



BORDERLESS INNOVATION

CATALYZING THE COMPETITIVENESS OF THE
SAN DIEGO-BAJA CALIFORNIA REGION

DEVELOPED IN COLLABORATION WITH



A REPORT BY

SAN DIEGO
DIALOGUE

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WITH THE GENEROUS SUPPORT OF



GOBIERNO DEL ESTADO
DE BAJA CALIFORNIA

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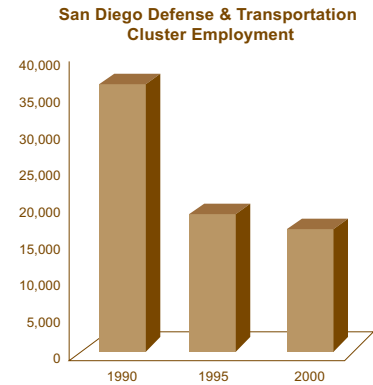


AEROSPACE & DEFENSE

“BAJA CALIFORNIA MAY HAVE THE POTENTIAL TO RE-INVIGORATE SAN DIEGO’S AEROSPACE INDUSTRY.”

This bold statement comes from one of Baja California’s maquiladora industry pioneers, John Riley of BC Manufacturing. This visionary perspective suggests how an emerging cluster in that state might hold synergistic potential for San Diego and perhaps all of Southern California.

In the early 1990s, San Diego saw a dramatic decline of its defense & transportation cluster from federal defense budget cuts. Many firms closed or moved their San Diego operations during the 1990s — taking with them 20,000 jobs — while others diversified into related technology clusters, such as software, electronics and non-military related transportation.



Sources: San Diego Dialogue, California EDD

Despite the turmoil, aerospace and defense-related activities remain a cornerstone of the regional economy. San Diego is home to more than 80 military facilities, making it one of the largest military complexes in the world. Defense-related activities make up 8 percent of San Diego’s gross regional product, and the county was ranked fourth in the United States in FY2004 for Department of Defense (DoD) contracts awarded (\$5.1 billion in value). Defense spending on a regional basis is even more impressive: DoD contracts amounted to more than \$16.9 billion in Los Angeles, Orange and San Diego counties alone in FY2004 — nearly 8 percent of all defense spending in the United States.⁵ Additional industry consolidation makes it likely that aerospace and defense-related clusters will continue to grow in both Southern California and San Diego, presenting the potential for crossborder manufacturing synergies.

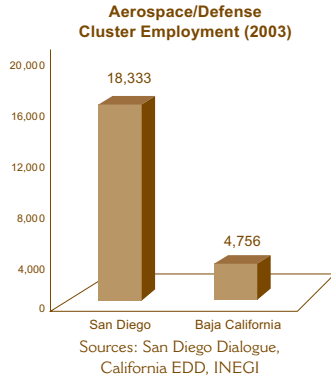
TWO EXAMPLES OF RECENT BUSINESS EXPANSIONS IN SAN DIEGO’S AEROSPACE INDUSTRY INCLUDE CHULA VISTA-BASED GOODRICH AEROSTRUCTURES’ MULTIBILLION-DOLLAR CONTRACTS WITH BOTH AIRBUS AND BOEING, AS WELL AS A SIGNIFICANT INCREASE IN NEW ORDERS FOR GENERAL ATOMICS AERONAUTICAL SYSTEMS’ UNMANNED AERIAL VEHICLES — MAKING IT ONE OF THE LEADING MANUFACTURERS OF UAVS IN THE WORLD.

AEROSPACE/DEFENSE: TAKING OFF?

San Diego’s aerospace/defense cluster is just beginning to rebound from the previous decade’s losses. As shown in the graph on page 15, cluster employment in 2003 was approximately 18,300, an increase from about



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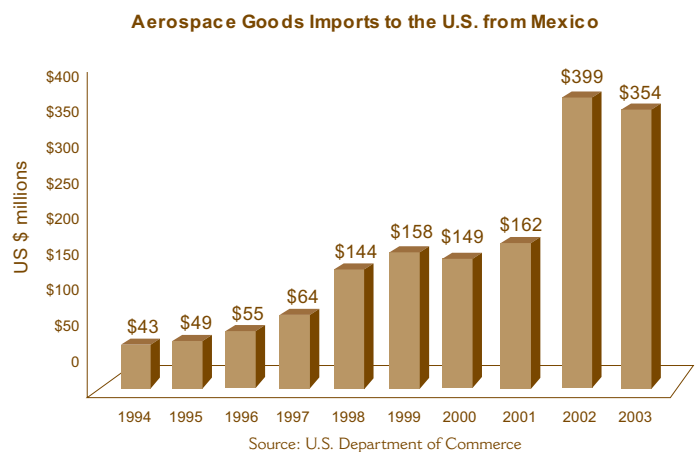


16,000 in 2000. Employment is spread out among nearly 300 firms, including SAIC, General Atomics, NASSCO, BAE Systems, Cubic, Goodrich Aerostructures, L-3 Communications and Northrop Grumman. These companies provide a broad range of services, among them systems integration, ship building and repair, avionics and electronics, research and development, wireless communications and unmanned aerial vehicle design and manufacturing. Also shown in the comparative employment graph, Baja California’s economic census data puts the number of aerospace and defense-related workers at a relatively significant number: 4,750, or about one-quarter of the size of San Diego’s.

