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INNOVATE

ANTELOPE VALLEY

Implementing Innovation Driven Economic Development Strategies
Through a Collaboration of the Antelope Valley Aerospace Industry



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A Project of the Antelope Valley Board of Trade

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INTRODUCTION

The Antelope Valley, a high desert region north of Los Angeles, has long been referred to as California's "Aerospace Valley." In the 1950s, major aircraft-building companies, following the lead of industry pioneer Lockheed, began to permanently locate in the area. The region's year-round clear skies, desert conditions and nearby expanse of dry lakebed proved to be the perfect environment in which to conduct experimental flight test operations. Both the United States Air Force and the NACA (National Advisory Committee for Aeronautics – predecessor of NASA) had well established operations at nearby Muroc Army Air Field (now Edwards Air Force Base), and with the approval of the master plan for what would become Air Force Plant 42, the Antelope Valley was fast becoming an aerospace industry hub.

By the mid fifties the budding aerospace industry had attracted thousands of new residents to the Antelope Valley. Unfortunately, as a result of a national shift in defense spending from aircraft to missiles, the Antelope Valley aerospace industry soon experienced the first of many economic downturns. Lockheed and the other companies which had located in the area, including Northrop, Douglas, Convair and North American Aviation conducted widespread lay-offs. This resulted in an immediate and unexpected economic recession for the area, adversely affecting the many new housing developments and service businesses that had cropped up to meet the needs of the growing populace. Out of that recession, however, the Antelope Valley Progress Association was formed in 1957.

Undaunted by the challenges facing its largest industry, a group of forward-thinking local businessmen gathered together and launched a campaign to market the Antelope Valley nationwide. They saw the region as a great place for residents and businesses alike to locate, and not just those associated with aeronautical enterprise. Since that time, the organization, which later became known as the Antelope Valley Board of Trade (AVBOT), has pursued an array of projects and opportunities to promote a diverse industry base and enhance the quality

of life in the greater Antelope Valley region. And as the local aerospace industry recovered, the organization would become one of its largest advocates, working to ensuring its continued success today.

As a part of that support, a standing committee of the Antelope Valley Board of Trade was created. Each month the Aerospace/ Defense Industry Task Force (“Task Force”) brings community stakeholders from the aerospace companies, economic development, and academia to the table, to discuss strategies and ideas for keeping the local industry and its workforce robust. The Task Force also has developed a mutually supportive relationship with the California Space Authority (CSA), a statewide organization with a similar mission. Since its inception, this collaborative has served as the foundation for implementing a host of initiatives to meet the needs of industry such as urging the California Legislature for manufacturing tax incentives and building statewide support for local production/flight testing of defense programs.

Included among the activities of the Task Force has been an ongoing discussion of the national trend of fewer young people pursuing math, science, engineering, and technology career paths. The monthly meetings have provided a roundtable to discuss ideas on how to grow a new generation of skilled workers for the industry on a local level. Aerospace employment numbers have fluctuated in the regional economy, but evidence of a national crisis is looming. Recent reports indicate that the American aerospace industry may be starting to lag behind the rest of the world in technological achievement due to a decline in access to a skilled workforce. Providing a forum for aerospace stakeholders to discuss the declines in math- and science-educated workers, as well as the shortfalls in both national and state workforce development policies, has helped the Antelope Valley Board of Trade build a foundation for a regional collaborative that continues to discuss strategies for addressing local aerospace workforce issues.

PROJECT OVERVIEW

For this WIRED II project, the Antelope Valley Board of Trade's Defense Industry Task Force was given the opportunity to foster job creation and retention through evaluating and implementing strategies from *The Innovation Driven Economic Development Model: A Practical Guide for the Regional Innovation Broker*. The model was developed as a "how-to plan" for building and growing regional industry cluster collaboration and positively effecting economic growth by creating a culture of innovation within a targeted region. Based in part on "New Growth Theory," developed by Stanford University's economist Paul Romer, the model suggested that new ideas, or innovations, are the primary drivers of economic prosperity in a region. Those new ideas can be applied in the areas of workforce development, educational pathways, new technologies, regional quality of life or other industry cluster-related issues. In the model, the "innovation broker" is the organization or entity that is able to draw all the regional stakeholders together to strategize and innovate new ways of using existing resources. Within the Antelope Valley region, AVBOT is that organization and the Task Force is the "test bed" for the innovation-driven model. The organization has adopted and applied the resources from the this phase of WIRED to expand and strengthen its collaborative and drive regional workforce transformation by advancing projects and objectives that have emerged from the innovative collaboration of its stakeholders.

