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Defense Industry Conversion, Base Closure, and the California Economy: A Review of the Literature and Annotated Bibliography

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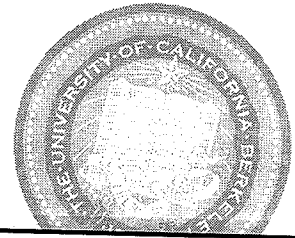
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**DEFENSE INDUSTRY CONVERSION, BASE CLOSURE, AND THE  
CALIFORNIA ECONOMY: A REVIEW OF THE LITERATURE  
AND ANNOTATED BIBLIOGRAPHY**

**BY**

**TED BRADSHAW  
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**Defense Industry Conversion, Base Closure, and the California Economy:  
A Review of the Literature and Annotated Bibliography**

by

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Center for Real Estate and Urban Economics  
University of California, Berkeley

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at Berkeley

## **Defense Industry Conversion, Base Closure, and the California Economy**

**A Series of Working Papers by Ted K. Bradshaw (Project Co-Director), Cynthia Kroll (Project Co-Director), Rokaya Al-Ayat, Mary Corley, Lyn Harlan, Josh Kirschenbaum, and Jason Moody. Judith Innes, Principal Investigator.**

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From December 1993 through June 1994, the Institute of Urban and Regional Development (IURD) and the Center for Real Estate and Urban Economics (CREUE) conducted research to provide background for the state's defense recovery strategic planning effort. The research resulted in a final report to the California Trade and Commerce Agency and a set of working papers on prospects for the California economy's recovery from defense cuts. The working papers are jointly published by IURD and CREUE and can be obtained from either institute. The full set of papers includes:

**Defense Industry Conversion, Base Closure, and the California Economy: A Review of the Literature and Annotated Bibliography.**

This work summarizes existing published research through spring 1994 on the defense industry, military base closure, and recovery efforts, with the primary focus on California. An annotated bibliography is appended to the paper.

**Defense Industry Conversion, Base Closure, and the California Economy: A Review of Research and Planning Activities for Recovery**

This paper reviews recent recovery efforts in California among counties experiencing defense industry job losses and communities experiencing base closures. The report also identifies ongoing research efforts on defense recovery topics.

**Defense Industry Conversion, Base Closure, and the California Economy: The Role of Technology Transfer and Emerging Technologies \***

This paper describes technology transfer programs and efforts as they relate to the recovery and restructuring of the California economy.

**Defense Industry Conversion, Base Closure, and the California Economy: Critical Issues for a Statewide Strategy**

Drawing from the three background working papers, this piece identifies critical needs for recovery and suggests some directions for recovery efforts.

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Defense Industry Conversion, Base Closure, and the California Economy:  
A Review of the Literature and Annotated Bibliography

Abstract

This paper summarizes existing published research through spring 1994 on the defense industry, military base closure, and recovery efforts, with the primary focus on California. The defense industry and its consequences for regional economies has been a subject of focus for research for many years. Defense spending in the manufacturing sector was found to have influenced the rate of growth and structure of whole industries and the pace and characteristics of development in some regions of the country. The size and structure of defense dependent industries raise concerns over the ease with which companies and regions can adjust to defense downsizing. While a great deal of research has gone into the transition of firms, less is known about the long term prospects of defense industry workers or the degree to which available transition programs are effective. Community adjustments following base closings have been documented for more than twenty years, and the experiences are often promising. Both older and more recent studies have found that bases tend to have only weak linkages with the local economy and that many regions are quite resilient to base closures. The communities most vulnerable to base closures are in rural areas where the base constitutes a large percentage of employment. Examples exist both of bases that have been reused successfully and of those that have languished. Key issues arising over base reuse in the 1990s include dealing with toxic contamination and unexploded ordnance, determining local jurisdiction and developing consensus on a reuse plan, and balancing demands for homeless assistance with other community needs. Federal, state and local agencies are each involved in recovery efforts for defense downsizing. Distinct programs have been developed to deal with the industry effects and with base closures. Much of the federal industry recovery effort has centered on the application of defense technologies to commercial markets and on using the research and development skills of defense firms to develop new technologies. For military bases, the major thrust of federal recovery efforts has been on community planning and economic development programs. The federal government has also begun to tailor some worker adjustment programs to the conditions of the defense industry and on military bases. State and local efforts are often shaped by the type of federal funding available for assistance. Many of the programs developed at all levels of government are new and remain to be tested.

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# Defense Industry Conversion, Base Closure, and the California Economy: A Review of the Literature and Annotated Bibliography

## EXECUTIVE SUMMARY

A great deal of research already exists that provides background for California to plan for a future with much lower defense budgets. In previous cycles of defense cutbacks and base closures, a body of information has been accumulated that can provide a foundation for the current policy adjustment and planning that is required in California. The purpose of this report is to review what is known about responses by states, communities, and individuals to cuts in defense spending, and to evaluate these themes in light of the changing California economy.

### *Defense Spending and the California Economy*

Regional growth patterns have been significantly influenced by defense spending in California and elsewhere. While general agreement on this fact is documented in the literature, the authors disagree about the ability of large areas such as Boston or Los Angeles to weather the consequences of significant cuts in spending. Some of the most important impacts of military spending on the California economy are:

- Defense spending has fostered growth of a labor force which has higher skills and higher earnings than in non-defense manufacturing industries. Defense concentrations draw skilled workers into the region, and then the concentration of workers attract related firms. Some evidence suggests that defense workers leaving the defense industry tend to stay in the same area and either find other work or, in the case of older workers, remain unemployed. Transfer of workers from defense to other industries has been difficult. Retraining programs have been ineffective.
- Defense firms have benefitted from funding in support of high technology, but conversion of their capacity to non-defense products has been increasingly less straightforward. The structure of defense firms, especially when employment is concentrated in a small number of firms, tends to make them less likely to be flexible in their production processes and to participate in innovation and less prone to future growth.
- Much less is known about subcontractors and their role in regional development and recovery from defense cuts. In all types of firms, research suggests that recovery is possible, yet net job loss is probable.
- California has already experienced a net loss of defense jobs, but the estimates of the impact vary from nearly 90,000 jobs to about 125,000 jobs. Kroll et al. estimate losses of 160,000 in direct jobs, and up to 360,000 with multiplier effects. Including multiplier effects, this accounts for as many as half of all jobs lost in the 1990 to 1993 period.
- Estimates of future job loss in California range from 24,000 to 125,000, depending on levels of national defense spending cuts, the general health of the economy, and California's share of defense dollars.



The key question for California's recovery from defense cuts remains the problem of skill transferability and mobility for defense workers. Defense cuts are best seen as part of the overall mix of changes that are occurring in the state's key economic sectors and its underlying support base.

### *Base Closure and the California Economy*

California has experienced the bulk of the national impact of recent base closures, with 21 major bases closing and one realignment, resulting in a loss of 82,127 jobs. The state is expected to absorb a total of 69 percent of the national personnel cuts from base closures in the 1988-1993 period; still, California remains home to 50 bases with a combined military and civilian employment of 270,000. While significantly less than the total job loss in the defense industry, base closure has a major impact on communities which rely on the base.

Research from bases closed (primarily outside California) prior to 1988 provide a significant number of conclusions which will be helpful to California communities facing closures. Most of these studies suggest that with proper planning and implementation, little net dislocation may result. The secondary impact of base closure is not very extensive, and communities with relatively diversified economies do not feel the impact too severely. In addition, research from this period shows that bases can be reused to create jobs to replace those lost when the military leaves. For example, one study of 100 bases found almost a 2 for 1 replacement of civilian jobs from 1961 to 1993. Other communities found that job loss and income declines did not follow base closures. One proviso of these studies is that the overall economy was growing when these studies were done. Another caution is that the figures on base reuse may include relocations of jobs from within the area to the base, and that the new jobs often went to different persons than those who lost jobs when the base closed.

Recent studies of base closure also provide interesting results.

- Most bases purchase little of their goods and services locally, so closure has a much broader regional or national impact. Second, the indirect multiplier of a base is in the range of 1.2 to 1.4, which means that for every dollar of military spending an additional 0.20 to 0.40 is spent in the local economy. While this estimate is much lower than often used in analyses to try to argue against a base closure, experience suggests that it is a reliable estimate.
- Base closure has significant community impact in terms of housing, medical facilities, retail trade, and public facilities. A significant impact will be on minority employment, especially blacks who have found good employment opportunities in both civilian and military positions.
- Base reuse opportunities are improving with experience from previous reuse efforts. The development of a good plan is essential, along with directed efforts to resolve problems.
- Base closure efforts can be facilitated with the implementation of several recommendations. One-stop shops and streamlined conveyance processes will help local communi-

ties attract new uses. State planning leadership is needed to coordinate efforts and provide better data. Base reuse efforts within the metropolitan areas can actually assist communities meet their overall regional objectives.

Research questions that remain include getting a better understanding of the impacts on the community of a base being closed, the impacts on the individuals who are displaced because of the base being closed, and the effectiveness of reuse efforts. Experience has conclusively demonstrated that local initiative and coordinated state efforts can have a positive effect in mitigating economic programs.

### *Federal, State, and Local Recovery Efforts*

In response to state and local problems because of defense cuts and the lagging economy, a number of programs are available that are specific to defense conversion. In addition, some programs that are general responses to declining industries have been expanded to serve persons, firms, or communities affected by defense cuts. The federal programs have increased significantly in recent years. In the 1993 budget, funding increased and programs were articulated for defense workers.

Programs are available in three areas: defense industries and technologies, defense workers, and communities.

- The major program for defense industries and technologies includes the Technology Reinvestment Program, from which California received \$118.5 million. Manufacturing Extension Partnerships and Cooperative Research and Development Agreements (CRADAs) provide many industrial opportunities and illustrate California's leadership in responding to these opportunities.
- Defense worker programs include the Defense Conversion Adjustment Program, as well as expanded programs in several training and worker assistance projects such as the Economic Dislocation and Worker Adjustment Assistance Act (EDWAA).
- Community assistance has been provided by the Office of Economic Adjustment and the Economic Development Administration. These programs total \$120 million nationally for FY 1994.

The state has a role of coordinating programs from different agencies and task forces. Several state agencies have played an important role in responding to defense cuts and have mobilized to provide resources and technical assistance.

Even with the federal and state programs in place, California communities have had a difficult time converting former military bases to civilian uses. Of the bases designated for closure since 1988, no former military base properties have been successfully transferred, communities have had difficulty getting organized, and barriers such as toxic remediation have prevented easy reuse. Businesses have had difficulties transferring military technologies to private markets, and workers receiving training often do not find adequate jobs. Nonetheless, California programs aimed to respond to the decline in defense spending find hope in the prospects of the current set of programs because they have benefitted from what has been learned from previous efforts.

# Defense Industry Conversion, Base Closure, and the California Economy:

## Introduction <sup>1</sup>

The 1990s have brought economic trials to California that had in recent history seemed unimaginable for the state. Employment levels have plummeted, led by losses in key manufacturing sectors such as aerospace, while unemployment levels have soared. California is no longer a rosy reflection of economic conditions nationwide — mirroring the nation's ups and downs, but with stronger up periods and less severe downward slides. Instead, the state has continued to lose jobs as the national economy recovers. At least a portion of this differential has been blamed on California's previous successes in attracting defense dollars to the private sector and military bases. A plan for recovery, then, must be based on an understanding of how defense spending has shaped the state's economy and how cutbacks in spending are being experienced by firms, individuals, and communities throughout the state.

A great deal of research already exists that provides background for state government in planning for a future with much lower defense budgets. A number of studies over the past decade look at how defense spending, as a de facto industrial policy, has shaped economic and regional growth in the United States. Other studies look directly at characteristics of defense firms or the defense industry labor force to understand growth and location patterns and flexibility and adaptability. For closer to three decades, a body of research has built up on the impacts of base closures on local communities, displaced workers, and local businesses. More recently, especially in the post-Reagan era, much has been written proposing or documenting adjustment responses to cutbacks in defense spending.

This paper identifies, describes, and evaluates these bodies of literature that relate broadly to defense spending and its impacts on the California economy. We have divided the literature into three major topic areas, each of which is discussed separately. The first topic area covers defense spending and the economy, with an emphasis on the private sector. The second section describes literature related to the impact of base closures in general and in particular on communities in California. The third section reviews published material on responses to defense cuts, at all levels of government and in the private sector. The paper closes with a summary of the key information gleaned from the literature, a brief presentation of the issues facing California in the future, and a delineation of questions still unanswered in the literature. A bibliography is included, with key references and many other sources annotated.

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<sup>1</sup>Note: All full references are found in the bibliography at the end of this report.

## Defense Spending and the California Economy

Defense spending has significantly affected the growth of key industries in the United States, the geographic location decisions of those industries, the migration patterns of skilled workers, and the structure of firms. As downsizing occurs, the mobility of firms and defense workers has come into question. At the national level, dislocation is expected to be mild, but local and state economies dependent on defense are experiencing much more severe impacts. In California, some studies estimate that as much as half of the state's employment losses may directly or indirectly result from defense spending cuts.

The literature on defense spending and its impacts on the economy falls into several distinct types. First, a number of academic studies in the 1980s addressed the impacts that defense spending has had on the industrial composition of the U.S. economy and on the regional distribution of employment growth. Second, some related studies have focused on characteristics of the labor force employed in defense industries, including occupational distribution and migration patterns. A third area of research has concentrated on the structure of firms in the defense industry and their historical experience with conversion efforts. Two other areas of research look more specifically at the recent impacts of defense cuts, either on the U.S. economy as a whole or on the California economy, while a number of other studies look at prospects for conversion or other forms of recovery, in the U.S. economy, California economy, or industrial sectors or firms.

These areas of research provide information on a number of questions of importance in planning for California's recovery efforts from defense cuts. Such questions include: How critical is defense spending to the strength of California's economy? How will defense employees and defense firms respond to spending cuts, and what are the implications for future economic growth in California? How has and will California weather defense cuts, and what factors are critical in the state's adjustment to lower defense budgets?

### **Defense Spending as an Industrial Policy: Impacts on the Shape of the U.S. Economy**

Defense spending since World War II has shaped the amount of growth in many industries, the structural characteristic of that growth, and the regional distribution of urban growth within the United States. The examination of defense spending and its impacts on the shape of the U.S. economy was begun by Ann Markusen and colleagues in the early 1980s. In a 1985 working paper, Markusen describes a "quiet industrial policy" of military spending that shifted resources towards specialized high-tech industries and away from basic commercial-oriented sectors and particularly capital goods (Markusen, 1985). The argument is expanded on in *The Rise of the Sunbelt* (Markusen *et al.*, 1991), where she and coauthors Hall, Campbell, and Deitrick contend that much of the Sunbelt expansion of the 1960s and 1970s grew from defense-spending decisions, which encouraged growth of industrial enclaves in sites outside of the traditional manufacturing heartland.

The impacts of defense spending on differential regional growth is documented by authors such as O'hUallachain (1987), Atkinson (1993), and Mehay and Solnick (1990). Atkinson emphasizes that the shift in production from conventional military products (which were originally produced by commercial firms) to aerospace- and electronic-based products (often produced by firms that are primarily DoD-funded) has led to greater regional concentration of the defense industry around specialized centers. Mehay and Solnick disaggregate defense spending by type and find that "investment" spending (i.e., procurement and R&D rather than operations) is the element of defense spending that is significantly related to differential growth in income and employment at the state level. Ettlinger uses theoretical arguments to emphasize the linkage between the characteristics of firms supported by defense spending with changing geographic patterns of urban development. With a market based on federal contracts rather than local markets, defense firms could be more footloose, locating outside the traditional manufacturing belt (Ettlinger, 1992).

Moving away from geographic implications, Jay Stowsky argues that defense spending in the private sector has shaped the internal structure of some industrial sectors. He argues, for example, that DoD spending often had the aim of advancing the technological state-of-the-art rather than promoting production and marketing efficiencies. Sectors whose growth has been fueled by this funding are overspecialized and not structured to compete in commercial areas (Stowsky, 1991). DiFilippo argues that the concentration of research and development spending in military work contributes less to innovation and growth in high technology than would direct investment in R&D for commercial purposes, and contrasts U.S. R&D policy with support for research and development in other industrialized nations (DiFilippo, 1991). A study of the U.S. software industry finds that DoD spending on R&D in this sector has favored large firms over smaller ones (where, the author contends, most innovation occurs), and that this approach supports applied research over basic research (Goldstein, 1991).

Some more recent works also focus on how the winding down from the cold war is likely to affect economic structure. Research completed by the early 1990s was not in agreement on the degree of vulnerability of defense-dependent places to significant cuts in defense spending. Atkinson, for example, suggests that the robustness, strength, and stability of large diversified areas such as Boston and Los Angeles will help these areas to weather the cuts, while work by Allen Scott is much less optimistic about the robustness of economies like Southern California's which are broadly laced with defense activity (Atkinson, 1993; Scott, 1992).

In sum, these studies suggest that defense spending has had a significant impact on the structure of U.S. manufacturing and related industry, on the regional growth patterns of the 1970s and 1980s, and on the future economic development of the country, through its influence on directions taken in research and development.

## Defense Spending and the Labor Force — Impacts on Composition and Mobility

Defense spending has fostered the growth of a labor force with higher skills and higher earnings than the average manufacturing worker. A key concern in determining California's economic future is whether these workers will remain in the state, maintaining the state's skilled labor base, or whether hard times will drive them to other places.

A number of works have begun to look specifically at labor force characteristics related to defense spending. Many of the general studies on defense spending catalogue the basic characteristics of defense workers (see for example Markusen and Yudken, 1992). These studies show some occupations heavily dependent on defense spending. For example, more than half of aircraft assemblers, more than one-third of aero/astronautical engineers, and almost one-fifth of tool programmers and electronic assemblers work in defense-related jobs, according to Markusen and Yudken. An empirical study of industry-occupation linkages shows spending in defense-dependent sectors have historically generated relatively high shares of wages, overall, with professional and managerial occupations receiving the largest benefits. In contrast, in heavy industry, the highest shares of wages are generally found in unskilled occupations, with the lowest share of total wages generated for professionals (Esparza, 1989). Defense production, then, has generated high-wage jobs, primarily in highly educated or skilled craft occupations.

Two recently reported studies focus on regional migration patterns of defense industry workers. Mark Ellis, with Barff and Markusen, used detailed cases from the 1980 census on moves between 1975 and 1980 to examine how workers in occupations with high degrees of defense dependence (both scientific/engineering and nonprofessional) vary from the rest of the labor force in their migration patterns (Ellis *et al.*, 1993). Scott Campbell examines the migration patterns of scientists and engineers whose work is primarily funded by DoD, during the 1982 to 1989 period (Campbell, 1993). Both studies found that defense workers move slightly less frequently than nondefense counterparts in similar occupations. Ellis and his coauthors found that defense workers tended to move further distances than other workers, and (not surprisingly) that their migration was highest into areas where defense spending had increased. They argue that defense concentrations have drawn workers to specific areas, rather than defense firms seeking out centers with a skilled work force in place. Campbell suggests that a more complex process is underway — defense firms have clearly drawn defense workers into their regions of concentration, but it is also likely that newer firms are drawn to defense concentrations partly because of the pool of skilled labor available. Ellis and Campbell also suggest somewhat different long-term responses of workers to defense cuts. Ellis *et al.* observe that defense workers who leave defense industry occupations tend to stay in the geographic area where they were located. This may offer a pool of entrepreneurial talent during a period of recovery from defense cutbacks. Campbell notes similar evidence, but comments that this tendency has been observed in periods when economic opportunities generally were expanding. He suggests that this "ratchet" effect will not necessarily hold in periods of austerity.

Work by Ong and Lawrence (1993) examines the experience of California aerospace workers receiving unemployment benefits in either 1989 or second-quarter 1992. The authors look at the characteristics of laid-off workers, compared to the workers still employed in the industry and the reemployment experience of the workers who were without jobs in 1989. The authors found that blue collar workers and minorities were most likely to be unemployed, but that the incidence of job loss among engineers and scientists had risen in the later period. Long-term unemployment was highest for workers 55 and older, especially engineers, scientists, and managers. Engineers and scientists collecting unemployment in 1989 were also less likely than blue collar workers to be reemployed in aerospace in 1992. Overall, only 17 percent of aerospace workers unemployed in 1989 were reemployed in aerospace in 1992. Of the remainder, 36 percent were employed in other industries, at an average earnings drop of 33 percent. Very few older workers were reemployed in any capacity in California by 1992. Ong and Lawrence, then, find significant downward mobility for workers, which, they argue, reflects a problem with the California economy extending beyond declining defense sectors.

A series of studies look at the case of labor in the Los Angeles area. Work by Scott and Mattingly (1989) documents the specialized skills of aircraft and parts industry workers. Aerospace workers facing layoffs in the Los Angeles area have the advantage of better education, broader competencies, and more intensive training than in previous lay-offs (Dubinsky, 1992). Despite these advantages, many workers are unable to move smoothly into other occupations (Scott and Mattingly, 1989), and job training programs are often not designed to meet the needs of a skilled labor force (Flaming, 1992). The high skill level of workers, if they are not reemployed, implies that the economic loss to communities may be significant, in terms of both government and business revenues, as well as spin-off employment opportunities (Wolch *et al.*, 1990).

More broadly, authors point to many shortcomings of efforts to transfer workers into other types of employment. A study of industrial restructuring in California in the early 1980s found that displaced workers did not move easily from basic industry to new high-tech jobs (Shapira, 1987). A more recent case study of displaced defense workers in New Jersey found that programs for recovery were often applied ineffectively (Mueller *et al.*, 1993). Ong and Lawrence also express concerns with the effectiveness of current retraining strategies and urge the linking of retraining to economic development efforts.

In sum, the literature indicates that the labor force associated with the defense industry differs from the general mix of the labor force in many other manufacturing sectors, and that the migration patterns of these workers are also somewhat different. While the greater skills of defense workers have advantages both for the individuals and communities, the transition period may still be very rough, especially in areas that have an oversupply of skilled workers. Retraining programs designed to meet the needs of less highly trained workers in heavy industry are likely to be ineffective in meeting the needs of displaced defense workers. Even when workers are successful in finding new jobs, they are likely to be at substantially lower wages.

## The Evolution of Defense Firms

The characteristics of defense spending have placed many defense firms on the cutting edge of new technologies, giving them a clear advantage over declining industries where the market is disappearing not only for the specific product but for the antiquated technology used for means of production. Despite this advantage, the structural characteristics of prime contractor firms often differs sharply from that of commercial firms, making transition to nondefense work problematic.

The nation has undergone several periods of defense spending build-up followed by a winding down of military activity, so adjustment to lower levels of defense spending is by no means unprecedented. In fact, the post-Cold War drawdown is close in size to the drawdown following the Vietnam War, but has been spread out somewhat more gradually. Significantly larger drops have been absorbed following World War II and the Korean War (Stewart, 1993). However, the structure of defense firms and their integration with the economy have changed significantly from earlier periods. Defense firms of the Second World War had a history of commercial production and were able and encouraged to retool rapidly to begin commercial production again following the end of the war. By the Vietnam period, firms were much more specialized in defense technologies and had no recent history of commercial production. Switching to nondefense products became much less straightforward.

A number of studies have focused on the characteristics distinguishing modern military contractors from other industrial firms (see, for example, Malecki, 1984; Markusen and Bloch, 1985; Markusen and Yudken, 1992). Military goods are sold to a single buyer, the federal government, rather than to multiple customers. Performance is a primary criterion of DoD awards, which are cost-insensitive compared to most commercial situations. Because of the difference in market structures, defense contractor firms tend to have high overhead and engineering costs, expensive products built to high standards, little familiarity with commercial markets, and little experience with large volumes of production (Flaming and Reid, 1992). The large scale, long time frames, and restrictive requirements placed on contracts have led to the concentration of military prime contracts in a small number of very large firms. Subcontracting operates in a more competitive environment than prime contracting, but even at this level, specialization in many defense products tends to lead to there being only a small number of competitors. Kroll, Corley, and Weare emphasize that the structure of defense firms, especially the concentration of employment in a very small number of firms, tends to make them less likely to be flexible in their production processes and to participate in innovation and less prone to future growth (Kroll, Corley, and Weare, 1993).

In contrast to research on prime contractors, little work has been done on subcontractor characteristics. Research by Allen Scott on subcontracting patterns in aerospace focuses on the geographic spread of activity, rather than on the industrial or structural characteristics of firms (Scott, 1993). In this research, Scott finds that Los Angeles prime contractors have linkages to firms well beyond the Los Angeles area, indeed well beyond California.



Characteristics of specific defense firms shape the way they are responding to the prospect of a long-term shrinkage in defense contracts. Attempts at conversion to nondefense products in the 1970s were discouraging (Markusen and Yudken, 1992). Large, specialized defense contractors found themselves ill-equipped to shift to production in an environment where cost competitiveness, rather than technological sophistication, was the key factor to success. More diversified firms with experience in commercial production found it much easier to shift their focus away from the DoD to commercial customers (Lall and Marlin *et al.*, 1992). Opportunities for near-term conversion also vary by industrial sector. Firms producing communications equipment, electronic computing equipment, and electrical measuring devices in general appear to have greater diversification opportunities than aerospace sectors (Lawson, 1987).

Attention has been focused within Congress on a range of concerns related to the impacts of defense cuts on the base of defense firms. Some concern exists for the retention of a base of specialized defense firms able to respond to future needs. Strategies for retaining such a base include supporting continued production of a few selected technologies and fostering dual-use technologies, appropriate to both DoD and commercial production (McCurdy, 1992). Conversion of knowledge to commercial production (i.e. technology transfer) is one approach that has been successful for some defense contractors (Brauer and Marlin, 1992). Recent experience in California has shown the range of different approaches taken by firms in responding to defense cuts, from divestment, consolidation (of defense production lines), and "warmdown" (focusing only on the limited amount of defense spending available) to conversion, diversification, and spinoffs (Kroll, Corley and Weare, 1993). Kroll *et al.* found that some of the largest defense contractors are trying a mixture of strategies to adjust to lower defense budgets, but that the focus is on firm survival, rather than maintenance of employment levels. Strategies that are successful for a firm are not necessarily helpful for a community or displaced workers. Lundquist emphasizes that despite all of the options, the outlook for defense companies overall is not promising. He notes the long-term nature of cuts, as compared to earlier periods, and argues that firms have no choice but to consolidate and to shrink radically and quickly in order to survive (Lundquist, 1992).

The findings of research on defense firms is far from definitive. The stereotype of defense firms as large dinosaurs, unable to survive in a modern economy without federal support, appears to be exaggerated. Many of the large defense contractors are moving swiftly to adjust to the changing climate for spending. Yet research suggests that these adjustments are unlikely to be net job producers. In fact, survival for the firm is often based on the demise of a significant portion of jobs within the firm.

### **Defense Employment Losses from the National Perspective**

At the national level, defense cuts are being absorbed relatively smoothly. The impacts on vulnerable regions, however, will depend on the timing and recovery assistance available. In the 1991 through 1993 period, a number of analyses have been produced looking at the impacts of defense cut-

backs or the "peace dividend" on the U.S. economy. Estimates of the magnitude of effects differ among studies, but most agree that the U.S. economy is well situated to absorb the cuts while still growing. A 1992 study by the Congressional Budget Office estimates that over the long term, reduced defense spending could increase GNP permanently by about 0.6 percent annually, assuming savings is used for deficit reduction or increased investment. The authors also find that in the first few years, cuts could depress GNP output by as much as 0.7 percent annually. If the savings were used for increased consumption instead of investment, the short-term impacts would be less severe, but the long-term gains from a reduced defense budget would also be lower (Congressional Budget Office, 1992).

A report by the Defense Conversion Commission comes to similar conclusions. The authors point out that the current drawdown is of a scale similar to that which occurred after the Vietnam war. It is of a much smaller scale than the drawdown following the Second World War and is occurring much more gradually than the post-Korean War drawdown. In examining the impacts of the cuts in the 1990s, the authors find slightly higher unemployment rates and lower growth rates during the mid-1990s than would have occurred without cuts, but a neutral effect or slight increase in growth in the long term. They argue that defense cuts played only a small role in the 1991 recession, on a national basis, compared to the effects of financial industry troubles, commercial overbuilding, high levels of debt, and corporate restructuring. They argue that strong growth is a key to recovery, and that programs to help in the transition for affected industries or communities may become a basis for shaping national policy in the future (Defense Conversion Commission, 1992).

A background report provided to the Commission by the Logistics Management Institute (LMI) puts further numbers to these broad assessments. In the January 1993 study, LMI estimates that losses in defense related employment will equal just under 1 million nationwide between 1991 and 1997. In their analysis, California would receive the largest single share of losses (about 180,000 jobs) and ranks fifth among states in relative job loss (1.7 percent of total jobs statewide). The heavy concentration of defense spending in California is further evidenced by the share of prime contracts awarded to California counties. Four of the top ten contract-receiving counties are in California, and Los Angeles County alone received over 8 percent of prime contracts in 1991 (Wingrove *et al.*, 1993).

Research by the Bureau of Labor Statistics provides further numerical detail on the impacts of defense cuts on employment at the national level (Saunders, 1993). The BLS analysis of employment impacts is comprehensive, examining effects on jobs in the Armed Forces, civilian DoD jobs, and private-sector jobs. Saunders estimates that between 1987 and 1992, defense cuts had already led to a loss of about 100,000 civilian DoD jobs, 188,000 jobs in the Armed Forces, and 600,000 private-sector jobs. By 1997, he estimates that an additional 100,000 civilian DoD jobs, 537,000 Armed Forces jobs, and 1.2 million private-sector jobs will be lost due to defense cuts. Over the ten-year period, defense purchases will have dropped from 6.4 percent of GDP in 1987 to 3.5 percent of GDP in 1997. Over two-thirds of the job losses will be in manufacturing and in government (including the military), but trade and services

jobs, combined, account for about one-fifth of the job loss and transportation and construction sectors also account for significant numbers of jobs.

A paper by the Committee for Economic Development reiterates that the impacts of cuts on the U.S. economy will be modest. The authors argue that the entire savings from cuts should be used for deficit reduction, while regional impacts may be mitigated through phasing of cuts and some selected federal spending (Committee for Economic Development, unknown date).

Most of the analyses do not report full multiplier effects of defense cuts, although some linkages were taken into account. (Muller *et al.*, 1993, estimate local area multipliers for a series of metropolitan areas and counties and conclude that in most areas the DoD presence is not the dominant economic force). Differences in the absolute numbers reported are explainable by the changes over time in the levels of cuts proposed, by somewhat different methods of analysis, and by the different aspects of job cuts being examined. The overall concurrence from the reports, however, is that the country can readily absorb the level of cuts proposed and that in the long run, economic benefits may ensue. Critical areas of focus are within regions and industries where the impacts are far from modest, with the hopes that the short-term response policies in these areas may pave the way for a longer-term understanding of effective national policy towards economic growth.

### **Defense Employment Losses from the California Perspective**

Once seen as a diversified state, reflecting the strengths of American industry, California instead has proven far more vulnerable than the nation to defense cuts. California has emerged as one of the regions most severely affected by defense spending cuts. The current experience is in contrast to the post-Vietnam period, when rapid growth quickly followed the 1974 recession, allowing the state's economy to quickly recover from defense job losses. The rise in defense spending was one of the factors enabling the state, and especially Los Angeles County, to recover strongly from the 1982 recession. In 1993, neither rapid growth of the labor force nor expanded government spending is likely to bring economic expansion to the state, and the recession has been prolonged.

