

## Executive Summary

### **Inspiring Job Creation, Job Retention: The California Innovation Corridor WIRED Initiative**



As the U.S. worker seeks to find or retain employment in a job-hungry environment, no challenge seems more important than creating meaningful, family-wage jobs and sustainable economic prosperity. The California Innovation Corridor (CIC or Corridor) partnership, guided by the California Space Authority (CSA) as program lead and with funding from the U.S. Department of Labor/Employment Training Administration (DOL/ETA) through the California Labor and Workforce Agency (CLWA), executed an initiative to explore how a region can become a sustainable high-



wage, job-creation habitat through innovation and alignment of its workforce, economic development and education resources. Training, placement, student and capacity-building successes in over two dozen projects make the California Innovation Corridor Initiative a national model for collaboration and leading-edge insights about regional economic prosperity and sustainable job growth in the 21<sup>st</sup> Century global environment. If



developed into local action plans, these insights could foster job creation and retention while addressing California's unemployment problem. Twenty-five projects were successfully completed with more than 300 products and deliverables in the four year period from 2006-2010.



These products and deliverables are available to California regional communities, as well as those across the U.S., for replication, scaling or simply for inspiration. All are viewable at: [www.InnovateCalifornia.net](http://www.InnovateCalifornia.net)

# California Innovation Corridor Partnering and Supporting Organizations

## California Space Authority – Program Manager

ACE Clearwater Enterprises  
The Aerospace Corporation  
Allan Hancock College  
Antelope Valley Board of Trade  
Antelope Valley College  
Bay Area Council Economic Institute  
(BACEI)/Bay Area Science Innovation  
Consortium (BASIC)  
The Boeing Company  
California Council on Science & Technology  
California Labor & Workforce Development  
Agency, Employment Development Dept.  
(CLWA/EDD)  
California Manufacturing Technology Consulting  
California Space Education & Workforce Institute  
California State Polytechnic University,  
San Luis Obispo  
California Troops to Teachers  
California Workforce Association  
Cerritos College/  
Center for Applied Competitive Technologies  
Chabin Concepts  
City of Lancaster, Lancaster University  
Center/The Aerospace Office  
City of Lompoc Economic Development Office  
College of the Canyons  
CONNECT  
Economic Alliance of the San Fernando Valley  
Economic Vitality Corporation of  
San Luis Obispo County  
El Camino College  
Employment Training Panel, CLWA/EDD  
Garvey Spacecraft Corporation/California State  
University, Long Beach  
Golden Capital Network  
Greater Antelope Valley Economic Alliance  
Hannover Fairs USA, Incorporated  
Kelly Space & Technology, Incorporated  
Kern County Workforce Investment Board  
Kern Economic Development Corporation  
Labor Market Information Division. CLWA/EDD  
L5 Performance Systems  
Lockheed Martin Space Systems Company  
Los Angeles County  
Economic Development Corporation  
Los Angeles City Workforce Investment Board  
Los Angeles County Workforce Investment Board  
Mains Associates  
Mathematics Engineering Science Achievement  
(MESA)  
Mission Community Services Corporation/  
Women's Entrepreneurial Ventures  
NASA Ames Research Center  
NASA Dryden Flight Research Center  
NASA Jet Propulsion Laboratory  
Naval Postgraduate School  
Northrop Grumman Corporation  
NOVA – North (Santa Clara) Valley Workforce  
Investment Board  
Orange County Business Council  
Orange County Workforce Investment Board  
Private Industry Council of  
San Luis Obispo County  
Raytheon Company  
Riverside County Economic Development  
Agency, Workforce Division  
San Bernardino County  
Workforce Investment Board  
San Diego East County Economic Development  
Council/Connectory  
San Diego Workforce Partnership  
South Bay Economic Development Partnership  
South Bay Science Foundation  
South Bay Workforce Investment Board  
Southern California Edison  
Space Exploration Technologies  
Space Information Laboratories, Incorporated  
Space Systems/Loral  
Stanford University/  
Space Systems Development Laboratory  
Stauffer Communications, LLC  
Strategic Innovations Group  
Strategic Vitality, LLC  
Supplier Excellence Alliance  
University of California, Riverside/Bourns College  
of Engineering  
University of California, Santa Cruz, Extension  
University of Southern California, Viterbi School  
of Engineering, Western Regional  
Applications Center (WESRAC)  
Ventura County Economic  
Development Association  
Workforce Development Centers  
of Riverside County  
Workforce Investment Board of Ventura County

## Messages from the California Labor and Workforce Development Agency and the California Space Authority



Jaime Fall, Deputy  
Secretary, California  
Labor & Workforce  
Development Agency

Stating that California's capacity for innovation and entrepreneurship has served as the state's key engine for job growth and prosperity since the early days of aviation, the Deputy Secretary of the California Labor and Workforce Development Agency, Jaime Fall, applauded the work of the California Innovation Corridor partners. In a letter to the California Space Authority (CSA), he wrote:

*"As the awardee of the Corridor WIRED multiple-year grant, the California Labor and Workforce Development Agency would like to recognize the Herculean efforts of the California Space Authority, the Corridor WIRED Program Management organization responsible for developing and managing one of the most ambitious WIRED initiatives in the nation. Well-deserved accolades also go to the dozens of funded partner organizations...the training, insights, projects, models and tools developed in the WIRED Corridor Initiative to educate and train California's workers for 21<sup>st</sup> Century jobs can go a long way in helping to address California's current unemployment and job loss. Congratulations to all involved!"*

For four years (2006-2009), the California Space Authority has been driving talent development and global competitiveness through the California Innovation Corridor *Workforce Innovation in Regional Economic Development – WIRED* Initiative. Conceived by CSA in 2005, the Corridor Initiative, originally one of only thirteen nationwide WIRED grants, was funded by the U.S. Department of Labor/Employment Training Administration (DOL/ETA) through the California Labor and Workforce Development Agency (CLWA).

In cooperation with dozens of funded partners and collaborators, as well as hundreds of stakeholders across the thirteen Corridor counties from Alameda County north to San Diego County south, the Corridor has successfully completed the work of the California Innovation Corridor WIRED Initiative. Developing over 300 products, tools, and models ready for replication statewide and nationwide, Corridor partners are already engaged, individually and in partnerships developed during the WIRED effort, in follow-on activities to ensure that the Corridor strategic goal areas of Innovation Support, Supplier Competitiveness and Talent Development, continue to receive the attention they deserve in the global, demand-driven 21<sup>st</sup> Century economy and worker/employer environment. We applaud the work of our partners and thank both the State and DOL/ETC for their support of the California Innovation Corridor Initiative.



CSA Executive Director  
Andrea Seastrand with  
California Innovation  
Corridor Initiative  
Program Manager  
Judy Turner

## Overview: California Innovation Corridor Initiative

Conceived and developed by the California Space Authority (CSA), the California Innovation Corridor Initiative was created out of a strategic partnership of sixty public/private and nonprofit organizations convened on behalf of California’s most innovative region of regions, spanning thirteen counties along the coast from Alameda County in the north to San Diego in the south and east to Los Angeles County’s Antelope Valley. Submitted by the State of California for U.S. Department of Labor (DOL) funding under DOL’s Employment Training Administration’s nationwide *Workforce Innovation in Regional Economic Development – WIRED* Initiative, the Corridor Initiative was initially one of only thirteen national WIRED multi-year awards. Four years later, forty-five WIRED grants have been awarded to U.S. regions from Maine to California.

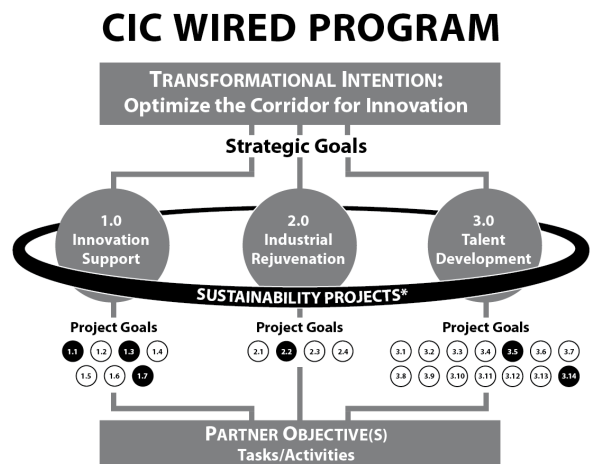
Support by the California Labor and Workforce Development Agency (CLWA) as fiscal agent, the California Space Authority served as Program Manager for the Corridor Initiative, executing eighty-two scopes of work with 41 funded partners in thirteen counties for the twenty-five projects proposed in the Corridor Initiative for completion between 2006 and 2008. Funded partners included various workforce and economic development entities, training providers, community colleges, universities, nonprofits, and private-sector companies. Collaborators and stakeholder organizations not originally identified in the grant proposal included many more of each of the above, plus other government agencies and professional associations (see list of partners/collaborators above). Dozens of collaborating organizations and hundreds of stakeholder groups ultimately participated, sharing best practices and building on diverse experiences along the way. Many times entirely new partnerships were created and are continuing to function collaboratively even after the WIRED project which brought them together has been completed. Phase II of the Corridor Initiative was funded with unused partner funding from Phase I of the Initiative. Well over 300 products and deliverables have been produced through the Corridor WIRED initiative. They are available for review at [www.InnovateCalifornia.net/deliverables](http://www.InnovateCalifornia.net/deliverables).

**“Optimize the Corridor for innovation and 21<sup>st</sup> Century workforce competitiveness”** was the overarching intent of the Corridor WIRED initiative, with this being addressed initially (Phase I) through twenty-five Corridor projects implemented via three separate, but aligned pathways during the performance period. Phase II efforts built on Phase I projects within three strategic goal areas of Innovation Support, Supplier Competitiveness (initially Industrial Rejuvenation) and Talent Development. Eight capacity-building sustainability projects were identified at the start as likely to have significant, long-term impact.

*For full Corridor Initiative report including project detail, visit the following link:*

<http://www.innovatecalifornia.net/WIREDdeliverables/0.0-CIC-Final-Report.pdf>

\*Sustainability Projects are those projects that support both a strategic transformational goal and also the greater CIC WIRED grant effort as a whole. See *Sustainability Projects, page 27*.