STAKEHOLDERS

While the aerospace industry in the Antelope Valley has changed significantly since the 1940's, the region has endured as an excellent environment for large scale aircraft manufacturing. Some of the most widely recognized aerospace programs undertaken in the Valley have included the development and assembly of the F-117 Stealth Fighter, the Space Shuttle orbiters, the B-1 and B-2 bombers, the U-2 spy plane, and more recently components of the F-22 Raptor, the F-35 Joint Strike Fighter as well as the Predator and Global Hawk unmanned aerial vehicles (UAVs).

The Antelope Valley has also become renowned as the world epicenter for flight testing. Plant 42-based contractor operations host numerous secret projects where designs for experimental prototypes are honed in the area's restricted airspace. Edward Air Force Base continues to hold claim to more major milestones in flight than any other place on earth. NASA's Dryden Flight Research Center, located on Edwards AFB, is the agency's primary location for aeronautical research in the country, and still serves as the secondary location for Space Shuttle landings. In addition, the Mojave Air and Space Port has been nationally recognized as a hub for the commercial space tourism industry with the success of the Ansari X-Prize winning SpaceShipOne and the current production of Virgin Galactic's SpaceShipTwo and XCOR Aerospace's Lynx.

Representatives of the aerospace industry's three major defense contractors: Lockheed Martin Corporation, Northrop Grumman Corporation and The Boeing Company, as well as Edwards AFB and NASA-Dryden Flight Research Center have been a part of the Antelope Valley Board of Trade's Aerospace / Defense Industry Task Force for many years. These entities continue to welcome the efforts of the organization as a whole to advocate on behalf of local industry at both a state and federal level as well as within the region.

From academia, Antelope Valley College (AVC), California State University, Bakersfield - Antelope Valley (CSUB-AV), the Lancaster University Center (LUC) and its California State University, Fresno (CSUF) Antelope Valley Engineering Program, and the Antelope Valley High School District's Career Prep Council have provided representation to the collaborative. The Aerospace Office, a local nonprofit industry and education liaison, continues to serve as an important information resource to the Task Force. And, more recently, AVBOT has developed relationships with the South Valley Workforce Center (a partnership between the City Palmdale, the Los Angeles County Workforce Investment Board and Goodwill Industries) and the Small Business Development Center (a U.S. Small Business Administration program) hosted by College of the Canyons to explore greater opportunities for job creation and entrepreneurship in the Antelope Valley region.

The collaborative has also seen representation from the Kern County portion of the Antelope Valley region, where an emerging commercial space sector is gaining momentum at Mojave Air and Space Port. The East Kern Airport District, operator of the space port, continues to support AVBOT's mission.

Finally, local governments including the City of Lancaster, the City of Palmdale, Los Angeles County, and the Rosamond Community Services District has been integral stakeholders in the economic and workforce development activities of AVBOT's Task Force.

With Edwards Air Force Base, China Lake Naval Air Weapons Station, NASA Dryden, Mojave Air & Space Port and the major aerospace companies, including Lockheed Martin, Northrop Grumman and Boeing employing more than 26,000 workers in the region¹ the need for sustainable growth in the industry remains high. Because of this, the Task Force plays a crucial role in maintaining a dialogue between industry and community to ensure long-term viability of local aerospace enterprise.

¹ According to the Greater Antelope Valley Economic Alliance [GAVEA] Economic Roundtable Report 2009

PROJECT ACTIVITIES & OUTCOMES

The project activities and outcomes funded through AVBOT's involvement of this phase of the WIRED initiative were selected for their contribution to the overarching goal of driving innovation and workforce transformation in the region.