Studies on defense spending cuts and the California economy look at a range of topics, including the impacts of defense cuts to date on the economy, the role defense cuts have played in the prolonged recession, further cuts which may be expected before drawdown is complete, and key factors determining the level, direction, and speed of the state's recovery. The Commission on State Finance (COSF) has carefully tracked the impacts of defense spending and cuts on the California economy. Their Fall 1992 study is much more optimistic than their May 1993 update. In the earlier paper, they argue that California has experienced defense cuts in the past, and that the economy in the 1990s is less dependent on defense spending than in earlier periods of drawdown (Commission on State Finance, 1992 and 1993). For example, at the peak of the Vietnam period, defense spending equaled almost 14 percent of gross state product, while it peaked below 9 percent during the 1980s. Defense spending in California has been

highly concentrated in contracts for weapons and support, and the top 20 firms have accounted for 75 percent of contracts. COSF estimates that California is receiving more than its proportional share of the cuts. About two-thirds of the cuts are the result of the nationwide cutback in defense, but California's strength in strategic weapons (which have been sharply reduced or eliminated) and the high cost of doing business in California have added to the impacts of cuts on the state. COSF estimates that while Los Angeles, Orange, and San Diego counties accounted for 59 percent of defense expenditures in California, 83 percent of aerospace jobs lost between 1988 and 1992 were in these three counties. In the earlier report, COSF estimates job loss at 126,000 from 1988 to 1992 (including military base civilian jobs) and project an additional 81,000 jobs lost in the 1993 to 1997 period, of which 60,000 are in aerospace and 21,000 at military bases. COSF's revised figures in mid-1993 portray a bleaker picture for the state. COSF estimates job losses in the first five years to equal 162,000 (aerospace plus military bases), with an additional 125,000 (90,000 in aerospace) to be lost in the 1993 through 1997 period.

Alternative perspectives on current and projected statewide impacts are provided in several other studies. A University of California analysis expands on the assessment of impacts to include multiplier effects and also develops a forecasting model to estimate impacts through 1997 (Kroll, Corley and Weare, 1993). The study estimates job losses in defense sectors from 1988 through 1993 to be close to 160,000 (in defense manufacturing and civilian DoD employment). Multiplier effects may have brought these losses to almost 360,000. With multiplier effects, defense-generated employment losses may account for as many as half of all jobs lost in the 1990 through 1993 period. If this is the case, then defense spending cuts are playing a very large role in the severity of California's recession. The forecasting model by Kroll *et al.* predicts future defense manufacturing employment from national defense spending levels, general health of the economy, and California's share of defense dollars. The report presents a range of forecasts. If the state attracts at least 19 percent of national prime contracts, and the national economy expands moderately, the losses may be as low as 24,000 in defense manufacturing in the near future. A drop in share to 16 percent (far below current levels) and a slower growing economy would bring job losses to 55,000, while a drop in share to 12 percent would be required to bring losses to the levels forecast by COSF. Like the COSF study, the Kroll study emphasizes the particular vulnerability of the Southern California area in defense manufacturing losses, and also points to the high share of losses in base-related jobs experienced in Northern California.

A series of analyses of the California economy by the UCLA Forecasting Project concurs with the COSF and Kroll *et al.* studies on the severity of impacts of defense cuts in the early 1990s (see Hensley and Flaming, 1992; UCLA Business Forecasting Project, 1992; and Kimbell, 1993). Their 1993 forecast of future employment change is consistent with the levels discussed in Kroll *et al.* The UCLA forecast estimates a loss of 46,000 aerospace manufacturing jobs in California over the next four years (Kimbell, 1993).

Other reports put defense impacts in the context of broader spending patterns and broader economic trends. An analysis by the Center for the Continuing Study of the California Economy, while

recognizing the impacts of defense cuts on the economy, argues that recovery must be considered in the context of changes occurring in the broader economy (Levy and Arnold, 1992a). In both the post-Vietnam and post-Reagan drawdowns, the economy has weathered defense cuts well until a broader recession hit, at which point California's defense dependence increased the severity of its recession. Levy and Arnold urge that recovery be based on a broader transition policy rather than defense conversion, and that the level of recovery be judged by the impacts on prosperity rather than job numbers. A 1993 CCSCE report estimates a smaller level of job loss for the 1993 to 1997 period than is found in the COSF report, setting an upper bound at 100,000 jobs, even when accounting for a relatively high share of cuts being felt in California (Center for the Continuing Study of the California Economy, 1993).

A second University of California report, by Bowman *et al.*, focuses on the state's budget deficit, but considers the role of defense spending in employment and budget levels. The authors' numbers suggest that defense cuts contributed, directly and indirectly, about one-fourth of the state's job losses, with construction losses playing an equally important role (Bowman *et al.*, 1993). (Some of the difference between the Kroll and Bowman findings may result from the Bowman study's earlier date; the state revised their employment series in June 1993, two months after the Bowman study was published). Bowman and his coauthors argue that major recessions of this type tend to have long-term impacts on the growth of the region's economy, as workers and firms migrate out during hard times.

The issue of California's high level of vulnerability is addressed further in work by RAND Corporation. In a 1993 study, the research firm examined the possible causes for California's growing disadvantage compared to the rest of the country in the strength of defense manufacturing (Dertouzos and Dardia, 1993). The authors argue that California's competitive advantage in defense manufacturing relative to the rest of the nation has been weakening for more than a decade. They explain part of the disadvantage by industrial mix — California has a higher share of missiles and space employment and a lower share of electronics and communications employment than the national mix. Statewide business climate factors may be contributing to this shift as well, but California's loss of competitiveness for nondefense manufacturing is far less than for defense manufacturing. Changing competitiveness within Los Angeles County alone may explain a further portion of the shift. Much of the competitive loss in California can be traced to losses specifically in Los Angeles County. However, the RAND study also points to the impacts of changing contracting practices on California. California firms competed well for cost plus fixed-fee contracts and also received a large share of sole source contracts. With more emphasis now being placed on fixed-price, competitive bids, California's share has dropped and may drop further.

While the studies disagree on the degree of contribution of defense cuts to the current recession, all of the authors agree on the importance of looking beyond the defense industry to the broader economy in crafting a recovery strategy. Dertouzos and Dardia suggest that a targeted program may be necessary because of the concentration of impacts in Southern California, but argue that programs encouraging new ventures or worker mobility are more effective than direct subsidies or new nondefense

contracts for defense contractors. Kroll, Corley, and Weare urge attention to maintaining the underlying economic resources of the state—its education base and physical infrastructure— and strengthening business relations. Levy and Arnold emphasize the importance of strong recovery at the national level in spurring growth within the state (Levy and Arnold, 1993b).

### **Looking Forward for the Defense Industry and California — Questions Left Open in the Literature**

The literature on defense spending and the economy suggests that it has had a strong effect on the shape of the U.S. economy and on California and other states. While defense spending has brought valuable resources to some industries and some regions of the country, translating these resources into future growth is not straightforward. Firms appear to have many alternative routes for adjustment, but most are likely to involve smaller job bases. Because many new experiments in firm adjustment are just beginning, documenting these efforts and monitoring the results will be very important for determining their rate of success. In addition, while a great deal of attention has been focused on prime contractors and key defense industry sectors, much less is known about the subcontractors— their size, level of output, adjustment problems, and prospects.

Research on the potential for transition of defense workers is in an early stage, with many questions remaining unanswered on skills transferability and mobility. Findings to date suggest that many barriers exist for defense workers, and that California may be losing a significant portion of its skill base as defense workers migrate to other parts of the nation. Information is only beginning to emerge on the adjustment periods for workers, and much more could be learned on how long they remain unemployed, what jobs they move to, whether they relocate geographically.

Studies of overall impacts on the California economy strongly emphasize the importance of viewing defense cut impacts in the context of broader changes that are occurring to the state's key economic sectors and to its underlying support base. Further understanding the linkages between defense sectors and other sectors of the economy and with the underlying resources of the economy are of key importance in planning a response strategy.

Future research in this area needs to focus on several important areas of work, then. These include a monitoring of the adjustment process of key defense employers, an identification of the subcontractor base and its ability to adjust, expanded analysis of worker impacts, reemployment and mobility experiences, and examination of the linkages between defense sectors and the rest of the economy.

## Military Bases and the California Economy

California has experienced the bulk of the national impact of recent base closure; from the first three rounds of base closure identified by the Base Realignment and Closure Commission, California has absorbed a total of 69 percent of personnel cuts (82,127 military and civilian jobs which were eliminated or moved out of state) from 21 major bases and one realignment out of 163 bases to be closed nationally during the 1988, 1991, and 1993 cycles (Governor's Office of Planning and Research, March 1993). The impact on California of base closures was less severe during earlier rounds— only seven of the 100 major bases closed prior to 1980 were in California, and even these had a relatively minor impact. For example, the total civilian job loss on the seven bases was 3,970 jobs, only 4.5 percent of the total; moreover only 2,372 military personnel were transferred— just 1.7 percent of the total (Office of Economic Adjustment, 1993). Still, California remains home to 50 of the nation's 428 bases with a combined military and civilian employment in California of about 270,000, or 1.8 percent of the California workforce (Nation, 1993: 10,13). Moreover, another round of closures are due to be announced in 1995, and California is expected to face additional closures at that time.

The elimination of the 25 California bases and their 82,000 jobs is coming during a period of protracted economic recession and severe defense industry cuts. While job loss in the defense industry may be a more severe blow to the state economy during the early 1990s, base closures have a large local presence and importance, often comprising a major part of the local economy in the cities and rural counties in which they are located. The loss of a base often goes beyond job loss, raising fear and concerns about the ripple effect on secondary employment, loss of retail sales and businesses, declining housing values, declines in community services, and impact on minority communities.

The impacts of military base closures have been tracked over the past 30 years, yet studies have provided only limited answers to the key questions of the nature and extent of the impact of closure on the local economy and the prospects for base reuse. Moreover, each base and the local economy in which it operates is unique, expanding the range of issues which determine the potential consequences of closure and opportunities for reuse. The purpose of this review is to summarize and assess what is known about base closures and to identify the key areas in which unanswered research questions seriously hamper our understanding of the base conversion process.

### I. Review of Previous and Ongoing Research on Base Closures

**A. Pre-1988 Closures.** In spite of the huge interest and emphasis on base closure since the early 1990s, many bases closed following the end of World War II. Evidence of these closures may be seen through the many local air fields in rural and urban areas which were once military bases.<sup>2</sup> Much of

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<sup>2</sup>In California, Chico, Crescent City, Arcata, Monterey, and Visalia, airports were once military bases (see Simmons *et al.*, 1993: 1).

the post-war transition has not been well documented, but several reports are instructive. The leading reference in the field is the work by John E. Lynch, who evaluated 12 communities assisted by the Office of Economic Adjustment (OEA), the Department of Defense agency charged with the task of assisting communities affected by closure or reduction in defense activity. The emphasis of these studies is on identification of successful programs to create jobs to replace civilian jobs lost at the base. The overriding concern of these studies has not been to assess the impact of base closure on the local community, but to document that communities can attract jobs to the abandoned base facilities and how they do it.

The studies of the pre-1988 closures are generally optimistic about the recovery from base closure. It is important to keep in mind that no study indicated that the impact was negligible, nor that local communities could disregard the closure and continue with business as usual. All indicated that individuals displaced by closure faced relocation or a difficult transition to new employment, often at lower wages. It is also important to remember that many conditions today are different from those experienced by earlier base closures, such as greater emphasis on toxic cleanup, a longer-term economic downturn, and different policies toward base reuse.

One of the earliest studies was commissioned by the United States Arms Control and Disarmament Agency during the 1960s to explore the impact on communities and workers experiencing base closures announced in November 1964, which eliminated 80 bases and over 80,000 jobs. Under the direction of Professor Darwin Daicoff, selected communities were studied from a number of perspectives with the conclusion that "the individuals and communities affected by the announcement adjusted without calamitous economic or social consequences" (Daicoff, 1970: 2). A number of conclusions from this important study should be repeated because they anticipated the most important conclusions from recurring studies.

1. When an installation closure is less than 5 percent of total regional employment, little net displacement occurred.
2. Civilian personnel (and of course military personnel) who were transferred to jobs in other locations avoided local unemployment.
3. DoD personnel and their dependents who were transferred vacated jobs in the local community which created new opportunities for other local people who might have lost jobs due to base closure.
4. Some communities lost economic diversification and higher paying jobs in the transition to a non-military economy.
5. Communities typically follow a series of phases in response to base closure announcements: disbelief followed by efforts to rescind the decision; panic; resignation; and finally optimism.
6. Swift closure after announcement tended to unite communities to work for recovery from any economic loss.
7. Rapid transfer of ownership to local authorities facilitated community recovery efforts.
8. Curtailment of base activities adversely affected housing— both a loss of equity in existing housing and a slowing in rate of new construction (Daicoff, *et al.*, 1970: 5-6, 50-57).



Another early study by MacKinnon (1978) also found that communities losing bases did not experience great levels of job loss or drops in per capita income levels. New jobs did, however, tend to be lower-paying, and excess housing was a problem. Retail sales losses were minimal, according to MacKinnon. In addition, through better community leadership and organization, previously unmet social and economic needs of the community were satisfied by the availability of base facilities such as housing, recreational facilities, education, health, and airport facilities.

A report from Massachusetts in 1974 looking at the secondary employment impacts of military base closures used a survey methodology to determine how many jobs were lost due to the elimination of 3,430 base employees. Only 1,230 secondary-impact jobs were identified, for a multiplier of about 1.36. The study showed that the impact was dampened because many suppliers to the base were not dependent on the base for much business, and this loss could be made up or absorbed without any personnel changes. In addition, local impacts were not manifested in job totals because workers lost some income (but not jobs) due to the loss of overtime work, a longer wait by unemployed persons before a new job is created, reduced profits, and other compensating effects that are real, but hard to measure (Joint Commission on Federal Base Conversion, 1974: 75-76).

A most interesting study that confirms these results was done in four rural communities that hosted new bases sited in the 1970s and 1980s. The study found that the new bases were integrated into the local community very weakly, and that employees of the base spent money on base rather than in the community (Muller, *et al.*, 1991, in C. Hill: 4).

The most well-known and extensive study of the early efforts at base conversion reviewed the experiences of nearly 100 bases that completed projects assisted by the Office of Economic Adjustment from 1961 to 1993. This study was completed in 1990 and updated in 1993. From a careful review of employment data, the bases lost 87,557 civilian jobs, but in the intervening years (through 1993) they gained 171,177 civilian jobs. The most common new base activities included air-field-related businesses and college or university campuses. For example, 42 air fields were converted to serve municipal or general aviation needs. Over 150,000 persons attend colleges, secondary voc-tech programs, or training institutions on previous base sites. A number of industrial parks, governmental facilities, and even large manufacturing plants were built on at least 75 old base properties (Department of Defense, *Civilian Reuse of Former Military Bases*, 1991, 1993).

Some analysts question the applicability today of the frequently mentioned results of this study—the nearly two-for-one replacement of lost civilian jobs at closed bases. In spite of the uncontested evidence that base reuse can be a locus for extensive economic activity, questions remain about whether these data are very significant and if they can be generalized, as well as if they indicate any benefit to persons initially hurt by the closure. Hill and Raffel (1993: 9) identified a series of criticisms of this study, including:

— total new jobs did not distinguish between employees of firms transferred from within the region to the base location from those jobs which were new to the region;

- the study included only bases seeking OEA assistance;<sup>3</sup>
- the comparison did not include military positions lost— in this case over 125,000;
- job replacement totals do not distinguish if persons laid off from the base obtained new jobs or if the new jobs went to others.

Also, a careful examination of the base closure data from the full study (Department of Defense, 1993) show that 27 of the 97 closed facilities have failed to reach their original civilian employment level in spite of the overall trend. It should also be noted that many of the studied effects were over a period of a number of years and that small rural places had a more difficult time than larger urban centers (see the excellent review by Rowley and Stenberg, 1993). It is important, moreover, to respect the cautions in several of publications (especially Daicoff and MacKinnon) that the economic recovery documented in these early base closure communities could be closely associated with generally strong economic growth during this period and that recovery could be much weaker in periods of slow economic growth.

In sum, research on the early base closure experience has documented mitigated local impact and extensive reuse opportunities, in spite of current fears of economic distress following base closures.

**B. Impact of Recent Base Closure on Local Areas.** Over the last decade, extensive research has been completed on a number of aspects of base closure, and local communities are involved in efforts to evaluate the impact of base closure and to forge responsive strategies. Many of the recent analyses are policy and consultant reports, rather than published studies, with the consequence that data are not as well documented and methodologies are not as careful. A number of local effects can be identified.

1. Secondary effects of base closures. Bases spend money locally and outside the local area on contracts and purchases of goods and services. There have been many estimates but few detailed studies of the actual expenditures for goods and materials locally by bases. One of the most careful was done by Kleinhenz and Puri (1993) of the purchases by the El Toro Marine base in Orange county. They reviewed detailed records from the base and only were able to identify \$1.6 million spent annually for materials, supplies, and services in the county, out of a total annual spending<sup>4</sup> of \$61 million. This is just 2.6 percent. They note that "the base receives nearly its entire supply of fuel from non-local sources. Most merchandise in the Base Exchange store is purchased directly from federal government supply sources..." (Kleinhenz and Puri, 1993: 5).

Even while there is strong evidence that bases purchase little from local businesses, policies may be promoted to increase the amount of local purchase. This remains an area of particularly inadequate research and reporting, however.

2. Job and Economic Multipliers. There is a great deal of interest in the economic multipliers of a base closure on the local community. Because money circulates in a local economy, the loss of a large

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<sup>3</sup>Interviews have suggested that this may not be a significant issue, as nearly all major bases received assistance.

<sup>4</sup>This includes non-payroll expenditures.

employer such as a military base is presumed to significantly slow the flow of money much beyond the initial impact on the base. High multipliers are often assumed in order to show severe local impact of a proposed base closure in appeals to halt the closure of a base or to obtain government agency funding and compensation for losses. On the other hand, most of these high multipliers seem to be ungrounded by any reasonable economic assumptions. In part this is because data are not published on the multipliers of military bases (even if there was a typical base for which a multiplier could be generated), and in part because users of the multiplier concept do not understand it.

As a rule of thumb, a military base multiplier is probably between 1.2 and 1.4, which means that for every dollar of military spending there will be the total of the original \$1.00 military spending plus between \$0.20 and \$0.40 total secondary economic activity in the community due to contracts, consumer goods purchased by base employees, and the cumulative subsequent purchases by all persons until all the money is spent outside the local community. Multipliers of two, three, or higher are simply not even remotely reasonable when considering impact at the local level. The reason economic multipliers are not higher is leakage — bases, businesses, and individual consumers all purchase items and services produced outside the local area and the local impact is dissipated.

In a recent analysis of the multiplier in Merced county (California) which anticipates the closure of Castle Air Force Base, Bradshaw (1993) showed that industries similar to an air base had multipliers between 1.3 and 1.6, but that a base multiplier should be lower due to base provided services, including housing, health, recreation, and commissary and exchange retail outlets. Interestingly, in spite of some public claims that the multiplier was much higher, the base published an estimate of local impact that implied a multiplier of 1.38, within the range of comparable industries (Castle Air Force Base, Cost Analysis Branch, Economic Resource Impact Statement, 1992). However, this impact is actually an overestimate because of the unique spending patterns of military bases and personnel which tend to externalize many expenditures from the local economy. The study concludes that the military base is a particularly isolated economy and that its local impact is much lower than most people would anticipate.

The Logistics Management Institute (Muller *et al.*, 1993) provides one of the most useful summaries of multipliers for both base and prime contract effect on local economies. Their study, which is used internally by Department of Defense to evaluate impacts from proposed base closures, compares multipliers from a number of different bases across the country. For example, their data for Merced estimate that the multiplier for the Department of Defense payroll is only 1.18, and for civilian employees it is 1.24. In urban areas where there is less leakage such as Los Angeles, the DoD payroll has a multiplier of 1.25 and the civilian payroll has a multiplier of 1.33. The multipliers for San Diego are just slightly lower. It is important to remember that the smaller the area, the lower the multiplier because of so much leakage. Prime contracts have higher local multipliers because businesses buy more locally than bases: the average multiplier for prime contracts is 1.42 for small counties, 1.54 for medium-size counties, and 1.68 for large counties.

Table 1

Local Area Multipliers in LMI study<sup>5</sup>

<u>Area</u>	<u>Prime Contract</u>	<u>DoD Payroll</u>	<u>Civilian</u>
Los Angeles	1.60	1.25	1.33
San Diego	1.68	1.24	1.33
Large Metro Areas	1.68	1.26	1.35
Medium metro	1.54	1.20	1.26
Nonmetro areas	1.42	1.13	1.16

Some impact studies use very high multipliers. For example, one base reports that their "gross income multiplier" is 3.7 and that within their economic region the base budget of \$157 million has led to a regional economic impact of \$580 million (Governor's Office of Planning and Research, March 1993). Many of the bases being closed have utilized data quite out of line with established impact estimates. Mayors and other local political leaders around the country frequently publicize very high local multipliers for their bases, in part to convince the military not to close the base and in part to advocate assistance to communities facing closures. For example the Mayor of the Rantoul Illinois (home of Chanute Air Force Base, which is being closed) claimed that the loss of 2,143 military jobs will lead to 8,000 total jobs lost, and that its budget of \$130 million has an economic impact of \$340 million (multiplier of 2.6) (reported in Hannaford, 1989: 11). In another study, Robert Hartwig assumed a multiplier of 2.0 for the effect of cuts at Chanute Air Force Base in Illinois. This multiplier was based on the assumption that in every cycle of money in the local economy, 50 percent of the income was spent locally. If private persons spend 75 percent locally, he went on, the multiplier became 4.0. Since virtually nothing purchased comes from local sources, this assumption could not possibly be valid.<sup>6</sup> The study, however, illustrated an important point. It assumed (correctly, we believe) that military personnel spend less of their income locally than nonmilitary personnel, and that the replacement of military with private employees would enhance the local economy.

While the data on multipliers suggest that the indirect impact of a closed base is less on a small community than a large urban area, the data also show that the impact on the community is much more devastating when the base constitutes a large percentage of the employment in an area. Thus, rural bases

<sup>5</sup>Source: Muller *et al.*, 1993. Data rounded to nearest hundredth, and reformatted as standard multipliers. The estimated total direct, indirect, and induced impact of base expenditures in each category is obtained by multiplying base spending by the multiplier. Thus, the loss of a \$100 million military payroll in Los Angeles would remove a total of that \$125 million (1.25 x \$100 million); the \$100 million represents direct earnings and the \$25 million represents indirect and induced earnings.

<sup>6</sup>A common misconception is that all dollars spent locally at retail stores enter as local expenditures in calculating the multiplier. In fact, the local multiplier only includes the added value due to retail activity (e.g., markup), with the value of the item purchased allocated to the area in which it was manufactured. The value to the local economy from the purchase of a car, thus, is just the dealer markup, with the car dealer's cost allocated to the place where the car was manufactured.

are more isolated economies than their urban counterparts, purchasing lower percentages of their goods and services from local sources. However, rural bases often are the only significant source of employment in an economy without diversification, and consequently the closure of the base brings more severe stress because the community is singly dependent on the base for what few jobs are there. A consistent finding is that rural communities and communities heavily dependent on military spending have a harder time responding to closure than large diversified urban communities. Rowley and Stenberg reanalyzed the OEA data on 100 bases closed 1961-1990 and concluded that nonmetro counties that had a base close lost twice as large a proportion of total employment as metro counties with a base closing and that they regained less employment; nonmetro base-closing counties employment grew at a rate of 78 percent of all nonmetro counties, whereas metro base closing counties grew at a 90 percent of the corresponding metro total rate. In conclusion, it is clear that a base closure hurts both urban and rural counties, which consequently fall below their respective average growth rates, but rural counties are hurt more.

Recent base closures may have less impact on small rural communities than during previous closure cycles. Hill and Raffel (1993: 11) note, for example, that a third of the bases closed between 1960 and 1979 were in urban areas where they constituted less than one percent of the county workforce, whereas nearly two-thirds the bases closing in the 1990s are embedded in urban environments where they are less than 1 percent of the workforce.

*Job loss and loss of retail sales.* Bradshaw's study of Castle Air Force Base closure has demonstrated that many of the consequences of base closure are complex and mitigated by factors that reflect on the isolated character of the base economy. In many areas facing base closure, a large retiree population makes use of base medical facilities and commissary and exchange retail shopping. The loss of the base will close these facilities, and the retirees will have to switch to the private economy, or move to another location close to a base. We do not expect that many will move simply to take advantage of the base facilities. Consequently, in Merced county, the shift of retiree spending to private sources would nearly equal the loss to private retail outlets of spending generated by military and civilian payrolls on base. In fact, the closure of the base commissary and exchange retail outlets could have a benefit on total retail sales tax collected (since purchases on base pay no tax). Moreover, assuming that new residents are attracted to the county to fill the housing vacated when the base closes, a significant increase in retail sales could be expected. This retail sales increase, however, might not be felt by some small stores because large warehouse and discount stores are opening up in the area, including a new Wal-Mart and CostCo.

Similarly, impacts in the local community of job loss due to base closure will not necessarily lead to large increases in total local unemployment because departing military spouses will vacate jobs. Bradshaw estimated that the number of vacated jobs due to spouses leaving the area will almost equal the number of jobs lost from civilian base employment and secondary effects in the county. The problem, however, is that the spouse jobs which will be opened up include many highly skilled or professional

jobs such as nurses and school teachers, but the displaced workers include many with minimal skills such as waitresses and waiters, gardeners, or clerks (Bradshaw, 1993).

Job loss from the base may also be mitigated by transfer to other locations. In *Defense Spending in the 1990s*, it was reported that a Department of Defense study found that 60 percent of persons who lost their jobs were transferred to other positions, 20 percent retired, and only 20 percent were actually displaced. However, this figure is probably misleading in today's economy since transfers from a base to another position are difficult to obtain given the general high level of cutbacks that are occurring throughout the Department of Defense and the federal government.

*Community impacts.* The actual impact of closure on communities is less well-documented. One of the most consistent fears of base closure is that the community quality of life will collapse. The loss of population in small communities would show up in plunging enrollments at local schools, deserted downtowns, empty public coffers, and free-falling real estate prices.

Base housing that will be vacated is an important community asset. We lack a full list of the housing to be vacated in California, but a partial list is provided by Hill and Raffel (1993: 14) indicate that at least 15,000 family units will be vacated, along with 19,000 barrack spaces. The availability of these housing units will become an important asset for reuse. A case could be made that strategic efforts to fill these housing units with persons who can contribute to the economic revitalization of the region is an essential piece of any reuse plan.

Mather AFB	1,271 family units, 700 barracks
George AFB	1,540 family units, 749 barracks
Castle AFB	933 family units
Tustin MCB	1,300 family units, 1,400 barracks
Moffett Field NAS	800 family units
Long Beach NS	1,894 family units, 1,381 barracks
Presidio	1,335 family units, 103 barracks
Fort Ord	5,849 family units, 14,748 barracks

Base facilities can easily meet public needs. Hill and Raffel also note that many bases have schools on their premises which could be turned over to communities for reuse. Base training facilities also provide ready-made university campuses. Bases also have hospitals that will be closed, and which could meet community needs. Of course, the conversion of base airports to civilian uses has been a main reuse strategy for many years.

*Minority Employment.* California's population includes about 10 percent Black and 30 percent Hispanic. The employment at selected bases being closed in California by race are shown in Table 2. These data show that both civilian and military personnel at the bases pending closure include a high proportion of Black employees, and the reduction of military jobs means an end to one of the key employment opportunities for persons who may have had difficulty finding comparable employment elsewhere.

Table 2

Race/Ethnicity of Personnel at Bases Slated for Closure (percent)<sup>7</sup>

Closure Cycle	Civilian			Military		
	White	Black	Hispanic	White	Black	Hispanic
1989	61.1	18.7	6.2	68.2	19.9	4.2
1991	64.4	15.2	8.6	66.2	20.7	5.9
1993	57.2	20.9	6.4	66.4	16.0	9.3

**C. Base Reuse Experience.** There is a substantial literature on the experience of community efforts to reuse closed military bases. Most of these studies compare one or two bases and show different strategies and outcomes from the reuse effort. Kirschenbaum and Marsh describe base reuse in terms of context and process. The context includes prior land use, community characteristics, and the character of the facilities. Process includes the various agencies and planning steps that must be taken to successfully locate new uses on the vacated base facilities and land.

The nature of existing facilities and the location of the closed military base set initial constraints and opportunities for reuse. In one of the best articles, Guskind contrasts the conversion tasks facing New Hampshire communities bordering Pease Air Force Base, where the base is prime real estate in the middle of a thriving urban area, and Chanute Air Force Base in small rural Rantoul, Illinois. In the case of Pease, the first base to actually close in the post-1988 closures, options are many but consensus has not been achieved. The excellent airfield has given rise to a major airport to supplement Boston's crowded Logan Field, and an aircraft maintenance facility. Local opposition to these and related proposals (giant theme park, shopping mall, residential development) seem to be in the midst of controversy among different communities and residents. One area of agreement has been reached, however, to set aside some of the land for a wildlife refuge. One recent report on the conversion concluded that the effort has been "slow, costly, and above all, politically contentious," and that despite modest successes in attracting new businesses, "half the jobs derive from a federal pork-barrel project, a passport and visa office" (Maremont).

However, Rantoul has a harder task. Following years of failed effort to halt the closure of the base community leaders turned to reuse planning. Unfortunately the base airfield had been decommissioned (and now needs repairs), and the base retained its position as the main component of an undiversified economy. The state of Illinois has worked to attract United Airlines to locate a maintenance facility in Rantoul, offering a \$100 million package.

<sup>7</sup>Data as of September 30, 1992. Percentages for 1989 based on total of 3,405 civilian and 3,901 military; 1991 based on total of 9,804 civilian and 29,626 military; 1993 based on total of 18,997 civilian and 25,050 military personnel. Does not include "other" category which is remainder. Source: calculated from Department of Defense, Manpower Data Center.

Cunningham (1993) reviewed the closure and reuse experiences of 24 bases nationally and concluded that redevelopment would profit from following ten basic steps.

1. Defend against the closure decision within the system, not politically.
2. Start reuse planning the moment closure is announced.
3. Find regional consensus and avoid turf battles.
4. Empower a local authority.
5. Anticipate the unexpected.
6. Plan for the whole base, not just a prime use.
7. Develop both long-term and short-term strategies.
8. Develop achievable, not necessarily obvious redevelopment plans.
9. Learn from the experience of others.
10. Lobby for assistance, not opposition.