## Projects of the California Innovation Corridor Initiative

***Strategic Transformational Goal 1: Create an atmosphere in which the culture, environment and systems are characterized and driven by robust innovation and flourishing entrepreneurship. 1.0 Projects:***

- Innovation Driven Economic Development Model (1.1)\*
- 21<sup>st</sup> Century Workforce Profile Analysis (1.2)
- Innovation Asset Mapping Inventory (1.3)\*
- Innovation-Based Entrepreneurial Ventures (1.4)
- Joint University Innovation Model (1.5)
- Enabling Student Payloads on U.S. Launches (1.6)
- WIB Innovation Resource Toolkit (1.7)\*

***Strategic Transformational Goal 2: Ensure common “smart supplier”, competitiveness and enterprise-driven outcomes across supply chain training provider/support network. 2.0 Projects:***

- Smart Supplier Initiative (2.1/2.2)\*
- Outreach Plan to Supplier Contacts (2.3)
- Manufacturing Technician Training/Certification Program (2.4)

***Strategic Transformational Goal 3: Integrate consideration of current and future industry enterprise needs into workforce and educational planning and policymaking. 3.0 Projects:***

- Workforce Needs Analysis (3.1)
- Space Employer/University Consortium (3.2)
- Space-Related University Programs (3.3)
- Systems Engineering Orientation/Training (3.4)
- STEM Collaborative Action Plan (3.5)\*
- High-School Teacher Institutes (3.6)
- Retraining of Dislocated Software Specialists (3.7)
- Aerospace Community Development Program (3.8)
- Troops to Teachers Program (3.9)
- Stanford Mentoring Model (3.10)
- Mechatronics Certification Program Development/HS Outreach (3.11)
- Science Educator Conferences (3.12)
- Space Education Center Website (3.13)
- WIB Learning Collaboratory (3.14)\*

***Phase II Projects (Phase I enhancements):***

- Demonstration: *Innovation Driven Economic Development Model* (Project 1.1 follow-on)
- Innovation Asset Mapping Inventory Expansion (enhancement of Project 1.3)
- Talent Development/Innovation Webinars (follow-on to Project 1.5)
- University and Student Payload Demonstration Project (enhancement to Project 1.6)
- Smart Supplier Transformation Initiative (enhancement to Project 2.2)
- Launch-Related Industry Mentoring with Demonstration of Virtual Classroom Tool (3.3)
- STEM Collaborative Action Plan Implementation (enhancements to Project 3.5)
- Aerospace Community Development Strategy (enhancement to Project 3.8)
- Enhancement of California Space Education Center Website (follow-on to Project 3.13)
- WIB Learning Collaboratory (Bridging gap between HR and WIB professionals)
- Sustainability/Expansion of InnovateCalifornia.net
- Ongoing Sustainability in Support of California Innovation Corridor WIRED Initiative

***\*Sustainability projects supporting both a strategic Corridor goal and the overarching Initiative***



## California Innovation Corridor Sample Impact!

### **Sampling of Training: Incumbents, Unemployed & Displaced Workers**

364 new hires/incumbents trained in new satellite manufacturing processes (*Space Systems/Loral, Palo Alto*)

27 displaced Silicon Valley IT workers were trained and certified as aerospace software engineers (*NOVA WIB/University of Santa Cruz Extension*)



36 entry-level and low-skilled workers were trained/certified as aerospace manufacturing technicians (*El Camino College, Torrance/Hawthorne*)

28 individuals completed the 14-week *Vision to Venture* series of classes (*Mission Community Services, San Luis Obispo*)

35 innovation-oriented business owners participated in the “Entrepreneur Boot Camp” held in conjunction with the California Tech 100 event (*Golden Capital Network, Orange County*)

96 working engineers participated in the systems engineering orientation/training offered (*The Aerospace Corporation, Los Angeles; California Polytechnic State University, San Luis Obispo*)

### **Degrees and Certifications Developed**

A.S. Degree, Engineering Technology with Emphasis in Mechatronics (*Allan Hancock College, Santa Maria*)

A.S. Degree, Electronics Technology with Emphasis in Mechatronics (*Allan Hancock College*)

“Aerospace Manufacturing Technician” Certificate (*El Camino College*)

“Software Engineering for Aerospace and Defense Applications” Certificate – (*UC Santa Cruz Extension*)

“Engineering Technology, Emphasis in Mechatronics” Certificate (*Allan Hancock College*)

“Electronic Technology with Emphasis in Mechatronics” Certificate (*Allan Hancock College*)

“Supply Chain Management” Certificate (*Antelope Valley College*)

### **Sampling of Employment Placements**

36 entry-level and low-skilled workers completing the *Aerospace Manufacturing Technician* Certification at El Camino College – hired by Los Angeles South Bay aerospace

20 displaced workers completing the “Software Engineering for Aerospace and Defense Applications” Certification from UC Santa Cruz Extension hired into aerospace

19 entry level workers completing customized aerospace technician training facilitated by Lancaster University Center, delivered by Antelope Valley College, hired by Antelope Valley aerospace

## Guides and Blueprints Fostering Systems Alignment

In the “Key Enablers” section beginning on page 295, California Space Authority emphasizes the importance of industry engagement, systems alignment and model practices as key enablers fostering innovation and regional prosperity.

The Corridor Initiative developed numerous model practices, but the three which most directly speak to the need for systems alignment of workforce and economic development and education, with industry, as a means for addressing the challenges of the 21<sup>st</sup> Century, are those which follow. Driven as they were by the changing 21<sup>st</sup> Century workplace, these guides are completely compatible with a regional sector strategy. In outlining new roles for the workforce, economic development and education systems, identifying success factors and providing case studies or implementation pilots, these three system guides offer a collective blueprint for other regions in aligning the three systems.

**Guide for 21<sup>st</sup> Century Economic Development** (guiding economic development’s evolution from an attraction/retention model to an innovation support model): *Innovation Driven Economic Development Model*, see p. 81-86

### **Quote from the final report of an Economic Development Stakeholder**

*“WIRED fostered a much-improved understanding for our organization of the needed coordination and disconnects between employers, workforce agencies, economic development organizations, students, and educational institutions. The resulting insights will drive our planning and priorities for some time to come.”*

**Guide for 21<sup>st</sup> Century Education Systems** (guiding education’s evolution from a 19<sup>th</sup> Century agrarian/20<sup>th</sup> Century industrialization model to a 21<sup>st</sup> Century high-tech innovation economy model): *High Stakes: STEM Education, The Essential Ingredient for California Competitiveness (STEM Collaborative Action Plan)*, p 148.

### **Quote from the final report of an Education Stakeholder**

*“I discovered that it is necessary to leverage all K-U, Academia, government agencies, industry resources...to collaborate... in solving both economic and workforce development challenges for the 21st century. Developing and nurturing relationships have been extremely important to the current success of the Corridor and will become more important for future success on programs that will impact the state and nation...”*

**Guide for 21<sup>st</sup> Century Workforce Systems** (guiding workforce system’s evolution from solely a WIA model to a demand-driven talent development model): *WIB Toolkit: Racing for the Future*, see p. 264.

### **Quote from the final report of a WIB Stakeholder**

*“In my professional life, I never really engaged with economic development professionals or the senior members of their boards. I wasn’t sure if WIBs should focus on economic development. This project opened my eyes to life outside of the WIA and how WIBs could become more demand-driven by really listening to the needs of business. The WIRED assignments allowed me to broaden my vision about how the workforce system and the economic development approaches could link together and support each other.”*

## **Development and Implementation of the Innovation Driven Economic Development Model and Toolkit**

In 2008, the Bay Area Council Economic Institute/Bay Area Science and Innovation Consortium (BACEI/BASIC), a partner in Phase I of the California Innovation Corridor Initiative, launched the *Innovation Driven Economic Development Model* (Model) and an accompanying “toolkit” of products produced by other partners.

Researching innovation centers worldwide and capturing innovation insights from Silicon Valley CEOs as part of an innovation roundtable event, BACEI/BASIC had developed a blueprint for fostering regional prosperity through the creation of an innovation culture. This culture, said the Model, would be characterized by the presence of **four innovation drivers: *Inventors, Transformers, Financiers, Brokers.***

### **“Purposeful Support” for Innovation\***

- ***Raise the Stakes: Introduce Innovation as the Imperative***
- ***Reassess the Region: Identify Current/Potential Sources of Innovation***
- ***Connect the Innovators: Conduct a Disciplined, Collaborative Process***
- ***Broker Breakthroughs: Help Innovators Take Collaborative Action***
- ***Network the Brokers: Accelerate and Expand Innovation Development***
- ***Redefine Success: Change the Metrics in Economic Development***

*\*Innovation Driven Economic Development Model, 2008*

Other Project 1.1 efforts supported the Model and were considered part of the “Toolkit” accompanying the Model.

As entrepreneurial companies are critical to the pipeline feeding an innovation economy, connecting regional entrepreneurs, venture capital, technical assistance and business resources attuned to the special needs of entrepreneurs is imperative. Through Golden Capital Network, the Corridor Initiative launched three “Venture Communities” designed to bring entrepreneurs together with investors and resources. The Corridor also hosted a statewide “California Tech 100” event to connect entrepreneurs and venture capitalists.

To support global competitiveness, the California Space Authority linked 16 California companies with nine international business firms at a business match-making session taking place during the International Satellite Communications exchange – ISCe.

The Los Angeles Economic Development Corporation (LAEDC) undertook a business climate survey, reinstated its former “Regional Business Assistance Network” (RBAN) program, and developed fact sheets for key innovation industries in the County.

In Phase II of the project, the California Space Authority guided implementation of the Model in two Corridor sub-regions.

The Los Angeles County Economic Development Corporation founded the South Bay Aerospace Consortium (Consortium) to implement the Model in the South Bay aerospace community.





*Dr. Wanda Austin,  
President/CEO,  
The Aerospace  
Corporation*

Chairperson for the Consortium was Dr. Wanda Austin, President/CEO of The Aerospace Corporation, a federally-funded Research and Development center which supports the U.S. Air Force, other government agencies, and provides some technical assistance to the commercial sector.



*Cathy Hart,  
Program  
Manager,  
Southern  
California  
Edison*

The Antelope Valley Board of Trade (AVBOT), another Corridor strategic partner from an aerospace area of California, engaged new stakeholders to

participate in implementing the Model in the Antelope Valley. Cathy Hart, Program Manager for Southern California Edison and President of AVBOT, led the Antelope Valley implementation effort.

The South Bay Aerospace Consortium’s 2009 work produced two outcomes. First was identification of key occupations needed by aerospace (Production/Touch Labor #1, Systems Engineering #2). Second was the *Long-Range Economic Development Strategy for the South Bay Aerospace Industry*.

AVBOT funded the Greater Antelope Valley Economic Alliance (GAVEA) in its development of the capstone effort in the region’s implementation of the Model: *A Vision Report 2010: Regional Collaboration as the Blueprint for Prosperity*. A business cluster study was also developed.

Using the *Innovation Driven Economic Development Model* as a guide for a regional collaboration among workforce, education, economic development, industry and government, the South Bay and the Antelope Valley project partners were able to implement a collaborative, region-wide sector strategy supporting ongoing innovation.

**South Bay Aerospace Consortium**

*Back row (l to r): Robert McBearty, Peter Manternach, Al Shepetuk, James Gonzales, Dr. Jose Anaya, Ray Wells, Ray Cooke, Robert Mejia*

*Front (l to r): Judy Turner, Marisa Villanueva, Charlotte Lazar-Morrison, Dena Bouskos, El Segundo City Councilman John Parsons*



## ***Asset Mapping Inventory Enhances Collaboration, Fosters Innovation***

California has a wealth of innovation assets not always well understood. The California Innovation Corridor (CIC) portal on Connectory.com, developed by Connectory founder, the San Diego East County Economic Development Council (ECEDC), under Phase I of the Corridor WIRED Initiative and expanded by CSA under Phase II, is a tool to support the identification of innovation assets and enhance supplier competitiveness. By linking suppliers, primes and government to potential innovation and supplier partners, the CIC portal helps establish the “culture of innovation” within the Corridor and the state.