Education and Outreach

A key strategy of *The Innovation Driven Economic Development Model* involves educating stakeholders on the concepts of collaboration and innovation. To that effect, AVBOT leaders have introduced the model and supporting literature to its stakeholders and have used the materials as a catalyst for discussion and inspiration of transformational ideas. In addition, AVBOT has committed to publish several columns over the next year, for the benefit of its broader regional audience, on the subjects of regionalism, collaboration, and entrepreneurship and has made "innovation" a theme for its 2010 Annual Business Outlook Conference, which it will host in February. The planning committee for the conference has adopted the title "Innovate: Antelope Valley" for the conference and is in the process of developing a non-traditional format for its thirty-eighth annual event. In addition, as a result of discussion within the Aerospace Defense Industry Task Force, the concept for an "innovation forum" is being explored, as a direct result of WIRED, and will likely be implemented in the third quarter of 2010.

Products

Business Cluster Study² –

The Antelope Valley Board of Trade partnered with the Greater Antelope Valley Economic Alliance to develop a business cluster study for the region. The study delineated the

² See Appendix I for more information about the Business Cluster Study.

business clusters in general by two digit North American Industrial Classification (NAICS) codes. A methodology was then developed to conduct a more comprehensive study where different cluster categories may have overlapping synergies and characteristics in innovation that would further support a regional collaborative.

Antelope Valley Business Directory³ –

The Antelope Valley Board of Trade also partnered with the Greater Antelope Valley Economic Alliance on developing a searchable business directory. With a growing reliance worldwide on internet-based search engine services (or portals) to provide current information about business within a certain industry or region, it was essential for the Antelope Valley to have such a tool available. The Antelope Valley Industrial Business Directory provides a searchable database of innovative companies within the region to assist companies in creating a supply chain for goods and services as well as creating a virtual reference point for future inter- and intra-industry collaboration.

Antelope Valley Industrial Base and Vacancy Report⁴ –

Despite the ability to conduct business activities online from virtually anywhere in the world, physical location is still plays a significant role in stimulating innovative collaboration within a cluster. Through WIRED, the Antelope Valley Board of Trade and the Greater Antelope Valley Economic Alliance were able to produce a 2009 update to the Antelope Valley Industrial Base and & Vacancy Report. This report ensures that entities involved in the attraction, retention and growth of high-tech or high-value manufacturing or supply chain businesses have

³ See Appendix II for more information on the Antelope Valley Business Directory.

⁴ See Appendix III for a copy of the *2009 Industrial Base and Vacancy Report*.

current information regarding the availability of industrial property for lease, purchase or future development in the Antelope Valley.

Antelope Valley Long-Term Economic Vision Statement –

One of the most significant outcomes is the Greater Antelope Valley Economic Alliance's *AVision Report 2010: Regional Collaboration as the Blueprint for Prosperity*⁵, a strategic plan for long range regional collaboration and economic prosperity in the Antelope Valley. The plan is an update of a report completed ten years ago at the time the GAVEA's inception. As a key regional player in terms of business attraction and retention, GAVEA has successfully captured some of the key concepts from the *Innovation Driven Economic Development Model* and re-mapped its own role as a regional collaborator. AVBOT supports GAVEA's significant place at the regional collaboration table, particularly is support of the retention and attraction of high-tech, high skill jobs and industry sectors, including aerospace. In addition, GAVEA will be a key player in the development of an emerging renewable energy sector within the region that may share the same supplier, workforce, and educational challenges as the existing aerospace industry cluster.

Lancaster Leadership Academy –

Another WIRED-funded project resulting from AVBOT's Task Force collaborative is a partnership with the City of Lancaster to develop regional leaders who would become future champions of regional innovation. In an effort to create better collaboration between organizations and develop more effective leaders, the City of Lancaster retained Cambridge Leadership Associates (CLA) to conduct the first of these annual training programs. The

⁵ See Appendix IV for a copy of the *AVision Report 2010: Regional Collaboration as the Blueprint for Prosperity*.

program consisted of a three-day introductory workshop, to be followed by a six month work period and finally another three-day review workshop.

Conducted by CLA co-Founder and Harvard Kennedy School of Government professor Marty Linsky, the program was dedicated to the teaching of Adaptive Leadership. Adaptive Leadership has been the centerpiece of CLA's consultation and facilitation practice as well as the subject of two books written by Linsky and Dr. Ronald Heifetz, co-founder of the Kennedy School of Government Center for Public Leadership.