The process of planning and reusing a base has benefitted from decades of botched efforts. The OEA today has a formal structure of recommendations to be followed that involve the following steps (OEA, Nov. 1991). Many of the strategies of the OEA effort are similar to those suggested by other groups. The first step is to select a formal planning body who has responsibility for preparing a base reuse plan. The plan (often done with OEA funding) should include a development strategy that gives emphasis to one set of resources and development opportunities. For example, a community might emphasize human resource development and use the base for worker training sites, universities, or colleges. Another strategy might be to emphasize the utilization of existing worker skills and attract industries to use displaced workers. Some bases have physical features which could become the basis for effective development strategies, such as an opportune geographic location (proximity to border, on routes between places, etc.) or the potential to become a market center for business, transportation, or shopping. Some bases have or are near to natural resources that can be developed, such as geothermal and mineral resources. Other bases are in a location where they can facilitate historic development and tourism. Retirement communities can utilize excess housing and hospital facilities to attract retirees whose local economic contribution is often greater than that of an employee.

After the identification of these options, the community needs to have a process to realistically identify the potential of each option and to rank and select ones to proceed with. Acquisition of facilities and establishment of zoning needs to be accomplished. Zoning requirements of the local jurisdictions have not applied to military bases, and determinations will have to be made about the zone that things should fit into and what to do to bring faulty facilities into compliance. This phase of the task typically requires public money, including some possible grants from the Economic Development Administration. An alternative at this stage is to enter into negotiations with a developer who will arrange financing and work with local entities. Finally, a community implements the plan, attracts businesses and institutions, and solves problems.



In reviewing a number of reuse studies, it is clear that jurisdiction over land use is one of the most pressing concerns. In some cases, the base is within a jurisdiction with clear authority to determine land use, whereas in others the jurisdiction's authority stops at the base boundary. Neither leads to an easy planning process, for when jurisdictions must compete for authority it is sometimes difficult to get cooperation when there is the potential for clear winners and losers. On the other hand, local decisions may not meet regional or even state objectives, and efforts may be executed to block local choices in the interest of state and regional goals. For example, in the closure of Pease a statewide redevelopment agency was proposed to override local opposition to plans for a major airfield use. In some areas, the impasse over land use jurisdiction and planning has stopped all development for a long period of time, as in Hamilton Air field in Marin county.

**D. New Base Closure Issues.** Past experience in base closure provides important lessons for future efforts, though there are new pressures during the current wave of closures.

*Toxic contamination.* In any discussion of base closure, the issue of toxic cleanup becomes one of the most frequently mentioned new issues facing base reuse. For example, Nation has suggested that "environmental contamination may be the biggest roadblock to re-use at a majority of bases" (Nation, 1993: 18). While contamination of base land is not a new issue, awareness of the extent of the problem and the need to clean up contamination poses new challenges to reuse.

We lack good data on the level and severity of contamination of bases in California and the impact of this contamination for reuse. On the one hand, over 100 bases scheduled to close are on the superfund list (Nation, 1993: 19), and unexploded ordnance may prevent reuse until a technology is developed to remove it. The Governor's testimony of April 25, 1993 (Office of Planning and Research, 1993) estimated that as much as \$10 billion might be required to clean up California bases, though base-by-base estimates from the California Environmental Protection Agency for the six BRAC Round 3 bases on the Superfund list totals just over \$800 million (Office of Planning and Research, July 1993: 5). These estimates seem rather unsure, especially as new technologies may well reduce the costs of specific cleanups. For example, March Air Force Base reported reducing costs from \$300 million to \$122 due to streamlining and new technologies. On the other hand, many bases find escalating costs as greater contamination is discovered.

The Department of Defense has developed policies to implement fast track cleanup of bases in response to the President's five-point program. Each base will have a base cleanup team, which will be the primary forum in which issues affecting base cleanup to facilitate reuse. Unlike earlier toxic problems, the new policy stresses being "open, cooperative and forthright with the public concerning environmental cleanup activities" (Deputy Secretary of Defense, Memorandum dated September 9, 1993). In California, an important source of information is the *Cal/EPA Base Closure Environmental UPDATE*, published bi-monthly by Cal/EPA. A number of case studies of reuse note that problems with toxics unnecessarily hampered opportunities. However, it also appears that some of the most severe adminis-

trative problems concerning toxic cleanups have been resolved. The amount of money available to clean up bases is very significant, large enough to provide an immediate compensating economic benefit to states losing bases. President Clinton's five-point plan for base reuse and conversion announced in California in July had a \$2.2 billion commitment for environmental cleanup, illustrating a strong federal obligation to assist communities meet their environmental responsibilities.<sup>8</sup>

Several recent policy developments have eased the blockade that toxic contamination might pose for reuse of base lands. First, the base land and facilities can be used in part without waiting for complete toxic removal. Some bases could not start their reuse efforts until all parts were cleaned, but this restriction no longer holds. Areas that are clean and that pose no health hazard can now be used. Second, conflict over liability for environmental contamination was confusing. For a time, federal liability was restricted if reuse occurred, but recent legislation has removed this uncertainty. Finally, the process of doing state and federal environmental reviews, fitting analyses of contamination into reuse plans, and developing effective cleanup strategies (and funding) are becoming less severe problems.

*Planning and conveyance.* The Office of Economic Adjustment (OEA) in the Department of Defense is the lead agency for assisting local communities respond to the closure of a base. While local initiatives and grass-roots planning have been central concerns for base reuse since the OEA was formed in 1961, the process is becoming increasingly decentralized. Communities can identify options, set priorities, and implement plans based on local preference. Today the military is taking an increasingly helpful and facilitating role with base reuse, identifying contact persons on base who have considerable authority to coordinate military plans and to meet community needs and objectives.

However, communities face the severe task of being as coordinated and having as unified a response as the new base administration. Past base reuse plans have been hampered by lack of community consensus (e.g., Hamilton base in Marin county). If recent experience is any indicator, it is increasingly clear that conflict within and among communities over base reuse plans will hamper a large proportion of plans. For example, Kirschenbaum and Marsh note that in many cases the planning area is not adequately defined and the impacts are not well understood in terms of the geographic region. Inevitably, some jurisdictions have felt slighted in terms of their representation and the conclusions of the regional plan. A key tension is between the community in which the base is located and outlying communities — the central community typically controls land use, while many of the employment impacts and reuse options are regional in nature. In California, the county has an ambiguous role, both as a provider of county services and as the local government for unincorporated areas. The tensions between areas has been resolved with apparent full cooperation in several areas, whereas in the case of George Air Force Base, the town of Adelanto broke away from the regional joint powers agency in a flurry of legal battles.

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<sup>8</sup>It is interesting to note that Castle Air Force base with moderate contamination will spend about \$20 million per year on cleanup, almost exactly the amount being spent for construction before closure was announced.

The OEA experience has proven to be a benefit to guiding communities in their planning and reuse efforts. Funding will be \$39 million in 1994 for planning and implementation, and the publications available from OEA are valuable guides for local communities.

*McKinney Housing for the Homeless Act: Competing demands.* The McKinney Act provides a preferential screening period for nonprofit groups interested in providing shelters for the homeless on excess government property. The potential for groups using preference has been cited as an obstacle for reuse planning, but none of the 24 bases studied by Cunningham (1993) reported any problems by groups under the McKinney Act. Cunningham felt that if homeless assistance providers fail to work within the planning process, Congress might change the law; however, as more information on available facilities becomes public, pressures may increase, pitting local planning authorities against nonprofit homeless shelter groups.

**E. Recommendations for more effective conversion.** A number of articles have offered recommendations for more effective conversions of bases. This review does not include all recommendations, as many have been implemented to some degree since they were published; a more complete analysis of policy changes on an ongoing basis would be helpful. While many of the recommendations require changes in federal policy, several can be implemented within existing frameworks.

1. Streamlining of the conveyance process. A popular effort is to establish a "one-stop" shop, which would include appointing a single point of authority such as a so-called "conversion czar" in Washington and to give more authority to local transition coordinators. A very important component is to increase the availability of information including an electronic clearinghouse and data base,

2. Speeding the availability of bases for reuse. Some attention has been given to the rate of draw-down and the potential for reuse. In some bases such as Castle, facilities can be turned over to private parties before the base closes completely if they are no longer needed by the military. Hill and Raffel feel that leasing former military bases to national guards or reserves or other military reuse defeats the purpose of the closure and hampers local reuse planning and conversion efforts (1993: 20).

3. Distinguish between rural and urban bases, between those that are in wealthier or poor areas, and then target assistance to those bases with the greatest need. Hill and Raffel stress the need for a national agenda for conversion that will make optimal use of scarce economic development resources.

4. Several recommendations have been offered for establishing federal enterprise zones or offering tax credits to businesses locating on closed bases. These economic development incentives may be useful locally. (Local Agency Military Base Recovery Areas [LAMBRA] offer tax credits following enactment of AB693 [Cannella, 1993].)

5. State planning leadership remains a critical issue. With so many bases being closed in California, there is no need to have each base competing for various options such as transportation hubs or centers for toxic remediation. The state leadership can include efforts to facilitate local cooperation and planning, more effective local joint-powers organizations that meet the different needs of all the parties,

and increased funding for the planning challenges of base closure. The data and economic development strategies of the state should be forged to assist local communities.

6. Incorporating defense conversion with existing economic development programs. This recommendation is being pursued by many organizations who see the challenge of defense conversion (Nation: 53).

A slightly different approach is taken by Bonnie Fisher of the Roma Group in San Francisco. She suggests that we should "seize the opportunity in military base closures" and that a far-sighted approach is needed. Base closure is a "once-in-a-lifetime opportunity," she writes, "to improve metropolitan areas, and to take important steps forward in the areas of economic development, housing, and quality of life" (1993: 15). Among her nine suggestions for a more effective long-range strategic effort, she recommends that the nation establish clear objectives and priorities for the reuse of bases, establish a job corps for toxic cleanup, enhance open space values, implement environmentally sound development standards, and create alternatives to metropolitan sprawl.

## II. Remaining Research Questions.

The above review has illustrated the tension between the results of the early wave of base conversion studies which had an empirical, though perhaps overly optimistic perspective on the consequences of base conversion, and the current reports which stress the short-term planning tensions and difficulties faced by communities with bases. The main conclusion from reading many of the most recent reports on base closure and conversion is that the nature of the impact of a base on the local region and the way military activities fit into the regional economy is very inaccurately and incompletely represented. The key theme of several reports is to express concern about the seriousness of the impact, but to offer little insight into the probable real consequences or the tools that are available to assist all communities in their response to declining business opportunities. Another set of reports discusses local base responses to closure and focuses on the processes of local economic development, often in a critical manner. Moreover, some of the most important issues are not mentioned in the literature or in the recent analyst reports — e.g., housing reuse strategies, the loss of some of the most effective job training being done in the nation, and the disproportionate impact on minority workers.

Another key limitation of the existing studies is that they focus on the impact of base closure on the base's physical property and on the community, but there is virtually no analysis of the impact on individuals. The problems a displaced worker faces is virtually lost, along with any special conditions associated with race, sex, age, or other demographic characteristics.

One should evaluate what we need to know about base closures in terms of the information needed to forge an effective state response. The following list identifies minimal requirements of an adequate state information base to allow effective response, and an assessment of what we lack in the way of understanding of each.

1. Which bases are being closed, facing potential closure, and how many base employees will be dislocated? For the most part, these data are available through the base itself or the Base Closure and Realignment Commission (BCRC), and the process is quite open so that information is generally available. Much of the process of closing bases is based on military need and budget, according to publicized criteria. Specific information on planned closures is made available in advance, and public input has had some influence on decisions. The dynamics of selecting bases for closure changes from round to round, and thus the state needs to monitor the BCRC and the political pressures around base closure. On the other hand, it would be a mistake to assume that further closures can be avoided through political pressure.

2. What are the impacts on the community of a base closure? The empirical assessment of the impact of base closure on the individuals and communities affected by the loss of military employment and spending, and the effectiveness of different reuse efforts is minimal at best. At minimum, more extensive studies need to be done to extend and update the studies done during the 1960s and 1970s. Many of the conclusions of the earlier studies seem to be verified by current analysis, though there has been little effort to replicate them. Some of the most important gaps in our knowledge of impacts on base closure communities include:

- total economic multiplier;
- extent of local contracts, sub-contracts, and related economic loss due to a base closure, and the associated job loss from contract cancellation within specific industrial sectors;
- loss of retail sales, tax revenue, and resulting business closures, especially taking into account closure of base commissary and exchanges and changing retail businesses (expansion of Wal-Mart's, Price Clubs, etc.);
- short- and long-term housing market changes, including options and priorities for reuse of vacant military and private housing;
- impact on community facilities and programs, such as schools, hospitals, and public services, both on-base and off-base;
- community quality of life and character, which will lose the particular military life style;
- community processes and governance, and how to better increase participation in community decision-making;

3. What is the impact of closure on individuals? Perhaps the largest gap in our understanding is on the experience of dislocated individuals in finding alternative employment, in coping with stress of dislocation, and in the use of services available to them. As mentioned above, the demographic impact of closure is unevenly felt, probably having a greater dislocation among minority groups. Yet we have little information at this level. In addition, the reduction of training and education functions provided by the military are limiting options for many young persons.

A second area of impact on individuals concerns the different severance arrangements that are being used to reduce military force levels at the same time that bases are being closed. For example, at

Castle about 10 percent of military personnel are taking retirement rather than be transferred to another base, some with early retirement incentives. Some retirees will stay in the local area and need employment, since they are usually young and still able and in need of work, but they fit into different employment categories than the civilians who simply lose their jobs when a base closes. A related issue involves retirees in the area who used to enjoy privileges of medical care, shopping, and recreation on base. With the closure of the bases, we know little of how these individuals will respond; most antidotal evidence we have is that few will move to remain near a base, though there is no concrete evidence on this point.

A third level of impact on individuals that needs to be explored involves spouses and relatives. The fact that many spouses are actually employed in the local labor market has significant impact on the number of jobs that will be lost and the impact on particular businesses.

Fourth, there is very little data on the occupational skills of displaced base workers or their career interests and objectives. Planning for new jobs for these persons, or even evaluating economic development options within the region are hampered because of limited knowledge of the available workforce.

4. What is the impact of base closure on the state and its economic regions? Much of the emphasis in responding to pending base closures has been on local firms and businesses, but the limited local impact noted in previous sections due to base closure is leakage to other parts of California and the nation. We know little about the extent of impact and if it is concentrated in particular industries and firms around the state. For example, if a firm in San Jose handles most of the medical supplies for all the closed bases, the cumulative impact on that firm will be significant even if no San Jose bases are being closed.

5. Finally, what is the cost-benefit evaluation of the federal, state, or local initiatives to reuse bases? The assumption that local cooperation leads to better reuse has not been tested. Nor has the assumption that job retraining programs lead to better employment options been evaluated, though mounting evidence suggests that few graduates of job training programs find employment in the field they are trained for or that they find employment earlier than others not trained. On the other hand, some training programs have reported very high success rates through innovative programs. A careful evaluation of training and other programs will lead to more effective investment of funds available to assist communities facing base closure.

### **III. Implications for State Planning**

The state of California might play a number of roles in response to base closure. Nation, for example, suggests that the state play a supportive role, recognizing California's limited role in conversion (Nation, 1993). For the most part Nation's suggested roles are minimal, providing limited planning or implementation of responses. Other states are taking a stronger and more proactive role, according to Sass, who identified a range of possible strategies from minimal involvement and providing technical and informative support to being more directly involved in assisting local communities. At the extreme, some states can take a proactive or preemptive developer role (Sass, 1993: 16-18). Sass notes that Cali-

California is taking a minimal-involvement approach, and has used on a limited basis some of the remaining strategies, but for numerous reasons has hesitated to take larger steps toward a more proactive development role, relying instead on local interests and initiatives. As a consequence, Sass shows that California has little power to force regional cooperation and that competition among bases for limited redevelopment options hampers effective reuse strategies (Sass 1993: 84-88; 94-99). While recent initiatives have facilitated a broader response for California than implied by Sass, these roles are more concerned with process than with the direct steps that can be taken to address the impacts associated with a base closure.

In local economic development, experience has overwhelmingly demonstrated that local initiative and coordinated state efforts can have a positive effect in mitigating economic problems. The steps to effective local economic development require a process that links detailed economic information about the local economy and the changes it is experiencing with visions of options that the community finds viable and feasible. The state role in California may include:

- Providing detailed information about the impact of the base closure on specific groups of persons, including their geographic location and demographic character.

- Giving an overall portrait of the regional economy and potential areas in which demand might increase.

- Detailing the local and statewide resources that might be available to assist in defense conversion and industrial expansion in local areas, including assistance in accessing federal resources that might come available.

- Assisting with local participation in the planning process so that choices are based on consensus. Areas of assistance include both financial resources and technical information.

- Coordination among local areas so that resources are focused at each area on the best options through cooperation.

- Assistance in developing viable implementation strategies.

## **Conclusion**

Base closure studies illustrate the dual tension between community difficulties and emerging opportunities. The results suggest that the impact on a local area of a base closure may not be as severe as many fear, though the pattern of reuse may be much more difficult. In any case, this poses a great challenge for state planning which needs to assist communities in realistic assessments and in planning for the long-term restructuring of their economies.

## Federal, State, and Local Recovery Efforts

The speed with which California recovers from the drop-off in defense procurement and base closure relies on several factors. As Kroll, *et al.*, observed in *Defense Spending, California Employment and the State's Future* (1993), the direction and composition of economic growth in California depends on (1) the ability of California defense firms to maintain or expand their share of the shrinking federal defense budget while developing export opportunities; (2) the ability of firms to shift production to non-military products and customers; (3) the ability of defense employees to find alternative employment at comparable salary and benefit levels; and (4) the extent which local economies can shift from a dependence on defense firms or a military base to other basic economic activities. While some of these factors will work themselves out in the private market, local, state, and Federal agencies and organizations are also attempting to affect these factors. The purpose of this section of the paper is to review the existing literature on federal, state, and local programs designed to assist and facilitate these transitions. Because these are relatively new programs, critical review of programs is scarce; we rely on the literature supplied by agencies and consortiums involved in the process.

By way of background, it is important to understand that most revitalization programs designed to address industrial downsizing differ from those targeted to communities confronted with military base closures. Reductions in defense contracts have broad regional economic consequences, whereas military base closures present primarily land use issues with local economic impacts. Strategies for defense industry downsizing are centered around policies and programs designed to stimulate new business development and worker retraining, while recovery assistance for communities experiencing military base closures tend to focus on land use planning and future development of the base real estate. Additionally, although military and civilian retraining efforts are underway, they are significantly different than those programs for laid-engineers and other defense industry workers. With few exceptions, literature on base closure recovery and defense cutback recovery is handled separately; therefore it is treated separately in this section.

### Federal Response

Although not explicitly designed for this purpose, Department of Defense (DoD) spending has been one of the nation's strongest industrial development policy tools in the 20th century. The dissolution of the Soviet Union and the end of the Cold War profoundly changed U.S. defense needs and in so doing, has seriously altered the market for defense products. New directions in defense spending have already shifted more than once since the late 1980s and the end of the Cold War. Federal policy during the late 1980s focused primarily on cushioning the blow to firms, workers and communities by slowing down the flow of contracts, rather than completely canceling them. The Administration resisted using federal dollars for defense conversion efforts, believing that market forces would best drive the process.



However, a prolonged recession inspired Congress and the new Administration to provide resources for a number of economic adjustment programs in addition to maintaining a "warm down" approach to military cutbacks (Kroll *et al.*, 1993).<sup>9</sup>

Base closure recovery assistance has received similar attention on behalf of the federal government as did the evolution of programs for defense industry. When the first round of base closures were announced in 1988, local communities, state governments and the federal government did not have adequate funding to facilitate conversion efforts at the local level. Many communities were forced to draw from minimal municipal budgets and recruit extensive volunteer hours to facilitate the initial reuse planning efforts.

It was not until the Defense Authorization and Appropriation Bills for FY 1991 and FY 1992 that the federal government began to target funding for community planning, dislocated workers and affected businesses. Through this funding cycle the DoD, the Department of Labor (DoL) and the Department of Commerce (DoC) received increases in their budgets to address industry, community and employment retraining needs created by defense downsizing (Knight, 1991).<sup>10</sup>

*1993 and 1994 Defense Authorizations and Appropriations:* A commitment was made by the Clinton Administration in March 1993, to spend over \$20 billion by FY97 for investments in defense conversion. At that time, the new Administration announced the Defense Reinvestment and Conversion Initiative of \$1.7 billion (which included \$1.4 billion appropriated during the previous fiscal year). The conversion package included four areas of funding: (1) military and civilian worker training and adjustment; (2) community adjustment programs for areas impacted by base closures or a significant loss of employment due to defense firm layoffs; (3) dual-use technology and commercial-military integration; and (4) conversion opportunities in new civilian technology investments. The 1994 defense appropriations bill signed in late 1993 allocated \$2.49 billion for defense conversion and base closure projects. At this time, it is difficult to discern how and when the new programs will be implemented.

The Assembly Office of Research (Umino, 1993) provides a comprehensive table that conveniently describes the details of the 1993 and 1994 federal conversion programs. This table (Figure 1) is included for reference of the program titles along with eligibility definitions, match requirements, availability of awards and program contacts. It should be noted that many of the 1993 programs will be continued into 1994.<sup>11</sup> A discussion follows on the major programs that were designed to assist (1) **Defense Industry and Technology**; (2) **Defense Workers**; and (3) **Communities** confronted with defense budget reductions.

<sup>9</sup>Former Secretary of Defense Les Aspin used this term early in 1993 to describe the method of cutting back spending without gutting the strength and economic viability of defense contractors, in order to ensure military preparedness.

<sup>10</sup>Prior to the introduction of a comprehensive set of conversion programs and federal appropriations in 1991 and 1993, minimal funding for community economic dislocations could be obtained from a variety of existing federal programs outside of the DoD. It should be noted that these programs were not designed or funded to confront the multitude of issues and new concerns associated with base and industry downsizing.

<sup>11</sup>The programs of the 1993 funding cycle were more innovative than their predecessors but the lead agencies remained the same. As stated in detail by Simmons, Nation and the Defense Budget Project reports, the Office

## Defense Industry and Technology

Several different programs provide direct assistance to defense firms in their transition to lower defense budget. Most programs are designed not only for defense firms, but are also available more broadly to firms investing in new technologies. *Technology Reinvestment Program (TRP)*: Garnering the most attention is the TRP, administered by a newly formed interagency team, the Defense Technology Conversion Council (DTCC), which includes the DoD's Advanced Research Projects Agency (ARPA) (formerly the Defense Advanced Research Projects Agency), the Department of Commerce's National Institute of Standards and Technology (NIST), the National Science Foundation and the National Aeronautics and Space Administration (NASA) (U.S. DoD, March 1993). In FY93, approximately \$471.6 million was authorized for TRP, a series of nine programs which provide matching funding for three sets of programs: technology development, technology deployment (using commercial and military products and processes for other uses) and manufacturing education and training.

In March 1993, ARPA issued a description of the programs which in May 1993 was used as a request for proposals. This document, *Program Information Package for Defense Technology Conversion, Reinvestment, and Transition Assistance*, describes the types of projects to be funded and proposal criteria (U.S. DoD, May 1993). A second document, the *Small Business Innovation Research (SBIR) Program for Defense Technology Conversion, Reinvestment, and Transition Assistance*, was issued in May 1993. The SBIR component of TRP was a relatively modest \$7.2 million. Again, proposals require matching funds and also require partnerships with other firms, government agencies and in some instances, universities or other educational institutions. Proposals from California have been of some success, receiving approximately \$118.5 million by December 1993.

Approximately \$474 million has been appropriated in the 1994 Defense Authorization Bill for the continuation of TRP. (TRP Administration is likely to pass from DoD-ARPA to another agency, possibly the Department of Commerce's (DoC) National Institute of Standards and Technology.) In addition, the DoD administers funding for dual-use technology outside TRP, not all of which require costing sharing or formal partnerships (Nation, 1993). The 1994 bill also includes \$197 million to help domestic shipbuilding companies become competitive in the construction of commercial ships.

*Advanced Technology Program (ATP)*: The Department of Commerce's National Institute of Standards and Technology (NIST) is a federal laboratory which provides technical research and services to support the competitive objectives of U.S. industry. ATP provides seed money to firms that want to research generic technologies needed to develop commercially viable products. First authorized in 1988, ATP provides matching funds for high-risk research projects that develop technologies before there is a

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of Economic Adjustment within the Department of Defense, the Department of Energy, the Economic Development Administration within the Department of Commerce, and the Job Training and Partnership Act established through the Department of Labor will play major roles in providing funding for recovery efforts.

market for them. FY94 is the fifth year of funding for the program and will receive \$199.5 million, up from \$67.9 million in FY93.

The 1994 DoC appropriation bill funded the NIST-administered Manufacturing Extension Partnerships (formerly the Technology Center Program and the State Technology Extension Program), with \$30.2 million. Funding goes to state run centers which provides technical aid and grants to small and mid-sized companies.

*Cooperative Research and Development Agreements (CRADAs):* Over the last two decades, the Department of Energy's national laboratories have seen a portion of their defense-related funding replaced by funds for research on energy resources, environmental issues, communications technology, and technology transfer from defense to commercial uses. Since 1987, Cooperative Research and Development Agreements (CRADAs) have been used to encourage commercial firms to work jointly with the national laboratories to develop new products or improve existing ones. In 1993, the DOE entered into more than 500 such agreements with industry, more than five times the number as of early 1992. Those agreements amount to \$700 million worth of research, with the DOE contribution less than half that amount. In addition to CRADAs, most of which are with large national firms, DOE administers a Small Business Partnership.

*Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA):* One of the largest non-DoD federal expenditures which has attracted the bidding attention of the nation's defense and aerospace contractors is the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). This Act appropriates \$659 million dollars over a six year period for research and development on "intelligent vehicle-highway systems." The bill grants leeway on spending at the state and local levels and boosts financial support for a broad range of transportation and infrastructure projects, as well as anti-air pollution and congestion programs. It also provides funds for research and development in the fields of magnetic levitation and intelligent vehicle highway systems (Kroll, *et al.*). It should be noted, however, that Congress has not fully authorized funding for ISTEA since 1991.

## Defense Workers

The profile of workers displaced by defense cutbacks has proven challenging for existing worker adjustment and retraining programs. Because of DoD regulations and specifications, defense workers, across occupational groups, are likely to be specifically trained with skills not directly applicable in commercial enterprise. Additionally, with a combination of a slowly recovering economy, massive layoffs, and a dwindling supply of manufacturing jobs, it has been difficult for laid-off defense workers to find new jobs and the existing worker retraining programs have been strained. Described briefly here are some of the studies and programs available on the subject.

*Economic Dislocation and Worker Adjustment Assistance Act (EDWAA), Title III of the Job Training Partnership Act (JTPA):* The Department of Labor (DoL) EDWAA is the primary source of federal funds

for displaced workers. This program is funded and supervised at the federal level, but operated by states and local agencies. In FY93, more than \$200 million was provided to train former Pentagon and defense industry employees for new jobs, with \$84 million going to EDWAA. Another \$20 million went to establish college training programs in environmental restoration and hazardous waste management and to award fellowships in those programs to displaced workers.

*Worker Adjustment and Retraining Notification Act (WARN):* Federal legislation in 1989 created WARN, which requires firms with 100 or more full-time employees to give at least 60 days' notice to workers in plants that are closing or planning mass layoffs. (Significant to employees of small subcontractors and vendors, legislation becoming effective in 1994 will change the size of the firms to 50 employees.)

*Defense Conversion Adjustment Program (DCA):* In 1991 the Department of Labor was allocated \$150 million to assist dislocated defense workers, which was to be obligated by September of 1993.<sup>12</sup> The DCA program was administered through the existing Job Training and Partnership Act. In essence, the JTPA's responsibility was expanded to specifically include displaced defense workers.

*Defense Diversification Program (DDP):* In addition to the EDWAA funding, the JTPA received \$75 million in 1993 appropriations for a new program targeted to assist and retrain displaced defense employees. The DDP will provide grants for job training, adjustment assistance, and employment services. This program is a central component of the worker retraining program arising from the 1993 budget.

*Labor Health and Human Services Appropriations Act:* Until 1994 the DoD has traditionally passed funds to the Department of Labor to be used under the instruction of the Job Training and Partnership Act for displaced defense and military civilian employees. In 1994, JTPA programs will receive funding directly from the DoD. In turn, Congress has provided over \$1 billion for general dislocated worker assistance under the Labor Health and Human Services Appropriations Act.

*Public Service Opportunities for Military Personnel:* The 1994 DoD appropriations also introduced public service employment opportunities for displaced military personnel. This effort is an extension of the Troops to Teachers program initiated in the FY1993 Authorization Act. This program did not receive additional funding, but funding was set aside to study public service employment opportunities. In conjunction with this general program, \$10 million of unspent FY1993 funds and \$15 million of earmarked FY1994 would be used to promote careers in law enforcement and health care for separated active military personnel (Defense Budget Project, 1993).

In addition to these primary programs to assist both civilian and military personnel employed at bases designated for closure there is also significant funding for separation pay, retirement incentives and benefits. These are explained in detail in the Defense Budget Project's recent report and in Nation's paper.

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<sup>12</sup>All of these funds were not allocated in 1993 and the subsequent funding is being used for job training programs in 1994. By the end of 1993 almost two-thirds of this funding had been distributed.

*Worker Retraining Constraints:* Since the inception of the Trade Adjustment Assistance (TAA) program, the first federally financed worker retraining program in the early 1960s, there has been considerable debate about their effectiveness. A study by Mueller (Mueller, *et al.*, 1993) compares and contrasts the Economic Dislocation and Workers Adjustment Assistance (EDWAA) program and TAA, in a case study of a defense plant layoff in New Jersey. Similar recommendations for targeted retraining efforts came from a study of the Los Angeles County defense industries and its workers (Wolch *et al.*, 1990). It was recommended that retraining should be aimed at those occupations and industries which are both sizable and growing. It was also observed that job placement services are critical as defense workers' professional networks are apt to be in the declining defense sector and therefore of limited use. The study found that training programs lack realistic links to existing demand for labor and economic development agendas and recommended that such information be considered when designing programs.

## The Communities

When defense cutbacks were first introduced in 1987, local communities, state governments and the federal government had minimal funding to facilitate conversion efforts at the local level. The primary agency in place to assist communities faced with impending downsizing was the Office of Economic Adjustment within the Department of Defense. The Office of Economic Adjustment was established in 1961 to assist communities resolve difficulties caused by significant Defense program changes. This agency has been the core of community assistance, but not the only participant in the process.<sup>13</sup>

In the realm of community planning, the OEA was the main agency for assistance, but additional monies were made available through economic adjustment grants from the Economic Development Administration (EDA) within the DoC. The Department of Housing and Urban Development (HUD) offers Community Development Block Grants (CBDGs) to promote neighborhood revitalization along with community economic adjustment and the Federal Aeronautics Administration provides funding for converting surplus military airport facilities for use as civilian airports (Knight, 1991).

