewhere. Further, the County should encourage compact development which makes efficient use of land and infrastructure as a way to save money and land. Finally, the County should encourage industries and firms to incorporate sustainable practices that result in reduced air/water pollution and overall environmental impact. These practices can include co-generation, use of renewable energies, co-location of suppliers and customers and locations in greater proximity to transit and the increase in non-automobile modes of transport.

In summary, these three strategic goals should be applied as a “lens” to decision-making throughout the County. Throughout the implementation of this strategy, County officials should ask the following questions when looking at new policies, programs, or investments:

- How will this investment support the growth of Kern’s economic engines, its industry clusters?
- How will this activity or policy result in reducing disparities by increasing the participation of Kern’s low and moderate income (LMI) population?
- How are these decisions helping us preserve our agricultural heritage and open spaces and improve our air quality?

To accomplish this, Kern County will help the formation of new industries which are innovative and globally competitive, develop a workforce which is highly skilled and adaptable and able to succeed in the existing and emerging knowledge economy, grow the overall number of jobs in order to ensure that the fast-growing population will have sufficient employment to meet its needs and plan for its future through intelligent solutions to land use conflicts which require some sacrifice in order to ensure a prosperous economy in the future.

### 1.3. Method of Approach

This economic development strategy employed a methodology based on a combination of quantitative fact-finding and analysis followed by focus groups and discussions with representatives of a wide range of companies and organizations throughout the County and adjacent areas. Relying on economic data obtained from federal and state sources as well as private subscription services, the quantitative analyses used methodologies developed by the ICF Consulting Global Economic Development Practice and applied to numerous regions throughout the United States and abroad over the past two decades.

The focus groups, interviews and further discussions allowed most elements of this plan to be tested and elaborated. While there are important stakeholders in the County who could not be interviewed, there is no particular element of this plan that reflects the opinion of any one person.
alone, and everything said was scrutinized from the perspective of experience with many other regions throughout the country.

The vision at the core of this plan has already been presented to business leaders and public officials active in promoting the development of the County economy. Every element of the vision has also been discussed with and reviewed by the County’s Community and Economic Development Department and Kern Economic Development Corporation.

1.4. Organization of this Document

There are three components to the Kern County Economic Development Strategy, each corresponding to a chapter of this document:

- **Economic Overview**: This chapter introduces an overview of the current economy. The chapter provides the framework that guided this analytic process and should guide the County as it continues to analyze and support its economic growth. This chapter also introduces the economic input “foundations” that support competitiveness.

- **Industry Cluster Overviews**: This chapter explores the status of Kern’s industry clusters, the competitive challenges they face and provides recommendations for how to overcome these challenges and for the overall vision of the cluster’s future. These cluster overviews present benchmark data comparing Kern’s cluster with competitor economies throughout California.

- **Strategic Flagship Initiatives**: This chapter proposes the set of strategic initiatives through which the County and its partners will strengthen the competitiveness of the County’s cluster-based economy. Each Flagship includes goals, structure, recommendations and resource requirements. These Flagships are based on the analytic work conducted for Kern County, an understanding of best practices and focus groups and interviews with representatives of Kern’s industry clusters and economic input foundations.

- **Implementation and Monitoring**: This final chapter focuses on how the Flagships proposed can be formalized and implemented. The steps proposed emphasize the importance of re-energizing the cluster approach to managing collaboration. The goal of the implementation process is to engage clusters in working together on a continuing basis over time and with the public sector and other institutions over time. This chapter also proposes how to monitor and measure the outcomes of the strategy.

1.4.1. **Why Purposeful, Collaborative Action?**

Kern County has already demonstrated a strong spirit of collaboration, throughout focus groups and cluster groups which began after the 1999 strategy. However, the process of developing and promoting clusters in an economy is not always natural and the dynamics of this process must be understood. As any student of Silicon Valley’s miracle will tell you, the Silicon Valley is anything but natural. There certainly were existing economic foundations and fortuitous events that shaped the clustering of technology-based industries in that region; however, there was also a continuing stream of purposeful strategic and opportunistic action to leverage advantage where it existed and to attract and create advantage where it did not. While Silicon Valley is not necessarily the goal for Kern County, a vibrant economy with an admirable quality of life is. Whether it is Silicon Valley (which lost its farmland for higher value activities) or Napa Valley (which retained its farmland by moving into the highest value products from its farms), economic
success stories come where leadership and vision are the catalysts and talent, knowledge and resources the ingredients.

The “natural” element of clustering results from far-sighted individuals who, often out of self-interest or in order to achieve their own vision, realize the need to collaborate to address common challenges. In smaller regions, and with respect to certain industries, these informal support mechanisms for clustering can work. However, in today’s global environment, wholly unplanned clustering is more the exception than the rule. At the same time, however, government agencies or other public institutions cannot easily create clusters de novo unless the conditions are right. There must be some natural tendencies towards clustering in a region, some reasons why clustering in a particular industry makes sense in a region, for purposeful action to be effective. These conditions or competitive advantages may include such elements as the presence of key or major players in a specific industry or distinctive competencies in a local University. Leading regions around the world are realizing the strategic value of capitalizing on such distinctive advantages and of catalyzing and supporting the industry clusters which are the drivers of robust, competitive, innovative economies.

This recognition is fueling the rising tide of purposeful collaborative action—i.e., intervention—aimed at addressing competitiveness gaps in regions around the world. Kern County recognized this process when it initiated a cluster-based competitiveness strategy in 1999. Now, again, Kern must institute a comprehensive, formal, yet flexible framework for managing a series of initiatives to support cluster-based economic development.

That is because the purposeful collaborative actions usually necessary to accelerate economic development must also usually be continual over the years for economic growth to be sustained. The actions must be rethought and renewed periodically, and new actions introduced, to account for changes in local companies and institutions, the local economy, and global markets and technologies. Institutions set up to provide for continual long-term action must themselves be renewed periodically. Sometimes continued collaborative action and periodic renewal take place as a matter of course through momentum, but more often there has to be an intervention specifically aimed at revitalizing the institutions.

### 1.4.2. Expectations: Small Solutions, Not Grand Illusions

Cluster-based economic development strategies are not about reports or committees. Successful strategies are about learning how to change again and again. The actions developed to enhance Kern County’s clusters and overall economy are practical and necessary. If there is significant progress on implementing the proposed initiatives, each cluster will advance. Through this strategy participants from the public and private sectors have come to learn that successful economies achieve their goals, not because of an external agency, but because the people and their institutions and organizations are capable of seeing the world around them differently and are willing and able to change. These changes are never easy, but each time a change is accomplished that accomplishment reinforces the value of undertaking further actions. With this strategy, Kern County is on its way to developing a more prosperous, equitable, sustainable and innovative economy.
2. Setting the Stage for Competitiveness: General Analysis and Key Findings

2.1. General Conclusions about Kern

Kern County is a dynamic and rapidly changing County. Population growth presents an opportunity to continually expand the labor force but it also puts increasing strains on the County’s underlying infrastructure, from roads to schools, and is threatening some of the County’s prime farmland and industrial activities as residential development is placed in areas where it is competing directly with economic activities. In recent years the County has made significant improvements in key economic and social areas such as the growth in average weekly wages, but has not performed as strongly as some neighboring counties in other measures such as the unemployment rate.

Kern’s economy is based on the diverse assets of agriculture, oil, aerospace and transportation and warehousing services. Despite this seeming economic diversification, the overall performance of the County has been mixed in recent years when compared to the State and other counties, although noticeable progress has been made overall. This is due in part to the cyclical and uncertain nature of oil and aerospace which are often affected by factors beyond the County. Further, the agricultural sector consists mostly of low paying and often seasonal employment which limits the positive multipliers within the economy.

Moreover, key industries in the County, like Value-Added Agriculture, are regional and national leaders, and new ones, such as Transportation, Logistics & Warehousing, are emerging and growing. The region also has distinctive assets related to renewable energy and aerospace, two areas with significant potential to expand and develop. Wind and biomass are growing forms of locally-generated renewable energy while solar remains an untapped potential. Aerospace potential is driven by the emergence of private sector space-travel activities as well as a highly-skilled workforce in East Kern, particularly in engineering, whose training can be applied in new aerospace manufacturing. Lower business costs, the availability of land, and relatively lower costs of living also add to Kern’s attractiveness and competitive advantage. On the other hand, lackluster new business growth, lower educational attainment and skills gaps, out migration of young people, a high incidence of low-to-moderate income residents, and air quality issues—especially within the San Joaquin Valley—are significant disadvantages in the County that need to be addressed.

2.2. Measures of a High Performing Economy

Economic strategy begins with a clear sense of how the region has been performing in the past, and what its primary challenges are. Countywide economic performance is not a one-dimensional concept, however, and its assessment needs to go beyond traditional economic indicators. For these reasons, this report considers three dimensions of economic performance: Prosperity, Equity/Disparity, and Sustainability. This overview provides a brief assessment of each of these three factors of high performing economies. In general, Kern County’s economic performance is mixed.
2.2.1. **Prosperity: Providing for the County’s Needs**

Prosperity refers to the ability of an economy to provide its residents with their material wants and needs. In practical terms, prosperity is closely tied to issues of employment, income, and business growth. The following indicators were examined to assess the region’s prosperity:

- Population and Migration
- Demographic Characteristics
- Labor Force and Employment
- Income and Wages
- Business Establishments

**Population and Migration**

Kern County’s population is concentrated in its urban areas that have been growing quickly. The population of Kern County was 661,645 in 2000, compared with the 1990 population of 543,477. During the 10-year period between 1990 and 2000, Kern County grew by 21.7%. In 2000, approximately 584,400 residents, or 88% of the population, lived in urban areas, while the other 12% resided in rural areas (Census, 2000). More recent estimates from the State of California Department of Finance puts Kern’s population as of January 2004 at approximately 724,900, representing an increase of 8.7% from 2000.

The population of the “Consolidated Plan Jurisdiction” (Kern County minus Bakersfield, Taft, Delano, and Wasco) was 348,101 in 2000. This population is a 7% increase over the same areas’ 1990 population of 327,581. The Con Plan Jurisdiction is growing more slowly than the County as a whole and the City of Bakersfield. Because Wasco and Delano are no longer considered in the Consolidated Plan Jurisdiction, and because the City of Bakersfield continues to annex incorporated lands, the population of the Con Plan Jurisdiction is less now than it was for the last Con Plan.

Going forward, Kern County’s growth is expected to continue its rapid increase in population. In five years, the County is projected to add another 160,000 people or the equivalent of another four cities the size of Delano. Kern will soon cross the 800,000 person threshold. Moreover, the population is expected to climb to 1.5 million by 2050, which is well more than twice the current population. (State Department of Finance). Kern County’s soaring population growth represents a pressure to maintain strong and ongoing economic growth (as well as thoughtful and efficient land use planning).

Although the population is growing rapidly, Kern County has also witnessed significant outmigration of young people, and the retention of skilled, young professionals is increasingly a challenge in many parts of the County. This could be motivated by a lack of opportunity within the community, as well as strong pull factors from nearby regions. Thus, this trend should be reversible, if opportunities to earn a living and maintain a high quality of life within the region are enhanced, particularly for young people.

**Demographic Characteristics**

Kern County has a relatively young population, despite the growing trend of young people leaving the County. In 2000, the median age in Kern County was 29.9, compared to the low-to-
mid 30s median ages found in neighboring counties. Sacramento County has one of the highest median ages in the Central Valley (33.8), followed by San Joaquin (31.9) and Fresno Counties (30.6).

**Figure 1. Median Age of the Population, 2000**

![Graph showing median ages of different counties in the Central Valley](image)

Source: Census, 2000

Relative to national standards, Kern County is ethnically diverse, though less diverse than neighboring Los Angeles County. The County is predominantly White (49.5%) and Hispanic/Latino (38.4%). In the coming decades the County will become increasingly Latino.

**Table 1. Kern County, by Race and Ethnicity, 2000**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percent</th>
<th>Number</th>
</tr>
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<tbody>
<tr>
<td>White</td>
<td>49.5%</td>
<td>327,190</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>38.4%</td>
<td>254,036</td>
</tr>
<tr>
<td>Black or African American</td>
<td>5.7%</td>
<td>37,845</td>
</tr>
<tr>
<td>Asian</td>
<td>3.2%</td>
<td>21,177</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.9%</td>
<td>5,885</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>0.1%</td>
<td>728</td>
</tr>
<tr>
<td>Some other race</td>
<td>0.1%</td>
<td>989</td>
</tr>
<tr>
<td>Two or more races</td>
<td>2.1%</td>
<td>13,795</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>661,645</td>
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</tbody>
</table>

Source: Census, 2000
**Chapter 2 – Economic Overview**

**Labor Force and Employment**

Today, Kern County has a year-round labor force of nearly 305,000, which has been growing at an average annual rate of 1.43% since 1994. This is slightly lower than the California average of 1.48%. However, Kern County’s annualized total employment growth (1.78%) was greater than the State’s 1.71% growth between 1993 and 2004. The County’s total employment also grew faster than the growth of its labor force during the same period, suggesting that the economy was adding jobs faster than new labor. Despite these positive trends, labor force and employment are growing faster in Sacramento, San Bernardino, and San Joaquin Counties (see table below).

Although mirroring a similar State and regional pattern, Kern County’s unemployment rate has been historically high compared to other comparable counties and California as a whole (see table below). In 1990, there were over 30,000 people out of work, compared with 40,000 people today. In the early 1990s, the rate reached nearly 18%, and between 1994 and 2003, the annual unemployment rate ranged from a low of 10.7% (2001) to a high of 15% (2004). Even at the height of the boom in 2000, the annual unemployment in Kern was approximately 11.3%, far higher than the State average of 4.9% and that of comparison counties such as San Joaquin and San Bernardino. However, Kern County’s unemployment rate has been lower than that of neighboring Fresno County since 1995. Unemployment in Kern may be structural but it is not unchangeable.

**Table 2. Labor Force Employment Trends**

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<tbody>
<tr>
<td>Kern</td>
<td>266,021</td>
<td>277,948</td>
<td>302,324</td>
<td>1.43%</td>
<td>226,166</td>
<td>246,349</td>
<td>265,177</td>
<td>1.78%</td>
</tr>
<tr>
<td>Fresno</td>
<td>356,951</td>
<td>376,487</td>
<td>399,098</td>
<td>1.25%</td>
<td>306,358</td>
<td>325,823</td>
<td>342,283</td>
<td>1.24%</td>
</tr>
<tr>
<td>Sacramento</td>
<td>534,019</td>
<td>580,500</td>
<td>649,984</td>
<td>2.21%</td>
<td>495,699</td>
<td>556,073</td>
<td>613,711</td>
<td>2.40%</td>
</tr>
<tr>
<td>San Bernardino</td>
<td>672,274</td>
<td>746,893</td>
<td>870,706</td>
<td>2.92%</td>
<td>614,497</td>
<td>710,938</td>
<td>820,554</td>
<td>3.27%</td>
</tr>
<tr>
<td>San Joaquin</td>
<td>240,543</td>
<td>249,527</td>
<td>278,922</td>
<td>1.66%</td>
<td>209,929</td>
<td>227,603</td>
<td>250,768</td>
<td>1.99%</td>
</tr>
<tr>
<td>California</td>
<td>15,294,023</td>
<td>16,375,610</td>
<td>17,460,005</td>
<td>1.48%</td>
<td>13,979,189</td>
<td>15,522,291</td>
<td>16,282,683</td>
<td>1.71%</td>
</tr>
</tbody>
</table>

*Note: All figures are annual and not seasonally adjusted.

Source: ICF Consulting; BLS*
Incomes and Wages

Kern County had a median household income of $35,466 in 1999, which is slightly higher than Fresno County’s level of $34,725, but noticeably lower than that of Sacramento, San Bernardino, and San Joaquin Counties as well as the entire State. Additionally, Kern’s median household income grew 23.8% since 1989, slower than the growth in all of these counties, including Fresno. It should be noted that Kern’s cost of living is lower than in some of the comparison Counties which is reflected by the lower incomes. For example, according to Bankrate.com, Fresno County is approximately 17% more expensive than Kern County. To maintain the same standard of living, a family earning $35,466 in Kern County would have to earn $41,000 in Fresno County. The figure below shows median household income levels in 1989 and 1999 for Kern and comparison counties.

Note: All figures are annual and not seasonally adjusted.

Source: ICF Consulting; BLS
As depicted in the figure below, average weekly wages in Kern County have been higher than wages in Fresno County, but lower than overall wages in the State. Since the beginning of the recession, Kern County has had a modest growth in average weekly wages, from an annual level of $579 in 2001 to $622 in 2002, representing a 7.4% growth. This growth compares favorably to the statewide growth in average weekly wages of 3.0%.

Note: Wages are annual and total of all industries.

Source: BLS
Business Establishments

Kern County had approximately 15,550 business establishments in 2003, up from an estimated 14,600 establishments in 2001. The growth in business establishments in Kern County between 2001 and 2003 was 6.4%, which is on par with Fresno’s. However, Kern County’s business establishment growth fell well short of the statewide growth, as well as the growth in San Bernardino, Sacramento, and San Joaquin Counties. The figure below indicates the growth in business establishments for Kern County and comparison regions.

![Figure 5. Growth in Business Establishments, 2001-2003](chart.png)

*Note: Reflects total of all industries.*
*Source: ICF Consulting; BLS*

2.2.2. Equity: Analysis of Opportunities for LMI People in Kern County

The economic growth that generates prosperity can threaten sustainability if it aggravates social disparity and exclusion, or creates a sense of a widening gulf between “haves” and “have-nots”. Broad-based support for economic strategy is essential, if a County is to be able to maintain a long-term focus on its fundamental objectives. Questions to consider include how well Kern is doing at providing opportunities for people with low and moderate incomes? Do the County’s jobs pay wages which are supportive of raising a family or buying a home? Are there concentrations of poverty or low educational outcomes which are limiting economic growth?

Several indicators of disparity are useful to review, including:

- Income Distribution
- Incidence of Low Income Families
- Educational Outcomes
The following section explores some of these questions by focusing on economic opportunities available to Low and Moderate Income\(^2\) (LMI) individuals in Kern County.

Over 293,000 persons or 46.4 percent of Kern County’s population are LMI residents. This sub chapter explores the demographic characteristics of Low and Moderate Income individuals especially with regard to education attainment, employment, income distribution, poverty, unemployment, self-employment and small business ownership. Later in this report we will describe the employment opportunities and the prevalence of entry-level jobs in highly-recommended clusters for LMI individuals and dislocated workers from declining industries as well as look at employment opportunities and the prevalence of entry-level jobs in each highly recommended cluster by occupation.

**GEOGRAPHIC CONCENTRATIONS OF LOW AND MODERATE INCOME PEOPLE**

Low and moderate income people are found throughout Kern County; however they are concentrated in some communities. As indicated in the table below, the proportion of low and moderate income people in low income communities ranges up to 70 percent. Communities with relatively higher concentrations of low income people present an important opportunity to economic development efforts.

\(^2\) “Low-income person is a member of a family that has an income equal to or less than the Section 8 very low-income (50 percent of median income) limit, and moderate-income person is a member of a family that has an income equal to or less than the Section 8 low-income (80 percent of median income) limit, pursuant to 24 Code of Federal Regulations 570.3.
Table 3. Low and Moderate Income Cities/Communities

<table>
<thead>
<tr>
<th>City/Community</th>
<th>Total Population</th>
<th>Low/Moderate Total</th>
<th>Low/Moderate Universe</th>
<th>Percentage Low/Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arvin</td>
<td>12956</td>
<td>9119</td>
<td>12874</td>
<td>70.8%</td>
</tr>
<tr>
<td>Bodfish</td>
<td>1823</td>
<td>1055</td>
<td>1840</td>
<td>57.3%</td>
</tr>
<tr>
<td>Buttonwillow</td>
<td>1266</td>
<td>763</td>
<td>1255</td>
<td>60.8%</td>
</tr>
<tr>
<td>Delano</td>
<td>38824</td>
<td>20865</td>
<td>33972</td>
<td>61.4%</td>
</tr>
<tr>
<td>Fellows</td>
<td>153</td>
<td>89</td>
<td>155</td>
<td>57.4%</td>
</tr>
<tr>
<td>Ford</td>
<td>3512</td>
<td>2062</td>
<td>3503</td>
<td>58.9%</td>
</tr>
<tr>
<td>Lake Isabella</td>
<td>3315</td>
<td>2285</td>
<td>3319</td>
<td>68.8%</td>
</tr>
<tr>
<td>Lamont</td>
<td>13296</td>
<td>9143</td>
<td>13196</td>
<td>69.3%</td>
</tr>
<tr>
<td>Lost Hills</td>
<td>1938</td>
<td>1381</td>
<td>1972</td>
<td>70.0%</td>
</tr>
<tr>
<td>Maricopa</td>
<td>1111</td>
<td>588</td>
<td>1098</td>
<td>53.6%</td>
</tr>
<tr>
<td>McFarland</td>
<td>9618</td>
<td>5927</td>
<td>8491</td>
<td>69.8%</td>
</tr>
<tr>
<td>Mettler</td>
<td>157</td>
<td>118</td>
<td>159</td>
<td>74.2%</td>
</tr>
<tr>
<td>Mojave</td>
<td>3836</td>
<td>2165</td>
<td>3607</td>
<td>60.0%</td>
</tr>
<tr>
<td>Oildale</td>
<td>27885</td>
<td>14920</td>
<td>27827</td>
<td>53.6%</td>
</tr>
<tr>
<td>Onyx</td>
<td>476</td>
<td>352</td>
<td>521</td>
<td>67.6%</td>
</tr>
<tr>
<td>Shafter</td>
<td>12736</td>
<td>7244</td>
<td>12113</td>
<td>59.8%</td>
</tr>
<tr>
<td>South Taft</td>
<td>1898</td>
<td>1230</td>
<td>1850</td>
<td>66.5%</td>
</tr>
<tr>
<td>Unincorporated Areas</td>
<td>139246</td>
<td>68092</td>
<td>131361</td>
<td>51.8%</td>
</tr>
<tr>
<td>Wasco</td>
<td>21263</td>
<td>8699</td>
<td>15072</td>
<td>57.7%</td>
</tr>
<tr>
<td>Weedpatch</td>
<td>2726</td>
<td>2199</td>
<td>2842</td>
<td>77.4%</td>
</tr>
<tr>
<td>Weldon</td>
<td>2387</td>
<td>1510</td>
<td>2457</td>
<td>61.5%</td>
</tr>
<tr>
<td>Wofford Heights</td>
<td>2276</td>
<td>1282</td>
<td>2237</td>
<td>57.3%</td>
</tr>
</tbody>
</table>

US 2000 Census

**EDUCATION**

Education attainment is the best predictor of income attainment, with low and moderate income residents having lower levels of education overall than other income groups. Overall, Kern County residents have lower levels of education attainment than California residents or the nation as a whole. As indicated in Table 4, 32 percent of Kern County adults have less than a high school degree, while only 23 of California’s adult population is without a high-school degree. Conversely, only 13 percent of Kern’s adult population has a Bachelor’s degree or higher compared to 26 percent for California’s adult population as a whole.
Table 4. Educational Attainment, Kern County, California, U.S., 1999

<table>
<thead>
<tr>
<th></th>
<th>Kern County</th>
<th>California</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Less than high school</td>
<td>120,981</td>
<td>32%</td>
<td>23%</td>
</tr>
<tr>
<td>High school</td>
<td>97,344</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>Some college</td>
<td>88,776</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>Associate degree</td>
<td>24,697</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>34,739</td>
<td>9%</td>
<td>17%</td>
</tr>
<tr>
<td>Master's degree</td>
<td>11,562</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Professional school degree</td>
<td>3,909</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Doctoral degree</td>
<td>1,659</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>383,667</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Universe: Population 25 years and over
Census, 2000: Table P37

A comprehensive economic development strategy for Kern County should include efforts on the part of area school districts to improve high-school graduation rates, programs to enable adults to obtain their high-school equivalency degree, and vocational training programs that prepare individuals for entry-level occupations in the County’s leading industries (i.e. its clusters). In today’s global labor market, unskilled and uneducated people will likely continue to experience wage erosion and discontinuity in their employment history.

**Income Distribution**

Median Income in Kern County was $35,446 in 1999, 7.9% less than 1989 (adjusted for inflation). Furthermore in 1999, the income bracket with the largest number of households was "Less than $10,000". Fully 28 percent of Kern County residents earned less than $10,000 per year in 1999, compared with 21 percent for California as a whole (see Table 5a). Half of Kern County residents earn less than $20,000 per year.

Table 5a. Individual Income Distribution, Kern County and California, 1999

<table>
<thead>
<tr>
<th>Earning Less Than (Annual Income)</th>
<th>Percent of Kern County’s Population</th>
<th>Percent of California’s Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10,000</td>
<td>28%</td>
<td>21%</td>
</tr>
<tr>
<td>$20,000</td>
<td>50%</td>
<td>41%</td>
</tr>
<tr>
<td>$30,000</td>
<td>65%</td>
<td>57%</td>
</tr>
<tr>
<td>$40,000</td>
<td>76%</td>
<td>70%</td>
</tr>
<tr>
<td>$50,000</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>$75,000</td>
<td>98%</td>
<td>95%</td>
</tr>
<tr>
<td>$100,000</td>
<td>99%</td>
<td>99%</td>
</tr>
</tbody>
</table>

Universe: Population 16 years and over with earnings

Wage and salary income remains the dominant source of income overall at 72.9%, while self-employment income contributes 6.9% and retirement, social security and investments account
for 16.1% of income. Only 0.7% of income was derived from public assistance income in Kern County.

Women are more likely to be low-income workers than men. As shown in Table 5b below, women earned a median of $27,408 for full-time work during 1999, while men earned a median of $41,566 for full-time work during the same period in Kern County. Part-time workers experience lower incomes than full-time workers and women are more likely to work part-time than men.

### Table 5b. Median Income by Work Status

<table>
<thead>
<tr>
<th></th>
<th>Female 2000</th>
<th>Male 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$12,076</td>
<td>$22,816</td>
</tr>
<tr>
<td>Worked full-time, year round in 1999</td>
<td>$27,408</td>
<td>$41,566</td>
</tr>
<tr>
<td>Other</td>
<td>$9,064</td>
<td>$12,325</td>
</tr>
</tbody>
</table>

Universe: Population 15 years and over with income in 1999. Table PCT45 - SF3
Source: Us Census 2000

**POVERTY STATUS**

Twenty-one percent of people lived in poverty in 1999 in Kern County, while only 16 percent of Californians lived in poverty. Sixty-six percent of Kern’s female-headed households with children are poor, which is the highest rate of poverty of any group in Kern County.

Black and Hispanics are more likely to live in poverty than other races, with 36 percent of blacks and 32 percent of Hispanics under the poverty line in 1999. Only 15 percent of whites and Asians are poor.

### Figure 6. Kern County Percent under Poverty by Race

**EMPLOYMENT**

As shown in Table 6 below, Kern County residents overall work in a variety of occupations. Detailed occupational statistics for Low and Moderate Income residents by industrial cluster are included in section 4.2.3 of this report.
Chapter 2 – Economic Overview

Table 6. Employment by Occupations, Kern County, California (SOC-SF3)

<table>
<thead>
<tr>
<th>Top 10 Occupations</th>
<th>Both Sexes</th>
<th>M/F Split</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>1) Professional and related occupations:</td>
<td>39,504</td>
<td>17%</td>
</tr>
<tr>
<td>2) Office and administrative support occupations</td>
<td>32,287</td>
<td>14%</td>
</tr>
<tr>
<td>3) Sales and related occupations</td>
<td>23,830</td>
<td>10%</td>
</tr>
<tr>
<td>4) Management, business, and financial operations occupations:</td>
<td>23,196</td>
<td>10%</td>
</tr>
<tr>
<td>5) Transportation and material moving occupations:</td>
<td>18,596</td>
<td>8%</td>
</tr>
<tr>
<td>6) Farming, fishing, and forestry occupations</td>
<td>15,517</td>
<td>7%</td>
</tr>
<tr>
<td>7) Construction and extraction occupations:</td>
<td>14,679</td>
<td>6%</td>
</tr>
<tr>
<td>8) Production occupations</td>
<td>12,888</td>
<td>6%</td>
</tr>
<tr>
<td>9) Installation, maintenance, and repair occupations</td>
<td>10,981</td>
<td>5%</td>
</tr>
<tr>
<td>10) Food preparation and serving related occupations</td>
<td>10,887</td>
<td>5%</td>
</tr>
<tr>
<td>Total of Top 10</td>
<td>202,365</td>
<td>87%</td>
</tr>
</tbody>
</table>

Source: US Census, 2000

UNEMPLOYMENT & UNDEREMPLOYMENT

Overall unemployment and under-employment are long standing and serious economic development issues for Kern County. Kern County’s unemployment rate is typically twice the national average and has ranged from a low of 8.5 percent to a high of 15.1 percent over the past four years. In June of 2004, twelve percent of Kern’s adult population was unemployed, while the official unemployment rate for the nation was only 5.6 percent. (An under-employed person is one who must accept a lower-skilled job or a job with fewer hours than he/she wants.) While there are no reliable statistics on underemployment, Kern’s high unemployment and relatively undiversified industrial base are perfect conditions for under-employment. Unemployment and under-employment contribute to lower incomes and rising poverty in the county.

SELF-EMPLOYMENT

Overall, 11.3% of Kern County households earn income from self-employment activities. As shown in Table 7 this rate is comparable to other large rural Southern California counties. A total of 23,519 households earned $675,413,500 in aggregate self-employment income in 1999, or $28,718 per household, again comparable to self-employment income in similar Southern California counties.

Table 7. Self Employment, 1999

<table>
<thead>
<tr>
<th>Total Households</th>
<th>Kern County</th>
<th>Kings County</th>
<th>San Bernardino County</th>
<th>San Luis Obispo County</th>
</tr>
</thead>
<tbody>
<tr>
<td>With self-employment income</td>
<td>23,519</td>
<td>3,809</td>
<td>61,011</td>
<td>16,970</td>
</tr>
<tr>
<td>% with Self Employment Income</td>
<td>11%</td>
<td>11%</td>
<td>12%</td>
<td>18%</td>
</tr>
<tr>
<td>Aggregate Self-employment Income</td>
<td>$ 675,413,500</td>
<td>$ 110,152,000</td>
<td>$1,692,088,800</td>
<td>$ 530,030,200</td>
</tr>
<tr>
<td>Average Self-employment Income</td>
<td>$ 28,718</td>
<td>$ 28,919</td>
<td>$ 27,734</td>
<td>$ 31,233</td>
</tr>
</tbody>
</table>
HOUSING COSTS

Rapid population growth fueled by and in-migration from Southern California is fueling an increase in housing costs. This is resulting in residents paying an increasing share of their incomes for housing, both rental and ownership. According to a recent survey, apartment rents have increased between 20 and 30% in recent years. As reported in the Bakersfield Californian, a survey by Kern Appraisal Co. appraiser George Green of Bakersfield rents demonstrated that from April 2000 to October 2004, one-bedroom apartments increased 27.7 percent from $440 to $562, two-bedroom apartments increased 27.4 percent from $532 to $678, and three-bedroom apartments increased 20.9 percent from $674 to $815. Home prices have increased at an even faster rate.

2.2.3. Sustainability: Improving Environmental Outcomes

The goal of a well-conceived economic development strategy is sustainability, a term that particularly refers to the relationship between human society and the environment. In Kern County, this relationship is of critical importance, given the increasing pressures on the environment driven by population and industrial growth. The County not only includes some of the most fertile farmland in the world, but also the fragile high desert ecosystems and the southernmost portion of the Sierra Nevada Mountains. Kern is a distinct and diverse geographical region. Economic and population growth impacts these and other aspects of the environment in fundamental ways. Two types of environmental issues are profiled in this section:

- Urbanization and loss of farmland
- Air quality

URBANIZATION AND LOSS OF FARMLAND

Throughout the Central Valley, loss of agricultural lands is a growing concern. Although new urbanized economies are resulting in an increasingly diversified economy, the loss of farmland threatens not only the nation’s most productive agricultural region, but also the identity and character of the communities throughout the Valley. The American Farmland Trust (AFT), a national farmland conservation group, has ranked the Sacramento and San Joaquin Valleys as the most threatened agricultural areas in the United States.

Kern County alone has lost more than 76,000 acres of farmland from 1990 to 2002, the most among Central Valley counties. This is more than double the amount lost by Tulare County which lost 32,000 acres over the same time. While Kern County’s agricultural lands still far outweigh the urbanized areas (in 2002 Kern County had 989,000 acres of cropland, 1.77 million acres of grazing land and 113,000 acres of urban land) much of the farmland conversions are taking place on the most productive agricultural lands close to Bakersfield\(^3\). Further, there are few limits in place to curb this ongoing process. As urbanized areas expand, not only is housing and infrastructure placed directly on farmland, but new residents become frequent critics of the ongoing farming just beyond the urbanized areas. This results in an impact on farming beyond the direct loss of land. Farmers in turn are motivated by the increasing value of their land to sell

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AIR QUALITY

Kern County is split into two air quality districts: San Joaquin Valley Unified Air Pollution Control District (western Kern County) and Kern County Air Pollution Control District (East Kern County/Mojave Desert Air Basin). For most pollutants, the San Joaquin Valley is designated as a non-attainment area. In some cases, the Valley is designated as severe and extreme, meaning that it exceeds acceptable and healthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and inhaleable particulate matters. East Kern County/Mojave Desert Air Basin is only non-attainment in the category of eight-hour ozone.

Controlling the levels and emissions of various types of air pollutants from point, mobile, and other sources to achieve attainment and maintenance of National Ambient Air Quality Standards (NAAQS) is an ongoing challenge for the County, and one that is an important consideration for future planned economic growth. In addition to industrial growth, a critical challenge for compliance in non-attainment areas is reducing offsite (indirect source) emissions generated from housing development. The Kern COG Transportation model estimates that each new house produces an average of 60-70 vehicle miles traveled per day, contributing to direct and indirect mobile source pollution impacts.

While Kern County and its two basins still face stringent and changing regulatory requirements to achieve State and federal standards in the near future, most indicators, such as concentration measurements, show an improvement in air quality in both air pollution districts. Although Fresno and Kern Counties have had significantly higher ozone levels than the rest of the San Joaquin Valley Basin, Kern County showed the best improvement and drove overall air quality improvement in the Basin in the 1990s. Historical and comparable data for one-hour ozone and PM-10 measurements are presented below for Kern County’s basins and the San Francisco Bay Area Basin.4

Table 8. Highest Daily Maximum Hourly Ozone Measurements (in ppm)

<table>
<thead>
<tr>
<th>Air Basin</th>
<th>1993</th>
<th>1999</th>
<th>2001</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mojave Desert (Eastern Kern)</td>
<td>0.200</td>
<td>0.137</td>
<td>0.146</td>
<td>0.163</td>
</tr>
<tr>
<td>San Joaquin Valley (incl. Western Kern)</td>
<td>0.160</td>
<td>0.155</td>
<td>0.149</td>
<td>0.156</td>
</tr>
<tr>
<td>San Francisco Bay Area</td>
<td>0.130</td>
<td>0.156</td>
<td>0.134</td>
<td>0.128</td>
</tr>
</tbody>
</table>

Source: California Air Resources Board

---

2.3. Kern’s Cluster Portfolio: What Drives Performance

The key to building Kern County’s economic prosperity over time is to strengthen each of our industry clusters. Industry clusters are the engines of Kern County’s economy. Clusters are led by export-oriented lead industries, supplied by local supplier companies, and supported by an array of public and private institutions. These clusters have high economic multipliers and are wealth generators for the County because their economic activity utilizes many supplier and service inputs that represent high-quality jobs. In addition, clusters, as the name implies, continually attract capital, skilled and less-skilled labor to the County making the economy both deeper and broader.

Clusters drive our economy because they produce goods and services that are sold outside the County and thus bring new economic wealth to Kern County. The clusters compete in markets outside the County—across California, the United States, and the world—and their competitiveness in these markets largely determines the prosperity of the entire County. The exporting industries in these clusters are also linked to related supply industries and to economic input institutions. These ‘value-chain’ linkages are an integral feature of industry clusters: The better the value-chain linkages the stronger the cluster. With strong linkages, information can move more rapidly between customers, producers and suppliers; skilled labor can be attracted and shared; firms can react more quickly to market changes; and new technologies can be more rapidly incorporated. In turn, the clusters will be able to grow more rapidly and perform more competitively in the global economy.

Therefore, making a cluster deeper means adding more value locally—retaining wealth while reducing dependency on others. Broader clusters means that as clusters develop, they add new export market-serving segments, so that the economy is more robust or resilient in the face of global economic cycles, since one cluster segment may be doing well when another is not. Building and maintaining a strong cluster portfolio means that our County must enable each of these interdependent groups to maximize their innovation and efficiency so that they cause more enterprise to form, enable existing companies to expand, and attract new businesses into the County.

For these reasons, there is a general public interest in ensuring that these clusters succeed, and they are important focal points for economic strategy. Cluster-based economic development is not about the government “picking winners”, as an older generation of state-led economic
development tried to do. Rather it is about creating a customized economic development strategy that reflects the existing strengths of the County, and recognizes that actions and initiatives must be tailored to the specific needs of its economy and the clusters.

### 2.3.1. Kern’s Industry Clusters

The research behind this report identified seven significant industry clusters in Kern County. These seven were determined by examining detailed employment-by-industry statistics in Kern County (which is synonymous with the Bakersfield Metropolitan Statistical Area). In order to be designated as a cluster, an industry or group of industries had to be a clear economic strength of the County with a pre-existing set of competitive advantages. Empirically, the best way to determine this is by looking at how specialized Kern is in the industry: if the County has more people employed in the industry than the US average, it is probably due to some long-standing competitive advantage of the County which can serve as the basis of a cluster strategy. In other cases, the County does not have more people employed compared with the US average yet appears to be growing quickly and has key segments which are highly specialized and above average concentration.

The seven clusters have been organized into several distinct categories to describe their stage of lifecycle.

- Value-Added Agriculture: Established Cluster
- Transportation, Logistics & Warehousing Services: Established Cluster
- Energy and Chemicals: Transforming Established Cluster
- Aerospace and Defense: Transforming Emerging Cluster
- Health Services and Medical Technologies: Emerging Cluster
- Business and Professional Services: Emerging Cluster
- Tourism, Recreation & Entertainment: Emerging Cluster

A Growth-Share Matrix shown below is a useful way to summarize the competitive performance of Kern County’s industry clusters. It shows three things simultaneously: the County’s level of specialization in each cluster, indicated by the height on the vertical axis (the location quotient); a 10-year growth rate, and the total employment, shown by the size of the bubble.
2.3.2. **Methodology for Selection of Clusters**

In selecting Kern’s leading industry clusters, ICF used three techniques:

- Quantitative analysis of economic factors;
- Review of existing County clusters and definitions;
- Discussions with County economic development professionals and leaders and private sector members of the proposed cluster.

This process resulted in a list of seven clusters of differing sizes and maturities within Kern’s economy. The following is a table of these seven clusters and the corresponding cluster from the prior economic development strategy (1999).

### Established Clusters

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Value-Added Agriculture</td>
<td>Value-Added Agriculture</td>
<td>Remains largest, most dynamic and most competitive cluster in the County.</td>
</tr>
<tr>
<td>N/A</td>
<td>Transportation, Logistics &amp; Warehousing</td>
<td>Fast-growing and export oriented. Already part of economic strategy of several local communities. Builds from Kern’s strategic location within the State, the access to land and the availability of labor.</td>
</tr>
<tr>
<td>Chemicals and Plastics</td>
<td>Energy and Chemicals</td>
<td>Transforming cluster where focus must remain on the core competency of energy with the goal to move into downstream activities such as plastics (which has had limited growth).</td>
</tr>
</tbody>
</table>
success thus far). Also, energy focus allows for emergence of alternative energy as seed cluster.

Less Dominant or Smaller Clusters

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace</td>
<td>Aerospace and Defense</td>
<td>Continues to be leading cluster in East Kern. Should also incorporate defense activities which are directly related.</td>
</tr>
<tr>
<td>Financial Services</td>
<td>Business and Professional Services</td>
<td>Cluster is a broader set of attributes than financial services and back offices. Kern must position itself for growth in various professional services as the overall economy expands.</td>
</tr>
<tr>
<td>Tourism/ Retirement/ Film</td>
<td>Tourism, Recreation &amp; Entertainment</td>
<td>Tourism remains and film is incorporated as a specific tourism segment (attracting people who will film movies in Kern due to the natural amenities). Recreation and Entertainment are included in Tourism because they are components to making Kern a more attractive location for tourists and local residents. Retirement is dropped as a countywide strategic focus.</td>
</tr>
<tr>
<td>N/A</td>
<td>Health Services and Medical Technologies</td>
<td>Health Services are growing rapidly throughout the Central Valley to meet the demand from a growing population. Many of these jobs are high skilled and well-paying. Kern must position itself to benefit from this growth and become a key center for health care. Medical Technologies is included as a strategic focus for Kern to be a location to develop and potentially manufacture medical technologies – from drugs to equipment.</td>
</tr>
<tr>
<td>Textiles and Apparel</td>
<td>N/A</td>
<td>This is not a cluster in Kern. Employment is declining and there are no backwards linkages to other segments of Kern’s economy. Although Los Angeles still has an apparel industry, Kern is less likely to benefit from the decline in apparel in LA because apparel jobs are mostly going offshore.</td>
</tr>
<tr>
<td>High Tech</td>
<td>N/A</td>
<td>This is not a distinct cluster but a component of every cluster. All industries maintain their competitiveness through the efficient application of new technologies. High tech instead must be an objective within every cluster – from using GPS in crop production to advanced software tools in warehousing to energy storage technologies in wind power.</td>
</tr>
</tbody>
</table>

The 2004-2005 Strategy represents changes from the 1999 economic development strategy. These changes are due to a reassessment of the contributions to the economy of the previously defined clusters. As economies change over time it is necessary to reevaluate prior categories and definitions. In the 2004-2005 Strategy, value-added agriculture and aerospace have remained as clusters whose definition is largely unchanged.

**Value-Added Agriculture** is the leading cluster countywide with the bulk of its employment concentrated throughout the Valley. The cluster builds on Kern’s historic role as a leading center for crop production, particularly cotton and vegetables. The cluster also benefits from the recent growth of food processing work, particularly carrot and tomato processing.

**Transportation, Logistics & Warehousing** is added because of its fast growth and tremendous potential within Kern. This is a leading cluster and supports the competitiveness of...
the Energy and Chemicals and Value-added Agriculture clusters through the use of warehousing and distribution services. Given Kern’s location to the immediate north of Los Angeles County with California’s two major north south interstates running through the County as well as the only year-round pass over the Sierras in the San Joaquin Valley, it is a natural place for growth in Transportation, Logistics & Warehousing. In recent years, Kern has become the location for major distribution centers such as IKEA, Target, and Sears.

**Energy and Chemicals** is reframed from the prior Chemicals and Plastics focus. Although there will remain a focus on moving into downstream activities such as additional chemicals and plastics manufacturing, there will also be a focus on developing seed activities in renewable energies (wind, solar, biomass, and geothermal) as well as ongoing support for the major petroleum extraction and refining activities. These are principally energy industries.

**Aerospace and Defense** remains as a leading industry cluster for the County and particularly for East Kern where the economy of most communities is dependent on the strength of the aerospace and defense industries. The County has among the best natural assets in the West for continued expansion in aerospace and defense though faces some challenges and uncertainties through the 2005 Base Realignment and Closure (BRAC) process. The potential for space tourism offers a new hope for the industry though is not yet a sure bet for major employment gains to the cluster.

**Business and Professional Services** becomes an expanded cluster beyond the prior Financial Services cluster. This is due to the growth in many segments of business services which are not all in financial industries. As the Kern County and the San Joaquin Valley grow, there will be increasing need for locally based services in business and professional services. Some of these industries are relocating from Southern California while others are emerging locally. The broad focus on business and professional services enables the cluster to meet the changing demands of local businesses. An example of the role which Kern plays is represented by the fact that State Farm has located one of their two California Regional Offices in Kern.

**Tourism, Recreation & Entertainment** has remained as a cluster though the focus has changed slightly from the prior emphasis on tourism as distinct from retirement and film. ICF has worked with many regions on tourism strategies and believes that it is most important to focus one’s efforts on distinct market niches. Both retirement and film must be understood as tourism niches from the standpoint of attraction (i.e. attracting retired people to Kern because of amenities or attracting film crews to Kern because of locations). However, this strategy proposes that film remain a distinct part of the tourism marketing and attraction while retirement ceases to be a key component to the strategy. There will not be a distinct focus on retirement in the cluster, except as a market segment. The reasons to not focus as directly on retirement are the following:

- **Housing Inflation**: Attraction of retired people, particularly from LA will may further push the real estate market higher and have a negative impact on one of Kern’s main attractions— its low cost of housing.
- **Lack of spending**: Retired people are often on fixed or limited incomes. This suggests that they may not spend as much locally as other population segments.
- **Why limit focus to one segment?** Kern should be attracting more skilled workers who will strengthen the economy. Focusing on retirement may counteract attempts to attract young skilled workers.
• **No Need:** Population growth suggests no need to attract specific market segment. Retirement attraction is important for regions with declining population (such as Upstate New York).

**Health Services and Medical Technologies** has been added as a cluster because of the fast growth in employment and the potential for new locally based technologies serving the growing health care sector. Throughout the San Joaquin Valley, population growth has resulted in major increases in hospital and health care employment. This reflects the services side of the cluster. In addition, general growth in health care spending and the resulting interest in new technologies has made health care technologies a vital part of the cluster.

### 2.3.3. Additional Kern County Economic Sectors

The seven clusters identified all constitute groupings of industries where the County has a competitive advantage. However, there are other sectors which contribute broadly to employment in the County which are excluded from the focus of this strategy. Specifically, the three main sectors not included in this list of clusters are:

- Government (Federal, State, Local)
- Construction (Residential, Commercial)
- Retail (All types of stores, Gas Stations)

These sectors are typically not included in a cluster-based economic development strategy unless there is a strong case that their activities are “export-oriented”. In each of these three cases, there is an “export” component of these sectors but it is neither the most significant nor the leading edge of the sector.

Government is the largest single source of employment for the County. Government jobs range from teachers and local government to state agencies and prisons to federal departments and employees. The biggest growth component of this employment is teachers, which is driven by increases in population. This is not export oriented. State employment has also grown quickly and can be argued to be “export-oriented” given that the funding for the employment is shared among residents from throughout the State. However, the main growth has been in prison jobs and given the revenue picture for California, this growth is unlikely to continue in the immediate future. Federal jobs have declined in the past decade with military accounting for a large proportion of the decline. However, these defense-related jobs are considered part of the Aerospace and Defense cluster and the strategy to maintain and gain employment should be treated within that cluster. In summary, government is an important part of the employment base for Kern but cannot be treated as a key cluster. Control over this employment growth for the most part does not reside within Kern hence naming government a strategic industry would not effectively transfer ability to successfully implement this strategy within Kern.

Construction and retail are similar in that they are largely driven by population growth. The construction industry in Kern is large and highly concentrated but is driven by the fast growth in housing throughout the County. Kern County has many construction occupations with high location quotients (i.e. a higher concentration than for the national economy). Further there are local firms who export their construction services (such as Columbo Construction) but there is not a sufficient number of such firms to constitute a distinct construction cluster. In summary, construction is a key industry for Kern County but is not an industry cluster. The County’s
strategy with construction should be to ensure that the local workforce is trained for the jobs within that industry through vocational and apprenticeship programs. Supporting these occupations will also directly benefit the existing clusters which also require similar vocational skills.

Retail is also fast-growing and driven by population growth. Given the size of Kern, the County as a whole has limited retail “leakage” where residents are leaving the County to shop for basic items elsewhere. Specific communities within the County may recognize retail as an important part of their strategy and may conduct retail studies and strategies to identify what is missing from their communities and what people are shopping for outside of their community which could be brought in. Countywide there may be some retail employment which is truly export oriented. In these cases, the strategic approach is part of the tourism cluster (such as any shopping along I-5). Any strategy to grow retail must look at retail as a segment within the tourism industry for people passing through the County or spending time in one of the County’s distinct communities.

In summary, government, construction and retail are not included because they are either principally local serving or controlled by factors beyond the County’s control. Each of these sectors may be an important part of an individual city or community’s economic strategy. However, they are not key to the overall countywide strategy.

The purpose of a cluster strategy is to focus the economic development efforts and activities towards the growth and expansion of the industries with the greatest potential to improve the economic performance of the entire economic region – which in this case is Kern County. This approach does not preclude the County from assisting firms which are not within one of the identified clusters. For example, if a furniture or apparel manufacturer was planning a move to Kern County and wanted assistance with land use or job training issues, the County should, in most circumstances, support the new business. However, the County should not do so at the expense of any firm within the clusters or if this new firm’s approach to business was not in line with the County’s expressed economic development goals. In applying the cluster logic to economic development, the County should be putting its efforts in the directions which will yield the best results – that is, towards attracting, retaining, and expanding firms within the existing portfolio of clusters and for supporting firms whose business approach align with the County’s economic development goals.