The CIC Innovation Asset Mapping project leveraged an existing online platform – Connectory.com, a buyer/supplier, searchable, capabilities-based online inventory – to build a portal identifying the Corridor’s innovation assets, public and private. The project, led jointly by the Bay Area Science Innovation Consortium, CSA and the ECEDC, implemented by teams of workforce and/or economic development entities throughout the Corridor, captured regional innovation assets in the following categories:

- Industry/small business/entrepreneurial firms
- University labs and research centers
- Military installations
- Federal labs and research institutions

Profiles of innovation assets identified include relevant facility, technology, personnel and/or equipment descriptions, as well as official designations and certifications, e.g. Woman, Veteran or Minority-Owned Business, and AS 9100. While over 1,700 Corridor innovation assets have

now been identified, this is only a portion of those that exist; identification of innovation assets will be ongoing.

Additional benefits to those of innovators were realized by this project:

- Some innovation employers identified became resources for other Corridor WIRED projects; others among the innovation asset employers responded to workforce or supplier or other surveys
- Actually participating in the inventory asset mapping project enabled Workforce Investment Board and economic development professionals lacking an understanding of the importance of “knowing your territory” the opportunity to see first-hand the value of not only identifying but truly understanding the employer/worker community.

[http://www.connectory.com/portal\\_home.aspx?portalid=5](http://www.connectory.com/portal_home.aspx?portalid=5)



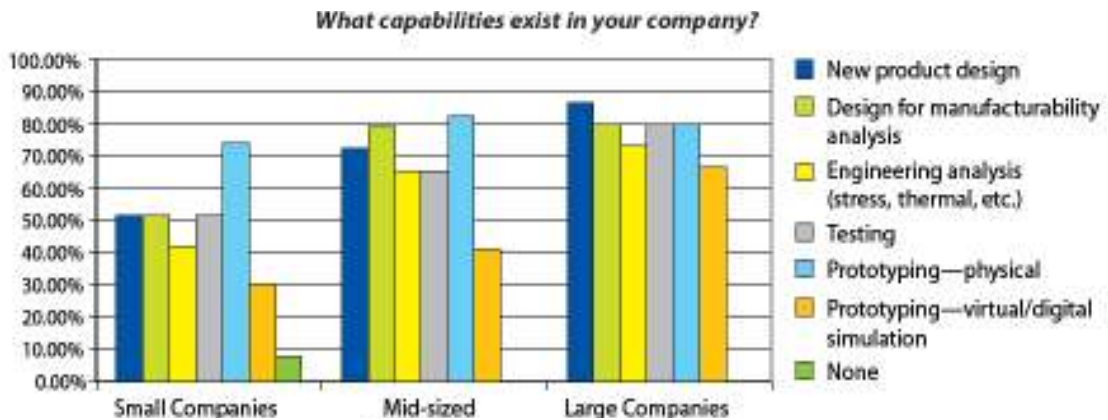
## Capacity Building: Supplier Transformation Strategy

The WIRED Project 2.2 team, led by the California Space Authority (CSA), beginning with a comprehensive survey of 288 suppliers, identified the common supplier learning outcomes required needed for 21<sup>st</sup> Century success, developed four training modules and piloted the four modules in two-day training courses. Over 100 suppliers were instructed on the Supply Chain Management principles that have been identified as critical to supplier training and success in the 21<sup>st</sup> Century global market.

In addition, a demonstration project was conducted by the California Manufacturing Technology Consultants (CMTC) with Omega Precision (Omega), a forty-year veteran of close-tolerance machining on diverse materials. Introducing Omega to the Smart Supplier Success Factors (see p. 119), as well as a benchmarking tool from the U.S. Department of Defense Mentor Protégé program, supplier training provider CMTC used assessments to examine Omega’s internal and sub-tier capabilities. Omega then developed a broader range of subcontractors and the ability to

manage them, enabling Omega to win “Boeing Supplier of the Year” honors in 2008 and increase its earnings 15% over the previous year.

In Phase II of the Corridor Initiative, CSA developed an online supplier company assessment and a web-based, self-paced version of the Supply Chain Principles course developed in Phase I, including a supplier pre and post test. International outreach to assist suppliers in their global marketing efforts included the coordination of a trade mission and information exchange between California suppliers and the French Aerospace Valley. Throughout the four-year “Smart Supplier” effort, an annual Supplier Transformation Forum was held, engaging dozens of prime contractors, government organizations, suppliers, training providers and nonprofits in panels, presentations and roundtables designed to educate suppliers about 21<sup>st</sup> Century competitiveness issues and solutions. Key topics from these forums were selected for follow-on workshops and seminars, which often included tours, student participation and networking.

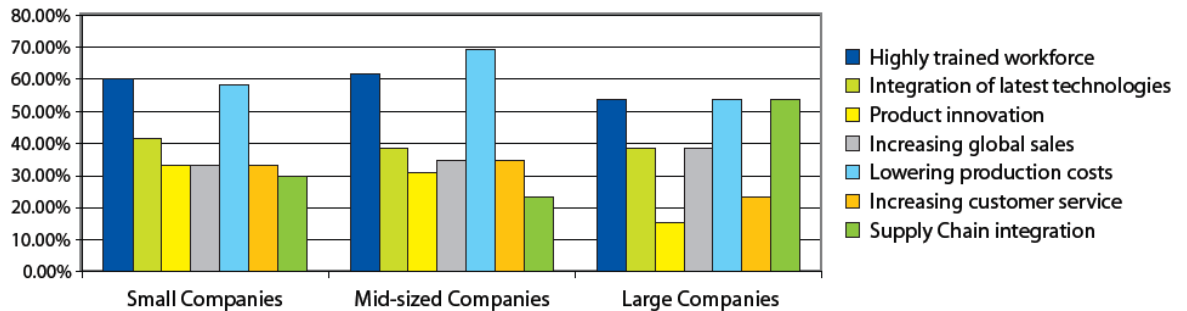


*California Aerospace Supplier Transformation Requirements for 21<sup>st</sup> Century Global Competitiveness*, California Space Authority, Antelope Valley College, 2008 (see Corridor WIRED Deliverables for Project 2.2 at [www.InnovateCalifornia.net](http://www.InnovateCalifornia.net))

The fact that 80% of production now lies in the hands of suppliers, with primes often focused only on integration, means that 80% of nationwide innovation is also now required of suppliers. This has implications for the supplier workforce, which now must include design and engineering capabilities, as well as production skills.

Figure below also bears out these facts. “Integration of latest technologies” and “Product innovation” are shown as near-term critical success factors for small and mid-sized companies, just after “Highly trained workforce” and “Lowering of production costs” in importance.

*Which of the following are the most important to your company’s success in the next three years?*



<sup>1</sup>California Aerospace Supplier Transformation Requirements for 21<sup>st</sup> Century Global Competitiveness, California Space Authority, Antelope Valley College, 2008

“Integration of latest technologies” was addressed in this project through a manufacturing-for-design simulation, enabled through super-computing, typically a large company capability. The demonstration showed how the latest technologies could put small suppliers on par with larger companies. The effort had University of Southern California graduate students working with the Western Research Applications Center (WESRAC) build a supercomputer, run a manufacturing simulation for an aerospace supplier, with the pilot validating the potential value of offering innovations collectively (e.g. supercomputing) to small suppliers.

learning outcomes from this project, others like the California Space Authority, developed different models to address supplier competitiveness. CSA’s Global Smart Supplier Strategy includes the now-Annual Supplier Forum, featuring “hot topics”, targeted workshops to address the topics, as well as the online supplier self-assessment and self-paced Supply Chain Management coursework. An estimated 400 suppliers, as well as WIBs, economic development and education entities and government organizations have participated in these events over the course of the Corridor WIRED Initiative. The Smart Supplier Initiative has significantly increased awareness/ understanding of the 21<sup>st</sup> Century Supply Chain Transformation and what it means to employers and workers.

While Antelope Valley College developed a “Supply Chain Management” certificate based on

Module 1	Module 2	Module 3	Module 4
<b>Principles of Supply Chain Management</b> Introduce the concept of global supply chain operations and the fundamentals of managing the supply chain	<b>Introduction to Supply Chain Relationships</b> Understand supply chain across functional and organizational boundaries and the consequences of strategic alignment of the supply chain	<b>Principles of Procurement &amp; Sourcing Management</b> Describe the importance of international procurement and sourcing management to an organization	<b>Introduction to Law and Regulation of Business</b> Understand the key areas of law and regulation as they apply to corporate daily operations and global management



## Sampling: Corridor Education Programs

Training and education programs aligning with the degrees, certificates on page \_\_\_

Antelope Valley Engineering Program - assures high desert residents local higher education options to obtain an engineering degree. Lancaster University Program enrollment grew from 15 to 40 students, with the Introduction to Engineering Course attracting 31 high school students. Sample impact: single mom able to stay in the area to successfully complete engineering degree and find employment as an engineer with Lockheed Martin at a healthy family wage.

Antelope Valley STEM Career Pathways – assists students, teachers, parents, in understanding coursework necessary for technical certificates, degrees. Pathways created for: Aeronautical and Aviation Technology, Drafting/Computer Aided Design (CAD), Electronics Technology and Engineering Technology.

El Camino College facilitated establishment of Project Lead the Way programs in five LA South Bay high schools, fostered their expansion at seven high schools.

Garvey Spacecraft Corporation, with California State University, Long Beach, conducted a rocket development and launch program, with

student payload opportunities provided and nine industry mentors participating.

New Mechatronics course developed at Fremont High School.

Cerritos College created a new Pathway Programs Department to centralize Career Technical Ed initiatives, student recruitment



Space Information Labs, with JPL developed a new high school level Earth Science curriculum designed to meet science content standards and serve as a University of California-approved Lab Science course.

Six regional education demonstrations were conducted around the state to test principles and/or recommendations from the STEM Collaborative Action Plan

Space Information Labs established new STEM/engineering “Endeavour Academy” at Torrance H.S.

Aerospace Community Development Program was initiated to foster aerospace and STEM career understanding of students, professors and advisors.

A UCR business class allowed Engineering and MBA students to work in teams on an action research project characterizing corporate innovation and 21<sup>st</sup> Century skills.

Stanford University conducted a student payload program and a launch project with San Jose State as well as mentoring programs at Fremont, Saratoga High Schools, with Bloomington, Pajaro High Schools supporting

A virtual classroom technology was developed and demonstrated to foster remote mentoring, real-world student work.

College of the Canyons began a Robotics Academy for high school students.

A CubeSat Launcher designed and prototyped by graduate students at the Naval Postgraduate School in Monterey will, if successfully manifested and launched, enable more student payload launches in one year than that of all previous years.