That number is likely to grow — and quickly. According to the U.S. Department of Commerce, Mexico is the ninth-largest supplier of aerospace goods and equipment to the United States.⁶ As seen in the graph below, the value of these goods totals more than \$350 million, having grown nearly tenfold from 1994 to 2003. While Mexico is not considered an aerospace powerhouse compared to Canada, France or the United Kingdom, the growth of the country’s aerospace industry highlights the strategic decisions firms are making in global sourcing options. As noted recently by a representative from Boeing, approximately 700,000 people worldwide were involved in some way through supply chains in the development of the Boeing 777.⁷

Baja California has the highest concentration of aerospace-related component and equipment manufacturers in Mexico — including such firms as Honeywell, Delphi Connection Systems, Gulfstream, C&D Aerodesign, Mexmil and Suntron. In addition, the state is home to manufacturers with defense-related subsidiaries, suppliers or contract operations, such as NASSCO (ITM division), Cubic, MAGNETIKA, Seacon Global, GKN-Chemtronics and Chelton (a division formerly owned by REMEC Defense & Space).

Not only low-tech products are being produced for the aerospace/defense sector. Components for such well known weapon systems as the TOW and Longbow missiles are made in Baja California, as are a variety of electronics, wiring harnesses, airplane



CALIFORNIA’S EMPLOYMENT DEVELOPMENT DEPARTMENT DATA SHOW THAT SAN DIEGO LOST MORE THAN 19,000 MANUFACTURING JOBS BETWEEN 1990 AND 2004. MORE THAN 90 PERCENT OF THESE MANUFACTURING JOB LOSSES WERE CONCENTRATED IN “AEROSPACE PRODUCTS AND PARTS MANUFACTURING.”



AEROSPACE & DEFENSE

Global Technology Regions

Aerospace & Defense

- São Paulo, Brazil*
- Montreal, Canada*
- Toronto, Canada*
- Paris, France*
- Toulouse, France*
- Düsseldorf-Cologne, Germany*
- Hamburg-Kiel, Germany*
- Munich, Germany*
- Haifa, Israel*
- Tel Aviv, Israel*
- Tokyo, Japan*
- Kobe, Japan*
- Madrid, Spain*
- Edinburgh, UK*
- London, UK*
- Manchester, UK*
- Atlanta, US*
- Dallas-Ft. Worth, US*
- Denver, US*
- Los Angeles, US*
- Norfolk, US*
- Orange County, US*
- San Diego, US*
- Seattle, US*
- Tucson, US*
- Wichita, US*

Source: San Diego Dialogue Analysis of Technology Industry Sources

interiors and underwater connectors used in naval applications. Major aerospace-related companies are also operating in other regions of Mexico, including GE's engineering center in Querétaro, Mexico, which employs nearly 500.

Mexico's Secretariat of Economy has embarked on an ambitious effort to promote aerospace investments in Mexico, as reflected by recent trips to Milan and the Paris Air Show, at which companies and representatives of Baja California were present. Mexican and U.S. officials at the federal level are also in the process negotiating a Bilateral Aviation Safety Agreement (BASA). Existing Federal Aviation Administration (FAA) regulations require critical aerospace products manufactured in Mexico to be inspected in the United States as well; the BASA would allow certain Mexico-based manufacturers to have their goods certified at production lines in Mexico, which would streamline the process and reduce expenses. An estimate by the U.S. Department of Commerce predicts that implementation of BASA could spur up to \$1 billion in aerospace exports from Mexico to United States. For the San Diego-Baja California region, BASA's impact could be profound.

BASA, BC MANUFACTURING, AND BAJA'S AEROSPACE FUTURE

"IN AEROSPACE, WE REALLY HAVE TO LOOK AT THE LONG-TERM." SO STATES JOHN RILEY, LONG-TIME MAQUILADORA INDUSTRY EXECUTIVE AT BC MANUFACTURING, AND A PROMOTER OF AEROSPACE AND TECHNOLOGY INVESTMENTS IN BAJA CALIFORNIA. "THE BASA CERTIFICATION FROM THE FAA GIVES OUTSIDE VALIDATION THAT WE HAVE THE SKILLS NEEDED FOR ULTIMATELY ATTRACTING MANUFACTURERS OF CRITICAL FLIGHT COMPONENTS. LONG TERM, THOUGH, I LIKE TO THINK THAT WITHIN TWENTY YEARS WE'LL BE MANUFACTURING FINISHED COMMERCIAL AIRCRAFT HERE."