*Office of Economic Adjustment (OEA):* From 1988 to 1992 the OEA annual budget was approximately \$5 million. The 1993 federal appropriations brought a sixfold increase to the OEA's budget to \$29 million. Through the 1993 Authorization, Congress has approved an expansion of the functions of the Office to make both planning and implementation grants to communities (Defense Budget Project, 1993). With the introduction of an increased budget for the OEA, the agency may now make grants to communities that are dependent on defense but have not felt the impact of downsizing. (Simmons, 1993a). This

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<sup>13</sup>In 1970 the President's Economic Adjustment Committee was created to channel the efforts of the OEA through various federal department that would be affected by changes in the defense structure. This Committee, chaired by the Secretary of Defense, was originally comprised of 18 representatives from federal departments and has been recently increased to 23 department representatives. Through the efforts of the President's Economic Adjustment Committee a framework was in place to confront the impending base closures, but little funding was attracted to the structure to effectively support communities confronting base closures.

provides a new opportunity for communities to conduct proactive planning. Even with the increase in budget, the OEA has maintained the viewpoint that it is the local community's responsibility to develop its reuse plan and the Office functions as an information and funding source for the local initiatives.

The FY 1994 budget of the Office of Economic Adjustment was increased 30 percent over FY 1993's budget to \$39 million.<sup>14</sup> With respect to some communities' greater economic dependency on their military bases, Congress directed the OEA to spend 25 to 50 percent of its budget on communities that stand to lose 5 percent or more of their employment base due to a closure or are subject to multiple closures (Defense Budget Project, 1993).

*Economic Development Administration:* The EDA administers the Sudden and Severe Economic Dislocation (SSED) program which provides grants to areas that have had economic dislocations due to plant closings, layoffs, or base closings. Funding may be applied to local government agency programs or projects that are part of a defense conversion strategy or base re-use plan. In addition to this program, the Public Works and Economic Development Act of 1965, administered by EDA was supplemented with \$50 million targeted at communities substantially and seriously affected by defense cuts in 1991.<sup>15</sup>

As the Department of Commerce becomes more involved in funding community military base reuse planning and implementation efforts, a bond has formed with the OEA. These agencies work closely on assisting communities at the local level. In 1993 the DoD provided the EDA \$80 million for community planning and the implementation of these plans. Infrastructure grants can also be made with this funding.

Unlike the past, where EDA funds were channeled through the DoD, the EDA received funding directly from the Department of Commerce to facilitate its defense conversion initiatives in 1994. The EDA requested \$33 million to supplement last year's request and was appropriated \$80 million in the FY 1994 Commerce, Justice State Appropriations Act (Defense Budget Project, 1993). From FY92-FY94, a total of \$210 million has been targeted for defense recovery programs, \$140 million has been spent, and California has received \$40 million (Charles Oaks,<sup>16</sup> 1994).

*Other Programs:* In addition to the two traditional sources of Community Planning programs, approximately \$90 million was earmarked for Operations and Maintenance funding for specific projects at bases designated for closure. California will receive a significant share of these earmarked funds in

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<sup>14</sup>Significant reductions in the national defense budget over the last three years have created a demand for this agencies services. This demand was reflected in the recent authorizations and appropriations. This is evident in the funding cycle experienced by the OEA in FY1994. The Administration requested \$29 million for FY1994, \$70 million was authorized, but only \$39 million was appropriated. This appropriation was a 30 percent increase over the FY1993 budget and the initial request by the Administration.

<sup>15</sup>This funding has a similar target as the OEA funding and the these two agencies have developed a Memorandum of Understanding. The MOU states that the OEA will provide planning assistance and the EDA will provide infrastructure "brick and mortar" funding. (Simmons, 1993b).

<sup>16</sup>Personal interview.

addition to its share of OEA and EDA community planning monies. Specific projects targeted to the state include:

Monterey Institute of International Studies	\$5.0 m
California State University System (Fort Ord)	\$15 m
California Statewide Economic Development Network	\$3.125 m
San Diego State University Center on Defense Conversion	\$7.0 m
S.F. State University California Economic Recovery and Environmental Restoration Project	\$0.75 m
Mare Island Conversion and Reuse Study	\$250,000
Mare Island Worker Retraining for Environmental Restoration	\$2.5 m
Mojave Regional Technical Center for San Bernardino County	\$167,000

In addition to these earmarked programs for the state, there were additional programs responding to national issues that will provide additional funding for programs within the state. This is especially true in the area of worker retraining. For example, \$15 million was earmarked for a national program for Personnel training in Law Enforcement and Health Care Professions (U.S. Congress, National Defense Authorization Act for FY 1993, 1993).

*President Clinton's Five Point Plan:* In the Summer of 1993 President Clinton confirmed his commitment to assisting communities affected by base closures when he announced the Five Point Plan. The \$5 billion plan included \$2.8 billion for economic development and \$2.2 billion for environmental cleanup. As noted by Nation, this plan did not introduce any additional funding from the 1993 appropriations (Nation, 1993). However, the \$5 billion dollar program included five steps to improve the reuse and recovery planning process for communities experiencing closures. These five points listed below can be considered the stimulus for future legislation and the bridge from the substantial 1993 conversion appropriations to the 1994 appropriations recently announced. The 5 points included:

- Jobs-centered property disposal
- A fast-track clean-up program for environmental remediation at the bases
- A single federal transition coordinator for each affected community
- Larger economic development planning grants.
- Easy access to transition and redevelopment help

## State Action

Nation (1993) notes that initial recovery efforts at the state level have been encumbered by a lack of political consensus. However, a combination of a prolonged recession, significant activism at the local level (described below) and an increase in the availability of federal funds requiring matching grants stimulated both the legislature and the Governor to respond.

Recently, the state has played two roles in assisting community and regions cope with defense downsizing. First, the state through different agencies has been actively involved in the conversion process. Many of these agencies have been mandated by federal programs to assist lead federal agencies in administering local recovery programs. This role is not of a proactive nature. The agencies are just fulfilling their obligations as stipulated by the federal programs. More recently, studies have been conducted by the

Governor's office, the legislature's Offices of Research, and a handful of task forces on the subjects of defense cutbacks and base closures. These state agencies, research offices, and task forces have proven useful in gathering and disseminating information on federal recovery programs and matching state grants.

### *State Agencies*

Many state agencies have been involved in the state's defense conversion efforts. However, a majority of the federal programs for defense conversion and diversification do not require state participation, except for some matching funding. For example, the Office of Economic Adjustment works directly with the local community without a state liaison. On the other hand all of the DoL's JTPA programs require the state's Employment Development Department to participate in the grantmaking process to local communities. The Assembly Office of Research has highlighted state agency involvement in the following manner for base closure assistance (California Military Base Reuse Task Force, 1994: Appendix F):

#### CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT

This is the lead agency for administering federal job training programs at the local level.

#### CALIFORNIA EMPLOYMENT TRAINING PANEL

The Panel provides funding support for a number of programs involved in defense conversion, including the California Manufacturing and Technology Center (CMTC), the California Supplier Improvement Program (CalSIP), and Project California.

#### CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

This agency provides information and monitors the remediation of toxic contamination at military bases through the department of Toxic Substances Control (Base Closure Branch) and the State Water Resources Control Board.

#### CALIFORNIA HOUSING AND COMMUNITY DEVELOPMENT

Finances housing rehabilitation, public facilities, and economic and community development projects.

#### CALIFORNIA TRADE AND COMMERCE AGENCY

Coordinate and develop economic and business development programs.

#### CALIFORNIA TRANSPORTATION DEPARTMENT

Evaluates present and future needs for airports in the state's public-use airport system, and to provide direct grants to assist with airport operation after a facility is converted.



## *State Task Forces*

In early 1993, the Governor designated the state Trade and Commerce Agency (TCA) as the lead agency in defense recovery programs, at the same time establishing the Council on Defense Industry Conversion and Technology. As Nation (1992) points out, the Council provided critical assistance to firms responding to the federal TRP program by steering firms to state agencies offering matching funds.<sup>17</sup> The Council identified \$35.4 million available FY93 from various state levels, in addition to \$4.7 million from the TCA's Economic Development Grand and Loan Fund.<sup>18</sup> In February 1994, the Governor's California Military Base Reuse Task Force released the results of a six-month study on base closures in California. State legislation reflecting Task Force recommendations from the study is likely to follow.

Figure 2 from the January 1994 *Cal/EPA Closure Environmental Update* highlights the Conversion Workgroups presently active in the state. The Governor's office and state legislature have formed their own task forces, each with slightly different missions and mandates. In addition to these efforts other state agencies have organized task forces to address issues highlighted in the following table.

## **Local Efforts**

This section reviews existing published information on local recovery efforts. A companion volume on current research and planning activity describes ongoing efforts which have yet to be evaluated. Since recovery needs are different for communities experiencing loss of defense contract dollars than those planning the reuse of former military bases, this section is divided into two parts. The first section will examine community efforts with regard to defense downsizing and the second section will investigate the community response in the wake of military base closures.

Regional business groups and local government economic development agencies defense cutback recovery efforts predate comprehensive intervention at the state and federal level, and were frequently part of a response to the overall recessionary slowdown. These activities have evolved in several forms. Early involvement by city or county government, especially through economic development organizations, labor groups and defense-related industries, have enabled broad-based response strategies to begin as early as 1990 in some communities. New non-profit business entities, public/private partnerships, and industry consortiums have formed throughout the state, advocating a number of strategies, including development of new industries and expanding and strengthening existing ones, pursuit of regulatory reform, and defense worker retraining. A few examples of these local efforts follow.

The San Diego City Council was one of the first local legislative entities to address the issue of defense downsizing as a local issue. In January 1992, the San Diego City Council adopted the recommendations of a regional Economic Development Task Force to develop and implement an Economic

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<sup>17</sup>Remember, TRP programs required both partnerships, which may include state agencies, and cost sharing by non-federal sources.

<sup>18</sup>An additional \$23.2 was available, subject to appropriation.

Conversion Program. The program, spear-headed by the San Diego Consortium & Private Industry Council, with partial funding from the state Trade and Commerce Agency and DoD's OEA, included an extensive survey of regional defense contractors, suppliers and vendors to assess the impact of defense cutbacks. Results of the study are being used to facilitate worker re-training programs and other economic development strategies to mitigate the impacts of the reduction in defense spending on the San Diego economy, (San Diego Consortium & Private Industry Council, 1993). Their published survey and report includes references to local, state and federal assistance programs.

The Los Angeles Economic Development Corporation, the Los Angeles Economic Roundtable, Southern California Edison Company, the Department of Water and Power and other business groups, businesses and utilities in the region have been active for the last several years in defense industry assessment and conversion efforts. Much of the research sponsored by these groups have contributed to the founding of such groups as CALSTART. Originally conceived as a Los Angeles region technology consortium CALSTART, located in a former Lockheed building in Burbank, California has become a state-wide advanced transportation consortium, one of three established nationwide by a \$10 million appropriate through ISTEA. CALSTART's goal is to develop zero-emission vehicles to create a new, advanced transportation technology industry in California. Research on the electric vehicle manufacturing industry in California has found that the state breeds technological innovation and possesses a broad industrial and manufacturing base capable of developing and manufacturing electric vehicles. In addition to ISTEA funding, CALSTART has raised an additional \$14 million for participating members and \$2 million in state funding. CALSTART was active in developing and fine-tuning proposals by California firms for ARPA funding, providing the advice and expertise of an technology advisory board made up of scientists and engineers from universities and the private sector, (Kroll, 1993).

While one of CALSTART's goals is the fostering of a new technologies, other regional programs are directed toward strengthening existing ones. Joint Venture: Silicon Valley (JVSV) was created in January 1992 by a group of the region's industry, government, community and education leaders to promote the transition and continuing competitiveness of the region's firms and workforce. One of the key initiatives created by the business consortium has been the Defense/ Space Consortium, a group of defense, space and commercial firms, education and research organizations and local and state public entities. The consortium is organized to foster regional technology partnerships with the goal of maintaining the region's defense base while providing the startup infrastructure and technical support for collaborative efforts on dual-use and new technologies. The Consortium is also active in organizing and supporting a region-wide defense workforce retraining and job placement effort.

Defense firms are looking to federal and state government for regulatory reform as well. JVSV's Defense/Space Consortium is interested in improving the business climate for defense contractors in the U.S., while allowing them to expand into other markets (Kroll *et al.*). In a 1991 survey of Los Angeles region defense businesses conducted by the Economic Roundtable, respondents gave top priority to a

stable regulatory environment (Flaming and Drayse, 1994). While the JVSV consortium is interested in DoD procurement reform, the L.A. businesses were interested in state "business-friendly" issues such as environmental regulation and workers compensation reform.

The message from most of these newly formed business consortiums and industry joint ventures seem to be the same. California's economy has prospered in the past, because, in addition to a skilled labor force, mild climate and first class universities, its industries have been able to develop and nurture a preeminent technological base of talent. Most recovery programs seek ways to maintain this technological base.

Because the programs are new, there has been no way of evaluating their effectiveness. A critical but difficult task in the future will be to measure and monitor the effectiveness and to institute a system of evaluation.

### **Community Military Base Recovery Efforts**

As suggested by the research reviewed in Section 2, the key to successful recovery efforts on behalf of communities experiencing military base closures is to establish a comprehensive reuse planning body that is respected by the constituents and jurisdictions affected by the closure. The conversion of a former military base is a complicated process involving many participants and procedures. The federal and state initiatives (described in the previous sections) have eased the burden on communities attempting to convert their military bases, but these programs have not created a trouble-free process to assist communities make the transition from an active military base to civilian occupation of the real estate. This section highlights the structure of the community planning process and evaluate the community efforts.

#### *Planning Process*

The conversion of military bases from active military occupation to civilian use is a cumbersome process involving many participants. The federal government is responsible for the disposal of the military property, and the local community is charged with establishing how the property will be reused. No formal guidelines been developed to assist local communities in convening reuse planning bodies and to coordinate the interaction of these bodies with the federal government, but the OEA has published a handful of guidelines to assist communities in getting started. In disposing of excess federal property, the host branch of the military occupying the base, must conform to rigid guidelines for property disposal and toxic remediation of the facility designated for closure. The community impacted by the closure then has the responsibility to organize itself and determine which reuse options will best facilitate the economic restructuring of the region.

The 1949 Federal Property and Administrative Services Act sets forth the basic statutory framework for disposal of surplus federal properties (General Services Administration, 1988). Once federal property such as a military base is determined excess and the existing tenant branch of the military sees

no use for the property, there are four primary methods of disposal: transfer to federal agencies, public benefit conveyances (PBC), negotiated sale and public sale. Other federal government agencies have the first priority on the property, followed by state and local governments, and finally open public sale. Public Benefit Conveyances (PBC) are agreements between the federal agency disposing of property and nonfederal public agencies or eligible private nonprofit organizations attempting to acquire the property at discounted prices, usually free. The principal categories under which PBCs may occur include correctional facilities, health or educational use, historic monuments, homeless assistance, parks and recreation, public airports, and wildlife conservation. This definition has been recently broadened by the Pryor Amendment in 1994 to include economic development as a possible PBC category. The military has utilized all of these methods of conveyance since the enactment of the 1949 Act except for homeless assistance, which was introduced through the McKinney Act in 1987.

The potential for free land and/or facilities for impacted communities attracts many players to the military base reuse planning process. In addition to lucrative aspects of the PBCs, the economic, political and social impacts of a closed military facility are not contained by city boundaries. These regional implications force the reuse planning process to include a wide variety of participants. Defining the size of the impacted community is a critical decision in the process. This decision will incorporate the realm of players to become involved. This has been a notoriously unsuccessful process. Highly impacted communities most proximate a base feel they should have a greater role in the conversion planning process than representatives from areas with less impacts. Kirschenbaum and Marsh have noted the competitive nature of establishing a reuse planning body has created ambiguity of responsibility and paralysis within the community (Kirschenbaum and Marsh, 1993).

In addition to the numerous participants involved in the planning process, the spatial arrangement of military bases and incorporated cities within a county has tremendous impacts on the reuse planning process. Bases can be remotely located entirely in an unincorporated county, surrounded by abutting jurisdictions, or can include incorporated jurisdictions within their boundaries. Another possibility is the location of the base entirely within an incorporated city. A more unusual scenario involves the simultaneous closure of a number of military bases within a series of contiguous jurisdictions. Given these various scenarios along with the enormous interest in the reuse planning process, there is no generic model that can be implemented to direct the community planning process. However, there are various guidelines that can be used to ease the reuse planning process. These recommendations have been noted by Cunningham (1993), Hill and Raffel (1993), Kirschenbaum and Marsh (1993), Mayer (1992), Nation (1993a), Simmons (1993a, 1993b), and Wake and Siegal (1993).

### *Evaluation*

In the previous two sections the federal and state recovery programs has been observed. The reactive approach by both the federal government and the State of California has left much to be desired on

behalf of the communities experiencing base closures in the late 1980s and early 1990s. Before the comprehensive approach to base closures was incorporated in 1993, overworked city staffs with minimal budgets were forced to undertake enormous planning challenges with little assistance. The programs are now in place but it is difficult to evaluate many of the programs designed by the federal and state government since they have only recently been implemented.

Simmons (1993a) has documented some of the difficulties encountered with the federal programs at the community level. A majority of the problems are rooted in the grant writing process. Obtaining much of the funding offered by the OEA, EDA, and DoC is complicated by a complex grant application process. It takes a lot of community effort and money to apply to these federal programs. Communities have also complained of lengthy response times on behalf of the federal government to their proposals. Some have suggested that officials administering recovery programs in Washington D.C. have little knowledge of community needs and local issues. This situation should be rectified through the Transition Coordinator program in Clinton's Five Point Plan.

There is also little baseline of data to help implement programs associated with military base closures. The programs for displaced workers illustrate this point rather well. There are millions of dollars available to fund training programs for displaced workers, but there have been no studies on what type of training should be implemented or how the jobs will correspond to the local economies. This example epitomizes the entire process. Immediate answers and solutions are wanted to pressing problems, but without a sense of where to start.

Even with the federal and state programs in place, California communities have had a difficult time converting former military bases to civilian use. Since 1988, no former military base properties have been successfully transferred to civilian uses in California. As noted above, the property disposal process is extremely complex. However, communities have had a difficult time organizing reuse planning authorities and deciding on which reuse options to pursue. George Air Force Base (designated for closure in 1988) in San Bernardino County represents the potential dangers inherent in failing to establish jurisdictional cooperation in developing a reuse planning body. In this case the cities of the Victor Valley developed competing reuse planning bodies, which ultimately stymied the entire process.

Recovery assistance programs to aid the community reuse planning process are evolving quickly. Communities are learning through experience and the federal and state governments have aggressively responded to the community needs. A tremendous amount of federal and state legislation has been designed and funding has been appropriated to facilitate the conversion of military bases. This process is still in its infant stages and more investigation and action is needed by all levels of government to facilitate effective community reuse planning. However, even with all of the required funding and legislation, the community has the ultimate responsibility to organize its constituents in order to accommodate a successful conversion of former military bases. This is where the recovery efforts organized by all levels of government will be tested.

## CONCLUSION

As the effects of defense industry downsizing and multiple military base closures are realized, recovery programs at all levels of government have been maturing to address community and regional needs over the last seven years. A variety of programs in the areas of industrial restructuring, worker retraining, community planning, and information dissemination have been developed by many agencies at various levels of government to assist impacted areas. Many programs were first created after significant increases in federal conversion funding in 1993. Since these programs are relatively new and have not been evaluated, there is not a large body of literature on recovery programs for areas coping with significant economic losses associated with reductions in the federal defense budget. Rather, these programs are described in program statements produced by the administering agencies and collections of these programs found in resource guides.

This analysis of the literature or program statements has attempted to provide a mechanism to identify appropriate programs to combat the negative externalities of defense downsizing in California. Many of the programs are being implemented for the first time and need to be tested. California has been affected by virtually all aspects of defense budget reductions and presents a rich laboratory for implementation of recovery efforts at all levels of government. An effective application and evaluation of these programs will be central to the economic recovery of the state.

**FIGURE 1**

**SELECTED FEDERAL FUNDS FOR DEFENSE CONVERSION  
FISCAL YEAR 1994**

Source: Assembly Office of Research

**SELECTED FEDERAL FUNDS FOR DEFENSE CONVERSION  
FISCAL YEAR 1994**

<b>PROGRAM</b>	<b>ELIGIBLE APPLICANTS</b>	<b>MATCH REQUIREMENT</b>	<b>REGULATIONS</b>	<b>AVAILABILITY OF AWARDS</b>	<b>PROGRAM CONTACTS</b>
<b>Defense Personnel Retraining</b>					
Environmental Education and Training Grants - DOD (\$17 M/FY 1994)	Institutions of higher education for environmental education and training related to environmental restoration and hazardous waste management.	No match required.	See Federal Register around end of April 1994.	To be determined.	Lt. Col. Steve Walker, Department of Defense, USUHS - PMB, Room A1040A, 4301 Jones Bridge Road, Bethesda, MD 20814-4799 or Sam Shipleit (301) 295-1975 FAX: (301) 295-1974 Attention: DESF & G Program, P. O. Box R, Woodbridge, VA 22194.
Defense Conversion Adjustment - DOL (\$150 M one-time appropriation)	State, substate grantees, employers, employer associations, and representatives of employees to provide retraining and readjustment assistance to workers dislocated by defense cutbacks.	No match required.	See Federal Register, 07/09/92 and 06/03/93.	Currently available through 09/30/97.	Robert Colombo, Director, Dislocated Worker Program, U.S. Department of Labor, 200 Constitution Avenue, N.W., Suite N5426, Washington, D.C. 20210 (202) 219-5577, extension 117
Defense Diversification - DOL (\$75 M one time appropriation)	State, substate grantees, employers, representatives of employees, labor management committees, and other employer-employee entities for retraining and readjustment assistance to workers dislocated by defense cutbacks.	No match required.	See Federal Register, July 19, 1993.	Currently available through 09/30/94.	Robert Colombo, Director, Dislocated Worker Program, U.S. Department of Labor, 200 Constitution Avenue, N.W., Suite N5426, Washington, D.C. 20210 (202) 219-5577, extension 117
Service Members Occupation Conversion and Training VA (\$10 M/FY 1994)	Employers of unemployed veterans and disabled veterans for job training.	Not applicable.	See Federal Register around end of May 1994.	Currently available on a first-come first-served basis.	Jesse Brown, Secretary, Veterans Affairs, 810 Vermont Avenue, N.W., Washington, D.C. 20420 (202) 535-8900 Attention: Glen Halsey, KDD - Operations Support Division, 800 Capitol Mall, #MIC47, Sacramento, CA 94280 0001 (916) 323-0724 or various VA Regional Offices (800) 827-1000 for assistance



PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
Teacher and Teacher's Aide Placement Assistance Program (DOD/OASD) (\$65 M/FY 1994)	Service members and eligible individuals who will lose defense jobs may receive stipends, and local education agencies who hire individuals separated from military service, terminated Department of Defense and Department of Energy employees, and displaced defense contractor scientists and engineers may receive grants for placement of qualified defense related personnel in schools that serve a concentration of children from low income families.	Not applicable.	See Federal Register, February 15, 1994.	Immediately.	Ollo Thomas, Department of Defense, Office of the Assistant Secretary of Defense (Personnel and Readiness) (PSP&F) (DoDA), The Pentagon, Room 3E784, Washington, D.C. 20301-4000 (703) 696-4384.  Dr. John Ganz, Chief Placement Officer, Troops to Teachers, DANTES, 6490 Sautley Field Road, Pensacola, Fl. 32509-5243 (904) 452-1320 FAX: (904) 452-1978 Attention: Macc Henderson
<b>Community Adjustment</b>					
Community Adjustment and Economic Diversification Planning (HUD) (\$2M/FY 1994)	Units of general government in nonentitlement areas (i.e., areas which are not metropolitan cities or part of urban counties and do not include Indian Tribes) for special purpose planning grants for community adjustment and economic diversification activities needed as a result of the effects on localities of certain Department of Defense activities, such as base closings or contract cancellations.	No match required.	See Federal Register, March 30, 1994.	Effective April 29, 1994, on a first come, first served basis.	James Selvaggi, Deputy Director, Office of Technical Assistance, Department of Housing and Urban Development, 451 Seventh Street, S.W., Room 7188 Washington, D.C. 20410 (202) 708 2090 or (202) 708-3176
Economic Development Administration (DOC) (\$80 M/FY 1994)	State and local governments (including redevelopment area, economic development district, or a nonprofit organization) to resolve recent and severe adjustment problems that result in serious job losses and long term economic deterioration.	State or local share 25%.	See Federal Register, 03/10/92, 01/11/93, 05/06/93, and a new Federal Register, March 30, 1994.	Immediately.	David F. Wilschi, Director, Economic Adjustment Division, Economic Development Administration, Herbert Clark Hoover Building, 14th Street and Constitution Avenue, N.W., Suite 117327, Washington, D.C. 20230 (202) 482-2659 Sacramento Contacts for proposal package: William J. Lewis (916) 551-2160, Deena R. Sosson (916) 551-1541, Charles Oaks (310) 575-7286

PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
"Section 386" DOD (a portion of \$48 M to be determined)	Local school districts affected by base closures or defense cutbacks.	No match required.	See Federal Register around end of April to May 1994.	Before 06/30/94.	Dr. Hector O. Narvarez, Director, Section 6 Schools, Department of Defense, 4040 North Fairfax Drive, Arlington, VA 22203-1635. (703) 696-4373 or (703) 696-4354 Attention: John Shaver
Defense Industry Adjustment Grants (Noncompetitive) OEA-DOD (a portion of \$35 M/FY 1994)	State, local governments, sub state jurisdictions, and regional organizations, or states on behalf of local governments to plan for, conduct, and assist community adjustment efforts.	State or local share 25%, with 10% cash.	No announcement.	To be determined.	Paul J. Dempsey, Director, Office of Economic Adjustment, ODUSD (A&T), 400 Army-Navy Drive, Suite 200, Arlington, VA 22202-2884 (703) 697-9155 or (703) 695-1800 Sacramento contact: Anthony Gallegos, (916) 557-7365
Community Planning Assistance Grants (Noncompetitive) OEA-DOD (a portion of \$35 M/FY 1994)	State, local governments, sub state jurisdictions, and regional organizations, or states on behalf of local governments for base reuse planning.	State, local, or others share 25%, with 10% cash.	No announcement.	To be determined.	Paul J. Dempsey, Director, Office of Economic Adjustment, ODUSD (A&T), 400 Army-Navy Drive, Suite 200, Arlington, VA 22202-2884 (703) 697-9155 or (703) 695-1800 Sacramento contact: Anthony Gallegos, (916) 557-7365
Planning Grants to Respond to Economic Impact from Job Losses (Competitive) OEA-DOD (a portion of \$35 M/FY 1994)	States to minimize the adverse effects of military base closures, realignments, and reductions in defense industry employment.	State share 25%, with 10% cash.	See Federal Register, around May 1994.	Around 06/01/94.	Paul J. Dempsey, Director, Office of Economic Adjustment, ODUSD (A&T), 400 Army-Navy Drive, Suite 200, Arlington, VA 22202-2884 (703) 697-9155 or (703) 695-1800 Sacramento contact: Anthony Gallegos, (916) 557-7365
Military Installation Conversion Demonstration - CNCS (\$ to be determined for FY 1994)	Communities (including counties) and community based agencies to pay for the Federal share of establishing and carrying out military installation conversion demonstration programs and to assist in converting to community use affected military installations.	Community share is 75% of the total cost of the conversion.	See Federal Register, January 7, 1994 and around July 1994 for notification of availability of funds.	Before September 30, 1994.	Peg Rosenberry, Program Officer, Special Programs, The Corporation for National and Community Service, 1100 Vermont Avenue, N.W., Washington, D.C. 20525 (202) 606 5000, extension 124 or Michael Robbins (202) 606-5000, extension 155.

