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Executive Summary

Technology Workforce Issues and Opportunities In the California Innovation Corridor

Significant changes are occurring in the composition of California industry—and related workforce demands by employers.

Under a grant to the California Innovation Corridor as part of the US Department of Labor WIRED Initiative, the California Space Authority partnered with workforce investment boards and economic development offices to conduct a workforce skills analysis of 200 employers in a seven-county area of Southern California. The purpose of the assessment was to gather information about the skills required for critical employment positions and to identify future workforce gaps in order to develop a strategy to address future California Innovation Corridor employer needs.

The assessment was designed to focus on key space and information technology companies, government employers, space entrepreneurial and small business companies, and manufacturing companies. The research was based around the analytical approach recommended by the California Economic Strategy Panel's California Regional Economies Project.

Industry data analysis. Working with the California Employment Development Department, Labor Market Information Division (LMID), all partners received a set of county-level data compiled by 3-digit NAICS code (North America Industry Classification Standard) that detailed employment, wage, and other size, growth, and industry concentration data. The datasets were used to identify employment trends in each county and determine a set of NAICS codes to be used to target companies for survey work that would represent innovation industries and clusters.

California Innovation Corridor. Looking at industry clusters in the 13-county California Innovation Corridor, major employment growth categories in the 2001-2006 period included, in order by amount of employees, the business management and support services; wholesale and retail; recreation and travel; healthcare and pharmaceuticals/chemicals; construction; financial services; and energy production/distribution. The remaining three clusters, all of which were manufacturing, contracted. They included chemical and material manufacturing; computers, electrical and electronic equipment; and all manufacturing.

Clusters of Opportunity. The Orange County Workforce Investment Board identified CIC clusters of opportunity for this report using the LMID datasets combined with an IMPLAN Input-Output System under the model provided by the 2005 California Regional Economies Project. The resulting CIC clusters of opportunity include food & agriculture, energy production & distribution, construction, transportation & logistics, environmental & waste management, education, personal services & education, and business management & support services.

Seven-county survey area. The data for the seven counties paints a picture of change. Ten of the 32 large, high-wage categories show strong growth in employment, though only four show a weekly wage per employee of greater than \$900. No strong-growth, top-wage jobs were in manufacturing industries. The top 20 largest NAICS sectors showed good growth overall, adding over 300,000 jobs in the 2001-2006 period. Professional and technical services reported impressive numbers across the board—450,000 workers with an average weekly wage of \$964, totaling more than \$7.2 billion of payroll for the region, and adding nearly 46,000 new jobs.

However, there were some notable areas of employment contraction in the seven counties. Among the top 20 NAICS, the most severe job losses were, in order of greatest to least, management of companies and enterprises; computer and electronic product manufacturing; transportation equipment manufacturing; fabricated metal product manufacturing; and merchant wholesalers of durable goods. Telecommunications was another major loss. These losses represent some of the sectors in which



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California innovation is transformed into commercial products. Further, the transportation equipment sector is where the region's aerospace companies reside.

Employer survey. Survey instruments were designed to collect employer data on critical occupations, skillsets, and employee performance. They were fielded by the partners between Q4 2006 and Q3 2008 with companies in NAICS categories deemed innovation industries, involving individual respondents in a capacity to assess hiring and employee performance at their respective companies.

Responses were collected from 182 companies in time for production of this report. Data from an additional 20 Kern County employers was subsequently collected and referenced but not included in the aggregated data analysis. The responses were from a good cross-section of company sizes and involved individual respondents with a sufficient level of authority to speak on workforce performance and needs at their company. Here are some of the key findings.