GIVEN BAJA CALIFORNIA'S PROXIMITY TO SOUTHERN CALIFORNIA (ONE OF THE LARGEST CONCENTRATIONS OF AEROSPACE COMPANIES IN THE WORLD), AND THE FACT THAT THE RUNWAY AT TIJUANA'S AIRPORT IS THE SECOND-LONGEST IN THE REGION (AFTER MIRAMAR, WHICH IS A MILITARY INSTALLATION), SUCH A VISION MIGHT BE POSSIBLE. "THE FACT THAT WE ALREADY HAVE SKILLED WORKERS HERE MANUFACTURING SOME AEROSPACE PRODUCTS IS A START, BUT WE ALSO HAVE SUPPORT FROM THE FEDERAL, STATE, AND LOCAL GOVERNMENT AGENCIES TO MAKE THIS HAPPEN," RILEY EMPHASIZES.

"MY HOPE IS, TO REALLY ACCELERATE THIS OPPORTUNITY, THAT BAJA CALIFORNIA AND SOUTHERN CALIFORNIA DEVELOP A REGIONAL APPROACH – MORE OF A SYNERGISTIC EFFORT WHERE BOTH SIDES GAIN SOMETHING, AND INDUSTRY GROWS IN PARTNERSHIP WITH BAJA. I LIVE IN SAN DIEGO, BUT I KNOW THAT BOTH SIDES WILL BENEFIT IF WE DO THIS TOGETHER."



AEROSPACE & DEFENSE

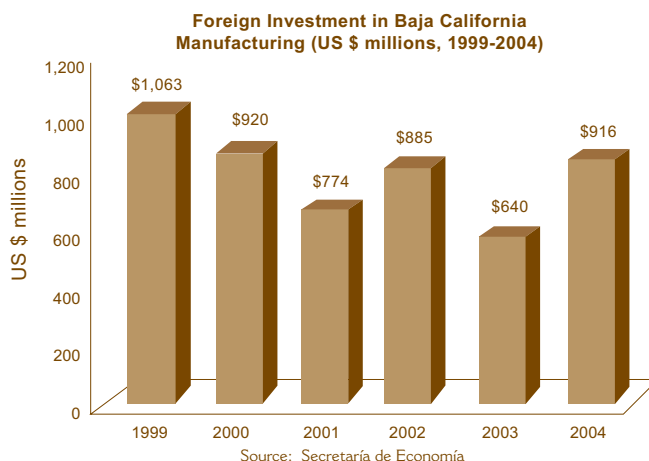
POTENTIAL SYNERGIES

Compared with biomedical devices, the crossborder integration among aerospace/defense & transportation companies in the San Diego-Baja California region is limited to only a handful of companies. Although NASSCO, Cubic, Chelton and GKN Aerospace-Chemtronics have a presence on both sides of the border, most companies operate only on one side. In part, this may be due to military contracting restrictions; however the extent of this remains to be determined. Better leveraging of complementary capabilities, such as engineering and design in San Diego and advanced manufacturing in Baja California, could give the region a major competitive edge.

Coordinating additional workforce education and training focused on this sector could provide a major boost to that competitiveness. Already, San Diego State University and UCSD offer a joint graduate degree in Engineering Science/Applied Mechanics as part of their Aerospace Engineering program,⁸ allowing students to take advantage of the faculty and resources of both institutions. A crossborder aerospace engineering program could enhance and expand the highly qualified labor pool for firms on both sides of the border. A precedent for such programs has already been set by the MEXUS degree program (SDSU/UABC/CETYS/Southwestern College), as well as engineering education partnerships between Arizona State University and Tec de Monterrey.

FROM A VARIETY OF PERSPECTIVES, BAJA CALIFORNIA HAS BEEN ABLE TO REMAIN COMPETITIVE AND KEEP ATTRACTING FOREIGN INTEREST, DESPITE WIDESPREAD ACCOUNTS OF THE MAQUILADORA INDUSTRY'S DOWNFALL.

AS A STATE, BAJA CALIFORNIA HAS RECEIVED THE THIRD-LARGEST AMOUNT OF FOREIGN INVESTMENT IN THE COUNTRY AFTER THE FEDERAL DISTRICT AND NUEVO LEON. AS SEEN BELOW, BETWEEN 1999 AND 2004, BAJA CALIFORNIA ATTRACTED AN AVERAGE OF \$866 MILLION IN FOREIGN INVESTMENT EACH YEAR (NEARLY \$5.2 BILLION TOTAL) IN MANUFACTURING FACILITIES ALONE.



Finally, the creation of regional marketing materials that highlight the capabilities of aerospace companies on both sides of the border could boost awareness of the potential for crossborder collaboration in the industry. Such joint economic development efforts, and a rethinking of our aerospace strengths compared to other regions, could launch a broad range of important activities.