Adaptive Leadership is succinctly defined as the successful usage of a diagnostic methodology to develop solutions to multifaceted issues. Unlike technical problems (such as a broken window or flat tire), which can be clearly solved by a single authority, adaptive challenges (including topics such as poverty, global warming or in this case, regional workforce development) often include high degrees of complexity, requiring education and collaboration to reach a satisfactory resolution.

Proper implementation of the Innovation-Driven Economic Development Model is an adaptive challenge. The model is centered on building a sustainable regional collaborative of people in positions of leadership able to address a host of economic development-related challenges. Doing so makes it imperative that future generations of the community be continually better acclimated to working collaboratively.

In supporting this program and ensuring the inclusion of the emerging leaders within the aerospace industry in this training opportunity, scholarships were provided to five participants including representatives of major defense contractors Lockheed Martin and The Boeing Company, the United States Air Force, and the Antelope Valley Board of Trade.

Currently the program has resulted in the formation of three collaborative groups focused on developing regional business incentives, supporting the creation of jobs in the alternative energy industry and increasing regional business attraction efforts.

Sustaining High Tech Workforce Education –

The Aerospace Office, working with the Lancaster University Center and the Antelope Valley High School District, was able to provide essential infrastructure to support capacity-building technical education in the Antelope Valley. It has been a primary topic of collaboration within the Task Force that in order to sustain and grow the regional aerospace and high tech workforce, it would be absolutely critical for the region to “home-grow” its own engineers and skilled technicians.

Human resources personnel at prime aerospace companies have shared with the Antelope Valley Board of Trade that the recruiting costs to fill a single engineering position have run as high as \$70,000 per new employee. It is subsequently disheartening to these companies that many out-of-the-area recruits arrive in the Antelope Valley only to discover that they are not amiable to the region’s high desert environment or the amenities of the local communities. Companies find these “transplant” employees – are difficult to retain on a long-term basis. Local educators and business leaders have therefore explored ideas and initiatives to home-grow the valley’s own pool of science, engineering, and technical trade students. In spite of these efforts, however, there are hundreds of high-skilled technical and engineering jobs that remain unfilled with aerospace employers throughout the Antelope Valley.

There is, therefore, no question that the urgency created by of a shortage of engineers and technicians is already being widely felt in the local aerospace industry. Industry stakeholders in the Antelope Valley, in particular, have begun to pay attention to STEM (science, technology, engineering, and math) education issues, and recognize that regional innovation is lacking. AVBOT’s stakeholders realize that a broader and more cohesive effort is needed, pulling together many more local resources to address these issues.

In 2004, with the support of the Aerospace Office, a unique partnership was formed in the Antelope Valley to begin to meet the need for home-grown workforce. California State University Fresno in cooperation with California State University Bakersfield and Antelope

Valley College began a program at the Lancaster University Center facility to offer a seamless pathway for local students to complete an undergraduate degree in either electrical or mechanical engineering without commuting out of the Antelope Valley. Classroom instruction has integrated live instructors and distance-learning technology. State-of-the-art laboratory facilities were constructed at the LUC as a result of generous donations from the Air Force Research Laboratory, the Air Force Flight Test Center located at Edwards Air Force Base, and NASA-Dryden Flight Research Center.

The program's first baccalaureate degrees were granted in May of 2007. At the completion of the current semester, Fall of 2009, the program will have graduated a total of twelve students with Master of Science degrees and nine students with Bachelor of Science degrees, in either Mechanical or Electrical Engineering. A majority of these graduates are or intend to be employed within the local aerospace industry.

Unfortunately, amid these amazing achievements, the program received some discouraging news this year. As a result of cuts in state funding to the California State University system, CSUF announced its need to phase out of its support of the engineering program in the Antelope Valley by Spring of 2011. As a result, AVBOT and its Aerospace/ Defense Industry Task Force stakeholders have taken a lead role in the effort to attract another university to assume the program. Collaborative members have already hosted representatives from at least one prominent state university to the Antelope Valley to engage in a dialogue about potential interest. In the meantime, regional stakeholders are working together to sustain the CSUF program and maintain student enrollment through the transition period until a permanent plan for the continuity is finalized.