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PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
<p>Defense Procurement Technical Assistance - DOD (\$12M/FY 1994, of this total, \$600,000 is available for Indian programs only)</p>	<p>State and local governments, private nonprofit organizations, tribal organizations, and Indian owned economic enterprises to enter into cost sharing cooperative agreements to support procurement technical assistance programs, which can give day to day assistance to business firms and provide much greater technical assistance (e.g., preparing bids/proposals and setting up quality assurance and accounting systems) than DoD representatives.</p>	<p>Dod's share of an eligible entity's net program cost shall not exceed 50%, unless the eligible entity/recipient proposes to cover a distressed area. For Indian programs, Dod's share shall not exceed 75% or \$150,000, whichever is less.</p>	<p>See Federal Register, February 1, 1994.</p>	<p>Solicitations available March 15, 1994. Applications due April 29, 1994. Selections made in early September 1994.</p>	<p>Sim Mitchell, Program Manager, Office of Small and Disadvantaged Business Utilization, Defense Logistics Agency, Cameron Station, Alexandria, VA 22304 6100 (703) 274 6471.</p>
<p><b>Defense Transition Reinvestment Project - Partnerships</b></p>					
<p>Technology Development Focus Areas</p> <ul style="list-style-type: none"> <li>• High Density Data Storage Systems</li> <li>• Object Technology for Rapid Software Development and Delivery</li> <li>• Interoperability Testbeds for the National Information Infrastructure</li> <li>• High Definition Systems Manufacturing</li> <li>• Low Cost Electronic Packaging</li> <li>• Uncooled Infrared Sensors</li> <li>• Environmental Sensors</li> <li>• Technology Deployment for Manufacturing Extension Centers Only</li> </ul> <p>DOD/ARPA (\$150 M \$180 M)</p>	<p>Partnerships, partnerships with the federal government, small businesses, and defense dependent small businesses to develop dual use technologies, to deploy manufacturing and technology assistance to small firms, and to establish education and training programs that enhance U.S. manufacturing skills and target displaced defense industry workers.</p>	<p>50% match or more.</p>	<p>See Commerce Business Daily, April 8, 1994 and May 20, 1994.</p>	<p>A program information package will be available in mid April. Planned deadline for receipt of proposals June 30, 1994.</p>	<p>1 800 - DUAL - USR, Monday Through Friday, 8:00 A.M. to 7:00 P.M., Eastern Daylight Savings Time.  FAX: (703) 461 2372 to Technology Reinvestment Project, PA# 94 27.  Electronic Mail: Internet Address pa94 -27@arpa.mil.</p>

PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
ARPA Dual Use Partnerships DOD/ARPA (\$150 M/FY 1994)	Defense Department, defense contractors, federal laboratories, and universities to encourage and provide for research, development, and application of dual use technologies. Application must be made by two or more firms working together.	To be determined.	To be determined.	To be determined.	Technology Reinvestment Project, 3701 North Fairfax Drive, Arlington, VA 22203 1714 1-800-DUALUSE; (1 800-382-5873)
Regional Technology Alliances DOD/ARPA (\$100 M/FY 1994)	One or more eligible business firms and a sponsoring agency (e.g., state or local government) to facilitate the use of one or more defense critical technologies for defense and commercial purposes.	To be determined.	To be determined.	To be determined.	Technology Reinvestment Project, 3701 North Fairfax Drive, Arlington, VA 22203 1714 1-800-DUALUSE; (1 800-382-5873)
Manufacturing Engineering Education -- DOD/ARPA (\$24 M/FY 1994)	Institutions of higher education or consortia of institutions of higher education to enhance existing or establish new programs in manufacturing engineering.	To be determined.	To be determined.	To be determined.	Dr. Michael McGrath, Executive Director, Manufacturing, ARPA SISTO, 3701 North Fairfax Drive, Arlington, VA 22203-1714 (703) 696 2224 FAX: (703) 696-2202 Attention: Antonia Slone (703) 522-6067
Advanced Manufacturing Technology Partnerships -- DOD/ARPA (\$30 M/FY 1994)	Two or more eligible firms or a non-profit research corporation established by two or more firms for research and development of advanced manufacturing technologies with the potential for having defense and dual use applications.	To be determined.	To be determined.	To be determined.	Dr. Michael McGrath, Executive Director, Manufacturing, ARPA SISTO, 3701 North Fairfax Drive, Arlington, VA 22203-1714 (703) 696 2224 FAX: (703) 696-2202 Attention: Antonia Slone (703) 522-6067
Commercial Military Integration Partnerships DOD/ARPA (\$100 M/FY 1994)	Department of Energy national weapons laboratories and specific technologies to provide for development of viable commercial technologies.	To be determined.	To be determined.	To be determined.	Technology Reinvestment Project, 3701 North Fairfax Drive, Arlington, VA 22203-1714 1 800 DUALUSE; (1 800-382-5873)

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PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
Technology Transfer (Cooperative Research and Development Agreements) DOE (a portion of \$20 M)	Private industry and university networks in conjunction with a national laboratory.	50% match or more.	See Commerce Business Daily for call for proposals. See a model Cooperative Research and Development Agreement available through a national laboratory.	To be determined.	Warren Chernock, Deputy, Science and Technology Advisor for Defense Programs, U.S. Department of Energy, 1000 Independence Avenue, S.W., DP4, Washington, D.C. 20585 (202) 586-7590 Attention: James Van Fleet, Defense Program Technology Transfer Division, (202) 586-5784
<b>Defense Transition Reinvestment Project - Nonpartnerships</b>					
Agile Manufacturing & Enterprise Integration ... DOD/ARPA (\$35 M plus carry-over from FY 1993/FY 1994)	To be determined.	To be determined.	See Federal Register around April-May 1994.	To be determined.	Dr. Michael McGrath, Executive Director, Manufacturing, ARPA-SISTO, 3701 North Fairfax Drive, Arlington, VA 22203-1714 (703) 696-2224 FAX: (703) 696-2202 Attention: Antonia Slone (703) 522-6067
Advanced Materials Synthesis & Processing -- DOD/ARPA (\$30 M/FY 1994)	To be determined.	To be determined.	To be determined.	To be determined.	Technology Reinvestment Project, 3701 North Fairfax Drive, Arlington, VA 22203-1714. 1-800-DUALUSE (1-800-382-5873)
Dual Use Technology Initiatives -- DOD/ARPA (\$424 M/FY 1994) Advanced Lithography Advanced Simulation Computing Systems & Communications Technology Defense Research Sciences Integrated Command & Control Materials & Electronics Microelectronic Manufacturing Microelectronics/SF/MATECII	To be determined.	To be determined.	To be determined.	To be determined.	Technology Reinvestment Project, 3701 North Fairfax Drive, Arlington, VA 22203-1714. 1-800 DUALUSE (1-800-382-5873)

PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
Business Loans Defense Economic Assistance SBA (\$ to be determined for FY 1994)	A small business (including prime contractor or subcontractor) that has been, or can reasonably be expected to be, detrimentally affected by the closure or substantial reduction of a Department of Defense installation for direct or guaranteed loans.	Not applicable.	See Federal Register February 9, 1994.	To be determined.	John Cox, Assistant Administrator for Financial Assistance, Small Business Administration, 409 3rd Street S.W., Washington, D.C. 20416 (202) 205 6490 or Michael Dowd (202) 205 7511.
Shipyard Technology Development DOD/ARPA (\$50 M/FY 1994)	To be determined.	To be determined.	To be determined.	To be determined.	Technology Reinvestment Project, 3701 North Fairfax Drive, Arlington, VA 22203-1714. 1-800-DUALUSE (1-800-382-5873)
Small Business Innovative Research -- DOD (\$145 M/FY 1994)	Small businesses with less than 500 employees for research or research and development purposes oriented towards technology innovation, and new commercial products or processes which benefit the public.	No match required.	See Federal Register, 01/26/93 (see Pl. 102 564) and Commerce Business Daily, April 4, 1994.	Solicitation Number 94.2 will be issued, May 1, 1994 Deadline: July 15, 1994, 2 P.M., Eastern Daylight Savings Time	Robert Wrenn, SBIR Program Manager, OSD/SADBU, U.S. Department of Defense, The Pentagon, Room 2A340, Washington, D.C. 20301-3061 (703) 697-1481 or Defense Technical Information Center, ATTN: SBIR, Cameron Station, Alexandria, VA 22304-6145 1(800) 225 DITC
U.S. Japan Industry & Technology Management Training -- AFOSR/DOD (\$10 M/FY 1994)	Institutions of higher education and non-profit institutions with a capability to promote interchange between Japan and U.S. scientist, engineers, and managers, including placing U.S. participants in foreign research facilities and laboratories.	Special consideration to organizations that agree to share program costs on an equitable basis.	See Announcement for The Department of Defense, Fiscal Year 1993: United States - Japan Industry and Technology Management Training (Special Announcement 93-3) from AFOSR (Academic and International Affairs). See Commerce Business Daily around end of April 1994.	Plan is to award several two year grants of approximately \$1 M to \$3 M. Availability of 1994 awards to be announced.	Dr. Kolo White, AFOSR/NI, 110 Duncan Avenue, Suite B115, Bolling Air Force Base, Washington, D.C. 20332-0001 (202) 767-4970 FAX: (202) 767-5012

PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
<b>Miscellaneous</b>					
Advanced Technology Program DOC/NIST (\$200 M/FY 1994)	Large and small, for-profit businesses and joint ventures for high risk science and technology research and development.	Maximum grant \$2 M/project over 3 years. (Indirect costs not covered.) Joint venture share 51%.	See Federal Register, March 21, 1994.	Full proposals must be received by 3 P.M. Eastern Daylight Savings Time on June 22, 1994. Awards available around 12/01/94.	George Uriano, Director, Advanced Technology Program, U.S. Department of Commerce, National Institute of Standards and Technology, Route 270 and Quince Orchard Road, Building 101, Room A430, Gaithersburg, MD 20899 (301) 975 2636 or 1 800-ATP-FUND FAX: (301) 926 9524
Airport Improvement -- FAA/DOT (\$1.7 B/FY 1994)	State and local governments for airport planning and development of eligible construction projects and public airports.	Varies, usually a 10% match.	Criteria for release of grants available in the Airport and Airway Improvement Act of 1982.	By 09/30/94.	Peter Melia, Western Pacific Region, Federal Aviation Administration, P. O. Box 92009 (310) 297 0660
Civilian Airport Systems Improvement (part of the Airport Improvement Program listed above) -- FAA/DOT (\$42 M/FY 1994)	Possibly 16 current or former military airports to improve capacity of civilian airport systems.	10% match.	To be determined.	By 09/30/94.	James V. Mottley, Military Airport Program, App-4, Office of Airport Planning and Programming, Federal Aviation Administration (FAA), 800 Independence Avenue SW, Washington, DC 20591 (202) 267-8780
National Industrial Competitiveness Through Efficiency, Environment, Energy, and Economics -- DOE/EPA (\$3.3 M/FY 1994)	State agencies only, with a private industrial partnership	Minimum of 50% from either state or private industry partnership or in-kind contributions.	No regulations. See Federal Register, 11/06/92 and January 27, 1994.	Solicitation available 02/10/94. Applications due 03/31/94. Selections made in mid-May 1994. Awards available from May to September 1994.	Ernest Rios, Contracting Officer, U.S. Dept. of Energy, San Francisco Support Office, 1301 Clay Street, Oakland, CA 94612-5219 (510) 637-1950
Shipyard Modernization Loan Guarantees -- MA/OSF (\$30 M plus \$45 M carry over/FY 1994)	Communities affected by military base closures for shipyard modernization and ship building.	Varies: 75% or 87.5% of the project cost, depending on category of vessel financed or up to 87.5% for advanced or modern shipbuilding technology.	See Federal Register, March 31, 1994.	To be determined.	Mitchell D. Lax, Director, Office of Ship Financing, Maritime Administration, 400 7th Street, S.W., Room 8122, Washington, D.C. 20590 (202) 366-5744 (202) 366-1907 Attention: David Lippold

PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
<p>Advanced Technology Education NSF (\$14 M \$15 M/FY 1994)</p>	<p>Two year colleges, other associate degree, granting institutions, two year college systems, and consortia of two year colleges with other appropriate organizations and institutions such as four year colleges and universities, secondary schools, professional societies, and non profit, educational research and development groups for:</p> <p>(1) support of up to five National/Regional Centers of Excellence in FY 1994, (2) support of comprehensive programs to focus on curriculum development, faculty or teacher enhancement, faculty or teacher reparation, instructional materials development, or instrumentation and laboratory improvement and (3) support of a few special projects such as conferences, workshops, symposia, studies and other activities involving advanced technology education.</p>	<p>Varies (see Advanced Technology Education publication available by calling (703) 306-1668).</p>	<p>See Federal Register 08/28/93 and NSF publication, Advanced Technological Education.</p>	<p>National/Regional Centers of Excellence - up to \$50,000 for one to two years for planning grants and \$1 M per year for 3-5 years for implementation grants. Projects of varying types, including special projects (e.g., workshops, conferences, and seminars) - \$50,000 to \$500,000 per year for one to five years depending on project complexity. Deadlines: (1) 1993 preproposals 11/01/93, (2) formal proposals - 03/22/94, and (3) formal proposals for planning grants for centers 11/01/93 or 03/22/94, (4) 1994 preproposals 07/28/94 (5) formal 1994 proposals 01/26/95.</p>	<p>Jack Waintraub or Elizabeth Teles, Program Director, Advanced Technology Education, National Science Foundation, Depl. N Bldg, Announcement No. 83-132, 11200 Rockville Pike, Suite 300, Rockville, Maryland 20852 (703) 306 1668</p>

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PROGRAM	ELIGIBLE APPLICANTS	MATCH REQUIREMENT	REGULATIONS	AVAILABILITY OF AWARDS	PROGRAM CONTACTS
Manufacturing Extension Partnership DOC/NIST (\$2.5 M/FY 1994)	State share 50% for planning (maximum award \$150,000/project). State share 50% with one half in cash for implementation (maximum award \$250,000/project). State share for regional linkages (maximum award \$250,000/project).	States, multi-state efforts, or private nonprofit organizations on behalf of the state to help states improve the planning, coordination, and implementation of their technology extension activities.	See Federal Register, January 12, 1994 and March 17, 1994.	Proposals accepted until 4 P.M. Eastern Daylight Savings Time on April 18, 1994.	Dr. Phillip Manzella, Director, Manufacturing Extension Partnership, Polymers Building [Building 224], Room B115, National Institute of Standards and Technology, Gaithersburg, MD 20899 (301) 975-3414 Regional Manager - David Gold (301) 975-5049 or Roger Kilmner (301) 975-3473

( ) Appropriation

AFOSR/DOD Air Force Office of Scientific Research/U.S. Department of Defense  
 ARPA Advanced Research Projects Agency  
 CNCS Corporation for National and Community Service  
 DOC U.S. Department of Commerce  
 DOC/NIST U.S. Department of Commerce/National Institute of Standards and Technology  
 DOD U.S. Department of Defense  
 DOD/OASD Office of the Assistant Secretary of Defense (Personnel and Readiness)  
 DOE U.S. Department of Energy  
 DOL U.S. Department of Labor  
 DOT U.S. Department of Transportation  
 EPA U.S. Environmental Protection Agency  
 FMA U.S. Federal Aviation Administration  
 HUD U.S. Department of Housing and Urban Development  
 MA/OSF Maritime Administration/Office of Ship Financing (Department of Transportation)  
 NIST National Institute of Standards and Technology  
 NSF National Science Foundation  
 OEA DOD Office of Economic Adjustment/Department of Defense  
 SBA Small Business Administration  
 VA Office of Veteran Affairs

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**FIGURE 2**

**BASE CLOSURE WORK GROUPS**

Source: Cal/EPA Base Closure Environmental Update

## BASE CLOSURE WORK GROUPS

*Current Committees, Councils, and Task Forces Working on Base Closure and Conversion*

<b>TITLE</b>	<b>MISSION</b>	<b>MEETINGS</b>	<b>CONTACT</b>
<b>SENATE SELECT COMMITTEE ON DEFENSE BASE CLOSURE</b>	Expedite conversion of defense base closures into economic units	Last hearing: 12/9/93  Next hearing: TBA	Senator Ruben Ayala (916) 445-8011
<b>ASSEMBLY DEFENSE CONVERSION TASK FORCE</b>	Obtain the maximum amount of Federal funds for California; influence how Federal funds are expended in order to provide the most benefit to California's economy; provide the most State assistance, independent of Federal action, for defense conversion; and assure that California does not bear a disproportionate share of future base closures and cutbacks in defense procurement and research and development	Biweekly meetings  Next meeting: TBA	Teresa Stark of Assemblywoman Barbara Lee's Office (916) 445-7442  Information Hotline: (800) 337-5600
<b>GOVERNOR'S MILITARY REUSE TASK FORCE</b>	Promote the rapid conversion of decommissioned military bases and other defense facilities to civilian uses	Last meeting: 12/17/93  Next meeting: TBA	Mayor Susan Golding, Chair (619) 236-6330  Ben Williams, Governor's Office of Planning and Research (916) 322-3170
<b>CALIFORNIA DEFENSE CONVERSION COUNCIL</b>	Establish a coordinated and integrated statewide plan for defense conversion and specifically assist industry in the conversion process	Monthly meetings  Last meeting: 12/15/93  Next meeting: TBA	Chris Holben, Economic Development, Trade and Commerce Agency (916) 324-9777  Steve Jarvis, Strategic Technology, Trade and Commerce Agency (818) 568-9437
<b>CALIFORNIA BASE CLOSURE ENVIRONMENTAL COMMITTEE</b>	Ensure accelerated environmental restoration and reuse at closing bases	Quarterly meetings  Next meeting: TBA	David Wang, CEO, Office of Military Facilities, DTSC - (916) 255-2009
<b>CAL/EPA BASE CLOSURE ENVIRONMENTAL ADVISORY GROUP</b>	Promote and maintain communications between Cal/EPA and interested organizations, agencies, and elected representatives regarding environmental restoration, closure, and reuse of military bases	Quarterly meetings  Next meeting: 1/20/94	Joyce Whiten, Office of Military Facilities, DTSC (916) 255-2066
<b>DEFENSE ENVIRONMENTAL RESPONSE TASK FORCE</b>	Determine ways to improve interagency coordination of environmental response actions at closing bases, and identify ways to consolidate and streamline practices, policies, and administrative procedures of Federal and state agencies to carry out environmental response actions more expeditiously	Last meeting: 9/23 - 24/93  Next meeting: 1/26/94	Col. Gary Thomas of Sherri Wasserman Goodman's Office, Deputy Under Secretary of Defense (703) 697-9789  California contact: David Wang, CEO, Office of Military Facilities, DTSC (916) 255-2009

# Defense Spending, Defense Cutbacks, and the California Economy

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- The article discusses environmental liabilities that have hampered base conversion to other activities and the potential federal roles for dealing with these problems. The Comprehensive Environmental Response, Compensation and Liability Act of 1986 (CERCLA) make property owners liable for clean-up costs even if they did not place the waste on the property. This has made developers and local governments wary of acquiring base property. CERCLA has some language on notification and remediation that is specifically aimed at transfer of federal properties. This provision greatly restricted the ability of the federal government to transfer base properties to other owners. The Community Environment Response Facilities Act of 1992 was passed to alleviate this problem, by allowing federal properties to be subdivided and uncontaminated portions of properties to be sold. The article closes with recommended strategies for private owners and communities in purchasing federal facilities or materials, to minimize potential liability.
- Sedway & Associates. *Highest and Best Use Analysis, Mather AFB*. San Francisco: Sedway & Associates and the Mather AFB Appraisal Team, 1990.
- This report presents a definition of Highest and Best Use followed by a discussion of physical characteristics, public regulations, and market factors relevant to the subject. An analysis and conclusions regarding highest and best use are then presented. This highest and best use analysis is an integral portion of an appraisal conducted for Mather AFB, and is considered to be inseparable from the accompanying valuation analysis and assumptions and limiting conditions.
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- The purpose of this study is to provide data on the existing supply of housing units within the region, analyze region-wide impacts due to the downsizing of Fort Ord, provide recommendations for short-term mitigation and re-use of the vacated stock, and assess the housing impacts associated with proposed alternative land use/vision plans.
- Shulman, Seth. *The Threat at Home: Confronting the Toxic Legacy of the U.S. Military*. Boston: Beacon Press, 1992
- A readable toxic tour of major military contamination sites in the U.S.
- Siegel, Lenny, et al. *The U.S. Military's Toxic Legacy*. Sabattus: Military Toxics Project, 1991
- A comprehensive look at the U.S. military's hazardous waste practices.
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- Simmons, Charlene Wear, Roger Dunstan, and Kenneth W. Umbach. *California Military Base Closures*. Sacramento: California State Library, California Research Bureau Issue Summary CRB-IS-93-002, April 1993. This issue summary discusses the base closure process and the relative employment impacts on California from the current round of recommended closures and provides information about federal and state programs designed to facilitate and fund military base reuse planning efforts and community infrastructure investments. A survey of the 17 military installations currently being closed in California provides information about the status of local planning and reuse efforts.
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- Terner found that single soldiers spent 70 percent of their budgets on entertainment, recreation, transportation and savings -- a greater proportion of which is spent off-base. In contrast, married soldiers spent only 5 or 6 percent of their earnings on entertainment and spent over 40 percent of their earnings on-base.
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- The BCP (BRAC Cleanup Plan) process centers on a single goal: expediting and improving environmental response actions in order to facilitate the disposal and reuse of a BRAC installation, while protecting human health and the environment.
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**Keyword: California economy**

- Bank of America. *California Almanac.* San Francisco: Bank of America, World Information Services, 1991.
- Bowman, David, John Ellwood, Frank Neuhauser, and Eugene Smolensky. *Removing the Current Recession from the State's Budget Deficit: Searching for California's Structural Deficit.* Berkeley: Berkeley Institute for Research on Policy Solutions, Graduate School of Public Policy, University of California at Berkeley, Working Paper No. PS5, April 1993.
- This paper examines the long-run implications of the 1991-1993 recession for California's State Budget. While California historically has tracked the nation in its direction of job growth, the current recession is not typical. In contrast to other periods, certain regions in California, and certain sectors within the state, are losing jobs much more rapidly than the rest of the state or nation. They attribute 24.4 percent of job losses between May 1990 and September 1992 to construction industry losses, 10 percent directly to aerospace and DoD employment, and 23 percent of losses overall to defense spending cutbacks. [Note: their analysis was completed before a major revision in employment numbers was published for the state.] The authors argue that in the past, business cycles have had a permanent effect on the state's economy, through impacts on migration patterns, and that this downturn is also likely to affect the state permanently, by permanently lowering state employment. In examining the impacts on the state's budget, the authors conclude that a structural imbalance in California's budget is likely to continue and that a multi-year budgetary process would help to address the imbalance.
- Bules & Associates. *California Industry Migration Study.* San Francisco: Bules & Associates, 1992.
- Report with separate charts. Study commissioned in November 1991 by five California utility companies to track manufacturing companies either relocating or expanding outside of California. Tracking of 1,035 firms who have expanded or relocated elsewhere in U.S., Mexico, or Puerto Rico, with a direct job loss ranging from 168,000 to 224,000. Twenty-six percent of firms went to Mexico, with 32 percent going to the states of Texas, Nevada, Arizona, Colorado, and Oregon. Business costs, primarily labor and real estate, dominated migration

decisions; however, business climate issues such as environmental regulations, business taxes, and permit restrictions were considered to be of equal importance to some.

\_\_\_\_\_. *California Industry Migration Study: 1993 Update*. San Francisco: Bules & Associates, 1993.

Center for the Continuing Study of the California Economy. *California Economic Growth*. Palo Alto: Center for the Continuing Study of the California Economy, 1993.

The Center annually forecasts trends in the California economy, for the state and several geographic subregions. This edition contains a short section describing alternative forecasts of the impacts of defense spending cuts on employment levels in the state.

Cohen, Stephen S., Clara Eugenia Garcia, and Oscar Loureiro. *From Boom to Bust in the Golden State: The Structural Dimension of California's Prolonged Recession*. Berkeley: Berkeley Roundtable on the International Economy, University of California at Berkeley, BRIE Working Paper 64, September 1993.

Dertouzos, James, and Michael Dardia. *Defense Spending, Aerospace, and the California Economy*. Santa Monica: RAND Corporation, 1993.

The authors examine the possible causes for California's growing disadvantage compared to the rest of the country in the strength of defense manufacturing. Overall, California defense manufacturing grew more quickly than nationally through 1987, but the relative advantage was narrowing over the previous decade. Since 1987, California has lost aerospace jobs more rapidly than the country as a whole. Part of this disadvantage is explained by the state's industrial mix -- California has a higher share of missiles and space employment and a lower share of electronics and communications employment than the national mix. Statewide business climate factors appear to have a small effect as well, but California's loss in competitiveness for nondefense manufacturing is far less than for defense manufacturing. Changing competitiveness within Los Angeles alone may explain a further portion of the shift. Another set of factors that appears to be significant is the impact of changing contracting practices on California firms. California firms were most likely to win contracts that were cost plus fixed fee, that were on a single-contract basis, that were in sectors such as space propulsion, and for R&D. California was much less competitive for fixed-price and competitive contracts. Because so much of the loss is concentrated in Southern California and in Los Angeles County in particular, the authors argue that targeted programs are likely to be important in recovery. They suggest programs that encourage new ventures and worker mobility are more likely to be effective than direct subsidizations to defense contractors in the form of new large nondefense projects.

Galbraith, Craig S. "High-Technology Location and Development: The Case of Orange County." *California Management Review* 28(1) (Fall 1985): 98-109.

The author has conducted a direct survey of top executives of high-tech companies in Orange county. The survey questionnaire had three parts: (1) questions related to factors important for high-tech companies in their location decisions; (2) questions related to factors important for relocation or expansion outside of area decisions; and (3) questions related to strategies designed to cope with housing costs in Orange county. 98 high-tech firms have been surveyed through phone. The author contends that in contrast to the Glasmeir study, which focus on "local" characteristics of high technology, the impact of ambiance (culture, climate, density, recreational activities, schools) and CEO attitudes were important in the success of Orange County high-tech firms. Glasmeir et.al. had concluded the most important factors were business-related (lack of major industrial headquarters, presence of major university, high defense spending), or transportation- and communication-related rather than amenity-related. The author concludes that (1) high-tech firms operate on a different set of factors than traditional industry in making their location decisions; (2) the availability of professional and technical personnel, quality of life in the area and the desire of CEO to live in the area are critical; and (3) proximity to suppliers and markets are of secondary importance; high-tech firms are footloose in their location decisions.

Kimball, Larry J. "The UCLA Forecast for the California Economy." In *The UCLA Business Forecast for the Nation and California*. Los Angeles: UCLA Business Forecasting Project, John E. Anderson Graduate School of Management, University of California at Los Angeles, UCLA-BFP Forecast, December 1993.

Kling, Rob, et al. *Postsuburban California: The Transformation of Orange County Since WWII*. Berkeley: University of California Press, 1991.

Levy, Stephen, and Robert K. Arnold. *The Outlook for the California Economy*. Palo Alto: Center for the Continuing Study of the California Economy, November 1992b.

A second update to the 1992 edition of *California Economic Growth*. This update focuses on a broad range of issues facing the California economy in the 1990s.

\_\_\_\_\_. *The Outlook for the California Economy*. Palo Alto: Center for the Continuing Study of the California Economy, May 1992a.

A supplement to the Center's 1992 edition of *California Economic Growth*. Discusses impacts of defense cuts and the greater problems associated with economic transition in California.

Los Angeles Times. "The Times 100: The Best Performing Companies in California." *Los Angeles Times*, 27 April 1993, Business Section, Part II.

This is the sixth edition of the *Times* annual guide to the best and the biggest in California business. The section takes its name from the *Times*' ranking of companies by return on equity, a list they call the Times 100. They also rank firms by sales, growth, market value, employment and a host of other factors, which together make up a report card on California companies during 1992.

Scott, A., and A. Paul. "Collective Order and Economic Coordination in Industrial Agglomeration: The Technopolies of Southern California." *Environment and Planning* 8 (1990): 179-193.

The authors discuss the pervasiveness of nonmarket institutional arrangements in capitalist economic systems. They define typical economic coordination in industrial agglomerations -- quasi-integration, voluntary associations, informal business cultures, and government institutions. They describe the growth of the high-tech industrial agglomerations (technopoles) of Southern California since the 1950s. They stress two important nonmarket or quasi-market forms of mediating transactional relations, namely interfirm alliances and collectively supplied coordinating services.

Scott, Allen J. *Metropolis: From the Division of Labor to Urban Form*. Berkeley: University of California Press, 1988.

Southern California Edison Business Retention Group and Economic Development Corporation of Los Angeles County. *Greater Los Angeles Technology Resources Guide: 1993/1994 Edition*. Woburn: Corporate Technology Information Services, 1993.

Teitz, Michael, and Philip Shapira. *Growth and Turbulence in the California Economy*. Morgantown: Regional Research Institute, 1989.

UCLA Business Forecasting Project. *The UCLA Business Forecast for the Nation and California*. Los Angeles: UCLA Business Forecasting Project, John E. Anderson Graduate School of Management, University of California at Los Angeles, December 1993.

### **Keyword: California Impacts**

Beltramo, Michael. "Defense Contracting and the Los Angeles Economy." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*, Los Angeles: Economic Roundtable, 1992.

A majority of Los Angeles County's high-tech industrial base is dependent on very large defense programs carried out under contracts awarded to a handful of large firms in the County. Ten firms account for 80 percent of the funds concentrated in the aircraft industry. Using a database of defense contracts awarded to L.A. County firms provided by Office of Economic Adjustment under the Office of the Secretary of Defense. Contractors receiving most DoD funds in L.A. County: McDonnell Douglas, Hughes Aircraft, Rockwell International, TRW, Aerojet, General Dynamics, Lockheed, Aerospace, Northrop, Litton.

Commission on State Finance. *Defense Spending in the 1990s: Impact on California*. Sacramento: Commission on State Finance, Summer 1990.

\_\_\_\_\_. *Impact of Defense Cuts on California*. Sacramento: Commission on State Finance, Fall 1992.

The study estimates the losses in jobs in California's defense industry and the extent to which they are the result of declining national spending, the mix of defense activities in California (which have been hit particularly hard), or the movement of facilities to lower-cost regions outside of California. The study also looks at potential gains to California from the "peace dividend."

\_\_\_\_\_. *Impact of Defense Cuts on California: An Update*. Sacramento: Commission on State Finance, May 1993.

An update of a previous analysis. They estimate that further losses through 1997 will equal 125,000 jobs -- three-fourths in aerospace and one-fourth at closed military bases. The report emphasizes the importance of recovery efforts that make use of federal resources for defense conversion, job retraining, and community adjustment.

Economic Development Corporation of Los Angeles County and A. T. Kearney, Consulting Firm. *An Industry in Transition: Strategies and Issues for Aerospace & Defense Companies in Southern California*. Los Angeles: A. T. Kearney, June 1993.

According to the results of a new study, Los Angeles County aerospace and military contractors are not fleeing the defense market and moving into commercial work, but up to 20 percent of the contractors, subcontractors, and suppliers say they will move out of California.

Henseley, David G., and Daniel Fleming. "Economic Impacts of Defense Cutbacks." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*, Los Angeles: Economic Roundtable, 1992.

Based on a ten-year-period simulation (1992-2001), the authors conclude that by 2001 there will be 184,300 fewer jobs in all sectors of the county's economy.

Holben, Chris. "Memorandum." Sacramento: California Trade and Commerce Agency, Memorandum to Defense Conversion Council, December 1993.

Kimbell, Larry J. "Defense Conversion Issues." *UCLA Business Forecast for the Nation and California* (September 1993): Nation 2.1-2.4.

Defense cuts come on top of shrinking employment in manufacturing due to increased international competition and management emphasis on tight cost controls. Neither the short-run outlook described here, nor the long-term projections forthcoming this fall, offer any hope that high-paying jobs will soon be available in this key sector.

Kroll, Cynthia, et al. "Defense Losses and the California Economy: Private Sector Impacts and New Directions." *Center for Real Estate and Urban Economics Quarterly Report*. Berkeley: Center for Real Estate and Urban Economics, University of California at Berkeley, April 1993.

This article describes recent patterns of defense cuts and job losses in California, particularly in private manufacturing and discusses possible directions for recovering from these losses.

Kroll, Cynthia, Mary M. Corley, and Christopher Weare. *Defense Spending, California Employment and the State's Future*. Berkeley: Center for Real Estate and Urban Economics, University of California at Berkeley, Working Paper No. 93-218, October 1993.

This report examines the role of defense spending in the California economy and the impact of spending cuts on the state's employment levels and growth. The study includes extensive analysis of employment statistics and development of an econometric forecasting model. The authors also examine structural and occupational characteristics of defense sectors. They conducted interviews of firms, public/private partnerships, and state agencies to provide a summary of the range of responses being generated in the state. The report concludes that defense spending cuts have contributed significantly to the state's recent job losses but that recovery from these losses must look beyond defense conversion to making broader and more effective use of all of the state's resources.

Los Angeles Economic Development Corporation. *The Los Angeles County Aerospace Task Force Report*. Los Angeles: Los Angeles Economic Development Corporation, March 1993.

Nation, Joseph E. *Defense Industry Transition in California*. Sacramento: Senate Office of Research, Draft Report, December 1993.

Describes the magnitude of impacts of defense cuts on California employment levels, discusses some of the difficulties of transition, describes federal resources available and proposed, and discusses possible state role in the recovery effort. Estimates that California has lost 178,000 jobs directly related to defense spending since 1986, equaling at least 1/4 of total state job loss since 1988. Emphasizes that the mix of cuts (share to procurement, R&D, etc.) is significant in estimating impacts to California. Some detail provided on distribution of defense spending, on dependency of different industries on defense spending, and on defense industry dependency of different counties in California. Contains an interesting discussion on defense firms and their ability and interest in converting to nondefense production. Emphasizes that access to and amount of financing are very significant barriers to conversion, especially for small firms and suppliers. Job retraining problems and overall weakness of the California economy are also noted as barriers to recovery. Found that large firms are tending to continue in DOD products or niches, while a few prime contractors and many subcontractors are seeking DOD-type customers (e.g. NASA, DOE, FAA), and suppliers are more likely to be aggressively pursuing commercial opportunities. Includes a description of state responses and some recommendations for the future.

Sherwood-Call, Carolyn (Economist, Federal Reserve Bank of San Francisco). "Economic Impacts of Military Base Closings and Realignment." *FRBSF Weekly Letter* No. 93-28 (20 August 1993): 1-2.

This *Weekly Letter* examines the impact of base closures and realignments on the western economy. While the changes are small relative to the District economy, they loom large for regions in which military bases provide a large proportion of the area's total jobs.

**Keyword: community response**

Carpenter, Susan. *Community Problem Solving by Consensus*. Washington, D.C.: Program for Community Problem Solving, 1990.

City of San Diego and the San Diego Consortium & Private Industry Council. *San Diego Economic Adjustment Program*. San Diego: City of San Diego, March 1993.