- Engineering was the single largest critical occupation. Out of six broad categories of occupations, engineering was the most mentioned critical occupation. Technicians and scientists also ranked highly among critical occupations.
- Science, Technology, Engineering and Mathematics (STEM) training is essential. Roughly eight out of ten times an innovation company in the survey pool mentioned a critical occupation or role, that role would fall within engineering, technical, scientific / R&D, mechanical, or computer science-related functions at the company.
- Employers seem to anticipate desiring a greater level of education or credentialing in the future. Among respondents who were asked to compare current hiring expectations with future ones, the importance of degree and certificate programs seemed to increase.
- The lack of workplace skills and work ethic among younger employees was a serious concern for many respondents. Several employers commented on difficulties with attitude and experience among newer hires and less experienced workers.
- Most critical occupations fall into high wage categories. The median wage for the largest category—engineers—runs from more than \$60,000 to over \$105,000 per year.
- Workplace skills and technical knowledge are the most serious problem. Workplace skills and technical knowledge were rated the highest in importance by employers, but employee performance is well below expectation in both categories.
- Problem-solving and work ethic skills were also serious cause for concern. Performance in both areas failed to exceed expectations, and both were rated important.
- Performance in social skills and computer skills exceeded expectations. However, based on respondent comments, there are specific issues within these categories. For instance, interpersonal workstyle issues were a top mention in open-ended questions.
- No educational preparation exceeds employer expectations. Both entry-level and professional level education are below expectation, and technical level education just meets a basic level of satisfaction.
- Critical skills shortages are real. More than three-quarters of respondents expressed some concern about critical skills shortages at the technical level, professional level, or both.

- Anticipated new future required skills center on technology and industry-specific skills. Seventy out of 82 mentions of new required skillsets addressed either IT/computer-related or new technology or industry-specific skills.
- Desired high school or community college training covers a wide range. Respondents were interested to about the same degree in training related to mechanical, trades, electronics, and industry-specific technical skills as opposed to workplace skills and communication / teamwork.

Recommendations and strategies. The partners were asked to comment on regional training resources and recommend strategies for training investments. They produced a range of recommendations:

- Improve on-the-job training (OJT) opportunities. Partners saw opportunities to build OJT and apprenticeship programs.
- Expand business-education collaboration for curricula and training programs and outreach. There was significant consensus that training strategies must systematically integrate input from business. There were a few different models advanced for doing so.
- Improve business, educator, student, employee, and parent understanding of training resources and employment prospects. There was extensive discussion of the difficulty for businesses and employees understanding training resources and prerequisites, as well as increasing student interest in training by improving awareness of identified growth occupations.
- Be aware of and responsive to generational issues and the difference between teachable practical skills and skills related to individual character. There was consensus that action was needed to improve both practical and character-based skills, though there was a shortage of ideas on how to handle the latter other than the strategies mentioned above. Potentially more could be done at the K-12 level to address character and attribute issues, and that it might be possible to develop a suite of cluster-specific workplace skills training units.
- Mobilize leaders. Some partners noted the importance of working with elected leaders to draw attention to funding needs and to increase awareness of existing training resource.
- Expand the role of Workforce Investment Boards to drive transformational change. Orange County persuasively asserted that WIBs are well-positioned to convene and advocate transformational change that drives integration of workforce and economic development.
- Work across jurisdictions for identified super-clusters. For *super-clusters* that reach across major economic regions and deliver wide-ranging benefits across counties and industries, it is recommended that special prioritization and cross-jurisdictional work be undertaken.

Each partner provided additional recommendations, strategies, and insights that were summarized in the body of the report. Full partner reports were included in the appendices.

Insights from other CIC WIRED projects. All CIC WIRED projects unearthed insights relevant for this analysis. Six points stand out due to commonalities across projects or relevance to this workforce skills analysis. First, California faces hiring difficulties across disciplines and educational levels. Second, workers need better skills in communication, teamwork, computers, analytical ability, and business. Third, employers need more cost-effective ways to drive experience and ongoing training. Fourth, there needs to be greater alignment and coordination of strategies and metrics across economic stakeholders. Fifth, we need common strategies for overarching identified needs. And sixth, a common assessment should be explored for certifying basic technology skill competencies.