2.4. The County’s Economic Foundations: The “Infrastructure” that Supports Competitiveness

The formation, expansion and attraction of companies into Kern’s clusters depend largely on the County’s capacity to provide sources of economic input advantages. In today’s fast-paced economy greater pressure is now being focused on economic institutions to become agile producers of inputs to clusters—just as companies must be agile in responding to global markets. This poses a substantial cultural shift for places whose institutions have viewed themselves as governing rather than supplying the economy. Yet, in successful economies, the distinctiveness of economic institutions has continually proven to have made the difference between being a leader or a follower in the global economy. Evidence is fairly conclusive that economies with the institutional capacity to generate skilled workers that the economy requires, capacity to provide the financing that enterprise requires, as well as telecommunications and physical infrastructure, and business climate and quality of life can become leaders. No element
of the community is exempt from needing to understand and to learn to competitively serve the surrounding economy.

Understanding how institutions that shape key economic foundations function and interact with the surrounding economy is a critical part of devising an economic competitiveness strategy. This understanding needs to be extended to comprehension of the relationships between firms and economic foundation institutions. New forms of co-operation between firms and economic foundation providers are essential. Kern County’s future will depend upon the ability of its economic foundation institutions and providers to create that distinctive advantage or edge required by the established and emerging clusters that define the County.

The goal is to create a “vital cycle” in which the jobs and investments of successful clusters then attract the new ideas, people, and capital that, in turn, further enhance economic foundations—from human resources to overall quality of life—providing even more advantage for the industry clusters.

The following are the seven categories of economic foundations that have major impacts on the competitiveness of clusters, and the sustainable prosperity of economies. These economic input foundations provide distinctive competitive advantages for the industry clusters, generating productivity improvements that result in more and higher-quality jobs and more investment in the economy.

- **Human Resources** (Preparation, Advancement, Renewal): Developing and sustaining the workforce skills needed for competitiveness.
- **Finance** (Initiation, Expansion, Restructuring): Providing the continuum of capital needed to form and expand companies.
- **Infrastructure** (Water, Sewer, Bandwidth, Energy): Access to land; Funding sewer/water; Cost-effective development.
- **Transportation** (Mobility, Storage): Ensuring the flow of goods.
- **Business Climate** (Tax, Regulation, Administration): How the taxes, regulations and policies impact competitiveness and how the responsiveness of local governments affect employer and resident needs.
- **Quality of Life** (Housing, Climate, Recreation): Providing for the amenities and services that draw new people to the County.
- **Innovation** (Discovery, Development, Deployment): Generating knowledge and moving it to the marketplace.

The sections that follow will profile Kern County’s strengths and weaknesses in each of these seven categories.

### 2.4.1. **Human Resources (Preparation, Advancement, Renewal)**

Human Resources are widely recognized as the key to success in the knowledge economy. But what is less commonly recognized is that building a knowledge economy requires both educating people and ensuring that jobs are available that reward their investment in education. There are three key systems of labor market and skills development that are assessed in terms of workforce skill levels and production of graduates. These systems are assessed as follows: preparation (K-12), advancement (college and university), and renewal (continuing education
and retraining). The goal is developing and sustaining the workforce skills needed for competitiveness.

Kern’s human resources foundation is anchored by K-12 schools, community colleges, and universities. Annually, Kern graduates approximately 8,200 students from high school. Kern also graduates nearly 2,200 students annually from trade schools, colleges, and universities. These include Cal State Bakersfield with 1,150 Bachelor's degrees and nearly 300 Master's degrees per year\(^5\) and Point Loma Nazarene University and University of La Verne each graduate nearly 50 people per year. Junior and Trade colleges include Bakersfield College which graduates about 900 people per year, Cerro Coso Community College which graduates approximately 200 people per year, San Joaquin Valley College which graduates about 220 people per year, and Taft College graduates about 130 people per year. The following are the enrollment figures for these institutions:

<table>
<thead>
<tr>
<th>Table 10. Kern County Educational Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakersfield College</td>
</tr>
<tr>
<td>Cerro Coso College</td>
</tr>
<tr>
<td>California State University, Bakersfield</td>
</tr>
<tr>
<td>*Fresno Pacific University Bakersfield Center</td>
</tr>
<tr>
<td>*National University</td>
</tr>
<tr>
<td>*Point Loma Nazarene University</td>
</tr>
<tr>
<td>*San Joaquin Valley College</td>
</tr>
<tr>
<td>*Santa Barbara Business College</td>
</tr>
<tr>
<td>Taft College</td>
</tr>
<tr>
<td>*University of California, Santa Barbara</td>
</tr>
<tr>
<td>*University of La Verne</td>
</tr>
<tr>
<td>*University of California, Merced</td>
</tr>
<tr>
<td>*University of Phoenix</td>
</tr>
</tbody>
</table>

*Indicates satellite campuses for the larger institution of the same name located elsewhere. Enrollment numbers are for the Kern County location only.

In addition to the formal academic institutions, the human resources system in the County is supported by the many workforce development courses, training providers, and counselors.

The following are some of the key countywide and regionally-specific challenges facing the human resources system. These challenges are based on concerns raised by representatives from the various communities and economic development staff from the cities and the County. In most cases, there is a parenthetical reference to where this is a distinct challenge. In no way does this suggest that these challenges are only in that city or community.

\(^5\) California State University, 2002-2003 Data
• Link Workforce Training with Cluster Needs: Disconnect between the workforce development/job training activities and overall economic development. (Countywide)

• Data Gathering on Occupational Growth: Need for better information on occupation growth and skill needs. Need to be able to identify future workforce skill needs and demand by employers. (Countywide)

• Additional Vocational Training: Need for more vocational training in the high schools. This is not particular to any cluster but there is a general need for more vocational education. Few people from Kern County enter the University of California system yet the local school systems are mostly focused on putting people into universities. The local school system and community colleges should have more trade and vocational programs to support the real needs of the economy. (Countywide)

• Job Retraining: How to assist laid off workers in finding employment at the same or higher wages, especially in the oil industry. (Countywide)

• Quality of Workforce: Difficulty identifying skilled and dependable workers. Lack of motivation or discipline is a challenge for employers. (Countywide)

• Overcome Perceptions of Low Education: The perception that Kern County has a low educated workforce is a limiting factor for outside firms looking to locate within the County. Further, the perception can be a limiting factor for residents themselves when there is an ongoing expectation that the County does not have high levels of educational attainment. There is need to improve education attainment and then to translate that improvement into a improved perception by outside firms looking to locate within the County. Others have stated that “low expectations” are a form of “soft bigotry” which must be overcome. (Countywide)

• Size of Rural Workforce: Lack of overall workforce size in the more rural areas of the County. This impedes growth of new industries because there is not an available workforce. (This is true throughout East Kern and all other rural areas of the County)

• More High Skilled Workers: Need for larger concentration of highly-educated or skilled workers particularly for firms in manufacturing or ones who have a high tech process. (Countywide)

• School Quality Encouraging Sprawl: Poor quality schools in older urban areas encourage urban sprawl and result in increased urban blight. For example, wealthier residents in poor performing school districts move out of their neighborhood into new developments where they perceive the schools to be better. This results in lower income families remaining behind in the older neighborhoods because they cannot afford to move. Since the low income families also lack the resources to continually improve their homes or communities, their neighborhoods experience increased blight which then further encourages people to move to the new sprawling developments. The challenge is how to improve schools and encourage people to remain within the older urban areas. (Bakersfield)

• New Schools: How to build sufficient new classrooms for the growing population. In particular there will be an additional 10,000 students attending high schools within the next 8-10 years. (Kern High School District)

• More Training Despite Reduced Budget: How to continually provide employment services to employers and job seekers with a reduced budget. (Countywide)
2.4.2. **Finance (Initiation, Expansion, Restructuring)**

There are three key levels at which financial systems operate: Initiation (seed and early-stage financing), expansion (venture, joint ventures, commercial credit) and restructuring (mergers and acquisitions and specialized credit facilities). These are typically assessed in terms of known levels of seed or angel capital investment (qualitative), venture capital placements and other transactions. The goal is to provide the continuum of capital needed to form and expand companies.

- **Non Traditional Lending:** Lack of venture capital or high risk capital for non-traditional lending. This affects the growth of new start-up firms or growing existing companies in the County who are not part of an established and recognized industry. (Bakersfield and Kern County noted this with wide agreement from others throughout the County)

- **Disconnect Between Lenders’ Approach and Industry Realities:** Bankers/lenders often use information on an industry which is incompatible with the reality of the industry in Kern County. For example, when identifying growth prospects of an industry, they may use a 2 digit NAICS code analysis which presents a different picture of that industry’s structure and dynamics than the more specific 4 or 6 digit NAICS code which is a segment of that larger 2 digit industry. This limits growth of Kern businesses because the lenders do not have an accurate picture of the industry. (Countywide)

2.4.3. **Infrastructure (Water, Sewer, Sites, Bandwidth)**

There are several forms of physical infrastructure key to cluster operations: Operations (power, water, waste) and facilities (availability of industrial sites, parks). These are typically assessed in terms of energy, water and waste costs and quality, and acres of quality industrial real estate. The goals are access to usable land, ensuring the flow of goods and funding for sewer/water. In addition, the information infrastructure is also key to competitive cluster development: Bandwidth (high speed, high capacity infrastructure), digital switching services and information services availability. These are assessed in terms of quantity of fiber and fiber connectivity (hubs, server hotels), wireless (cellular and satellite) service, and number of information service providers and specialized services.

Road and rail transportation of people and cargo are perhaps the most decisive aspects of Kern’s physical infrastructure as far as economic development is concerned. The County is conveniently located within 100 miles of Los Angeles, 200 miles of San Diego and Las Vegas, and 300 miles of San Francisco and Sacramento. Water and sewer are also important economic development factors to Kern.

The County’s “Infrastructure” foundation consists of the roads, rails, land, and high speed internet availability. Passing through the State are two of the key north south highways in the State, Interstate 5 and Highway 99. Also passing through the County is the major east west highway heading towards Barstow which connects with Interstates 15 and 40. The County has airports in Bakersfield, California City, Mojave, Inyokern, Shafter, Taft, Lost Hills, Tehachapi, Delano, and Wasco. Rail access includes the Burlington Northern/Santa Fe line with an inter-modal facility in Shafter.

The following are some of the key countywide and regionally-specific challenges facing the infrastructure system.
• **Funding New Infrastructure**: Lack of money for new sewer and water infrastructure. Need to generate sufficient revenues to pay for the maintenance and upgrading of existing infrastructure. (Delano, McFarland, Lamont, Bakersfield and County of Kern)

• **Inconsistent Infrastructure Quality**: There is inconsistency in the quality of the infrastructure throughout the County, particularly between the incorporated and unincorporated areas. (Countywide)

• **Size of County Affects Communication**: Large size of the County affects communication among the cities. This was noted as a key challenge to working together as well as sharing information. Participants of the well-attended, December 16, 2004, “Presentation of Draft Report” noted that more meetings such as this one, which brought people together from throughout the County, are helpful as a way to reduce the barriers which are the result of the County’s size. (Countywide)

• **Broadband Access**: Need for high speed broadband access to rural areas. Many areas still lack access to high speed internet which affects their ability to grow economically, particularly for industries such as tourism which rely so heavily on the internet for information. (East Kern)

• **Capture Federal Funds**: Need to capture more of the federal dollars that are flowing to other communities due to the BRAC process. (East Kern Airport District)

• **Lack of available industrial facilities and capital to develop them.** This was presented as a problem that communities do not have available buildings for new industries although they have available land for industrial activities. Specifically, if someone is looking to move into the County within 6 months, there are not enough vacant buildings, or spec buildings to accommodate their requests. (Bakersfield, Taft, Ridgecrest)

### 2.4.4. Transportation (Air, Rail, Highway Access)

In a fast-moving global marketplace, the transport and storage of goods is a key service. Highways, rail lines and airport facilities are all key parts of a transportation infrastructure. When speed to market is prized, having access to a high quality transportation infrastructure is a major competitive advantage. Transportation is typically assessed in terms of frequency and costs of air service, miles of highway and rail lines.

Kern County is fortunate based on its existing transportation infrastructure and its proximity to major markets. Some of its key transportation strengths include:

• California’s major north/south transportation corridors (Highway 99 and Interstate 5).
• Year-round transportation to the east—Highway 58 to Interstates 40 or 15.
• Proximity to Los Angeles and its Ports.
• Two major rail lines (Union Pacific and Burlington Northern Santa Fe).
• New inter-modal facilities / inland port facilities in process.
• Multiple airport facilities (14 publicly-owned airports including Meadows Field in Bakersfield, Minter Field in Shafter, Mojave Airport and Inyokern Airport)
The following are some of the key countywide and regionally-specific challenges facing the transportation system.

- **Improvements to Highway 99**: Need for improvements to highway 99 corridors – both access and aesthetics. Road quality in need of major upgrades which are costly. Interstate designation unlikely given the additional investments which would have to be made first. (Delano, Bakersfield, Shafter)

- **East/West Across Bakersfield**: Need for improvements in the movement in and out of Bakersfield. There are no expressways through the city. Highway 58 is disjointed and there are no byways to the south. Trucks have to run through the town. This affects all transportation-dependant industries and has a negative impact on both air quality and the local quality of life. (Bakersfield)

- **Industrial Sites with Rail**: Need for more industrial sites which are directly served by rail and control of residential encroachment that affects the growth in both rail and industrial uses.

- **Roadways Needing Upgrades**: Overall growth in the County has resulted in increased use and wear and tear on the roads. As the quality of the roads decreases, the County may lose some of its competitiveness in transportation and logistics activities which would affect all the clusters. Some of these impacts on the roads may be attributable to the increase in transportation and logistics activities on the County’s roads. According to the American Association of Highway Officials, a single truck (weighing 80,000 pounds) has the same impact on the roads as 9,000 cars. (Countywide).

- **Controlling Encroachment**: Fast residential development is encroaching on airports and rail lines. Formerly agricultural lands have turned over to residential uses which are often incompatible with the land use needs surrounding these important infrastructure facilities for the County.

**2.4.5. Quality of Life (Housing, Climate, Recreation)**

Quality of life has historically been one of the draws of Kern County, particularly as it related to affordable homes and stable communities. Key elements to the County’s quality of life include its low cost of living, an amenable year-round climate, and easy access to various recreational activities. Average temperatures year-round are between the 40s and the 90s. The County has several professional sports teams, including minor league baseball and arena football as well as a location for NASCAR events. In addition to a County fair, there are several annual festivals including a Jazz Festival and a Shakespeare Festival.

The following are some of the key countywide and regionally-specific challenges facing the County’s quality of life.

- **Limited Indicators**: Need better information on the County’s overall quality of life. There are not accepted indicators which can accurately portray the overall quality of life in the County.

- **More Recreational Opportunities**: Need for more recreational and cultural opportunities across the board, particularly for younger people. There is the need for more places for young people to go to which give them a chance to learn something instead of simply hanging out. (McFarland, Delano)
• **Assistance to Low Income**: Need for more assistance for low-income families. Many people ask for this assistance. (McFarland)

• **Improving Overall Issues**: How to improve the many challenges which affect the ability to raise a family and attract highly-skilled or educated workers. These include poor air quality in the San Joaquin Valley, high drop out rates, high infant mortality, high poverty rates, low wages, and low educational attainment. (Countywide)

### 2.4.6. Business Climate (Tax, Regulation, Administration)

There are three key features of metropolitan business climate that are crucial to industry clusters: Tax levels, regulatory efficiency, and administrative complexity. These can be assessed in terms of new concepts such as ‘return on taxation, which is critical to companies (value received in public services for tax dollar per employee), regulatory efficiency (permit burden), and administrative quality (degree of ‘smart infrastructure’ in place). The issue is how the taxes, regulation and policies impact competitiveness.

The business climate in Kern County is supportive of economic growth and development of new jobs. There is a general agreement that economic growth is good and needed on the part of elected officials throughout the County.

The following are some of the key countywide and regionally-specific challenges facing the County's business climate.

• **Reform State Laws**: Need to reform many statewide laws and regulations which affect economic development and create a perception that California is not business friendly. These include worker’s compensation, energy deregulation, SB 975 (prevailing wage requirement for receipt of government subsidy) **(Note: These issues may be challenges to economic development in Kern County but they are not unique to Kern nor are they challenges which Kern alone will likely change. Therefore, for the purposes of Kern’s economic strategy, they are assumed as part of the background business climate facing all of Kern’s California competitors though not necessarily the out of state competitors)**.

• **Costs of Fees**: Increasing building fees at the County and City levels. County residents and businesspeople noted that this is also a reality that cities all across California are facing and that Kern still has relatively low fees and permit processing times are fast.

• **Air Quality Limits**: Limitations imposed by the Air Quality District in the Valley region of the County impacts the ability to expand industrial activities in the Valley. Though some residents mentioned that these air quality limits in the Valley may present an opportunity for industrial growth in East Kern, other limitations in the eastern half of the County (such as infrastructure, workforce, proximity) suggests otherwise.

### 2.4.7. Innovation (Discovery, Development, Deployment)

Understanding the economic impact of innovation requires recognition of the “innovation pipeline”. This is made up of the public and private institutions and organizations that (a) conduct research and create new knowledge, (b) develop new applications for this knowledge, and (c) move these applications to the marketplace in the form of new or expanding businesses that sell the applications as products or processes. The extent to which a particular County or region is able to participate in the various steps of the pipeline impacts the economic impact of innovation in the economy. The innovation pipeline works well when the discovery,
Chapter 2 – Economic Overview

development, and deployment systems generate a high volume of high-quality content that flows speedily from one system to the next.

Kern County has elements of an innovative economy but is too concentrated in the Discovery stage. Some product development is occurring but it is often taking place within individual firms and thus having limited benefit to the overall economy. Some of the specific key challenges in innovation in Kern are:

- Need for greater support for the development of renewable energy technologies. (Countywide)

- Need for expansion of technology-based employment opportunities in eastern Kern. (East Kern)

- Need for better local systems to support the commercialization of innovative ideas. (Countywide)

- Need for access to funding for high risk innovative ventures. (Countywide)

2.5. Summary: A Mixed Picture of Dynamic Assets and Mounting Challenges

The analysis of economic performance (prosperity, disparity, sustainability), clusters and economic foundations reveals significant gaps in the County's systems which must be addressed in order to strengthen the overall economic outcomes for the County. Some of the major challenges which will affect Kern's economic growth over time:

- Persistent high unemployment rate

- Relatively low average wage across many industries

- Low educational attainment – particularly the number of college graduates

- High population growth

- Land use, residential encroachment and the infrastructure costs of sprawl

These are challenges which will shape the economic performance and prosperity of the County. There is no specific recipe for how these challenges will affect the County's economic growth. But it is evident that they must begin to be addressed.

The subsequent chapter details the competitive position, challenges and opportunities for each of the seven highly-recommended clusters discussed above. These cluster overviews shed greater insight into the specific challenges facing the County. Each cluster overview is followed by recommendations for the cluster.
3. Shaping the Future: Cluster Overviews

3.1. Introduction to Cluster Overviews

3.1.1. Our Economic Portfolio Goal: Building Competitiveness

Cluster strategy is about finding commonly shared problems across members of related industries—whether producers, suppliers or economic input institutions—and collaborating to develop creative solutions. The resolution of these problems, through new County and regional solutions creates a locally shared advantage that cluster members can use to compete globally.

High performing economies rarely need cluster strategies. The reason for this is that their industries commonly work together on shared issues and local institutions seek out their “customers” in specific industries to ensure they are delivering what is needed—whether skills, innovation, finance, planning or infrastructure.

High performing economies are distinct because everyone is a supplier, of some kind, to someone else, and everybody knows it. The economy is about everyone and everyone is prepared to negotiate new roles and relationships or “deals” with one another. In high performing economies colleges and universities have ongoing dialogues with each industry to align degrees and courses; universities and laboratories have both a policy and culture fostering innovation among research faculty and laboratory staff with linkages to diverse commercialization partners; there are a wide range of channels for securing capital for early stage proof of concept or production scale up that are known to entrepreneurs and existing firms; infrastructure for industry development, transportation, power and water is focused on meeting the needs of the next generation economy through technology parks and innovation zones; local governments have quality control and customer assurance programs for all services, from permits to tax assessment, and; quality of life is recognized as a “product” that must be delivered—whether quality schools and health care, or recreation and entertainment.

Government programs alone cannot deliver these outcomes. Achieving an environment of advantages in economic inputs that evolve over time as needs and opportunities change is the product of every institution and firm in an economy learning the virtues and culture of collaborative innovation. Building a strong economy requires thinking of our economy as a portfolio of clusters that must be carefully managed. In Kern County there are some emerging clusters and some established ones. Each has an array of competitiveness challenges. Cluster competitiveness is, essentially, enabled by addressing these challenges. If we can address them and build our capacity to respond and adapt to changing markets and other conditions, we will have created new sources of advantage.

Kern’s industry clusters are ready to start on this path. By focusing on achieving small solutions as clusters and by the County recognizing their strategic import, the clusters will continue to grow and expand within Kern County.

3.1.2. Overview Elements

This chapter presents an analysis of each of Kern County’s recommended industry clusters and a series of recommendations for improved competitiveness. ICF Consulting conducted extensive industry analysis to identify the clusters, benchmark them to competitors and describe the key indicators of competitors. ICF Consulting also worked with the County to conduct focus groups for five of the clusters and additionally carried out dozens of interviews with business...
and government leaders. In the focus groups, each cluster helped identify initial challenges and opportunities that informed their strategy. Collectively, the analyses and recommendations in this chapter are the cluster overviews. However, as noted above, each overview is only the starting point for the cluster and for the County. These strategies, like this overall strategy, are living, working documents that should be the foundation for ongoing action. The prospects are good for ongoing action.

In a subsequent chapter, we will identify Flagship initiatives which will be the implementing glue of the entire Kern County Economic Development Strategy. These specific initiatives will be how the County tackles the challenges identified in the cluster overviews.

Each cluster overview comprises the following elements:

- **Overview**: A summary of the cluster’s key characteristics.

- **Cluster Performance**: A discussion of the cluster’s competitive position, including absolute and relative employment growth, life cycle stage—seed, emerging, expanding or transforming—and their specialization (measured by location quotient) benchmarked to selected competitors to provide an indication of the cluster’s competitiveness.

- **Cluster Segments**: An identification and description of the cluster segments, including comparison of size and concentration.

- **Cluster Map**: A schematic of the cluster’s three layers—exporting industries, suppliers, and economic foundations.

- **Cluster Distribution**: A map of total employment levels across the various areas of the County.

- **Cluster Entrepreneurial Dynamism**: A description of the presence of new firms in the cluster compared to other counties.

- **Cluster Occupations**: A discussion of entry-level occupations, as well as the share of total employment in key occupations compared to that of San Bernardino or Fresno County.

- **Economic Foundation Challenges**: An identification of the cluster challenges in economic foundation areas.

- **Key Insights for Strategy Implementation**: A summary of the strategic directions for the cluster which the County should endorse based on the cluster and foundation analyses.

- **Vision and Recommendations**: A conclusion with specific recommendations which emerged from the analysis for each cluster. In many cases, the clusters will be responsible for implementing these recommendations in a collaborative manner as part of the cluster network to be developed within the Kern Economic Development Corporation (KEDC).
3.2. Value-Added Agriculture Cluster: Innovating and Increasing Value

3.2.1. Overview: The Expanding Value-Added Agriculture is the County’s Most Dominant Cluster

Kern County’s value-added agriculture cluster is the largest and most significant of the clusters in Kern’s economy. It is an expanding cluster which is highly specialized and concentrated and overall employment growth that outpaces competitor Counties. Ensuring the competitiveness of the various segments of this cluster should be a high priority in the County’s economic development efforts.

Value-added agriculture employs over 58,000 people in the private sector. Key employment strengths are in all forms of crop production, primarily fruit, vegetables, other crops, cattle, sheep, goats, and other animal production. The leading crops in the County are grapes ($403 million in revenues in 2003), almonds ($280 million), citrus ($278 million), carrots ($269 million), and milk ($230 million). The County is also strong in agricultural support activities, such as crop harvesting, farm labor contractors and crew leaders, and farm management services.

While Kern County is home to important agricultural resources and primary production activities, the County is weaker in more downstream and higher value added areas of the value-added agriculture cluster. In particular, the County does not have significant levels of most forms of food processing and beverage manufacturing (despite key strengths in preserved food and vegetable processing, primarily carrots). However, the County has experienced some growth in the food processing area, a positive indicator of the County’s potential to move into and compete in higher value-added activities. The gap between primary production and manufacturing activities is even more important given the below-County-average wages in primary production compared with the above-County-average wages for manufacturing. Additional growth in the food processing segments will support overall wage improvements for the cluster.

3.2.2. Cluster Performance: Leading Competitors

Kern County’s value-added agriculture cluster is fast-growing and highly concentrated. The following are the factors which are used in assessing cluster performance:

- **Strong Growth Dynamics.** Between 1993 and 2003, this cluster exhibited strong recent average annual growth, driven particularly by strong, upward trends in the crop production and food processing segments, particularly fruits and vegetables.

- **Life Cycle: Expanding Cluster:** In an analysis of 10-year dynamics in the cluster, Kern County’s value-added agricultural cluster is in the expanding stage of its lifecycle, a stage characterized by high growth and high concentration relative to the national average.

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6 Value-added agriculture includes all segments of the broader agriculture economy. The use of the term value-added implies that in order to remain competitive, all aspects of the industry must focus on value-added activities.

7 As of Q4 2003
• **Relatively Fast Growth and High Concentration.** This cluster is also performing well against competitors. As indicated in the growth share matrix below, Kern County is far outpacing competitor Counties both in growth and concentration. The location quotient, which compares the County’s relative employment size to that of the United States, is the key measure of employment concentration. Kern’s cluster has above average employment concentration when compared with that of the United States (8.70 times greater than the national average), and also grew faster than national average of 0.2%.

![Figure 8. Value-Added Agriculture Growth Share Matrix](image)

3.2.3. **Cluster Segments: Concentrated in Crop Production**

The value-added agriculture cluster consists of nearly 1,000 firms, mainly in the area of primary production and support activity, but also in manufacturing and distribution. The table below indicates the North American Industry Classification System (NAICS) codes that comprise this cluster, and corresponding figures for employment, business establishments, average weekly wage, and concentration (location quotient). Other key elements of the cluster’s structure are described below.

• **Significant Employment in Crop Production.** Cluster employment is approximately 58,000 people, with production and support activities accounting for nearly 95% of employment, the remainder are in manufacturing. Among these segments, the highest levels of employment are found in support activities for crop production (32,286) and crop production (19,654). Among the manufacturing segments in the cluster, food manufacturing has the highest level of employment (4,697).

• **High Concentration.** Kern has a well concentrated value-added agriculture cluster. The location quotient for the entire cluster is 8.70. The leading segments in concentration are support activities for crop production (55.23), sheep and goat farming (39.47), and crop production (15.50).
• **Low Wages.** The vast majority of the employment in the cluster is concentrated in low wage segments such as crop production and support activities for crop production. These segments, accounting for over 50,000 jobs, pay on average of $250 to $400 per week. Average weekly wages are significantly higher in manufacturing and distribution segments than in production and support activities, with the exception of other animal production which has the highest average weekly wage.

**Table 11. Employment, Business Establishments and Average Weekly Wage by Cluster Segments, 2003**

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Description</th>
<th>Employment</th>
<th>Business Establishments</th>
<th>Average Weekly Wage</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>Crop Production</td>
<td>19,654</td>
<td>509</td>
<td>$403</td>
<td>15.50</td>
</tr>
<tr>
<td>1121</td>
<td>Cattle Ranching and Farming</td>
<td>801</td>
<td>64</td>
<td>$480</td>
<td>3.50</td>
</tr>
<tr>
<td>1123</td>
<td>Poultry and Egg Production</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1124</td>
<td>Sheep and Goat Farming</td>
<td>94</td>
<td>17</td>
<td>$305</td>
<td>39.47</td>
</tr>
<tr>
<td>1125</td>
<td>Animal Aquaculture</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1129</td>
<td>Other Animal Production</td>
<td>149</td>
<td>10</td>
<td>$1,014</td>
<td>3.82</td>
</tr>
<tr>
<td>1151</td>
<td>Support Activities for Crop Production</td>
<td>32,286</td>
<td>286</td>
<td>$255</td>
<td>55.23</td>
</tr>
<tr>
<td>1152</td>
<td>Support Activities for Animal Production</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>311</td>
<td>Food Manufacturing</td>
<td>4,697</td>
<td>40</td>
<td>$614</td>
<td>1.53</td>
</tr>
<tr>
<td>312</td>
<td>Beverage and Tobacco Product Manufacturing</td>
<td>82</td>
<td>6</td>
<td>$618</td>
<td>0.20</td>
</tr>
<tr>
<td>33311</td>
<td>Agricultural Implement Manufacturing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>333294</td>
<td>Food Product Machinery Manufacturing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>42491</td>
<td>Farm Supplies Merchant Wholesalers</td>
<td>284</td>
<td>36</td>
<td>$964</td>
<td>1.29</td>
</tr>
</tbody>
</table>

*Source: Bureau of Labor Statistics; ICF Consulting*

Notes: "-" indicates suppressed data.

**3.2.4. Cluster Map: Limited Manufacturing**

The figure below depicts the various segments and sub-segments of the cluster definition according to the three “layers” of a cluster – exporters, suppliers, and economic input foundations. In addition to the cluster definitions, the map shows the segments from other clusters on which this cluster depends. The figure also indicates areas where the County

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8 As of the third quarter of 2003.
exhibits strong or weak concentration of activities (based on its location quotient), as well as supply-level segments characterized by relatively higher dependency on suppliers from outside of the County. The economic foundation level encompasses the categories that help enable and support the cluster by providing key inputs and resources that the cluster depends on.

Most areas of agricultural production are highly concentrated in the County, while pesticides and fertilizers are key imports for the cluster. As indicated below at the supplier level, the cluster in Kern County has a relatively higher dependency on pesticide and fertilizer suppliers/manufacturers from outside of the County. Not surprisingly, in supplier segments that are strongly concentrated in Kern, the County relies less on imported supplies (suppliers from outside of the County).
### Figure 9. Value-Added Agriculture Cluster Map

<table>
<thead>
<tr>
<th>Exporting Level</th>
<th>High Kern Concentration (LQ&gt;1)</th>
<th>Low Kern Concentration (LQ&lt;1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fruit and Vegetable Preserving and Specialty Food Manufacturing</td>
<td>Beverage Manufacturing</td>
</tr>
<tr>
<td></td>
<td>Dairy Product Manufacturing</td>
<td>Animal Food Manufacturing</td>
</tr>
<tr>
<td></td>
<td>Bakeries and Tortilla Manufacturing (Commercial Bakeries)</td>
<td>Grain and Oilseed Milling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sugar and Confectionary Product Manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Snack Foods, Roasted Nuts, Perishable Prepared Food, and Other Food Manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tobacco Manufacturing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplier Level</th>
<th>High Kern Concentration</th>
<th>Low Kern Concentration</th>
<th>Higher Dependency on Suppliers from outside of County than within</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crop Production</td>
<td>Support Activities for Animal Production</td>
<td>Pesticide and Other Agricultural Chemical Manufacturing (Energy and Chemicals Cluster)</td>
</tr>
<tr>
<td></td>
<td>Animal Production</td>
<td>Agricultural Implement Manufacturing</td>
<td>Other Fertilizer Manufacturing (Energy and Chemicals Cluster)</td>
</tr>
<tr>
<td></td>
<td>Farm Labor Contractors and Crew Leaders</td>
<td>Food Product Machinery Manufacturing</td>
<td>Architectural and Engineering Services (Business and Professional Services Cluster)</td>
</tr>
<tr>
<td></td>
<td>Farm Management Services</td>
<td>Pesticide and Other Agricultural Chemical Manufacturing (Energy and Chemicals Cluster)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farm Supplies Merchant Wholesalers</td>
<td>Other Fertilizer Manufacturing (Energy and Chemicals Cluster)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Petroleum Refineries (Energy and Chemicals Cluster)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wholesale Trade (Transportation, Logistics &amp; Warehousing Cluster)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic Foundation Level</th>
<th>Human Resources (i.e., Employers’ Training Resource): Skilled technicians</th>
<th>Infrastructure: Water and sewer, energy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Innovation: Company lab research</td>
<td>Transportation: Roads and Rail</td>
</tr>
<tr>
<td></td>
<td>Land Use Planning: Ag, Residential and industrial zoning policies</td>
<td>Marketing: Farm Bureau</td>
</tr>
</tbody>
</table>
3.2.5. **County Distribution: Employment Concentrated in the Valley**

Value-added agriculture is an important economic activity primarily in the fertile, valley areas of Kern County. Agricultural activity takes places in nearly all zip codes throughout the County, but most of the employment is located throughout the valley areas to the north and immediate east and south of Bakersfield. The map below shows distribution of aggregate employment levels by zip codes across the County. It is important to note, however, that the intensity of the shading is not an indication of relative employment density or concentration, which is typically defined as per capita or per 100,000 people. The range of shades reflects the various levels of total employment.

![Figure 10. Value-Added Agriculture Regional Distribution](image)

### 3.2.6. **Moderate Entrepreneurial Dynamism**

Measured as the share of total companies three years old or less, entrepreneurial dynamism is comparatively moderate in Kern County’s value-added agriculture cluster. Kern is leading Fresno County and San Joaquin County in the number of new firms (3 years old or less) as a share of the total firms in the County. (See figure below) However, Santa Barbara County has a slightly higher percentage (10) of new firms compared with Kern’s percentage (7). Santa Barbara was also the second-fastest growing competitor cluster. As a measure of new firm development or start-up, the presence of younger and more specialized, higher-value-added producers in Santa Barbara may account for that county’s higher dynamism level.
3.2.7. **Cluster Occupations: Wide Range of Entry-Level Jobs**

**ENTRY-LEVEL OCCUPATIONS**

For the entry level occupation analysis the value added agriculture cluster includes the following sectors: Crop Production (NAICS 111), Animal Production (NAICS 112), Support Activities for Agriculture and Forestry (NAICS 115), Food Manufacturing (NAICS 311), Beverage and Tobacco Product Manufacturing (NAICS 312).

Entry-level positions and the total employed by occupation in the Value-Added Agriculture Cluster include agricultural workers and animal breeders, front-line supervisors, graders and sorters of agricultural products, and industrial truck and tractor operators. Detailed occupational statistics are outlined in Table 12 below for occupations of more than 75 total jobs.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous Agricultural Workers, Including Animal Breeders (605) SOC 45-20XX</td>
<td>11,301</td>
</tr>
<tr>
<td>First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers (600) SOC 45-1010</td>
<td>1,081</td>
</tr>
<tr>
<td>Graders and Sorters, Agricultural Products (604) SOC 45-2041</td>
<td>758</td>
</tr>
<tr>
<td>Industrial Truck and Tractor Operators (960) SOC 53-7051</td>
<td>535</td>
</tr>
<tr>
<td>Driver/Sales Workers and Truck Drivers (913) SOC 53-3030</td>
<td>404</td>
</tr>
<tr>
<td>Grounds Maintenance Workers (425) SOC 37-3010</td>
<td>317</td>
</tr>
<tr>
<td>Packaging and Filling Machine Operators and Tenders (880) SOC 51-9111</td>
<td>264</td>
</tr>
</tbody>
</table>
Chapter 3 – Cluster Overviews

Packers and Packagers, Hand (964) SOC 53-7064 253
Other Production Workers, Including Semiconductor Processors and Cooling and Freezing Equipment Operators (896) SOC 51-9 233
Laborers and Freight, Stock, and Material Movers, Hand (962) SOC 53-7062 221
Industrial and Refractory Machinery Mechanics (733) SOC 49-904X 151
Bookkeeping, Accounting, and Auditing Clerks (512) SOC 43-3031 149
Cleaners of Vehicles and Equipment (961) SOC 53-7061 147
Bakers (780) SOC 51-3011 143
Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics (722) SOC 49-3040 95
Food Batchmakers (784) SOC 51-3092 88
Inspectors, Testers, Sorters, Samplers, and Weighers (874) SOC 51-9061 84
First-Line Supervisors/Managers of Production and Operating Workers (770) SOC 51-1011 79

Source: MJC, 2004; Census Bureau, 2000

**KEY OCCUPATIONS**

The figure below compares the percentage of cluster employment in key occupations in Kern County’s value-added agriculture cluster with Fresno’s. The largest percentage of Kern’s cluster employment is in farming/fishing/forestry occupations (44%), followed by finance and administration (24%). Compared with Fresno, Kern has a higher level of employment in management-related positions, but lower levels in production, transportation/material moving, and farming/fishing/forestry.

**Figure 12. Percentage of Cluster Employment in Key Occupations, by County**
3.2.8. **Economic Foundation Challenges**

The cluster-specific economic foundation challenges range from infrastructure and business climate, to human resources, marketing, and innovation. The following challenges were identified by various stakeholders in the cluster.

**INFRASTRUCTURE**

- **Public Transportation to Transport Workers to Job Sites:** The County has limited public transportation routes, particularly in rural areas. This presents a significant challenge to residents of rural communities, many of whom are low-income immigrants, who need to access food processing jobs in other areas such as Bakersfield. Additionally, many of the firms in value-added agriculture have 24-hour operations, but public transportation is not provided on a 24-hour basis. While some firms, such as IKEA, have set up transportation services for their employees, access to public transportation still remains a problem for certain parts of the County, particularly in rural communities with high levels of employment in agriculture.

- **Contamination of Farmland and Water:** Managing and reducing contamination of land and water affecting farmland is a challenge for the cluster. Key potential sources of the contamination include human sludge, as well as the use of pesticides and fertilizers.

- **Water and Sewer Capacity:** The County lacks sufficient water and sewer capacity for food processors. In this area, one of the issues is how to expand the use of gray water.

- **Increasing Land Costs:** The cluster is facing higher land costs due to competing pressures from urban development, which may affect the development of new farm operations.

**HUMAN RESOURCES**

- **Weak Perception of Cluster Career Ladders:** Changing the perception of the range of occupations and job opportunities throughout Value-Added Agriculture is a challenge for the cluster. The common perception is that Value-Added Agriculture is only about picking crops.

- **Higher-Skill Jobs in the Cluster:** Higher-skill jobs in the cluster have limited support in training and workforce development (such as water technicians or engineering). Working with the schools and training programs to ensure that people are receiving training is an important issue for the cluster.

**INNOVATION**

- **Attraction of Innovators:** The majority of agriculture innovation is taking place within individual firms. There remains a challenge in attracting high quality agriculture innovators into Kern County beyond the specific benefits they receive from these individual companies.

- **Perception of Kern in Agricultural Innovations:** Despite its many agricultural assets and contributions, Kern County does not have a strong image as a place to incubate new agriculture technologies. The perception of being an innovative agricultural region is typically due to either the presence of a University research center or a highly competitive and publicly accessible agricultural industry such as winemaking.

- **Expansion of Existing Operations:** New innovations will come from within existing farms as opposed to starting new farms. The challenge is to create more opportunities of innovation.
such as the baby carrot which led to firm expansion locally and resulted in thousands of food processing jobs, many of which pay higher than the County median.

**MARKETING**

- **Local Buying Campaigns**: How to increase the visibility of Kern County’s agricultural products in the marketplace, building from successful “Buy California” campaigns.

**BUSINESS CLIMATE**

- **Regional Planning**: In order to protect and maintain agricultural and industrial land, there must be improved regional planning which designates and protects key areas from residential development and other encroachment. While in 2005 there is sufficient land to support growth in residential, agricultural and industrial areas, within 10 to 15 years, there will be increasing conflicts among uses. Proper planning today will ensure that the County’s main economic engine will remain and grow over time. Regional planning efforts must take into account the land needs for both growers and food processors and create adequate buffer zones around their facilities.

**3.2.9. Key Insights for Strategy Implementation**

Kern County’s Value-Added Agriculture cluster faces important challenges. The following table summarizes the key insights based on the diagnosis of the cluster’s performance and economic foundation challenges. These conclusions relate to the strategic priority areas of the County’s economic development plan.

<table>
<thead>
<tr>
<th>Table 13. Summary of Value-Added Cluster Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conclusion</strong></td>
</tr>
<tr>
<td>Cluster Analysis</td>
</tr>
<tr>
<td>Value-Chain Depth: Opportunity exists to increase the number of firms and employment in the higher value-added, higher wage food manufacturing segments, building on existing capacity in Fruit and Vegetable Preserving and Specialty Food Manufacturing, and Dairy Product Manufacturing.</td>
</tr>
<tr>
<td>Growth and Concentration: The County has significant concentrations in most areas of production and processing, and growth is primarily driven by crop production, and food and vegetable processing. The County can explore growth opportunities in niche areas within these strong cluster segments.</td>
</tr>
<tr>
<td>Economic Foundation Analysis</td>
</tr>
<tr>
<td>Contamination: Need to manage and reduce contamination of land or water affecting farmland.</td>
</tr>
<tr>
<td>Water and Sewer: Need to ensure sufficient water and sewer capacity for food processors, and expand use of gray water.</td>
</tr>
<tr>
<td>Transportation: Need to provide affordable and convenient access to job sites</td>
</tr>
</tbody>
</table>
Skills Training Programs: Need to support the higher-skill jobs within agriculture by working with the schools and training programs to ensure that people are receiving training.

Branding: Need to promote “Buy Kern,” building off the “Buy California” theme

Perception of Cluster Career Ladders: Need to change the perception of the range of occupations and job opportunities throughout Value-Added Agriculture.

Regional Planning: Need to protect and maintain agricultural and industrial land by improving regional planning which designates and protect key areas from residential development and other encroachment.

Land Costs: Need to manage urban development pressures which may affect the ability for new farms to come into operation

Attraction of Innovators: Need to attract high quality agriculture innovators into Kern.

Improve Perception of Kern in Ag Innovations: Need to improve the perception of Kern as a place to incubate new agriculture technologies.

Expand Existing Operations: Need to create more opportunities for existing firms.

3.2.10. Vision and Recommendations

VISION:
Kern County will continue to innovate in extracting value from its agricultural assets, while moving increasingly into downstream activities.

RECOMMENDATIONS:

• Focus business attraction efforts on three segments: Food processing, Niche agriculture (i.e. organics), Agricultural technology (i.e. irrigation equipment).

• Establish additional training programs to support growth in food processing jobs.

• Plan for and develop effective east/west bypass around Bakersfield.

• Establish industrial zone/district that enables growth of food processors and reduces the impact of residential encroachment. Co-location of food processing encourages more efficient use of infrastructure and enables easier transportation for workers.

• Encourage increased use of gray water by food processors.

• Secure supplies of low cost energy by educating users on options to optimize cost effectiveness and help Kern County become a recognized throughout California as a place of excellence for alternative energy utilization.

• Encourage use of wind farms on agricultural land to add value to land and preserve open space and to expand access to energy. This is appropriate for all sub-regions of the County with at least moderate amounts of wind.

• Provide access to financing for LMI persons in cluster to develop new enterprises (such as farming or trucking).
3.3. Energy and Chemicals Cluster: Moving Downstream and Capturing the Wind

3.3.1. Overview: Energy and Chemicals Cluster is Historically one of the Key Parts of County’s Economic Base

Kern County has a long history of upstream and downstream activities in the energy and chemicals sectors, stemming from the rich presence of natural resources. Kern County has developed an extremely strong oil and gas production capacity, but the County’s record in downstream petroleum-based activities, however, is mixed. The County is very strong in petrochemicals, but weak in further downstream chemical and plastics manufacturing segments.

More recently, Kern County has witnessed development of its alternative/renewable energy industries, particularly biomass and wind energy. Wind assets in Kern County, particularly in the Tehachapi area, are among the best in California and the nation, attracting firms and investments from throughout the State and country for the development of this industry in Kern. Biomass conversion activities have strong linkages with the County’s agricultural base. Agricultural waste and other diverted bio-waste products are among the key feedstock for biomass activities.

The energy and chemicals cluster has nearly 13,000 private sector jobs in oil and gas production, field services, electricity, refining, chemicals, and plastics. There is also some employment in alternative energy operations. The cluster is not only a significant source of overall employment, but also a provider of high-paying, moderate-to-high skill jobs such as those in technical and engineering occupations. All industry segments which comprise the cluster pay significantly higher wages than the County average. In some more specialized or highly-skilled areas, wages are double the County average.

3.3.2. Cluster Performance: Transforming Cluster with Declining Employment and Weak Relative to Competitors

Kern County’s energy and chemicals cluster is well-concentrated, but slow-growing. The following are the factors which are used in assessing cluster performance:

- **Lack of Employment Dynamism.** The energy and chemicals cluster has had stagnant growth dynamics in the 10-year period between 1993 and 2003. Overall, cluster employment had an average absolute decline of 1.3% annually during this period, which is a 1.0% decline relative to the U.S. rate of -0.3%. The County, however, has experienced moderate growth in extraction jobs since 2000, and has had expansion in petrochemicals and some other chemicals.

- **Life Cycle: Transforming Cluster:** The cluster is in the transforming stage of its lifecycle, a stage characterized by low growth and high concentration relative to the national average.

- **Weak Competitive Position:** When compared with other counties, Kern County’s energy and chemicals cluster is not growing as fast as that of San Bernardino, Alameda County, Orange County, and Houston. San Bernardino has experienced the fastest average annual growth of 4.7% relative to the United States among the competitor counties despite its relatively small total employment size and employment concentration. Alameda and Orange Counties are also outpacing Kern in terms of growth. While Houston has one of the largest
concentrations of energy and chemicals activities in the nation, Kern has the second highest concentration. These competitiveness indicators are captured in the growth share matrix below.

3.3.3. Cluster Segments: Strengths in Extraction and High Wages

Kern County’s energy and chemicals cluster consists of approximately 380 firms in extraction, manufacturing, and power industries, with the largest number of firms in support activities and related civil engineering construction. The table below indicates the ten industry segments that comprise the cluster, and their corresponding employment, business establishments, average weekly wages, and concentration. Key elements of the cluster’s structure are:

- **Substantial Jobs.** Across the cluster, there are approximately 13,000 private sector jobs. Oil and gas extraction, with 2,881 jobs, is the largest cluster segment in terms of employment. Pump and compressor manufacturing is one of the lowest.

- **High Concentration.** The location quotient, which compares the County’s relative employment size to that of the United States, is the key measure of employment concentration. Kern County’s energy and chemicals cluster has above national average employment concentration overall. Among the cluster segments, Kern County is heavily concentrated in oil and gas extraction (11.87), as well as in support activities for mining (11.29). The County has below average concentration (LQ < 1) in electric power generation/transmission/distribution (0.77), chemical manufacturing (0.21), plastics and rubber products manufacturing (0.53), and pump and compressor manufacturing (0.89).

- **Strong Wages.** The cluster generates higher-than-County average wages. Extraction, mining, distribution, and power industries have higher average wages than the manufacturing industries, with average weekly wages ranging from approximately $600 to $1,400. Natural gas distribution has the highest average weekly wage at $1,381, followed closely by oil and gas extraction ($1,315) and petroleum and coal products manufacturing ($1,131). On the
other end, plastics and rubber products manufacturing has the lowest average weekly wage at $601.


<table>
<thead>
<tr>
<th>NAICS</th>
<th>Description</th>
<th>Employment</th>
<th>Business Establishments</th>
<th>Average Weekly Wage</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>211</td>
<td>Oil and Gas Extraction</td>
<td>2881</td>
<td>55</td>
<td>$1,315</td>
<td>11.87</td>
</tr>
<tr>
<td>213</td>
<td>Support Activities for Mining</td>
<td>4108</td>
<td>110</td>
<td>$1,013</td>
<td>11.29</td>
</tr>
<tr>
<td>2211</td>
<td>Electric Power Generation, Transmission and Distribution</td>
<td>643</td>
<td>29</td>
<td>$1,184</td>
<td>0.77</td>
</tr>
<tr>
<td>2212</td>
<td>Natural Gas Distribution</td>
<td>556</td>
<td>6</td>
<td>$1,381</td>
<td>2.50</td>
</tr>
<tr>
<td>237</td>
<td>Heavy and Civil Engineering Construction</td>
<td>2592</td>
<td>104</td>
<td>$902</td>
<td>1.36</td>
</tr>
<tr>
<td>324</td>
<td>Petroleum and Coal Products Manufacturing</td>
<td>715</td>
<td>26</td>
<td>$1131</td>
<td>3.04</td>
</tr>
<tr>
<td>325</td>
<td>Chemical Manufacturing</td>
<td>383</td>
<td>23</td>
<td>$894</td>
<td>0.21</td>
</tr>
<tr>
<td>326</td>
<td>Plastics and Rubber Products Manufacturing</td>
<td>860</td>
<td>20</td>
<td>$601</td>
<td>0.53</td>
</tr>
<tr>
<td>33313</td>
<td>Mining and Oil and Gas Field Machinery Manufacturing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics; ICF Consulting
Notes: "-" indicates suppressed data.