**Keyword: defense conversion**

Lundquist, Jerrold T. "Shrinking Fast and Smart in the Defense Industry." *Harvard Business Review* (November-December 1992): 74-85.

Lundquist argues that the cuts from reduced defense spending will be larger than have ever been experienced before. He focuses particularly on the long-term nature of the cuts, and argues that they will fall hardest on defense contractors, rather than on military operations. Defense firms will be most able to survive if they shrink radically and quickly. The large contractors need to concentrate activity in their most competitive, successful, and profitable sectors, selling off, closing down, or sharply reducing the scope of other sectors of the firm.

**Keyword: defense industry**

Assembly Sub-Committee on Business Recovery and Job Retention. "Defense Conversion: The Private Defense Sector." Sacramento: California State Assembly, Sub-Committee on Business Recovery and Job Retention, September 1992.

Bischak, Gregory A., ed. *Towards a Peace Economy in the United States: Essays on Military Industry, Disarmament and Economic Conversion*. New York: St. Martin's Press, 1991.

Breheeny, Michael J., ed. *Defense Expenditure and Regional Development*. London: Mansell Publishing, 1988. Book review by Manuel Castells in *Economic Geography* 66(1), Jan 1990, 83-85.

Bury, Elizabeth. "How Important is the Gunbelt: Some Empirical Evidence: A Critique of Ann Markusen, Peter Hall, Scott Campbell, and Sabina Deitrick's *The Rise of the Gunbelt*." *Berkeley Planning Journal* (1992): 166-174.

The author attempts to test the impact of defense spending on regional growth between 1977 and 1986. She particularly tests the following hypothesis of Markusen et al.: "defense spending, particularly procurement spending, has been the one major determinant of differential rates of regional growth in the U.S. from 1977 to 1986." She concludes that Markusen et al. overstate the gunbelt's significance as the one major cause of disparities in regional economic growth. "Because of Pentagon bureaucracy, an emphasis on secrecy, diversion of skilled employees from other sectors, and relatively high salary levels, it may be that military spending does not ripple through the economy to the extent that other types of spending do, and that fewer jobs are created per dollar of military spending than other types of investment."

DiFilippo, Anthony. "Military Spending and Government High-Technology Policy: A Comparative Analysis of the U.S., West Germany, Japan and Great Britain." In *Towards a Peace Economy in the United States: Essays on Military Industry, Disarmament and Economic Conversion*, Gregory A. Bischak, ed. New York: St. Martin's Press, 1991.

The author discusses the impact of military R&D's demands for technical personnel on civilian markets. He contends that direct application to the civilian economy would produce more promising results compared to relying on indirect effects through spin-offs from military work.

—. *How the Military-Serving Firm Differs From the Rest*. Washington, D.C.: National Commission for Economic Conversion and Disarmament, March 1991.

Esparza, Adrian. "Defense Impact Analysis within a Social Accounting Framework." *Growth and Change* 20(3) (Summer 1989): 63-79.

This paper uses a Social Accounting Matrix (SAM) of the California economy to evaluate (1) industrial-occupational linkages associated with defense production; (2) the relative impact of defense expenditures in a regional economy. Multipliers derived from the SAM are used to trace the distribution of wages and salaries payments from 24 industries to managerial, professional, skilled, and unskilled sectors of the labor force. Expenditures by federal defense and non-defense sectors and households are used to assess the relative impacts of defense spending in the overall regional economy. The results indicate that duality is prevalent in the regional labor market, with managerial and professional occupations receiving the greatest benefits from defense production. Overall impacts to the regional economy are less attributable to defense spending than non-defense and household sectors.

Ettlenger, Nancy. "Development Theory and the Military Industrial Firm." In *The Pentagon and the Cities*, Andrew Kirby, ed. Newbury Park: Sage Publications, 1992.

This essay relates development theory to characteristics of military industrial firms (MIFs). Ettlenger argues that MIFs are distinctly different from commercial firms (CFs) in their cycles of development and that as a consequence, they have had very different patterns of location and very different impacts on the communities in which they locate.

Flaming, Daniel, ed. *Los Angeles County Economic Adjustment Strategy for Defense Reductions*. Los Angeles: Economic Roundtable, 1992.

Goldstein, Nance. "Defense Spending as Industrial Policy: The Impact of Military R&D on the U.S. Software Industry." In *Towards a Peace Economy in the United States: Essays on Military Industry, Disarmament and Economic Conversion*, Gregory A. Bischak, ed. New York: St. Martin's Press, 1991.

The author discusses the economic role of military R&D spending in the software industry. She contends that DoD spending on software has affected the commercial industry's development. "First, it has shifted the industry's research and product development toward more applied and developmental work at the expense of basic research. Second, it has redistributed public resources toward large firms away from the industry's smaller firms." She argues that DoD spending on software R&D has favored large firms at the expense of smaller firms where most innovation occurs. She gives the example of ADA, a standardized computer programming language developed by DoD engineers, which has not been adopted in the commercial markets. Firms with ADA-

specialized engineers are concentrated in large firms. The DoD's preference for firms with the potential for follow-on contracts eliminates smaller firms as well.

House Armed Services Committee. *Future of the Defense Industrial Base: A Report of the Structure of the U.S. Defense Industrial Base Panel*. Washington, D.C.: U.S. Congress, House Armed Services Committee, 102nd Congress, 2nd Session, April 7, 1992.

Kirby, Andrew, ed. *The Pentagon and the Cities*. Newberry Park: Sage Publications, Urban Affairs Annual Reviews, Volume 40, 1992.

Book review by Daniel C. Knudsen in *Economic Geography*.

Lall, Betty G., and John Tepper Marlin. *Building a Peace Economy: Opportunities and Problems of Post-Cold War Defense Cuts*. San Francisco: Westview Press, 1992.

This book is basically a manual on the underlying issues, basic needs, and strategies related to defense cuts and recovery. The authors broadly define conversion as "the process of moving from a military to a civilian mode of production and other activities." They briefly describe the situations facing several different groups -- defense contractors and labor, military bases and weapons complexes, and national laboratories. They define indices to describe the relative vulnerability of different states and localities, and then describe existing state conversion programs and the discussion that has gone into developing a federal response. The second half of the book is devoted to profiles of each state, describing its level of defense dependence, areas within the state receiving high amounts of defense dollars, and existing state legislation where relevant.

Malecki, Edward J. "Military Spending and the U.S. Defense Industry: Regional Patterns of Military Contracts and Subcontracts." *Environment and Planning, C, Government and Policy* 2 (1984): 31-44.

The author discusses the geographical patterns of defense industry activity. He notes that the "technology push for a market [in defense-oriented production] that tends to buy the newest technology available, regardless of price, contrasts with the demand pull and price elasticity dominant in consumer and industrial-goods industries," and the market structure of the defense industry is oligopolistic. He also notes that the overall degree of geographical concentration of subcontracts are similar to that of prime contracts.

Markusen, Ann, and Joel Yudken. *Dismantling the Cold War Economy*. New York: Basic Books, 1992.

This is a historical review of the aerospace, communications, and electronics complex (ACE complex). The authors argue that the ACE complex has benefitted from "government fostering R&D, public capital for plant construction and modernization, guaranteed market for product, bailout for firms in troubled periods, training funds for employee development, trade protection, export promotion, economic adjustment for displaced workers and communities." They contend that the discourse on industrial policy and economic conversion should shift from the preoccupation with competitiveness and toward economic development. They identify different strategies that defense-oriented firms select faced with cuts in defense spending: (1) finding niches within the still huge Pentagon budget; (2) focusing on new generation of high-tech weapons; (3) lobbying for maintenance of high defense budgets; (4) positioning themselves in particular military niches where their expertise will be dominant; (5) diversification through buying up non-defense companies or through land development. They predict that small firms may suffer disproportionately from budget cuts. They note the McDonnell-Douglas aircraft company in Long Beach as an example of an innovative conversion to light rail transit assembly.

Markusen, Ann, and Robin Bloch. "Defensive Cities: Military Spending, High Technology, and Human Settlements." In *High Technology, Space, and Society*, Manuel Castells, ed., Beverly Hills: Sage Publications, Urban Affairs Annual Reviews, Volume 28, 1985.

The authors discuss the structure of the military industry: military goods are sold to one monopsonist buyer (the federal government), performance and timeliness are dominant criteria for DOD awards, cost insensitivity, on the supply side these industries are oligopolistic, subcontracting is competitive but some subcontractors have captured market niches where they have become monopolists of certain highly specific parts, the military products are few in number but highly sophisticated, resource and market arrays are relatively unimportant locational factors for military-oriented producers, land and labor rank high among locational decision factors, agglomeration economies are important in the location of military-oriented manufacturing.

Markusen, Ann R. *The Economic and Regional Consequences of Military Innovation*. Berkeley: Institute of Urban and Regional Development, IURD Working Paper No. 442, University of California at Berkeley, May 1985.

The author questions the conduct of a "quite industrial policy" via the Pentagon. She argues that defense-led innovation has artificially accelerated the shift of resources to high-tech industries, with adverse consequences for basic, commercially-oriented sectors, especially capital goods." She contends that defense-related manufacturing has different impacts on the composition, level, and location of employment than does commercially oriented industry. Military-related industries involve continual innovation; therefore, their workforce is predominantly professional. Women are underrepresented among defense workers. Defense-oriented innovation is aimed at

flexibility, maneuverability, invisibility, undetectability, etc. This mobile equipment has required massive investments in computing and electronics.

—. "Why Shifting Gears is Not Easy: Structural Barriers to Macroeconomic Adjustment." In *The Economics of Disarmament*, Manas Chatterji and Jurgen Brauer, eds., New York: New York University Press, 1992.

Markusen, Ann, et al. "Military Spending and Urban Development in California." *Berkeley Planning Journal* 1(2) (Winter 1985): 54-68.

A study of four cases, each with a different type of military-related production: Vallejo, a blue collar community dominated by a naval shipyard since the 1890s; Los Angeles County, the center of aerospace industry; Santa Clara County (Silicon Valley), home of a diversified high-tech sector; Livermore, home to two nuclear weapons labs. In all of the cases, military spending has served as a catalyst for growth.

Markusen, Ann, Peter Hall, Sabina Deitrick, and Scott Campbell. "Rejoinder to Elizabeth Bury." *Berkeley Planning Journal* (1992): 175-181.

Markusen, Ann, Peter Hall, Scott Campbell, and Sabina Deitrick. *The Rise of the Gunbelt: The Military Remapping of Industrial America*. New York: Oxford University Press, 1991.

Two chapters in this book, "Aerospace Capital of the World: Los Angeles Takes Off" and "Why the Gunbelt?," are of particular interest for us. The first provides a concise history of the aerospace industry in Los Angeles County. The chapter includes brief history of aerospace in the military-industrial complex (major firms: Glenn Martin, Donald Douglas, Lockheed Brothers, North American, Jack Northrop, Howard Hughes). The authors describe several critical historical junctures that created the "Aerospace Alley" in Los Angeles: (a) in the era of interwar isolationism, several founder fathers of pioneer aircraft firms (young entrepreneurs) relocated to SC; (b) military-scientific-industrial complex emerged in mid-1930s, translation of aircraft into aerospace; (c) during WWII, pioneer manufacturers entered into mass production; (d) and finally the race towards aerospace during cold-war era of mid 1950s marked the real birth of the military-industrial complex.

McCurdy, Dave. *Future of the Defense Industrial Base*. Washington, D.C.: Report of the Structure of U.S. Defense Industrial Base Panel of the Committee on Armed Services, House of Representatives, 102nd Congress, 2nd Session, April 1992.

A committee report addressing the task of preserving the defense industrial base in a period of spending cuts. The report examines means of preserving a base for defense production in a period of cuts and restructuring. They refer to concerns that firms may move entirely out of defense production (especially contractors), leaving a lack of capacity and greater dependence on imports. Some strategies they mention include identifying a few "silver bullet" technologies to focus continuing defense production on, and to concentrate on dual-use technologies that also have a commercial application. In addition, they recommend refocussing the discussion of defense capabilities by considering a strategy that considers *economic* as well as military strength. This leads to consideration of programs of technology transfer and strengthening capabilities in emerging sectors such as environmental technology, transportation technology, and communications infrastructure.

Mehay, Stephen L., and Loren M. Solnick. "Defense Spending and State Economic Growth." *Journal of Regional Science* 30 (1990): 477-487.

An analysis of the regional growth effects of federal defense spending. The relationship between defense spending and state personal income and manufacturing employment between 1976 and 1985 is modeled. The authors conclude that aggregate defense spending has a positive effect on both of the growth measures. However, when defense expenditures are disaggregated, only investment-type outlays appear to consistently affect state economic growth. They disaggregate defense outlays into military payroll, civilian payroll, procurement contracts, research and development, services, and construction. The two subcategories they create differentiate between investment and operation and maintenance expenses. Their results indicate that the concerns of state officials over the geographic distribution of defense dollars are warranted in the case of investment-type outlays, particularly for procurement contracts and to a lesser extent for R&D projects.

O'hUallachain, Breandan. "Regional and Technological Implications of the Recent Growth in American Defense Spending." *Annals of the Association of American Geographers* 72 (1987): 208-23.

The author discusses the role of the current military buildup in the spatial redistribution of American manufacturing industry. In examining the geographic impacts of the current buildup, he assesses the current increase in scale of defense spending and the shift in policy in favor of technological improvements, particularly the link between the Defense Dept. and high-tech industries.

Reid, Elizabeth. "Defense Dependence and Growth Expectations in the Aerospace Industry." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*, Los Angeles: Economic Roundtable, 1992.

The typical high-tech firm sells 54 percent of its products to the DOD. In L.A. County, two significant groups are identified: (1) a very large, highly defense-dependent cluster of firms that is declining in employment and beginning to leave the area; (2) a small, diversified cluster of firms that anticipates employment growth and intends to stay in the area.

Reppy, Judith. "U.S. Defense Industry: Unmanaged Change." In *Arms Industry Limited*, Herbert Wulf, ed., SIPRI, 1993.

The author contends that there is very little interest among the defense contractors in converting their defense operations into civilian use. Instead, companies have chosen to become smaller, laying off workers and closing plants. She divides the defense industry into parts: prime contractors, subcontractors, and vendors. Faced with the changes in the defense market, firms have chosen two broad strategies: stabilization or withdrawal. She predicts the defense industry to be smaller, and more concentrated in the future.

Scott, Allen J. "Growth and Future Prospects of the Aerospace-Defense Industry in Los Angeles County." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*, Los Angeles: Economic Roundtable, 1992.

The aerospace-defense industry grew rapidly in LA County over the postwar decades. Scott estimates that 51-65 percent of core high-tech employment in the county is directly dependent on defense spending. Two sectors, SIC 372 and SIC 376, are particularly at risk due to defense cutbacks.

\_\_\_\_\_. "Interregional Subcontracting Patterns in the Aerospace Industry: The Southern California Nexus." *Economic Geography* 69(2) (April 1993): 142-156.

The paper describes an empirical study of the geography of intra- and interregional industrial linkages in the aerospace industry located in Southern California. The study draws from a NASA report on prime contractors and their first- and second-tier subcontractors. The analysis focuses on the flow of funding to subcontractors, with the major attention directed at flows involving the Southern California Region. California received 30.2 percent of prime contracts from NASA in FY 1989. This represents a drop in share from the 1970s, when the state received over 40 percent of NASA prime contracts. Of the 28 different establishments awarded NASA prime contracts in 1989, 12 were in Southern California (in fact representing only four organizations). Of the \$9.0 billion awarded in 1989 in prime contracts, \$2.7 billion was subcontracted in large contracts (\$10 million or greater) in the first-tier (i.e. from the initial prime contract). The author finds that first-tier linkages for the most part occur in Sunbelt divisions and that intra-Pacific contracting accounts for 25 percent of the value of first-tier subcontracting. However, the net dollar flow of first-tier subcontracts is negative in the Sunbelt and strongly positive in the "Manufacturing Belt." Second-tier subcontracting brings a large net inflow of dollars back to the Pacific and especially to the Southern California nexus. Tracking prime and subcontracts by location within Southern California shows the differential role each county plays. All prime contracts tracked in the study (those subcontracting out \$10 million or more) were awarded in Los Angeles or Orange County, and these two counties dominate subcontracting activity as well. San Diego and San Bernardino Counties also received significant shares of first-tier subcontracts, while Santa Barbara and Ventura became significant players in the second-tier round of subcontracting. Scott concludes that the aerospace industry in California, while still dominant in many transactions, has an underlying weakness reflected in its loss of share in the 1980s which makes it particularly vulnerable to negative impacts from defense cuts.

Scott, Allen J., and Doreen J. Mattingly. "The Aircraft and Parts Industry in Southern California: Continuity and Change from the Inter-War Years to the 1990s." *Economic Geography* 65(1) (January 1989): 48-71.

The authors discuss the history and the geography of the aircraft and parts industry in Southern California from its origins in 1920s and 1930s to the present. They contend that the inception and growth of the aircraft industry in Southern California can better be explained by focusing on "external economies" generated by local labor markets and by network of inter-establishment transactions. In addition to the factors critical for Marshallian industrial district formation, several other elements have facilitated the growth of the aircraft and parts industry: (a) breakthrough technological developments; (b) increasing federal purchases of aircrafts; (c) educational institutions; (d) resistance to unionization of labor force.

They discuss the historical evolution of the industry in three periods: (a) the pre-WW2 period; (b) the WW2 period; (c) the post-WW2 period. Their discussion is centered around spatial aspects of local labor markets and inter-establishment linkages. For the study of the latter, they have conducted a mail-survey of 986 establishments in SC (Data Sources: California Manufacturers Register). Their questionnaire was designed to gather information on sales and marketing, purchasing contracting, and modes of transacting (telex, fax, phone, face-to-face, mail). Following their historical review of the industrial geography of SC in the article, the authors confirm that the aircraft and parts industry in SC has evolved spatially and temporally very differently compared to mass production and craft industrial production in the U.S. The growth of the industry has been in association with dense pools of highly specialized blue-collar and white-collar labor. They emphasize the importance of the positive external economies (specialized input and service providers, local infrastructure of small producers and subcontractors). They attribute the innovative capacity in the industry in SC to the presence of dense webs of external economies in the region. The authors conclude that increasing competitive pressure from world markets warrants coherent industrial policies if similar outcome is to be avoided as in the steel, automobile, and parts of semiconductor industry.

Strack, Blake, and Claude Welch, eds. *Winning at Peace: Planning for Economic Success After the Cold War*.

Buffalo: Baldy Center for Law and Social Policy, State University of New York at Buffalo, Working Paper Series NW 92.01, 1992.



Warf, Barney. "The Pentagon and the Service Sector." *Economic Geography* 69(2) (April 1993): 123-141. The article focuses on the role of defense spending in employment in service sectors. The analysis is based on military prime contracts to service sector firms, which are estimated to produce 620,000 jobs nationwide (1990; direct, indirect, and induced). Key sectors with military ties include research and development, computer software, and transportation and communications. Compared to manufacturing, these firms are more labor-intensive, more vertically disintegrated, and more dependent on backward and forward linkages, leading them to agglomerate in large metropolitan areas. There is relatively small representation of prime contracts to business services firms or financial industries. California and Virginia received the largest share of service prime contracts, with Massachusetts, Florida, and Texas also receiving large shares. The author uses state I-O models to estimate the jobs generated by spending in each state. The primary beneficiaries are California and the Washington, D.C., area. The author notes that the impacts of cuts in the service sectors may be more severe than other military spending cuts, because of higher multiplier rates, and that California may be particularly vulnerable because of the state's high share of both manufacturing and service prime contracts.

**Keyword: defense policy**

Aspin, Les. *An Approach To Sizing American Conventional Forces for the Post-Soviet Era: Four Illustrative Options*. Washington, D.C.: U.S. Congress, House Armed Services Committee, February 1992.

\_\_\_\_\_. *Bottom-Up Review*. Washington, D.C.: U.S. Department of Defense, September 1993.

California Institute for Federal Policy Research. *Report for the California Congressional Task Force on Defense Reinvestment and Economic Development*. Washington, D.C.: California Institute for Federal Policy Research, March 1993.

Center on Budget and Policy Priorities. *The Military Payoff*. Washington, D.C.: Center on Budget and Policy Priorities, February 1991.

Defense Budget Project. *Responding to Changing Threats: A Report of the Defense Budget Project's Task Force on the FY 1992-1997 Defense Plan*. Washington, D.C.: Defense Budget Project, 1991.

\_\_\_\_\_. *Issue Brief: Defense-Related Economic Adjustment and Federal Policy*. Washington, D.C.: Defense Budget Project, February 1992.

\_\_\_\_\_. *Final FY 1994 Defense Authorization and Appropriations: Defense Reinvestment and Transition Programs*. Washington, D.C.: Defense Budget Project, December 1993.

\_\_\_\_\_. *FY 1994 Defense Acquisition Plan Saves Most Systems, Cuts Back Some*. Washington, D.C.: Defense Budget Project, March 1993.

\_\_\_\_\_. *Initial Analysis of the FY 1994 Defense Budget*. Washington, D.C.: Defense Budget Project, March 1993.

\_\_\_\_\_. *Issue Brief: President Clinton's Defense Reinvestment and Transition Programs*. Washington, D.C.: Defense Budget Project, March 1993.

\_\_\_\_\_. *Issues for Conference: The FY 1994 House and Senate Defense Authorization and Appropriations Bills*. Washington, D.C.: Defense Budget Project, October 1993.

Kauffman, William and John Steinbruner. *Decisions for Defense: Prospects for a New Order*. Washington, D.C.: Brookings Institution, 1991.

Kosiak, Steven. *Analysis of the Fiscal Year 1994 Defense Budget Request, with Historical Defense Budget Tables*. Washington, D.C.: Defense Budget Project, April 1993.

The Administration's proposed \$263.4 billion fiscal year (FY) 1994 budget for National defense represents a 5 percent real (inflation-adjusted) reduction in budget authority from FY 1993 and \$11.4 billion cut from the FY 1994 level proposed by Bush. Tables include: Funding for Major Acquisition Programs; Clinton vs. Bush: FY 1994 Weapon System Procurement by Quantity.

Logistics Management Institute. *The DoD Drawdown: Planned Spending and Employment Cuts*. Bethesda: Logistics Management Institute, LMI Report D.C.201R1, 1993.

The title pretty much says it all. Includes budget authority and actual outlays by year through 1997, and by program. Terminated weapons systems are discussed in various categories: aircraft, communications, missiles, etc.

Strack, Blake, and Claude E. Welch, Jr. "Laissez-Faire Follies." *Society* 30(4) (May/June 1993): 4.

Taibl, Paul, and Steven Kosiak. *An Affordable Long-Term Defense*. Washington, D.C.: Defense Budget Project, February 1993.

U.S. Government Printing Office. *The President's Private Sector Survey on Cost Control: Taskforce Report on the Office of the Secretary of Defense*. Washington, D.C.: U.S. Government Printing Office, July 1983.

U.S. House of Representatives. "Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 1994, and for Other Purposes." Washington, D.C.: U.S. Government Printing Office, Conference Report (H. Rept. 103-339), November 1993.

—. "National Defense Authorization Act for Fiscal Year 1994: Conference Report to Accompany H.R. 2401." Washington, D.C.: U.S. Government Printing Office, Conference Report (H. Rept. 103-357), November 1993.

**Keyword: economic development**

Alameda Center for Environmental Technologies (ACET). "A Proposal for the East Bay Conversion and Reinvestment Commission." Alameda: Alameda Center for Environmental Technologies, 27 September 1993.

California Strategic Blueprint Work Group. *A Strategic Blueprint: Sustainable Economic Conversion for California & the Nation*. San Francisco: California Strategic Blueprint Work Group, August 1993.

The key issue before California, and the nation, is the creation of good, sustainable jobs. What's necessary is nothing less than revitalization -- conversion -- of the economies of California and states like it that are reeling from the blows of defense cuts, corporate down-sizing, and other structural problems. Who will create these jobs? A partnership led by business, including government and our schools, with each partner charged to do only what it does best. *A Strategic Blueprint* describes economic revitalization as a process for California -- a comprehensive plan and process stressing practicality, innovation, and results.

Cooper, Arnold C. "The Role of Incubator Organizations in the Founding of Growth-Oriented Firms." *Journal of Business Venturing* 1(1) (Winter 1985): 75-86.

Using a sample of 161 new, growth-oriented firms, the relationships of the new companies to their incubator organizations are studied. The sample was constructed by scanning feature stories in *Inc.* (Jan 81 to Nov 84) and *Venture* magazines (Jan 80 to June 84). The research has focused on four factors expected to relate incubator organizations to the entrepreneurial process: (1) the location of the new firm relative to the incubator organization; (2) the nature of the business of the new firm relative to the incubator organization; (3) the type of incubator organization, whether an industrial firm or a university or hospital; (4) the size of the incubator organization. He has found that 84 percent of the firms in the sample had started in the same geographic location as the incubator organization. Entrepreneurship within a region seems to depend upon the pool of people already there. Software firms were more likely to be spin-offs from universities; bio-technology firms were often spin-offs from universities and hospitals.

Fosler, Scott R., ed. *Local Economic Development: Strategies for a Changing Economy*. Washington, D.C.: International City Management Association, 1991.

Gregerman, Alan S. *Competitive Advantage: Framing a Strategy to Support High Growth Firms*. Washington, D.C.: National Council for Urban Economic Development, 1984.

Mayer, Virginia M. *Small City Economic Development: Roads to Success*. Washington, D.C.: National League of Cities, 1991.

Umino, Wendy. *Assembly Office of Research Issue Brief: Economic Development Assistance Programs in State Government*. Sacramento: Assembly Publications Office, April 1993.

**Keyword: federal programs & policy**

Advanced Research Projects Agency. *Program Information Package for Defense Technology Conversion, Reinvestment, and Transition Assistance*. Washington D.C.: Technology Reinvestment Project, March 1993.

Alison, Thomas M., and Peter Almquist. *Analysis of Defense Conversion Legislation*. Washington, D.C.: Defense Conversion Commission, Annex I to *Adjusting to the Drawdown. Report of the Defense Conversion Commission*, February 1993.

This annex analyzes legislation for defense conversion that was enacted into law for the 1993 fiscal year. The first section discusses the purposes of this document. The second section describes the framework for evaluating legislation that the Commission developed in the course of its review. The third section applies the framework to the legislation and summarizes the Commission's findings. The fourth section discusses the next steps for conversion legislation.

Bradford, Donald F. "The Defense Economic Adjustment Program." *Defense Management Journal* 4(1) (Winter 1967-68): 26-30.

Clinton, President William J., and Vice President Albert Gore, Jr. *Technology for America's Economic Growth: New Direction to Build Economic Strength*. Washington, D.C.: White House, February 1993.

Congressional Budget Office. *The Technology Reinvestment Project: Integrating Military and Civilian Industries*. Washington, D.C.: U.S. Congressional Budget Office, July 1993.

- Executive Office of the President. *Technology for Economic Growth: President's Progress Report*. Washington, D.C.: Executive Office of the President, November 1993.
- Feldman, Jonathan. "Broadening the Peace Dividend." *Society* 30(4) (May/June 1993): 32.
- Feldman, Jonathan, Robert Krinsky, and Seymour Melman. *Criteria for Economic Conversion Legislation*. Washington, D.C.: National Commission for Economic Conversion and Disarmament, December 1988.
- Holliman, Sherry D. *Programs and Downsizing Strategy (Annex K)*. Washington, D.C.: Defense Conversion Commission, Annex to *Adjusting to the Drawdown. Report of the Defense Conversion Commission*, February 1993. This Annex discusses the impact of the drawdown on civilian workers and the programs available to them. The author argues that the best long-term solution to these disruptions will be the increase in new jobs that will come with economic recovery. However, some constructive short-term measures are available in the meantime.
- Hutchinson, Robert A., et al. *Compendium of Programs to Assist the Transition (Annex G)*. Bethesda: Logistics Management Institute, LMI Report No. D.C.201R3, Annex to *Adjusting to the Drawdown. Report of the Defense Conversion Commission*, February 1993. This compendium provides brief descriptive summaries of established programs, new legislation, and other initiatives that are relevant for DoD downsizing. Many Federal, state, and local economic-oriented assistance programs that currently exist or are being planned, which can be used to help mitigate economic impacts, are identified.
- Knight, Edward. *Federal Economic Aid to Communities, Workers, and Businesses Affected by Defense Cuts*. Washington, D.C.: Congressional Research Service, Library of Congress, January 1991.
- Lynch, John. "The Pentagon's Community Aid Program." *Bulletin of the Atomic Scientists* 43(8) (October 1986): 34-47.
- Matzkin, Kenneth. *Diversifying Defense Dependent Communities*. Washington, D.C.: President's Economic Adjustment Committee, November 1989.
- McGraw-Hill. *Federal Technology Report*. New York: McGraw-Hill's Federal Technology Report, October 1993.
- National Commission for Economic Conversion and Disarmament. "1993 Conversion Legislation: An Update." *New Economy* 3(4) Issue 16 (Fall 1992): 4-5. A complete analysis of the FY 1993 Defense Authorization, including how the legislation restructured the relationship between EDA and OEA. *The New Economy* is published quarterly by the National Commission for Economic Conversion and Disarmament.
- Neu, C. R., and Michael Kennedy. *Do We Need Special Federal Programs To Aid Defense Conversion?* Santa Monica: RAND Corporation, RAND Issue Paper IP-104, February 1993.
- Nunno, Richard M. *Defense R&D Restructuring*. Washington, D.C.: U.S. Library of Congress, Congressional Research Service, Science Policy Research Division, CRS Issue Brief, 1992 (updated October 1992).
- Pages, Erik R. *Recent Conversion Proposals: A BENS Assessment*. Washington, D.C.: Business Executives for National Security, April 1993. New conversion proposals have been developed at all levels of government, starting with President Clinton's conversion initiative announced on March 11, 1993. This paper examines the President's plan and the key conversion proposals in the 103rd Congress. It then describes these new initiatives to spur effective conversion for businesses, communities, and workers.
- Pister, Karl. "Mobilizing R&D for the Economic War: Advice to the Next President." *Science and Technology* 4(2) (1988): 70.
- Public Employee Department, AFL-CIO. *Military Base Closures: Federal Programs to Assist Civilian Employees and their Communities*. Washington, D.C.: Public Employee Department, AFL-CIO, 1990.
- Simmons, Charlene Wear. *Defense Conversion Policy: The Defense Authorization and Appropriations Act for Fiscal Year 1993*. Sacramento: California State Library, California Research Bureau, 1993.
- U.S. Congress. *National Defense Authorization Act for Fiscal Year 1993*. Public Law 102-484 Directs military spending for FY 1993. The unique quality of this Defense Authorization is its interest in breaking down artificial walls between military and civilian economies. The U.S.'s military-industrial policy is stated: maintain military production capacity and ability, rely more on commercially-available technology, reduce DoD reliance on industrial sectors that are not integrated into civilian markets, reduce barriers to the use of commercially-available technology by defense contractors, etc. (Sec. 4211). Dual-use technologies are encouraged, and a defense-conversion program is created and funded (this is essentially, with some changes, the conversion program that President Clinton announced in March 1993).
- U.S. Department of Commerce. *Programs of the Economic Development Administration*. Washington, D.C.: U.S. Department of Commerce, 1992.