## Workforce Investment Boards Transition to Meet 21<sup>st</sup> Century Worker and Employer Demands

As the California Workforce Association (CWA), representative of California's forty-nine statewide local Workforce Investment Boards (WIBs), states in its final partner report, "In most other states, the public workforce system was not a key player in the first generation of WIRED grants, but in California, CSA included WIBs from the beginning as key players." CWA was included in the Corridor WIRED Leadership Team, the Project Leads Forum, and WIRED Academies. Its influence figured significantly in all of the Corridor's signature products.

Again citing CWA's final WIB Learning Collaboratory report:

*California Workforce Association's key accomplishments include refocusing California's local workforce system on the importance of responding to the needs of their local employers and an emphasis on talent development. Local Boards are identifying sector policies to better help their local and regional businesses stay competitive. CWA has helped forge tighter partnerships among Local Boards to look at issues regionally instead of in isolation. California will be better served if local partnerships understand their importance in the regional landscape. The Corridor will prosper when there is a steady flow of a skilled, educated workforce.*

In addition to the many California Innovation Corridor projects including Workforce Investment Board (WIB) partners or orientations, two of the Corridor WIRED projects were primarily designed to address the need for

California Workforce Investment Boards to better understand and adapt to the worker and employer demands of the 21<sup>st</sup> Century global economic environment. The **Workforce Investment Board (WIB) Learning Collaboratory** project was led by the California Workforce Association (CWA) and its project partner the California Space Authority (CSA), Corridor WIRED Program Manager and an industry and employer nonprofit. The Collaboratory's sister project, the **WIB Toolkit: Racing for the Future**, was led by the California Council on Science and Technology (CCST), with CWA and the California Space Education and Workforce Institute (Institute) as project partners.

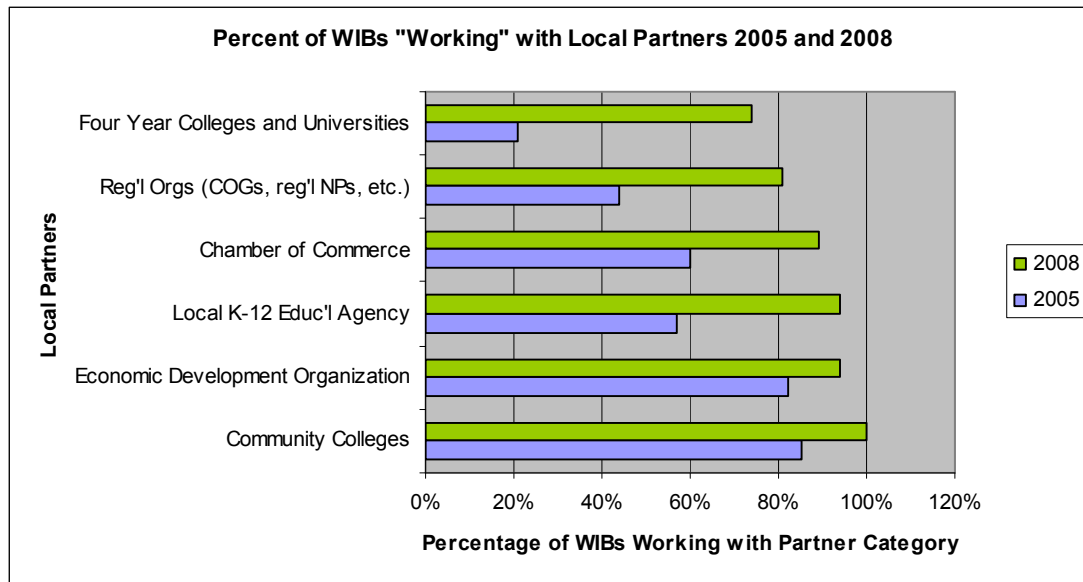


The Toolkit provides an overview of five roles important for local WIBs:

- Convener (of community workforce stakeholders)
- Workforce Analyst (community experts regarding workforce composition, key industries, trends, etc.)
- Broker (intermediary facilitating solutions, e.g. between industry and community college for customized education)
- Community Voice (representing workforce interests)
- Capacity Builder (enhancing workforce resources)

These roles align with the *Innovation Driven Economic Development Model (Model)*, which emphasizes importance of Brokers, and with both the Model and the Innovation Asset Mapping project, which stress the value of understanding regional innovation assets.





*California Workforce Association WIB Survey Report/Analysis*

The Toolkit is comprised of five categories:

- Background (nature of 21<sup>st</sup> Century global workplace and skills needed)
- Five Core WIB Roles (see above)
- Industry Profiles (overview of key California high-tech industries)
- Case Studies (WIB successes)
- Resources (WIB references)

The Collaboratory was a professional development effort created to embed into statewide and local WIB planning and operations the WIRED principles of an innovation-driven economy characterized by the alignment of workforce, economic development and education in support of 21<sup>st</sup> Century worker and employer needs. The WIB Toolkit was an online resource created, in addition to others initiated by CWA and/or CSA, to assist in WIB professional development.

Five monographs informed the work of the WIB Learning Collaboratory project:

- *Regional Workforce Strategies*
- *Youth and STEM*
- *WIB and Community College Collaboration*

- *WIB Primer*
- *WIBs and WIRED*

Through the Collaboratory-supported conferences, surveys, studies, white papers and its regular WIB and statewide workforce stakeholder interfaces, the CWA made great strides in engaging local WIBs in WIRED-related dialogue, strategy-building and planning. Between the Collaboratory, the WIB Toolkit project, and other Corridor WIRED work of WIBs, much progress was made in WIB adaptation to the 21<sup>st</sup> Century global innovation economy and WIB responsiveness to a demand-driven system.

An interesting element in Phase I of the Learning Collaboratory was the inclusion of a Social Networking Survey to gauge the kind and strength of working relationships between local WIBs and their community partners in education, economic development, as well as their interfaces with State agencies, some of which is mandated activity. As might be expected, State-mandated interfaces were strong, but it was interesting to see that both WIRED-funded and non-funded WIBs are

working with community partners more than are non-WIRED WIBs.

*Supply Chain Transformation: Role of the Workforce Investment Boards*, while developed under the Smart Supplier project, was another resource provided WIBs and the Learning Collaboratory project. Its conclusion, written by the NOVA Workforce Investment Board which developed the study, stated:

*Workforce Investment Boards can contribute to supplier success by assisting with workforce recruitment, providing links to training resources, and by utilizing their many partnerships to make connections between industry, economic development, education and job seekers. WIBs can enhance their contributions to the economic success of their communities by developing an understanding of the requirements and challenges of the driving industries in their regions.*

Like NOVA, the San Diego Workforce Partnership (WIB) conducted an analysis on potential WIB roles in an innovation economy. *Innovating Workforce Development by Supporting Business Innovation: Case Studies from California*, offered WIBs a new perspective:

*WIBs were designed to provide job training opportunities to the most disadvantaged people in particular communities. The move toward economic development is very recent, and possibly at odds with the core mission of many WIBs who see their primary role as supporting low-wage or dislocated workers and disadvantaged youth. The stories presented here (WIBs and Innovation) were selected precisely because they represent a departure from the bread-and-butter activities of WIBs and demonstrate what might be*

*the next stage of workforce development.*

In Phase II of the WIB Learning Collaboratory project, CWA and its Phase II Learning Collaboratory partner, CSA, took full advantage of the WIB surveys, monographs, projects, presentations and elements it developed, as well as those developed by CSA and its Corridor partners in Phase I.

A cross orientation opportunity was designed for WIBs and employers, meant to facilitate better understanding of each other's purpose, needs, processes and resources. The threefold purpose was described as follows:

- To enhance understanding of WIBs to Corporate Human Resource hiring, workforce development considerations, and constraints
- Acquaint HR professionals with WIBs as workforce resources
- Orient the corporate HR community to WIB job placement, dislocated worker and talent development resources through facilitation of a shared strategy

"HR 101" and "WIB 101" sessions were designed and delivered. Results of the Phase II element of the Learning Collaboratory were very positive, according to CWA:

*"One of the fundamental motivators behind the Phase II project was for the Learning Collaboratory to create a strategic partnership between WIBs and HR. Through the two presentations and CWA's participation in the Professionals in Industry Human Resources Association – PIHRA, this has truly been accomplished."*

## ***Teacher Professional Development***

31 teachers participated in two MESA summer Math Physics Technology Institutes in 2007 for a projected student impact of 4,960 (32/class x 5 classes/day)

47 teachers/administrators participated in the Lancaster University Center co-sponsored international Society of Automotive/Aerospace Engineers' "World in Motion" professional development opportunity



75 teachers participated in the Space Information Labs 2007 teacher professional development opportunity in conjunction with the NASA AIM launch – projected student impact: 12,000.

55 teachers participated in the Space Information Labs 2008 JPL 50<sup>th</sup> Anniversary teacher education opportunity for a student impact of 8,800.

## ***Sampling: Student Experiential Learning Opportunities***

2007: 30 pre-engineering students participated in the Lancaster University Center's four-week summer program to introduce "real-world" STEM work.

2007: Stanford's balloon launch program engaged over 500 students in creating PearlSat" payloads, analyzing return results.



Garvey Spacecraft's rocket development and launch program involved 80+ students the experience of participating in Corridor Initiative launches either in the field, lab or both.

1200 students participated in El Camino College's Project Lead the Way courses.

41 University of California, Riverside (UCR) MBA and Engineering students involved in the innovation action research project conducted three student-to-student workshops and designed and ran the 2-day UCR Tech Horizons Conference

2007: 20 high school students enrolled in Allan Hancock College's fourth annual Mechatronics Institute.



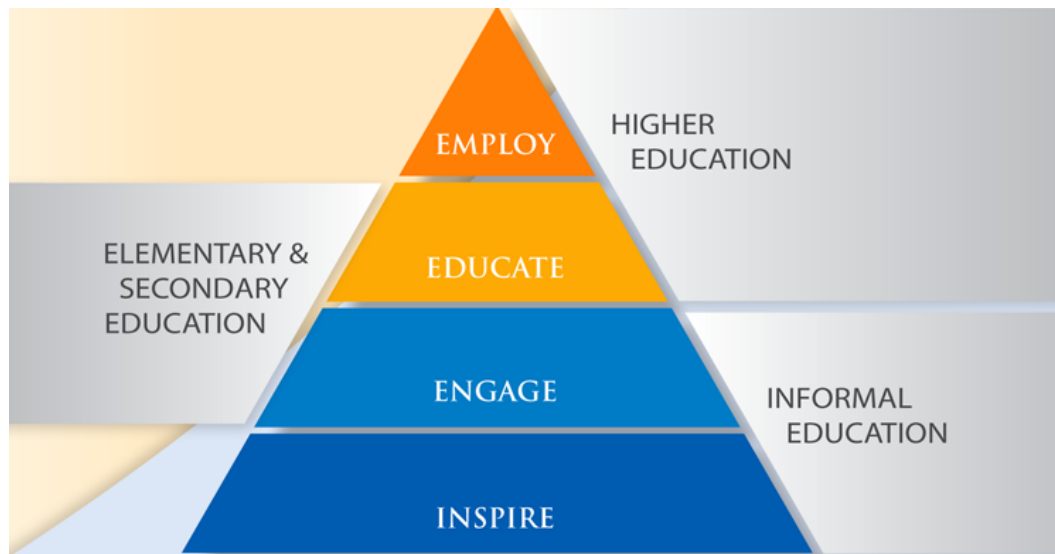
130 students participated in Allan Hancock College's Mechatronics certificate and degree courses.