3.3.4. Cluster Map: Limited Downstream Activities

The figure below depicts the various segments and sub-segments of the cluster definition according to the three “layers” or levels of a cluster – exporters, suppliers, and economic input foundations. In addition to the cluster definitions, the map shows segments from the transportation and logistics cluster on which this cluster depends. The figure also indicates areas where the County exhibits strong or weak concentration of activities (based on its location quotient), as well as supply-level segments characterized by relatively higher dependency on suppliers from outside of the County. Not surprisingly, in supplier segments that are strongly concentrated, the County relies less on suppliers from outside of the County. The economic foundation level encompasses the categories that help enable and support the cluster by providing key inputs and resources that the cluster depends on.

Kern County has more strength and depth at the supplier level. The County’s energy and chemicals cluster has more industry segments with high concentrations at this level. There are a few highly concentrated segments at the exporting level. But most areas of chemical and plastics manufacturing, which constitute some of the key exporters of energy and chemicals cluster, are weak in Kern County.
### Figure 14. Energy and Chemicals Cluster Map

<table>
<thead>
<tr>
<th>Exporting Level</th>
<th>High Kern Concentration (LQ &gt; 1)</th>
<th>Low Kern Concentration (LQ &lt; 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Fertilizer (Mixing Only)</td>
<td>• Basic Chemical Manufacturing</td>
</tr>
<tr>
<td></td>
<td>• Plastics Pipe, Pipe Fitting, and Unlaminated Profile Shape Manufacturing</td>
<td>• Nitrogenous Fertilizer Manufacturing</td>
</tr>
<tr>
<td></td>
<td>• Polystyrene Foam Product Manufacturing</td>
<td>• Paint, Coating, and Adhesive Manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other Petroleum and Coal Products Manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other Chemical Product and Preparation Manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other Plastics Product Manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Electric Power Distribution</td>
</tr>
</tbody>
</table>

### Supplier Level

<table>
<thead>
<tr>
<th>High Kern Concentration (LQ &gt; 1)</th>
<th>Low Kern Concentration (LQ &lt; 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Oil and Gas Extraction (crude, natural gas, and LNG extraction)</td>
<td>• Pump and Compressor manufacturing</td>
</tr>
<tr>
<td>• Natural Gas Distribution</td>
<td>• Mining and Oil and Gas Field Machinery and Equipment Manufacturing</td>
</tr>
<tr>
<td>• Support Activities for Oil and Gas Operations</td>
<td>• Electric Bulk Power Transmission and Control</td>
</tr>
<tr>
<td>• Petroleum Refineries</td>
<td>• Hydroelectric Power Generation</td>
</tr>
<tr>
<td>• Drilling Oil and Gas Wells</td>
<td>• Fossil Fuel Electric Power Generation</td>
</tr>
<tr>
<td>• Other Electric Power Generation</td>
<td>• Water and Sewer Line and Related Structures Construction</td>
</tr>
<tr>
<td>• Oil and Gas Pipeline and Related Structures Construction</td>
<td><strong>Higher Dependency on Suppliers from outside of County than within</strong></td>
</tr>
<tr>
<td>• Power and Communication Line and Related Structures Construction</td>
<td>• Mining and Oil and Gas Field Machinery and Equipment Manufacturing</td>
</tr>
<tr>
<td>• Pipeline Transportation (Transportation and Logistics Cluster)</td>
<td>• Electric Bulk Power Transmission and Control</td>
</tr>
<tr>
<td>• Truck Transportation (Transportation and Logistics)</td>
<td>• Hydroelectric Power Generation</td>
</tr>
<tr>
<td>• Wholesale Trade (Transportation and Logistics)</td>
<td>• Fossil Fuel Electric Power Generation</td>
</tr>
</tbody>
</table>
3.3.5. **County Distribution: Employment Concentrated in Valley, West**

The largest pockets of employment in the energy and chemicals cluster are located in the valley, west (around the Taft area), and in the areas to the north of Bakersfield as indicted in the map below. The map indicates distribution of aggregate employment levels across the County. It is important to note, however, that the intensity of the shading is not an indication of relative employment density or concentration, which is typically defined as per capita or per 100,000 people. The range of shades reflects various levels of total employment.

**Figure 15. Regional Distribution, Employment, 2003**

3.3.6. **Lagging Entrepreneurial Dynamism**

Measured as the share of total companies 3 years old or less, entrepreneurial dynamism is relatively weak in Kern County’s energy and chemicals cluster. Kern lags most of the competitor regions, namely Houston, Los Angeles, Orange County, and San Bernardino. (See figure
Approximately 6% of the companies in Kern County’s energy and chemicals cluster are younger than four years, which compares unfavorably to Houston’s 11% and even Orange County’s 9%.

### Figure 16. Energy and Chemicals Entrepreneurial Dynamism

| Entrepreneurial Dynamism, Energy & Chemicals Cluster: Kern County & Competitors |
|--------------------------------|-----------------|
| Kern               | 6%              |
| Houston            | 11%             |
| Los Angeles        | 8%              |
| Oakland            | 6%              |
| Orange County      | 9%              |
| San Bernardino     | 8%              |

### 3.3.7. Cluster Occupations: Significant Opportunities for Low to Moderate Skilled Employment

For the entry level occupation analysis the energy and chemicals cluster includes the following sectors: Oil and Gas Extraction (NAICS 211 – 213), Utilities sector (NAICS 22), and Petroleum and Coal Products Manufacturing (NAICS 324).

Entry-level positions and the total employed by occupation in the Energy and Chemicals Cluster are outlined in Table 15 below and sorted by total employment.

### Table 15. Top Entry-Level Occupations, Energy and Chemicals Cluster, Kern County, 1999

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-Line Supervisors/Managers of Construction Trades and Extraction Workers (620) SOC 47-1011</td>
<td>757</td>
</tr>
<tr>
<td>Mining Machine Operators (684) SOC 47-5040</td>
<td>630</td>
</tr>
<tr>
<td>Derrick, Rotary Drill, and Service Unit Operators, and Roustabouts, Oil, Gas, and Mining (680) SOC 47-50YY</td>
<td>528</td>
</tr>
<tr>
<td>Miscellaneous Extraction Workers, Including Roof Bolters and Helpers</td>
<td>518</td>
</tr>
<tr>
<td>First-Line Supervisors/Managers of Production and Operating Workers</td>
<td>419</td>
</tr>
<tr>
<td>Driver/Sales Workers and Truck Drivers (913) SOC 53-3030</td>
<td>379</td>
</tr>
<tr>
<td>Other Production Workers (896) SOC 51-9</td>
<td>375</td>
</tr>
</tbody>
</table>
3.3.8. **Economic Foundation Challenges: Industrial Zoning, Political and Policy Support**

The cluster-specific economic foundation challenges range from infrastructure and business climate, to human resources, marketing, finance, and innovation. The following cluster challenges were identified by various stakeholders in the cluster.

**BUSINESS CLIMATE**

- **Encouraging additional support from the State and federal government on renewable energy:** The County lacks the support of strong programs, mandates, incentives, coordination, and financial resources to accelerate growth.
• Increasing local demand incentives for renewable energy to encourage commercialization of research in Kern County, and attract business developers in this area. The weakness of the local market for renewable energy products and services is a challenge for the County. The County does not have the strong renewable energy consumption mandates seen in other counties, such as renewable-powered public transit and buildings.

• Lack of Public-Private Interest and Commitment, and Champion for Renewable Energy: Some have sensed lack of interest and/or commitment to develop capacity in renewables, particularly on the research and development and workforce development components. The County has not played a strong role in getting people together and creating synergies across business, academia, and military. Approval of this strategy will serve as an official first step in advancing this concept as part of the County’s official economic development strategy.

Business Climate

• Increasing the supply of biomass feedstock through regulations and incentives, and reducing price of feedstock: The costs associated with acquiring biomass inputs are high. The challenge is to encourage potential suppliers of biomass to divert important inputs to biomass plants, instead of traditional waste streams (i.e., landfill). Or create a new market for agriculture operators. Without incentives for people who have the fuel (feedstock), it is not going to be economical to put more plants in.

• Addressing barriers due to strict environmental regulations: Many businesses in the cluster face challenges with adhering to strict environmental regulations, such as air quality controls, and keeping informed of changes to existing regulations or new legislation. Oil and energy related companies face more stringent regulations.

• Attracting renewable energy companies to Kern: Kern has few renewable energy companies. Attracting companies to develop new renewable facilities and help sell to local and export markets is a growth challenge for the cluster.

• Retaining Existing Large Renewable Operators: It is important that companies, such as GE Wind, stay in Kern County.

• Addressing Industrial Zoning Issues: Some companies have faced barriers with the County when dealing with industrial zoning issues and the zone change application process. The challenge will be to work with stakeholders to balance different perspectives in the County.

• Working more synergistically to leverage and develop competencies related renewable energy: The County has diffuse, unorganized resources and competencies which are not being fully explored and harnessed to develop strengths in renewable energy.

Human Resources

• Limited supply of qualified workers for renewable energy companies: It is difficult to find qualified people such as mechanical engineers, and hard to compete for skilled mechanics and others with power plants experience that can get higher wages/salaries in traditional energy areas.
• **Prepare workforce for new skill set:** Average age in this cluster is 50. In next 10 to 15 years, many firms will face major turnover. In addition to this gap, the skills of the past are not the skills that will be needed in the future. Operations are increasingly driven by technology. Many in the workforce lack strong computer and technology skills.

• **Retaining skilled workers in Kern County:** It is difficult to retain highly-skilled employees and their families in Bakersfield. Bakersfield and the surrounding oil economy are not as attractive as other regions with strong energy and chemicals clusters, such as Houston or New Orleans. This is contrary to popular assumptions about Bakersfield which suggest that it is hard to attract people but once they come they are more likely to stay. The key difference here relates to the retention of highly skilled employees in the energy industry who are seeking other opportunities within the industry.

**MARKETING**

• **Strengthening Market Linkages and Supply Chain in Renewable Energy:** Supply chain for turning the resources and assets into viable products in the marketplace is weak and County could possibly lose that potential. Coordination and linkages across industries that are producers and users of renewable energy are underdeveloped. The County has technologies and equipment present, but lacks the companies that develop/manufacture and use the technologies.

• **Limited Coordinated Marketing of Kern’s Renewable Assets:** Existing renewable energy activity in the County is fragmented with a few independent operators. The County also lacks strong documentation and promotion of its renewable energy assets and infrastructure.

**INFRASTRUCTURE**

• **Limited Refinery Capacity:** There are only two refineries left in Bakersfield. Although the Shell refinery has recently been sold and will likely remain open, there remains the potential for a refinery closure given challenges with air quality compliance. Any closure of a refinery would result in significant job losses and have a major impact on the supply of refined products in the County.

• **Visual Impact of Wind Farms:** How to minimize any negative visual impact of wind farms may be an issue.

• **Limited Airline Service:** There are limited direct flights between Kern County and other energy markets, such as Houston. Continental recently began flying nonstop from Meadows Field to Houston. This is a major improvement for travel to/from Kern County.

• **Improving quality of roads:** The poor state of the roads and highways, such as Hwy 110 and 66, is a burden on trucks used to transport materials and products.

• **Resolving Competing Land Uses:** Maintaining a balance between industry and developers in land use planning is an important issue facing the County.

**FINANCE**

• **Limited Expansion Capital for Renewable Operators:** 95% of the smaller companies lack the capital resources to expand. The County does not have adequate capital funding mechanisms in place.
INNOVATION

- **Innovating and diversifying renewable energy technology uses and applications to create value:** There is some renewable energy activity in the County but most of the renewable energy produced just goes up on the grid. The County lacks the strong research and training capacity at local higher education institutions to be leading innovators in renewable energy.

### 3.3.9. Key Insights for Strategy Implementation

Kern County’s energy and chemicals cluster faces important challenges. The following table summarizes the key insights based on the diagnosis of the cluster’s performance and economic foundation challenges. These conclusions relate to the strategic priority areas of the County’s economic development plan.

**Table 16. Summary of Energy and Chemicals Cluster Diagnosis**

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>County’s Strategic Priority Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>Value-Chain Depth: Kern County has more strength and depth at the supplier level. Need to improve presence of refined products manufacturing and traditional and renewable power generation.</td>
<td>Business Attraction and Expansion</td>
</tr>
<tr>
<td>Growth Dynamics: The industry is slow-growing with above-average concentration, and lagging behind competitor counties. This transforming cluster needs new sources of innovation and productivity to improve competitive position.</td>
<td></td>
</tr>
<tr>
<td>Entrepreneurship: Entrepreneurship is weak compared to that of competitor counties. County needs to address barriers and challenges to new business development.</td>
<td></td>
</tr>
<tr>
<td><strong>Economic Foundation Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>Need to consider visual impact of wind farms: Wind farms may have negative visual impact on surrounding area.</td>
<td>Land Use and Infrastructure</td>
</tr>
<tr>
<td>Need to address competing land uses: Need to ensure balance between industry and developers in land use planning priorities.</td>
<td></td>
</tr>
<tr>
<td>Need to address industrial zoning: At times cluster faces barriers with the County when dealing with industrial zoning issues and zone change application process. Need to continuously work to understand and balance perspective of both industry and government.</td>
<td></td>
</tr>
<tr>
<td>Need to improve quality of roads: Improvements needed on routes such as highways 119 and 166.</td>
<td></td>
</tr>
<tr>
<td>Need to increase airline service: Continental recently came into Bakersfield International and has provided direct flights to Houston, which has been a major improvement.</td>
<td></td>
</tr>
<tr>
<td>Need to increase supply of qualified skilled workers in renewable energy: Hard to find qualified people such as mechanical engineers, and hard to compete for skilled mechanics and others with power plants experience who can get more competitive wages elsewhere in the cluster.</td>
<td>Human Resources</td>
</tr>
</tbody>
</table>
• **Need to reduce high turnover rates, particularly in renewable industry**: Need to attract people who are willing to work and be trained in-house.

• **Need to prepare workforce for new skills requirements**: Need to train for the skills that will be required in the future. Need to focus on partnership with community colleges and trades schools to develop and improve needed curriculum and technology skills training.

• **Need to retain skilled workers in Kern County**: It is difficult to get people to settle in Bakersfield with their families long-term. Bakersfield is not as attractive as other counties with strong energy and chemicals clusters, such as Houston and New Orleans.

• **Need to improve coordinated marketing of Kern’s renewable assets**: Need to show the documentation of the various assets.

• **Need to strengthen local demand conditions for renewable energy**: Renewable energy consumption is weak at the local level. Need to develop ways to encourage or mandate local renewable energy utilization to help strengthen local market for renewable energy products and services, encourage commercialization of research in the County, and attract renewable energy businesses.

• **Need to retain existing large renewable operators in the County**: It is imperative that GE Wind and others stay in Kern County.

• **Need to strengthen market linkages and supply chain**: Need more coordination and linkages across industries that are producers and users of renewable energy. Need the companies that develop/manufacture and use the technologies to be located in the County. Need attraction of companies to develop new renewable facilities and help sell to markets, particularly to world markets.

• **Need to increase refinery capacity**: Only two refineries left in Bakersfield, and they face challenges with compliance.

• **Need to address waste diversion to increase the supply of biomass feedstock**: Need to encourage potential suppliers of biomass to divert important inputs to biomass plants to increase availability of and drive down price of feedstock.

• **Need to mitigate barriers in environmental regulations**: Need to work with industry to help overcome their issues with environmental regulations (i.e. San Joaquin Unified Air Pollution Control District and air quality issues in oil and gas).

• **Need to increase expansion capital for renewable operators**: 95% of the smaller companies lack the capital resources to expand. Need capital funding mechanisms in place.

• **Need to innovate and diversify technology uses and applications to create more value**: Need to go beyond just placing energy on the grid. Need to develop research and training capacity at local higher education institutions to be competitive. High-end research at the regional university will serve to attract manufacturers and commercialization entities to the County who benefit from spin-offs and technology transfer.

• **Need to encourage additional support from the federal and State levels on renewable energy**: Need strong programs, mandates, and coordination such as California Governor’s mandate for 33% renewable by 2020 to accelerate growth. Need to support stronger renewable energy mandates at State Level. Need to explore federal support for renewable energy. Need to collaborate with such agencies as Penwell, National Science Foundation, the Department of Defense (DOD), and the American council of Renewable Energy (ACORE) (both based in Washington, D.C.) to assist in directing resources and capital to the County.

• **Need to generate greater public-private interest and commitment, and championing of renewable energy**: Need County to play a critical role in getting people together and creating synergies across business, academia, and military. Need increased dialogue on
the issues and challenges for development in this area.

- **Need to organize County assets in renewable energy:** The County has diffuse, unorganized resources and competencies in industry, academia, and government that need to just work more synergistically.

### 3.3.10. Vision and Recommendations: Harness Alternative Energies and Move Downstream

**VISION**

Kern County will become California’s leading source for wind and biomass power and will become one of the leading places for downstream activities in plastics (bio- and petroleum-based).

**RECOMMENDATIONS**

- Need to address waste diversion to increase the supply of biomass feedstock. Need to encourage potential suppliers of biomass to divert important inputs to biomass plants to increase availability of and drive down price of feedstock.
- Make public commitment to expansion of renewable energy in County through local utilization and purchase of locally-produced renewable energy.
- Bring together assets in renewables, such as wind, solar and biomass, to expand this opportunity and help make Kern a center for these new technologies. Attract companies to develop renewable facilities in County.
- Support new research at CSUB which develops innovations with commercial applications in Kern County.
- Maintain political support for existing refineries and allow for development of new refineries and power plants.
- Zone for industrial uses to enable expansion of manufacturing (from refineries to plastics).
- Focus attraction on expansion into downstream activities such as plastics given Kern’s strong position for manufacturing.
- Develop new training programs to support cluster training needs.
3.4. Transportation, Logistics & Warehousing Cluster: Ready to Move Ahead

3.4.1. Overview: Transportation, Logistics & Warehousing is a Strong, Emerging Cluster in the County

Driven by the availability of cheap land for warehousing and distribution and access to key transportation infrastructure, including the Port of Long Beach/Los Angeles and the major north-south and east-west highways and interstates in California, the Transportation, Logistics & Warehousing cluster’s presence and growth in Kern County has been significant in the past ten years. Employing over 12,000 people with above-average wages in the key segments of road, air, rail, logistics, warehousing, and wholesale trade, the cluster has achieved overall growth of 2.4% in the 10-year period between 1993 and 2003.

Kern County has strengths in facilities support, specialized freight, trucking and logistics services for road and rail, rental, leasing, and equipment repair. The County’s industry cluster is also strong in wholesale trade, which depends on the strong availability of transportation providers and services across various modes. The Transportation, Logistics & Warehousing cluster’s strengths also appear tied to the County’s strengths in energy and agriculture, two export-oriented industries that are heavily dependent on the large-scale transport of materials and final products. However, general long-distance truck freight and air transportation are weaknesses in the industry cluster in Kern County.

3.4.2. Cluster Performance

Kern County’s Transportation, Logistics & Warehousing cluster has achieved moderate growth and concentration. These employment dynamics suggest that the County’s Transportation, Logistics & Warehousing cluster is increasingly a key competitive countywide player. The following are the factors which are used in assessing cluster performance:

- **Positive Growth Dynamics.** This cluster is performing well overall in terms of employment growth. Between 1993 and 2003, employment in Transportation, Logistics & Warehousing grew on average by 2.4% annually, driven by growth in warehousing/storage, trucking, and support activities cluster segments.

- **Life Cycle: Just Expanding.** In an analysis of 10-year dynamics in the cluster, Kern County’s Transportation, Logistics & Warehousing cluster is barely into the expanding stage of its lifecycle, a stage characterized by high growth and high concentration relative to the national average.

- **Relatively Moderate Growth.** The growth share matrix shows the cluster’s growth relative to the U.S. and competitor counties. While growing slower than major transportation hubs of San Bernardino and San Joaquin, the County’s ten-year growth in Transportation, Logistics & Warehousing has been higher than the U.S. average growth of 1.6%. Kern County is also outpacing Fresno and Sacramento.

- **Comparatively Good Concentration.** The location quotient, which compares the County’s relative employment size to that of the United States, is the key measure of employment concentration. Transportation and logistics is slightly more concentrated in Kern County compared with the concentration of the industry in the whole of the United States. However,
Transportation, Logistics & Warehousing activities are more concentrated in the neighboring counties of San Joaquin and San Bernardino, which have location quotients of 1.65 and 1.52, respectively.

**Figure 17. Transportation and Logistics Growth Share Matrix**

![Transportation and Logistics Growth Share Matrix](image)

**3.4.3. Cluster Segments**

The Transportation, Logistics & Warehousing cluster consists of nearly 11,000 employees and nearly 1,200 firms in the different wholesaling, transportation, equipment rental/leasing, repair and maintenance, support activities, and local service providers (i.e. couriers/messengers). As indicated in the table below which identifies the NAICS definitions that comprise the cluster, the largest numbers of business establishments are found in the truck transportation segment. Other key elements of the cluster’s structure are:

- **Truck Transportation Segment Leads in Employment.** The leading segment for employment is truck transportation (3,342). Other key cluster employers include warehousing and storage (1,701), machinery/equipment/supplies merchant wholesalers (1,420), and support activities for transportation (1,257).

- **Above Average Concentration.** Kern County’s Transportation, Logistics & Warehousing cluster is slightly more concentrated than the U.S., with a location quotient of 1.09. The leading cluster segments in concentration are commercial and industrial machinery / equipment rental and leasing (1.92), repair and maintenance (1.83) and warehousing and storage (1.64). The segments with the weakest concentration include couriers and messengers (0.41), transit and ground passenger transportation (0.45), and farm product raw material merchant wholesalers (0.46).

- **High Wages.** The cluster has one of the highest average weekly wages in the County. Disaggregated by segment, the average weekly wage ranges from a low of $266 in the transit and ground transportation segment (i.e., taxi/limousine service, charter bus, and urban transit) to a high of $1,230 in pipeline transportation of crude oil, natural gas, refined
products, and other commodities. Strong wages can also be found in the chemical and allied products merchant wholesalers segment which has a weekly average wage of $998, as well as the other categories of merchant wholesaling.

Table 17. Transportation and Logistics Employment, Business Establishments, and Average Weekly Wage by Cluster Segments (2003)  

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Description</th>
<th>Employment</th>
<th>Business Establishments</th>
<th>Average Weekly Wage</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>4235</td>
<td>Metal and Mineral (except Petroleum) Merchant Wholesalers</td>
<td>288</td>
<td>8</td>
<td>$811</td>
<td>1.22</td>
</tr>
<tr>
<td>4238</td>
<td>Machinery, Equipment, and Supplies Merchant Wholesalers</td>
<td>1420</td>
<td>115</td>
<td>$772</td>
<td>1.10</td>
</tr>
<tr>
<td>42448</td>
<td>Fresh Fruit and Vegetable Merchant Wholesalers</td>
<td>158</td>
<td>18</td>
<td>$802</td>
<td>1.08</td>
</tr>
<tr>
<td>42449</td>
<td>Other Grocery and Related Products Merchant Wholesalers</td>
<td>413</td>
<td>17</td>
<td>$905</td>
<td>1.00</td>
</tr>
<tr>
<td>4245</td>
<td>Farm Product Raw Material Merchant Wholesalers</td>
<td>69</td>
<td>8</td>
<td>$784</td>
<td>0.46</td>
</tr>
<tr>
<td>4246</td>
<td>Chemical and Allied Products Merchant Wholesalers</td>
<td>227</td>
<td>19</td>
<td>$998</td>
<td>0.87</td>
</tr>
<tr>
<td>4247</td>
<td>Petroleum and Petroleum Products Merchant Wholesalers</td>
<td>203</td>
<td>20</td>
<td>$715</td>
<td>0.97</td>
</tr>
<tr>
<td>481</td>
<td>Air Transportation(^9)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>484</td>
<td>Truck Transportation</td>
<td>3342</td>
<td>254</td>
<td>$699</td>
<td>1.25</td>
</tr>
<tr>
<td>485</td>
<td>Transit and Ground Passenger Transportation</td>
<td>307</td>
<td>18</td>
<td>$266</td>
<td>0.45</td>
</tr>
<tr>
<td>486</td>
<td>Pipeline Transportation of Crude Oil, Natural Gas, Refined Petroleum Products, and other Commodities</td>
<td>88</td>
<td>11</td>
<td>$1,230</td>
<td>1.10</td>
</tr>
<tr>
<td>488</td>
<td>Support Activities for Transportation</td>
<td>1257</td>
<td>51</td>
<td>$741</td>
<td>1.23</td>
</tr>
<tr>
<td>492</td>
<td>Couriers and Messengers</td>
<td>30</td>
<td>451</td>
<td>$712</td>
<td>0.41</td>
</tr>
<tr>
<td>493</td>
<td>Warehousing and Storage</td>
<td>1701</td>
<td>25</td>
<td>$538</td>
<td>1.64</td>
</tr>
<tr>
<td>5324</td>
<td>Commercial and Industrial Machinery and Equipment Rental and Leasing</td>
<td>391</td>
<td>44</td>
<td>$779</td>
<td>1.92</td>
</tr>
<tr>
<td>8113</td>
<td>Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance</td>
<td>557</td>
<td>73</td>
<td>$638</td>
<td>1.83</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics; ICF Consulting

---

\(^9\) As of the third quarter of 2003.

\(^{10}\) The data includes 3 business establishments with combined employment of 27 in the lower NAICS level for non-scheduled air transportation (48121). However, employment at the 481 level is suppressed in the dataset.
3.4.4. Cluster Map

The figure below depicts the various segments and sub-segments of the cluster definition according to the three “layers” or levels of a cluster – exporters, suppliers, and economic input foundations. In addition to the cluster definitions, the map shows the segments from other clusters on which this cluster depends. The figure also indicates areas where the County exhibits strong or weak concentration of activities (based on its location quotient), as well as supply-level segments characterized by relatively higher dependency on suppliers from outside of the County. Not surprisingly, in supplier segments that are strongly concentrated, the County relies less on suppliers from outside of the County. The economic foundation level encompasses the categories that help enable and support the cluster by providing key inputs and resources that the cluster depends on.

Kern County has a strong presence of transportation and logistics activities at both the exporting and supplier levels. Most categories of merchant wholesaling, with the exception of that of petroleum, chemical, and allied products, are highly concentrated in the County at the export level. At the supplier level, the cluster in Kern County not only has a high concentration of key input activities, but is also well-supplied by companies located in the County. One exception is air transportation, a segment in which the County appears relatively more dependent on suppliers from outside of the County. Not surprisingly, in supplier segments that are strongly concentrated in Kern, the County relies less on imported supplies (suppliers from outside of the County). Many of the high concentration segments at both the supplier and exporting level appear to be strongly linked to the County’s activities in agriculture and energy and chemicals.

![Figure 18. Transportation and Logistics Cluster Map](image-url)
### 3.4.5. County Distribution: Employment Strongest in the Upper Valley

The highest levels of employment are located in the northern part of Kern County from Shafter to Delano with moderate levels located along the Highway 58 transportation corridor to the east as depicted in the diagram below. The China Lake area of the County also has a moderate level of employment in transportation and logistics. The map below shows distribution of aggregate employment levels across the County. It is important to note, however, that the intensity of the shading is not an indication of relative employment density or concentration, which is typically defined as per capita or per 100,000 people. The range of shades reflects various levels of total employment.
3.4.6. **Entrepreneurial Dynamism is Even with Competitors**

Kern’s entrepreneurial dynamism, measured as the share of total companies less than 3 years old (see figure below), is fairly even with key competitors. Approximately 11% of the companies in Kern County’s Transportation, Logistics & Warehousing cluster are younger than four years, which compares favorably to the approximate 13% in both San Bernardino and Sacramento. Although San Joaquin has had faster employment growth and higher concentration than Kern, San Joaquin, with only 7.3% of total firms 3 years old or less, trails Kern in the presence of new companies.
3.4.7. **Cluster Occupations**

**Entry-level Occupations**

For the entry level occupation analysis, the Transportation, Logistics & Warehousing cluster includes the following sectors: Air Transportation (NAICS 481), Truck Transportation (484), Transit and Ground Passenger Transportation (485), Pipeline Transportation (486), Support Activities for Transportation (488), Couriers and Messengers (492), Warehousing and Storage (493), Commercial and Industrial Machinery and Equipment Rental and Leasing (532-533).

Entry-level positions include bus drivers, truck drivers, airfield operations specialists, aircraft mechanics, taxi drivers, and couriers and messengers. Table 18 provides detailed information on occupations with more than 50 positions.

**Table 18. Top Entry-Level Occupations, Transportation and Logistics Cluster, Kern County, 1999**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Drivers (912) SOC 53-3020</td>
<td>375</td>
</tr>
<tr>
<td>Driver/Sales Workers and Truck Drivers (913) SOC 53-3030</td>
<td>322</td>
</tr>
</tbody>
</table>


11 Unlike the larger cluster analysis, the following sub-sectors could not be included here because the data is not available: Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance (8113), Metal and Mineral (except Petroleum) Merchant Wholesalers (4235), Machinery, Equipment, and Supplies Merchant Wholesalers (4238), Fresh Fruit and Vegetable Merchant Wholesalers (42448), Other Grocery and Related Products Merchant Wholesalers (42449), Farm Product Raw Material Merchant Wholesalers (4245), Chemical and Allied Products Merchant Wholesalers (4246) and Petroleum and Petroleum Products Merchant Wholesalers (4247).
Chapter 3 – Cluster Overviews

Air Traffic Controllers and Airfield Operations Specialists (904) SOC 53-2020 190
Aircraft Mechanics and Service Technicians (714) SOC 49-3011 183
Taxi Drivers and Chauffeurs (914) SOC 53-3041 158
Laborers and Freight, Stock, and Material Movers, Hand (962) SOC 53-7062 144
Taxi Drivers and Chauffeurs (914) SOC 53-3041 139
Couriers and Messengers (551) SOC 43-5021 139
Supervisors, Transportation and Material Moving Workers (900) SOC 53-1000 103
Aircraft Pilots and Flight Engineers (903) SOC 53-2010 89
Stock Clerks and Order Fillers (562) SOC 43-5081 85
Industrial Truck and Tractor Operators (960) SOC 53-7051 82
First-Line Supervisors/Managers of Retail Sales Workers (470) SOC 41-1011 81
Dispatchers (552) SOC 43-5030 63
Customer Service Representatives (524) SOC 43-4051 63
Bus and Truck Mechanics and Diesel Engine Specialists (721) SOC 49-3031 58
Shipping, Receiving, and Traffic Clerks (561) SOC 43-5071 51

Source: MJC, 2004; Census, 2000

**Key Occupations**

The figure below compares the percentage of cluster employment in key occupations in Kern County’s Transportation, Logistics & Warehousing cluster with San Bernardino’s. The largest percentage of Kern’s cluster employment is in transportation/moving material occupations (40%), followed by sales (18%). Compared with San Bernardino, Fresno has a higher level of employment in sales, but a lower level in transportation/moving material.
3.4.8. Economic Foundation Challenges

The cluster-specific economic foundation challenges range from infrastructure and business climate, to human resources, marketing, and innovation. The following challenges were identified by various stakeholders in the cluster.

**Human Resources**

- **Training and Skills Development:** The challenge is to develop and attract a trained labor force to serve needs of diverse jobs and employers of various sizes, as well as strengthening job-ready skills. For example, some businesses have difficulty hiring vehicle and maintenance mechanics, hydraulic and fork-lift operators, and other key support occupations. Faced with this challenge, some firms have relied on in-house training, which is very costly.

- **Job Security:** The cluster has many seasonal workers who are unable to find year-round sources of employment. The seasonality in employment and lack of the equivalent of a year-round job with benefits may hurt the attractiveness and competitiveness of jobs in the cluster. The seasonal nature of employment is partially due to the agriculture industry.

**Infrastructure**

- **Congestion on Key Arteries:** The County has growing congestion and competing uses on key transportation corridors, which may impact the County’s ability to expand the cluster and move goods. No major highways have been built in the past few years, while existing highways, such as 46 and 65, are congested due to population growth, along with increased road utilization. Congestion has been an issue for more than a decade, yet the problem has not been adequately addressed.
Chapter 3 – Cluster Overviews

BUSINESS CLIMATE

- **Communicating Changes in Traffic Laws to Affected Users**: Changes in traffic regulations are not effectively reaching affected businesses. For example, changes in road regulations for truckers in the city limit have constrained some facilities, and have led to increased traffic citations.

- **Public Financing of Infrastructure**: Kern County has been unable to adopt a self-funding program such as a ½ cent sales tax to pay for the development of transportation infrastructure.

- **Safety Regulations**: Improving safety regulations for agriculture truck drivers, specifically, and all truck drivers, generally, is one of the issues in this cluster.

SUPPLY CHAIN/MARKETING

- **Linking Transportation and Logistics Providers**: Some firms in the cluster have difficulties in identifying backhaul opportunities with trucking companies. A software program (Manugistics) for carriers, brokers, and dealers is available to help improve cooperation and increase utilization per carrier/route, and is used in Southern California, but not in Kern County.

- **Relatively High Cost of Logistics Providers**: There is a high cost of container transportation for businesses, particularly the larger distribution centers like Target and Sears. Due to the low of number of manufacturers/customers, there are limited scale efficiencies from the supplier’s perspective. For example, it is not always cost-effective or profitable for rail transport providers to service short-distance inter-modal customers.

3.4.9. **Key Insights for Strategy Implementation**

Kern County’s Transportation, Logistics & Warehousing cluster faces important challenges. The following table summarizes the key insights based on the diagnosis of the cluster’s performance and economic foundation challenges. These conclusions relate to the strategic priority areas of the County’s economic development plan.

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>County’s Strategic Priority Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster Analysis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Value-Chain Depth</strong>: Need to sustain Kern County’s strong presence of transportation and logistics activities at both the exporting and supplier levels, as well as improve capacity in air transportation.</td>
<td>Business Attraction and Expansion</td>
</tr>
<tr>
<td><strong>Moderate Growth, High Wages</strong>: Need to build on existing strengths in Transportation, Logistics &amp; Warehousing to catch up with competitors in terms of employment growth and the number of firms.</td>
<td></td>
</tr>
</tbody>
</table>

**Economic Foundation Analysis**
• **Training and Skills Development**: Need to develop and attract trained labor force to serve needs of diverse jobs and employers of various sizes, and need to strengthen job-ready skills.

• **Job Security/Year-Round Employment**: Need to provide year-round employment for seasonal workers; need to set up internal job sharing to even out seasonality in employment.

• **Improving services and resources of ETR**: Need to strengthen outreach to transportation and logistics cluster.

• **Marketing cluster as a career opportunity**: Need to increase value for alternative and technical/trade career paths among high school students; need to promote the idea of vocational training to school system as a way to address the serious shortcomings of current system – drop outs, dead ends, etc.

• **Congestion on Key Arteries**: Need to continue to expand and move goods in face of growing congestion and competing uses.

• **Increasing use of Kern Airport (Meadows)**: Air cargo has lots of opportunity as a result of expansion of Kern County Airport.

• **Waste Management**: Need sufficient alternatives to support waste hauling to landfills.

• **Public Financing of Infrastructure**: Need to adopt a self-funding program such as ½ cent highway tax to pay for development of the infrastructure.

• **Communicating changes in traffic laws to affected users and facilities**: Need to communicate changes in regulatory environment affecting businesses.

• **Safety regulations**: Need to improve safety regulations for agriculture trucks/drivers, specifically, and all truck drivers, generally.

• **Attracting more logistics providers to County to increase competition and drive down costs**: Need to develop plan to lower high cost of container transportation for businesses, particularly the bigger distribution centers like Target and Sears. Low number of manufacturers/customers means that there are limited scale efficiencies from the supplier’s perspective. Need more cooperation (or providers) for inbound/outbound containers, and need to attract more logistic companies to the County in lieu of increased rail capacity. Need increased outbound capacity which could be improved by using the railroad, but the railroad cannot meet the needs.

• **Linking Transportation and Logistics Providers and Users**: Need to develop B2B network of containers and shipments to identify available backhaul.

### 3.4.10. **Vision and Recommendations**

**VISION:**

Kern County will become the Transportation, Logistics & Warehousing center for the San Joaquin Valley and will increase employment growth rate relative to San Bernardino County.

**RECOMMENDATIONS:**

- Attract more logistics providers to County to increase competition and drive down costs.
- Establish training programs for Vehicle Maintenance and Operators, Bus Drivers, Airfield Operations Specialists, and Aircraft Service Technicians (currently underserved by County programs).
• Adopt new mechanism for funding transportation infrastructure, such as an increase in the local sales tax.
• Zone for industrial land along rail lines to reduce negative impact of residential encroachment.
• Establish greater linkages with Ports such as Oakland.
• Communicate changes in traffic laws more effectively to transportation firms to prevent surprise ticketing.
3.5. Business and Professional Services Cluster: Awakening to its Potential

3.5.1. Overview: Business and Professional Services is an Emerging Cluster

Business and professional services is a broadly-defined, emerging cluster that includes management, administration, technical, engineering, and scientific services. In Kern County, there are more than 22,000 private jobs in this cluster, making this cluster the leading employer in the County behind the value-added agriculture cluster. Within this cluster, Kern County is strong in accounting, bookkeeping, and payroll services, as well as scientific and engineering consulting services. Moreover, the County has weaknesses in most other advanced professional services, but some strengths are emerging in these areas. The wage picture is mixed. Professional service employees have wages that are higher than the County average, while administrative service employees have relatively lower wages.

3.5.2. Cluster Performance

Kern County’s business and professional services have been growing in the past 10 years, but faces significant competition from neighboring Counties. The cluster experienced losses in computer systems design and headquarter jobs since 2000. The following are the two factors which are used to assess cluster performance:

- **Moderate Growth Dynamics.** Overall, the Business and Professional Services Cluster grew an average of 2.4% annually between 1993 and 2003. This growth was driven primarily by employment growth in the administrative and support/waste management/remediation services segment, which grew by 4.4% annually, followed by the professional, scientific, and technical services segment, which grew by over 1% annually.

- **Life Cycle: Emerging Cluster.** In an analysis of 10-year dynamics in the cluster, Kern County’s business and professional services cluster is in an early developing stage of its lifecycle, a stage characterized by moderate growth and lower concentration relative to the national average.

- **Slow Growth and Low Concentration Relative to Competitors.** The Business and Professional Services Cluster is growing slower than the U.S. average of 3.4%, and much slower than competitor Counties such as San Bernardino, Orange County, and Sacramento. Kern County’s cluster also lags behind the competitor Counties, with the exception of Fresno, in concentration. Only Los Angeles County with its large and mature cluster is growing more slowly.
3.5.3. Cluster Segments

Kern County’s business and professional services cluster consists of more than 1,600 firms in administrative, professional, scientific, and technical services businesses, as well as those in educational and training areas. The table below indicates the ten industry segments that comprise the cluster, and their corresponding employment, business establishments, average weekly wages, and concentration. Key elements of the cluster’s structure are:

- **Large Employer.** Kern County’s Business and Professional Services cluster accounts for the largest source of cluster employment behind the Value-Added Agriculture cluster. Approximately 22,450 people are employed in the Business and Professional Services clusters, with the bulk of them employed in the Administrative and Support and Waste Management and Remediation Services (10,598 employees) and Professional, Scientific, and Technical Services segment (986).

- **Mixed Concentration.** The location quotient, which compares the County’s relative employment size to that of the United States, is the key measure of employment concentration. The business and professional services cluster is not strongly concentrated overall. The cluster has a location quotient of 0.73, and the segment with the highest concentration is Other Schools and Instruction (1.56), which includes fine arts, language, and driving schools. With a location quotient of 1.04, the Business Schools and Computer and Management Training Segment is slightly more concentrated relative to the national average.

- **Range of Wages.** Wages in the business and professional services cluster varies considerably, ranging on average from a low of just over $300 to a high of slightly more than $850. The leading segments in wages include Management of Companies and Enterprises
($854) and Professional, Scientific, and Technical Services ($832), followed by Technical and Trade Schools ($567). The lowest wages are found in schools and educational businesses.

Table 20. Employment, Business Establishments, Average Weekly Wage, and Location Quotient by Cluster Segments (2003)

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Description</th>
<th>Employment</th>
<th>Business Establishments</th>
<th>Average Weekly Wage</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>Professional, Scientific, and Technical Services</td>
<td>8260</td>
<td>966</td>
<td>$832</td>
<td>0.63</td>
</tr>
<tr>
<td>55</td>
<td>Management of Companies and Enterprises</td>
<td>2619</td>
<td>60</td>
<td>$854</td>
<td>0.79</td>
</tr>
<tr>
<td>56</td>
<td>Administrative and Support and Waste Management and Remediation Services</td>
<td>10598</td>
<td>554</td>
<td>$418</td>
<td>0.69</td>
</tr>
<tr>
<td>6114</td>
<td>Business Schools and Computer and Management Training</td>
<td>165</td>
<td>10</td>
<td>$443</td>
<td>1.04</td>
</tr>
<tr>
<td>6115</td>
<td>Technical and Trade Schools</td>
<td>119</td>
<td>16</td>
<td>$567</td>
<td>0.63</td>
</tr>
<tr>
<td>6116</td>
<td>Other Schools and Instruction</td>
<td>687</td>
<td>46</td>
<td>$319</td>
<td>1.56</td>
</tr>
<tr>
<td>6117</td>
<td>Educational Support Services</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics; ICF Consulting

Notes: "-" indicates suppressed data.

3.5.4. Cluster Map

The figure below depicts the various segments and sub-segments of the cluster definition according to the three “layers” or levels of a cluster – exporters, suppliers, and economic input foundations. The figure also indicates areas where the County exhibits strong or weak concentration of activities (based on its location quotient), as well as supply-level segments characterized by relatively higher dependency on suppliers from outside of the County. Not surprisingly, in supplier segments that are strongly concentrated, the County relies less on suppliers from outside of the County. The economic foundation level encompasses the categories that help enable and support the cluster by providing key inputs and resources that the cluster depends on.

12 As of the third quarter of 2003.
The cluster map for Business and Professional Services is unique in that many of the cluster segments at the exporting level, such as engineering and technical services, serve as “key suppliers” of inputs to other clusters, such as aerospace and energy and chemicals. Employment services and educational support services segment are classified as suppliers because they supply support and labor-related services to the firms in this cluster that either provide training and education, or depend on specialized and skilled labor. The map reinforces that Kern is strong in some areas of the cluster, while weak in others, particularly segments requiring workers with higher education and skill levels, or graduate and advanced degrees, such as legal and computer systems design services.

**Figure 23. Business and Professional Services Cluster Map**

<table>
<thead>
<tr>
<th>EXPORTING LEVEL</th>
<th>High Kern Concentration (LQ &gt; 1)</th>
<th>Low Kern Concentration (LQ &lt; 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Engineering Services</td>
<td>Architectural and Landscape Architectural Services</td>
</tr>
<tr>
<td></td>
<td>Professional and Management Development Training</td>
<td>Surveying and Mapping (including Geophysical)</td>
</tr>
<tr>
<td></td>
<td>Automobile Driving Schools</td>
<td>Specialized Design Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Computer Systems Design and Related Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Management, Scientific, and Technical Consulting Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scientific Research and Development Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advertising and Related Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Legal Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Management of Companies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Testing Laboratories</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPLIER LEVEL</th>
<th>High Kern Concentration (LQ &gt; 1)</th>
<th>Low Kern Concentration (LQ &lt; 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Office Administrative Services</td>
<td>Employment Services</td>
</tr>
<tr>
<td></td>
<td>Facilities Support Services</td>
<td>Educational Support Services</td>
</tr>
<tr>
<td></td>
<td>CPAs, Court Reporting, and Stenotyping Services</td>
<td>Business Support Services</td>
</tr>
<tr>
<td></td>
<td>Security System Services (except locksmiths)</td>
<td>Computer Training</td>
</tr>
<tr>
<td></td>
<td>Exterminating and Pest Control Services</td>
<td>Business and Secretarial Schools</td>
</tr>
<tr>
<td></td>
<td>Apprenticeship Training</td>
<td>Technical and Trade Schools</td>
</tr>
<tr>
<td></td>
<td>Building Inspection Services</td>
<td>Fine Arts, Language, and Exam Preparation/Tutoring Schools</td>
</tr>
</tbody>
</table>
3.5.5. **County Distribution: Employment Concentrated In Highly-Populated Areas**

Most employment in the Business and Professional Services cluster is located in the Valley and East Kern, with some in West Kern. Some of the employment in East Kern, particularly in the China Lake and Edwards Air Force Region, may be contractors to the Aerospace cluster. The map below indicates distribution of aggregate employment levels across the County. It is important to note, however, that the intensity of the shading is not an indication of relative employment density or concentration, which is typically defined as per capita or per 100,000 people. The range of shades reflects various levels of total employment.

*Figure 24. Business and Professional Services Regional Distribution*

---

<table>
<thead>
<tr>
<th>ECONOMIC FOUNDATION LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Human Resources: CSUB, Bakersfield College, Private Universities</td>
</tr>
<tr>
<td>• Transportation: Air and road transportation</td>
</tr>
<tr>
<td>• Quality of Life: Entertainment, Neighborhoods, Parks</td>
</tr>
<tr>
<td>• Finance: Small business capital</td>
</tr>
</tbody>
</table>
3.5.6. **Strong Entrepreneurial Dynamism**

Measured as the share of total companies 3 years old or less, the Kern County’s entrepreneurial dynamism in Business and Professional Services (14%) is relatively strong, despite the slower growth rate and weak concentration. The Kern County’s new firm dynamism is stronger than that of Fresno (12%) and Los Angeles (11%), but trailing San Bernardino (17%) and Sacramento (15%) slightly. While not leading competitors, Kern County’s strong entrepreneurial dynamism in Business and Professional Services may reflect the presence of rich opportunities and conditions for small-to-medium businesses.

**Figure 25. Business and Professional Services Entrepreneurial Dynamism**

![Entrepreneurial Dynamism, Business & Professional Services Cluster: Kern County & Competitors](image)

3.5.7. **Cluster Occupations**

**ENTRY-LEVEL OCCUPATIONS**

For the entry level occupation analysis, the business and professional services cluster includes the following sectors: Professional, Scientific, and Technical Services (NAICS 54), Management of Companies and Enterprises (NAICS 55), Administrative and Support and Waste Management and Remediation Services (NAICS 56). Entry-level occupations in the Business and Professional Services Cluster are outlined in Table 21 below for all occupations of more than 75 positions.