\_\_\_\_. *Advanced Technology Program*. Gaithersburg: National Institute of Standards and Technology, 1993.

U.S. Department of Defense. "Advanced Planning Grants for Communities Economically Dependent on DoD Spending." *Federal Register* Volume 58 (29 July 1993).

To help minimize the potential economic impacts resulting from reductions in DoD spending, the OEA has statutory authority to award Advanced Planning grants (only) in Fiscal Year (FY) 1994 to help develop community adjustments and diversification strategies in response to possible defense-related job losses. Grants may be made available to states and local governments that can demonstrate an economic dependence on military, DoD civilian, and defense industry employment. A total of \$2,000,000 is available.

U.S. Department of Defense, Advanced Research Projects Agency (ARPA). *Program Information Package for Defense Technology Conversion, Reinvestment, and Transition Assistance*. Arlington, VA: Advanced Research Projects Agency (ARPA), March 1993.

\_\_\_\_. *Small Business Innovation Research (SBIR) Program for Defense Technology Conversion, Reinvestment, and Transition Assistance*. Arlington, VA: Advanced Research Projects Agency (ARPA), May 1993.

U.S. Department of Defense, Office of Economic Adjustment. *Federal Assistance for Local Economic Development*. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment.

\_\_\_\_. *Economic Adjustment/Conversion*. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment, the President's Economic Adjustment Committee, and the Office of the Assistant Secretary of Defense for Manpower, Installations, and Logistics, July 1985.

\_\_\_\_. *Managing Rapid Growth*. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment, President's Economic Adjustment Committee, March 1988.

\_\_\_\_. *Diversifying Defense Dependent Communities: EAC Community Guidance Manual XI*. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment, November 1989.

\_\_\_\_. *Resources for Local Public Sector Development*. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment, May 1989.

\_\_\_\_. *Diversifying Defense Affected Economies: Community Guidance Manual XIV* [Formerly, *Diversifying Defense Dependent Economies*]. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment, President's Economic Adjustment Committee, May 1990.

The Office of Economic Adjustment was created in 1961 to aid communities facing significant changes at nearby Department of Defense (DoD) installations. Our experience in the 400 places where we have worked since then shows that there are many reasonable ways to blunt the impact of threats to local economies.

\_\_\_\_. *Using Former Military Installations as Correctional Facilities: Community Guidance Manual XIII*. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment, President's Economic Adjustment Committee, March 1990.

\_\_\_\_. *Diversifying Defense Affected Economies*. Washington, D.C.: U.S. Department of Defense, Office of Economic Adjustment, President's Economic Adjustment Committee, 1992.

U.S. Department of Defense, Office of Under Secretary of Defense (Acquisitions). *A Directory of Federal Reinvestment and Transition Initiatives for People, Business, and Communities*. Washington, D.C.: U.S. Department of Defense, Office of Under Secretary of Defense (Acquisitions), August 1993.

White House Technology Reinvestment Project. *Government Points of Contact for the Technology Focus Areas in the Technology Reinvestment Projects Program Information Package*. Washington, D.C.: White House Technology Reinvestment Project, April 1993.

White House. *Defense Reinvestment and Conversion White House Paper*. Washington, D.C.: President Clinton Position Paper, 1993.

White House position paper describing programs geared to defense conversion.

\_\_\_\_. *Information Package: Defense Reinvestment and Conversion*. Washington, D.C.: Office of the Assistant to the President for Economic Policy, 1993.

This is a summary of Clinton's defense conversion program, prepared for the White House press corps (March 11, 1993). It pulls together both new and pre-existing defense conversion spending, classified in four broad areas: worker assistance, community assistance, dual-use (contractor conversion), and new technology projects (big, non-defense projects which may benefit the defense sector). 1993 spending is pegged at \$1.7 billion; over the 1993-97 period they report nearly \$20 billion, of which almost half is new technology projects and one-quarter is dual-use technology assistance.

\_\_\_\_. *Revitalizing Base Closure Communities*. Washington, D.C.: July 1993.

**Keyword: industry conversion**

Bitzinger, Richard A. *Adjusting to the Drawdown: The Transition in the Defense Industry*. Washington, D.C.: Defense Budget Project, April 1993.

This report addresses two critical questions confronting policymakers searching for appropriate federal -- as well as state and local -- programs to manage this transition: What is the nature of the various firms, rather than the market, experiencing these impacts; and which strategies and options are available to and being taken by firms to deal with the structural change.

Brauer, Jurgen, and John Tepper Marlin. "Converting Resources from Military to Non-Military Uses." *Journal of Economic Perspectives* 6(4) (Fall 1992): 145-164.

The article starts with a brief historical account of military spending, and the organization of military industries. The authors note that military markets often operate with one buyer (DoD) and very few suppliers, producing a limited number of expensive goods whose prices are set by formal negotiations. New military-oriented firms rarely enter the market and old ones rarely exit. They make the distinction between the conversion of specific physical capital and conversion of the knowledge of individual military specialists to new civilian uses (human capital conversion). They conclude: "It is the severity of the cuts, combined with the way they are highly concentrated: in specific, specialized industries with few potential alternative civilian products: in particular military-dependent regions of the country: in particular occupational categories with skills that may not easily be transferable to alternative employment."

Business Executives for National Security. *Weathering the Defense Transition: A Business Based Approach to Conversion*. Washington, D.C.: Business Executives for National Security, 1992.

This paper acknowledges the many definitions of "conversion" and focuses on the efforts of firms to develop products for civilian markets and to become less dependent upon DoD as a customer. Many large contractors (i.e., General Dynamics) have been spooked by earlier conversion failures (Boeing, Grumman) and instead have chosen to downsize and focus on their defense areas of expertise. Small start-up/spin-off ventures show some promise (Raytheon, Northrop). Several case studies are given, revealing that in different cases, various factors are crucial to the success or failure. Some firms received no government assistance, some relied heavily. Ability to shift from technology-driven to cost-driven marketing is important.

CALSTART. *Annual Report: CALSTART: A Non-Profit Consortium Developing Advanced Transportation Technologies*. Burbank: CALSTART, 1992.

Describes a business and government agency consortium. The mission of the group is to develop the technology to manufacture advanced electric vehicles.

Center for Economic Conversion. *Economic Conversion Update: A Summary of Economic Conversion Activities Around the Nation*. Mountain View: Center for Economic Conversion, May 1993.

Many states and localities continue to provide well-tested conversion programs in the areas of: conversion loan programs, manufacturing extension programs, economic conversion business networks, and market studies for new civilian products and industries. A number of states are also considering new conversion legislation covering everything from mandatory alternative use committees (CT) to enterprise zones for base closures (CA).

Center for Strategic and International Studies. *Integrating Commercial and Military Technologies for National Strength: An Agenda for Change*. Washington, D.C.: Center for Strategic and International Studies, March 1991.

DeGrasse, Robert W., Jr. "Corporate Diversification and Conversion Experience." In *Economic Adjustment and Conversion of Defense Industries*, John E. Lynch, ed., Boulder: Westview Press, 1987.

The author discusses how corporations can shift defense-specific resources to non-military enterprises based on the experiences of six defense firms which have initiated special efforts to adjust to defense contract reductions during 1960s and 1970s: Kaman Corp, Bloomfield Connecticut; Acurex Corporation, Mountain View, CA; Boeing Vertol, Delaware County, PA; Raytheon Company, Lexington, MA; Ingalls Shipbuilding, Pascagoula, Mississippi; Rohr Industries, San Diego, CA. Constraints encountered: 1) new products developed by defense-oriented firms tended to be over-designed and had quality control problems due to inadequate testing; 2) marketing problems; 3) production control is very different in producing for commercial markets compared to the defense-oriented firms.

DeGrasse, Robert W., Jr. "American Perestroika." *Society* 30(4) (May/June 1993): 17.

Flaming, Daniel, and Allen J. Scott. "Economic Adjustment Strategies for a Defense Dependent Industrial Base." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*. Los Angeles: Economic Roundtable, 1992.

The authors discuss obstacles to public sector support of high-tech industries such as (1) marked underdevelopment of broadly-based coalitions for supporting local industrial growth; (2) concentration of defense

industry in a few prime contractors. They stress the need to forge an industrial development strategy founded on principles such as collaborative problem-solving and public-private partnerships.

Flaming, Daniel, and Mark Drayse. *Technology and Jobs: Defense Conversion in the Los Angeles Region*. Los Angeles: Economic Roundtable, 1994.

Gordon, Suzanne, and Dave McFadden, eds. *Economic Conversion: Revitalizing America's Economy*. Cambridge: Ballinger Publishing Co., 1984.

Hoskins, Anne. *Economic Initiatives: Special Report on Economic Conversion*. Washington, D.C.: Center for Policy Alternatives, July 1991.

Jones, Marie R. *Converting the Cold War Economy: 63 Companies Change for the Future*. Mountain View: Center for Economic Conversion, 1992.

\_\_\_\_\_. *Converting the Cold War Economy: Defense Companies Change for the Future*. Mountain View: Center for Economic Conversion, August 1992.

This report focuses particularly on conversion and diversification, telling the stories of 63 defense firms that have successfully used these two strategies.

Jones, Marie R. *Economic Conversion Update: A Summary of Economic Conversion Activities Around the Nation*. Mountain View: Center for Economic Conversion, May 1993.

\_\_\_\_\_. *Economic Conversion Update: A Summary of Economic Conversion Activities Around the Nation*. Mountain View: Center for Economic Conversion, December 1993.

\_\_\_\_\_. *Local and State Activities*. Mountain View: Center for Economic Conversion, 1993.

This article is the executive summary of *Economic Conversion Update*, May 1993.

Lawson, James. "Civilian Market Opportunities for Defense Industry." In *Economic Adjustment and Conversion of Defense Industries*, John E. Lynch, ed., Boulder: Westview Press, 1987.

Eight major defense industries have been selected to determine the feasibility for transitioning defense industrial firms to new civilian markets. The author concludes that only three of these defense-related sectors (radio and telecommunications [365,366], electronic computing equipment [357], and electrical measurement instruments [382]) appear to have feasible near-term alternative civilian/commercial markets. Potentially successful diversification opportunities is a complex task requiring the examination of strengths and weaknesses of the company in terms of technological capability and expertise, market skills, market linkages, and the corporate environment, as well as specific market requirements. This complexity have led to economic conversion approaches to be unsuccessful.

Lynch, John E. *Economic Adjustment and Conversion of Defense Industries*. Boulder: Westview Press, 1987.

Markusen, Ann R., and Catherine Hill. *Converting the Cold War Economy: Investing in Industries, Workers, and Communities*. Washington, D.C.: Economic Policy Institute, 1992.

Marshall, Eliot. "Military Labs Hit by Funding Retreat: Base Closures, Along with a Planned Reorganization of R&D, Herald a Major Shrinking of Defense Research Facilities." *Science* 253(5016) (12 July 1991): 131.

Mayer, Virginia M. *Local Officials Guide to Defense Economic Adjustment*. Washington, D.C.: National League of Cities, 1992.

A guide intended for elected officials in defense-dependent communities. Particularly helpful in providing ideas about how to conduct economic analyses of defense dependency and conversion potential.

National Commission for Economic Conversion and Disarmament. *Successful Conversion Experiences*.

Washington, D.C.: National Commission for Economic Conversion and Disarmament, November 1991.

Oden, Michael, Catherine Hill, Elizabeth Mueller, Jonathan Feldman, and Ann Markusen. *Changing the Future: Converting the St. Louis Economy*. Piscataway: Center for Urban Policy Research, State University of New Jersey at Rutgers, Working Paper No. 59, November 1993.

Platt, David J. *Defense Drawdown: Financial Overview and Strategies of the Top 25 Prime Contractors (Annex E)*. Washington, D.C.: Defense Conversion Commission, Annex to *Adjusting to the Drawdown. Report of the Defense Conversion Commission*, February 1993.

Faced with this permanent downsizing, defense contractors' financial and business strategies are focusing on survivability, not growth. When a market shrinks by 46 percent in real terms over a five-year period, firms face enormous financial pressures and uncertainty. How these companies will face these pressures and uncertainties and the role the Department of Defense will play is the focus of this Annex.

Renner, Michael, ed. *Economic Adjustment after the Cold War: Strategies for Conversion*. Geneva: United Nations Institute for Disarmament Research, 1992.

The author discusses a range of strategies for firms in an environment of reduced defense spending: adjustment, diversification, spin-off, alternative use, and conversion. He suggests that civilian orientation can be achieved by "(1) expansion of existing civilian production operations; (2) development of civilian variants of military products or components; (3) development of new civilian products based on existing military technology; (4) development of entirely new civilian products; or (5) acquisition of other civilian companies or assets.

Reppy, Judith. "Defense Companies' Strategies in a Declining Market: Implications for Government Policy." Unpublished paper, December 1992.

The author discusses several strategies employed by defense firms: teaming, joint ventures, acquisitions and mergers.

Stewart, William G., II. *From War to Peace: A History of Past Conversions*. Bethesda: Logistics Management Institute, LMI Report D.C.201R4, January 1993.

The report compares the impacts of defense drawdowns after the second World War, Korea, Vietnam, and the Reagan buildup. WWII draw-down was large, sudden, and extensively managed by the government. Firms involved in defense production had generally switched suddenly during as a result of the war from civilian production. One object of government policy during the drawdown was to ensure that these firms could switch back to civilian production as quickly as possible. The Korean War draw-down was also sudden but smaller, as military production did not reach WWII levels. Compared to the post-WWII period, more firms remained in military production after the war, beginning a specialization of firms in this type of production. The Vietnam war brought the expansion of firms that were already specialized in defense production. In the post-war period, these firms and their employees faced difficulties in shifting to civilian work. In the Reagan period, build-up was slightly higher than in Vietnam but quite gradual. It began in a period when there was a great deal of excess capacity in the economy. The drawdown, though relatively less severe than in some other periods, began in a weakened economy, while defense firms were less flexible than ever in their production capabilities. Authors observe that the WWII draw-down dwarfs all others. In each case a recession has followed. The most consistent government policy has been a GI Bill program to transition military personnel to civilian employment.

Stowsky, Jay. *Beating our Plowshares into Double-Edged Swords: The Impact of Pentagon Policies on the Commercialization of Advanced Technologies*. Berkeley: Berkeley Roundtable on the International Economy, University of California at Berkeley, BRIE Working Paper No. 17, 1991.

The author accepts the notion that military programs have an impact on the trajectory of technological development, and asserts that whether the impact on the civilian economy will be negative or positive depends on a number of factors such as (a) the purpose of the program (technological advance or specific military applications); (b) the compatibility of military product development with commercial market requirements. Pentagon's involvement in aircraft and microelectronics had the explicit aim to advance the technological state-of-the-art. In its involvement in numerically controlled machine tools (U.S. Air Force), by contrast, the focus has been on the development of specific tools with little spinoffs. The author argues that unlike the programs in 1950s and 1960s, defense procurement policies are actually prohibiting the diffusion of new commercial technologies. Military's early involvement has contributed to the creation of a military-dependent and an uncompetitive machine tool sector.

The author argues that government policies can encourage technological innovation or alternatively promote the achievement of production and marketing efficiencies. He also argues that Pentagon contracts can potentially undermine the U.S. competitive position in a range of market-dominated high-tech sectors.

The author concludes that although military technologies can be adapted to commercial uses (for example, remote controls for tv sets, solar-powered calculators, and graphite tennis rackets are a spinoff of aerospace technology), they are rare and limited to aerospace and electronics applications. Commercial producers which have historically relied on Pentagon funding now find themselves with technical oversophistication, over-specialized personnel, restrictions on diffusion in the name of national security, and damaging protectionism and are less and less able to compete in civilian markets.

The creation of military-industrial firms, of a military-dependent and uncompetitive structure, is aided by programs that focus on the development of specific military product applications rather than promoting general technological state-of-the-art. The author argues that the Defense Dept's technological development policies are undermining U.S. competitiveness in high-tech sectors, and concludes by stressing the importance of a counterbalancing industrial policy where tradeoffs between Pentagon's technological development policies and nation's requirement for competitive industrial development are explicitly addressed.

—. *From Spin-Off to Spin-On: Redefining the Military's Role in Technology Development*. Berkeley: Berkeley Round Table on the International Economy, University of California at Berkeley, BRIE Working Paper No. 50, 1991.

U.S. Congress. *Redesigning Defense: Planning the Transition to the Future U.S. Defense Industrial Base*. Washington, D.C.: U.S. Government Printing Office, July 1991.

U.S. Congress, Office of Technology Assessment. *Defense Conversion: Redirecting R&D*. Washington, D.C.: U.S. Government Printing Office, May 1993.

\_\_\_\_\_. *Defense Conversion: Redirecting R&D: Summary*. Washington, D.C.: U.S. Government Printing Office, 1993.

This report concentrates on new opportunities to advance civilian technologies and improve industrial competitiveness. Part One asks how government R&D may be put on a new course, shifting from the military goals that dominated Federal technology efforts. Part Two considers some options for new national initiatives that meet public needs while fostering the growth of knowledge-intensive, wealth-creating industries.

U.S. Department of Defense, Office of Logistics. *Opportunities for Private Investment*. Washington, D.C.: U.S. Government Printing Office, No. 306, 1990.

**Keyword: local & regional impacts**

Atkinson, Robert D. "Defense Spending Cuts and Regional Economic Impact: An Overview." *Economic Geography* 69(2) (April 1993): 107-122.

Identifies the regional distribution of defense employment, the degree of dependency on defense of different regions, and the likely impacts of reduced spending. Defense spending is of particular interest because unlike many other government expenditures, it is quite concentrated regionally and in urban areas, with over half of spending going to seven states. Rather than estimating from SIC codes (which generally include both defense and non-defense activities), Atkinson estimates defense-based industry employment from national estimates of jobs and the distribution of prime contracts by states. The shift in production from conventional military products to aerospace and electronic based products has led to greater regional concentration of the defense industry. Because of the time lag, the paper focuses on data from 1991 and earlier and emphasizes the relative strength and stability of the large diversified urban areas (like Los Angeles and Boston) dependent on defense. While he notes that defense industry cuts will particularly affect the "winners" of the build-up period (New England, California, Washington), he also expects that the robustness of the economies of these areas will help many places to weather the cuts.

Muller, Thomas, Reed Hansen, and Robert Hutchinson. *The Local Economic and Fiscal Impact of New DoD Facilities -- A Retrospective Analysis*. Bethesda: Logistics Management Institute, January 1991.

Muller, Thomas, Robert A. Hutchinson, Debra E. Goldstone, and William B. Moore. *A Method for Estimating Local Impacts of Cuts in Defense Spending*. Bethesda: Logistics Management Institute Report D.C.201R6, 1993.

An input-output analysis of defense spending and local employment, relying on the DoC RIMS-II model.

Smardon, Richard C., and Emanuel Carter. "Military Base Expansion and Typical Impacts to Rural Communities." *Small Town* (March-April 1990): 3-4.

**Keyword: plant closure**

Howland, Marie. *Plant Closings and Worker Displacement: The Regional Issues*. Kalamazoo: W. E. Upjohn Institute for Employment Research, 1988.

Using Dun and Bradstreet data, the author seeks to identify factors explaining regional variation in plant closings. She focuses on SIC 354, 367, and 371. In this study, five variables are hypothesized to predict regional differences in plant closures: production costs, unionization, production cost changes, imports, and local market growth. Her findings seem to support the proposition that business start-ups and expansions, not plant closures, explain variance in regional growth rates. She suggests that start-up and closure decisions may not be related. An absence of studies of factors influencing closure and relocation decisions is noted.

Kenney, Robert T. "Redesigning Industrial Plants for New Uses." In *Plant Closure and Community Recovery*, John E. Lynch, ed., Washington, D.C.: National Council for Urban Economic Development, 1990.

Lynch, John E. *Plant Closures and Community Recovery*. Washington, D.C.: National Council for Urban Economic Development, January 1990.

MacLachlan, Ian. "Plant Closure and Market Dynamics: Competitive Strategy and Rationalization." *Economic Geography* 68(2) (April 1992): 128-145.

This paper examines the role of market dynamics and competitive strategy in industrial plant closure. The case of Sheller-Globe Corporation's Canadian Steering Wheel Division is discussed.



Shapira, Philip. *The Crumbling of Smokestack California: A Case Study in Industrial Restructuring and the Reorganization of Work*. Berkeley: Institute of Urban and Regional Development, University of California at Berkeley, IURD Working Paper No. 437, November 1984.

This paper examines how industrial sectors and enterprises are changing their patterns of production, leading in many cases to job loss, workplace reorganization, and plant closures. Industrial restructuring in California is discussed. "Smokestack" industries (automobile production, steel, electrical goods, rubber, lumber, and food processing) have provided the base for the establishment of workplace, social, and community relationships. The sectors of new employment growth (high-tech) have different occupational and organizational characteristics.

\_\_\_\_\_. "Industry and Jobs in Transition: A Study of Industrial Restructuring Displacement in California." Ph.D. Dissertation, Department of City and Regional Planning, University of California at Berkeley, 1986.

\_\_\_\_\_. *Industrial Restructuring and Worker Transition in California Manufacturing*. Berkeley: Institute of Regional and Urban Development, University of California at Berkeley, IURD Working Paper No. 452, January 1987.

This paper examines the extent and consequences of industrial restructuring and worker dislocation in California between 1979 and 1984. The extent of worker displacement through plant shutdowns and layoffs, and the relationships (by sector) with job loss and job creation, are assessed. The primary data source is the January 1984 Current Population Survey, where supplemental questions were asked to workers of 20 years + age who have been displaced from their jobs during Jan. 79 and Jan. 84. Shapira looks at the shift from basic to high-tech industry, and within basic industry from capital-intensive to labor-intensive industries.

He questions the extent to which sectoral employment changes can be considered structural or cyclical. He defines structural change as "significant declines or increases in sectoral employment which go beyond expected cyclical variations and reflect permanent breaks with patterns of employment established in earlier years" (p. 16). Thus, structural change can be positive or negative. To examine this issue, he has developed a series of regression models to test the relationship between sector employment and the overall performance of the California economy. [  $EMP = f(\ln CALGSP)$  ].

Conclusions of the analysis of the dynamics of employment loss and gain associated with industrial restructuring and plant closures in California: (a) worker displacement is extensive in California; (b) in high-tech and non-manufacturing sectors, more jobs were created than lost. The capital-intensive basic industry sector, however, lost more jobs than gained; (c) there are differential impacts on workers from job displacement; (d) there has been significant costs from job displacement; (e) only a small proportion of displaced basic industry workers are able to make the transition into high tech.

The research refutes the notion that displaced workers can easily move into new high-tech jobs.

Nation, Joseph E. *Military Base Closures and Re-use in California*. Sacramento: Senate Office of Research, December 1993.

**Keyword: state programs & policy**

Atkinson, Robert. "Ten Lessons for Successful State Technology Policy-Making: Learning from Michigan and Pennsylvania." *Economic Development Commentary* 14(2) (Summer 1990): 20.

\_\_\_\_\_. "Some States Take the Lead: Explaining the Formation of State Technology Policies." *Economic Development Quarterly* 5(1) (February 1991): 33-44.

Brockman, Paul, and Paul Phelps. *Science and Technology Programs in the States, 1992*. Alexandria: Advanced Development Distribution, February 1992.

California Council on Defense Conversion and Technology Assessment. "Interim Report to Governor Pete Wilson." Sacramento: California Council on Defense Conversion and Technology Assessment, June 1993.

California Council on Science and Technology. *Project California Update*. Irvine: California Council on Science and Technology, February 1993.

\_\_\_\_\_. *Project California: A Blueprint for Energizing California's Economic Recovery: An Action Agenda Program of the California Council on Science and Technology*. Irvine: California Council on Science and Technology, October 1993.

California Institute for Federal Policy Research. *Institute Update: A Monthly Journal of California News from Capitol Hill*. Washington, D.C.: California Institute for Federal Policy Research, various issues.

California Trade and Commerce Agency. *California Defense Adjustment Matching Grant Program*. Sacramento: California Trade and Commerce Agency, Economic Development Programs, June 1993.

The California Defense Adjustment Matching Grant Program is designed to provide a portion of the matching funds required of communities seeking federal funding for defense-related economic adjustment strategies and programs. \$1 million is available through October 1, 1993. Applications will be accepted on an ongoing basis through October 1 or until the \$1 million has been obligated.

Carnegie Commission on Science, Technology, and Government. *Science, Technology, and the States in America's Third Century*. New York: Carnegie Commission on Science, Technology, and Government, September 1992.

Clarke, Marianne K. *A Governor's Guide to Economic Conversion*. Washington, D.C.: Capitol Resources Policy Studies, Economic Development, Science and Technology Program, National Governors' Association, 1992.

Summarizes the key impacts of defense spending cuts on states economies. Describes alternative strategies for facilitating economic conversion.

Employment Development Department. *Employment and Training Programs in California*. Sacramento: Employment Development Department, November 1992.

Employment Training Panel. *Bulletin*. Sacramento: Employment Training Panel, various dates.

Feller, Irwin. "American State Governments as Models for National Science Policy." *Journal of Policy Analysis and Management* 11(2) (1992): 288-309.

National Governors Association. *True Federalism: Recognizing the Role of the States in the Development and Diffusion of Industrial Technology*. Washington, D.C.: National Governors Association, April 1993.

Phelps, Paul B., and Paul R. Brockman. *Science and Technology Programs in the States 1992*. Alexandria: Advanced Development Distribution, February 1992.

State of Washington, Department of Community Development. *Diversification: Strategies for Military-Dependent Communities, Firms, and Workers in Washington State*. Olympia: State of Washington, Department of Community Development, January 1992.

Umino, Wendy. *Defense Conversion Resource Guide*. Sacramento: Assembly Publications Office, October 1993.

**Keyword: technological change**

Bahrami, Homan. "The Emerging Flexible Organization: Perspectives from Silicon Valley." *California Management Review* 34(4) (Summer 1992): 33-52.

This article describes some of the organizational features of the emerging flexible enterprises in Silicon Valley. The conclusions are based on the study of 37 high-tech firms there. Flexible organizational structures include delayering and downsizing, team-based networks, alliances, and partnerships, and a redefined employer-employee covenant (tradeoff between corporate flexibility and individual security). He notes the pivotal importance of informal networks in high-tech companies. Productivity of knowledge-based entities seems to depend on employee's capabilities, commitments, motivations, and relationships. He also notes the semi-permeable boundaries in the high-tech sector which have arisen as a result of the formation of alliances and partnerships. The key features of the new emerging organizational model include multiple centers, steeples of expertise, interdependent units, multiple alliances, diverse structures, cosmopolitan mindset, and an emphasis on flexibility.

Baran, Barbara. "Office Automation and Women's Work: The Technological Transformation of the Insurance Industry." In *High Technology, Space, and Society*, Manuel Castells, ed., Beverly Hills: Sage Publications, Urban Affairs Annual Reviews, Volume 28, 1985.

In contrast to analysts who argue that automation tends to eliminate higher- and middle-level clerical occupations, the author contends that most traditional clerical categories are declining -- routine, semiskilled, and skilled. Narrow routine clerical jobs are disappearing the most rapidly. She argues that whereas "the first round of automation did, indeed, de-skill and "proletarianize" much clerical work, the second round is totally eliminating many of those degraded functions." What is being de-skilled is professional work, and the focus is on how to translate functions performed by knowledge-workers into computer software.

She concludes that for women at the bottom of the clerical hierarchy, jobs are disappearing. She has found that, in her study of the insurance industry, unskilled labor is being expelled and as a result average skill levels are rising. At the same time, however, occupational structure is polarizing.

Brotchie, John F., Peter Hall, and Peter W. Newton. *The Spatial Impact of Technological Change*. London: Croom Helm, 1987.

Broz, Joseph, David Cranmer, Mark DeSantis, and Beverly Fleisher. *Aspects of Performance in the High Technology Sector*. Washington, D.C.: Executive Office of the President, Office of Science and Technology Policy, Issues in Science and Technology Policy Working Paper, 1993.

Cainarca, Gian Carlo, Massimo G. Colombo, and Sergio Mariotti. "An Evolutionary Pattern of Innovation Diffusion. The Case of Flexible Automation." *Research Policy* 18 (1989): 59-86.

Castells, Manuel, ed. *High Technology, Space, and Society*. Beverly Hills: Sage Publications, Urban Affairs Annual Reviews, Volume 28, 1985.

Five characteristics are identified which makes a location attractive for high-tech activities: (1) due to science-based and knowledge intensive nature of high-tech, they need a close connection to major universities and a large pool of technical and scientific labor; (2) given the dependence on government markets, they tend to cluster historically in regions where military has established testing sites; (3) areas with a strong union tradition tend to discourage high-tech location; (4) they require the existence of venture capital; (5) production process is highly discrete and can be separated in time and space and need all activities to be located along good communication networks.

Christensen, Kathleen E., ed. *The New Era of Home-Based Work: Directions and Policies*. Boulder: Westview Press, 1988.

A collection of articles indicating changing working arrangements (home-based work, contracting, telecommuting) that fit into the needs for employer flexibility and lower wage and fringe benefits costs.

Christopherson, Susan, and Michael Storper. "The Effects of Flexible Specialization on Industrial Politics and the Labor Market: The Motion Picture Industry." *Industrial and Labor Relations Review* 42(3) (April 1989): 331-347.

The authors examine the transition to flexibly specialized production organization in the motion picture industry and its impact on the distribution of work and wages and the definition of skills. The production process in the motion picture industry has transformed from mass-production (factory-like production; the studio system) to flexibly specialized and vertically disintegrated. In the latter, the studio acts primarily as a financial investor, and an independent production company organizes the production through a large number of specialized firms. In this model, income has become more of a function of total hours worked than of seniority. The new model entails two distinct groups of workers: core workers (accounts for two-thirds of total number of hours worked and a high share of overtime hours) and peripheral workers (earn high hourly wages but are unemployed for longer periods). Status and income divisions are based on increasing disparities in access to work hours.

Cooke, P. "Some Spatial Aspects of Regulatory and Technological Change in Telecommunication Industries." *Environment and Planning* 24(5) (May 1992): 683-703.

The author argues that deregulation in computing and communications industries has increased the level of competition and at the same time has given rise to systems of "quasi-regulation." Firms are observed to exert their own forms of quasi-regulation by forming strategic alliances, joint ventures to control the wasteful dynamics of stand-alone competition. Corporate activity is tending towards "quasi-regulation" to reduce competitive and market-based uncertainties.

Council on Competitiveness. *Gaining New Ground: Technology Priorities for America's Future*. Washington, D.C.: Publications Office, Council on Competitiveness, 1991.

Dorfman, Nancy S. *Innovation and Market Structure: Lessons from the Computer and Semiconductor Industries*. Cambridge: Ballinger, 1987.