24 university students used the lunar simulant testbed at NASA Ames.

## A Statewide STEM Impact from STEM Collaborative Action Plan

From 2006 – 2009, the California Space Education and Workforce Institute (Institute) successfully led the California Innovation Corridor (Corridor) project in developing a statewide private/public collaborative action plan for science, technology, engineering and math (STEM). A STEM Collaborative Action Plan Steering Committee was established and outreach conducted to engage over 400 project participants.

Three initial forums were convened to share STEM perspectives among stakeholder domains. The Institute engaged the Alliance for Collaborations to Heighten Education Success (ARCHES) in developing *High Stakes: STEM Education, The Essential Ingredient for California Competitiveness*, (the STEM Collaborative Action Plan – STEM CAP), believed to be the nation's first



Statewide STEM stakeholders engaged:

- Education
- Industry
- Workforce System
- Academia
- Economic Development
- Informal Science

Directors/executives from all California educational systems were engaged:

- Office of Public Instruction (K-12)
- California Community College
- California State University
- University of California

private, public collaborative statewide plan addressing the STEM crisis.

View the plan at: [www.InnovateCalifornia.net/documents/STEMCAPDOC.pdf](http://www.InnovateCalifornia.net/documents/STEMCAPDOC.pdf)

ARCHES culled the recommendations of the 22 most cited National and State STEM reports down to 100 recommendations, which were further synthesized down to 25 recommendations by the STEM CAP Advisory Group. Those 25 cross-cutting recommendations were further distilled into the final ten STEM CAP recommendations through the inputs

and feedback of 25 stakeholder focus groups engaging 273 participants from industry associations, educator and administrator professional associations, informal science, various math and science stakeholder groups.

Also as an element of the STEM Collaborative Action Plan, six regional projects implementing STEM CAP principles and recommendations were conducted by ARCHES in the summer of 2008, proving the value of STEM CAP recommendations and their accompanying suggested actions.

The organizing principle for the STEM Collaborative Action Plan was NASA's Strategic Education Framework: Inspire, Engage, Educate, Employ. Each of the STEM CAP's ten recommendations is aligned with one of these areas.

As part of the project, the Institute created the first statewide private/public STEM Inventory. The STEM Inventory includes STEM programs from education, informal science, industry and government at all levels of the NASA/STEM CAP continuum. [www.STEMINVENTORY.net](http://www.STEMINVENTORY.net).

The STEM Inventory is an online, user-friendly, searchable database of many California and national STEM programs organized by grade level, geography and topic, targeted to students, STEM practitioners, teachers and parents.

In Phase II of the STEM Collaborative Action, the STEM Inventory was enhanced to better accommodate video and establish social networking aspects to foster a statewide STEM community of practice. Also in Phase II, the STEM CAP Forum reconvened, a STEM community environmental assessment was completed, and a *Guidebook for Creating a Community STEM Pathway* was developed.

## STEM CAP Recommendations

### Inspire

- *Motivate students and adults, using a variety of incentives, to study and enter STEM careers, with special effort geared to those in currently under-represented and under-served groups*
- *Build public support for and understanding of the value of STEM education for all students and citizens*

### Engage

- *Provide rigorous, relevant Career Technical Education (CTE) that prepares students for both higher education and the workplace in order to reinforce classroom instruction and provide tangible, relevant skills for greater subject matter retention and competency*
- *Deliver science and math curriculum that motivates, energizes, and rewards the natural curiosity and interest students bring to the subject*

### Educate

- *Align state K-12 science and math standards and assessments with post-secondary and workforce expectations of what high school graduates should know and be able to do*
- *Implement a comprehensive package of recruitment strategies for math and science teachers throughout grades K-12 to expand and diversify the pool of fully prepared and certified candidates*
- *Strengthen teacher preparation programs in math and science through inclusion of hands-on, problem-based instruction and strategies that will benefit all students including under-represented and underserved groups*
- *Provide ongoing, research-based professional development programs, focused on both content and pedagogy, for all math and science teachers and faculty K-higher education*

### Employ

- *Create industry partnerships directly engaged with educators to deliver relevant, motivational and exciting instruction to reinforce/enhance STEM curriculum while setting the foundation for building a competitive and qualified workforce in tune with emerging work realities*
- *Create hands-on internships and fellowships for students, teachers and faculty with employers in industry, academia, informal science networks and civic organizations*

*\*High Stakes: STEM Education, The Essential Ingredient for California Competitiveness, California Space Education & Workforce Institute w/support of ARCHES, 2008*



## Findings: Innovation Support

Why is innovation important? One reason is its economic and job impact, as well as its wage value for workers. As stated in the *Innovation Driven Economic Development Model* (Model) described earlier, in a section entitled **“Without An Innovative Economy, Other Community Outcomes Are Difficult to Achieve”**:

*An innovative economy is at the core of regional vitality and quality of life. Without an innovative economy, any gains in social inclusion, livable community, and collaborative governance are short-lived. An innovation economy is the engine that produces economic opportunity and community revenues that make possible career mobility, investment in educational systems, development of community infrastructure and amenities, investments in environmental preservation, and other critical assets for regional vitality and quality of life.*

According to the Obama Administration, approximately 70% of U.S. jobs are attributable to small business. State resources show that 95% of California firms qualify as small business based on the Small Business Administration’s definition (<500 employees). Many innovation companies are well below 500 employees (most Los Angeles County Economic Development business climate high-tech innovation company surveyees had <50 employees). Small business is a critical job resource for California and the U.S.

Yet, the most important part of the story for those wishing to create and/or retain the greatest number of jobs is that all small businesses are NOT equal in terms of job generation or economic impact. Few in California question the value of the tourism industry, yet many do not understand the value of the innovation and technology sector.

### Small Aerospace vs Small Hotel Job Multiplier and Economic Impact

Impact Type	Average Salary Small Hotel	Average Salary Small Aerospace Co	Impact Sm Hotel Multiplier	Impact Sm Aero Multiplier	Hiring Impact Differential
Direct	\$33,400	\$103,450	\$45,090	\$305,177	6.8
Indirect	\$47,000	\$68,529	\$63,450	\$202,160	3.2
Induced	\$43,800	\$41,818	\$59,130	\$123,363	2.1
<b>Multiplier Total</b>	<b>1.35 Jobs</b>	<b>2.95 Jobs</b>	<b>\$167,670</b>	<b>\$630,701</b>	<b>3.8</b>

Impact Type	Small Hotel Jobs	Population	Small Hotel Personal Income	Small Hotel Output
Direct	20	42	\$668,000	\$1,712,000
Indirect	2	4	\$94,000	\$262,000
Induced	5	11	\$219,000	\$621,000
<b>Total</b>	<b>27</b>	<b>57</b>	<b>\$981,000</b>	<b>\$2,595,000</b>

Impact Type	Small Aero Co Jobs	Population	Small Aerospace Company Personal Income	Small Aerospace Company Output
Direct	20	42	\$2,069,000	\$6,108,000
Indirect	17	36	\$1,165,000	\$3,087,000
Induced	22	46	\$920,000	\$2,605,000
<b>Total</b>	<b>59</b>	<b>124</b>	<b>\$4,154,000</b>	<b>\$11,800,000</b>

CSA panel presentation to WIBs Sept. 7, 2009: *“Impact of Companies on Local Economy and Infrastructure, Quantitative Metrics”*



One element of the CIC's Innovation Support effort was the employment of the Southern California Edison Economic Impact (Pollack) Model to analyze the economic value of a small innovative company. ***Data above shows that worker income in a small innovation company was more than three times that of a small service sector company, with job and economic impact four times greater.***

Several Corridor partner organizations explored the nature of innovation prior to their other activities. While their exact definitions of innovation differed, consensus was: ***A new technology or process is innovation only when it is put into service (commercialized), producing a new or vastly improved product, service or application, one which reveals or meets a demand.***

This description has great significance in terms of innovation funding and R&D tax policy. In its analysis of R&D funding for California (*Overview of California State-Funded R&D, 2004-2007: Understanding the State's Role in Shaping R&D Spending*), California Council on Science and Technology (CCST) found that, in 2005, California ranked first in the nation for receiving federal R&D investment, garnering \$19.4 billion. In the same year, \$50 billion in R&D was conducted in California by industry. It is likely that most of the industry investment was in "development" research, as industry, according to the report, is the largest provider of development research, that supports "the final stage in preparing a product or process for public consumption", i.e. the commercialization or innovation described above.

R&D tax credit rationale is based on the assumption, illustrated in the "Small Aerospace" tables above, that the State will receive a high return on investment

for its support of innovation-oriented R&D. Unfortunately, in 2008, that rationale did not prevail. Restrictions were made to the California R&D tax credit that decreases its usefulness to companies by 50% through the 2010 tax year. Since 31 other states now offer R&D tax credits, the California R&D tax credit adjustment could become a competitive advantage to other states, probably impacting small business even more than large companies. The CCST report states, "...most tax returns with R&D claims are filed by small and medium-sized businesses; in 2002, over 60 percent of R&D credit claims were filed by businesses with gross revenues of under \$1 million."

California, according to the CCST report, leads the nation in total R&D dollars, enjoying over three and a half times that of any other state. It also points out that, in at least some of California's R&D investments, the return is two to one from other sources. Yet, per capita, California R&D is slipping, with the state now ranking only 19<sup>th</sup> for academic R&D funding relative to GDP. To fully understand the role of California's R&D investments in directing statewide R&D, more consistent tracking will be necessary. An R&D strategy at the state level is also advised to support California's high-tech sector.

Support of entrepreneurs was also addressed by the three venture communities established by Golden Capital Network as part of the Corridor effort. Chabin Concepts, in its *Venture Community Guidelines*, provides a key insight:

***To support entrepreneurs, communities can work to build and support visibility for innovators, vertical and functional networks, access to all stages of capital,***

*access to talent, access to customers and strategic partners, and establishment of anchor companies in the local community.*

Much of this support can be provided by effective innovation asset mapping, such as that conducted by the Corridor, with Corridor innovation assets now housed in a single “California Innovation” portal for the benefit of entrepreneurs, suppliers, primes, universities and other innovation stakeholders:

[http://www.connectory.com/portal\\_home.aspx?portalid=5](http://www.connectory.com/portal_home.aspx?portalid=5)

Insights gained in developing the Corridor’s innovation asset resource inventory included the following from the Corridor’s full final report:

- Companies residing in a certain industry sector can no longer be assumed to have capabilities, workforce needs and activities similar to those of each other
- As stated in the final report of the Corridor’s “Workforce Analysis” project: **“Aerospace, bioscience and other emerging technologies reside in multiple NAICs codes and are therefore problematic to find and measure – requiring other qualitative approaches to truly gauge breadth of emerging industries in a region”**
- The Corridor’s Innovation portal is the type of tool that can assist in identifying emerging regional innovation assets because it is capabilities-based rather than industry-based. It can provide the foundational data that enriches essential face-to-face contact necessary to keep up with the evolving innovation community

Early research efforts of the BACEI/BASIC to develop an economic development model to support innovation included an Innovation Networking Roundtable (Roundtable). The event provided much of the foundational information for the *Innovation Driven Economic Development Model* described previously. The event also included insight on the importance of a new kind of public/private collaboration to support innovation.

