

1. The Challenge

The challenge the City of Palmdale faced was to find a way to establish a state-of-the-art institution in the City that would provide comprehensive graduate and undergraduate education and research focused on aerospace engineering, science and math skills to meet the needs of the critical aerospace industry. The City further faced the challenge of creating partnerships with academia and industry to bring this institution to a reality.

The City of Palmdale is home to some of the largest aerospace firms in the world. It is located in the Antelope Valley and is the gateway to what is known as “The Aerospace Valley.” Palmdale is also home to the largest U.S. Air Force production plant, Air Force Plant 42, and is in close proximity to Edwards Air Force Base, the nation’s premier test flight facility, the Air Force Flight Test Center (AFFTC), the NASA Dryden Flight Research Center, and the Mojave Space Launch Site. China Lakes Naval Weapons Center is at the north end of the Valley. Aerospace is the leading employer in the area and is vital to the expanding Palmdale economy.

Critical to retaining and expanding this dynamic industry is maintaining the leading edge in aerospace technology and developing a qualified workforce through education and training. City leaders realized the key ingredient to meeting this challenge was to establish a locally based academic institution that could educate and train the workforce. At the same time, it would be necessary to provide added value to industry partners by expanding research capability for future program attraction. This would require premier university partners to provide the education and research capability to support such a demanding industry. The nearest such institution is approximately 75 miles away through some of the most congested traffic in the nation. Due to the current crisis in State financing, the chance of the State establishing a new campus or satellite facility was deemed remote.

2. Program Implementation and Costs

The City developed a strategic plan to attract both academic and research partners and to identify critical components needed for success; 1) developing strategic partnerships in education and research at the university level, and with industry, and 2) providing certain incentives that would attract the partners.

The City partnered with the California Space Grant Consortium (Consortium), administered by the University of California, San Diego. As part of the National Space Grant Consortium, which is funded by NASA through an act of Congress, the Consortium provides direct access to over 550 colleges and universities nationwide. The other initial partner is the NASA Dryden Flight Research Center's Office of Academic Investment. Together the three entities developed the Aerospace, Education, Research and Operations (AERO) Institute.

The AERO Institute was founded to address education at every stage of the academic pipeline and to serve as a technology demonstrator to both the onsite and the distance education communities with leading edge technology infrastructure in telecommunications, wireless access and digital broadcasting.

In January 2004, the Palmdale City Council voted to support the AERO Institute by leasing the City's vacant \$3.7 million civil courthouse for \$1 per year, including utilities. The City also purchased approximately \$80,000 in new office furniture. The AERO Institute pays only \$24,000 per year for custodial and maintenance services. The lease originally provided 8,000 square feet of space for classrooms, resource libraries, telecommunication rooms and administrative offices and was subsequently expanded to 10,000 square feet to accommodate additional classrooms and laboratories. It also provided space for the NASA Dryden Office of Academic Investment and NASA's Educational Resource Center (ERC). The ERC provides

education, training and resources to teachers and educators in the areas of science and technology, and it serves as a NASA model for off-base community-outreach laboratories. The staff of the Office of Academic Investment serves as on-site support staff. In addition, NASA provided nearly \$350,000 in direct funding for administrative support, approximately \$50,000 for the digital recording and broadcasting studio, and another \$30,000 for technology infrastructure for distance broadcasting and high-speed internet access. To further assist the AERO Institute, in January 2006, the Palmdale City Council voted to approve the purchase of advanced technology lab equipment in the amount of \$350,000. The Consortium authorized funding of \$100,000 for four graduate research student interns to work directly with industry. The total investment to date including marketing and operating costs exceeds \$4.5 million.

3. Results

The results of this unique partnership and collaboration have been dramatic. Since its inception, the AERO Institute has attracted \$2.5 million from NASA, the Federal Department of Education, the California Space Grant Foundation, National Oceanographic and Atmospheric Administration, and Adobe Systems to perform education, research and operations programs utilizing government-academic-industry partnerships.

The goal of this project was to bring a world-class education, research and development institution for the study of aerospace engineering and aerospace design to Southern California. We have met this goal by attracting and providing the first west coast location for the Purdue University College of Engineering. The Institute also provides a Palmdale location for several other prestigious universities, including California State Polytechnic University, Pomona; University of Southern California Viterbi School of Engineering; University of California, San Diego Jacobs School of Engineering and Embry-Riddle Aeronautical University. The dynamic

partnerships with these universities are combining resources to help working professionals earn advanced graduate degrees in engineering and business and enhance the professional workforce. Since becoming fully implemented in March 2004, the AERO Institute has registered 124 students for a variety of courses, the majority employed by local aerospace firms. In addition, several courses are being developed by Purdue University at the request of local aerospace contractors and will be taught exclusively for their employees at the AERO Institute.

To continue with enhancement of this world-class educational facility, Lockheed Martin Corporation's Advanced Development Programs Division known as "Skunkworks" became a partner to support the development of advanced technology labs. The Palmdale City Council approved \$350,000 in January 2006 for the purchase of specialized lab equipment. This equipment will be utilized by Lockheed to study nanotechnology applications for aerospace materials. Lockheed Martin has agreed to provide oversight of the labs at no cost to the AERO Institute. The Revolutionary Technology Programs Unit with Lockheed Martin have identified the equipment that will be purchased and employed in advanced research between Lockheed Martin and universities of the AERO Institute, specifically Purdue University. The lab program provides access to graduate students and fellows to work in close proximity with corporate engineers, and provides an employee attraction and training program opportunity for the local aerospace industry. Four graduate students are currently employed as researchers working with Lockheed Martin on carbon tube nanotechnology applications.

In addition, this unique educational partnership is helping our nation meet its goals in training and educating new engineers, maintaining our nation's status as a leader in science and technology.

4. Lessons Learned

The City of Palmdale's partnership to establish the AERO Institute provided lessons that could be instructive to other communities interested in enhancing educational resources within their community. In the development of a new educational institute, communities should include organizational dynamics early in the planning process to ensure that all share the same vision.

City officials learned that timelines need to be established to provide for project phasing and milestone attainment at various stages to ensure that the process stays on track. Participants in the project need to be innovative in problem solving, including utilization of partnerships. In addition, Memorandums of Understanding should be created to establish clearly defined roles for each of the partners, including the identification of a lead agency and how they are to interface with the lead agency (City). Additionally, due to the unique curriculum of each of the partner universities, care has to be taken to cohesively mesh the offerings and present the courses.

To bring this institution to fruition, the City learned that it needed to be flexible in its contracting processes to accommodate the needs of the other institutions. It was equally important for City officials and project managers to understand and be able to work through the requirements that a federal contract can impose, such as indemnifications, local headquarters review, program and project expense categories, and full time equivalent staff verses other staffing methods.

Final lesson learned: To establish a world-class, leading edge educational institution, the initiative needs a local government administrator who has the knowledge and foresight to bring government, academia and industry together to create such an institution, along with the local resources to get it accomplished.