---

13 This analysis does not include the following sub-sectors of NAICS 61 because separate occupational statistics are not available for this four digit NAICS codes sectors: Business Schools and Computer and Management Training, Technical and Trade Schools, Other Schools and Instruction, and Educational Support Services.
Table 21. Top Entry-Level Occupations for Business Service Cluster, Kern County, 1999

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grounds Maintenance Workers (425) SOC 37-3010</td>
<td>1874</td>
</tr>
<tr>
<td>Janitors and Building Cleaners (422) SOC 37-201X</td>
<td>927</td>
</tr>
<tr>
<td>Security Guards and Gaming Surveillance Officers (392) SOC 33-9030</td>
<td>712</td>
</tr>
<tr>
<td>Secretaries and Administrative Assistants (570) SOC 43-6010</td>
<td>681</td>
</tr>
<tr>
<td>Bookkeeping, Accounting, and Auditing Clerks (512) SOC 43-3031</td>
<td>513</td>
</tr>
<tr>
<td>First-Line Supervisors/Managers of Office and Administrative Support Workers</td>
<td>358</td>
</tr>
<tr>
<td>Driver/Sales Workers and Truck Drivers (913) SOC 53-3030</td>
<td>293</td>
</tr>
<tr>
<td>Maids and Housekeeping Cleaners (423) SOC 37-2012</td>
<td>250</td>
</tr>
<tr>
<td>Designers (263) SOC 27-1020</td>
<td>238</td>
</tr>
<tr>
<td>Laborers and Freight, Stock, and Material Movers, Hand</td>
<td>230</td>
</tr>
<tr>
<td>Inspectors, Testers, Sorters, Samplers, and Weighers</td>
<td>223</td>
</tr>
<tr>
<td>Receptionists and Information Clerks (540) SOC 43-4171</td>
<td>198</td>
</tr>
<tr>
<td>Office Clerks, General (586) SOC 43-9061</td>
<td>192</td>
</tr>
<tr>
<td>Paralegals and Legal Assistants (214) SOC 23-2011</td>
<td>189</td>
</tr>
<tr>
<td>Photographers (291) SOC 27-4021</td>
<td>159</td>
</tr>
<tr>
<td>Sales and Related Workers, All Other (496) SOC 41-9099</td>
<td>152</td>
</tr>
<tr>
<td>Miscellaneous Legal Support Workers (215) SOC 23-2090</td>
<td>145</td>
</tr>
<tr>
<td>First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers</td>
<td>125</td>
</tr>
<tr>
<td>Registered Nurses (313) SOC 29-1111</td>
<td>124</td>
</tr>
<tr>
<td>Computer Operators (580) SOC 43-9011</td>
<td>120</td>
</tr>
<tr>
<td>Reservation and Transportation Ticket Agents and Travel Clerks (541) SOC 43-4181</td>
<td>120</td>
</tr>
<tr>
<td>Travel Agents (483) SOC 41-3041</td>
<td>120</td>
</tr>
<tr>
<td>Billing and Posting Clerks and Machine Operators (511) SOC 43-3021</td>
<td>114</td>
</tr>
<tr>
<td>Customer Service Representatives (524) SOC 43-4051</td>
<td>111</td>
</tr>
<tr>
<td>Packers and Packagers, Hand (964) SOC 53-7064</td>
<td>110</td>
</tr>
<tr>
<td>Data Entry Keyers (581) SOC 43-9021</td>
<td>109</td>
</tr>
<tr>
<td>Miscellaneous Agricultural Workers, Including Animal Breeders (605) SOC 45-20XX</td>
<td>105</td>
</tr>
<tr>
<td>Word Processors and Typists (582) SOC 43-9022</td>
<td>98</td>
</tr>
<tr>
<td>File Clerks (526) SOC 43-4071</td>
<td>97</td>
</tr>
<tr>
<td>Pest Control Workers (424) SOC 37-2021</td>
<td>95</td>
</tr>
</tbody>
</table>
Refuse and Recyclable Material Collectors (972) SOC 53-7081 88
Welding, Soldering, and Brazing Workers (814) SOC 51-4120 84
First-Line Supervisors/Managers of Housekeeping and Janitorial Workers 82
First-Line Supervisors/Managers of Mechanics, Installers, and Repairers 80

**KEY OCCUPATIONS**

The figure below compares the percentage of cluster employment in key occupations in Kern County’s business and professional services cluster with Fresno’s. The largest percentage of Kern’s cluster employment is in finance and administration occupations (16%), followed by buildings/grounds maintenance (1%). Compared with Fresno, Kern has a higher level of employment in skilled and technical-related occupations such as architecture, engineering, and computers. Among the key occupations indicated below, Fresno only exceeds Kern in building/grounds maintenance occupations.

![Figure 26. Percentage of Cluster Employment in Key Occupations](image)

**3.5.8. Economic Foundation Challenges**

The cluster-specific economic foundation challenges range from marketing and human resources, to quality of life, business climate, and infrastructure. The following cluster challenges were identified by various stakeholders in the cluster.

**MARKETING**

- **Marketing Kern’s professional services firms to local businesses:** Many local firms choose to purchase professional services (such as legal services) from providers located outside the County. There is a need to work with major consumers of these services to demonstrate the quality of the services already existing within the County, albeit this is a
challenge. In addition there is a challenge to grow local professional services because of growing competition. Many large law firms are choosing to set up offices directly within Kern. While these outside firms’ higher cost structure may make their services uncompetitive, their presence poses a challenge to existing professional service firms.

**Human Resources**

- **How to identify individuals for entry level positions with high school diploma or above:** Many firms have specific educational requirements (i.e. diploma, college degree). In general, availability of people who have high school and college degrees is a challenge. When companies need to hire workers with specific higher level skills, they tend to come from outside the County.

- **How to hire workers with the correct “soft skills” and work with high schools to ensure that these are taught:** Skill-specific programs that provide life and pre-professional/career skills have been removed from the high school curriculum. Increasingly difficult to find people with basic business and professional skills, such as typing, bookkeeping, and general office skills. Even when you find trained workers who have the degree, they lack quality in other soft skills such as spelling, writing, and communication.

- **How to develop more jobs with “career” ladders and growth to higher pay:** Many of the growing jobs in the County are “go nowhere jobs” which pay less than $10 per hour. There is a major challenge to identify and support the growth of living wage jobs. Part of this issue relates to skills and knowledge of existing job opportunities.

- **How to maintain or increase science and technology funding to the schools:** How to maintain funding for schools to improve science and technology curriculum is a challenge. Red tape exists with private sector wanting to fund job-specific programs in the high school. Many barriers due to policy and regulations governing district curriculum. Need private sector and school districts to communicate.

**Business Climate**

- **How to further Engage the Latino Community in Economic Development:** The Latino community is a large and growing community within Kern County and must be sufficiently represented in any economic development activity. The challenge will be to further engage the Latino community in this cluster process and the subsequent implementation activities.

**Quality of Life**

- **Limited Cultural Amenities:** The County lacks strong offerings of cultural amenities, which are attractive to “Knowledge Workers” and other high skilled workers. Lifestyle choices tend to favor bigger metropolitan/urban areas, particularly among young professionals. The lack of amenities is a particular challenge for law firms which face competition from higher salaries in other markets.

- **Perception of Poor Air Quality and Need for Improvements:** How to continually improve the County’s air quality as well as market the improvements that have been made is an important issue for the County. The air quality is cleaner now than 20 years ago, suggesting that the County is progressive and addressing its challenges seriously.
• **Maintaining Low Cost Housing**: Economic growth will place upward pressures on the housing market, which could impact Kern's advantage as a place with affordable housing.

**INFRASTRUCTURE**

• **Limited and Costly Air Service Connections**: Lack of direct and affordable air transportation and lack of connections to key markets hurts Kern. This remains a challenge despite having completed surveys to look at opportunities in this area.

### 3.5.9. Key Insights for Strategy Implementation

Kern County’s business and professional services cluster faces important challenges. The following table summarizes the key insights based on the diagnosis of the cluster’s performance and economic foundation challenges. These conclusions relate to the strategic priority areas of the County’s economic development plan.

**Table 22. Summary of Business and Professional Services Cluster Diagnosis**

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>County’s Strategic Priority Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>• <strong>Value-Chain Depth</strong>: Need to develop strengths in cluster segments requiring workers with higher education and skill levels, or graduate and advanced degrees, such as legal and computer systems design services.</td>
<td><strong>Business Attraction and Expansion</strong></td>
</tr>
<tr>
<td>• <strong>Employment and Wages</strong>: Cluster is the second largest source of cluster employment in the County. To improve competitiveness, however, County needs to maintain strengths in administrative and education and training, while increasing presence in the higher-wage professional, technical, and scientific services segment.</td>
<td></td>
</tr>
<tr>
<td><strong>Economic Foundation Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>• <strong>Quality of Life Infrastructure</strong>: Need to expand cultural amenities in the County which are attractive to “Knowledge Workers” and other high skilled workers. Need to encourage people to make better use of existing amenities within the County (such as jazz clubs, comedy clubs, etc.). Often people work hard to bring these facilities to the County but then they close because of lack of support.</td>
<td><strong>Infrastructure</strong></td>
</tr>
<tr>
<td>• <strong>Perception of Poor Air Quality and Need for Improvements</strong>: Need to continually improve the County’s air quality as well as market the improvements that have been made.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Maintaining Low Cost Housing</strong>: Need to continue to grow the economy while maintaining Kern’s advantage as a place with affordable housing.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Identifying individuals for entry level positions with high school diploma or above</strong>: Need to help firms meet specific educational requirements (i.e. diploma, college degree), and increase the availability of people who have high school and college degrees.</td>
<td><strong>Human Resources</strong></td>
</tr>
<tr>
<td>• <strong>Workforce quality</strong>: Need to hire workers with the correct “soft skills” and work with high schools to ensure that these are taught. Need people who have typing, bookkeeping, and general office skills. Needs jobs for high school students who can get started in a</td>
<td></td>
</tr>
</tbody>
</table>
career to get a foundation for future opportunities in business and professional areas.

- **Science and Technology Funding in the Schools:** Need to maintain funding for schools to improve science and technology curriculum. Need to address barriers that exist due to policy and regulations governing district curriculum, and need private sector and school districts to communicate.

- **Marketing Kern’s professional services firms to local businesses:** Need to work with major consumers of these services to demonstrate the quality of the services from within the County, to offset preference for outside vendors and grow local professional services base.

- **Developing more jobs with “career” ladders and growth to higher pay:** Need to identify and support the growth of living wage jobs. Part of this relates to skills and knowledge needs of existing job opportunities.

- **Engaging the Latino Community in Economic Development:** Need to further engage the Latino community in this cluster process and the subsequent implementation activities.

### 3.5.10. Vision and Recommendations

**VISION**

Kern will continue to benefit from the outgrowth of service jobs from the Los Angeles region while improving the linkages to other clusters in the County.

**RECOMMENDATIONS**

- Maintain open space and agricultural land to prevent Kern from losing its distinction from Southern California.

- Create and market entertainment districts within County’s urban areas. Need cultural amenities to attract and retain “creative class” and to effectively market existing amenities so that they remain within Kern (i.e. jazz and comedy clubs).

- Ensure diverse participation within the cluster to accurately reflect County’s workforce and ensure economic development activities benefit full spectrum of County.
3.6. Tourism, Recreation & Entertainment Cluster: Sharing the Wealth

3.6.1. Overview: Tourism, Recreation & Entertainment Cluster Has Strong Potential

While not a mature, fast-growing cluster, the performance of tourism, recreation, & entertainment in Kern County suggests that key growth opportunities exist in the future. The County already generates significant tourism and visitor activity from people traveling between major cities in Northern and Southern California, as well as residents of large metropolitan areas in Southern California seeking a close weekend “get-away” destination. However, the County faces key competitive disadvantages such as an underdeveloped tourism infrastructure, poor branding and packaging of tourism assets, and strong competition from overseas entertainment industries, particularly in the areas of post-production.

The cluster has more than 18,000 jobs primarily in accommodation and food services. In addition to food service and restaurants, Kern County has strengths in sports and recreation instruction, and vacation camps. These strengths are tied to the County’s strong outdoor assets, such as water kayaking and hiking. Within this cluster, the County is not strong in entertainment. Despite the close proximity to Los Angeles’s leading media and entertainment industry, film production, in particular, is very limited.

3.6.2. Cluster Performance: Positive Growth – Weak Concentration

Kern County’s Tourism, Recreation & Entertainment cluster is growing at about the rate of the overall economy but is growing faster than competitors. Still, the cluster remains weakly concentrated. The following are the factors which are used in assessing cluster performance:

- **Positive Absolute Growth.** The cluster has experienced average annual employment growth of 2.0% between 1993 and 2003.

- **Life Cycle: Seed Cluster.** The cluster is in the seed stage of its lifecycle, a stage characterized by low growth and low concentration relative to the national average.

- **Modest Relative Growth and Concentration.** The cluster is performing modestly against competitors. Kern’s average employment growth rate of 2.0% was slightly slower than the national average of 2.2% annually. Still, Kern’s cluster is leading nearby Santa Barbara and Fresno counties in terms of growth, but trailing Sonoma significantly. Kern’s cluster is as concentrated as Fresno’s, but less so than other competitors. (See Growth Share Matrix below). In general, despite the modest growth, Kern’s cluster lacks specialization.
3.6.3. **Cluster Segments: Strength in Accommodation and Food Services though Low Concentration Overall**

The tourism, recreation, & entertainment cluster consists of approximately 1,200 firms in motion picture and sound recording industries, as well as arts, entertainment, recreation, accommodation, and food services segments. The table below indicates employment, business establishments, average weekly wages, and concentration for each major segment of the cluster. Key elements of the cluster’s structure are:

- **Most Employment in Accommodation and Food Services.** Kern County’s Tourism, Recreation & Entertainment cluster employs approximately 18,300 people, most of whom (roughly 88%) work in the accommodation and food services businesses, followed by arts, entertainment, and recreation (nearly 11%). Employment in the motion picture and sound recording, which is slightly over 300, accounts for only 1.7% of cluster employment.

- **Below-Average Concentration.** The location quotient, which compares the County’s relative employment size to that of the United States, is the key measure of employment concentration. Kern County’s Tourism, Recreation & Entertainment cluster is not strongly concentrated in Kern County with an overall location quotient of 0.8, which is below the national average concentration for this industry cluster. Among the segments, accommodation and food services has the largest concentration (0.76), followed by arts, entertainment, and recreation (0.48) and motion picture and sound recording industries (0.43).

- **Low Wages in Leading Employment Segment.** Average weekly wages across the segments range from the mid to high $200s. Wages are low in accommodation, food services, and recreation, while high in film production.
### Table 23. Employment, Business Establishments, Average Weekly Wage, and Location Quotient by Major Cluster Segments (2003)

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Description</th>
<th>Employment</th>
<th>Business Establishments</th>
<th>Average Weekly Wage</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>512</td>
<td>Motion Picture and Sound Recording Industries</td>
<td>316</td>
<td>15</td>
<td>$292</td>
<td>0.43</td>
</tr>
<tr>
<td>71</td>
<td>Arts, Entertainment, and Recreation</td>
<td>1925</td>
<td>123</td>
<td>$262</td>
<td>0.48</td>
</tr>
<tr>
<td>72</td>
<td>Accommodation and Food Services</td>
<td>16046</td>
<td>1024</td>
<td>$236</td>
<td>0.76</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics; ICF Consulting

#### 3.6.4. Cluster Map: Limited Amenities

The figure below depicts the various segments and sub-segments of the cluster definition according to the three “layers” or levels of a cluster – exporters, suppliers, and economic input foundations. In addition to the cluster definitions, the map shows segments from other clusters on which this cluster depends. Specifically, the cluster relies on the transportation cluster for wholesale suppliers, and the value-added agriculture cluster for food product suppliers to restaurants and other eateries. The figure also indicates areas where the County exhibits strong or weak concentration of activities (based on its location quotient), as well as supply-level segments characterized by relatively higher dependency on suppliers from outside of the County. Not surprisingly, in supplier segments that are strongly concentrated, the County relies less on suppliers from outside of the County. The economic foundation level encompasses the categories that help enable and support the cluster by providing key inputs and resources that the cluster depends on.

Kern County does not have a strong presence of well-concentrated segments at the exporting and supplier levels. Many of the suppliers in this cluster are coming from outside of the County. The relatively higher dependency on firms outside of Kern is particularly noticeable in the arts and entertainment areas – two areas where Kern County neither has many business establishments nor strengths. Kern’s cluster also relies on meat and snack food product suppliers from outside the County because the County is weak in snack and animal food product manufacturing segments (see Value-Added Agriculture).

---

14 As of the third quarter of 2003.
### Figure 28. Tourism, Recreation & Entertainment Cluster Map

<table>
<thead>
<tr>
<th>EXPORTING LEVEL</th>
<th>High Kern Concentration (LQ &gt; 1)</th>
<th>Low Kern Concentration (LQ &lt; 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sports and Recreation Instruction</td>
<td>Motion Picture and Video Production</td>
</tr>
<tr>
<td></td>
<td>Recreational and Vacation Camps</td>
<td>Record Production</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPLIER LEVEL</th>
<th>High Kern Concentration (LQ &gt;1)</th>
<th>Low Kern Concentration (LQ &lt;1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Limited Service Eating Places</td>
<td>Traveler Accommodation</td>
</tr>
<tr>
<td></td>
<td>Mobile Food Services</td>
<td>Rooming and Boarding House</td>
</tr>
<tr>
<td></td>
<td>Higher Dependency on Suppliers from outside of County than within</td>
<td>Full-Service Restaurants</td>
</tr>
<tr>
<td></td>
<td>Sound Recording Studios</td>
<td>Drinking Places (Alcoholic Beverages)</td>
</tr>
<tr>
<td></td>
<td>Promoters of Performing Arts, Sports, and Similar Events</td>
<td>Sound Recording Studios</td>
</tr>
<tr>
<td></td>
<td>Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures</td>
<td>Promoters of Performing Arts, Sports, and Similar Events</td>
</tr>
<tr>
<td></td>
<td>Independent Artists, Writers, and Performers</td>
<td>Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures</td>
</tr>
<tr>
<td></td>
<td>Canned, Snack, Animal Food Products (Value-Added Agriculture Cluster)</td>
<td>Independent Artists, Writers, and Performers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canned, Snack, Animal Food Products (Value-Added Agriculture Cluster)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECONOMIC FOUNDATION LEVEL</th>
<th>Human Resources: High schools and community colleges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infrastructure: Roads and air service</td>
</tr>
<tr>
<td></td>
<td>Quality of Life: Recreational amenities and local entertainment</td>
</tr>
<tr>
<td></td>
<td>Finance: Access to capital for new enterprises</td>
</tr>
</tbody>
</table>
3.6.5. **County Distribution: Employment Concentrated in the Valley**

The Tourism, Recreation & Entertainment Cluster is fairly well-distributed throughout the County. The largest levels of employment are in and around Bakersfield and the Kern River Valley although there is tourism employment spread throughout the County. The map below indicates distribution of aggregate employment levels across the County. It is important to note, however, that the intensity of the shading is not an indication of relative employment density or concentration, which is typically defined as per capita or per 100,000 people. The range of shades reflects various levels of total employment.

![Figure 29. Tourism, Recreation, & Entertainment Regional Distribution](image)

**Source:** Dun and Bradstreet/ICF Consulting

3.6.6. **Healthy Entrepreneurial Dynamism**

Kern has a healthy presence of new businesses in this cluster when compared to other Counties. Kern’s entrepreneurial dynamism, measured as the share of total companies 3 years old or less, is roughly the same as the dynamism of competitor Counties in California, and slightly behind Boulder’s. (See Entrepreneurial Dynamism figure below)
3.6.7. *Cluster Occupations: Opportunities Across the Cluster for Entry-Level Training*

**ENTRY-LEVEL OCCUPATIONS**

For the entry level occupation analysis, the Tourism, Recreation & Entertainment cluster includes the following sectors: Performing Arts, Spectator Sports, and Related Industries (NAICS 711), Museums, Historical Sites, and Similar Institutions (NAICS 712), Amusement, Gambling, and Recreation (NAICS 713), Accommodations (NAICS 721), and Food Services and Drinking Places (NAICS 722).

Top occupations include cooks, waitresses and waiters, cashiers, frontline supervisors, and food prep workers. The table below includes occupations with more than 125 positions.

*Table 24. Top Entry-Level Occupations, Tourism, Recreation & Entertainment Cluster, Kern County, 1999*

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooks (402) SOC 35-2010</td>
<td>2387</td>
</tr>
<tr>
<td>Waiters and Waitresses (411) SOC 35-3031</td>
<td>2280</td>
</tr>
<tr>
<td>Cashiers (472) SOC 41-2010</td>
<td>1404</td>
</tr>
<tr>
<td>First-Line Supervisors/Managers of Food Preparation and Serving Workers (401) SOC 35-1012</td>
<td>909</td>
</tr>
<tr>
<td>Combined Food Preparation and Serving Workers, Including Fast Food (405) SOC 35-3021</td>
<td>560</td>
</tr>
<tr>
<td>Food Preparation Workers (403) SOC 35-2021</td>
<td>557</td>
</tr>
<tr>
<td>Maids and Housekeeping Cleaners (423) SOC 37-2012</td>
<td>511</td>
</tr>
</tbody>
</table>
Chapter 3 – Cluster Overviews

Dining Room and Cafeteria Attendants, Bartender Helpers, and Miscellaneous Food Preparation and Serving Related Workers 395
Janitors and Building Cleaners (422) SOC 37-201X 393
Bartenders (404) SOC 35-3011 342
Dishwashers (414) SOC 35-9021 299
Grounds Maintenance Workers (425) SOC 37-3010 280
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop (415) SOC 35-9031 273
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop (406) SOC 35-3022 260
Chefs and Head Cooks (400) SOC 35-1011 225
Customer Service Representatives (524) SOC 43-4051 197
Miscellaneous Entertainment Attendants and Related Workers (443) SOC 39-3090 153
Recreation and Fitness Workers (462) SOC 39-9030 137

Source: MJC, 2004; Census 2000

KEY OCCUPATIONS

The figure below compares the percentage of cluster employment in key occupations in Kern County’s Tourism, Recreation & Entertainment cluster with Fresno’s. The largest percentage of Kern’s cluster employment is in food preparation (24%), followed by finance and administration (13%). Compared with Fresno, Kern has a higher level of employment in management-related positions such as finance, administration, and office support, but lower levels in sales and food preparation.

Figure 31. Percentage of Cluster Employment in Key Occupations
3.6.8. Economic Foundation Challenges: Branding, Fragmentation, Workforce

The cluster-specific economic foundation challenges range from infrastructure and business climate, to human resources, marketing, and finance. The following cluster challenges were identified by various stakeholders in the cluster.

**BUSINESS CLIMATE**

- **Balancing Needs of Tourism with Other Clusters**: The needs of tourism should be appropriately aligned with the needs of other clusters. For example, as the County pursues growing its transportation and logistics cluster, it should do so in a way that does not negatively impact communities or sub-regions which have the potential for growth in tourism. The County should appropriately zone and plan to reduce any potential conflicts between the needs of the various clusters. It is not incompatible to have both warehouses and river rafting. However, the County will have to be particularly concerned with air quality implications of its growth to not negatively impact the quality of life which is essential for its tourism cluster to grow. The challenge is more one of planning than making a choice between clusters.

- **Fragmentation/Resolving Competing Regional Interests**: There are competing interests among different sub regions, and there is a perception among stakeholders that tourism is not championed countywide.

- **Cultivating Local Filmmakers and Talent**: Kern has a rich history of being a film location dating back to 1913. To accelerate film activity in the County, the challenge will be to cultivate local filmmakers and talent to create the County’s own industry as opposed to relying on outside filmmakers using the County for its natural beauty or physical characteristics.

- **Attracting Film Companies to the County**: How to attract a studio to serve as an anchor for other activities, as well as an employment generator, is a key challenge. Currently, most filming that takes place within the County uses studios and production houses based in Hollywood.

**HUMAN RESOURCES**

- **Professionalizing the Industry**: Many tourism and hospitality staff view their occupations as jobs and not as a career. Also, the commitment on the part of business operators to train their staff and professionalize their operations is weak. As a result, many tourism operators are not competitive or marginally competitive.

- **Low Workforce Quality**: In general, the workforce in Kern is meeting the current needs of the tourism industry. However, many workers lack quality training, particularly in customer service. Training and extension opportunities for are limited. In some cases, the attendance at training workshops and seminars has been weak.

- **Coordinating Training Efforts**: Workforce development efforts are not as unified in tourism industry as efforts in other industries. Most business operators do not work with industry groups and associations to get the training they need.
MARKETING

- **Branding and Marketing Diversity of Tourism Assets**: Tourism in the County lacks a clear and focused brand. The County is faced with the challenge of organizing and branding a variety of tourism assets – such as kayaking and water sports, fishing, mountain climbing, natural resources, golfing, desert activities – under a common, unified theme or set of themes that is attractive to the target market.

- **Packaging Tourism Offerings**: It is difficult for tourists to find package deals or make pre-reservations for recreational activities in the County. There are also not enough piggy back packages with tourism- and traveler-related companies to make County’s tourism offerings more attractive and convenient for visitors.

- **Working cooperatively and cohesively with others in Kern County who are trying to promote tourism**: Board of Trade and other tourism stakeholders face the challenge of working more closely in order to maximize the limited funds and resources available.

INFRASTRUCTURE

- **Lack of high-quality tourism infrastructure**: Some of the communities, particularly those in the mountain regions, have tourism assets that are attractive. However, hotel, lodging, and restaurant developers may be unwilling to invest until the market and demand conditions are stronger in these areas. The challenge is to encourage investments to upgrade tourism facilities in these underdeveloped tourism areas.

- **Improving arterial access routes**: Better arterial transportation infrastructure would help facilitate tourism growth. For example, tourism in Ridgecrest may benefit from improvements in the key access routes, such as highways 395 and 14.

- **Improving regional infrastructure and offerings for creative class**: The County does not have a dynamic arts and entertainment community. Models for artist/musician meccas, such as New York, SoHo and Sedona (New Mexico), can be adopted by the County to address the challenges of attracting the creative class who can drive the ideas and creativity needed for tourism, as well as the broader economy.

- **Developing infrastructure to support the media and entertainment industries**: Currently, a lot of business and functions related to media and entertainment such as post-production is outsourced to places in East Asia, like Hong Kong. Kern, with the right resources and commitments, can better position itself to compete with East Asia for this market.

FINANCE

- **Funding for Positioning, Branding, and Visibility**: Funding for tourism is limited, which makes it difficult for the County to effectively promote and market its tourism assets.

- **Pushing the Bed Tax**: The bed tax could help provide dollars for tourism initiatives, but it was rejected by residents. There was opposition to the tax because it was not properly communicated that the taxes would be coming from visitors, not residents.
3.6.9. **Key Insights for Strategy Implementation**

Kern County’s Tourism, Recreation & Entertainment cluster faces important challenges. The following table summarizes the key insights based on the diagnosis of the cluster’s performance and economic foundation challenges. These conclusions relate to the strategic priority areas of the County’s economic development plan.

Table 25. Summary of Tourism, Recreation & Entertainment Cluster Diagnosis

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>County’s Strategic Priority Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>- <strong>Value-Chain Depth:</strong> Explore opportunities to develop cluster segments beyond sports and recreation, and limited service restaurants.</td>
<td><strong>Business Attraction and Expansion</strong></td>
</tr>
<tr>
<td>- <strong>Employment and Wages:</strong> Wage level is low relatively to other clusters in the County, but can increase with a stronger tourism market and offerings.</td>
<td></td>
</tr>
<tr>
<td><strong>Economic Foundation Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>- <strong>Need to improve tourism infrastructure in the Mountain areas.</strong> Need to increase the number and quality of hotels and lodging in this area.</td>
<td><strong>Infrastructure</strong></td>
</tr>
<tr>
<td>- <strong>Need to expand restaurant infrastructure.</strong> Need to encourage growth in the number and diversity of high-quality restaurant offerings.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Need to improve arterial access routes to Ridgecrest and Kern River Valley (Highways 395, 178, and 14).</strong> Better transportation would open up development in tourism and other industries.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Need to professionalize the industry:</strong> Need to get staff to see tourism and hospitality occupations as a career and not just a job.</td>
<td><strong>Human Resources</strong></td>
</tr>
<tr>
<td>- <strong>Need to provide better training opportunities to upgrade skills:</strong> There is need for additional training to improve hospitality and quality of service.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Need to coordinate training efforts:</strong> Business operators should collaborate with associations to coordinate and tailor training programs.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Need to Brand and Market Diversity of Tourism Assets:</strong> Tourism marketing is diffuse and not coherent. Need to develop regional theme(s) to better capture and convey variety of existing tourism assets, including outdoors, natural resources, arts and entertainment and golfing.</td>
<td><strong>Marketing</strong></td>
</tr>
<tr>
<td>- <strong>Need to Package Distinctive Tourism Offerings:</strong> Need to provide the convenience of destination packages, pre reservations for recreational activities, and mapped-out itineraries. Need to increase piggy back packages with tourism- and traveler-related companies, as well as with airlines that will be servicing the new airport.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Need to work cooperatively and cohesively with others in Kern County who are trying to promote Tourism:</strong> Board of Trade has played a role here, but the entity needs to work as closely as needed with others to maximize the limited funds and resources available.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Need to increase funding for positioning, branding, and visibility:</strong> Need funds to help support marketing, such as a presence at trade shows and in travel magazines.</td>
<td></td>
</tr>
</tbody>
</table>
• **Need to resolve competing regional interests:** Consider equally the tourism interests and priorities of all Kern's sub-regions and develop an integrated plan that builds on and showcases each region's tourism assets. Create an effective management plan that considers the roles of each chamber of commerce.  

  **Collaboration**

• **Need to push the Bed Tax:** Need to put the tax back on the election ballot and make sure to communicate that the taxes are coming from visitors, not residents.  

  **Business Attraction and Expansion**

• **Need to cultivate local filmmakers and talent:** Need to explore growing local film industry, improving the film festival, and cultivating local filmmakers and talent to create their own industry in County and add value in the County.  

• **Need to explore attracting studios and developing post-production infrastructure to service media and entertainment industry:** A studio could serve as a big employment generator and anchor for film activities in the County.  

• **Need to Balance Priorities of Tourism with Other Clusters:** For example, the County suffers from air quality problems which are negatives for tourism. So need to balance the transportation needs with that of tourism.  

---

### 3.6.10. Vision and Recommendations: Connect Your Assets, Lay Claim to Southern California Tourists

**VISION**

Kern will become recognized as a destination of choice for weekend getaways from Southern California while growing from its existing strengths.

**RECOMMENDATIONS**

- Establish single County tourism marketing arm and focus on core assets:
  - Bakersfield Basque culture/cuisine and music ("Bakersfield Sound")
  - Kern River Valley outdoors activities (river rafting)
  - Agricultural tourism (growth opportunity)
  - High desert (growth opportunity)
- Encourage longer stays by connecting urban visits with outer areas.
- Build and expand economic impact of growing markets (such as VFR, Southern California and retirees).
- Establish “main street” program to improve the look of Kern’s distinct and historic rural downtown streets.
- Establish County microenterprise program to create opportunities for LMI persons.
- Expand training programs for cooks, prep-cooks and bartenders (currently underserved by County training programs).
- Work with the Kern Film Commission to increase marketing efforts and to identify and reduce regulatory burdens on the film industry. Establish a simple and well-coordinated registration process for film production events.
3.7. Health Services and Medical Technologies Cluster: A Healthy Position for Growth

3.7.1. Overview: Health Services and Medical Technologies Cluster is Growing

Kern County has nearly 18,000 jobs in the health services and medical technologies cluster. The growth in this sector has been driven largely by the growing population. As a result, the cluster’s key strengths are in areas driven by patient care needs, including medical and mental health practitioners, medical and diagnostic labs, and homes for the elderly. On the other hand, the supply chain for health-related equipment and technologies appears to be weak in Kern County. The County does not have a strong presence of medical devices and equipment manufacturing firms, which are key sources of procurement of materials and supplies for hospitals, medical offices, and other health care facilities in the County. Moreover, wages in the cluster, while typically higher than the County average, range significantly, depending on the nature of the occupation.

3.7.2. Cluster Performance: Emerging Cluster With Strong Relative Growth

Kern County’s Health Services and Medical Technologies cluster is performing well. The following are the factors which are used in assessing cluster performance:

- **Strong Absolute 10-year Growth.** Kern’s Health Services and Medical Technologies cluster grew 2.5% annually between 1993 and 2003. The cluster’s growth comes from nursing and residential care facilities which had an average annual growth of nearly 5% between 1993 and 2003, as well as ambulatory health care services which grew at 3.5%.

- **Life Cycle: Emerging Cluster:** The cluster is in the emerging stage of its lifecycle, a stage characterized by high growth and low concentration relative to the national average.

- **Mixed Competitive Position.** Kern County grew faster than the U.S. average of 2.1%. As indicated below, Kern County grew faster than Orange County and San Diego, but slower than Austin and San Bernardino. In terms of concentration, Kern’s cluster trails all of its competitor Counties.
3.7.3. Cluster Segments: Low Concentration Across Cluster

Kern County’s cluster consists of more than 1000 firms, primarily in health care services, and to a much lesser extent in medical equipment and supplies manufacturing. The cluster also consists of instrumentation and testing manufacturing, but the data available for Kern County does not indicate firms or employment in this area. The table below lists the industry segments that comprise the cluster, and their corresponding employment, business establishments, average weekly wages, and concentration. Key elements of the cluster’s structure are:

- **Large Cluster.** The Health Services and Medical Technologies Cluster employs more than 17,500 people. The largest employment levels are found in ambulatory health care services (8,785), followed by hospitals (4,794), nursing and residential care facilities (3,540). The smallest segment is the medical equipment and supplies manufacturing with approximately 430 jobs.

- **Ambulatory Services Segment Leads in Concentration.** The location quotient, which compares the County’s relative employment size to that of the United States, is the key measure of employment concentration. Kern County’s health services and medical technologies cluster is not strongly concentrated in Kern County. The cluster has a location quotient of 0.76 overall, which is below national average concentration. Among the various segments, ambulatory health care services leads with a concentration of 0.91. The hospitals segment has the weakest concentration among the four key segments present in Kern County. Within the hospitals and care facilities segments, some sub-segments have above-average concentrations, which are indicated in the cluster map section.

- **Higher Wages in Medical Manufacturing.** The average weekly wage in the cluster ranges from $376 in nursing and residential care facilities to $802 in hospitals. Weekly wages in
ambulatory health care services and medical equipment/supplies manufacturing averaged $770 and $761, respectively.

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Description</th>
<th>Employment</th>
<th>Business Establishments</th>
<th>Average Weekly Wage</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>334510</td>
<td>Electromedical Apparatus Manufacturing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>334516</td>
<td>Analytical Laboratory Instrument Manufacturing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>334519</td>
<td>Other Measuring and Controlling Device Manufacturing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3391</td>
<td>Medical Equipment and Supplies Manufacturing</td>
<td>436</td>
<td>15</td>
<td>$761</td>
<td>0.72</td>
</tr>
<tr>
<td>621</td>
<td>Ambulatory Health Care Services</td>
<td>8785</td>
<td>847</td>
<td>$770</td>
<td>0.91</td>
</tr>
<tr>
<td>622</td>
<td>Hospitals</td>
<td>4794</td>
<td>26</td>
<td>$802</td>
<td>0.57</td>
</tr>
<tr>
<td>623</td>
<td>Nursing and Residential Care Facilities</td>
<td>3540</td>
<td>123</td>
<td>$376</td>
<td>0.64</td>
</tr>
</tbody>
</table>

*Source: Bureau of Labor Statistics; ICF Consulting*

*Notes: *-* indicates suppressed data.*

### 3.7.4. Cluster Map: Lack of Supply Chain

The figure below depicts the various segments and sub-segments of the cluster definition according to the three “layers” or levels of a cluster – exporters, suppliers, and economic input foundations. In addition to the cluster definitions, the map shows segments from other clusters on which this cluster depends. The figure also indicates areas where the County exhibits strong or weak concentration of activities (based on its location quotient), as well as supply-level segments characterized by relatively higher dependency on suppliers from outside of the County. Not surprisingly, in supplier segments that are strongly concentrated, the County relies less on suppliers from outside of the County. The economic foundation level encompasses the categories that help enable and support the cluster by providing key inputs and resources that the cluster depends on. The cluster map reinforces that Kern has strengths in some areas of health care services, but lacks depth in the supply chain for medical equipment and supplies.

15 As of the third quarter of 2003.
**Figure 33. Health Services and Medical Technologies Cluster Map**

<table>
<thead>
<tr>
<th>EXPORTING LEVEL</th>
<th>High Kern Concentration ( (LQ &gt; 1) )</th>
<th>Low Kern Concentration ( (LQ &lt; 1) )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Offices of Physicians</td>
<td>• Physical, Occupational and Speech Therapists, and Audiologists</td>
</tr>
<tr>
<td></td>
<td>• Offices of Dentists</td>
<td>• Podiatrists</td>
</tr>
<tr>
<td></td>
<td>• Chiropractors</td>
<td>• Outpatient Care Centers</td>
</tr>
<tr>
<td></td>
<td>• Optometrists</td>
<td>• Home Health Care Services</td>
</tr>
<tr>
<td></td>
<td>• Mental Health, Residential Mental Retardation, Mental Health, and Substance Abuse Facilities</td>
<td>• Hospitals</td>
</tr>
<tr>
<td></td>
<td>• Community Care Facilities for the Elderly</td>
<td>• Nursing Care Facilities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPLIER LEVEL</th>
<th>High Kern Concentration ( (LQ &gt; 1) )</th>
<th>Low Kern Concentration ( (LQ &lt; 1) )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Medical and Diagnostic Laboratories</td>
<td>• Other Medical Equipment and Supplies Manufacturing</td>
</tr>
<tr>
<td></td>
<td>• Wholesale Trade (Transportation, Logistics &amp; Warehousing Cluster)</td>
<td>• Electromedical Apparatus Manufacturing</td>
</tr>
<tr>
<td></td>
<td><strong>Higher Dependency on Suppliers from outside of County than within</strong></td>
<td>• Analytical Laboratory Instrument Manufacturing</td>
</tr>
<tr>
<td></td>
<td>• Other Measuring and Controlling Device Manufacturing</td>
<td>• Employment Services (Business and Professional Services Cluster)</td>
</tr>
<tr>
<td></td>
<td>• Surgical Appliance and Supplies Manufacturing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Legal Services (Business and Professional Services Cluster)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECONOMIC FOUNDATION LEVEL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Human Resources: Specialized training programs, Private universities</td>
</tr>
<tr>
<td></td>
<td>• Transportation: Highways, Proximity to major suppliers in Southern California</td>
</tr>
<tr>
<td></td>
<td>• Finance: Access to capital for new ventures</td>
</tr>
</tbody>
</table>
3.7.5. **County Distribution: Employment Primarily in Valley, Mountains, and East**

Employment in Kern’s Health Care and Services Technology is primarily located in the Valley, Mountains, and East. The map indicates distribution of aggregate employment levels across the County. It is important to note, however, that the intensity of the shading is not an indication of relative employment density or concentration, which is typically defined as per capita or per 100,000 people. The range of shades reflects various levels of total employment.

**Figure 34. Health Services and Medical Technologies Regional Distribution**

Source: Dun and Bradstreet/ICF Consulting

3.7.6. **Low Entrepreneurial Dynamism**

Measured as the share of total companies 3 years old or less, entrepreneurial dynamism in Kern’s Health Services and Medical Technologies cluster is poor compared to other competitor Counties. Kern’s entrepreneurial dynamism is at 5%, while San Diego’s measures 8%.
3.7.7. **Cluster Occupations: Wide Range of Entry Level Opportunities**

**ENTRY-LEVEL OCCUPATIONS**

For the entry level occupation analysis, the health services and medical technologies cluster includes following industry sectors: Ambulatory Health Care Services (NAICS 621), Hospitals (NAICS 622), and Nursing and Residential Care Facilities (NAICS 623).

Entry-level positions include health aides, medical assistants, vocational nurses, personal and home care aides, dental assistants, secretaries and administrative assistants and office clerks as outlined in Table 27 below which includes occupations of more than 75 employees.

### Table 27. Top Entry-Level Occupations, Health Services and Medical Technologies Cluster, Kern County, 1999

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing, Psychiatric, and Home Health Aides (360) SOC 31-1010</td>
<td>2211</td>
</tr>
<tr>
<td>Medical Assistants and Other Healthcare Support Occupations (365) SOC 31-909X</td>
<td>1090</td>
</tr>
<tr>
<td>Licensed Practical and Licensed Vocational Nurses (350) SOC 29-2061</td>
<td>652</td>
</tr>
<tr>
<td>Personal and Home Care Aides (461) SOC 39-9021</td>
<td>517</td>
</tr>
<tr>
<td>Dental Assistants (364) SOC 31-9091</td>
<td>484</td>
</tr>
<tr>
<td>Secretaries and Administrative Assistants (570) SOC 43-6010</td>
<td>451</td>
</tr>
</tbody>
</table>
Office Clerks, General (586) SOC 43-9061 417
First-Line Supervisors/Managers of Office and Administrative Support Workers (500) SOC 43-1011 318
Billing and Posting Clerks and Machine Operators (511) SOC 43-3021 313
Clinical Laboratory Technologists and Technicians (330) SOC 29-2010 294
Diagnostic Related Technologists and Technicians (332) SOC 29-2030 280
Emergency Medical Technicians and Paramedics (340) SOC 29-2041 265
Maids and Housekeeping Cleaners (423) SOC 37-2012 257
File Clerks (526) SOC 43-4071 197
Cooks (402) SOC 35-2010 179
Health Diagnosing and Treating Practitioner Support Technicians (341) SOC 29-2050 177
Bookkeeping, Accounting, and Auditing Clerks (512) SOC 43-3031 157
Janitors and Building Cleaners (422) SOC 37-201X 122
Miscellaneous Health Technologists and Technicians (353) SOC 29-2090 89
Food Servers, Nonrestaurant (412) SOC 35-3041 88
Interviewers, Except Eligibility and Loan (531) SOC 43-4111 80
Data Entry Keyers (581) SOC 43-9021 79
Medical Records and Health Information Technicians (351) SOC 29-2071 78
Food Preparation Workers (403) SOC 35-2021 78
Dietitians and Nutritionists (303) SOC 29-1031 75
First-Line Supervisors/Managers of Housekeeping and Janitorial Workers (420) SOC 37-1011 75

Source: MJC, 2004; Census 2000

**KEY OCCUPATIONS**

The figure below compares the percentage of cluster employment in key occupations in Kern County’s health services and medical technologies with San Bernardino’s. The largest percentage of Kern’s cluster employment is in healthcare practitioner occupations (25%), followed by office/administrative support (20%). Compared with San Bernardino, Kern has a higher percentage of employment in healthcare support and office/administrative support occupations, while San Bernardino has a higher percentage of people employed in technical and professional areas.
3.7.8. Economic Foundation Challenges: Skills, Local Suppliers, Marketing

The cluster-specific economic foundation challenges range from human resources and supply chain/marketing, to infrastructure and business climate. The following cluster challenges were identified by various stakeholders in the cluster.

Human Resources

- **Developing and accessing the needed range of skilled health care personnel from nurses to various technicians.** There is limited local training for some areas facing labor shortages such as nurses, echo tech, and dieticians, and many of the existing programs are not large enough to meet demand. The lack of qualified workers, particularly nurses, is a barrier to provision of care.

- **Attracting and Retaining qualified physicians and nurses:** Many of the health care residents/workers are not attracted to Kern County or leave after training because the County is not perceived as an attractive place for a young physician or nurse.

- **Limited resources to sustain and expand nursing programs:** Instructors and trainers face challenges in keeping local grant-based nurse training programs running. Many of the instructors will be retiring, and there is limited funding to grow these programs.

- **Marketing and attracting students to private universities:** Private universities, some of which have an accelerated format, can be an alternative to the CSU. National has found that many of their current students tried to go to CSU system but could not afford it. However, private universities in the County such as National University are new and do not have enough students enrolled, particularly in nursing.
• **Expanding high school medical training programs.** There is a lack of interest at the K-12 level for health care fields. Awareness and preparation programs such as the job shadow program at Stockdale H.S. and the medical program at Kern Valley H.S. are limited in the County.

• **Diversifying the pool of health care workers.** The pipeline of students going into the field does not strongly reflect the full diversity of Kern, particularly the Hispanic community.

• **Improving comprehension of non-native doctors:** How to ensure non-native doctors and medical personnel have the English-speaking skills to be fully understood by patients, particularly older ones, is a challenge.

**MARKETING/SUPPLY CHAIN**

• **Expanding local supply chain for medical supplies:** There is a strong dependency on outside sources for procuring medical supplies for hospitals and other health care providers. This spending represents a significant loss to the local economy.

• **Marketing the quality of medical services in Kern County:** Perception of the general quality of medical services in Kern County has not changed and has possibly gone down in recent years. There may have been some improvements over the past few years but these have been lost in the broader quality debate. There should be an attempt to market these improvements and focus efforts on improving the overall quality.

• **Expanding connections with other clusters to grow cluster:** There is a lack of synergies between aerospace technology and health services. For example, aerospace instrumentation firms have technologies to calibrate instruments which could be used in the development of medical technologies.

• **Maintaining growth and expand exports.** Kern faces challenges with keeping up with local demand and serving surrounding rural counties such as Tulare and Kings. The cluster has not developed strengths in specific competencies and specializations that can drive further growth outside of these markets.

**INFRASTRUCTURE**

• **Expanding infrastructure to enable communications to rural areas:** The communications infrastructure in outlying areas is weak, which poses a challenge for health care delivery. Part of the problem is County’s inability to offer communications services that might compete with the private sector.

• **Ensuring that health services keep up with growth of the County:** Physical capacity in hospitals is very constrained. Capacity has not been able to adequately keep pace with rising demand.

**BUSINESS CLIMATE**

• **Addressing problem of growing uninsured population:** 17-18% of the population is uninsured; there is also very high Medi-Cal and Medicare populations. Collectively, almost half of population is not insured or is covered only by a government program.
3.7.9. **Key Insights for Strategy Implementation**

Kern County’s health services and technology cluster faces important challenges. The following table summarizes the key insights based on the diagnosis of the cluster’s performance and economic foundation challenges. These conclusions relate to the strategic priority areas of the County’s economic development plan.

**Table 28. Summary of Health Services and Medical Technology Cluster Diagnosis**

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>County’s Strategic Priority Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Value-Chain Depth:</strong> Maintain health services strength while building key segments of the supply chain, such as medical equipment manufacturing and medical technology.</td>
<td>Business Attraction and Expansion</td>
</tr>
<tr>
<td>▪ <strong>Employment and Wages:</strong> Employment in manufacturing segments is weak. There are opportunities to provide increased employment and higher wages by expanding into medical, laboratory, and analytic device/instrumentation manufacturing.</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Entrepreneurships/New Firms:</strong> County needs to strengthen the dynamism of the cluster in terms of the growth of new firms.</td>
<td></td>
</tr>
<tr>
<td><strong>Economic Foundation Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Need to expand infrastructure to enable communications to rural areas:</strong> improve communications infrastructure in outlying areas to better provide health communications technology services. Need to assure security, cost effectiveness and expanded broadband access to wider coverage area.</td>
<td>Infrastructure</td>
</tr>
<tr>
<td>▪ <strong>Need to ensure that health services keep up with growth of the County:</strong> Need to increase physical capacity in hospitals.</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Need to train the needed range of skilled health care personnel:</strong> Need to provide local training for some underserved areas such as echo tech and dieticians, and expanding existing programs.</td>
<td>Human Resources</td>
</tr>
<tr>
<td>▪ <strong>Need to attract and retain qualified physicians and nurses:</strong> Need to market Kern as a location for nurses and doctors, particularly young ones.</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Need resources to expand nursing program:</strong> Need for instructors and trainers to keep local grant-based nurse training programs running.</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Need to market and attract students to private universities:</strong> Need to market National and other private universities as an accelerated format for training and certifying students. Some of these programs save 1/3 of the time, with the same amount of training and quality.</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Need to expand high school medical training programs:</strong> Need to promote an interest in K-12 for health care fields, and expand existing H.S. programs. Existing programs could be expanded.</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Need to diversify the pool of health care workers:</strong> The pipeline of students going into the field should more reflect the full diversity of Kern, particularly the Hispanic community.</td>
<td></td>
</tr>
<tr>
<td>▪ <strong>Need to improve comprehension of doctors:</strong> Need to ensure doctors and medical personnel are fully understood by patients, particularly older ones.</td>
<td></td>
</tr>
</tbody>
</table>
- **Need to market the quality of medical services in Kern County.** Need to change perception of quality of medical services in Bakersfield, and convey improvements that have been made over the past few years.

- **Need to expand local supply chain for medical supplies:** Need to reduce dependency on outside sources for supplying medical supplies for hospitals and other health care providers and capture economic benefits from purchasing goods and services locally.

- **Need to Expand Connections with Other Clusters to Grow Cluster:** Need to explore ways to create synergies between aerospace technology and health services. For example, aerospace instrumentation firms have technologies to calibrate instruments which could be used in the development of medical technologies.

- **Need to maintain growth and expand exports.** Need to keep up with local demand and continue to serve surrounding rural counties such as Tulare and Kings. Potentially serve patients in bigger markets such as Los Angeles, San Diego, or even Fresno if Kern has unique competencies.

### 3.7.10. Vision and Recommendations: Think Valley-wide, Make and Supply Locally

**VISION**

Kern County will become the leading health services and medical technologies cluster for Southern San Joaquin County and will become renowned for providing care to key market segments, such as the elderly.