#### John Kao on the Bay Area Innovation Networking Roundtable<sup>1</sup>

*This gathering offers a glimpse of what the future of our country’s approach to innovation might look like on a grand scale. Our national agenda should not be a grand project along the lines of the old top-down five year plans, but rather a free-flowing, unencumbered dance among the private and public sectors, among academics and NGOs, entrepreneurs and individual citizens. It is neither the bureaucratic top-down of a government agency, nor the invisible hand of the private sector. What we need is a blend of the two that finds the sweet spot between the invisible and the controlling hand – in short, the helping hand.*

<sup>1</sup> *Innovation Nation*, John Kao, Free Press, A Division of Simon & Schuster, 2007

The culminating report from the Roundtable event included the summary findings of the gathering. These findings described the “Emerging Patterns of the Next Wave of Innovation”, and workforce and economic stakeholders would be wise to study them.

Partners in the Joint University Innovation Model project also have insights of interest to innovation stakeholders.

Below are insights from both of above:

### ***Emerging Patterns of the Next Wave of Innovation<sup>1</sup>***

- A networked environment – in which ideas are brokered both within and between organizations – is critical to creativity
- Regional capabilities must be connected to global networks
- Maintaining and attracting a talented workforce is a critical factor in an innovation infrastructure; businesses need to draw on the best talent from wherever it can be found, including globally
- Companies must be flexible and adaptable to changes affecting their markets and technology platforms
- Ideas come from everywhere; companies must lose any “not-invented-here” mentality
- Taking risks and not being afraid to fail are essential
- Innovation on the business side of the process can be as important as the science
- The four network roles of inventor, transformer, financier and broker are at the core of the new global innovation model, so it is important to pick the right role or roles for your particular company

<sup>1</sup> Bay Area Innovation Network Roundtable: Identifying the Emerging Patterns of the Next Wave of Innovation, Bay Area Science Innovation Consortium, 2007  
<http://www.innovatecalifornia.net/WIREDDeliverables/Innovation%20Roundtable%20Report.pdf>

### **Sample of Findings from Innovation Companies, Joint University Innovation Model<sup>1</sup>**

- The reward system is an effective parameter for innovation
- The market/customer determines the need for new products
- Financial health of the company affects R&D investment
- Benefits of innovation are measured by customer satisfaction, revenue
- Primary collaborators are in U.S., 50% are in California
- Outsourcing is done to reduce labor compensation, penetrate new markets
- Language barriers affect outsourcing
- Companies concerned those outsourced to are too far away
- R&D driven by top management, then engineering
- Only 12% of online surveyees (106 companies) partner with university labs
- California companies stay in California for the availability of highly educated professionals
- Companies hire primarily locally, with exception of employees with advanced degrees, for which they prefer to hire within U.S., locally if possible
- Outright sale is preferred exit strategy (4-6 years online surveyees)
- There is no “magic formula” for innovation in a company
- Individuals may be singularly significant, e.g. Steve Jobs, Apple
- Networking is a critical innovation factor - between those with technology needs, those with technology solutions

<sup>1</sup> Partners: University of California, Riverside; Stanford University, California Space Authority. Data from innovation company interviewees and 106 surveyed companies

As part of its support to the nationwide WIRED partners, the U.S. Department of Labor offered regions technical assistance from a variety of sources. One such source was the company called New Economy Strategies, which BACEI/BASIC called upon early in the Corridor effort to characterize global best practices in innovation support.

## ***Innovation Success Factors/Global Best Practices***

*Lightening Bolt Challenges: Obstacles and Opportunities  
Unearthed in the Global Benchmarking of Regional Innovation Capacity  
-----New Economy Strategies*

- **Economic development planning supported by innovation metrics**  
***Best Practice: John Adams Innovation Institute – Greater Boston*** Editions of the annual “*Index of the Massachusetts Innovation Economy*” provide valuable innovation metrics for MA, CA, NY, other key innovation states (e.g. SBIR awards, Patents, Corp R&D expenditures, innovation cluster employment, etc.)
- **Robust adult/continuing education programs**  
***Best Practice: Dipoli – Finland*** “Dipoli, the Lifelong Learning Institute of Helsinki University of Technology, is one of the premier continuing education institutes for engineering in Europe. It works with companies to provide specifically designed programs for training in engineering and management and may serve as a model for bridging the gap between formal academic programs and training within firms”
- **Promotion of a variety of advanced certification programs**  
***Best Practice: Technical Education in India*** A National Skills Standards Act was passed in India in 1994 by the “All India Council for Technical Education, the central body responsible for India’s 1,346 engineering colleges, to facilitate development of voluntary skills and certification standards. India’s Department of Higher Education cites 357 Industrial Training Institutes with a capacity to serve 1.5M people in over 200 industries. Mid-level professionals requiring advanced applications training are served by 290 polytechnics nationwide.
- **Leveraging of public/private technology parks, infrastructure, collaboratories**  
***Best Practice: Singapore Science Park*** A set of Singapore technology parks founded co-locating academic institutions and industrial facilities has created a particularly strong infrastructure for technology transfer. Singapore Science Park consists of three different parks with a “vast array of customized facilities created to support work in a variety of fields from medicine to media” and also contains Asia’s first R&D facility dedicated to telecommunications
- **Endorsement of a globally networked business model, leveraging global outsourcing to ensure its companies/workforce are more competitive**  
***Best Practice: Outsource Competitor/Partner – India*** The country has defined itself as a hub for IT software and consulting services, employing its vast technically educated workforce in the service of growing India’s IT industry by means of leveraging its talents first on low transnational telecom cost work outsourced from other countries
- **Proactive Federal and State policies toward technology competitiveness**  
***Best Practices: Singapore and Korea*** Despite its small size, Singapore recently devoted \$5B USD on R&D, both public and private, in key industry sectors, acknowledging thereby the advancement of its innovation policy. Korea is moving towards a knowledge-based economy through its Vision 2025, setting a goal of achieving competitiveness with G-7 nations. Both Singapore and Korea have developed and are implementing aggressive innovation policy

***Best Practice: Many of the above-mentioned players*** “It was evident from our review of global best practices in innovation capacity that challenger nations have developed more formalized networks. Often these networks are government-led and have resulted in industries and firms that have benefited from strong alignment between government policies and firm success. This *organized dialogue* amongst industry, academia and government over policies for the successful development of innovation capacity has often resulted in success for all three sectors of society.”

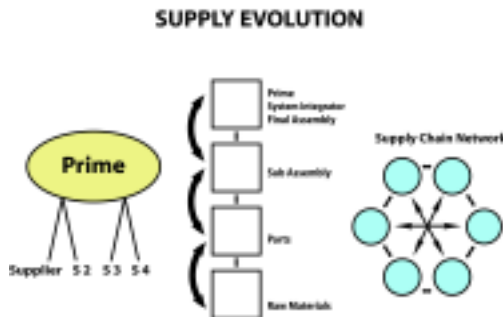
## Findings: Supplier Competitiveness

The single most important insight gleaned from the Corridor Supplier effort was articulated in the Supplier project final report, learned in relation to aerospace, but is applicable more broadly:

*As prime contractors have become focused on final integration, with 80% of systems development now moved out to the supply network, the result is that 80% of product and process innovation is now expected from suppliers.*

Thus, for the U.S. to remain competitive globally, the challenge to quickly bring California and U.S. suppliers up to 21<sup>st</sup> Century expectations cannot be overstated. It is primarily the manufacturing sector which offers workers and small business owners pathways out of poverty and into work promising long term family wage incomes. Since California is home to about 50% of U.S. manufacturing, failure to keep our California industrial base globally competitive would threaten not only our national security but our very quality of life.

First, it was important to review what had happened to the supplier environment:



*California Aerospace Supplier Transformation Requirements for 21<sup>st</sup> Century Global Competitiveness, 2008*

Much of the information gathered about the changes in the supplier environment was garnered from CSA's annual Supplier Transformation Forums.

### A Changing Landscape for Aerospace Suppliers<sup>1</sup>

- ❖ Suppliers are working in a global "flat world"
- ❖ They are doing business in a digital, socially networked world
- ❖ Supplier work is changing from "Stable & Certain" to "Sense & Respond"
- ❖ Collaboration and competition are coming from more places
- ❖ 6 Sigma and Lean are standard, not exceptional
- ❖ Marketplace is moving from "Make & Sell" to "Sense & Respond"
- ❖ Suppliers exist in an E-Commerce, E-Process global marketplace
- ❖ Data, information and communication are more critical
- ❖ Pace of change is accelerating

#### Key Messages for Suppliers

- **Nearly 80% of former "prime" manufacturing/assembly work had moved down to suppliers, with most primes now focused on final integration**
- **Impact: 80% of the innovation and engineering falls to suppliers**
- **Suppliers unlikely to remain competitive simply providing components**
- **Supplier transformation and training are only competitive options**

#### The Best Companies Are Adjusting to Stay Successful

<sup>1</sup> From Presentations, Handouts, Supplier Transformation Forum, November 9, 2006

Other conclusions were drawn from comparison of findings of the Supplier project with other CIC projects. The following were conclusions cited in the Supplier project final report:

- Supply chains have evolved into dynamic complex supplier networks requiring significant change, trust, collaboration and communication, with clearly defined technical and business requirements, balanced accountability, responsibilities and reward
- Need for balance of innovation and risk
- Need for Innovation metrics
- Early collaboration with customers and suppliers, innovators and markets is critical
- Interdisciplinary skills and teams, ad hoc teams are required
- Expectation of the shared risk, investment, reward of innovation
- Common assessment processes are needed across the supply chain network

### Smart Supplier Success Factors<sup>1</sup>

- Successfully managing supplier relationships (upstream, downstream)
- Successfully managing process and quality performance demands in an environment of both vertically integrated chains of companies as well as dynamic, distributed networks of companies
- Remaining flexible, agile, to deal rapidly with changes/disruptions in one layer or node of the supply system
- Expanding capacity to take on new functions, e.g. design, engineering, quality assurance formerly a responsibility higher up the chain
- Engaging earlier in the product development cycle with both customers, suppliers, i.e. requirements definition, design
- Real-time, open sharing of more data, earlier, more often, i.e. schedule, quality (open systems)
- Digital modeling and simulation capabilities (utilization of high performance computing if possible)
- Full understanding of customer requirements
- Performing to industry standards
- Aligning research/development
- Software engineering and systems engineering capabilities
- Solid planning, process, risk, LTS management (schedule, cost, quality control)
- Recruitment and retention of quality-conscious workers (technicians, engineers)
- Effective inventory, logistics, materials management
- Effective sub-contract, intellectual property management
- Development of long-term strategic relationships (customers, suppliers)
- Reputation management
- Incorporate foreign content to assure foreign market access; control counterfeits
- Ongoing training in latest technologies, basic skills, business practices
- Lean practices
- Willingness/ability to expand to meet customer needs (e.g. equipment, facilities)
- Customer and supplier collaboration (process streamlining, cost/risk reduction, product design, development, etc.)
- Regulatory compliance (e.g. ITAR), regulatory flowdown management
- Product lifecycle management
- Forecasting
- Rapidly introduce new technologies
- Focus on core competencies
- Capture and proposal strategies
- Supplier diversity
- Understanding program pricing targets and company's contribution
- Obtain/maintain appropriate certifications
- Utilize internal audits
- Market solutions providing differentiation (technology, cost, speed)

<sup>1</sup> From presentations, handouts provided at the October, 2007 Supplier Transformation Forum, October 2008 Forum



## Findings: Talent Development

According to a U.S. Department of Education, Office of Vocational and Adult Education report (*Adult Basic Education to Community College Transition Symposium Report*), 90 percent of the country's fastest-growing jobs require post-secondary education or training, yet 60 percent of Americans have no post-secondary credentials.