Through WIRED, the following infrastructure was implemented to sustain the CSUF/ Lancaster University Center Engineering Program:

- a. A machinist/mechanical engineering laboratory technician was hired to support the Mechanical Engineering 95 Producibility class for the 2009-2010 academic year.

- b. An Electrical Engineering adjunct professor are to be hired to teach the upper division Electronics II Laboratory and the Electromagnetic Theory and Applications Laboratory.
- c. Two *Project Lead the Way* certified teachers are to be hired for lesson planning and curriculum implementation during the 2009-2010 academic year for Antelope Valley High School District.

In addition, as part of the engineering pipeline an Engineering 11 class for 20 high school math and science students will be taught in the spring at the LUC.

These strategies were critical to the continuity of both current and future students in the CSUF programs. Stakeholders feel confident that discussions with another university for long term sustainability of the program will prove to be fruitful, largely due the positive responses already received as a of the broad-based community support and collaboration of the regional stakeholders.

One success story to note in terms of local regional collaboration has been between Northrop Grumman and Antelope Valley College. Northrop currently has over 100 fabrication and assembly worker positions open for work on F-35 and Global Hawk, which require minimal training in blueprints reading and basic fabrication. Antelope Valley College worked with Northrop to develop curriculum for these two courses, taught by local industry professionals, which students can take concurrently over a 16-week semester (8 weeks in the summer term.) Since the classes began in the summer of 2008, Northrop has hired 95 percent of the students who have completed the courses. Although the programs success was not a direct result of WIRED, it does demonstrate the level of innovation and collaboration that can be achieved.

AVC Feasibility Review –

An unfunded initiative resulting from this WIRED II project involves AVBOT support of an Antelope Valley College Feasibility Review that would inform college decision-makers of the Los Angeles County Workforce Investment Board/ I-TRAIN administrative and management processes, including estimated costs, involved in the use of Workforce Investment Act (WIA) and American Recovery and Reinvestment Act (ARRA) funds for training career technical training programs of potential benefit to the local Antelope Valley workforce development. The study would provide the following information to Antelope Valley College:

- Identify/ clarify administrative differences in funding process requirements between the California Community College's Systems Office and the LA County WIB;
- Identify all procedures associated with the application for WIA/ARRA funds;
- Identify management controls imposed on the use of WIA/ARRA funds;
- Estimate costs associated with the application, acquisition and continuing management of WIA/ARRA funds;
- Provide an analysis of the pros and cons associated with WIA/ARRA funding;
- Included recommendation for the initial acquisition and continuing use of WIA/ARRA funds.

The study will help Antelope Valley College assess potential future partnering with the WIB to provide training dollars to potential future students of AVC's career technical programs. Due to the time constraints of WIRED, AVBOT will leverage other resources outside the scope of this project to further this collaborative effort in the coming months and help further a future partnership between the college and the WIB.

While the members of the Antelope Valley Board of Trade Aerospace /Defense Industry Task Force are extremely proud of the outcomes achieved as a result of the Phase II of WIRED, we understand that it is just the beginning of implementing the Innovation Driven Economic Development Model in the Antelope Valley.

Plans are already underway to extend many of the current initiatives well beyond their initial WIRED scope. Also, as a result of WIRED, many new ideas for growing our regional industry cluster beyond its core players have been identified.

Furthermore, the Task Force looks for the addition of new stakeholders within its membership that will both broaden and strengthen the collaborative. With a continued emphasis on attracting innovative, high-value companies to the area, the Task Force looks forward to capturing more of the entrepreneurship that is characteristic of the stakeholders within the economic development model.

For over fifty-two years the Antelope Valley Board of Trade has represented the practice of regionally collaborative economic development strategies and through opportunities such as those provided by WIRED, the organization continues to look for ways to make the region a more innovative, interactive environment for those entities that contribute to its long-term prosperity.

Then Antelope Valley Board of Trade thanks the following
for their contributions to the WIRED Phase II Project



Lancaster University Center (LUC)
The Aerospace Office Inc.