**RECOMMENDATIONS**

- Capture outsourcing of lab work from LA.
- Expand catchment area for hospital care to possibly include Tulare and Kings through the development of distinct capabilities within Kern’s health services.
- Increase regional import substitution by identifying goods and services currently purchased outside the County for which a competitive Kern County business opportunity could be created. Options include expanding local medical suppliers to meet growing needs of hospitals. Consider using a web-based buyer-supplier system.
- Explore possibilities in medical equipment manufacturing particularly analytic device / instrumentation manufacturing.
- Expand training programs for Billing and Posting Clerks and Clinical Lab Technicians and Technologists.
- Expand high school medical training programs.
- Diversify the pool of health care professionals through more concerted marketing and outreach into Latino community.
- Develop linkages with other clusters to grow technology side of clusters. Example: Aerospace instrumentation firms have technologies to calibrate instruments which could be used in the development of medical technologies.
3.8. Aerospace and Defense Cluster: Ready to Reach New Heights

3.8.1. Overview: Aerospace is a Small Cluster with Potential to Grow and Expand

Aerospace and Defense activities are a vital part of the economy in Eastern Kern, and have the potential to contribute more broadly to Kern’s overall economy. Kern County has key strengths in aircraft manufacturing, as well as key assets in aviation and aerospace research from defense-related activities at China Lake and Edwards Air Force Base. The cluster also benefits from the number of aerospace contractors and small firms in the County. The County is also the site of a new set of aerospace activities centered around the Mojave Airport. The privately-funded suborbital flight by SpaceShipOne achieved by aeronautical engineer Dick Rutan represents a possible new segment within Kern County’s illustrious history in aerospace. After many years of research, development, test, and evaluation and several notable successes, the likes of Paul Allen, co-founder of Microsoft Corporation, provided the venture capital necessary to help achieve this historic goal of a privately funded suborbital flight.

The County’s competitiveness in the aerospace and defense cluster depends heavily on the existence of many of the missions at the military installations. The many high-level scientists and engineers associated with defense activities, some of whom spin-off research and technologies into the private sector are an important source of talent and entrepreneurship for the cluster. Planned base closures and mission reductions across the United States could impact growth prospects for the cluster.

Moreover, supply chain weaknesses could be a growth challenge. The cluster consists of a few manufacturers and has a relatively stronger dependency on inputs from outside of the County. The cluster also faces challenges with capturing the benefits of research in the County, private sector workforce development, marketing and awareness of the cluster’s contributions to the County and State economy, and access to venture capital funding particularly for research and development-intensive new enterprises.

The following sections profile the performance and structure of the cluster. It is important to note that absolute employment figures are underestimated in this analysis. Employment levels are based on NAICS data, which does not fully classify all the firms engaged in aerospace-related activities. There are a large number of technical and engineering contractors conducting aerospace work, many of them are not captured by the NAICS categories for aerospace. With these limitations in mind, the employment picture for aerospace and defense is actually much larger when these engineering contractors and public sector defense jobs are included. Nevertheless, the trends and benchmarks are useful gauges of the cluster’s competitiveness and growth potential relative to other aerospace regions in California.

3.8.2. Cluster Performance: Emerging Cluster with Aerospace Employment on the Decline

Kern County’s aerospace and defense cluster is an emerging cluster. This is measured through the private sector employment in direct aerospace jobs (primarily aerospace product and part manufacturing). While there are over 13,000 civilian employees at Edwards Air Force Base and China Lake, many of these employees are not directly in aerospace activities. Further, some of
the employment in the communities surrounding those facilities is captured by the other clusters. The following discussion about the aerospace and defense cluster is based on NAICS data which is exclusively aerospace employment. The following are the factors which are used in assessing cluster performance:

- **Declining Absolute Employment.** Overall, private sector cluster employment declined 0.5% annually between 1993 and 2003, though slower than the U.S. decline of 3.1% annually. The County, however, has experienced moderate growth in aerospace manufacturing since 2000. This is a better story than for many of the surrounding aerospace-dependent communities, even other areas within the Antelope Valley.

- **Life Cycle: Emerging Cluster:** The cluster is in the emerging stage of its lifecycle, a stage characterized typically by higher growth and lower concentration relative to the national average. Kern’s aerospace cluster’s concentration is measured relative to the entire County, not to the communities in East Kern.

- **Better Relative Growth Position, Low Concentration:** Although declining in absolute employment, Kern County’s aerospace and defense cluster is shedding jobs slower than the national average and competitor counties such as Orange and Los Angeles Counties. Relative to the U.S. average annual employment growth of -3.1%, Kern had 2.6% growth between 1993 and 2003. On the other hand, Kern County has slightly below average employment concentration (0.91 location quotient), and the second lowest concentration among the competitor counties depicted below.

![Aerospace Growth Share Matrix](image-url)
3.8.3. Cluster Segments: Manufacturing Key to Cluster

Kern County’s private sector aerospace and defense cluster consists of aircraft manufacturing firms and key suppliers. The table below indicates the key industry segments that comprise the cluster, and their corresponding employment, business establishments, average weekly wages, and concentration. Key elements of the cluster’s structure are:

- **Significant Manufacturing Jobs.** More than 1,300 people are engaged in aerospace manufacturing. This does not include the significant number of people conducting aerospace research and development at defense installations in Kern County, or the many aerospace related contractors whose employment may be captured under various NAICS segments related to scientific, technical, and engineering services, which are part of the business and professional services cluster segments.

- **High Manufacturing Concentration.** The location quotient, which compares the County’s relative employment size to that of the United States, is the key measure of employment concentration. Kern County’s aerospace and defense cluster has below national average employment concentration overall. However, the aerospace product and parts manufacturing segment is concentrated above the national average with a location quotient of 1.56. Other segments are below average in concentration.

- **Strong Wages.** Wages are generally high in the cluster, particularly in the aerospace product and parts manufacturing segment. In 2003, the average weekly wage in this segment was $1,451, well above the average wages in most segments of other clusters.

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Description</th>
<th>Employment</th>
<th>Business Establishments</th>
<th>Average Weekly Wage</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>3364</td>
<td>Aerospace Product and Parts Manufacturing</td>
<td>1,353</td>
<td>12</td>
<td>$1,451</td>
<td>1.56</td>
</tr>
<tr>
<td>332813</td>
<td>Electroplating, anodizing, and coloring metal</td>
<td>97</td>
<td>5</td>
<td>$485</td>
<td>0.66</td>
</tr>
<tr>
<td>332999</td>
<td>Miscellaneous fabricated metal product manufacturing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>33422</td>
<td>Radio and Television Broadcast and Wireless Communications Equipment</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>334511</td>
<td>Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System Equipment</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics; ICF Consulting

Notes: "-" indicates suppressed data. These cluster segments do not fully capture all employment and businesses related to and supporting aerospace, such as military/defense and contractors. Those jobs are estimated in the thousands and are not captured here because of the lack of consistent reporting of such jobs as aerospace. It must be noted that federal employment had an overall decline in Kern County which is also reflective of the loss of aerospace employment in Kern County.
3.8.4. Cluster Map: Aircraft Manufacturing is Leading Export Segment

The figure below depicts the various segments and sub-segments of the cluster definition according to the three “layers” or levels of a cluster – exporters, suppliers, and economic input foundations. In addition to the cluster definitions, the map shows segments from the transportation and logistics cluster on which this cluster depends. The figure also indicates areas where the County exhibits strong or weak concentration of activities (based on its location quotient), as well as supply-level segments characterized by relatively higher dependency on suppliers from outside of the County. The economic foundation level encompasses the categories that help enable and support the cluster by providing key inputs and resources that the cluster depends on.

Kern County appears to have weaknesses at the supplier level. There are no highly concentrated segments at the supplier level, and Kern County has a strong dependency on inputs from outside of the County. It is unclear how deep the existing supply chain goes in Kern County. However, Kern has strengths at the exporting level of the cluster with the aircraft manufacturing segment.

**Figure 38. Aerospace and Defense Cluster Map**

<table>
<thead>
<tr>
<th>EXPORTING LEVEL</th>
<th>High Kern Concentration (LQ &gt; 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aircraft Manufacturing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPLIER LEVEL</th>
<th>Low Kern Concentration (Higher Dependency on Suppliers from outside of County than within) (LQ &lt; 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Other Aircraft Parts and Auxiliary Equipment Manufacturing</td>
</tr>
<tr>
<td></td>
<td>Search, Detection, and Navigation Equipment</td>
</tr>
<tr>
<td></td>
<td>Electroplating, anodizing, and coloring metal</td>
</tr>
<tr>
<td></td>
<td>Miscellaneous Fabricated Metal Product Manufacturing</td>
</tr>
<tr>
<td></td>
<td>Broadcast and wireless communications equipment</td>
</tr>
<tr>
<td></td>
<td>Aircraft Engine and Engine parts Manufacturing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECONOMIC FOUNDATION LEVEL</th>
<th>Human Resources: AVC/Fresno State</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Innovation: Internal research at firms</td>
</tr>
<tr>
<td></td>
<td>Finance: Access to capital for new firms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECONOMIC FOUNDATION LEVEL</th>
<th>Infrastructure: Bandwidth, water/sewer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transportation: Mojave Airport, roads</td>
</tr>
</tbody>
</table>
3.8.5. County Distribution: Employment Concentrated in the East

The largest pockets of employment in the County’s aerospace and defense cluster are located in the eastern part, in and around China Lake, Mojave Airport, and Edwards Air Force Base as indicated in the map below. The map indicates distribution of aggregate employment levels across the County. It is important to note, however, that the intensity of the shading is not an indication of relative employment density or concentration, which is typically defined as per capita or per 100,000 people. The range of shades reflects various levels of total employment.

Figure 39. Aerospace Regional Distribution

3.8.6. Lagging Entrepreneurial Dynamism

Measured as the share of total companies 3 years old or less, entrepreneurial dynamism is relatively weak in Kern County’s aerospace and defense cluster. Kern lags most of the competitor counties, namely Los Angeles, Orange, San Bernardino, and San Diego Counties. (See figure below) Only 6% of the companies in Kern County’s aerospace and defense cluster are younger than four years, which compares unfavorably to Orange County’s 14% and even San Bernardino’s 13%.
3.8.7. Cluster Occupations: Moderate Job Opportunities for LMI Individuals

Entry-Level Occupation

For the entry level occupation analysis, the aerospace is composed of the Aerospace Product and Parts Manufacturing sector (NAICS 3364).

This relatively small cluster offers few entry-level positions with any occupational concentration. The table below outlines top occupations of more than 25 positions each.

Table 30. Top Entry-Level Occupations, Aerospace and Defense Cluster, Kern County, 1999

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft Mechanics and Service Technicians (714) SOC 49-3011</td>
<td>104</td>
</tr>
<tr>
<td>First-Line Supervisors/Managers of Production and Operating Workers (770) SOC 51-1011</td>
<td>84</td>
</tr>
<tr>
<td>Miscellaneous Assemblers and Fabricators (775) SOC 51-2090</td>
<td>50</td>
</tr>
<tr>
<td>Avionics Technicians (703) SOC 49-2091</td>
<td>45</td>
</tr>
<tr>
<td>Sales Representatives, Wholesale and Manufacturing (485) SOC 41-4010</td>
<td>39</td>
</tr>
<tr>
<td>Stock Clerks and Order Fillers (562) SOC 43-5081</td>
<td>35</td>
</tr>
</tbody>
</table>
Chapter 3 – Cluster Overviews

Office Clerks, General (586) SOC 43-9061 35
Inspectors, Testers, Sorters, Samplers, and Weighers (874) SOC 51-9061 35
Janitors and Building Cleaners (422) SOC 37-201X 30
Electricians (635) SOC 47-2111 30
Secretaries and Administrative Assistants (570) SOC 43-6010 29
Shipping, Receiving, and Traffic Clerks (561) SOC 43-5071 25
First-Line Supervisors/Managers of Mechanics, Installers, and Repairers (700) SOC 49-1011 25
Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic (820) SOC 51-4193 25
Painting Workers (881) SOC 51-9120 25

Source: MJC, 2004; Census, 2000

KEY OCCUPATIONS

The figure below compares the percentage of cluster employment in key occupations in Kern County’s aerospace and defense cluster with San Bernardino’s. The largest percentage of Kern’s cluster employment is in architecture and engineering occupations (25%). In contrast, the largest percentage of San Bernardino’s cluster employment is in production occupations. While Kern lags San Bernardino significantly in production occupations, Kern has comparatively higher percentages of employment in architecture and engineering, computer and mathematical, finance and administration, and installation and repair occupations.

Figure 41. Percentage of Cluster Employment in Key Occupations

![Figure 41. Percentage of Cluster Employment in Key Occupations](image-url)
3.8.8. **Economic Foundation Challenges: Skills, Political Support, Access to Finance**

The cluster-specific economic foundation challenges range from infrastructure and business climate, to human resources, marketing, finance, and innovation. The following cluster challenges were identified by various stakeholders in the cluster.

**BUSINESS CLIMATE**

- **State Political Support for Aerospace:** There is low recognition and visibility at the State level for the contributions of aerospace, particularly from Kern County, to the State economy. BRAC process faces a particular challenge. There is a lack of understanding and appreciation of the impact of the bases and government-run aerospace facilities to the County and broader state.

- **Lack of Targeted Aerospace Incentives:** There are no investment tax credits for firms or economic/workforce training incentives at the State level for the aerospace industry cluster. As a result, aerospace is moving to other states that provide financial incentives.

- **Stringent State Policies Limiting Growth:** State and federal environmental regulations placed on businesses in California are significant barriers to the development and implementation of projects. In some cases, the EIS/EIR process is streamlined when tied to federal money (Mojave experience); on the other hand, can be bogged down if there is threat to endangered species or other sensitive environmental areas.

- **Government Aerospace Classifications:** Government classification for aerospace jobs does not capture the complexity and full supply chain of the industry.

**HUMAN RESOURCES**

- **Recruiting and Retaining Skilled Employees:** How to recruit and retain qualified, highly skilled workers is a critical challenge facing the cluster and the County. In particular there is a shortage of engineers, computer scientists, and skilled technicians for aerospace. Some firms are recruiting in other states such as Oklahoma, Utah, and other areas that have subsidies for workforce training. Retention is also a concern based on the perception of the quality of life in Mojave and other places in eastern Kern. However, China Lake does not seem to have the same problem because they have been successful in using their young engineers to go out and recruit at the universities they came from.

- **Limited Support from Local Colleges for Aerospace:** Many in industry have not found CSU Bakersfield’s Bakersfield campus curriculum to be responsive. The Bakersfield campus is not offering the skills and workforce pipeline for critical areas related to aerospace. Part of the problem stems from CSU Bakersfield’s inability to set up an engineering school. This has led to local institutions taking on a variety of responses in an effort to bring high quality educational programs to the County. One such example is Antelope Valley Community College (AVC) located in Lancaster, CA, which, in cooperation with CSU Bakersfield-AV (Antelope Valley) campus and the City of Lancaster, has developed a Memorandum of Understanding (MOU) with CSU Fresno and CSU Bakersfield-AV for an Antelope Valley-based engineering program. The result is a four year engineering pathway from AVC through CSU Fresno (located in Fresno, CA). This MOU provides for a dual admission for a student enrolling in AVC. Another example is China Lake’s agreement with New Mexico
State University to train engineers for the area. China Lake was unable to get a California university to align with them.

**Marketing**

- **Marketing Private Sector Aerospace’s Contributions**: How to increase awareness of and support for Kern County’s existing aerospace private sector is a key challenge for the cluster. The commercial aerospace companies have a difficult time raising their profile because military defense spending is the main component of aerospace. How to attract a major aerospace employer to the County to act as a private sector anchor to the cluster is a related issue. The County and State have lost many of the main aircraft manufacturing conglomerates (i.e. Boeing and GE).

- **Marketing Aerospace as a Career Opportunity**: There is a perception among young people that aerospace could be volatile career path with low job security due to the up and down in defense/military funding.

- **Low Recognition/Visibility among General Population**: Many people do not know how far advanced the industry is and what technology is available in the market. The perception is that it is limited to making airplanes.

- **Limited Business/Product Marketing Funds**: Lack of marketing dollars to do outreach and marketing is a problem. This is usually a low priority within firms.

**Infrastructure**

- **Transportation Isolation**: Limited access to rail, air, and highway in eastern Kern County.

- **Expanding Bandwidth/Infostructure**: There are bandwidth problems when dealing with customers outside of immediate area in remote counties. This is a less significant challenge in Mojave since they now have wireless internet capabilities.

- **Housing Shortages**: Due to shortages of housing in communities like Mojave, many employees at Edwards AFB and other local facilities live outside of the area.

**Finance**

- **Accessing Early and Late-Stage Capital**: Aerospace companies find it difficult to source initial funds and operating capital. Although there are strong levels of invention disclosures/patents, there is limited technology transfer or a commercialization infrastructure in the County to attract venture capital. Aerospace perhaps perceived as very high risk endeavor from investor perspective.

**Innovation**

- **Accessing R&D funds**: The County has low levels of R&D investment in aerospace, particularly outside of government R&D sources such as NASA and the military. Existing sources of R&D investment include State and military, but the County is not a strong magnet for R&D dollars, particularly from industry. How to access new sources for R&D for major aerospace research ventures is an important issue.
**Chapter 3 – Cluster Overviews**

- **How to Manufacture Locally Produced R&D:** Kern is strong in R&D, but often does not retain what is developed in the County. Manufacturing and assembly are often outsourced.

**3.8.9. Key Insights for Strategy Implementation**

Kern County’s aerospace and defense cluster faces important challenges. The following table summarizes the key insights based on the diagnosis of the cluster’s performance and economic foundation challenges. These conclusions relate to the strategic priority areas of the County’s economic development plan.

**Table 31. Summary of Aerospace and Defense Cluster Diagnosis**

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>County’s Strategic Priority Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>- Value-Chain Depth: Strong concentration in the aircraft manufacturing segment, but weaknesses in supplier depth need to be addressed.</td>
<td>Business Attraction and Expansion</td>
</tr>
<tr>
<td>- Employment and Wages: Need to increase opportunities in aerospace, which would create higher paying jobs.</td>
<td></td>
</tr>
<tr>
<td><strong>Economic Foundation Analysis</strong></td>
<td>Infrastructure</td>
</tr>
<tr>
<td>- Transportation Isolation: Need to improve access to rail and highway, and increase capacity of regional airport (Ridgecrest)</td>
<td></td>
</tr>
<tr>
<td>- Need Expanded Bandwidth/Infrastructure: Need expanded bandwidth to send information to remote counties, particularly for firms which conduct a lot of FTP work.</td>
<td></td>
</tr>
<tr>
<td>- Need New Housing: Mojave needs new housing; need to attract investors/builders.</td>
<td></td>
</tr>
<tr>
<td>- Need to recruit and retain skilled employees: Need to recruit and retain qualified, highly skilled workers. In particular there is a shortage of engineers, computer scientists, and skilled technicians.</td>
<td>Human Resources</td>
</tr>
<tr>
<td>- Need Expanded Support from Local Colleges for Aerospace: Need curriculum that is more responsive to skills and workforce pipeline for critical areas, including aerospace and business administration.</td>
<td></td>
</tr>
<tr>
<td>- Need to market private sector aerospace’s contributions: Need to increase awareness of and support for Kern County’s existing aerospace private sector. Need to communicate how far advanced the industry is and what technology is available in the market.</td>
<td>Marketing</td>
</tr>
<tr>
<td>- Need to Market Aerospace as a Career Opportunity: Perception among young that could be volatile career path/low job security due to the up and down in funding.</td>
<td></td>
</tr>
<tr>
<td>- Need to Increase Business/Product Marketing Funds: Need to address lack of marketing dollars to do outreach and marketing.</td>
<td></td>
</tr>
<tr>
<td>- Need State Political Support for Aerospace: Need focus on aerospace from the governor’s office, and a catalyst from the State to accelerate investment and workforce attraction.</td>
<td></td>
</tr>
</tbody>
</table>
**Need to attract an anchor:** Need to attract a major aerospace employer to the County to act as a private sector anchor to the cluster. Lost many of the main aircraft manufacturing conglomerates from the State (i.e. Boeing, GE, etc). Need to attract a large employer to generate activity in the industry. Perhaps this is being addressed by Scaled Composites.

**Need Targeted Aerospace Incentives:** Need to develop incentive strategy, such as providing investment tax credits for firms or economic/workforce training incentives at the State level for the aerospace industry cluster. Need to explore working with other counties with aerospace to address State-level issues.

**Need to address stringent State policies limiting growth:** State and federal environmental regulations placed on businesses in California is a significant barrier.

**Need New Government Aerospace Employment Classifications:** Need to better classify those working in the industry directly or indirectly.

**Need EDA to Prioritize Funding:** Need to get EDA to address and fund the priority challenges within Kern. In particular, they should support the existing plans and applications submitted to EDA for solving water needs.

**Need to Access Start-Up Capital:** Need to explore ways to tap into start-up capital and support the growth of spin-offs and new firms. Also, need business training for entrepreneurs such as strengthening business planning skills.

**Need to get access to funds for R&D:** Need to access new sources for R&D for major aerospace research ventures. Need for matchmaking and funding from the State.

**Need to manufacture locally produced R&D:** Kern is strong in R&D, but often does not retain what is developed in the County. Need to prevent outsourcing of manufacturing and assembly jobs.

### Business Attraction and Expansion

#### 3.8.10. Vision and Recommendations: The Future of Space Travel is Here

**VISION**

Cluster to build from its worldwide position as originator of private 'space travel' and expand aerospace manufacturing.

**RECOMMENDATIONS**

- County to provide political support for BRAC process and growth in new aerospace segments (such as space tourism development).
- Consider attracting major “anchor” manufacturer to County to help spur aerospace activities.
- Establish financing program to bring high risk capital to deserving entrepreneurs and help investors understand the dynamics of the industry (and help entrepreneurs understand business planning).
- Work with K-12 on awareness and preparation in sciences and to expose students to interesting technologies.
- Create four year degree opportunities for Eastern Kern. Support Antelope Valley College collaborative program with Fresno State.
• Develop attraction and relocation incentives for new workers such as rent/housing subsidies. Work with real estate industry to change rental rules regarding security deposits.
3.9. Cross-Cutting Cluster Issues

The following challenges emerged across all the clusters in the County. These are shared opportunities and challenges that should be addressed at a countywide level.

- **Collaboration:** Limited communication between and across firms and government. Need to further engage and build private sector leadership in economic development.

- **Job Growth:** Need more job opportunities to combat persistent high unemployment, particularly in higher skill and wage jobs and in lower-polluting industries.

- **Human Resources:** Limited skills across labor force, disconnect between supply and demand, need for vocational programs and higher skilled workforce.

- **Land Use:** New development is resulting in competing land uses between industrial, agricultural and residential uses and unplanned encroachment limits the ability for firms to expand. Residential speculation is increasing land values and is impacting the ability for other uses to stay competitive.

- **Infrastructure:** Fast growth putting strains on infrastructure – particularly water and sewage; Need for innovations in energy generation to lower energy costs.

- **Transportation:** Fast growth threatens the advantages of accessibility as congestion grows on County roads and rail lines. Much of the network is aging and needs upgrades.

- **Air Quality:** Poor air threatens health of community residents and is a major deterrent for new businesses and residents. Further, urban sprawl creates worse air quality due to the high car use. These mobile source emissions may inadvertently restrict industrial growth due to the greater challenges in controlling car emissions relative to stationary source emissions.

- **Marketing:** Internal and external perception of County hurts clusters; tourism needs stronger countywide voice that unites urban and rural areas.

- **Finance:** There is a lack of local high risk capital for innovators, insufficient funds for microenterprise activities in low income communities.

These nine challenges are not identical for each cluster but are shared to some extent by all clusters. The conclusion from the cluster overviews is that the clusters alone cannot solve these challenges because the scale of the challenge involves agencies and entities from throughout the County and the needs cut across multiple industries. In order to solve the specific recommendations within each cluster overview, there is a need for a series of countywide initiatives focused on these cross-cutting areas. The cluster overviews have demonstrated that working to resolve these nine areas is the key for the County’s economic future.

The following chapter describes five Flagship initiatives proposed as a way to solve these cross-cutting challenges.
4. **Strategic Flagship Initiatives**

4.1. **Introduction**

A crucial achievement of this strategy has been finding common denominators for countywide action. Kern County business and community leaders regularly expressed concerns for a number of shared economic challenges, from skill levels to access to financing, to the need to reduce land use conflicts to the need for a revamped countywide brand. When so many firms and stakeholders share in common a series of concerns that affect the economy’s ability to grow and stay competitive, this is a sure sign that the County needs to take action.

This chapter describes five crosscutting initiatives, called “Flagships” which are proposed to solve these shared competitiveness challenges. The Flagships emerged from discussions with industry cluster groups and County and City representatives from throughout the County. The name Flagship is applied because these initiatives are broad and complex and require support from many industry and public sector leaders. Many of the Flagships are issues which Kern County has struggled with in the past while other ones are proposing new programs which have not before existed. The underlying theme for all the Flagships is that these initiatives are what need to be solved in order to ensure the County’s economic future.

Solving these challenges requires stakeholders from throughout the County being ready to make changes. Change may take the form of tough decisions, hard investments, developing new working relationships or including new voices. At times there will be differences among participants, between different clusters and sub-regions of the County. At these times and throughout the implementation of this strategy, the goals focus on the cross-cutting needs and challenges – those areas of concern which are shared and which must be solved in order to maintain the competitiveness of the County’s economy.

The following are the cross-cutting County issues and the proposed Flagship which will tackle each specific challenge:

<table>
<thead>
<tr>
<th>Cross-Cutting Problem(s)</th>
<th>Recommendations / Flagship Initiative</th>
<th>Actor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration: Limited communication between and across firms and government</td>
<td>Cluster Networks and Business Expansion, Attraction and Retention: Permanent cluster networks, co-chairs and groups.</td>
<td>Lead: Kern Economic Development Corporation (KEDC) Supporting: County Community and Economic Development Department (CEDD)</td>
</tr>
<tr>
<td>Job Growth: Need more job opportunities to combat persistent high unemployment</td>
<td>Cluster Networks and Business Expansion, Attraction and Retention: Cluster-focused expansion, attraction and retention strategy.</td>
<td>Lead: KEDC Supporting: CEDD</td>
</tr>
<tr>
<td>Human Resources: Limited skills across labor force, disconnect between supply and demand, need for additional vocational programs.</td>
<td>Workforce Skills Pipeline: Commitment to align training with needs of clusters; establish specific programs to address short term and pipeline needs.</td>
<td>Lead: WIB Supporting: ETR, CSUB, Community Colleges, Private Universities and colleges, school districts, and any other educational providers.</td>
</tr>
</tbody>
</table>
### Cross-Cutting Problem(s)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Recommendations / Flagship Initiative</th>
<th>Actor(s)</th>
</tr>
</thead>
</table>
| **Land Use:** Reconcile competing land uses (industrial, agriculture, residential) which threaten to slow economic growth over time. | **Infrastructure and Land Use Advisory Group:** County/ City land use planning to identify needs and conflicts | **Lead:** RMA (Planning)  
**Supporting:** COG, Cities, CEDD |
| **Infrastructure:** Fast growth putting strains on infrastructure – particularly water and sewage; Need for energy generation. | **Infrastructure and Land Use Advisory Group:** Structured approach to infrastructure funding and planning. | **Lead:** RMA (Planning)  
**Supporting:** COG, Cities, CEDD |
| **Transportation:** Fast growth resulting in congestion on rail and roads. | **Infrastructure and Land Use Advisory Group:** Plan and fund key transportation needs | **Lead:** RMA (Planning)  
**Supporting:** COG, Cities, CEDD, CalTrans, Transportation Foundation |
| **Air Quality:** Hazardous health impacts from poor air; Regulations limit new industry. | **Infrastructure and Land Use Advisory Group:** Encourage new developments which do not worsen air quality | **Lead:** RMA (Planning)  
**Supporting:** COG, Cities, CEDD |
| **Marketing:** Internal and external perception of County hurts clusters; tourism needs stronger countywide voice. | **Tourism Marketing Agency:** Marketing and branding strategy and County tourism agency. | **Lead:** Board of Trade  
**Supporting:** KEDC, Chambers |
| **Finance:** Lack of local high risk capital for innovators, insufficient funds for micro | **Finance and Entrepreneurship Programs:** Venture Forums, Entrepreneurship, Microenterprise. | **Leads:** CEDD and KEDC |

These cross-cutting issues are discussed in detail in the following chapter. A subsequent chapter describes the implementation structure for all the Flagships as part of the overall County economic development strategy.
4.2. Flagship 1: Cluster Network Development Strategies

4.2.1. Summary

This flagship proposes that KEDC hire cluster developers to establish cluster working groups across the industry clusters to foster collaboration among the private and public sectors and result in improved partnering and problem-solving of competitiveness challenges. The flagship also proposes that KEDC reorient its business attraction, retention and expansion program to respond to the needs of each industry cluster network.

4.2.2. Goals

- **Build Collaborative Culture**: Foster collaborative culture across Kern’s highly recommended clusters to solve competitiveness challenges and foster increased business communication.

- **Organize Cluster Networks**: Develop set of cluster networks which form the glue that makes the entire strategy work effectively. Each network will bring together producers, suppliers and foundations within the cluster in an ongoing basis to meet and develop collaborative actions to overcome key competitiveness challenges.

- **Strengthen Business Attraction and Retention**: Improve the County’s attractiveness to the targeted industry clusters and encourage relocation of firms with critical cluster capabilities and market linkages to Kern County which can fill gaps in existing cluster value-chain and result in an increase in solid employment opportunities.

4.2.3. Background

Kern County has been working with industry cluster networks and in business attraction for several years. The value of enabling and building competitive clusters is well understood. However, the development of a collaborative culture is an ongoing responsibility which requires continual support. Further, there is additional need to target the attraction and expansion strategies to the cluster needs. Business, government and community leaders throughout the County have identified the need for and value of working together in greater collaboration in the future. In addition, effective implementation of a cluster competitiveness strategy requires a specific group or mechanism to continue to rally and support the participants in generating and developing collaborative actions. This mechanism is referred to as a “cluster network”.

A cluster network is an association of export-oriented firms, supplier firms, and related economic foundations within an industry cluster. The cluster network provides a vehicle for bringing together different individuals and organizations with common interests and thus motivations for collaboration. An effective cluster network should be representative and inclusive of all industry-related actors. The network also provides a forum for the exchange of strategic ideas and knowledge, and for collaborative action. Having vibrant, strong cluster networks will greatly facilitate the management of strategy implementation.
The logic is that cluster working groups are a forum to "convene the marketplace". That is, cluster participants should collaboratively work together representing the entire value-chain of the cluster. This is not a structure characteristic of traditional industry associations. By convening the marketplace in this manner, the members of the cluster had the opportunity to learn more about one another and explore new collaborations that might enhance product or product marketing. Through the process of working together the cluster participants will become a market laboratory in which innovations emphasize businesses working together in new ways, rather than seeking new governmental programs. Moreover, as a partner in the process, government becomes a supplier of inputs--such as training or infrastructure--rather than the arbiter of industrial policy. As the clusters gain experience as a laboratory of market innovation, they should become comfortable in collaborating locally in order to compete globally.

The cluster process works through fostering discovery of common interests, identification of actions on which participants agree to work together, and development of explicit market solutions--business to business or business to government teaming or formation of new joint ventures for the marketplace. In addition, the cluster process also enables suppliers and institutions that would not ordinarily work together or communicate directly with businesses to learn how to be more responsive to their end user and in doing so improve competitive advantage in Kern.

Once the cluster networks are formed, the participants will also be directly involved in activities to promote new investment in Kern. New investment can come from two sources—home grown investments and relocations or new investments from other counties. The County has many of the standard location and financial incentives already in place to subsidize and compensate for the costs incurred in moving and re-establishing, including a portfolio of tax rebates. The cities of Delano and Shafter as well as the joint City of Bakersfield/Kern County have State Enterprise Zones that offer tax credits. KEDC also has a set of attraction, retention, and expansion...
services. These services have been effective but could be improved through a more comprehensive program which engages the clusters in the attraction of needed suppliers in their industry and builds support for collective funding of promotion programs.

4.2.4. **Strategy 1: Build and Maintain Countywide Cluster Networks**

This strategy proposes that the County develop and maintain cluster networks for six cluster working groups (Value-Added Agriculture; Energy and Chemicals; Transportation, Logistics & Warehousing; Aerospace and Defense; Health Services and Medical Technologies; and Business and Professional Services). These networks require a market-driven intermediary vehicle or organization that can serve as the home base and secretariat for cluster activities. The best location for these activities is the Kern Economic Development Corporation (KEDC) because their mission and commitment is consistent with the objectives of growing and maintaining the cohesion of cluster networks.

In order to maintain momentum within the cluster networks and to ensure a good return on participants’ time and effort, it is highly recommended that KEDC identify specific staff to be the professional cluster support team. These staff will be responsible for a variety of cluster management functions as well as providing the professional support for business attraction, retention and expansion services described in the next strategy. It may be necessary for KEDC to hire consulting support to carry out the initial cluster development process.

The management functions provided should go beyond simple logistical support to “proactive management” aimed at ensuring cluster networks remain active and strategic in their focus. It will be the responsibility of the KEDC to make sure that the cluster retains vitality and cohesiveness. The proactive management functions provided could include the following:

- **Cluster Co-Chair Identification**: Identifying leaders within the private sector who are willing to serve as co-chair of the cluster network. This voluntary leadership position requires individuals who are respected among other cluster participants and are capable of encouraging them to participate and stay involved. The Co-Chair is the leadership ‘anchor’ of the cluster network and helps communicate the broader goals of clustering and collaborative strategy to the community. Our experience suggests that each working group can best be implemented by two co-chairs. One co-chair can be drawn from a large company representing the cluster and one from a small company. Alternatively, the two co-chairs could represent distinctly different parts of the cluster. The following are some of the Co-Chair’s responsibilities:

- **Cluster Network Creation**: Enlisting co-chairs as well as the help of other industry or economic development groups in generating a list of possible participants, bearing in mind that the goal is cluster and geographic representation and civic enthusiasm. Using personal contacts to recruit members. Sharing invitee list template with personal contacts to expand invitee list if necessary. Reaching out to a broad spectrum of members of each cluster to define and grow the membership, with representation from throughout the County’s sub-regions.

- **Logistical support**: Scheduling and organizing meetings, arranging for facilities and equipment as needed, keeping track of cluster network participants and action team.

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16 Note that KEDC already manages a Logistics cluster so this will not be additive and Tourism is excluded because it will be managed differently.
members, etc. Bringing together cluster working groups to develop specific initiatives that will help collaboratively solve competitiveness challenges facing the cluster. Holding meetings of cluster membership quarterly and annually to track progress on collaborative actions by cluster participants.

- **Communications**: Providing information about network activities to cluster participants, to companies and institutions in the cluster, and to the general public; facilitating the exchange of information. Integrating information on membership, collaborative initiatives and their progress, and disseminating this information via the cluster web site and publications. Establishing a web-based intranet for cluster members that will enable them to have a shared nexus or community with common information as well as various ‘market forums’ through which buyers and suppliers can exchange information, skills can be offered and recruited, and partnerships for products and marketing organized.

- **Research and analysis**: Technical support, not just at request of cluster co-chairs or members, but at the initiative of the management providers in response to emerging strategic issues or concerns.

- **Performance monitoring**: Monitoring the level and quality of members’ participation and the quality and relevance of cluster network activities. Monitoring actions taken by cluster teams on collaborative action initiatives and report on progress to cluster membership.

- **Consensus-building**: Building consensus around cluster identity, focus of action, and strategic directions; facilitation of meetings, and mediation where conflicts emerge.

- **Technical assistance**: One-on-one help and advice for individual cluster network members charged with carrying out certain tasks or responsibilities.

- **Stimulus and direction**: Setting the agenda and direction for the cluster network, clarifying priorities, suggesting ideas and approaches to explore, and generally ensuring that the foment of ideas and enthusiasm in the cluster network does not dissipate.

- **Cross-cluster collaboration**: Working with the manager of other clusters to explore cross-cutting issues and themes and to convene thematic workshops that explore synergies among clusters and tackle cross-cutting issues.

Although as illustrated by the above discussion, the cluster developer has quite a significant and elaborate catalytic role to play, the management provider cannot dictate the actions the cluster network will take or make the network’s decisions. Rather the management provider will have to be responsible for introducing new ideas when thinking gets bogged down, suggesting avenues to explore, sharing lessons and best practices observed in the provider’s own experience, and offering third-party assessments of options being considered by the cluster network. The management provider will have to secure the buy-in of cluster network members to have recommendations accepted and acted upon by the cluster network.

For all these reasons, cluster work sessions are a healthy and constructive ongoing activity. The planning, convening, and following up on actions arising from collaborative initiatives is an activity that should be encouraged and assisted by KEDC until such a time that there is sufficient market capacity to self-manage this process. The achievement of a naturally clustering and collaboratively innovating market place is the highest aspiration of economic development.
Specific Actions and Recommendations

- **Staffing:** Recruit and hire cluster developer(s) for five clusters. The Logistics cluster already exists and includes a focus on Transportation and Warehousing. There is no cluster proposed for Tourism, Recreation & Entertainment. The cluster developers could be hired as consultants.

- **Membership:** Define cluster network for each cluster (list of producers, suppliers, supporting institutions)

- **Establish Networks:** Roll out cluster networks: Value-Added Agriculture and Aerospace are priority areas. Health Services, Energy and Chemicals and Business/Professional Services to follow.

- **Schedule:** Establish monthly or quarterly meetings of clusters with rotating chairs. Meeting structure could include: Confirm Challenges, Identify Actions, Develop Action Teams, Refine Actions.

- **Leadership:** Identify/select co-chairs from private sector for each cluster to represent the cluster in other Flagships.

- **Collaborative Actions:** Cluster to develop collaborative actions based on analysis from Kern’s Economic Development Strategy and dialogue within the cluster. KEDC should consider hiring consulting services to conduct a formal cluster building process which implements a consistent methodology across the cluster networks.

- **Jointly Develop Business Attraction:** The cluster developer within KEDC will also have shared responsibility for business expansion, retention and attraction services to that cluster. *(See Strategy 2)*
4.2.5. **Strategy 2: Restructure the Business Expansion, Attraction and Retention Program**

**Overview:** Develop collaborative programs focusing on US and international markets to promote Kern’s business advantages and to attract new investment to the County’s clusters. This effort will include packaging Kern County’s economic assets, directly introducing them to corporations and investors and indirectly promoting the County through trade forums worldwide. This part of the Flagship will develop attraction targets based on cluster needs and focus on recruiting companies in clusters in which production needs match the advantages in skills, technology, physical infrastructure and business climate that the County offers.

- **Leadership:** Maintain KEDC as the point of contact and lead agency countywide for business expansion, attraction, and retention.
- **Staffing:** Identify key staff at KEDC with responsibility for “portfolio” management of clusters who will be the cluster developer and managing business attraction and retention.
- **Background:** As part of the development of the cluster network, the cluster developer should visit and assist existing Kern businesses on issues such as available incentives, financing availability and permit processing. Design and conduct a survey of companies in Enterprise Zones, for example, to determine their basic needs from the County or the broader economy.
- **Update Materials:** Amend targeted industry clusters list to reflect new strategy. Kern County’s Economic Incentive Program currently has aerospace, chemicals/plastics, financial services, high-tech, textiles/apparel, and value added agriculture as the target industry clusters for business attraction, expansion, and retention efforts. Develop marketing packages for each targeted cluster.
  - Incorporate cluster information from the Strategy into marketing material. Design, produce, and distribute quarterly business newsletters.
  - Design, develop, produce, and distribute Kern marketing and demographic CD ROMs.
  - Develop, implement, upgrade, and maintain a dynamic Enterprise Zone website, along with other web-based tools and data that support business relocation decisions.
- **Develop Expansion Program:** Monitor countywide expansion project requests. Cluster developer participates in the expansion requests. Work with “Cluster Expansion Team” on permitting and land use needs.
- **Develop Retention Program:** Develop early warning system to identify potential retention firms. (Note: if the firm is in a segment which is a dying part of the cluster, may be less of a priority unless it is clear that the dying segment of the cluster is part of a transforming cluster which is likely to spawn new industries or firms.)
- **Develop Attraction Program:** Support growth of key cluster segments. Target incentive funds and programs towards clusters and key cluster growth segments.
  - Design, develop, produce, and distribute business recruitment folders with updated business statistics, general City information, incentive zone information, and other relevant information.
  - Identify, attend, and exhibit at trade shows and professional conferences to generate business relocation leads that meet the profile of strong attraction targets. In doing so,
partner with other economic development agencies in the County to attend trade shows and professional conferences compatible with the County’s targeted clusters and cluster segments.

- Develop relationships with key site selection entities.

**Proposed list of expansion and attraction targets**

Pursue specific attraction and expansion targets, focusing on cluster segments with the greatest potential for growth in the short-term, and cluster segments that are strategic priorities for overall cluster development in the long-term.

**Short-term:** Focus on targeting businesses in cluster segments with high growth potential, given existing cluster strengths and competitive position, to further drive overall growth in the cluster.

- **Aerospace:** Aerospace/Aviation Manufacturing and Assembly; Aerospace Maintenance and Engineering Support; and Space Tourism as warranted.
- **Business and Professional Services:** Engineering Services; Software and Computer Design Services
- **Health Services and Medical Technologies:** Medical and Diagnostic Laboratories, Hospitals, Specialized Health Care Facilities
- **Tourism, Recreation & Entertainment:** Recreational and Vacation Operators
- **Transportation, Logistics & Warehousing:** Distribution and Warehousing
- **Energy and Chemicals:** Plastics Product Manufacturing, Basic Chemical Manufacturing, Chemical Product and Preparation Manufacturing.
- **Value-Added Agriculture:** Fruit and Vegetable Preserving and Specialty Food Manufacturing; Beverage Manufacturing; Animal Food Manufacturing; Grain and Oilseed Milling, Sugar and Confectionary Product Manufacturing, Snack Foods, Roasted Nuts, Perishable Prepared Food, and other Food Manufacturing.

**Long-term:** Focus on targeting business in cluster segments with strong potential strengths and opportunities in the County, particularly those that support existing businesses and clusters and represent supplier areas with deficiencies in local capability. These segments may have been characterized by either slow 10-year growth or concentration, but have the potential to accelerate growth due to distinct advantages and assets in the County.

- **Business and Professional Services:** Scientific Research and Development Services
- **Health Services and Medical Technologies:** Medical Equipment and Supplies Manufacturing, Analytical Laboratory Instrument Manufacturing, Surgical Appliances and Supplies Manufacturing
- **Tourism, Recreation & Entertainment:** Filmmaking (e.g. Post-Production Services)
- **Transportation, Logistics & Warehousing:** Air Transportation.
- **Energy and Chemicals:** Renewable Energy Production and Services.
• Value-Added Agriculture: Food Product Machinery Manufacturing; Agricultural Implement Manufacturing.

4.2.6. Timeline

During the third and fourth quarters of 2005 there should be a priority to fund at least four cluster developers. These four clusters and the proposed source of funding for the staff position are provided below:

• Health Services and Medical Technologies (Funding: City of Bakersfield)
• Value-Added Agriculture (Funding: KEDC)
• Aerospace and Defense (Funding: Various East Kern businesses and communities)
• Energy and Chemicals (Funding: KEDC)

In subsequent years, KEDC should identify funding for a cluster developer for Business and Professional Services. The City of Bakersfield is proposed as one of the sources of funding for this position because of the strong likelihood that growth in this cluster will have the greatest positive impact on Bakersfield.

Further, the Energy and Chemicals Cluster may need to be subdivided into sub-clusters, depending on participation. One cluster segment which could likely become its own distinct cluster is Clean Energy Technologies. Given the strategic import of this segment and the County’s leading role in wind production, the cluster has tremendous potential. However, given its current small size, it lacks a specific champion. If the County recognized that clean energy technologies are a strategic industry of the future and wanted Kern County to play a leading role (which could also support goals of cleaner air), the County should consider a dedicated source of funding for a cluster developer in Clean Energy Technologies. This funding would have to be over five years in order for the cluster developer to have the opportunity to yield successes.

4.2.7. Resource Requirements

The resources requirements for this Flagship are the marketing costs, the staffing costs for business developers, and the logistics costs of meetings and management. Staffing and logistics costs are estimated to be approximately $100,000 per cluster. Since KEDC currently funds the cluster developer for Logistics, this will initially require an additional four cluster developers for an annual cost of $400,000. In many cases, members of the cluster will be able to participate in the funding for their developer.
4.3. Flagship 2: Human Resources and Skills Development

4.3.1. Summary

This flagship proposes that the WIB and its staff agency ETR focus a portion of their workforce development efforts on the distinct needs of the County’s industry clusters. The flagship also proposes that all education training providers throughout the County align their efforts with the needs of the industry clusters in order to foster greater expansion of skilled employment in the clusters.

4.3.2. Goals

- **Align Training with Cluster Needs**: To align workforce development, training and education in Kern County in a way that responds directly to the immediate and long-term needs of the County’s clusters.

- **Develop Higher-Skill Workforce**: To support the growth of a higher-skilled workforce through the creation and management of an ongoing skills pipeline which looks at training and workforce needs (demand) and existing skills and training programs (supply) and establishes a collaborative working relationship between all education and training providers and economic development stakeholders in Kern County.

4.3.3. Background

Kern County carries out many training programs across a variety of industries. While many of these programs directly serve the needs of the County’s highly-recommended industry clusters, there remain gaps in existing training and education programs in meeting the workforce development needs for LMI individuals entering the highly-recommended clusters.

This background section explores the training needs for the top five entry-level occupations for each highly-recommended cluster. Entry-level jobs are those that require on-the-job training, work experience, or vocational training as described below. In addition, this section briefly describes current vocational training programs which prepare LMI people for entry level work opportunities in the highly recommended clusters. Finally, this section will identify new vocational or short-term training programs might be needed in the County to meet the entry-level workforce needs of the highly recommended clusters.

**On-the-Job Training**

On-the-Job Training is often the most important form of training for low and moderate income individuals entering new employment opportunities. Indeed on-the-job training is the most significant source of education or training for a number of the recommended cluster occupations. On-the-job training is split into three distinct categories which include:

- **Long-term on-the-job-training**: Occupations that require more than 12 months of on-the-job training or combined work experience and formal classroom instruction for workers to develop the skills needed for average job performance.

- **Moderate-term on-the-job-training**: Occupations in which workers can develop average job performance after 1 to 12 months of combined on-the-job experience and informal training.
• **Short-term on-the-job-training.** Occupations in which workers can develop skills needed after a short demonstration or up to one month of on-the-job experience and instruction.

**WORK EXPERIENCE**

Some occupations require skills obtained through work experience in a related occupation. Virtually all industries have career ladders, which allow un-experienced workers to gain employment in an entry-level job through which they obtain on-the-job training and ultimately enough experience to move up based on work experience in an occupation.

**VOCATIONAL TRAINING**

Some occupations require completion of a post-secondary vocational education program in a training school.

**CURRENT TRAINING PROGRAMS IN KERN COUNTY**

Currently Kern County offers training programs in a number of areas for low and moderate income individuals that connect with employment opportunities in specific clusters. As indicated in the Table below, Kern County currently offers training programs which prepare LMI individuals for employment opportunities in all the recommended clusters. Current training programs are focused more heavily on preparing LMI individuals for jobs in Business and Professional Services and Health Services and Medical Technologies clusters. Note that this table is illustrative of training programs and is not meant to be a complete demonstration of all County programs.

<table>
<thead>
<tr>
<th>Training Programs</th>
<th>Cluster Served</th>
</tr>
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<tbody>
<tr>
<td>Bookkeeping</td>
<td>Business and Professional Services</td>
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<tr>
<td>Business administration</td>
<td>Business and Professional Services</td>
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<tr>
<td>Desktop publishing</td>
<td>Business and Professional Services</td>
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<tr>
<td>Electronic office equipment repair technician</td>
<td>Business and Professional Services</td>
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<tr>
<td>Legal office administration</td>
<td>Business and Professional Services</td>
</tr>
<tr>
<td>Office administration</td>
<td>Business and Professional Services; Health Services and Medical Technologies</td>
</tr>
<tr>
<td>Computer aided drafting</td>
<td>Business and Professional Services; Energy &amp; Chemicals; Aerospace</td>
</tr>
<tr>
<td>Welding certification</td>
<td>Energy &amp; Chemicals</td>
</tr>
<tr>
<td>Certified nurse assistant</td>
<td>Health Services and Medical Technologies</td>
</tr>
<tr>
<td>Medical assisting</td>
<td>Health Services and Medical Technologies</td>
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<tr>
<td>Medical office worker</td>
<td>Health Services and Medical Technologies</td>
</tr>
<tr>
<td>Laundry worker</td>
<td>Tourism, Recreation &amp; Entertainment</td>
</tr>
<tr>
<td>Food service assistant</td>
<td>Tourism, Recreation &amp; Entertainment</td>
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</tbody>
</table>
## TRAINING GAPS WITHIN KERN COUNTY FOR CLUSTER FOCUS

Among top ten occupations by cluster, those with over 200 jobs in Kern County, there are some opportunities for the County and its partners to better serve the workforce development needs of businesses while preparing LMI individuals for entry-level cluster-specific occupations through targeted training. The following occupations require training programs that are not readily available from the County:

- **Transportation and Logistics Cluster**: Bus Drivers, Airfield Operations Specialists, and Aircraft Service Technicians.
- **Tourism, Recreation & Entertainment**: Cooks, Prep-Cooks and Bartenders.
- **Health Services and Medical Technologies Cluster**: Billing and Posting Clerks, and Clinical Lab Technicians and Technologists.
- **Value-Added Agriculture**: Computer interface skills for manufacturing.