Most of the fastest-growing jobs require science, technology, engineering and math (STEM) skills and with baby-boomer retirements, fewer STEM professionals and technicians are available now than ever before. It is a "perfect storm" for a country (and a state) committed to global competitiveness.

Part of the solution lies with the U.S. workforce system, part with the state's educational systems and the rest is distributed among industry, nonprofits, community stakeholders and parents.

The California Workforce Association (CWA), the voice of California's 49 Workforce Investment Boards (WIBs), identified some of the barriers to implementing an innovation agenda at the local level from the WIB perspective:

- Issue #1: Workforce Investment Act (WIA) Performance Measures (which exhibit a "significant disconnect" between WIA and a collaborative regional innovation agenda)
- Issue #2: Demand-Driven Design ("WIA is largely silent on the WIB role, local authority and responsibility in responding to business needs")
- Issue #3: Role of the WIB (Need for collaboration with local entities "constrained by a lack of clear policy direction and of

dedicated strategic planning resources" to achieve workforce system transformation)

- Issue #4: Access to Resources

CWA outlined Federal, State and Local recommendations to address the above. See the CSA full Corridor final report (Key Findings) for detail.

In developing the Science, Technology, Engineering and Math Collaborative Action Plan (STEM CAP), project participants identified four key challenges facing California STEM education:

- Fewer high school students are interested in preparing for and obtaining a college degree in STEM
- Too many of California's students do not have access to high-quality science and mathematics instruction or quality materials
- Large percentages of California students, especially those in low performing schools, receive instruction from under-performing teachers
- California lacks state-level leadership to make high-quality science and mathematics education for all students a priority

All of the above are quite real and significant. Through other CIC Talent Development projects, however, other challenges were identified, some of which can be addressed through the STEM CAP, some of which are beyond its scope:

- Recognition of education's role in preparing the 21<sup>st</sup> Century workforce does not seem widely accepted within the education community.
- Lack of mechanisms within the four systems for student, parent, teacher career awareness, career relevancy

- and career preparation pathways, which especially impacts students without college educated parents
- Willingness to see industry, industry associations and employers as partners and subject matter experts, as well as outside funders
  - Less educator accountability than necessary for assuring a quality, relevant learning experience for all students
  - Systemic education issues that do not seem resolved by additional funding
  - Critical importance of educators remaining current with the educational needs of today's workers
  - Importance of inquiry and project-based learning in today's global environment. As it is now impossible to learn everything in school needed for success in the 21<sup>st</sup> Century career marketplace, it is increasingly important for students to engage and succeed in real-world scenarios to prepare them for the ever changing environment in which they will work
  - Broader recognition of the value of Career Technical Education (CTE) as a pathway to success and family wage jobs for students not interested or able to pursue four-year college after high school graduation
  - Importance of an interdisciplinary approach to career preparation. Nearly all of today's careers, as will be seen below, require cross-disciplinary skills and competencies. The strict departmental structure of our universities and the single focus of many of our degrees does not lend itself to the relevancy required to keep our universities cutting edge.
  - Perceived or real lack of articulation in STEM disciplines among segments of education K-University
  - There is also recognition of the need for more hybrid degrees which would address the domain understanding needed by a professional managing

a technology firm doing scientific or high-tech work. Such a degree, exemplified by the new California State University "Professional Science Masters" degree, addresses the competencies needed to manage or market a domain-based high technology business, for someone who does not plan to actually engage in domain-based (e.g. biotech) work itself.

Industry surveys were conducted as part of several Corridor projects, with surprising consistency in the results.

Probably the most significant, though not surprising, insight, is that across nearly all industry sectors surveyed in sub-regions of the California Innovation Corridor, two occupations emerge as the top careers critical to 21<sup>st</sup> Century industries:

- Engineers
- Technicians

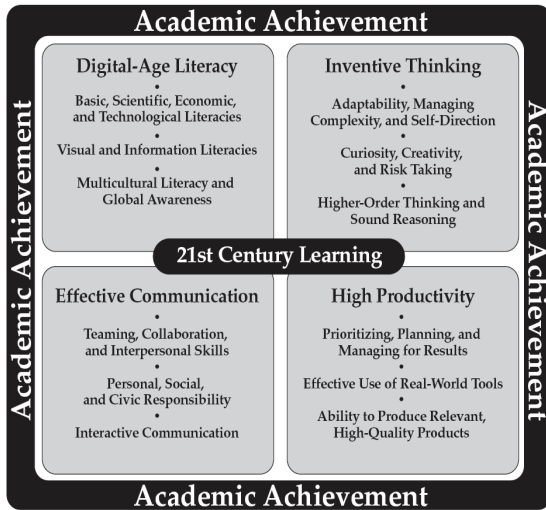
While the order of the two changes from sub-region to sub-region (Engineering #1 in some areas, #2 in others), it is clear that the need for these two occupations is uppermost in employer minds. Notes to the above:

- Need for systems engineers seems to be growing as technologies become more complex
- In heavy biotech-oriented sub-regions, scientists and technicians may appear as numbers one and two (e.g. Bay Area)

Also similar across several projects was the finding that, in addition to domain competency, today's workers need a set of additional skills to be competitive.

The 21<sup>st</sup> Century Workforce Skills illustration below, featured on the WIB

Toolkit, is fairly representative of the aggregated skills identified by most projects with a skills analysis element.



*enGauge 21<sup>st</sup> Century Skills*  
Source: NCREL, 2003

Two notes to the above: UCR found that business knowledge was also an expectation, and numerous partners identified “systems” understanding as important, as well.

An interesting data point in the STEM conversation about the importance of engineers and technicians is that findings of the Worker Profile project and Workforce Needs Analysis projects both indicate that industry is facing a critical skills *shortage* of technicians, meaning they are hard to find. In the scientist/technician dialogue in the Bay Area, it was indicated that it is easier to find PhDs than bio-technicians. This could be a good news story for California workers, if community colleges can accelerate technician training programs, as it was indicated that most of the STEM technician training positions require a two-year degree or technician certification.

While only featuring aggregated findings of the Workforce Profile Analysis and Workforce Needs Analysis projects, the

following is representative of findings of numerous Talent Development projects.

### Common Findings: Talent Development

- Engineers, technicians most critical occupations for innovation, also map to critical skills shortages
- STEM education/training is key
- Greater levels of education or certification are anticipated for STEM workers, except perhaps for the doctoral level
- Most critical occupations fall into high-wage categories (\$60-over \$105,000)
- Technical knowledge, communications and workplace skills all rank among top three skillsets needed
- Problem-solving and business skills also a key need
- No educational preparation of level exceeds employer expectations
- Industry-relevant, real-world experience is critical and sorely lacking in 21<sup>st</sup> Century workforce development

Common areas of recommendations:

- Build better linkage between education, academia and industry to ensure relevant knowledge, skill-building
- Educate policymakers about issues, recommendations, resources
- Develop more “real-world”, hands-on opportunities for STEM students
- Develop communications and problem-solving, business and workplace skills alongside technical knowledge
- Increase awareness of STEM career attractiveness among parents, educators and students
- Re STEM: Link educational levels
- Align workforce and economic development and education to address industry workforce needs

## Key Enablers of an Innovation Ecosystem: Industry Engagement, Systems Alignment and Model Practices

Regional collaboration, as anticipated, was indeed a success factor of the Corridor Initiative and an identified success factor for supporting an innovation culture beyond the Corridor Initiative. But regional collaboration alone, without the other enablers listed below, would not be enough to foster innovation and drive regional prosperity.

The Corridor Initiative, in its three pathways of activity and in its 25 discrete projects, especially those that from the start were labeled “sustainability projects”, again and again discovered that project and/or Corridor success was dependent upon these three factors:

- **Industry Engagement**
- **Systems Alignment**
- **Model Practices**

Distilled from across the CIC WIRED pathways and 25 projects, across the broad-based accomplishments of the 42 funded partners and across the 82 scopes of work making up the California Innovation Corridor Initiative, these three factors offer valuable insight to the rest of California and the nation in how to bring about the transformational change necessary to ensure California and U.S. global competitiveness.

The economic vitality necessary for high employment requires job creation and/or retention. Because workers are dependent upon thriving industries for long-term opportunity, it is critical to include the industry perspective as early as possible. It is perhaps a Corridor WIRED success factor that the CIC Initiative itself was conceived and managed by the California Space Authority, which represents the private and government space community

(employers) throughout the state. Many of the 25 projects included in the Corridor’s original WIRED proposal, while featuring cross-industry applicability, were derived from objectives in CSA’s eight years of space enterprise (employer) strategic planning. Because CSA as an association of employers understood the value of engaging industry and employers or their representative associations at the outset as well as throughout, nearly every Corridor project did so.

While conducting a sector strategy was not the purpose of the Corridor Initiative, the Initiative’s success, based on its early and frequent engagement of key industry sectors and its call for systems alignment on behalf of workplace sector needs, lends credence to the cluster-driven, sector strategy model that California has been attempting to implement through its “Industry Clusters of Opportunity” Initiative.



### **Industry Engagement**

There is no better way to articulate the value of early engagement of industry than what was said in the *Innovation Driven Economic Development Model*:

*Brokers should start at the source. The drivers of innovation will primarily come from the private sector.*

Without early and ongoing industry/employer engagement, the likelihood of designing effective worker, student or community programs addressing 21<sup>st</sup> Century workforce needs is slim. Numerous CIC projects engaged industry in both predictable and unique ways, supporting the drive to transform the education, workforce and economic development systems to respond to 21<sup>st</sup> Century innovation era needs.