### Structure

The Workforce Investment Board will become the lead entity responsible for ensuring that County training and education programs are responsive to the short and long-term needs of the clusters and will work in a collaborative manner with education providers from K-12 through university. The WIB will work with its Employers’ Training Resource as well as the deans or heads of instruction for every public or private education and training institution in the County (Community Colleges to California State University, Bakersfield), the heads of human resources and training of every cluster company (or at least those that are most concerned with skills issues) and key State entities (Employment Development Department, EDD). Over time, more specific representatives will be needed for specific action initiatives (e.g., experts in a given discipline or occupational skill from both the instructional and the employer side). The following is a partial list of the public and private education and training providers in the County who will be expected to participate in this Flagship:

- Kern County’s Career Services Centers
- Employers’ Training Resource
- Kern County Department of Human Services
- Weill Institute Small Business Development Center

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17 Other sources of training may exist for these occupations and a complete survey of training resources within Kern was beyond the scope of work.
• Kern Superintendent of Schools
• Bakersfield College
• Cerro Coso College
• California State University, Bakersfield
• *Fresno Pacific University Bakersfield Center
• *National University
• *Point Loma Nazarene University
• *San Joaquin Valley College
• *Santa Barbara Business College
• Taft College
• *University of Phoenix
• *University of California, Santa Barbara
• *University of La Verne
• *University of California, Merced

4.3.4. **Strategy 1: Provide Specific Funding from WIB to Support Training for Cluster Occupations and Skills**

- **Establish Cluster-based Training Responsibility at WIB:** Pass a resolution that encourages the WIB and ETR to pursue training for clusters as central to their mission. This resolution will ensure that the WIB places a portion of its annual training expenditures directly towards the needs of clusters.

- **Identify a WIB/ETR Economic Development Coordinator:** This coordinator will be directly responsible for working at the interface between County workforce development and economic development activities. The economic development coordinator will be responsible for participating in all the cluster networks or assigning someone else who can represent ETR and the WIB at the cluster networks. This coordinator will also be responsible for Cluster-based Occupational Job Tracking which are annual updates of cluster occupations and needs.

- **Convene WIB/ETR with Clusters:** Bring together WIB/ETR with cluster networks to define cluster needs and establish a working commitment to provide set aside for training for cluster occupations. Attention should be paid to ensure that new training opportunities support LMI persons within the cluster. The analysis in this strategy provides input for the LMI occupations within each cluster which would require assistance and support from the WIB to expand.

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**18** Refers to satellite campuses located in Kern County for a larger institution which is located elsewhere.
4.3.5. **Strategy 2: Establish New Training Programs at Kern’s Colleges and Schools to Support Key Skill Needs Among the Clusters**

- **Convene Training Providers**: Bring together WIB, Community Colleges, CSUB, Kern Superintendent of Schools and cluster reps to make commitments to sharing program information and coordinating training programs with clusters. (If possible establish an MOU).

- **Convene Clusters with Training Providers**: Delegates from each cluster will meet with the deans or heads of instruction for all secondary and post-secondary education institutions (public and private) in the County. During this meeting the group will: (a) Listen to the skills concerns of each set of cluster delegates. These may focus on skills preparation as well as retraining or continuing education. (b) Identify commonalities across the clusters that can guide the agenda of the Flagship. (c) Define work plans to address the priority crosscutting issues as well as for distinctive cluster-specific needs. The outcome of this first session should be confirmation that an ongoing dialogue between cluster representatives and educational institutions is good and can contribute to an improvement in meeting the skill needs of companies AND the formation of action teams to move elements of the agenda forward.

- **Confirm Skill Demand**: Cluster skill needs and training institution training activities need to be better aligned with each other in Kern County. Identify skill needs shared in common across clusters that need to be addressed. These may be needs for preparation of future employees as well as retraining of existing workforce. Carry out a survey of occupational or professional skill demand across members of each cluster or a carefully structured "focus group" during which participants on both sides bring their own "data" and knowledge together and collaboratively explore the "gaps" that might exist between supply and demand. The outcome of this inquiry or assessment can be used to focus training development and delivery more systematically.

- **Evaluate Supply**: Evaluate supply of existing training (at all levels) and cluster needs using existing courses and curriculum. Analyze the match between existing training and cluster needs using existing courses and curriculum but also explore new modes of delivery, timing or cost that may respond to workforce or student needs.

- **Establish Skills Preparation Groups**: Where there is agreement that there is a "mismatch" between skills training and labor market demand by cluster companies, then both sides can undertake simple projects through which the number of people to be trained in a given field is increased or decreased. The key requirement in this process is for companies to help assure training organizations--whether community colleges, universities or private training organizations--that their estimates of the number of individuals that will be absorbed or hired or who need to be retrained is reasonably accurate. The goal here is to make it worthwhile for both sides to better communicate with each other.

- **New Curriculum or Course Development**: In some cases there is an opportunity to develop either new training curriculum or ongoing courses and in some cases new degrees (or degrees missing from the County that might benefit its cluster economy) that might be able to support several clusters (such as engineering). In these cases a collaborative team can begin to plan the content and delivery modes for new courses or degree programs, using best practices and focusing on ensuring that the output of the courses is what the economy needs. There can be as many new course or curriculum teams as are called for. However,
establishing basic rules for managing this process would be very helpful. The key is to ensure that there are going to be students or employees enrolled in courses that are developed. In certain cases, courses can also be marketed externally from the County, helping to build the image of the County to potential labor markets. Consider using a 2-tiered approach to decision making about new training programs. If there is demand for greater than 100 jobs, establish new training program in County or Community College. If less than 100 jobs needed, consider vouchers or external partnerships. In addition coordinate training needs among businesses to identify and aggregate the level of demand for particular courses (e.g. a single firm may only need 4 new trained people but 15 other firms need the same training to add up to a countywide demand of greater than 100 people).

- **Ensure Responsiveness**: Manage the quality of supply and demand through ongoing skills pipeline activities.

- **Redesign On-Line Job-Skills Marketplace**: If there is sufficient interest on the part of clusters (in particular) there may be good reason to redesign the countywide on-line job-skills marketplace. As regions, such as Austin has done, this marketplace permits participating cluster companies to post job offers (confidentially, if required) and those seeking employment to post their resumes. The web site can be designed so that participant users can either scan for applicants using a keyword search, or have them automatically screened, and vice-versa. The Kern County marketplace is of a modest size spread across a large geographic area so that having one integrated skills marketplace might be helpful in creating greater local skills retention. Note that this web community could be expanded into a buyer-supplier exchange for each cluster using simple matching principles (not trying to replicate more complex industrial web ‘exchanges’).

- **Monitor Results**: The participants in the Skills Pipeline Flagship should set up simple criteria to measure their progress in generating more trained workers and retraining more existing workforce. These criteria can be used to help track the overall responsiveness of Kern County’s education system and labor force to cluster needs.
  - Expand existing WIB/ETR data gathering process to incorporate clusters.

- **Establish basic metrics of own performance.** This evaluation program will look at quality of training experience to students. Did they learn something? Did they learn what they needed? Would they recommend this? What happens after their training? Do their incomes go up? Etc. In addition review whether the County has sufficient programs to train for the 4500 additional entry level jobs across the clusters by 2008 (1300 Value-Added Ag, 900 Tourism, 880 Health Services).

### 4.3.6. Strategy 3: Ensure That K-12 Programs Provide Strong Basis and Various Options for Students

- **Establish innovative programs in schools**: Increase number of qualified workers for the County’s clusters by promoting careers and attractive work conditions to high school and college students. Starting in junior high schools there should be specific programs to prepare young adults for careers in Kern County. These include:
  - Expand vocational programs throughout high schools to train for skills and careers in Kern’s clusters.
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- Establish School to Work Program: Last year of high school allow people to go into the workforce and learning skills appropriate to that work environment. Job shadowing is a part of this. (See Project Hope in Detroit)

- Establish new entrepreneurship programs to get young adults interested in starting and growing companies in Kern County. Develop business plan competition in the high schools with juries from business students at CSU Bakersfield and local business leaders.

- Establish New Recruitment and Placement Program for Young Graduates: Placement program for young graduates and researchers from other parts of California into specific jobs within firms which are using innovative technologies. County role is to organize the local industries to share their job openings and then aggressively go after talented young graduates.

4.3.7. Timing

The various workforce development and economic development organizations involved in the Human Resources Flagship could meet formally on a quarterly basis, reporting to the Workforce Investment Board. At the quarterly meetings the Flagship’s action teams would report on the progress of their individual implementation activities. The timing of the Flagship should include immediate efforts (e.g., the first task alluded to above) and then break into specific actions, as required. Some action teams can move very quickly others will have a longer time to deliver their results (e.g., new trainee graduates, etc.).

4.3.8. Resource Requirements

There are no immediate resource requirements other than the time spent among each of the key education entities on coordination and meeting. This core team for this Flagship should be able to determine what materials are required both to launch this effort and build up its activities over time. The major costs may come about through the planning for new courses, curriculum or programs (such as vocation training). The more immediate tasks such as determine the specific mismatch between demand for and supply of skills within the County can likely be done with existing resources through the targeting of certain amounts of WIB funding for cluster-based training.
4.4. Flagship 3: Land Use and Infrastructure Planning

4.4.1. Summary

This flagship proposes that the County’s planning department become the lead entity in conducting comprehensive land use, transportation and basic infrastructure planning in a way which responds to the needs of the clusters by establishing an advisory group that is directly involved in the planning process and oversees major investment and land use decisions. This comprehensive approach to planning will take place in coordination with all other planning departments in the County.

4.4.2. Goals

- **Conduct Comprehensive and Coordinated Planning:** To manage land use and infrastructure planning activities in the County in a way that preserves prime agricultural land, accommodates the projected population growth and its transportation needs and reduces the potential for conflict between residential and industrial/agricultural activities in the County.

- **Align Planning with Cluster Needs:** To ensure that the County’s planning bodies understand the land use and infrastructure concerns of all clusters and balance cluster needs with growth pressures while maintaining sufficient open space, agriculture and industrial land to support the County’s economic competitiveness. To coordinate investment decisions with cluster representatives.

- **Improve Transportation Mobility:** To improve the movement of people, goods and services in and out of the County by identifying needs and mobilizing partners for planning and investment in needed improvements. To ensure that new transportation investments improve the competitive environment for the County’s clusters and are made with consultation with the clusters.

- **Increase Use of Alternative Energies:** To help foster increased usage of alternative sources of energy to reduce pollution and help spur the development of a local alternative energy industry.

4.4.3. Background

Long-range planning is difficult when local economies are changing fast, as is the case with Kern. Nevertheless, planners need to be strategic and consider the many forces at work on the economy. Cluster analysis provides a new basis for land use, infrastructure and transportation planning. Knowing which clusters are growing, and something about their typical needs for personnel, for facilities and for land provides a framework, or benchmark for establishing land use and other plans.

Kern County maintains a geographically advantageous and distinctive position within California and the entire West. For virtually every cluster in the County—from value-added agriculture to aerospace to tourism—accessibility and the costs and efficiency of goods movement are essential in enterprise formation, expansion and attraction. Improving the movement of people, goods and communications that are inbound, outbound and within Kern County is essential to maintaining and enhancing Kern County competitiveness. Transportation improvements will bring tangible economic benefits to all businesses in the County who need to ship or move...
goods on a timely basis as well as for residents who are moving throughout the County for work or during commute times. Moreover, incremental improvements will not only help retain and expand businesses already operating here, it will make Kern County more attractive as a location for production in each of the clusters for which goods shipment is a key cost factor. In Transportation, Logistics & Warehousing the weakest link in the chain can impede the entire value-chain from completing its delivery to end customers. Consequently every element of the road, rail or air service system in Kern County may be crucial to countywide economic competitiveness; every advantage a factor in success. For this reason, this initiative has been formed to bring together users and producers of the County’s transportation infrastructure to examine challenges and take action on strategic needs for the County’s future.

4.4.4. Structure

To respond to these important needs for coordination in infrastructure and land use planning, the County’s Planning Department will establish an economic development advisory group consisting of representatives of the industry cluster networks, government planners and others involved in land use and infrastructure planning. Working under the guidance of the County’s Resource Management Agency and its Planning Department, this advisory group, comprised of cluster co-chairs and including long-range planners from the County, the Kern Council of Governments and individual cities, will meet in an ongoing basis. Through this process, government would have access to top-level business leaders who are in the best position to understand the dynamics of their industry. These leaders should be a continuing source of long-range “planning intelligence”. This information should be used as economic input to the planning processes that today has been forced into a responsive position given the rapid growth and limited resources. With this source of economic input to long-range planning, Kern can move towards a smarter planning paradigm being adopted by many fast-growing communities that do not wish to lose their fundamental character and quality of life.

The proposed advisory group would also focus on infrastructure and transportation investments. See the infrastructure and transportation Flagships to identify specific recommendations. It is likely that the decision-making times for this advisory group would coincide with the decision making process for new investments in the County or beyond.

4.4.5. Strategy 1: Conduct Land Use Planning in a Way which is Responsive to the Short and Long Term Needs of the Clusters

- **Identify Leadership:** Establish the County’s Planning Department as the lead entity in carrying out comprehensive land use planning for the entire County yet coordinated with other planning jurisdictions, e.g., cities.

- **Establish Advisory Group:** Initiate a countywide advisory group consisting of representatives from all clusters to ensure that land use planning is conducted in a coordinated manner to account for the specific needs of the County’s clusters while preserving balanced growth with the economic needs of the environment. The advisory group will also ensure that land use decisions and infrastructure and transportation investments are made in ways which will most support the goals of the County’s economic strategy through improved coordination between the County planning department and the needs of the County’s industry clusters.

- **Review Planning Documents:** Gather and organize all existing plans and planning documents throughout the County and put together a collection of that information. Analyze
how these plans accommodate the project population growth and what important areas of
the County will likely be ‘lost’ to residential development.

- **Develop new Planning Framework**: Develop a “Cluster Competitiveness Land Use,
  Transportation and Infrastructure Planning Framework”. The framework would outline cluster
trends and their impacts regarding infrastructure and space, cluster-by-cluster.

- **Establish New Process for Cluster Land Uses**: Develop an expedited process for new
developments or investments which meet the goals of the strategy and have demonstrated
support from representatives of multiple industry cluster networks. Note that this
recommendation is meant to encourage land use decisions which support the goals of the
strategy (which combines job creation with equity/inclusion and maintaining open space /
reducing residential encroachment). Establish countywide “Cluster Expansion Team” to
facilitate applications and permits.

- **Provide Targeted Economic Incentives**: Give priority for use of the County's economic
  incentive program for developments which adopt cost saving approaches to land use and
  infrastructure (water/sewer).

- **Channel Growth**: Channel new growth into developed areas within communities to avoid
  additional loss of farmland and open space. Encourage residential growth within the existing
  “footprint” of Kern’s communities to reduce the infrastructure costs of new residential in
greenfields and the negative impact on farms and industry. One strategy to channel growth
into the existing communities is to invest additional resources within these communities such
as improving the pedestrian environment (sidewalks, new trees) as well as creating
neighborhood centers that bring together a mix of uses.

- **Encourage Infill Development**: Promote new infill and redevelopment of brownfields within
  the existing urban areas. One strategy to accommodate more housing within existing
  communities is to add “in law” units to the backs of lots or off of alleys. This provides new
  housing opportunities, particularly for aging parents or the married children of existing
  property owners. The County should consider supporting new communities of 12-15 homes
  per acre and encouraging neighborhood development with a mix of shopping, offices, open
  space and housing.

- **Expand County Planning Staff**: Expand the existing County planning staff to be able to
  more effectively conduct long range and strategic planning. The current level of staff requires
  that the department spend the majority of its energy in a responsive manner. There is a need
to hire personnel with responsibility for long-range comprehensive land-use planning for the
  County.

- **Establish Industrial and Agricultural Zones**: Establish and define new industrial and
  agricultural use zones throughout the County to accommodate projected growth in industrial
  activities. Create County industrial planning process to encourage coordination of localities
  on land use decisions.

- **Create Buffer Zones**: Use buffer zones and agricultural easements as various tools to slow
  the conversion of agricultural land to residential uses. Explore establishing urban growth
  boundaries around existing communities. Establishing buffer zones that maintain a
  separation between urbanized and agricultural areas allows both to coexist while providing
  needed open space to a growing urban population.

- **Plan Countywide Land Use Forum**: Encourage planners from all communities within Kern
  County to meet at a forum to discuss coordinating planning, incentives to preserve
agriculture (e.g. conservation easements), urban growth boundaries, residential encroachment, industrial zoning, air quality, rural planning and urban infill development.

- **Develop Land Use Vision:** Expand planning conference to countywide forum to develop land use vision. Follow models set in other communities such as Sacramento (See “Valley Vision”).
- **Modify Plans:** Review and modify existing County policies and documents (such as the General Plan) to determine if they meet the goals set forth in the County’s economic strategy.

### 4.4.6. Strategy 2: Support Cost-Effective Infrastructure

- **Encourage cost-effective development:** This will reduce the fiscal burden of building new infrastructure. Cost-effective development tools can include planned area developments which incorporate shared infrastructure, energy-efficiency, planning to reduce car-dependence (build near housing and with sufficient pedestrian options) and increased densities.
- **Identify New Local Funding for Infrastructure:** Capture the costs associated with new developments. Develop new approach to funding for water and sewer to account for costs of growth. Reconsider support for new “self funding” mechanism such as ½ cent sales tax.
- **Secure Federal Funds:** Gather political support to push for additional funding from EDA or the State to solve infrastructure needs. This may involve direct meetings with local representation in Sacramento and Washington D.C. Note that current EDA funding requests are not always met with significant local interest. The goal should be to gather the local political support to both identify the needs and secure the specific funding.
- **Establish Ongoing Meetings:** Establish regular meeting time between Cities, County and clusters to continually assess needs for all clusters in infrastructure and monitor funding/implementation of new projects.

### 4.4.7. Strategy 3: Ensure County Support and Access to Clean Energy Technologies

- **Encourage energy-efficient home construction:** This will reduce negative air quality impacts and reduce the costs of electricity for consumers. San Joaquin Valley has the highest electricity rates in the State. Encouraging new developments to be equipped with solar or other renewable energy technologies will reduce the long-term electricity costs.
- **Manage conflicts between different uses:** Manage potential conflicts between needs of clusters and other uses (such as residential).
- **Use Energy Saving Technologies:** Encourage all industries to implement energy saving technologies.
- **Provide Support for New Cluster:** Support the growth of a new Clean Energy Technology Cluster. This may involve County funding for a cluster developer who will work with local companies.
- **Establish Balanced Dairy Policy:** Allow only those dairies in the County under the condition that they capture the associated waste and produce substantial amounts of energy from it.
• Control Groundwater Runoff: Encourage agriculture industry to effectively maintain groundwater supplies.

**4.4.8. Strategy 4: Target New Transportation Investments Based on Cluster Needs**

• Establish Advisory Group: Identify team for advisory group to gather greater private sector input to transportation planning decisions. This advisory group could include the same participants as the advisory groups for land and infrastructure. The advisory group should work with the County Planning Department, Kern COG and the Transportation Foundation. If the County establishes a “Kern County Goods Movement Task Force” the advisory group should participate and also ensure cluster representation on this task force.

• Review Funding Decisions: Review all upcoming transportation funding decisions with cluster participants to determine if cluster needs are being addressed in the proposed investments. Prioritize among the proposed investments. Manage potential conflicts between needs across the clusters.

• Fund Streetscape Improvements: Create set aside within transportation investments to fund streetscape and main street improvements throughout the County. These improvements should help encourage the greater use of pedestrian and bicycling as an alternative to driving.

• Channel Transport Investments Within Developed Areas: Give priority to infrastructure investments which are inside the existing urban footprint. Support the development of new infrastructure for “greenfield” industrial development projects when it can be demonstrated that separating the development supports the County economic strategy’s goals.

• Identify Alternatives to New Investments before Funding: Before all major transportation investments which require completion of an EIR, work with local communities on a planning process to explore transportation alternatives. This process should go beyond the typical alternatives assessment of an EIR and incorporate solutions which identify operational efficiency improvements which are less expensive than the cost of the new infrastructure. By incorporating the clusters with the local communities, creative solutions may be developed which free limited transportation funds for other more economically beneficial projects.

• Proposed new transportation investments (Note: The County and its partners do not have control over most of these recommendations. They are offered here as a suggestion for investments which would have a positive impact on economic development).
  – Widen Route 119 near Taft.
  – Widen Seventh Standard Road along various sections near Highway 99.
  – Establish industrial corridors in key areas along highways 58 and 99 and along rail corridors to reduce the negative impact of residential encroachment.
  – Establish new east/west road crossing Bakersfield or make improvements to existing Highway 58 to facilitate smooth passageway across the city. These upgrades or new investments should be built in such a way to support the needs of the County’s clusters as well as to not jeopardize improvements in the County’s quality of life.
  – Make improvements on Highways 99 and 65. Quality and aesthetic improvements are needed.
Expand rail capacity, particularly in the route over the Tehachapi Summit. According to Kern COG estimates, there are 65 trains a day which pass through the currently congested summit and this is expected to increase to 100 trains per day over five to six years.

Expand direct air service to Bakersfield to help connect the County to other locations around the country and support the needs of clusters where direct connections to other cities is crucial for competitiveness (such as direct flights to Houston for the Energy and Chemicals cluster).

Focus on expanding the existing bus service and bicycle lanes to support alternatives to single occupancy auto travel.

- **Maximize use of non-County funded highways**: State and federal highways run throughout Kern County. Channeling some of the projected growth along those highways may have fiscal benefits to the County if some new transportation improvements are paid for by Sacramento or Washington. Note that encouraging development along these highways (particularly new industrial uses) should not result in adverse consequences such as inadvertently pushing more drivers away from these highways and onto County roads.

- **Support New Funding Source**: Identify and support new funding sources for transportation (such as County sales tax and regional traffic mitigation fee).

- **Support Inter-modal Facilities and Inland Ports**: Support the growth of inter-modal facilities in locations which can best make use of existing infrastructure and reduce conflict between different uses. Support the creation of an inland port in Shafter through engaging cluster representatives with the planning process to ensure that the County’s multiple clusters benefit.

- **Reduce Empty Backhauls**: Coordinate truck trips throughout the County to reduce backhauls with empty trailers.

- **Analyze Encroachment to Airports**: Analyze County growth patterns near airports to ensure that residential encroachment will not affect the airports’ abilities to develop related service adjacent to the airport.

- **Continue to Engage With State High Speed Rail Discussions**: Actively participate in the discussion about the possible high speed rail line linking San Francisco to San Diego. In particular, the County’s cluster networks should participate in the issue of routing and whether it will follow the Interstate 5 into Los Angeles or head east from Bakersfield towards Tehachapi and the Antelope Valley. Ensure that local planning provides sufficient infill development and residential densities to support a viable feeder rail network to link to the high speed rail line.

### 4.4.9. Timing

This initiative should begin as soon as possible in 2005. Because decisions about investments and land uses are made constantly, developing the advisory group during the first quarter of the year will ensure that there is formal private sector participation. It is unlikely that the cluster networks will be fully developed. Therefore, KEDC staff should initiate the advisory group process with the planning department and the COG. As the cluster networks develop, KEDC can bring cluster co-chairs or other interested cluster participants to become part of the advisory group.
4.4.10. Resource Requirements

The majority of the recommendations do not require additional resources. In the medium term, there will be a need to fund additional staff for the planning department in order to be able to fully conduct long-range planning. This may require 2-3 additional staff with one staff focused on working with the industry cluster groups and representing the County at cluster network meetings. These same staff people will also work directly on the land use, infrastructure and transportation Flagships.
4.5. Flagship 4: Tourism Marketing and Branding Kern County

4.5.1. Summary
This flagship proposes that the Board of Trade or another countywide entity become the leading voice for tourism and tourism marketing by establishing a new countywide brand and working closely with the various local communities on their tourism and marketing strategies.

4.5.2. Goals

- **Improve County’s Image:** Strengthen the current external and internal image of the County by focusing on the diverse assets in Kern and on existing efforts to brand the County’s distinct communities.

- **Align Tourism Activities Countywide:** Align the various tourism marketing efforts throughout the County and channel these activities into a countywide initiative.

4.5.3. Background
The 1999 Kern Economic Development Strategy recommended that the Board of Trade focus on the development of three “clusters”: tourism, retirement and film. While tourism remains a significant source of employment, retirement and film cannot be considered “clusters” deserving of specific countywide attention. Instead, there is a greater need for a renewed approach to marketing and tourism development and coordination on a countywide level.

4.5.4. Structure
The Board of Trade will maintain its tradition role as the Tourism agency for the County and work directly with the smaller communities. This Flagship does not have the same cluster participation as the other ones except in the event of a countywide branding process. Other than specific activities which require direct linkage with other clusters, this Flagship is the specific tourism cluster network development activity. Therefore, it is recommended that the leadership of the Board of Trade work closely with KEDC to understand their cluster network development process. While tourism will not have the same scale of cluster network development, knowledge of, and consistency with the KEDC process will be necessary to avoid retraining or unlearning later. Further, because KEDC will have the ongoing responsibility for marketing and branding of the other clusters, the Board of Trade should work closely with KEDC on any countywide branding activities.

4.5.5. Strategy 1: Establish Countywide Tourism Marketing and Development Entity

- **Consolidate Board of Trade:** Refocus Board of Trade to become single coordinated voice for countywide tourism marketing and promotion. The new entity will manage this Flagship. The functions to focus primarily on tourism marketing because of need for countywide voice. The new tourism agency will proactively work with local Chambers of Commerce on the development of tourism in each community in the County and coordination among the communities.
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- **Conduct Tourism Strategy Coordination**: The new tourism agency will proactively work with local Chambers of Commerce on the development of tourism in each community in the County. The agency will identify local leaders in each community who will participate countywide. Develop packages that link activities/attractions throughout the County.

- **Strengthen Core Assets**: Focus newly redesigned tourism marketing entity on Kern’s core assets:
  - Bakersfield Basque culture/cuisine and music (“Bakersfield Sound”)
  - Kern River Valley outdoors activities (such as river rafting, hiking, horseback riding, etc.)
  - Agricultural tourism (growth opportunity)
  - High desert (growth opportunity)

- **Expand Growing Markets**: Build and expand economic impact of growing markets (such as Visiting Friends and Relatives – VFR, Southern California and retirees).

- **Establish tourism packages**: which include the small rural communities in the County as well as Bakersfield. Create coordinated tourism experience in Kern. Connecting urban visits with outer areas will encourage longer stays.

- **Work with Rural Communities**: Help rural communities establish mix of tourism activities, including restaurants, shopping, lodging and groupings of local attractions.

- **Remove Film Activities**: Move Film activities into County RMA as a “film permit processing” function. Maintain Kern Film Commission within Board of Trade.

### 4.5.6. **Strategy 2: Develop County Brand**

- **Develop Branding Tool Kit**: Increase regional/international awareness of Kern County by developing a marketing strategy and brand representing the diversity of the County, using a ‘branding tool kit’.

- **Launch a Marketing and Branding Initiative**: Establish a unified marketing message focusing on an external audience (to attract firms and people) and a unified marketing message focusing on an internal market (to enhance the image of Kern County within the various cities and communities, making clear the advantages of living and working in Kern). Conduct perceptions survey internally and externally. Have branding focus on core assets and growing markets.

- **Establish “Kern Brand”**: There is currently no specific brand for the entire County. The recently completed Bakersfield brand serves as a model for the process though cannot be applied to the entire County. This may require a larger citizen involvement and/or the hiring of a firm involved in branding. Note that many of the competencies that led to the successful adoption of “Life as it should be” are within Kern County.

- **Implement Plan**: Develop and implement new County marketing plan.

- **Main Street Program**: Establish “main street” program to improve the look of Kern’s distinct and historic rural downtown streets.
4.5.7. **Timing**

This initiative should begin early in 2005. ICF proposes that the County resolve the functions of the Board of Trade in Q1 2005. The other activities in the flagship will be ongoing. The branding and marketing strategy should be conducted no sooner than Q4 2005.

4.5.8. **Resource Requirements**

The proposed flagship may result in initial cost savings to the Board of Trade because of a reduction in responsibilities. However, the proposed branding and marketing strategy may be a major cost (potentially $400,000-$500,000). The cost of the branding and marketing strategy could be shared between the County and the various communities involved in the strategy, including private sector entities such as Chambers of Commerce.
Flagship 5: Financing Entrepreneurship and Innovation

4.5.9. Summary
This flagship proposes that CEDD and KEDC develop new programs which respond to the finance needs of Kern County’s innovative entrepreneurs – whether in microenterprise or R&D intensive technology-based ventures.

4.5.10. Goals
• Access to Capital for Microenterprises: Provide entrepreneurial opportunities for low and moderate income people to establish new business in the clusters through establishing a microenterprise loan program.
• Access to Capital for High Risk Innovative Enterprises: Establish system to effectively provide support for countywide financial capital/angel/venture funding initiatives. Increase the availability of early stage (seed) and venture capital from within the County and beyond to increase the formation and expansion of cluster enterprises.
• Inform Investors of Cluster Opportunities: Facilitate access to financing for start-up and growth companies by improving knowledge of the County and its industries among lenders/investors, and by linking entrepreneurs to lenders/investors/funding agencies.

4.5.11. Background
A hallmark of economic prosperity is the ability of a County to secure the financing needed to catalyze and grow new enterprise in emerging and expanding clusters. Though Kern may have limited sources of financing, the State of California overall has substantial capital among its high net worth individuals (angel investors), within existing institutions (pension funds) and from venture capitalists in both Southern California and the Bay Area.

The history of investment by individuals and institutions in Kern County suggests that capital has predominantly flowed to familiar asset categories, such as agriculture, oil, energy, real estate and construction and less to new enterprises formed within the County in newer ventures. The most notable exception to this trend is the funding for SpaceShipOne by Paul Allen. The reason for this pattern has to do with the investor's familiarity with existing types of investment and their risk-reward structure. In order for capital to flow to other investments, such as those within emerging or more risky clusters (including new aerospace activities), potential investors must be educated about the nature of these investments. They must also be provided with a sufficient volume of candidate deals (at different stages) that meet the test of the competitive marketplace. Additionally, local entrepreneurs seeking investment capital must educate potential investors regarding risk return characteristics and management requirements of knowledge-based investments and must do so in terms with which the investors are more familiar. When the investment climate meets these conditions—good understanding by investors of opportunities, risks and rewards, and high volume and choice of investments—a successful capital pipeline will emerge. This pipeline will both enhance the development of regional enterprise and attract more entrepreneurs and supporting investment.

To further understand the microenterprise opportunities in Kern County, the following section provides additional background.
Analysis of Entrepreneurial and Micro-Enterprise Opportunities

DESCRIPTION OF OVERALL MICROENTERPRISE AND ENTREPRENEURIAL OPPORTUNITIES

Overall, 11.3% of Kern County households earn income from self-employment activities in 1999. Fully 23,519 households earned a total of $675,413,500 in aggregate income in 1999, or $28,718 per household.

As indicated in the table below, 24,361 sole-proprietor establishments earned gross receipts of $923 million ($37,920 per sole-proprietorship) in 1997, the most recent year for which there is data at the County level. Among the highly-recommended clusters the self-employed are concentrated primarily in: Transportation, Logistics & Warehousing; Business and Professional Services; and Health Services and Medical Technologies. In the overall economy, the self-employed are prevalent in construction, retail trade, social assistance, and professional, technical and scientific services.

<table>
<thead>
<tr>
<th>NAICS Code</th>
<th>Description</th>
<th>Total Self-Employed</th>
<th>Receipts ($1,000)</th>
<th>Receipts / Self-Employed Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>111-115</td>
<td>Forestry &amp; Agriculture Support Services</td>
<td>352</td>
<td>20,018</td>
<td>$ 56,869</td>
</tr>
<tr>
<td>311</td>
<td>Food Manufacturing</td>
<td>31</td>
<td>2,197</td>
<td>$ 70,871</td>
</tr>
<tr>
<td>312</td>
<td>Tobacco Manufacturing</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Subtotal Value-Added Agriculture</td>
<td>383</td>
<td>22,215</td>
<td>$ 58,003</td>
<td></td>
</tr>
<tr>
<td>211-213</td>
<td>Oil &amp; Gas Extraction</td>
<td>267</td>
<td>21,525</td>
<td>$ 80,618</td>
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<tr>
<td>221</td>
<td>Utilities</td>
<td>55</td>
<td>5,004</td>
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<tr>
<td>237</td>
<td>Heavy &amp; Civil Engineering Construction</td>
<td>131</td>
<td>6,838</td>
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</tr>
<tr>
<td>324</td>
<td>Petroleum and Coal Products Manufacturing</td>
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<td>D</td>
<td>D</td>
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<tr>
<td>325</td>
<td>Chemical Manufacturing</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>326</td>
<td>Plastics and Rubber Products Manufacturing</td>
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<td>D</td>
<td>D</td>
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<tr>
<td>Subtotal Energy &amp; Chemicals</td>
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<td>33,367</td>
<td>$ 73,658</td>
<td></td>
</tr>
<tr>
<td>Cluster: Logistics and Warehousing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>Transportation &amp; warehousing</td>
<td>1,029</td>
<td>68,772</td>
<td>$ 66,834</td>
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<tr>
<td>5324</td>
<td>Commercial &amp; Industrial Equipment Rental &amp; Leasing</td>
<td>131</td>
<td>6,608</td>
<td>$ 50,443</td>
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<tr>
<td>8113</td>
<td>Repair and Maintenance (Except Automotive)</td>
<td>99</td>
<td>3,810</td>
<td>$ 38,485</td>
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<tr>
<td>Subtotal Logistics &amp; Warehousing</td>
<td>1,259</td>
<td>79,190</td>
<td>$ 62,899</td>
<td></td>
</tr>
</tbody>
</table>

Gross receipts are higher than income because sole-proprietorships subtract expenses from gross receipts to get self-employment income.

One note about Value-Added Agriculture, clearly most farm and agricultural workers are seasonal migrants often working in the underground economy, so the self-employment number for agriculture includes only the legal tax-paying self-employed and thus under-represents self-employment in the cluster as a whole.
Chapter 4 - Flagships

Cluster: Business & Professional Services
54 Professional, scientific, & technical services  3,988  110,939  $ 27,818  
   Administrative & support & waste management & remediation services  1,709  34,782  $ 20,352 
611 Educational services  295  2,727  $ 9,244  
   Subtotal Business & Professional Services 5,992 148,448  $ 24,774

Cluster: Healthcare & Technology
62 Health care & social assistance  1,982  56,892  $ 28,704 
   Health Care Instruments Manufacturing  D D D  
   Subtotal Healthcare & Technology 1,982 56,892 $ 28,704

Tourism, Recreation, & Entertainment
71 Arts, entertainment, & recreation  769  14,377  $ 18,696 
72 Accommodation & foodservices  385  16,021  $ 41,613 
   Motion Picture and Sound Recordings  56  1,170  $ 20,893 
   Subtotal Tourism, Recreation, & Entertainment 1210 31,568 $ 26,089

Cluster: Aerospace
336 Aerospace  D D D

Non-Cluster Self-Employment Opportunities
23 Construction  2,410  149,934  $ 62,213 
31-33 Manufacturing  453  20,268  $ 44,742 
44-45 Retail trade  3,348  123,624  $ 36,925 
52 Finance & insurance  737  32,996  $ 44,771 
53 Real estate & rental & leasing  1,808  111,037  $ 61,414 
81 Other services (except public administration)  4,051  88,628  $ 21,878 
   Subtotal Non-Cluster 12,807 526,487 $ 41,109

All industries  24,361 923,772 $ 37,920

Source: 1997 Economic Census; MJC 2004
D= Withheld to avoid disclosure (e.g. one business in this sector)
* = NAICS codes: 481,484-486, 488, 492, 493

Overall future microenterprise and self-employment opportunities are likely to reflect similar concentrations, with the majority of new opportunities for LMI individuals in the retail trade, construction, real estate rental and leasing services, health care, professional and technical services, transportation and warehousing, and arts entertainment and recreation sectors.

Outline of Specific Opportunities for LMI-Owned Micro-Enterprises

Microenterprise and self-employment opportunities for LMI people are characterized by businesses that require lower capital investments, education, and skills than the typical entrepreneurial activity. In general LMI individuals have fewer retained earnings to invest in a microenterprise. Likewise the LMI business-owner usually obtains skills “on-the-job” prior to starting their business. Consequently, LMI-owned enterprises tend to be in highly competitive sectors because of relatively low barriers to entry. As indicated in Table 35 below, LMI persons are likely to find the best self-employment opportunities amongst the highly recommended clusters in the following sub-sectors: forestry and agriculture support services, transit and ground transportation, couriers and messengers, administrative support services, health care assistance, and arts entertainment and recreation services.
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Table 35. Self-Employment Opportunities for LMI People in Clusters, Kern County

<table>
<thead>
<tr>
<th>NAICS Code</th>
<th>Description</th>
<th>Total Self-Employed</th>
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<tr>
<td>Cluster: Logistics and Warehousing</td>
<td>485 Transit and Ground Passenger Transportation</td>
<td>77</td>
<td>2,506</td>
<td>$32,545</td>
</tr>
<tr>
<td>Cluster: Logistics and Warehousing</td>
<td>488 Support Activities for Transportation</td>
<td>40</td>
<td>1,879</td>
<td>$46,975</td>
</tr>
<tr>
<td>Cluster: Logistics and Warehousing</td>
<td>492 Couriers and Messengers</td>
<td>111</td>
<td>2,402</td>
<td>$21,640</td>
</tr>
<tr>
<td>Cluster: Logistics and Warehousing</td>
<td>8113 Commercial &amp; Industrial Equipment Repair &amp; Maintenance</td>
<td>99</td>
<td>3,810</td>
<td>$38,485</td>
</tr>
<tr>
<td>Cluster: Logistics and Warehousing</td>
<td>Subtotal Logistics &amp; Warehousing</td>
<td>327</td>
<td>10,597</td>
<td>$32,407</td>
</tr>
<tr>
<td>Cluster: Business &amp; Professional Services</td>
<td>56 Administrative, support, waste management, remediation services</td>
<td>1,709</td>
<td>34,782</td>
<td>$20,352</td>
</tr>
<tr>
<td>Cluster: Business &amp; Professional Services</td>
<td>611 Educational services</td>
<td>295</td>
<td>2,727</td>
<td>$9,244</td>
</tr>
<tr>
<td>Cluster: Business &amp; Professional Services</td>
<td>Subtotal Business &amp; Professional Services</td>
<td>2,004</td>
<td>37,509</td>
<td>$18,717</td>
</tr>
<tr>
<td>Cluster: Healthcare &amp; Technology</td>
<td>62 Health care &amp; social assistance</td>
<td>1,982</td>
<td>56,892</td>
<td>$28,704</td>
</tr>
<tr>
<td>Cluster: Healthcare &amp; Technology</td>
<td>Subtotal Healthcare &amp; Technology</td>
<td>1,982</td>
<td>56,892</td>
<td>$28,704</td>
</tr>
<tr>
<td>Tourism, Recreation, &amp; Entertainment</td>
<td>71 Arts, entertainment, &amp; recreation</td>
<td>769</td>
<td>14,377</td>
<td>$18,696</td>
</tr>
<tr>
<td>Tourism, Recreation, &amp; Entertainment</td>
<td>72 Accommodation &amp; foodservices</td>
<td>385</td>
<td>16,021</td>
<td>$41,613</td>
</tr>
<tr>
<td>Tourism, Recreation, &amp; Entertainment</td>
<td>Motion Picture and Sound Recordings</td>
<td>56</td>
<td>1,170</td>
<td>$20,893</td>
</tr>
<tr>
<td>Tourism, Recreation, &amp; Entertainment</td>
<td>Subtotal Tourism, Arts &amp; Entertainment</td>
<td>1210</td>
<td>31,568</td>
<td>$26,089</td>
</tr>
</tbody>
</table>

Source: 1997 Economic Census; MJC 2004

LMI individuals will also find self-employment opportunities in the construction, retail trade and real estate sectors, see the table below:

Table 36. Self-Employment Opportunities for LMI People in Other sectors, Kern County

<table>
<thead>
<tr>
<th>NAICS Code</th>
<th>Description</th>
<th>Total Self-Employed</th>
<th>Receipts ($1,000)</th>
<th>Receipts / Self-Employed Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Construction</td>
<td>2,410</td>
<td>149,934</td>
<td>$62,213</td>
</tr>
<tr>
<td>44-45</td>
<td>Retail trade</td>
<td>3,348</td>
<td>123,624</td>
<td>$36,925</td>
</tr>
<tr>
<td>53</td>
<td>Real estate &amp; rental &amp; leasing</td>
<td>1,808</td>
<td>111,037</td>
<td>$61,414</td>
</tr>
<tr>
<td>81</td>
<td>Other services (except public administration)</td>
<td>4,051</td>
<td>88,628</td>
<td>$21,878</td>
</tr>
<tr>
<td>Subtotal Non-Cluster</td>
<td>11,617</td>
<td>473,223</td>
<td>$40,735</td>
<td></td>
</tr>
</tbody>
</table>

Source: 1997 Economic Census; MJC 2004
4.5.12. Structure

This Flagship proposes a two-tiered approach based on the specific types of financing needs. CEDD will be responsible for the oversight of all existing and new County lending programs and will work with KEDC to develop venture forums and potential angel network. CEDD will be responsible for the oversight of select economic development financing tools available through the County: microenterprise, revolving loan fund (if it survives), Section 108, and industrial development bonds (IDB)—if County is to be issuer. The use of IDB financing will be reserved for new or existing businesses whose expansions and investments meet the goals of this economic strategy. KEDC will often be the entity which brings these prospective IDB deals to the County for review. KEDC will also be responsible for the longer-term strategy of identifying and securing higher risk capital for new ventures in the cluster economy.

4.5.13. Strategy 1: Provide Micro-Enterprise Funding for Small Scale Start-Ups in the Clusters

- Establish Program: In the short term, establish microenterprise program in the County to provide funding to encourage LMI entrepreneurs to participate as suppliers of services in cluster. (i.e. caterers in tourism; truck drivers in transportation; small-scale farmers in value-added agriculture; contracting to support development in all clusters).

- Conduct Outreach: CEDD will collaborate with countywide business development service providers (e.g., Small Business Development Center) to support, where appropriate, training and education for business start-ups and expansions. Although the program will not be limited to firms who identify with a particular cluster, special effort should be made to identify investments which provide entryways into the cluster economy (i.e. truck drivers for Value-Added Agriculture or Transportation, Logistics & Warehousing, small hotel operators in Tourism, Recreation & Entertainment or cleaning companies in Business and Professional Services).


- Large Scale IDB Project Financing: In the medium term, establish County-backed credit facility as part of attraction strategy to lower cost and risk of locating food processing, plastics manufacturing, and other major cluster firms in Kern.

4.5.15. Strategy 3: Develop Access to High Risk Capital

- Funds for High Risk Innovators: This longer term view is to develop a Kern “capital pipeline” for higher risk investors and developing a distinctive ‘Kern-focus’ while at the same time connecting effectively with ongoing capital market development in California.

- Expand Tomatoes on Steroids program: Program to include focus on expanding access to venture funding in County. The program will identify deserving entrepreneurs throughout the clusters to determine interest in providing access to high risk capital.

- Identify, develop and educate investors: The goal is to improve access to financing for, in particular, early stage companies in Kern. Host seminars for investors/traditional financial organizations in clusters to educate on risk management. Develop very specific insights into risk-return characteristics of specific investment opportunities that are taking shape in the
County, including: alternative energies; value-added agriculture; aerospace; medical technologies; tourism, recreation and entertainment; and transportation, logistics & warehousing, among others. Each cluster has distinct lending needs which can be addressed in a collaborative dialogue. Lenders need to appropriately analyze clusters and their growth potential.

- **Develop Online Finance Education Tool:** Develop database of potential lenders/investors. This database will have names of investors as well as general criteria for financing at various stages of business and industries. Provide this information in an online format. Determine and secure host for database.

- **Establish Finance Advisory/Mentorship Team:** Increase the volume of deal financing by establishing a finance advisory team to assist entrepreneurs on business plans. Consider establishing a cluster business mentorship program to assist entrepreneurs with need for advice from business experts. Focus on how to seek financing by providing inventory of community resources, tick list of criteria to take care of (e.g., patents, incorporation etc) to better prepare themselves for a financing approach.

- **Identify Intermediaries for Angels and Investment Groups:** Work with partners to identify money managers, investment bankers, bankers, venture capital firms and other intermediaries who manage capital for individuals or institutions in Southern California or even within Kern.

- **Conduct Investor Outreach:** Hold educational forums for investment advisors and investors to introduce the market opportunities for investing in Kern-specific cluster enterprises. Limit focus to demonstrating positive risk-return features of clusters and potential for adequate sources of deals. Invite investors to participate in a countywide angel network or venture network.

- **Prepare and Screen Angel and Venture Deals:** Work with appropriate partners to identify, prepare and screen candidate angel and venture stage deals within each cluster. If appropriate, establish ‘entrepreneurship boot camp’ program to be held on a period basis.

- **Produce a Kern County Venture Forum:** Organize and convene Venture Network event, emphasizing Kern companies of sufficient development and readiness. Invite statewide investors to the event. Work with local banks to invest seed money. Identify additional high net worth individuals locally to invite to the event.

- **Establish New Sources of “Angel” and Venture Capital:** High-net-worth investors have always been important sources of early-stage financing for companies, and more so in recent years. These “angels,” as they are called, may invest individually or through groups of like-minded individuals in venture capital pools. They could also form a Kern County Angel Network to continually fund local innovations (potentially also working with the banks and the seed money invested).

- **Present Candidates to Appropriate Investment Networks:** Organize and convene regular Angel Network events (quarterly or more often if desired) to provide ‘first look’ opportunity to angels. Manage these meetings to ensure effective screening and buffering of contacts working with intermediaries as appropriate.

- **Communicate Investment Climate Success Stories:** Prepare and distribute via print and web the results of the improved and more efficient capital pipeline in Kern County. Develop a marketing plan to promote the investment opportunities in Kern (working with cluster network developer).
4.5.16. **Timing**

The County should consider existing proposals to establish a microenterprise program in Q2 2005. The proposals regarding IDB should be pursued over time as KEDC and the County become aware of firms which would benefit from the County’s use of such bonds. The proposals regarding angel networks or venture forums should be pursued no earlier than 2006 as KEDC builds up its cluster groups and better understands their needs for high risk capital.

4.5.17. **Resource Requirements**

There are no new resources needed for this flagship. The microenterprise program is a reuse of existing funds, the IDB does not necessarily result in costs to the County and VC/angel funding will come from private sector.
### 5. Implementing and Monitoring the Strategy

#### 5.1. Implementation

To implement the countywide strategy presented here, ICF recommends that the following steps be taken:

- Identify a lead agency responsible for the implementation,
- Organize a Stewardship group to report on progress and oversee activities,
- Establish responsible agencies for each flagship,
- Prioritize among flagships, and
- Secure funding for key recommendations, starting with the hiring of cluster developers.

#### 5.1.1. Managing the Strategy: The Lead Agency

No countywide competitiveness strategy can succeed that does not have an organization dedicated to sustaining and overseeing the strategy’s collaborative activities from the individual cluster groups and cluster action initiatives to the implementation of the other Flagships. ICF recommends the County’s Community and Economic Development Department (CEDD) serve as the lead agency responsible for overseeing the implementation of the entire strategy. CEDD will be assisted by a variety of agencies and entities that will be individually responsible for various parts of the strategy. CEDD will also work with KEDC, ETR, school districts and others on a stewardship group which will report progress of the strategy to the Board of Supervisors. These roles are explained in greater detail in the sections below.

#### 5.1.2. Overseeing the Strategy: The Stewardship Group

The Stewardship group is proposed to be able to monitor the Flagships, the individual cluster actions and the overall implementation of the strategy. The group will oversee and evaluate the outcomes of the Flagship initiatives, present these outcomes to the Board and provide political or community leadership on the implementation of recommendations or actions. Other activities by stewardship group members are certainly feasible as determined through their own deliberative process and countywide feedback.

Membership in this group will include both permanent and rotating members. The permanent members will be the agencies and entities who managed the economic development strategy:

- Kern County Community and Economic Development Department (CEDD),
- Kern Economic Development Corporation (KEDC),
- Employers’ Training Resource (ETR), and
- Kern County Human Services Department (DHS).
In addition to the permanent members, there will be a series of rotating members including each cluster co-chair\(^{21}\), a representative from each agency responsible for the Flagship initiatives and community representatives. In some cases the permanent members are also responsible for a specific Flagship. In these cases, the Flagship representative will be someone other than the permanent member representative on the stewardship group and will speak to the issues raised in the implementation of the specific Flagship. It is likely that the stewardship group will have approximately 20 representatives.

ICF proposes that the Stewardship group replace the function of the existing CEDS Committee. Members of the CEDS Committee can participate on the new Stewardship group as either community members or if they are selected as cluster co-chairs. If the County chooses, it could appoint all CEDS Committee members as permanent members of the Stewardship Committee. However, the replacement of the CEDS Committee must be consistent with EDA guidelines.

The Stewardship group should meet at least quarterly throughout 2005 and may meet as infrequently as twice a year in 2006 and beyond. The main function is to oversee the implementation of the various components of the strategy and provide a report to the Board of Supervisors on progress.

The Stewardship group should also sponsor or co-host an annual report on strategy progress. This event would build on the Stewardship activities, report on the progress of the cluster networks, Flagship advancement and monitoring of performance. This could include an annual report to the County communities and become a shared forum for better understanding and advancing Kern County’s economic progress. The event could possibly coincide with the ongoing Kern Economic Summit.

### 5.1.3. Structure of Flagships: Roles for Leaders and Agencies to Play

Flagships require commitment and structure to effectively pursue. Therefore, each Flagship has been assigned to a particular agency or entity willing to take a leadership role in ensuring that the Flagship is pursued. This agency/entity will coordinate the activities of the Flagship and then work to build a supporting team to develop and implement the Flagship. Leadership may include hosting, convening, building collaborative teams and managing strategic decision-making.

The following table depicts how each Flagship will report to a Strategy Stewardship group which will ultimately report its progress to the Board of Supervisors and other cities which choose to adopt the countywide strategy. Note in the diagram that the “cities” are to the right of the Board of Supervisors to designate that they can also receive reporting from the Stewardship group. However, because this is a countywide strategy, the Board is the ultimate body responsible for the implementation of the strategy’s content.

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\(^{21}\) The cluster co-chair is usually a private sector figure who takes a leadership responsibility in the development of the cluster network. Leadership includes participation in the cluster networks and stewardship meetings as well as working to ensure that there is broad participation from throughout the cluster in the cluster network meetings.
The following are descriptions for each of the agencies and their role in the overall strategy management:

- **Resource Management Agency (RMA):** The RMA provides leadership on two Flagships as well as the overall strategy. The key agencies within the RMA are the County’s Planning and Community and Economic Development Departments. The specific RMA role is more of oversight while the agencies within the RMA will be chiefly responsible for the specific initiatives.

- **Community and Economic Development Department (CEDD):** CEDD functions as the main agency which will oversee the entire strategy implementation while only having responsibility for the Finance, Innovation and Entrepreneurship Flagship (with the assistance of KEDC).

- **Workforce Investment Board (WIB):** The WIB is the chief entity responsible for workforce development in the economic strategy. The WIB’s staff, Employers’ Training Resource, will manage the day-to-day work of the workforce development Flagship at the behest of the WIB board. The WIB and ETR will engage all other major educational providers in the County to participate in the review and redesign of training programs to more appropriately meet the needs of the clusters (such as CSU Bakersfield, community colleges, private universities and public junior high and high schools).

- **Kern Economic Development Corporation (KEDC):** As the County’s main economic development arm, KEDC will be responsible for developing and managing the cluster networks and using those relationships to effectively shape its business expansion, attraction and retention programs. This proposal is for an expansion of the current activities of KEDC (which are currently limited to one specific cluster). Further, KEDC will use its “Tomatoes on
Steroids” small business program as a vehicle to understand the financing needs of high risk businesses within the County to help inform the Finance Flagship.

- **County Planning Department**: The Planning Department within the RMA will be responsible for the land use and infrastructure Flagship. As the leading planning agency—yet coordinated with other planning jurisdictions—for the entire County (due to the large amount of County land and the joint planning authority with the City of Bakersfield on the Metropolitan Bakersfield plan), the County Planning Department is best suited to manage and guide the cluster-based approach to its land-use, transportation and infrastructure planning. The County Planning department will be responsible for managing the meetings of the advisory group and for reviewing and implementing the recommendations in this strategy report.

- **Board of Trade**: The Board of Trade’s role in the County is clearly in transition. This strategy provides recommendations which can be applied whether or not the Board of Trade remains a viable independent entity or whether it is absorbed by a different entity within the County. For the purposes of the implementation of the strategy, the Board of Trade’s functions should be entirely focused on developing tourism and organizing a countywide branding strategy. The film activities formerly within the Board of Trade should become part of the County RMA and should be focused on permit assistance. The retirement focus should become absorbed within the tourism or marketing activities as a specific market segment for the County to attract. The Board of Trade (or the new entity it becomes) should identify personnel with expertise in tourism, branding and marketing as well as people with strong relationships throughout the County. It is essential for the tourism focus of Kern to align the various activities across the smaller communities with events in the larger cities.

### 5.1.4. Prioritizing Flagships

The five Flagships have been identified as the key strategic actions to take to implement the economic strategy and reach the goals set forth in the introduction. Since resources and time are limited, it is necessary to prioritize among these Flagships. Given the specific needs of Kern County, the following is a proposal for how to prioritize the Flagships.

The key to successful implementation of this strategy is the careful and effective development of cluster networks. These private-sector led networks provide the bottom-up energy and market-based information which should guide policy makers in the design of programs and the investment decisions for major public investments. The cluster networks are also proposed as the source of industry needs within all other Flagships. Without proper organization of the cluster networks, the other recommendations lack an organized linkage to the marketplace. Therefore, ICF recommends that developing the cluster networks should be the immediate and highest level priority in the implementation of the strategy. As noted in the cluster network Flagship, it is proposed that KEDC hire four to five additional business developers to work on developing cluster networks for the following clusters:

- Health Services and Medical Technologies
- Business and Professional Services
- Aerospace and Defense
- Value-Added Agriculture
- Energy and Chemicals
After the development of the cluster networks, the two other Flagships with greatest urgency are Human Resources and Land Use and Infrastructure. Improving skills and managing population growth / urbanization are the key challenges before Kern County. Because these Flagships are staffed by entirely different agencies and do not require substantial new resources, it will not be difficult to implement these two Flagships simultaneously. However, the effectiveness of the Flagships is based on the extent to which the private sector, through the vehicle of the cluster networks, is well organized. Therefore, these Flagships will require the creation of cluster networks in order to be fully implemented.

The marketing/tourism Flagship and finance Flagship are both significant to the County’s long term economic competitiveness. These Flagships do not require the immediate attention of the other three. ICF proposes that the County implement aspects to these Flagships in the short term and then pursue other elements over the medium term. For example, the County should adopt a microenterprise policy and program given that there is a current proposal to make use of the existing revolving loan fund. The recommendations regarding expanding the use of IDBs, organizing venture forums or conducting a countywide branding process can be implemented in the future.

5.1.5. Proposed Timeline

The following table is a proposed timing for various aspects of the strategies over the first year. The goal is to stagger the introduction of key aspects of the overall strategy to manage work flow while also maintaining the strategy’s momentum.

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
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<td>Strategies</td>
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<td></td>
<td></td>
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<tr>
<td>Cluster Networks / Business Attraction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hire Cluster Developer: Business and Professional Services, V-Added Ag, Health Services, Aerospace Services</td>
<td>Hire Cluster Developer: Energy and Chemicals</td>
<td>Focus recruitment on: Health Services, Aerospace</td>
<td>Focus recruitment on: Renewable Energy, Food Processor</td>
<td>Focus recruitment on: Business and Professional Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Resources</td>
<td>Advisory Group Formed</td>
<td>Curriculum review and redesign</td>
<td>Begin meetings with clusters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Use-Transportation Infrastructure Advisory Group</td>
<td>Advisory Group Formed</td>
<td>Document / plan review</td>
<td>New planning designations/ investments proposed</td>
<td>Plan for Countywide Planning Vision and Forum</td>
<td>Hold planning forum/ visioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourism/Marketing</td>
<td></td>
<td></td>
<td>Begin tourism work with smaller communities</td>
<td>Begin internal perception strategy</td>
<td>Hire Marketing firm to conduct countywide branding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.1.6. **Applying Economic Strategy Goals to the Flagships**

Each Flagship has different objectives and recommendations. However, it is expected that within the Flagship initiatives, the participants will apply the key goals of the overall economic strategy to their decision-making. This is meant to ensure that the County’s economic development proceeds according to a series of collaboratively identified values and objectives. The following are suggestions for how decision-makers should review new policies or investments through implementing the strategy goals:

- **Expand Jobs and Overall Prosperity**: How will this investment support the growth of Kern’s economic engines, its industry clusters? Example: If the County is considering planning or additional funding for a road widening project, it should ask the question about which clusters will benefit and how. Will the project facilitate greater travel for commuters or exporters? What are the externalities caused by the road widening which may negatively impact a different cluster, such as tourism.

- **Foster Inclusion and Increased Equity**: How will this activity or policy result in increasing the participation of Kern’s LMI population or increasing the diversity of the decision-makers? Example: If the County is proposing funding for a new community college program or community center in a particular part of the County, it should look at whether the action opens up new opportunities for low income people to participate in the economy or if there are better uses of these funds to foster equity. The County should also consider whether or not it is providing incentives for firms who also share the goal of fostering inclusion and equity, either through the level of employee remuneration or labor and employment practices. The County should encourage a high road approach to economic development at all times.

- **Promote Sustainability and High Quality of Life**: How are these decisions helping us preserve our agricultural heritage and open spaces while improving our air quality? Example: If there is a request for County approval to rezone 100 acres of farm land to allow for a housing subdivision or a warehouse, the County should consider the overall rate of farmland conversion or the location of the farm land being converted. Will the new use take away needed open space or valuable and still productive soil. Will the change irrevocably alter the landscape in such a way that will be displeasing to the area residents?

As growth continues in the County it is likely that there will be increasing friction between different interests, particularly related to land uses, air quality and public investments. Applying these goals to decision-making will require decision-makers to frame their investments from a broad economic perspective which will ultimately benefit the County. The examples provided are only a few in the myriad examples likely to come before the County. The general goal will be to make the most of every opportunity and to expect the most for the County.

5.2. **Reporting Progress: Suggestions for Kern’s New Monitoring System**

As the strategy is implemented starting in 2005 and beyond, it will be necessary to track the County’s economic progress as well as Flagship initiatives and specific cluster actions that will shape the County’s economic future. The following is a proposal for how to implement a
monitoring system of the County’s economic progress. This monitoring system will use qualitative and quantitative data to follow economic achievements, tracking progress on a continuing basis and will allow Kern County to monitor and evaluate the County’s economic performance. Regions around the world have begun to establish monitoring systems in order to track their progress and make adjustments to policies in order to achieve the desired results. Note that access to the data, time to compile and evaluate, and organizational boundaries when seeking out data add to the complexity and difficulty of collecting and reporting.

Ideally, the monitoring system will track the following dimensions of the Kern County economy:

- **Economic Performance**: How the County is doing in generating prosperity, reducing disparity, and enhancing sustainability.
- **Cluster Competitiveness**: The employment, concentration and growth rates of clusters over time, for both emerging and established clusters.
- **Economic Foundations**: The strength and success of economic input institutions that meet human resource, finance, physical infrastructure, information infrastructure, business climate and quality of life needs of the County.
- **Progress of Flagship Initiatives**: The progress and success of Flagship Initiatives as they are carried out.
- **Progress of Cluster Action Initiatives**: The progress of the implementation of each cluster’s actions.

The quantitative and qualitative information will be used in conjunction with information provided by stewards, cluster co-chairs and their action team members on the status and improvement of the competitive development of their clusters to tell the County’s story during each year. Information will be produced based on reports from action initiatives and released through quarterly reports and quarterly meetings of the stewardship group. An annual report on the state of the County may also be produced using these information sources. This report will be used to help the public participate in the evolution of the County’s economy as it progresses towards a sustainable and prosperous next generation economy.

**Economic Performance Indicators**

Economic performance indicators track the overall health and well being of the County’s economy and the well being of residents. The primary questions these metrics should address are:

- Is the economy growing, is the rate of growth adequate, and is the economy’s industry makeup robust?
- Are incomes growing and is there equitable distribution of wealth?
- Is the consumption of resources commensurate with the capacity of the County and is it sustainable?
- How well is the County ensuring a high quality of life for residents?

To address these questions, the monitoring system needs to include the following:

- **Prosperity**: Measures of per capita wage and household income improvements.
• **Disparity:** Reduction in differences between urban and rural, majority and minority income and equity—opportunity, community quality and participation.

• **Sustainability:** Change in “ecological footprint” for land and energy, waste management, quality of air and water as the region grows.

• **Quality of Life:** Change in affordability of housing, health care, safety, and cultural resources relative to economic growth.

**Industry Cluster Performance Indicators**

• Kern County needs to track the performance of its industry clusters to evaluate how well they are doing, the adequacy of the level of support that is being supplied, any competitive gaps that exist or are emerging. In addition to tracking the existing clusters, leaders must also continually scan to identify any seed or emerging industry clusters. Indicators that need to be tracked include:

  • **Breadth:** Concentration, number of companies, size, role in clusters
  
  • **Depth:** Representation of value-chain, market niche, level of specialization
  
  • **Dynamism:** Rates of growth, nature of transformation, change in concentration, relationship to other clusters, cluster-to-cluster connections

**Economic Foundation Performance Indicators**

Kern County also needs to track the strengths and weaknesses of the fundamental sources of economic value provided by this County to its overall economy and its specific clusters. The following are the six major indicator categories of economic inputs (‘economic foundations’) which are essential to enabling and sustaining cluster formation, expansion and attraction.

• **Adaptability of human resources:** There are three key systems of labor market and skills development that are assessed in terms of workforce skill levels and production of graduates. These systems are assessed as follows: preparation (K-12), advancement (college and university), and renewal (continuing education and retraining).

• **Accessibility of innovation:** There are three key systems of innovation generation that serve a metropolitan economy: Discovery (basic and applied research), development (technology application and product development) and deployment (transfer of technology and best practices). These are typically assessed in terms of scale of research, intellectual property generation and technology commercialization revenue and spin-off formation.

• **Availability of capital:** There are three key levels at which metropolitan financial systems operate: Initiation (seed and early-stage financing), expansion (venture, joint ventures, commercial credit) and restructuring (mergers and acquisitions and specialized credit facilities). These are typically assessed in terms of known levels of seed or angel capital investment (qualitative), venture capital placements and other transactions.

• **Adequacy of physical infrastructure:** There are three key forms of physical infrastructure key to cluster operations: Transportation (air, rail, highway access), Operations (power, water, waste), and facilities (availability of industrial sites, parks). These are typically assessed in terms of frequency and costs of air service, miles of highway, energy, water and waste costs and quality and acres of quality industrial real estate.
• **Advanced information infrastructure:** There are three key dimensions of information infrastructure (‘Infostructure’) that are key to competitive cluster development: Bandwidth (high speed, high capacity infrastructure), digital switching services and information services availability. These are assessed in terms of quantity of fiber and fiber connectivity (hubs, server hotels), wireless (cellular and satellite) service, and number of information service providers and specialized services in the metropolitan region.

• **Acceptability of business climate:** There are three key features of metropolitan business climate that are crucial to industry clusters: Tax levels, regulatory efficiency, and administrative complexity. These can be assessed (but only if data is available) in terms of new concepts such as ‘return on taxation, which is critical to companies (value received in public services for tax dollar per employee), regulatory efficiency (permit burden), and administrative quality (degree of ‘smart infrastructure’ in place).

To address these questions, the County monitoring system could include the following performance metrics for each economic foundation category:

• **Adaptability of human resources**
  - Per-student expenditure (primary and secondary levels)
  - College student enrollment
  - Adult population with high school degree
  - Adult population with associate’s degree
  - Adult population with bachelor’s degree
  - Adult population with advanced degrees

• **Accessibility of innovation**
  - Number of scientists and engineers in the workforce
  - Total research expenditures by source (total, industry, academic, military)
  - Total value of SBIR grants awarded
  - Patents granted per year
  - Total number of start-ups and spin-offs generated annually
  - Ratio of early stage firms (<3 years) to established firms (>3 years)

• **Availability of capital**
  - Volume and value of public loans to industry
  - Number of venture capital placements
  - Value of venture capital placements

• **Adequacy of physical infrastructure**
  - Average travel time to work
  - Urbanized area road per square mile
  - Miles of local road per urbanized area
  - Percentage using alternative commutes (i.e. carpool, transit, etc)
Chapter 5 – Implementation

- Percentage who take public transit to work
- Operating cost of transit system per passenger trip
- Annual commercial flights and boardings

- Advanced information infrastructure
  - Percentage of households that own a computer
  - Percentage of households with internet access
  - Ratio of students per high speed computer

- Acceptability of business climate
  - Local fees and taxes
  - Average annual cost of land
  - Average annual cost of utilities (i.e., electricity, gas, and telecommunications)
  - Average weekly/annual wages

The quantitative and qualitative information will be used in conjunction with information provided by stewards, cluster co-chairs and their action team members on the status and improvement of the competitive development of their clusters to tell the region’s story during each year. Information will be produced based on reports from action initiatives. An annual report on the state of the implementation of the strategy may also be produced using these information sources. This report will be used to help the public participate in the evolution of the County’s economy into the future.

5.2.1. **Cluster Network Performance Monitoring**

In addition to monitoring economic performance, a different sort of performance monitoring and measurement is needed in Kern County for purposes of supporting an innovation strategy. Innovation will not take place to the extent envisioned in the strategy unless the cluster networks continue to thrive, work to foster the development of linkages between stakeholders in different sectors of an industry or across industry sectors, provide opportunities for exchange of ideas, and prove to be fertile fields for nurturing new types of collaboration. While innovation itself is notoriously difficult to capture, let alone measure, the health of the cluster networks can be more easily monitored and measured using a digital cluster network, which is described below.

**Creating a Digital Cluster Network**

In addition to committing to support each cluster group, a shared information system that could be used by the region’s cluster groups should be developed. A key reason for organizing cluster working groups into cluster networks is to enable members of the production, supplier and economic input foundations of each cluster to better ‘convene their marketplace’ to develop and implement collaborative solutions that have been identified. In particular, this network would help cluster members address shared challenges, and expand their export activity beyond the local environment into global markets through learning from and teaming with cluster partners. To meet each cluster’s needs for working together, a Kern County Cluster Network (KCCN) should be developed as an Internet-based service that would offer each cluster network the collaborative environment they require to build and help implement collaborative solutions for competitiveness. Using collaborative tools for Internet web transactions, the KCCN would begin
by creating a commons or 'nexus' through which all cluster members enter into their respective networks and can learn about countywide issues, and about one another, growing a community of exchange. These patterns of exchange should help enable continuous improvements in cluster partnering and operations.

The KCCN would be a 'virtual' environment overseen by Kern Economic Development Corporation (KEDC), contracted out to be developed and managed in incremental stages. This system could become the most extensive cluster network of its kind in the County. The elements of the KCCN should include the following:

- **KCCN Nexus**: A digital 'commons' for all the County clusters to exchange countywide and cluster-to-cluster information. This commons would be an Internet-based web-driven site. The Nexus would include the summary performance monitoring information.

- **Kern County Cluster Networks**: Cluster environments would be established that enable producers, suppliers and economic input institutions in each cluster to communicate and share information with each other and to make more efficient their buyer-supplier linkages, employee recruiting and employee training, learning and adoption of technology best practices. This web-based system would augment basic communications and exchange functions already on offer by KEDC, incrementally adding specific networking functions for each cluster over time. Not every cluster will wish to have the same network functions. However, if desired, the same templates used for one cluster network can be applied to another. The individual cluster networks are the most user-focused level of the Kern County Cluster Network.

Each cluster would need to specify a preliminary set of objectives for basic services and network activities that they would like to see offered through a shared Internet infrastructure. These parameters would then be used to build a series of basic and more advanced networking components. Quantifiable indicators could include the following:

- Numbers and regularity of cluster network meetings;
- Members’ attendance at meetings;
- Members’ withdrawals from further participation;
- Numbers of new participants in the cluster network and action teams over time;
- Number of action initiatives underway (and percentage of initiatives aborted);
- Rate of adherence of action initiatives to schedules and milestones specified in business plans;
- Numbers of references to network activities in local newspapers and in trade journals.
- Some indicators are not as readily quantifiable, though still easy to monitor and record:
  - Instances of interaction as a cluster network with counterpart industry clusters in other regions;
  - Accolades and commendations;
  - Tangible results of action initiatives.
The KCCN would be developed over time. The first generation of the network would be focused on first establishing the ‘nexus’ along with the basic web infrastructure for each cluster. This would be followed by adding cluster membership information and profiles, and then specific collaborative network components.

As noted, the responsibility for monitoring cluster network performance falls to the organization providing management support. Management providers can specify, in their proposals, the indicators they will monitor for a particular cluster networks and the mechanisms and tools they will use to address performance gaps in the level and quality of activity by cluster networks. In the troubleshooting section that follows, some of the typical challenges and alternative solutions are discussed. They are by no means comprehensive but are included to illustrate the challenges and the range of solutions possible.

5.3. Launching Our Future

The Kern County Economic Strategy will be implemented over the next five years and beyond. Many members of the County have already been directly involved in shaping the recommendations and Flagships, and more people will become involved in carrying them out. All economic stakeholders are invited to participate in helping accomplish these recommendations – whether as participants in a cluster network or as a citizen volunteer or as a community member at a Board of Supervisors’ meeting. The size of the challenges before Kern requires that all who are willing to participate are included. Most important, the implementation of this strategy will help foster a sea change in our County’s thinking, heralding a new era of collaboration that will enable us—through completing a number of small successes—to achieve and sustain a high performing, continually improving economy.

We have taken the first steps across our great County, now we must:

- Reinforce countywide thinking
- Make a commitment to growing our clusters
- Focus efforts on improving our local inputs, and
- Reward collaboration and inclusion.

While doing this, we must remember the goals of the strategy to increase jobs, reduce disparity and maintain the natural environment. This will enable a sustainable and prosperous future.
6. **Appendix A: Ensuring Vibrant Cluster Networks**

Over time, the signs of decreased vitality and the need for intervention may become recognizable in Kern’s cluster networks, to one extent or another. These indicators include:

- Flagging enthusiasm among participants in the cluster networks;
- Absenteeism at meetings;
- Sporadic meetings;
- Difficulty recruiting new members;
- Little progress in the implementation of existing action initiatives;
- Lack of new action initiatives.

The reasons vary from cluster network to cluster network because of differences in the make-up of each network, the structure of the industry, and changing circumstances; consequently, the type of intervention required will vary. However, with adequate technical and operational support, cluster groups can be reinvigorated and new cluster groups formed to work together on the priorities of Kern County.

If Kern’s cluster networks show signs of needing interventions, there are several approaches that can be taken to energize the cluster networks. Each solution can be affected by any of a host of different measures, depending on the specific individuals involved, the dynamics of a particular cluster network and the stage of cluster development, among other case-specific details. There can be no fixed prescriptions for the measures to adopt in particular situations. The implementation of the innovation strategy requires that whatever way works best in a particular situation, and with particular individuals, be adopted. Of course, network buy-in will have to be secured first, in most cases.

- **Rotate cluster co-chairs**—Implement a policy for an annual change in the individuals serving as cluster co-chairs. Infusion of new leadership with new perspectives, experiences, and leadership style can significantly re-energize and refocus cluster networks.

- **Increase interaction with foundation institutions**—Increase the participation of these institutions in the cluster network and get the perspective of their representatives. Many cluster groups have not had adequate engagement of major institutions, a renewed collaborative process, focusing on innovation can forge a structure more representative cluster structure and enable setting new priorities and commitments.

- **Expand membership**—Draw new participants into the network—“new blood.” While new members should be sought on a continual basis as opportunities arise, it should also be a strategic priority once a year. A “membership drive” to broaden the base of support for the cluster, and to ensure adequate representation by larger firms as well as smaller firms and start-ups, by export firms as well as supplier firms, and by type of foundations is necessary to maintain momentum and energy of a cluster network.

- **Address non-cluster based community issues**. Involve cluster network members in some community-wide issue as an effective mechanism to foster team spirit and create closer linkages among cluster members and between cluster members and the community. In
Austin, Texas, for example, a number of clusters have begun an annual tradition of convening and selecting activities to address equity issues. This assists the cluster in undertaking activities that demonstrate corporate responsibility while at the same time enhancing collaboration among the cluster members and between the cluster and the community.

- **Engage the media**—Invite reporters to join in cluster activities. This could result in news stories and reports that help remind participants that their efforts are worthwhile. The Bakersfield Californian has already written about the cluster and strategy process. At times when enthusiasm lags in a cluster process, having a media presence reminds participants of the larger import of their collaborative work.

There are always challenges to maintaining the momentum and effectiveness of cluster networks. These challenges need to be addressed by a proactive cluster support and management that can assist members in realizing the value of collaboration and of the network. Ultimately, the real key to success of a cluster-based approach to economic development and to the success of a cluster network is *sustained implementation* — in other words *succeeding by doing*. 
7. Appendix B: Methodology for Occupational Analysis of Cluster

Detailed occupational data for Kern County are available from the Bureau of the Census EEO special tabulation by industry based primarily on three-digit SIC code. In most cases, the “highly-recommended clusters” include a subset of various sub-sectors at a more refined level, namely at the four digit level. Therefore an exact match between the defined clusters and total employment by occupation for entry level employees is not always possible. Consequently in the tables below, four digit level NAICS code industries have been deleted from the “highly-recommended cluster” occupational analysis. In all cases these sub-sectors have a relatively minor portion of overall employment in the cluster, and their exclusion underestimates employment in some occupations by a small amount. For more detail on the methodology please see the methodology section in the Appendix.

For each sub-industry of each cluster, we extracted all jobs that have an SOC code of more than 20 as a general demarcation between jobs that require higher education and those that one can gain entrance to either through short or moderate-term on-the-job-training or vocational school education. Total employment for each occupational category was then summed across all sub-industries within the cluster. The resulting list was sorted by total jobs per occupation to obtain the most common entry-and mid-level positions. Finally, as most clusters have hundreds of occupations, we selected and reported only those occupations with more than 75 employees (except for aerospace and defense cluster which has a much smaller employment base).

Detailed occupational descriptions, with wage information, a quick job outlook, and education, training and skills requirements were prepared for the top five numerical occupations for each cluster. These occupational descriptions are presented below.
7.1. Detailed descriptions of top five entry-level jobs for each highly-recommended cluster

This section outlines job titles, an overview of required skills and knowledge, recommended training and education, pay range and job duties for the top five numerical occupations for each cluster. The information provided here has been excerpted from the Bureau of Labor Statistics Occupational Outlook Handbook the recognized source for occupational descriptions, qualifications, job outlook and earnings.

### 7.1.1. Cluster: Value-Added Agriculture - Top 5 jobs

<table>
<thead>
<tr>
<th>Detailed Job Description</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Agriculture Workers: 11,301 positions</strong></td>
<td>Farmworkers learn through short-term on-the-job training. Most do not have a high school diploma. The preponderance of workers without a high school diploma is particularly high in the crop production sector, where there are more labor-intensive establishments employing migrant farmworkers.</td>
<td>Overall employment of agricultural workers is projected to grow more slowly than the average for all occupations. Low wages, the physical demands of the work, and high job turnover should result in abundant job opportunities, however. Continued consolidation of farms and technological advancements in farm equipment will dampen employment growth.</td>
<td>Median hourly earnings of the more numerous farmworkers in crops, nurseries, and greenhouses were $7.24 in 2002. The middle 50 percent earned between $6.85 and $8.37 an hour, while the lowest 10 percent earned less than $6.24 and the highest 10 percent earned more than $10.32.</td>
</tr>
</tbody>
</table>

Agricultural workers play a large role in getting food, plants, and other agricultural products to market. Working mostly on farms or ranches or in nurseries, slaughterhouses, or ports of entry, these workers have numerous and diverse duties. Among their activities are planting and harvesting crops, installing irrigation, delivering animals, and making sure that our food is safe.

More than 4 out of 5 agricultural workers are farmworkers and laborers. Farmworkers and laborers, crop, nursery, and greenhouse perform numerous activities related to growing and harvesting grains, fruits, vegetables, nuts, fiber, trees, shrubs, and other crops. Among their activities are planting and seeding, pruning, irrigating, harvesting, and packing and loading crops for shipment. Farmworkers also apply pesticides, herbicides, and fertilizers to crops; repair fences; and help with irrigation.

**Nursery and greenhouse workers** prepare land or greenhouse beds for growing horticultural products, such as trees, plants, flowers, and sod. Their duties include planting, watering, pruning, weeding, and spraying the plants. They may cut, roll, and stack sod; stake trees; tie, wrap, and pack plants to fill orders; and dig up or move field-grown and containerized shrubs and trees.

In nurseries, entry-level workers must be able to follow directions and learn proper planting procedures. If driving is an essential part of a job, employers look for applicants with a good driving record and some experience driving a truck. Workers who deal directly with customers must get along well with people.

Nursery and greenhouse workers should have the most rapid job growth, reflecting the increasing demand for landscaping services.

See above
### Detailed Job Description

**Farm-workers**, farm and ranch animals care for live farm, ranch, or aqua-cultural animals that may include cattle, sheep, swine, goats, horses, poultry, finfish, shellfish, and bees. The animals are usually raised to supply such products as meat, fur, skins, feathers, eggs, milk, and honey. The farm-workers’ duties may include feeding, watering, herding, grazing, castrating, branding, debeaking, weighing, catching, and loading animals. On dairy farms, farm-workers operate milking machines; they also may maintain records on animals, examine animals to detect diseases and injuries, assist in delivering animals at their birth, and administer medications, vaccinations, or insecticides as appropriate. Daily duties of such farm-workers include cleaning and maintaining animal housing areas.

### Training, Qualifications, and Advancement

- **See above**

### Job Outlook

- **See above**

### Earnings

- Median hourly earnings for farm-workers who work with livestock were $8.22. The middle 50 percent earned between $6.98 and $10.32 an hour, while the lowest 10 percent earned less than $6.27 and the highest 10 percent earned more than $13.01.

### 2. First-Line Supervisors, farming, fishing, and forestry workers: 1,081 Positions

Directly supervise and coordinate the activities of agricultural, forestry, aqua-cultural, and related workers. Excludes first-line supervisors/managers of landscaping, lawn service, and grounds-keeping workers.

- **Most significant source of training:** Work experience in a related occupation.
- **Projected 2002-12 employment change:** About as fast as average
- **$12.87/hour**

### 3. Graders & Sorters, Agricultural Products: 758 positions

Graders and sorters of agricultural products examine agricultural commodities being prepared to be packed for market and classify them according to quality or size guidelines. They grade, sort, or classify unprocessed food and other agricultural products by size, weight, color, or condition and discard inferior or defective products. For example, graders sort eggs are by color and size and also examine the fat content, or marbling, of beef, assigning a grade of “Prime,” “Choice,” or something else, as appropriate. The grade that is assigned determines the price at which the commodity may be sold.

- **For graders and sorters, training requirements vary on the basis of their responsibilities. For those who perform tests on various agricultural products, a high school diploma is preferred and may be required. Simple jobs requiring mostly visual inspection may be filled by beginners provided with short-term on-the-job training.**
- **Slower-than-average growth also is expected for graders and sorters, and agricultural equipment operators, reflecting the agriculture industry’s continuing ability to produce more with fewer workers.**
- **Median hourly earnings of graders and sorters of agricultural products were $7.67 in 2002. The lowest 10 percent earned less than $6.22, and the highest 10 percent earned more than $11.80.**
### Value-Added Ag. Detailed Job Description

#### 4. Industrial truck and tractor operators: 535 Positions

Industrial truck and tractor operators drive and control industrial trucks or tractors equipped to move materials around a warehouse, storage yard, factory, or construction site. A typical industrial truck, often called a forklift or lift truck, has a hydraulic lifting mechanism and forks. Industrial truck and tractor operators also may operate tractors that pull trailers loaded with materials, goods, or equipment within factories and warehouses, or around outdoor storage areas.

#### 5. Truck Drivers & Drivers/Sales Workers: 404 Positions

Truck drivers are a constant presence on the Nation’s highways and interstates, delivering everything from automobiles to canned foods. Firms of all kinds rely on trucks for pickup and delivery of goods because no other form of transportation can deliver goods door to door. Even if goods travel in part by ship, train, or airplane, trucks carry nearly all goods at some point in their journey from producer to consumer.

Before leaving the terminal or warehouse, truck drivers check the fuel level and oil in their trucks. They also inspect the trucks to make sure the brakes, windshield wipers, and lights are working and that a fire extinguisher, flares, and other safety equipment are aboard and in working order. Drivers make sure their cargo is secure and adjust their mirrors so that both sides of the truck are visible from the driver’s seat. Drivers report equipment that is inoperable, missing, or loaded improperly to the dispatcher.

### Training, Qualifications, and Advancement

Material movers generally learn skills informally, on the job, from more experienced workers or supervisors. However, workers who use industrial trucks, other dangerous equipment, or handle toxic chemicals must receive specialized training in safety awareness and procedures. Many of the training requirements are standardized through OSHA and provided by employer.

State and federal regulations govern the qualifications and standards for truck drivers. Truck drivers must have a driver’s license issued by the State in which they live, and most employers require a clean driving record.

Taking driver-training courses is a desirable method of preparing for truck driving jobs and for obtaining a commercial driver’s license. High school courses in driver training and automotive mechanics also may be helpful. Many private and public vocational-technical schools offer tractor-trailer driver training programs.

### Job Outlook

Job openings should be numerous because the occupation is very large and turnover is relatively high—characteristic of occupations requiring little formal training. Many openings will arise from the need to replace workers who transfer to other occupations, or who retire.

Job opportunities should be favorable for truck drivers. In addition to growth in demand for truck drivers, numerous job openings will occur as experienced drivers leave this large occupation to transfer to other fields of work, retire, or leave the labor force for other reasons.

### Earnings

Industrial truck and tractor operators earn on average of $12.54/hour.

Median hourly earnings of heavy truck and tractor-trailer drivers were $15.97 in 2002. The middle 50 percent earned between $12.51 and $20.01 an hour. The lowest 10 percent earned less than $10.01, and the highest 10 percent earned more than $23.75 an hour.
### Value-Added Ag. Detailed Job Description

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grounds Maintenance Workers</td>
<td>317 Positions</td>
</tr>
</tbody>
</table>

Grounds maintenance workers perform the variety of tasks necessary to achieve a pleasant and functional outdoor environment. They also care for indoor gardens and plantings in commercial and public facilities, such as malls, hotels, and gardens.

*Landscaping workers* physically install and maintain landscaped areas. They grade property, install lighting or sprinkler systems, and build walkways, terraces, patios, decks, and fountains. In addition to initially transporting and planting new vegetation, they transplant, mulch, fertilize, and water flowering plants, trees, and shrubs and mow and water lawns. Landscaping workers perform a range of duties, including mowing, edging, trimming, fertilizing, de-thatching, and mulching, for such clients on a regular basis during the growing season.

*Grounds-keeping workers* maintain athletic fields, golf courses, cemeteries, university campuses, and parks. In addition to caring for sod, plants, and trees, they rake and mulch leaves, clear snow from walkways and parking lots, and use irrigation methods to adjust the amount of water consumption and prevent waste. They see to the proper upkeep and repair of sidewalks, parking lots, grounds-keeping equipment, pools, fountains, fences, planters, and benches.

### Training, Qualifications, and Advancement

There usually are no minimum educational requirements for entry-level positions in grounds maintenance, although a diploma is necessary for some jobs. In 2002, most workers had a high school education or less. Short-term on-the-job training generally is sufficient to teach new hires how to operate equipment such as mowers, trimmers, leaf blowers, and small tractors and to follow correct safety procedures.

### Job Outlook

Those interested in grounds maintenance occupations should find plentiful job opportunities in the future. Demand for their services is growing, and because wages for beginners are low and the work is physically demanding, many employers have difficulty attracting enough workers to fill all openings, creating favorable job opportunities. High turnover will generate a large number of job openings to replace workers who leave the occupation.

### Earnings

<table>
<thead>
<tr>
<th>Title</th>
<th>Median Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line supervisors/managers of landscaping, lawn service, and grounds-keeping workers</td>
<td>$15.89</td>
</tr>
<tr>
<td>Tree trimmers and pruners</td>
<td>12.07</td>
</tr>
<tr>
<td>Pesticide handlers, sprayers, and applicators, vegetation</td>
<td>11.94</td>
</tr>
<tr>
<td>Landscaping and grounds-keeping workers</td>
<td>9.51</td>
</tr>
</tbody>
</table>
### 7.1.2. Cluster: Energy & Chemicals - Top 5 jobs

<table>
<thead>
<tr>
<th>Energy &amp; Chemicals: Detailed Job Description</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Front-Line Supervisors of Construction Trades &amp; Extraction Workers: 757 jobs</td>
<td>Directly supervise and coordinate activities of construction or extraction workers.</td>
<td>Most significant source of training: Work experience in a related occupation</td>
<td>Projected 2002-12 employment change: About as fast as average</td>
</tr>
<tr>
<td>2. Mining Machine Operators: 630 jobs</td>
<td>Operate self-propelled mining machines that rip coal, metal and nonmetal ores, rock, stone, or sand from the face and load it onto conveyors or into shuttle cars in a continuous operation.</td>
<td>Most significant source of training: Moderate-term on-the-job training</td>
<td>Projected 2002-12 employment change: A decline</td>
</tr>
<tr>
<td>3. Derrick, Rotary Drill, Roustabout: 528 jobs</td>
<td>Derrick operators, oil and gas (47-5011.00)</td>
<td>Directly supervise and coordinate activities of construction or extraction workers.</td>
<td>Projected 2002-12 employment change: Little or no growth</td>
</tr>
<tr>
<td></td>
<td>Rotary drill operators, oil and gas (47-5012.00)</td>
<td>Operate rig derrick equipment and operate pumps to circulate mud through drill hole.</td>
<td>Projected 2002-12 employment change: Little or no growth</td>
</tr>
<tr>
<td></td>
<td>Roustabouts, oil and gas (47-5071.00)</td>
<td>Set up or operate a variety of drills to remove petroleum products from the earth and to find and remove core samples for testing during oil and gas exploration.</td>
<td>Projected 2002-12 employment change: More slowly than average</td>
</tr>
<tr>
<td></td>
<td>Assemble or repair oil field equipment using hand and power tools. Perform other tasks as needed.</td>
<td>Most significant source of training: Moderate-term on-the-job training</td>
<td>Projected 2002-12 employment change: More slowly than average</td>
</tr>
</tbody>
</table>
### Energy & Chemicals: Detailed Job Description

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Miscellaneous Extraction Workers, including Roof Bolters and Helpers - 518 jobs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helpers—extraction workers (47-5081.00)</td>
<td>Most significant source of training: Short-term on-the-job training</td>
<td>Projected 2002-12 employment change: More slowly than average</td>
<td></td>
</tr>
<tr>
<td>Help extraction craft workers, such as earth drillers, blasters and explosives workers, derrick operators, and mining machine operators, by performing duties of lesser skill. Duties include supplying equipment or cleaning work area. Excludes apprentice workers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roof bolters, mining (47-5061.00)</td>
<td>Most significant source of training: Moderate-term on-the-job training</td>
<td>Projected 2002-12 employment change: A decline</td>
<td></td>
</tr>
<tr>
<td>Operate machinery to install roof support bolts in underground mine.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service unit operators, oil, gas, and mining (47-5013.00)</td>
<td>Most significant source of training: Moderate-term on-the-job training</td>
<td>Projected 2002-12 employment change: A decline</td>
<td></td>
</tr>
<tr>
<td>Operate equipment to increase oil flow from producing wells or to remove stick pipe, casing, tools, or other obstructions from drilling wells. May also perform similar services in mining exploration operations. Includes fishing-tool technicians.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Energy & Chemicals: Detailed Job Description

5. Welding, Soldering and Brazing Workers -- 334 jobs

Welding is the most common way of permanently joining metal parts. In this process, heat is applied to metal pieces, melting and fusing them to form a permanent bond. They may perform manual welding, in which the work is entirely controlled by the welder, or semiautomatic welding, in which the welder uses machinery, such as a wire feeder, to perform welding tasks. Arc welding is the most common type of welding. Standard arc welding involves two large metal alligator clips that carry a strong electrical current. Two common but advanced types of welding are Gas Tungsten Arc (TIG) and Gas Metal Arc (MIG) welding. Like arc welding, soldering and brazing use molten metal to join two pieces of metal. Soldering commonly is used to join electrical, electronic, and other small metal parts. Brazing is used to join metals other than steel, such as brass.

Skilled welding, soldering, and brazing workers generally plan work from drawings or specifications or use their knowledge of fluxes and base metals to analyze the parts to be joined. These workers then select and set up welding equipment, execute the planned welds, and examine welds to ensure that they meet standards or specifications.

Cutters use the heat from an electric arc, a stream of ionized gas (plasma), or burning gases to cut and trim metal objects to specific dimensions.

Training, Qualifications, and Advancement

Training for welding, soldering, and brazing workers can range from a few weeks of school or on-the-job training for low-skilled positions to several years of combined school and on-the-job training for highly skilled jobs. Formal training is available in high schools, vocational schools, and postsecondary institutions, such as vocational-technical institutes, community colleges, and private welding schools. Some employers provide training. Courses in blueprint reading, shop mathematics, mechanical drawing, physics, chemistry, and metallurgy are helpful. Knowledge of computers is gaining importance, especially for machine operators responsible for the programming of computer-controlled machines.

Job Outlook

Job prospects should be excellent, as many potential entrants who could be welders may prefer to attend college or may prefer work that has more comfortable working conditions. Employment of welding, soldering, and brazing workers is expected to grow about as fast as the average for all occupations over the 2002-12 period. In addition, many openings will arise as workers retire or leave the occupation for other reasons.

Earnings

Median hourly earnings of welders, cutters, solderers, and brazers were $14.02 in 2002. The middle 50 percent earned between $11.41 and $17.34. The lowest 10 percent had earnings of less than $9.41, while the top 10 percent earned over $21.79.

Median hourly earning in mining machinery manufacturing in 2002 were $13.74.
7.1.3. **Cluster: Aerospace – Top 5 jobs**

<table>
<thead>
<tr>
<th>Detailed Job Description</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Aircraft Mechanics and Service Technicians: 104 jobs</strong></td>
<td>The majority of mechanics who work on civilian aircraft are certified by the FAA as &quot;airframe mechanic,&quot; &quot;powerplant mechanic,&quot; or &quot;avionics repair specialist.&quot; Mechanics who also have an inspector’s authorization can certify work completed by other mechanics and perform required inspections.</td>
<td>Opportunities for aircraft and avionics equipment mechanics and service technician jobs should be excellent for persons who have completed aircraft mechanic training programs. Employment of aircraft mechanics is expected to increase about as fast as the average for all occupations through the year 2012, and large numbers of additional job openings should arise from the need to replace experienced mechanics who retire. Avionics technicians are projected to increase at a slower than average rate. Despite the long-term forecast, these occupations are currently in a period of little to no growth. Reduced passenger traffic resulting from a weak economy and the events of September 11, 2001, have forced airlines to cut back flights and take aircraft out of service. Most job openings for aircraft mechanics through the year 2012 will stem from replacement needs.</td>
<td>Median hourly earnings in the industries employing the largest numbers of aircraft mechanics and service technicians in 2002 were:</td>
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<td></td>
<td>As aircraft mechanics gain experience, they may advance to lead mechanic (or crew chief), inspector, lead inspector, or shop supervisor positions.</td>
<td></td>
<td>Air transportation, scheduled $23.48</td>
</tr>
<tr>
<td></td>
<td>Many aircraft mechanics, also called airframe, powerplant, and avionics aviation maintenance technicians, specialize in preventive maintenance. They inspect engines, landing gear, instruments, pressurized sections, accessories—brakes, valves, pumps, and air-conditioning systems, for example—and other parts of the aircraft, and do the necessary maintenance and replacement of parts. Inspections take place following a schedule based on the number of hours the aircraft has flown, calendar days since the last inspection, cycles of operation, or a combination of these factors. Large, sophisticated planes are equipped with aircraft monitoring systems, consisting of electronic boxes and consoles that monitor the aircraft’s basic operations and provide valuable diagnostic information to the mechanic. To examine an engine, aircraft mechanics work through specially designed openings while standing on ladders or scaffolds, or use hoists or lifts to remove the entire engine from the craft. After taking an engine apart, mechanics use precision instruments to measure parts for wear and use x-ray and magnetic inspection equipment to check for invisible cracks. Worn or defective parts are repaired or replaced. Mechanics may also repair sheet metal or composite surfaces, measure the tension of control cables, and check for corrosion, distortion, and cracks in the fuselage, wings, and tail. After completing all repairs, they must test the equipment to ensure that it works properly.</td>
<td></td>
<td>Federal government $20.59</td>
</tr>
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<td></td>
<td>The FAA requires at least 18 months of work experience for an airframe, powerplant, or avionics repairer’s certificate. For a combined A &amp; P certificate, at least 30 months of experience working with both engines and airframes is required. Completion of a program at an FAA-certified mechanic school can substitute for the work experience requirement. Applicants must pass written and oral tests.</td>
<td></td>
<td>Air transportation, nonscheduled $19.84</td>
</tr>
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<td>As aircraft mechanics gain experience, they may advance to lead mechanic (or crew chief), inspector, lead inspector, or shop supervisor positions.</td>
<td></td>
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<tr>
<td></td>
<td>- Aircraft Mechanics and Service Technicians: 104 jobs</td>
<td></td>
<td>Support activities for air transportation $17.64</td>
</tr>
</tbody>
</table>
## Detailed Job Description

### 2. Industrial Production Managers: 84 jobs

Industrial production managers coordinate the resources and activities required to produce millions of goods every year in the United States. Although their duties vary from plant to plant, industrial production managers share many of the same major responsibilities. These responsibilities include production scheduling, staffing, procurement and maintenance of equipment, quality control, inventory control, and the coordination of production activities with those of other departments.

The primary mission of industrial production managers is planning the production schedule within budgetary limitations and time constraints. They do this by analyzing the plant’s personnel and capital resources to select the best way of meeting the production quota. Industrial production managers determine, often using mathematical formulas, which machines will be used, whether new machines need to be purchased, whether overtime or extra shifts are necessary, and what the sequence of production will be. They monitor the production run to make sure that it stays on schedule and correct any problems that may arise.

As production techniques have evolved beyond traditional mass assembly lines, industrial production managers have adapted to “lean” production techniques. Many manufacturers have adopted lean production techniques, while some others use a combination of lean and mass production techniques. In a traditional assembly line, each worker is responsible for only a small portion of the assembly, repeating that task on every product. Lean production employs teams to build and assemble products in stations or cells. When companies use stations, one worker may work alone with hand tools and various parts to complete a large portion of the assembly process. Rather than specializing in a specific task, workers are capable of performing all jobs within a team.

<table>
<thead>
<tr>
<th>Detailed Job Description</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
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<tbody>
<tr>
<td><strong>2. Industrial Production Managers: 84 jobs</strong></td>
<td>While there is no standard preparation, a college degree is required. Applicants with a college degree in industrial engineering, management, or business administration, and particularly those with an undergraduate engineering degree and a master’s degree in business administration or industrial management, enjoy the best job prospects.</td>
<td>Projected slower-than-average growth in employment reflects increasing productivity. Employment of industrial production managers is expected to grow more slowly than the average for all occupations through 2012. However, a number of job openings will stem from the need to replace workers who transfer to other occupations or leave the labor force. Applicants with a college degree in industrial engineering, management, or business administration, and particularly those with an undergraduate engineering degree and a master’s degree in business administration or industrial management, enjoy the best job prospects.</td>
<td>Median annual earnings for industrial production managers were $67,320 in 2002. The middle 50 percent earned between $50,710 and $88,880. The lowest 10 percent earned less than $38,980, and the highest 10 percent earned more than $114,750. Median annual earnings of industrial production managers in 2002 were:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Management of companies and enterprises $89,570</td>
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<td></td>
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<td></td>
<td>Semiconductor and other electronic component manufacturing 78,070</td>
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<td></td>
<td>Motor vehicle parts manufacturing 73,570</td>
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<td></td>
<td>Plastics products manufacturing 60,720</td>
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<td></td>
<td></td>
<td>Printing and related support activities 59,270</td>
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<tr>
<td><strong>3. Miscellaneous Assemblers &amp; Fabricators: 50 jobs</strong></td>
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</table>
Assemblers and fabricators produce a wide range of finished goods from manufactured parts or subassemblies. They produce intricate manufactured products, such as aircraft, automobile engines, computers, and electrical and electronic components. Assemblers may work on subassemblies or the final assembly of an array of finished products or components. Aircraft structure, surfaces, rigging, and systems assemblers put together and install parts of airplanes, space vehicles, or missiles, such as landing gear. Structural metal fabricators and fitters cut, align, and fit structural metal parts according to detailed specifications prior to welding or riveting.