Industry/employers were engaged in the 25 projects in the California Innovation Corridor Initiative to:

- help define innovation
- characterize the new supply chain network environment
- partner in demonstrations
- respond to workforce surveys
- sit on panels, committees
- make presentations
- grant interviews
- participate in STEM career awareness activities
- sponsor events, activities
- share industry programs, models
- provide facilities
- offer use of equipment
- lend subject matter expertise
- provide projects for real-world student work
- support teacher professional development
- work technology issues
- serve as program advisors
- mentor young people
- offer classroom instruction
- test theories
- design or refine curriculum
- make recommendations

In implementing industry engagement as a principle, clarification and articulation of the role of industry is important. Communication of such to all partners keeps them aware and respectful of industry's role and time contributed. Meetings to which

industry/employers are invited should have outcomes requiring them to be there, or there is risk of losing their participation. The single biggest "take-away" regarding industry engagement:

*Engage industry/employers at the beginning, not the middle or end of an initiative and retain their involvement throughout the effort to ensure real-world relevance and sustainability.*

### **Systems Alignment**

A principle challenge to the creation of successful regional collaboration in support of job creators and workers is that of aligning the public education, workforce and economic development systems. Some Corridor partners recognized this from the start, others learned it in attempting regional or sub-regional collaboration. Several factors characterize this challenge:

- Funding streams and accompanying mandates are different among the three systems
- Disparate goals and sometimes mandated metrics determine system priorities, seldom with an eye for addressing the demand-driven workplace
- Jurisdictional boundaries of the systems are not aligned, and none of the system boundaries are aligned with governance boundaries

Building a regional collaborative in such an environment requires creativity, trust and a willingness to value the regional economy perspective. Stakeholders must recognize that the industries generating jobs and regional prosperity through their investments in people and facilities and product/service development do not recognize or care about the varying boundaries of public systems or governance that have nothing to do with the flow of commerce. If anything, this perspective of industry

has been exacerbated by the global economy where products and services can be sourced from around the globe.

The alignment of systems behind Corridor Initiative objectives was a continual focus of the CIC Project Leads and partner meetings, and there were numerous occasions for collectively exploring how actual project practice demonstrated systems alignment or was hindered by its difficulty.

- In several projects or pathways, economic development and workforce partners were asked to jointly pursue project objectives:
  - In the Workforce Needs Analysis projects ED and WIB project partners were asked to agree on industry cluster targets, develop/disseminate/analyze employer surveys and collaboratively articulate conclusions
  - In addressing unique needs of entrepreneurs, one project asked its ED and WIB partners to approach the entrepreneur development and workforce issues from a regional economy (collaborative) perspective
- In the Supplier Transformation project and pathway, it was the systems representatives themselves that integrated their research and developed their individual project elements accordingly
- Systems alignment in development of the STEM CAP was assured by all three systems participating on the Steering Committee
- The Learning Collaboratory included findings, perspective of education and ED systems in their work throughout the performance period
- The WIB Toolkit featured the benefits of collaboration with ED and education

The *Innovation Driven Economic Development Model* recognizes the need for alignment of systems without mentioning the three system “players”:

*Regional innovation is the product of economic, social, environmental, and other place-based factors. It requires innovative companies, but also talent with education, skills and creativity, and livable communities that provide a quality environment, one that is attractive and supportive for people and commerce. It also requires effective regional governance, the ability of public and private entities to work together across boundaries to strengthen economic, social, and environmental assets that are the key to regional vitality and quality of life.*

The Learning Collaboratory’s final monograph *How Workforce Boards Connect to WIRED Projects* lists five strategies intended to allow WIBs to continue moving to a talent development system by capitalizing on the work done through the Corridor Initiative:

- Develop Strategy Design Using the 5 Roles of the WIBs
- **Collaborate with Economic Development**
- **Collaborate with Education**
- Know Everything About Your Labor Market and Supply and Demand
- Cultivate Networks

The Corridor Initiative made huge inroads in fostering working relationships across and within the Corridor among workforce and economic development and education entities, all encouraged to collaborate for the benefit of the region. This built new trust, new relationships and new opportunities to align and leverage the three key public systems supporting regional innovation.



## ***Model Practices***

The utilization of model practices or actual proven models is included as an important innovation enabler because it has the potential to *accelerate* the creation of a regional innovation ecosystem.

The CIC WIRED Initiative produced hundreds of deliverables. What follows is just a sampling of what the Corridor produced in the way of model practices or working models. For others, see “Deliverables” under [www.InnovateCalifornia.net](http://www.InnovateCalifornia.net)

- ***The Innovation Driven Economic Development Model***  
<http://www.innovatecalifornia.net/WIREDdeliverables/Innovation%20Driven%20Economic%20Development.pdf>
- **Innovation Asset Mapping Inventory**  
[http://www.connectory.com/portal\\_home.aspx?portalid=5](http://www.connectory.com/portal_home.aspx?portalid=5)
- **WIB Toolkit** <http://www.wibtoolkit.net/>
- **Supplier Transformation Requirements for 21<sup>st</sup> Century**  
<http://www.innovatecalifornia.net/WIREDdeliverables/CSA%20AVC%20Supplier%20Initiative%20Report%20Wired4Web.pdf>
- **STEM Collaborative Action Plan**  
<http://www.innovatecalifornia.net/WIREDdeliverables/STEMCAPDOC.pdf>
- **WIB Learning Collaboratory/Primer for WIBs (monograph #3)**  
<http://www.innovatecalifornia.net/WIREDdeliverables/Primer%20for%20WIBS-Monograph%203.pdf>
- **“WIB/WIA 101” training course – for employer Human Resource professionals** <http://www.innovatecalifornia.net/WIREDdeliverables/3.14-WIB-info-for-HR-departments.ppt>
- **“HR Fundamentals and Strategies for WIBs” - orienting WIBs to industry/employer (HR) perspective, how WIBs/HR departments might interface** <http://www.innovatecalifornia.net/WIREDdeliverables/3.14-HR-issues-for-WIBs.ppt>
- **(California Community College-approved) “21<sup>st</sup> Century Aerospace Manufacturing Technician” Certificate**  
<http://www.innovatecalifornia.net/WIREDdeliverables/Certification%20Manufacturing%20Tech%20Body%20of%20Knowledge.pdf>
- **(California Community College-approved) Associate of Science (AS) degree/Certificate in Engineering Technology with Emphasis in Mechatronics**  
<http://www.innovatecalifornia.net/WIREDdeliverables/Engineering%20Technology%20with%20Emphasis%20in%20Mechatronics.pdf>
- **Distributed Curriculum: Systems Engineering Course for Working Engineers**  
<http://www.innovatecalifornia.net/WIREDdeliverables/A%20Distributed%20Systems%20Engineering%20Curriculum%20for%20Working%20Engineers%20in%20California.pdf>
- **High School Earth Science Curriculum for University of California approval**  
<http://www.innovatecalifornia.net/WIREDdeliverables/MTPES%20UC%20Approval%20Course%20Description.pdf>
- **Venture Communities Guidelines – blueprint for creating venture communities according to Golden Capital Network model**  
<http://www.innovatecalifornia.net/WIREDdeliverables/Venture%20Communities%20Guidelines.pdf>

## **Program Management ▪ Leverage ▪ Sustainability**

### ***Program Management***

As Program Manager for the California Innovation Corridor WIRED Initiative, the California Space Authority employed a variety of strategies to bring the Initiative to a successful close. Several of these were called out as “Best Practices” by DOL/ETA. Key success factors in Corridor program management included:

- Public/private Leadership Team including workforce and economic development, education and industry
- Project (CSA staff) liaisons facilitating communication among program management, project partners and related projects
- Project Leads Forum fostering integration across all projects
- All Partner Meetings encouraging greater cross-talk and leverage
- Common reporting templates
- Use of webinars to reduce costs
- Constant fostering of cross-sector, public-private activities and relationship-building across jurisdictional, geographical, functional and domain lines

Four task forces established in early stages launched cooperative efforts across the partnership: Data, Policy/Issue Identification, Media/External Communications, Resource Development.

Development of an online presence for the partnership and its achievements (InnovateCalifornia.net) ensured continuity and fostered sustainability.

### ***Leveraged Resources***

In fall of 2009, CSA was requested by the State to query partners as to leveraged amounts they could report in support of their Corridor WIRED contracts. CSA received a 73% response rate to its request for information related to leveraged resources using the ETA guidance provided. This was considered to be quite good considering nearly all partner contracts had ended November 30, 2008. On its financial quarterly report for October – December, 2009, CSA reported \$2,355,469.96 in Federal leverage, \$1,381,569.74 in Non-Federal leverage, for a total reported Corridor Leverage amount of \$3,737,039.70. In addition to the Leverage reported, many partners indicated, but were not able to quantify for auditing purposes, thousands more of in-kind support to Corridor projects.

### ***Sustainability***

A key element of success in the CSA methodology was the early identification of “sustainability projects”. Six projects within the CIC WIRED Initiative were identified as having potentially more impact and longevity than the other 19 (see “Overview”, above)

These projects were seen as most likely to drive transformation in the three thematic areas, as well as within the three systems (workforce and economic development, education). Project Leads and All Partner meetings consistently featured findings of

these projects, with the intention being to expand Sustainability Project findings and insights throughout the Initiative.

Sustainability was also a frequent feature of Project Leads and Partner Meetings, with many new partnerships and strategic relationships developed. Partner capabilities and competencies were inventoried and uploaded to InnovateCalifornia.net to foster partnering even after the Initiative.

Phase II actually called out sustainability efforts in specific sustainability projects.

In addition to the replicable models listed above, sustainability of Corridor efforts throughout the nation was facilitated by numerous Corridor presentations at DOL Academies, where CSA shared Corridor strategies and lessons learned on:

- Developing statements of work
- Developing project metrics
- Enhancing STEM education
- Engaging industry
- Driving sustainability

CSA was also asked to present at two Workforce Innovation Conferences (2007 and 2008), sharing its WIRED program management experience. The greatest sustainability successes, however, grew out of the natural evolution of partnerships and institutionalization of WIRED principles. Examples include:

- WIB Learning Collaboratory support in transitioning WIBs to a demand-driven system has led to WIBs now using the WIB Toolkit and the five roles of WIBs in strategic planning
- Collaborative WIB/ED research on employer needs, leveraging Labor Market Information data as done in the 21<sup>st</sup> Century Workforce Profiles and Workforce Needs Analysis projects, is now standard practice in some areas
- California Innovation Corridor (Asset Mapping) Portal has been designated by the State as its new iHub repository
- *The Innovation Driven Economic Development Model* has been implemented in two Los Angeles County aerospace sub-regions, with their cluster and strategy work likely to have a decade of impact
- The CIC STEM Inventory is likely to be linked with a similar national Time-Warner effort, as well as being adopted by the Orange County Engineering Council representing over 40 Affiliated Professional Societies in Orange County
- Corridor partners believe it was the STEM Collaborative Action Plan that perhaps inspired the State Office of Education to start a STEM Task Force
- Online supplier assessment and Supply Chain Management Course will continue as a supplier resource
- IC.net provides a platform for retrieval of CIC models
- STEM Collaborative Action Plan served as foundation for a Gates/Bechtel grant establishing the California STEM Innovation Network

California Space Authority is proud of all the many projects, initiatives and programs that will continue and potentially expand as a result of the seeds planted with the California Innovation Corridor Initiative.