Assemblers and fabricators involved in product development read and interpret engineering specifications from text, drawings, and computer-aided drafting systems. They also may use a variety of tools and precision measuring instruments. Some experienced assemblers work with engineers and technicians, assembling prototypes or test products. As technology changes, so too does the manufacturing process. The concept of “lean” manufacturing, for example, places a greater premium on teamwork and communication within “cells” of workers than it does on the assembly line process. Team assemblers perform all of the assembly tasks assigned to their teams, rotating through the different tasks, rather than specializing in a single task. They also may decide how the work is to be assigned and how different tasks are to be performed. This worker flexibility helps companies to cover for absent workers, and increases their ability to respond to changes in demand by shifting labor from one product line to another.

New assemblers and fabricators are normally entry-level employees. The ability to do accurate work at a rapid pace and to follow detailed instructions are key job requirements. A high school diploma is preferred for most positions. Following detailed assembly instructions requires basic reading skills, although many instructions rely on pictures and diagrams.

Applicants need specialized training for some assembly jobs. For example, employers may require that applicants for electrical or electronic assembler jobs be technical school graduates or have equivalent military training. Other positions require only on-the-job training, sometimes including employer-sponsored classroom instruction, in the broad range of assembly duties that employees may be required to perform. As assemblers and fabricators become more experienced, they may progress to jobs that require greater skill and be given more responsibility.

A decline in employment is expected, reflecting increasing automation and the shift of assembly to countries with lower labor costs.

Work areas may be noisy, and many assemblers may have to sit or stand for long periods.

A high school diploma is preferred for most positions; specialized training is required for some assembly jobs.

### Detailed Job Description

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</table>

### 4. Aircraft and Avionics Equipment Mechanics and Service Technicians: 45 jobs

To keep aircraft in peak operating condition, aircraft and avionics mechanics use precision tools and instruments to measure, cut, install, and adjust parts. Although a few people become mechanics through on-the-job training, many have formal training through technical schools, community colleges, or the military. Airframe mechanics and repair technicians, and powerplant mechanics and repair technicians, are specialized aircraft mechanics who repair and maintain aircraft structures and engines, respectively.

Opportunities for aircraft and avionics equipment mechanics are expected to be good, as aircraft production is expected to increase. Median hourly earnings of aircraft mechanics and avionics technicians were $12.55 in May 2004.

Earnings vary by industry, geographic region, skill, educational level, and complexity of the machinery operated. In 2002, median hourly earnings were $18.71 for aircraft structure, surfaces, rigging, and systems assemblers; $14.02 for engine and other machine assemblers; $11.07 for coil winders, tapers, and finishers; $11.83 for fiberglass laminators and finishers; $11.63 for timing device assemblers, calibrators, and adjusters; $12.15 for electromechanical equipment assemblers; and $11.00 for all other assemblers.
Appendix B / Economic Development Strategy

Equipment mechanics and service technicians perform scheduled maintenance, make repairs, and complete inspections required by the Federal Aviation Administration (FAA). Many aircraft mechanics, also called airframe, powerplant, and avionics aviation maintenance technicians, specialize in preventive maintenance. They inspect engines, landing gear, instruments, pressurized sections, accessories—brakes, valves, pumps, and air-conditioning systems, for example—and other parts of the aircraft, and do the necessary maintenance and replacement of parts. Inspections take place following a schedule based on the number of hours the aircraft has flown, calendar days since the last inspection, cycles of operation, or a combination of these factors. Large, sophisticated planes are equipped with aircraft monitoring systems, consisting of electronic boxes and consoles that monitor the aircraft’s basic operations and provide valuable diagnostic information to the mechanic.

Mechanics specializing in repair-work rely on the pilot’s description of a problem to find and fix faulty equipment. For example, during a preflight check, a pilot may discover that the aircraft’s fuel gauge does not work. To solve the problem, mechanics may troubleshoot the electrical system, using electrical test equipment to make sure that no wires are broken or shorted out, and replace any defective electrical or electronic components. Mechanics work as fast as safety permits so that the aircraft can be put back into service quickly.

Training, most learn their job in 1 of about 200 trade schools certified by the FAA. About one-third of these schools award 2- and 4-year degrees in avionics, aviation technology, or aviation maintenance management.

The majority of mechanics who work on civilian aircraft are certificated by the FAA. The FAA requires at least 18 months of work experience for an airframe, powerplant, or avionics repairer’s certificate. For a combined A & P certificate, at least 30 months of experience working with both engines and airframes is required. Completion of a program at an FAA-certified mechanic school can substitute for the work experience requirement. Applicants for all certificates also must pass written and oral tests and demonstrate that they can do the work authorized by the certificate.

and service technician jobs should be excellent for persons who have completed aircraft mechanic training programs. Employment of aircraft mechanics is expected to increase about as fast as the average for all occupations through the year 2012, and large numbers of additional job openings should arise from the need to replace experienced mechanics who retire. Avionics technicians are projected to increase at a slower than average rate.

A large number of mechanics are expected to retire over the next decade and create several thousand job openings per year. Also contributing to favorable future job opportunities for mechanics is the long-term trend towards fewer students entering technical schools to learn skilled maintenance and repair trades.

DETAILED JOB DESCRIPTION

<table>
<thead>
<tr>
<th>TRAINING, QUALIFICATIONS, AND ADVANCEMENT</th>
<th>JOB OUTLOOK</th>
<th>EARNINGS</th>
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<td><strong>Job Description</strong></td>
<td><strong>Sales Representatives, Manufacturing: 39 jobs</strong></td>
<td><strong>Earnings</strong></td>
</tr>
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<tr>
<th>How their merchandise or services can meet those needs. Sales representatives may help install new equipment and train employees. They also take orders and resolve any problems with or complaints about the merchandise. Obtaining new accounts is an important part of the job. Sales representatives follow leads from other clients, track advertisements in trade journals, participate in trade shows and conferences, and may visit potential clients unannounced.</th>
<th>Prefer those with some college education. Increasingly employers prefer or require a bachelor’s degree as the job requirements have become more technical and analytical. Firms selling complex, technical products may require a technical degree in addition to some sales experience. Many sales representatives attend seminars in sales techniques or take courses in marketing, economics, communication, or even a foreign language to provide the extra edge needed to make sales. In general, companies are looking for the best and brightest individuals who have the personality and desire to sell.</th>
<th>Continued growth in the variety and number of goods to be sold. Also, many job openings will result from the need to replace workers who transfer to other occupations or leave the labor force. Job prospects for wholesale sales representatives will be better than those for manufacturing sales representatives because manufacturers are expected to continue contracting out sales duties to independent agents rather than using in-house or direct selling personnel.</th>
<th>Commission, in 2002. The middle 50 percent earned between $39,480 and $79,380 a year. The lowest 10 percent earned less than $28,770, and the highest 10 percent earned more than $108,010 a year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently, sales representatives who lack technical expertise work as a team with a technical expert. In this arrangement, the technical expert—sometimes a sales engineer—will attend the sales presentation to explain the product and answer questions or concerns.</td>
<td>Sales representatives also analyze sales statistics; prepare reports; and handle administrative duties, such as filing their expense account reports, scheduling appointments, and making travel plans. They study literature about new and existing products and monitor the sales, prices, and products of their competitors.</td>
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</table>
### 7.1.4. Cluster: Transportation, Logistics & Warehousing – Top 5 jobs

<table>
<thead>
<tr>
<th>Detailed Job Description</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
</table>
| **1. Bus Drivers: 375 Workers jobs**
Drivers pick up and drop off passengers at bus stops, stations, or, in the case of students, at regularly scheduled neighborhood locations based on strict time schedules. Drivers must operate vehicles safely, especially when traffic is heavier than normal.

*Local-transit and intercity bus drivers* report to their assigned terminal or garage, where they stock up on tickets or transfers and prepare trip report forms. In some transportation firms, maintenance departments are responsible for keeping vehicles in good condition. In others, drivers may check their vehicle’s tires, brakes, windshield wipers, lights, oil, fuel, and water supply before beginning their routes. Drivers usually verify that the bus has safety equipment.

*Motorcoach drivers* transport passengers on charter trips and sightseeing tours. Drivers routinely interact with customers and tour guides to make the trip as comfortable and informative as possible. They are directly responsible for keeping to strict schedules, adhering to the guidelines of the tours’ itinerary, and ensuring the overall success of the trip. These drivers act as customer service representative, tour guide, program director, and safety guide. Trips frequently last more than 1 day.

*School bus drivers* usually drive the same routes each day, stopping to pick up pupils in the morning and return them to their homes in the afternoon. Some school bus drivers also transport students and teachers on field trips or to sporting events.

| | Drivers must hold a commercial driver’s license (CDL) from the state in which they live. To qualify for a CDL, applicants must pass a written test and demonstrate that they can operate a bus safely.
Many employers prefer high school graduates and require a written test of ability to follow complex bus schedules. Many companies prefer applicants who are at least 24 years of age; some require several years of experience. School bus drivers must pass a background investigation to uncover any criminal record or history of mental problems.
Opportunities for promotion are generally limited. However, experienced drivers may become supervisors or dispatchers. | Persons seeking jobs as bus drivers should encounter good opportunities. Individuals who have good driving records and who are willing to work a part-time or irregular schedule should have the best job prospects. School bus driving jobs, particularly in rapidly growing suburban areas, should be easiest to acquire because most are part-time positions with high turnover and minimal training requirements. Employment prospects for motor coach drivers will fluctuate with the cyclical nature of the economy, as demand for motor coach services is very dependent on tourism.
Full-time bus drivers are rarely laid off during recessions. | Median hourly earnings in transit and intercity bus drivers in 2002 were as follows:
Local government $16.95
Interurban and rural bus transportation 15.15
Urban transit systems $15.02
School and employee bus transportation $11.29
Charter bus industry $10.64
Other transit and ground passenger transportation $9.79
Individual and family services $8.27 |
### Detailed Job Description

#### 2. Driver/Sales Workers and Truck Drivers: 322 jobs

Some local truck drivers have sales and customer service responsibilities. The primary responsibility of driver/sales workers, or route drivers, is to deliver and sell their firm’s products over established routes or within an established territory. They sell goods such as food products, including restaurant takeout items, or pick up and deliver items such as laundry. Their response to customer complaints and requests can make the difference between a large order and a lost customer. Route drivers may also take orders and collect payments.

The duties of driver/sales workers vary according to their industry, the policies of their particular company, and the emphasis placed on their sales responsibility. Most have wholesale routes that deliver to businesses and stores, rather than to homes.

### Training, Qualifications, and Advancement

State and federal regulations govern the qualifications and standards for truck drivers. All drivers must comply with federal regulations and any state regulations that are stricter than federal requirements. Truck drivers must have a driver’s license issued by the state in which they live, and most employers require a clean driving record. Drivers of trucks designed to carry 26,000 pounds or more—including most tractor-trailers, as well as bigger straight trucks—must obtain a commercial driver’s license (CDL) from the state in which they live. All truck drivers who operate trucks transporting hazardous materials must obtain a CDL, regardless of truck size. Federal regulations governing the CDL exempt certain groups, including farmers, emergency medical technicians, firefighters, some military drivers, and snow and ice removers.

### Job Outlook

Job opportunities should be favorable for truck drivers. In addition to growth in demand for truck drivers, numerous job openings will occur as experienced drivers leave this large occupation to transfer to other fields of work, retire, or leave the labor force for other reasons.

### Earnings

<table>
<thead>
<tr>
<th>Industry</th>
<th>Median Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>General freight trucking</td>
<td>$17.56</td>
</tr>
<tr>
<td>Grocery and related wholesalers</td>
<td>$16.90</td>
</tr>
<tr>
<td>Specialized freight trucking</td>
<td>$14.92</td>
</tr>
<tr>
<td>Grocery and related product wholesalers</td>
<td>$14.26</td>
</tr>
<tr>
<td>Building material and supplies dealers</td>
<td>$10.83</td>
</tr>
<tr>
<td>Automotive parts, accessories, and tire stores</td>
<td>$7.82</td>
</tr>
<tr>
<td>Specialty food stores</td>
<td>$14.98</td>
</tr>
<tr>
<td>Dry-cleaning and laundry services</td>
<td>$14.74</td>
</tr>
<tr>
<td>Grocery and related product wholesalers</td>
<td>$12.66</td>
</tr>
<tr>
<td>Limited-service eating places</td>
<td>$6.78</td>
</tr>
<tr>
<td>Restaurants</td>
<td>$6.47</td>
</tr>
</tbody>
</table>
## Detailed Job Description

### 3. Airfield Operations Specialists: 190 jobs

**Aircraft cargo handling supervisors**

Direct ground crew in the loading, unloading, securing, and staging of aircraft cargo and baggage. Determine the quantity and orientation of cargo and compute aircraft center of gravity. May accompany aircraft as member of flight crew and monitor and handle cargo in flight, and assist and brief passengers on safety and emergency procedures. Includes loadmasters.

**Airfield operations specialists**

Ensure the safe takeoff and landing of commercial and military aircraft. Duties include coordination between air-traffic control and maintenance personnel; dispatching; using airfield landing and navigational aids; implementing airfield safety procedures; monitoring and maintaining flight records; and applying knowledge of weather information.

**First-line supervisors/managers of transportation and material moving machine and vehicle operators**

Directly supervise and coordinate activities of transportation and material-moving machine and vehicle operators and helpers.

**Traffic technicians**: Conduct field studies to determine traffic volume, speed, effectiveness of signals, adequacy of lighting, and other factors influencing traffic conditions, under direction of traffic engineer.

**Transportation inspectors**: Inspect equipment or goods in connection with the safe transport of cargo or people. Includes rail transport inspectors, such as freight inspectors, car inspectors, rail inspectors, and other non-precision inspectors.

### Training, Qualifications, and Advancement

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Most Significant Source of Training</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft cargo handling supervisors</td>
<td>Work experience in a related occupation</td>
<td>Projected 2002-12 employment change: About as fast as average</td>
<td></td>
</tr>
<tr>
<td>Airfield operations specialists</td>
<td>Long-term on-the-job training</td>
<td>Projected 2002-12 employment change: About as fast as average</td>
<td></td>
</tr>
<tr>
<td>First-line supervisors/managers of transportation and material moving machine and vehicle operators</td>
<td>Work experience in a related occupation</td>
<td>Projected 2002-12 employment change: About as fast as average</td>
<td></td>
</tr>
<tr>
<td>Traffic technicians</td>
<td>Short-term on-the-job training</td>
<td>Projected 2002-12 employment change: Little or no growth</td>
<td></td>
</tr>
<tr>
<td>Transportation inspectors</td>
<td>Work experience in a related occupation</td>
<td>Projected 2002-12 employment change: More slowly than average</td>
<td></td>
</tr>
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### Detailed Job Description

#### Aircraft Mechanics and Service Technicians: 183 jobs

Many aircraft mechanics, also called airframe, powerplant, and avionics aviation maintenance technicians, specialize in preventive maintenance. They inspect engines, landing gear, instruments, pressurized sections, accessories—brakes, valves, pumps, and air-conditioning systems, for example—and other parts of the aircraft, and do the necessary maintenance and replacement of parts. Inspections take place following a schedule based on the number of hours the aircraft has flown, calendar days since the last inspection, cycles of operation, or a combination of these factors. Large, sophisticated planes are equipped with aircraft monitoring systems, consisting of electronic boxes and consoles that monitor the aircraft’s basic operations and provide valuable diagnostic information to the mechanic. To examine an engine, aircraft mechanics work through specially designed openings while standing on ladders or scaffolds, or use hoists or lifts to remove the entire engine from the craft. After taking an engine apart, mechanics use precision instruments to measure parts for wear and use x-ray and magnetic inspection equipment to check for invisible cracks. Worn or defective parts are repaired or replaced. Mechanics may also repair sheet metal or composite surfaces, measure the tension of control cables, and check for corrosion, distortion, and cracks in the fuselage, wings, and tail. After completing all repairs, they must test the equipment to ensure that it works properly.

#### Training, Qualifications, and Advancement

The majority of mechanics who work on civilian aircraft are certified by the FAA as "airframe mechanic," "powerplant mechanic," or "avionics repair specialist." Mechanics who also have an inspector’s authorization can certify work completed by other mechanics and perform required inspections.

The FAA requires at least 18 months of work experience for an airframe, powerplant, or avionics repairer’s certificate. For a combined A & P certificate, at least 30 months of experience working with both engines and airframes is required. Completion of a program at an FAA-certified mechanic school can substitute for the work experience requirement. Applicants must pass written and oral tests.

As aircraft mechanics gain experience, they may advance to lead mechanic (or crew chief), inspector, lead inspector, or shop supervisor positions.

#### Job Outlook

Opportunities for aircraft and avionics equipment mechanics and service technician jobs should be excellent for persons who have completed aircraft mechanic training programs. Employment of aircraft mechanics is expected to increase about as fast as the average for all occupations through the year 2012, and large numbers of additional job openings should arise from the need to replace experienced mechanics who retire. Avionics technicians are projected to increase at a slower than average rate. Despite the long-term forecast, these occupations are currently in a period of little to no growth.

Reduced passenger traffic resulting from a weak economy and the events of September 11, 2001, have forced airlines to cut back flights and take aircraft out of service.

Most job openings for aircraft mechanics through the year 2012 will stem from replacement needs.

#### Earnings

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- Federal government: $20.59
- Air transportation, nonscheduled: $19.84
- Aerospace product and parts manufacturing: $19.68
- Support activities for air transportation: $17.64
Appendix B / Economic Development Strategy

5. Taxi Drivers and Chauffeurs: 158 jobs

Taxi drivers pick up passengers in 1 of 3 ways: “Cruising” the streets to pick up random passengers; prearranging pickups; and picking up passengers from taxi stands established in highly trafficked areas. In urban areas, the majority of passengers “wave down” drivers cruising the streets. Customers may also prearrange a pickup by calling a cab company and giving a location, approximate pickup time, and destination. The cab company dispatcher then relays the information to a driver by two-way radio, cellular telephone, or onboard computer. Outside of urban areas, the majority of trips are dispatched in this manner. Drivers also pick up passengers waiting at cabstands or in taxi lines at airports, train stations, hotels, restaurants, and other places where people frequently seek taxis.

Drivers should be familiar with streets in the areas they serve so they can use the most efficient route to destinations. They should know the locations of frequently requested destinations, such as airports, bus and railroad terminals, convention centers, hotels, and other points of interest. In case of emergency, the driver should also know the location of fire and police stations and hospitals.

Chauffeurs operate limousines, vans, and private cars for limousine companies, private businesses, government agencies, and wealthy individuals. Chauffeur service differs from taxi service in that all trips are prearranged. Many chauffeurs transport customers in large vans between hotels and airports, bus, or train terminals. Others drive luxury automobiles, such as limousines, to business events, entertainment venues, and social events. Still others provide full-time personal transportation for private companies.

Local governments set license standards and requirements for taxi drivers and chauffeurs that include driving experience and training. In addition, many companies require a higher minimum age and prefer high school graduates.

Persons must have a regular automobile driver’s license, and must acquire a chauffeur or taxi driver’s license, commonly called a “hack” license. Local authorities generally require applicants for a hack license to pass a written exam or complete a training program that may include up to 80 hours of instruction. Applicants must know local geography, motor vehicle laws, safe driving practices, regulations governing taxicabs, and some aptitude for customer service.

Opportunities for advancement are limited. Experienced drivers may obtain preferred routes or shifts, or advance to dispatcher or manager jobs.

Persons seeking jobs as taxi drivers and chauffeurs should encounter good opportunities, because of the need to replace the many people who work in this occupation for short periods and then transfer to other occupations or leave the labor force.

Employment of taxi drivers and chauffeurs is expected to grow faster than the average for all occupations through the year 2012, as local and suburban travel increases with population growth. Employment growth also will stem from federal legislation requiring services for persons with disabilities. Rapidly growing metropolitan areas should offer the best job opportunities.

Earnings of taxi drivers and chauffeurs vary greatly, depending on factors such as the number of hours worked, customers’ tips, and geographic location. Median hourly earnings in the industries employing the largest numbers of taxi drivers and chauffeurs in 2002 were as follows:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi and limousine service</td>
<td>$9.71</td>
</tr>
<tr>
<td>Other transit and ground passenger transportation</td>
<td>$8.70</td>
</tr>
<tr>
<td>Individual and family services</td>
<td>$8.14</td>
</tr>
<tr>
<td>Automotive equipment rental and leasing</td>
<td>$7.99</td>
</tr>
</tbody>
</table>
### 7.1.5. Cluster: Tourism, Arts and Entertainment – Top 5 jobs

<table>
<thead>
<tr>
<th>Detailed Job Description</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Chefs, Cooks, Food Preparation Workers: 2,947 jobs</strong></td>
<td>Formal programs, which may offer training leading to a certificate or a 2- or 4-year degree, are geared more for training chefs for fine-dining or upscale restaurants. Executive chefs and head cooks who work in fine restaurants require many years of training and experience and an intense desire to cook.</td>
<td>Job openings for chefs, cooks, and food preparation workers are expected to be plentiful through 2012; however, competition for jobs in the top kitchens of higher end restaurants should be keen. Overall employment of chefs, cooks, and food preparation workers is expected to increase about as fast as the average for all occupations over the 2002-12 period. Employment growth will be spurred by increases in population, household income, and leisure time that will allow people to dine out and take vacations more often.</td>
<td>Wages of chefs, cooks, and food preparation workers vary greatly according to region of the country and the type of food services establishment in which they work. Wages usually are highest in elegant restaurants and hotels, and in major metropolitan areas. Median wages of head cooks and chefs range from $12.70 to $18.31. Median wages of restaurant cooks range from $8.08 to $10.49. Median wages for institution/cafeteria cooks range from $7.88 - $10.01. Median wages for food preparation workers range from $7.07 to $8.74, and for short-order cooks from $6.97 to $8.29. Fast-food cook wages range from $6.84 to $7.79.</td>
</tr>
</tbody>
</table>

In general, chefs and cooks measure, mix, and cook ingredients according to recipes, using a variety of pots, pans, cutlery, and other equipment, including ovens, broilers, grills, slicers, grinders, and blenders. Chefs and head cooks also are responsible for directing the work of other kitchen workers, estimating food requirements, and ordering food supplies.

Executive chefs and head cooks coordinate the work of the kitchen staff and direct the preparation of meals. They determine serving sizes, plan menus, order food supplies, and oversee kitchen operations to ensure uniform quality and presentation of meals.

Food preparation workers perform routine, repetitive tasks such as readying ingredients for complex dishes, slicing and dicing vegetables, and composing salads and cold items, under the direction of chefs and cooks. They weigh and measure ingredients, go after pots and pans, and stir and strain soups and sauces. Food preparation workers may cut and grind meats, poultry, and seafood in preparation for cooking. Their responsibilities also include cleaning work areas, equipment, utensils, dishes, and silverware.

Food preparation workers perform routine, repetitive tasks such as readying ingredients for complex dishes, slicing and dicing vegetables, and composing salads and cold items, under the direction of chefs and cooks. They weigh and measure ingredients, go after pots and pans, and stir and strain soups and sauces. Food preparation workers may cut and grind meats, poultry, and seafood in preparation for cooking. Their responsibilities also include cleaning work areas, equipment, utensils, dishes, and silverware.
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</tr>
</thead>
<tbody>
<tr>
<td><strong>2. Waiters and Waitresses: 2,280 jobs</strong></td>
<td>Waiters and waitresses, the largest group of these workers, take customers’ orders, serve food and beverages, prepare itemized checks, and sometimes accept payment. Their specific duties vary considerably, depending on the establishment. Hosts and hostesses welcome guests and maintain reservation or waiting lists. They may direct patrons to coatrooms, restrooms, or to a place to wait until their table is ready. Hosts and hostesses assign guests to tables suitable for the size of their group, escort patrons to their seats, and provide menus. They also schedule dining reservations, arrange parties, and organize any special services that are required. In some restaurants, they act as cashiers.</td>
<td>There are no specific educational requirements for food and beverage service jobs. Many employers prefer to hire high school graduates for waiter and waitress, bartender, and host and hostess positions, but completion of high school usually is not required for fast-food workers, counter attendants, dishwashers, and dining room attendants and bartender helpers. Due to the relatively small size of most food-serving establishments, opportunities for promotion are limited.</td>
<td>Job openings are expected to be abundant for food and beverage serving and related workers. Overall employment of these workers is expected to grow about as fast as the average over the 2002-12 period, stemming from increases in population, personal incomes, and leisure time. However, keen competition is expected for bartender, waiter and waitress, and other food and beverage service jobs in popular restaurants and fine dining establishments, where potential earnings from tips are greatest.</td>
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</table>
### Detailed Job Description

3. Cashiers: 1,404 jobs

Although specific job duties vary by employer, cashiers usually are assigned to a register at the beginning of their shifts and are given drawers containing a specific amount of money with which to start—their “banks.” They must count their banks to ensure that they contain the correct amount of money and adequate supplies of change. At the end of their shifts, they once again count the drawers’ contents and compare the totals with sales data. An occasional shortage of small amounts may be overlooked but, in many establishments, repeated shortages are grounds for dismissal.

In addition to counting the contents of their drawers at the end of their shifts, cashiers usually separate and total charge forms, return slips, coupons, and any other noncash items. Cashiers also handle returns and exchanges. They must ensure that returned merchandise is in good condition, and determine where and when it was purchased and what type of payment was used.

<table>
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<tr>
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<tbody>
<tr>
<td>3. Cashiers: 1,404 jobs</td>
<td>Cashier jobs tend to be entry-level positions requiring little or no previous work experience. Although there are no specific educational requirements, employers filling full-time jobs often prefer applicants with high school diplomas. Advancement opportunities for cashiers vary. For those working part time, promotion may be to a full-time position. Others advance to head cashier or cash-office clerk. In addition, this job offers a good opportunity to learn about an employer’s business and can serve as a steppingstone to a more responsible position. Opportunities for full-time and part-time cashier jobs should continue to be good, because of employment growth and the need to replace the large number of workers who transfer to other occupations or leave the labor force. There is substantial movement into and out of the occupation because education and training requirements are minimal, and the predominance of part-time jobs is attractive to people seeking a short-term source of income rather than a full-time career.</td>
<td>Many cashiers start at the federal minimum wage, which was $5.15 an hour in 2003. Some state laws set the minimum wage higher, and establishments must pay at least that amount. Median hourly earnings in the industries employing the largest numbers of cashiers in 2002 were as follows: Grocery stores $7.57 Department stores $7.55 Other general merchandise store $7.27 Gasoline stations $7.18 Health and personal care stores $7.08 Benefits for full-time cashiers tend to be better than those for cashiers working part time.</td>
<td></td>
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</table>
### Detailed Job Description

#### 4. Food Service Managers: 909 jobs

Food service managers are responsible for the daily operations of restaurants and other establishments that prepare and serve meals and beverages to customers. Besides coordinating activities among various departments, such as kitchen, dining room, and banquet operations, food service managers ensure that customers are satisfied with their dining experience. In addition, they oversee the inventory and ordering of food, equipment, and supplies and arrange for the routine maintenance and upkeep of the restaurant, its equipment, and facilities. Managers generally are responsible for all of the administrative and human-resource functions of running the business, including recruiting new employees and monitoring employee performance and training.

One of the most important tasks of food service managers is assisting executive chefs as they select successful menu items.

Managers interview, hire, train, and, when necessary, fire employees. Retaining good employees is a major challenge facing food service managers.

### Training, Qualifications, and Advancement

Most food service management companies and national or regional restaurant chains recruit management trainees from 2- and 4-year college hospitality management programs. Some restaurant and food service manager positions—particularly self-service and fast-food—are filled by promoting experienced food and beverage preparation and service workers.

A bachelor’s degree in restaurant and food service management provides particularly strong preparation for a career in this occupation.

### Job Outlook

Employment of food service managers is expected to grow about as fast as the average for all occupations through 2012. In addition to job openings arising out of employment growth, the need to replace managers who transfer to other occupations or stop working will create many job opportunities.

Applicants with a bachelor’s or an associate degree in restaurant and institutional food service management should have the best job opportunities.

### Earnings

Median annual earnings in the industries employing the largest numbers of food service managers in 2002 were as follows:

- Special food services $40,720
- Traveler accommodation $39,210
- Full-service restaurants $37,280
- Nursing care facilities $33,910
- Limited-service eating places $33,590
- Elementary and secondary schools $31,210
### Detailed Job Description

**5. Maids and Housekeeping Cleaners:**

Building cleaning workers—including janitors, maids, housekeeping cleaners, window washers, and rug shampooers—keep office buildings, hospitals, stores, apartment houses, hotels, and residences clean and in good condition. Some only do cleaning, while others have a wide range of duties.

### Training, Qualifications, and Advancement

- No special education is required for most janitorial or cleaning jobs, but beginners should know simple arithmetic and be able to follow instructions. High school shop courses are helpful for jobs involving repair work.
- Most building cleaners learn their skills on the job.
- In some cities, programs run by unions, government agencies, or employers teach janitorial skills.
- Advancement opportunities for workers usually are limited in organizations where they are the only maintenance worker. Where there is a large maintenance staff, however, cleaning workers can be promoted to supervisor and to area supervisor or manager. A high school diploma improves the chances for advancement.

### Job Outlook

- Overall employment of building cleaning workers is expected to grow about as fast as the average for all occupations through 2012.
- Average growth is expected among janitors and cleaners and among cleaning supervisors, but less-than-average growth is projected for maids and housekeeping cleaners.
- Limited formal education and training requirements, low pay, and numerous part-time and temporary jobs induce many to leave the occupation, thereby contributing to the number of job openings and the need to replace these workers.
- Much of the growth in these occupations will come from cleaning residential properties.

### Earnings

- Median annual earnings for janitors and cleaners, except maids and housekeeping cleaners, range from $16,370 to $22,820.
- Median annual earnings of maids and housekeepers range from $15,740 to $18,050.
- Median annual earnings for first-line supervisors and managers of housekeeping and janitorial workers range from $22,710 to $33,080.
### Cluster: Business and Professional Services – Top 5 jobs

<table>
<thead>
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<th>Training, Qualifications, and Advancement</th>
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<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Grounds Maintenance Workers: 1874 jobs</td>
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<tr>
<td>See description under Value-Added Agriculture</td>
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</tr>
<tr>
<td>2. Janitors and Building Cleaners: 927 jobs</td>
<td>No special education is required for most janitorial or cleaning jobs, but beginners should know simple arithmetic and be able to follow instructions. High school shop courses are helpful for jobs involving repair work. Most building cleaners learn their skills on the job.</td>
<td>Overall employment of building cleaning workers is expected to grow about as fast as the average for all occupations through 2012, as more office complexes, apartment houses, schools, factories, hospitals, and other buildings requiring cleaning are built to accommodate a growing population and economy.</td>
<td>Median annual earnings for janitors and cleaners range from $16,370 to $22,820. Median annual earnings for maids and housekeepers range from $15,740 to $18,050. Median annual earnings of first-line supervisors and managers of housekeeping and janitorial workers range from $22,710 to $33,080.</td>
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Building cleaning workers—including janitors, maids, housekeeping cleaners, window washers, and rug shampooers—keep office buildings, hospitals, stores, apartment houses, hotels, and residences clean and in good condition. Some only do cleaning, while others have a wide range of duties.
### Detailed Job Description


Guards, who are also called security officers, patrol and inspect property to protect against fire, theft, vandalism, terrorism, and illegal activity. These workers protect their employer’s investment, enforce laws on the property, and deter criminal activity or other problems. They use radio and telephone communications to call for assistance from police, fire, or emergency medical services as the situation dictates. Security guards write comprehensive reports outlining their observations and activities during their assigned shift. They may also interview witnesses or victims, prepare case reports, and testify in court.

All security officers must show good judgment and common sense, follow directions and directives from supervisors, accurately testify in court, and follow company policy and guidelines. Guards should have a professional appearance and attitude and be able to interact with the public. They also must be able to take charge and direct others in emergencies or other dangerous incidents. In a large organization, the security manager is often in charge of a trained guard force divided into shifts; whereas in a small organization, a single worker may be responsible for all security.

### Training, Qualifications, and Advancement

Most states require that guards be licensed. To be licensed as a guard, individuals must usually be at least 18 years old, pass a background check, and complete classroom training in such subjects as property rights, emergency procedures, and detention of suspected criminals. Drug testing often is required.

Guards who carry weapons must be licensed by the appropriate government authority, and some receive further certification as special police officers, which allows them to make limited types of arrests while on duty. Rigorous hiring and screening programs consisting of background, criminal record, and fingerprint checks. Applicants are expected to have good character references, no serious police record, and good health. They should be mentally alert, emotionally stable, communicate well, and physically fit in order to cope with emergencies.

### Job Outlook

Opportunities for security guards and gaming surveillance officers should be favorable. Numerous job openings will stem from employment growth attributable to the desire for increased security, and from the need to replace those who leave this large occupation each year. In addition to full-time job opportunities, the limited training requirements and flexible hours attract many persons seeking part-time or second jobs.

Employment of security guards and gaming surveillance officers is expected to grow faster than the average for all occupations through 2012 as concern about crime, vandalism, and terrorism continue to increase the need for security.

### Earnings

Median annual earnings of security guards were $19,140 in 2002. The middle Median annual earnings in the industries employing the largest numbers of security guards in 2002 were as follows:

- Elementary and secondary schools $24,470
- General medical and surgical hospitals $24,050
- Local government $22,120
- Traveler accommodation $21,390
- Investigation and security services $17,910
4. Secretaries and Administrative Assistants: 681 jobs

Secretaries and administrative assistants are responsible for a variety of administrative and clerical duties necessary to run an organization efficiently. They serve as an information manager for an office, plan and schedule meetings and appointments, organize and maintain paper and electronic files, manage projects, conduct research, and provide information by using the telephone, postal mail, and e-mail. They also may handle travel arrangements.

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</thead>
<tbody>
<tr>
<td><strong>4. Secretaries and Administrative Assistants: 681 jobs</strong></td>
<td>High school graduates who have basic office skills may qualify for entry-level secretarial positions. However, employers increasingly require extensive knowledge of software applications, such as word processing, spreadsheets, and database management. Secretaries and administrative assistants should be proficient in keyboarding and good at spelling, punctuation, grammar, and oral communication. Because secretaries and administrative assistants must be tactful in their dealings with people, employers also look for good customer service and interpersonal skills. Discretion, good judgment, organizational or management ability, initiative, and the ability to work independently are especially important for higher level administrative positions.</td>
<td>Overall employment of secretaries and administrative assistants is expected to grow more slowly than the average for all occupations over the 2002-12 period. In addition to those resulting from growth, numerous job openings will result from the need to replace workers who transfer to other occupations or leave this very large occupation for other reasons each year. Opportunities should be best for applicants, particularly experienced secretaries, with extensive knowledge of software applications. Projected employment of secretaries will vary by occupational specialty.</td>
<td>Median annual earnings in the industries employing the largest numbers of executive secretaries and administrative assistants in 2002 were: Management of companies and enterprises $36,770; Local government $34,600; Colleges, universities, and professional schools $32,210; State government $31,220; Employment services $29,700. Legal secretaries = $35,020 Medical secretaries = $25,430 Secretaries, except legal, medical, and executive, were about $25,290 in 2002.</td>
</tr>
</tbody>
</table>
### Detailed Job Description

**5. Bookkeeping, Accounting & Auditing Clerks: 513 jobs**

Bookkeeping, accounting, and auditing clerks are an organization's financial record-keepers. They update and maintain one or more accounting records, including those which tabulate expenditures, receipts, accounts payable and receivable, and profit and loss. They have a wide range of skills and knowledge from full-charge bookkeepers who can maintain an entire company's books to accounting clerks who handle specific accounts. All of these clerks make numerous computations each day and increasingly must be comfortable using computers to calculate and record data.

### Training, Qualifications, and Advancement

For occupations such as bookkeepers, accounting clerks, and Procurement clerks, an associate’s degree in business or accounting often is required. Some financial clerks have bachelor’s degrees in business, accounting, or liberal arts. Although a degree is rarely required, many graduates accept entry-level clerical positions to get into a particular company or to enter the finance or accounting field with the hope of being promoted to professional or managerial positions. Some companies have a set plan of advancement that tracks college graduates from entry-level clerical jobs into managerial positions. Workers with bachelor's degrees are likely to start at higher salaries and advance more easily than those without degrees.

### Job Outlook

Slower than average growth is expected in the employment of Bookkeeping, accounting, and auditing clerks through 2012. More job openings will stem from replacement needs. Each year, numerous jobs will become available as these clerks transfer to other occupations or leave the labor force. The large size of this occupation ensures plentiful job openings, including many opportunities for temporary and part-time work.

### Earnings

Salaries vary considerably, by the region of the country, size of the city, and type and size of the establishment all influence salary levels. Median hourly earnings were as follows:

- Procurement clerks $14.23
- Payroll and time-keeping clerks 13.94
- Bookkeeping, accounting, and auditing clerks 13.16
- Bill and account collectors 12.88
- Billing and posting clerks and machine operators 12.55
- Gaming cage workers 10.47
- Tellers 9.81
### Cluster: Health Services and Medical Technologies – Top 5 jobs

<table>
<thead>
<tr>
<th>Detailed Job Description</th>
<th>Training, Qualifications, and Advancement</th>
<th>Job Outlook</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nursing, Psychiatric, and Home Health Aides: 2,211 jobs</td>
<td>In many cases, neither a high school diploma nor previous work experience is necessary for a job as a nursing, psychiatric, or home health aide. A few employers, however, require some training or experience. Hospitals may require experience as a nursing aide or home health aide. Nursing care facilities often hire inexperienced workers who must complete a minimum of 75 hours of mandatory training and pass a competency evaluation program within 4 months of their employment. Some states require psychiatric aides to complete a formal training program. Opportunities for advancement within these occupations are limited. To enter other health occupations, aides generally need additional formal training. Some employers and unions provide opportunities by simplifying the educational paths to advancement. Numerous job openings for nursing, psychiatric, and home health aides will arise from a combination of fast employment growth and high replacement needs. High replacement needs in this large occupation reflect modest entry requirements, low pay, high physical and emotional demands, and lack of opportunities for advancement. For these same reasons, many people are unwilling to perform the kind of work required by the occupation. Therefore, persons who are interested in, and suited for, this work should have excellent job opportunities.</td>
<td>Median hourly earnings for nursing aides, orderlies, and attendants in 2002 were as follows: Employment services $11.38; Local government $10.33; General medical and surgical hospitals $10.09; Nursing care facilities $9.27; Community care facilities for the elderly $8.98</td>
<td>Median hourly earnings for home health aides range from $8.20 to $9.21. Median hourly earnings for psychiatric aides range from $11.04 to $13.14</td>
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</table>

Nursing and psychiatric aides help care for physically or mentally ill, injured, disabled, or infirm individuals confined to hospitals, nursing care facilities, and mental health settings. Home health aides' duties are similar, but they work in patients' homes or residential care facilities. Nursing aides/assistants, geriatric aides, unlicensed assistive personnel, or hospital attendants, perform routine tasks under the supervision of nursing and medical staff.

Home health aides help elderly, convalescent, or disabled persons live in their own homes instead of in a health facility. Under the direction of nursing or medical staff, they provide health-related services, such as administering oral medications.

In home health agencies, a registered nurse, physical therapist, or social worker usually assigns specific duties and supervises home health aides, who keep records of the services they perform and record patients' condition and progress. They report changes in patients' conditions to the supervisor or case manager.

Psychiatric aides, also known as mental health assistants or psychiatric nursing assistants, care for mentally impaired or emotionally disturbed individuals. They work under a team that may include psychiatrists, psychologists, psychiatric nurses, social workers, and therapists. In addition to helping patients dress, bathe, groom, and eat, psychiatric aides socialize with them and lead them in educational and recreational activities.
<table>
<thead>
<tr>
<th>DETAILED JOB DESCRIPTION</th>
<th>TRAINING, QUALIFICATIONS, AND ADVANCEMENT</th>
<th>JOB OUTLOOK</th>
<th>EARNINGS</th>
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<tbody>
<tr>
<td>2. Medical Assistants: 1,090 jobs</td>
<td>Some medical assistants are trained on the job, but many complete 1- or 2-year programs in vocational-technical high schools, postsecondary vocational schools, and junior colleges. Although medical assistants are not licensed, some states require them to take a test or a course before they can perform certain tasks, such as taking x rays. Employers prefer to hire experienced workers or certified applicants who have passed a national examination, indicating that the medical assistant meets certain standards of competence. Medical Assistants is projected to be the fastest growing occupation over the 2002-12 period. Job prospects should be best for medical assistants with formal training or experience, particularly those with certification.</td>
<td>The earnings of medical assistants vary, depending on their experience, skill level, and location. Median annual earnings of medical assistants were $23,940 in 2002. The middle 50 percent earned between $20,260 and $28,410. The lowest 10 percent earned less than $17,640, and the highest 10 percent earned more than $34,130.</td>
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Medical assistants perform routine administrative and clinical tasks to keep the offices of physicians, podiatrists, chiropractors, and other health practitioners running smoothly. In small practices, medical assistants usually are “generalists,” handling both administrative and clinical duties and reporting directly to an office manager, physician, or other health practitioner. Those in large practices tend to specialize in a particular area, under the supervision of department administrators.

Medical assistants perform many administrative duties, including answering telephones, greeting patients, updating and filing patients’ medical records, filling out insurance forms, handling correspondence, scheduling appointments, arranging for hospital admission and laboratory services, and handling billing and bookkeeping.

Clinical duties vary according to State law and include taking medical histories and recording vital signs, explaining treatment procedures to patients, preparing patients for examination, and assisting the physician during the examination. Medical assistants collect and prepare laboratory specimens or perform basic laboratory tests on the premises, dispose of contaminated supplies, and sterilize medical instruments. They instruct patients about medications and special diets, prepare and administer medications as directed by a physician, authorize drug refills as directed, telephone prescriptions to a pharmacy, draw blood, prepare patients for x rays, take electrocardiograms, remove sutures, and change dressings.
### Detailed Job Description

3. Licensed Practical and Vocational Nurses: 652 jobs

Licensed practical nurses (LPNs), or licensed vocational nurses (LVNs), care for the sick, injured, convalescent, and disabled under the direction of physicians and registered nurses. (The work of physicians and surgeons and registered nurses is described elsewhere in the Handbook.)

Most LPNs provide basic bedside care, taking vital signs such as temperature, blood pressure, pulse, and respiration. They also prepare and give injections and enemas, monitor catheters, apply dressings, treat bedsores, and give alcohol rubs and massages. LPNs monitor their patients and report adverse reactions to medications or treatments. They collect samples for testing, perform routine laboratory tests, feed patients, and record food and fluid intake and output. To help keep patients comfortable, LPNs assist with bathing, dressing, and personal hygiene. In states where the law allows, they may administer prescribed medicines or start intravenous fluids. Some LPNs help deliver, care for, and feed infants. Experienced LPNs may supervise nursing assistants and aides.

In addition to providing routine bedside care, LPNs in nursing care facilities help evaluate residents' needs, develop care plans, and supervise the care provided by nursing aides. In doctors' offices and clinics, they also may make appointments, keep records, and perform other clerical duties. LPNs who work in private homes may prepare meals and teach family members simple nursing tasks.

### Training, Qualifications, and Advancement

All states and the District of Columbia require LPNs to pass a licensing examination after completing a state-approved practical nursing program. A high school diploma or its equivalent usually is required for entry, although some programs accept candidates without a diploma or are designed as part of a high school curriculum.

Most practical nursing programs last about 1 year and include both classroom study and supervised clinical practice (patient care). Classroom study covers basic nursing concepts and patient care-related subjects, including anatomy, physiology, medical-surgical nursing, pediatrics, obstetrics, psychiatric nursing, the administration of drugs, nutrition, and first aid. Clinical practice usually is in a hospital, but sometimes includes other settings.

### Job Outlook

Employment of LPNs is expected to grow about as fast as the average for all occupations through 2012 in response to the long-term care needs of an increasing elderly population and the general growth of healthcare. Replacement needs will be a major source of job openings, as many workers retire.

Applicants for jobs in hospitals may face competition as the number of hospital jobs for LPNs declines. Employment of LPNs in nursing care facilities is expected to grow faster than the average.

Employment of LPNs is will grow much faster than average in home healthcare services. This growth is in response to an increasing number of older persons with functional disabilities, consumer preference for care in the home, and technological advances that make it possible to bring increasingly complex treatments into the home.

### Earnings

Median annual earnings of licensed practical nurses were $31,440 in 2002. The middle 50 percent earned between $26,430 and $37,050. The lowest 10 percent earned less than $22,860, and the highest 10 percent earned more than $44,040. Median annual earnings in the industries employing the largest numbers of licensed practical nurses in 2002 were as follows: Employment services $40,550; Home health care services $32,850; Nursing care facilities $32,220; General medical and surgical hospitals $30,310; Offices of physicians $28,710.
### DETAILED JOB DESCRIPTION

4. Personal and Home Care Aides: 517 jobs

Personal and home care aides—also called homemakers, caregivers, companions, and personal attendants—provide housekeeping and routine personal care services. They clean clients' houses, do laundry, and change bed linens. Aides may plan meals (including special diets), shop for food, and cook. Aides also may help clients move from bed, bathe, dress, and groom. Some accompany clients outside the home, serving as a guide and companion.

Personal and home care aides provide instruction and psychological support to their patients. They may advise families and patients on such things as nutrition, cleanliness, and household tasks. Aides also may assist in toilet training a severely mentally handicapped child, or they may just listen to clients talk about their problems.

### TRAINING, QUALIFICATIONS, AND ADVANCEMENT

In some states, this occupation is open to individuals who have no formal training. On-the-job training is then generally provided. Other states may require formal training. The National Association for Home Care offers national certification for personal and home care aides. Certification is a voluntary demonstration that the individual has met industry standards.

Advancement for personal and home care aides is limited. In some agencies, workers start out performing homemaker duties, such as cleaning. With experience and training, they may take on personal care duties.

### JOB OUTLOOK

Excellent job opportunities are expected for this occupation, as rapid employment growth and high replacement needs produce a large number of job openings.

Employment of personal and home care aides is projected to grow much faster than the average for all occupations through the year 2012.

### EARNINGS

Median hourly earnings in the industries employing the largest numbers of personal and home care aides in 2002 were as follows:

- Residential mental retardation, mental health and substance abuse facilities $8.63
- Vocational rehabilitation services $8.40
- Community care facilities for the elderly $8.14
- Individual and family services $8.12
- Home health care services $6.72
## Detailed Job Description

### 5. Dental Assistants: 364 jobs

Dental assistants perform a variety of patient care, office, and laboratory duties. They work chairside as dentists examine and treat patients. They make patients as comfortable as possible in the dental chair, prepare them for treatment, and obtain their dental records. Assistants hand instruments and materials to dentists and keep patients’ mouths dry and clear by using suction or other devices. Assistants also sterilize and disinfect instruments and equipment, prepare trays of instruments for dental procedures, and instruct patients on postoperative and general oral health care.

Dental assistants should not be confused with dental hygienists, who are licensed to perform different clinical tasks. (See the statement on dental hygienists elsewhere in the Handbook.)

### Training, Qualifications, and Advancement

- Most assistants learn their skills on the job, although an increasing number are trained in dental-assisting programs offered by community and junior colleges, trade schools, technical institutes, or the Armed Forces. High school students should take courses in biology, chemistry, health, and office practices.
- The American Dental Association’s Commission on Dental Accreditation approved 259 dental-assisting training programs in 2002. Programs include classroom, laboratory, and preclinical instruction in dental-assisting skills and related theory. In addition, students gain practical experience in dental schools, clinics, or dental offices.
- Without further education, advancement opportunities are limited. Some dental assistants become office managers, dental-assisting instructors, or dental product sales representatives. Others go back to school to become dental hygienists.

### Job Outlook

- Job prospects for dental assistants should be excellent. Employment is expected to grow much faster than the average for all occupations through the year 2012. In fact, dental assistants are expected to be one of the fastest growing occupations through the year 2012.
- In addition to job openings due to employment growth, numerous job openings will arise out of the need to replace assistants who transfer to other occupations, retire, or leave the labor force for other reasons. Many opportunities are for entry-level positions offering on-the-job training.

### Earnings

- Median hourly earnings of dental assistants were $13.10 in 2002. The middle 50 percent earned between $10.35 and $16.20 an hour. The lowest 10 percent earned less than $8.45, and the highest 10 percent earned more than $19.41 an hour.
- Benefits vary substantially by practice setting and may be contingent upon full-time employment. According to the American Dental Association, almost all full-time dental assistants employed by private practitioners received paid vacation time. The ADA also found that 9 out of 10 full-time and part-time dental assistants received dental coverage.