This book is a history of innovation in computer and semiconductor industries. The objective of the study is to identify the market conditions under which small, new firms innovate. She defines innovation as "a product or process that is, in a technological sense, new and has met the market test." She concludes that the structure of the market plays an important role in determining the kind of firm – large or small, new or old – that innovates. She notes that "in order to innovate, a firm must be in a position to develop, produce, and market a new product without serious cost disadvantages relative to potential competitors, whether they are in the same or other industries, and must have an incentive to invest in research and development, in addition to production, of the innovation and to assume the more than ordinary risks." The author contends that "the government had no direct role in supporting research that led to the major technological breakthroughs [in 1960s], most importantly, the transistor at Bell Laboratories, the silicon chip at TI, the planar process at Fairchild, and the integrated circuit at either of the two latter companies" (p. 216). She concludes that the U.S. government was neutral in influencing opportunities for new enterprises relative to established companies. She also notes that the government market has made it possible for some new firms to exploit a talent for innovation that might otherwise have languished for lack of funding. She identifies barriers to innovation as: (1) capital cost barriers; (2) other absolute cost barriers; (3) product differentiation barriers; (4) effects of industry maturation.

Fadem, Joel A. "Automation and Work Design in the U.S.: Case Studies of Quality of Working Life Impacts." In *Microprocessors, Manpower and Society: A Comparative, Cross-National Approach*, Malcolm Warner, ed., New York: St. Martin's Press, 1984.

This chapter assesses the qualitative nature of the work environment under conditions of automation.

Florida, Richard, and Martin Kenney. "Silicon Valley and Route 128 Won't Save Us." *California Management Review* 33(1) (Fall 1990): 68-88.

The author challenges the image of high-tech world with attributes such as "microscale," "flexibility," "trust," and "cooperation." He contends that "a history of strained, adversarial relations between chip companies and semiconductor equipment manufacturers underscores the decline of the U.S. semiconductor production equipment industry." "The Hobbesian realities of Silicon Valley and Route 128 fly in the face of academic theorists who would like to explain their technological dynamism and economic performance in terms of a theory of economic cooperation based on the high-fashion clothing and footwear industries of northern Italy." "One does not need a theory of cooperation and trust to explain the innovativeness and economic dynamism of Silicon Valley or Route 128, when a simple understanding of the super-profits that come from breakthrough innovation will do."

Garvin, David A. "Spin-Offs and the New Firm Formation Process." *California Management Review* 25(2) (January 1983): 3-20.

This article examines the structural conditions conducive to spin-offs and the environments from which they are most likely to arise." The author argues that spin-offs are seen in a wide range of industries early in their life cycle, not exclusively in technology-based industries such as the semiconductor industry. Broad structural and market conditions have an impact on the predominance of spin-offs. Rapidly growing demand, changing technology, and limited-scale economies all facilitate the entry of new firms. Spin-offs in particular are encouraged by the existence of multiple market segments, information and start-up advantages accruing to members of established firms, readily transferable technologies, and environments in which skilled human capital is the critical factor of production. These conditions are generally present in industries that have not yet achieved maturity.

Glasmeyer, Amy. "Innovative Manufacturing Industries: Spatial Incidence in the United States." In *High Technology, Space, and Society*, Manuel Castells, ed., Beverly Hills, CA: Sage Publications, Urban Affairs Annual Reviews, Volume 28, 1985.

Using the 1972 and 1977 Census of Manufacturers Plant location files and industry employment estimates, the author presents a state-level analysis of the location and growth of high tech in the mid-1970s. She concludes that NorthEast, Middle Atlantic, and Great Lake states are well represented in terms of absolute number of jobs. "The widespread presence of high-tech industries in both large and medium-sized states tends to support the proposition that the growth of high-tech industries may reduce a region's vulnerability to unexpected declines in any one sector." The in-state concentration of high-tech employment in a few key industries was most prevalent in the medium and smaller states.

Hadlock, Paul, Daniel Hecker, and Joseph Gannon. "High Technology Employment: Another View." *Monthly Labor Review* 114(7) (July 1991): 26.

Joint Venture: Silicon Valley. *Blueprint for a 21st Century Community*. San Jose: Consolidated Publications, June 1993.

Lazzareschi, Carla. "High-tech Companies Still Pacing the Pack." *Los Angeles Times*: 1 May 1990: 23.

Malecki, E. J., and P. Nijkamp. "Technology and Regional Development: Some Thoughts on Policy." *Environment and Policy* 6 (1988): 383-399.

The author argues that the seedbed or the incubator function of an area determines its innovation potential. He stresses the importance of point aspects of certain locations (quality of labor force, venture capital, etc.) as well as network aspects (e.g. knowledge transfer institutions). He discusses the favorable conditions for innovations to occur which foster regional growth. Location decisions of high-tech firms with high rates of innovations are discussed in this context in the article. He also discusses the factors that are essential for the "environment of entrepreneurship" and the urban incubator phenomenon. Finally, in the article, regional technology policies are discussed. He discusses the role of state venture capital funds, policies to promote new firms, science parks, and incubator facilities for new firms.

Malecki, Edward J. "Technology and Regional Development: A Survey." *International Regional Science Review* 8(2) (1983): 89-125.

This is a review of the literature on the role of technology and technological change in regional development. He reviews the traditional approaches to technology found in models of regional growth, in analyses of innovation diffusion, and in economic analysis of technological change.

\_\_\_\_\_. "The Location of Economic Activities: Flexibility and Agglomeration." In *Technology and Economic Development: The Dynamics of Local, Regional, and National Change*, Edward J. Malecki. New York: John Wiley & Sons, 1991.

He discusses the factors influencing the innovativeness and competitiveness of places and countries. Technical skills appears to be key to relating the process of technological change and competition.

\_\_\_\_\_. *Technology and Economic Development: The Dynamics of Local, Regional and National Change*. New York: John Wiley & Sons, 1991.

Mogee, Mary Ellen. *Technology Policy and Critical Technologies*. Washington, D.C.: National Academy Press, December 1991.

National Academy of Sciences. *Science, Engineering, and Public Policy: National Goals for a New Era*. Washington, D.C.: National Academy Press, Committee on Science, Engineering, and Public Policy, 1993.

National Telecommunications and Information Administration. *The National Information Infrastructure: Agenda for Action*. Washington, D.C.: National Telecommunications and Information Administration, September 1993.

Phillips, William. *Report of the National Critical Technologies Panel*. Washington, D.C.: U.S. Government Printing Office, March 1993.

Przemieniecki, J.S. *Critical Technologies for National Defense*. Washington, D.C.: American Institute of Aeronautics and Astronautics, 1991.

Saxenian, AnnaLee. "Silicon Valley and Route 128: Regional Prototypes or Historic Exceptions?" In *High Technology, Space, and Society*, Manuel Castells, ed., Beverly Hills: Sage Publications, Urban Affairs Annual Reviews, Volume 28, 1985.

\_\_\_\_\_. "Regional Networks and the Resurgence of Silicon Valley." *California Management Review* (Fall 1990): 89-112.

\_\_\_\_\_. "A Response to Richard Florida and Martin Kenney, Silicon Valley and Route 128 Won't Save Us." *California Management Review* (Spring 1991): 136-142.

The author contends that the characterization of industrial organization of the high-tech sector by Florida and Kenny is flawed. She reiterates her definition of flexible specialization as "a productive system in which coordination is achieved through shifting patterns of collaboration and joint problem solving among specialized units of production." She views competitive rivalries complementing cooperation and spurring innovation and technological advance. She contends that the crisis in Route 128 reflects problems caused by adoption of mass production practices in an environment of market instability. She concludes: "rather than proclaiming Silicon Valley and Route 128 as dead-end systems plagued by 'small size' and 'overspecialization,' we should identify the sources of their dynamism as well as their vulnerabilities."

\_\_\_\_\_. "Institutions and the Growth of Silicon Valley." *Berkeley Planning Journal* 6 (1991): 36-57.

The author suggests that Silicon Valley is best understood as an industrial district. "The enterprises which make up Silicon Valley's decentralized industrial structure are embedded in a social structure which supports a complex balance of cooperation and competition." She examines Silicon Valley historically in three periods: (a) 1950s when war has created technological and industrial infrastructure. In 1960s the importance of military spending on the economy has diminished. (b) 1970s: creation of a private institutional structure. Silicon Valley was known as the world's leading center of innovation in microelectronics. The period was characterized by high levels of inter-firm mobility and entrepreneurship promoting new firm formation and diffusion of technology and skill in the region. The region's industrial structure was characterized by extensive vertical and horizontal disaggregation. Lack of public involvement. (c) 1980s saw the intensification of international competition. Local firms responded by establishing organizational networks which formalized the informal cooperations of earlier decades. The author provides a historical account of Silicon Valley and concludes by asserting the need for institutional oversight to facilitate the formation of forums for local actors to respond jointly to shared challenges.

\_\_\_\_\_. "The Origins and Dynamics of Production Networks in Silicon Valley." *Research Policy* 20 (1991): 423-437.

\_\_\_\_\_. *Inside-Out: The Industrial Systems of Silicon Valley and Route 128*. Berkeley: Institute for Urban and Regional Development, University of California at Berkeley, IURD Working Paper No. 605, December 1993.

This is the introduction to the author's new book comparing two centers for electronics innovation: Silicon Valley and Route 128. She examines the question why Silicon Valley has adapted to changing patterns of international competition, while the Route 128 region appears to be losing its competitive edge. She argues that despite similar origins, these two regions have developed fundamentally different systems of industrial order during the postwar period. Silicon Valley is a regional network-based industrial system. Adaptation in Silicon Valley occurs through a decentralized process of experimentation. "Social networks and inter-firm production networks facilitate information exchange and mutual adjustment among horizontally linked specialist producers, fostering the pursuit of diverse technological opportunities and the creation of new markets." Route 128 region, by contrast, is dominated by a small number of relatively self-contained and integrated companies. Boundaries between firms and between firms and the external environment is more distinct, compared to the case in Silicon Valley where the boundaries are blurry. "Treating regional economies as socially embedded systems of industrial order rather than clusters of factors of production illuminates the divergent trajectories of Silicon Valley and Route 128 during the postwar period." She argues that the adaptive capacity of localized network-based forms of coordination are superior. She attempts to show the fallacy of an approach that focuses solely on market mechanisms and free flows of resources to explain industrial adjustment. She also argues that the concepts of agglomeration and external economies also cannot account for the differences of the two regions to adapt. Her explanation focuses on network structures which promote experimentation where firms engage in shifting inter-firm and inter-

industry patterns of cooperation and competition. "While the traditional vertically integrated corporation with hierarchical coordination flourished in an environment of market stability, horizontal coordination through inter-firm networks offers the flexibility and ability to respond quickly to shrinking product life cycles and accelerating technological change that have resulted from the intensification of international competition."

\_\_\_\_\_. *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Cambridge: Harvard University Press, 1994.

Schoenberger, Erica. "Some Dilemmas of Automation: Strategic and Operational Aspects of Technological Change in Production." *Economic Geography* 65(3) (July 1989): 232-247.

The author argues that the move to increased automation yields both advantages and serious disadvantages to the firm. Based on interviews with 37 manufacturing firms with extensive international activities, the author has gathered information about the nature of the production process and its evolution. The investigation has concerned manufacturing investments in high-tech industries in Western Europe in order to clarify why production would be located in a relatively high-cost area of the globe. Use of dedicated (inflexible) computer-controlled machine tools appears most prevalent among large and diversified firms. Programmable flexible automation technologies appear most likely for intermediate volumes of production. The reduction of labor content and labor cost as a share of total costs is a fundamental objective of increasing automation. Other justifications for automation are quality and consistency of output; thus, the decision to automate is not uniquely a cost-based argument. Advanced automation also reduces cycle times in production (translates to less inventory and better service, and higher quality). She notes that "advanced automation may be something of a two-edged sword, as dramatically reduced planning horizons pose new problems of effectively managing the temporal and spatial aspects of production." An important effect of advanced automation can be a substantial reduction in the area of physical plant space required to produce any given level of output which also reduces cost. Warehousing automation for example allows the firm to produce the same volume of output with half the manufacturing plant required previously. Reduced cycle times and changes in product design contributes to shrinking space requirements. She notes that reduced plant space requirements may lead to spatial concentration of industrial activity.

Scott, Allen J. *Electric Vehicle Manufacturing in Southern California: Current Developments, Future Prospects*. Los Angeles: Lewis Center for Regional Policy Studies, University of California at Los Angeles, 1993.

Scott, Allen J., and David Bergman. *Advanced Ground Transportation Equipment Manufacturing and Local Economic Development: Lessons for Southern California*. Los Angeles: Lewis Center of Regional Policy Studies, University of California at Los Angeles, Working Paper No. 8, October 1993.

Senker, Peter. "Technological Change and the Future of Work: An Approach to an Analysis." *Futures* 24(4) (May 1992): 351-363.

The author predicts that Information Technology (IT), new materials, and biotechnology are significant clusters of technologies likely to influence the future of work.

Storper, Michael, and Richard Walker. *The Capitalist Imperative: Territory, Technology and Industrial Growth*. Oxford: Basil Blackwell, 1989.

Stowksy, Jay. "Regional Histories and the Cycle of Industrial Innovation: A Review of Some Recent Literature." *Berkeley Planning Journal* 4 (1989): 114-124.

U.S. Congress. *Making Things Better: Competing in Manufacturing*. Washington, D.C.: U.S. Government Printing Office, February 1990.

U.S. Department of Energy. *1992 Department of Energy Defense Critical Technologies Plan*. Washington, D.C.: Sandia National Laboratories, 1992.

### **Keyword: technological transfer**

21st Century. "Save Our National Laboratories." *21st Century* (Winter 1993/94): editorial.

Alic, John, Lewis Branscomb, Harvey Brooks, Ashton Carter, and Gerald Epstein. *Beyond Spinoff: Military and Commercial Technologies in a Changing World*. Boston: Harvard Business School Press, 1993

Alistair Brett, David V. Gibson, and Raymond W. Smilor. *University Spin-off Companies: Economic Development, Faculty Entrepreneurs, and Technology Transfer*. Savage, MA: Littlefield Publishers, 1991.

AMTEX Partnership. *AMTEX Highlights*. Richland, WA: Pacific Northwest Laboratory, November 1993.

Aoyama, Yoko, and Manuel Castells. *Paths Toward the Informational Society: A Comparative Analysis of the Transformation of Employment Structure in the G-7 Countries, 1920-2005*. Berkeley: Berkeley Roundtable on the International Economy, BRIE Working Paper No. 61, 1993.

California Council on Science and Technology. "The Advanced Telecommunications Marketplace." Irvine: California Council on Science and Technology, Project California Insight, Special Series No. 3, June 1993.

- Chapman, Robert E., et al. *Technology-Based Economic Development: A Study of State and Federal Technical Extension Services*. Washington, D.C.: U.S. Department of Commerce, National Institute of Standards and Technology, June 1990.
- Cohn, Jeffrey. "Industrial Aid." *National Journal Government Executive* (December 1993): Agency Focus Section.
- Coll, C. F. "Opportunities for Small Business." Berkeley: Lawrence Livermore National Laboratory, University of California at Berkeley, Interdepartmental Memorandum, October 1993.
- Congressional Research Service. *Transfer of Technology from Publicly Funded Research Institutions to the Private Sector*. Washington, D.C.: U.S. Government Printing Office, 102-G, 1991.
- Council of Automotive Research. *U.S.CAR*. Dearborn, MI: Medin Information, April 1993.
- Davis, James, and Ralph Jacobs. *A Rational Role for DOE National Defense Laboratories*. Livermore: Lawrence Livermore National Laboratory, University of California at Berkeley, July 1993.
- Dean, Burton V., and Joseph J. Giglierano. "Multistage Financing of Technical Start-up Companies in Silicon Valley." *Journal of Business Venturing* 5 (1990): 375-389.  
Based on interviews of a sample of venture capitalists and entrepreneurs in Silicon Valley, the authors explore the following questions: (1) how are subsequent rounds of investment considered and made by venture capitalists; (2) what problems occur in the entrepreneur's search for subsequent funding. They conclude that venture capital firms reduce the risk associated with funding young companies by showing preferences for certain stages of financing, or for funding single versus multiple-round investments.
- Dewitt, Philip Elmer. "Don't Tread on My Lab." *Time* 143(4) (24 January 1994): 44.
- Dyer, T. M. *SNLL East Bay Conversion & Reinvestment Commission*. Livermore: November 1993.
- Engelking, Susan. "Brains and Jobs: The Role of Universities in Economic Development and Industrial Recruitment." *Economic Development Review* 18 (Winter 1992): 36.
- Fawcett, Sherwood, Hilliard Paige, and David Acheson. *Transfers of Technology to Industry from the U.S. Department of Energy Defense Programs Laboratories*. Washington, D.C.: Atlantic Council of the United States, Policy Paper Series, July 1992.
- Fisher, G., and C. Pitcock. *Small Business Technology Transfer Program*. Livermore: Lawrence Livermore National Laboratory, September 1993.
- Flaming, Daniel, and Elizabeth Reid. "Technology Commercialization." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*, Los Angeles: Economic Roundtable, 1992.  
By noting that the large defense firms are not easily able to convert their technology and manufacturing resources to commercial projects, the authors emphasize the pivotal role the public sector can play in stimulating technology commercialization. They identify obstacles that constrain aerospace industrial diversification of defense firms: (1) defense-oriented firms have high overhead costs due to their organizational structure tailored to be responsive to DOD; (2) DOD and NASA requirements have led defense firms to engineer and build their products to very high standards, making their products expensive; (3) most large defense firms have very little familiarity with commercial markets; (4) Their orientation toward high engineering costs and small production volume makes it difficult for them to be cost-competitive in commercial markets; (5) due to their operation under the control of DOD, large defense firms have developed an organizational culture unsuited for risk-taking and initiative required to compete in commercial markets.
- Gibson, David. "Key Variable in Technology Transfer: A Field Study Based on Empirical Analysis." *Journal of Engineering and Technology Management* 8(3) (December 1991): 287.
- Hughes, David. "Technology Transfer Now A Top Priority." *Aviation Week & Space Technology* 134(14) (8 November 1993): 40.
- Jaffe, Adam. "Geographical Localization of Knowledge Spillovers as Evidenced by Patent Citations." Cambridge: National Bureau of Economic Research, Working Paper No. 3993, February 1992.
- Kendrick, John. "NASA's Technology Transfer Helps Industry Technically and Monetarily." *Quality* 34 (September 1993): 13.
- McKenney, Bruce. *National Benefits from National Labs: Meeting Tomorrow's National Needs*. Washington, D.C.: Center for Strategic and International Studies, 1993.
- Morton, John F. "The Magic Art of Commercialization." *Technology Transfer Business* (Spring 1993): 7-10.
- Ols, John. "Technological Transfer: Federal Efforts to Enhance the Competitiveness of Small Manufacturers." *Economic Development Review* 18 (Winter 1992): 86.

- Parker, Douglas, and David Zilberman. "University Technology Transfers: Impacts on Local and U.S. Economies." *Contemporary Policy Issues* 11(2) (April 1993): 87.
- Roessner, David. "What Companies Really Want From the Federal Labs." *Chemtech* 23(11) (November 1993): 12-15.
- Standard & Poors. "Telecommunications: Current Analysis." *Standard & Poors Industrial Surveys* 161(30)1 (July 1993).
- U.S. Congress, Office of Technology Transfer. *Contributions of DOE Weapons Labs and NIST to Semi Conductor Technologies*. Washington, D.C.: U.S. Government Printing Office, OTA-ITE-598, September 1993.
- U.S. Department of Energy. *Changes and Challenges at the Department of Energy Laboratories*. Washington, D.C.: U.S. Department of Energy, Laboratory Missions Priority Team, 1993.
- \_\_\_\_\_. *Technology Transfer: 92/93*. Washington, D.C.: U.S. Department of Energy, January 1993.
- Waslter, John, and David Bellshaw. *Survey to Determine the Value of DYNA*. Livermore: Lawrence Livermore National Laboratories, January 1993.
- Wierengo, Danielle E., and Everett M. Rogers. *Linking National Laboratories to Regionally-Based Economic Development Through Cooperative Research and Development Agreements*. Albuquerque: Department of Communications & Journalism, University of New Mexico, 1993.
- Shafroth, Morrison. "Biotech: The Bay Area's Baby Booms." *San Francisco Business* (May 1992): 12.

**Keyword: U.S. impacts**

Committee for Economic Development. *The Economy and National Defense: Adjusting to Military Cutbacks in the Postwar Era*. New York: Research and Policy Committee, Committee for Economic Development, 1990. Argues that nationwide, the impact of defense cuts will not be large on the economy and that the entire savings from cuts should be used for defense reduction. Also advocates phasing of cuts if necessary and some federal spending to smooth the impact of reductions on regions significantly affected by cuts and on individuals who lack transferable skills.

Congressional Budget Office. *The Economic Effects of Reduced Defense Spending*. Washington, D.C.: U.S. Government Printing Office, February 1992.

This is an evaluation of the impacts of the defense cuts proposed in 1991 on U.S. economic growth in the short term and longer term. The authors find that over the long term, reduced defense spending would increase GNP permanently by about 0.6 percent annually, assuming the savings is used for deficit reduction or increased investment. In the first few years, however, the cuts would have a depressing effect on the economy, cutting real GNP perhaps as much as 0.7 percent in the mid-1990s from the level it would otherwise reach. If the cuts are used to fund increased consumption, the short-term impacts would be less severe, but the long-term gains would also be much less. States with large shares of the DoD budget include California, Texas, Virginia, Florida, New York, Washington, Pennsylvania, Massachusetts, Maryland, and Georgia; states whose economies depend heavily on defense spending also include Alaska, Hawaii, and Mississippi. Nevertheless, they forecast that 42 of the 50 states (including California) would experience reductions of output of less than 1 percent. The report examines three cutback cases in detail, affecting Monterey County, California; Maine's south coast; and St. Louis, Missouri. They conclude that the impacts on communities could be severe, but could be either mitigated at least in part by phasing or prolonged by adjustments problems. Long-term recovery is most likely in diversified areas.

Defense Conversion Commission. *Adjusting to the Drawdown: Report of the Defense Conversion Commission*. Washington, D.C.: U.S. Government Printing Office, GPO No. 306, December 1992.

Conducted for DoD at the behest of Congress, this study is mostly sanguine about the effects of defense cutbacks, although it does not focus primarily on the regional effects. Contains pretty extensive data and figures on defense spending, reductions, and employment. Modelling suggests an increase in the unemployment rate of up to 0.5 percent nationally and a reduction in GDP growth of between 0.25 percent and 0.50 percent per year. Defense industry policies and programs (existing and potential) are surveyed in Chapter 3. Various objectives are considered: maintaining a viable defense industrial base, stimulating technology development and use, ameliorating the hardships of cutbacks. Subsequent chapters address local impact and identify "at-risk" communities, and labor force conversion programs.

Kosiak, Steven, and Richard A. Bitzinger. *Potential Impact of Defense Spending Reductions on the Defense Related Labor Force By State*. Washington, D.C.: Defense Budget Project, May 1993.

This paper estimates the active military civilian Department of Defense and private-sector defense industry job losses resulting from falling defense budgets at the national and state level. This report also demonstrates how an economy's dependence on defense spending can influence the severity of labor force impacts. Sustained reductions in future defense budgets and rising concern over the cost of defense-related economic adjustment are fueling interest in the effect of defense spending reductions on U.S. employment. This paper estimates the active military, civilian, Department of Defense, and private-sector defense industry job losses resulting from falling



defense budgets at the national and state level. The heaviest labor force impacts as a share of state employment would occur in eight states (including) California.

Saunders, Norman C. "Employment Effects of the Rise and Fall in Defense Spending." *Monthly Labor Review* (April 1993): 3-10.

In this article, the author shows that the proposed defense spending cutbacks lead to a reduced supply of jobs in both the public and private sectors of the economy (10 pages, with tables).

Schmidt, Conrad Peter, and Steven Kosiak. *Potential Impact of Defense Spending Reductions on the Defense Industrial Labor Force by State*. Washington, D.C.: Defense Budget Project, March 1992.

Shama, Avraham. "The Price of Peace -- The Economic Impact of Reduced Defense Spending: National, State and Industry Strategies." Unpublished manuscript, Anderson School of Management, University of New Mexico, June 1992.

The paper provides baseline data on defense spending and employment by state, analyzes the economic impact of (Bush era) proposed cuts and of cuts twice that size on state economies, and outlines strategies for adapting to these impacts. Interestingly, California is not on the list of the ten areas expected to be most heavily hit by defense cuts (in terms of *relative* impacts on the state's economy). The alternative response strategies are briefly outlined but are not evaluated.

U.S. Congress, Office of Technology Assessment. *After the Cold War: Living With Lower Defense Spending*. Washington, D.C.: U.S. Government Printing Office, February 1992.

U.S. Department of Defense. *Distribution of Personnel by State and by Selected Locations*. Washington, D.C.: U.S. Department of Defense, DIOR, September 1991.

Whitehead, David. "FYI: The Impact of Private-Sector Defense Cuts on Regions of the United States." *Economic Review* Federal Reserve Bank of Atlanta 76(2) (March/April 1991): 30-41.

Wingrove, Earl R. III, Donna J. S. Peterson, and Scott E. Dahne. *Impacts of Defense Spending Cuts on Industrial Sectors, Occupational Groups, and Localities (Annex F)*. Bethesda: Logistics Management Institute, LMI Report D.C.201R2, January 1993.

Applies the Defense Economic Impact Modelling System (input-output model) to find where the burden of defense cutbacks will fall. Missiles, tanks, ordnance, ships, railroad equipment, search and navigation, and communication equipment are all heavily reliant on defense spending. Five states -- CT, VA, MA, Miss, CA -- will lose more than 1.5 percent of non-agricultural employment. Nationwide, the top 20 counties received 43 percent of prime contracts; four of these are in California. The majority of job losses will come in "precision production" categories, followed by "professional specialty." Extensive appendices contain data on prime contracts by county, SIC, etc.

**Keyword: workforce**

Atkin, Jerry, Barry Chersky, and Lee Schore. *Starting Over: A Survival Guide for Laid-Off Workers*. Oakland: Center for Working Life, 1990.

Bastress, Fran. *The Relocating Spouse's Guide to Employment*. Chevy Chase: Woodley Publications, 1989.

Bischak, Greg, Frank Emspak, Miriam Pemberton, and Jim Raffel. *Defense Industry Conversion: Strategies for Job Redevelopment*. Madison: School for Workers, Continuing Education Extension, University of Wisconsin Extension, 1993.

A valuable resource providing information on economic conversion, with particularly good information on worker training and economic development programs.

Campbell, Scott. "Interregional Migration of Defense Scientists and Engineers to the Gunbelt During the 1980s." *Economic Geography* 69(2) (April 1993): 204-223.

The study uses data from the Survey of Social Scientists and Engineers from 1982-1989 to track migration patterns among regions of the skilled professional defense labor force. Campbell argues that the buildup of defense centers is a cumulative process, of which migration following jobs is one part (jobs also are attracted to skilled areas, and spending attracted by existing installations and by boosterism). Campbell examines both the geographic distribution of defense scientists and their migration patterns. He finds that areas with high concentrations of defense scientists often have low concentrations of scientists in other fields. The mismatch between defense and nondefense scientists suggests that defense contracts were not following a skilled labor force, but that they created new centers of industrial technology. (Alternatively, defense-related demands may have squeezed nondefense-related work out of the area.) Campbell finds that DoD-funded scientists are more likely to have moved (among regions) in obtaining their first job, but less mobile than other scientists in later years, perhaps reflecting greater stability of funding for defense professionals. The Pacific region had net inflows of scientists and engineers from the East North Central, Middle Atlantic, East South Central, and West South Central regions from 1982 to 1989, parallel flows with the Mountain region, and a net outflow to the South Atlantic region. Campbell found an asymmetrical relationship between migration into and out of the Gunbelt of defense scientists. A "ratchet" effect seemed to

exist where scientists shifting to DoD funding were more likely to move to the Gunbelt, those retaining DoD funding were very likely to stay in the Gunbelt, and those shifting away from DoD funding were no more likely than other scientists to leave the Gunbelt. The concentration of movement of defense scientists prior to their first job suggests that a drain is occurring from the industrial heartland to defense industry concentrations. However, Campbell also found that many defense scientists were trained in the Gunbelt. Women and blacks migrated to the Gunbelt more frequently than others, and Asians were already highly concentrated in the Gunbelt. The most highly educated scientists were also the most mobile, whether moving into or out of the Gunbelt. Campbell concludes by pointing out that the "ratchet" effect will not necessarily hold in periods of austerity.

Dubinsky, Odessa. "Reemployment Opportunities and Needs in the Aerospace High Technology Industry Complex." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*, Los Angeles: Economic Roundtable, 1992.

Workers now losing jobs in aerospace have better education, broader competencies, and more intensive training than in previous lay-offs.

Ellis, Mark, Richard Barff, and Ann R. Markusen. "Defense Spending and Interregional Labor Migration." *Economic Geography* 69(2) (April 1993): 182-203.

The paper analyzes location and migration patterns of defense-related workers in the United States. The authors argue that the buildup of defense concentrations has had a significant effect on labor migration in the U.S., and that the skilled defense workforce (especially professionals) has moved to the locations of defense employment, rather than the firms seeking concentrations of skilled labor. Earlier research has shown that defense spending (base assignments and recruiting for defense contractors) has been a significant influence on interregional migration, and that workers tend to stay in their new region upon termination of employment. The geographic shift of defense contracts relates to the changing weapons requirements of the military in the Cold War period that was accompanied by a shifting focus from economies of scale and cost minimization to quality and performance characteristics. The labor pools that formed around the new industrial concentrations were highly technically skilled. Using a detailed sample from the 1980 Census, the authors test for differences in migration propensities, distance migrated, and destinations chosen, in the context of the geographic incidence of defense spending. The study found that in the 1975-1980 period, scientists and engineers, overall, were more likely to move than other types of workers, but that those in defense-dependent occupations were *less* likely to move than other scientists and engineers. Workers in occupations most closely tied to defense spending tended to move further than other workers. The amount of migration among defense workers was the highest to areas where defense spending had increased. The effect was apparent both for scientists and engineers and for blue collar workers in occupations highly dependent on defense spending, although blue collar workers overall have a lower propensity to move. In concluding, the authors hypothesize that many of these workers will stay in defense areas, even as spending is cut, possibly forming the basis for entrepreneurial efforts involving new markets and industries.

Flaming, Daniel. "Aerospace Workers and the Job Training System." In *Los Angeles County Economic Adjustment Strategy for Defense Reductions*, Los Angeles: Economic Roundtable, 1992.

Thirty-eight percent of laid-off aerospace workers need retraining to find new jobs. Sixty-six percent of those workers needing retraining require 6-18 months of training to obtain jobs at skill levels comparable to their old jobs. The author concludes that the Job Training Partnership Act (JTPA) is not meeting the needs of the laid-off aerospace workers.

Henderson, Yolanda K. "Defense Cutbacks and the New England Economy." *New England Economic Review* (July/August 1990): 3-24.

Kane, Matt, and Paula Duggan. *Dislocated Workers: Coping with Competition and Conversion*. Washington, D.C.: Northeast-Midwest Institute, 1991.

Law, Robin M., Jennifer R. Wolch, and Lois Takahashi. *The Future of Technopolis: Militarized Industrial Spaces in Southern California*. Los Angeles: Los Angeles Homelessness Project, Working Paper No. 31, Department of Geography, University of Southern California, 1991.

In this paper, the location and labor force characteristics of a sample of technopoles linked to Southern California's defense sector are investigated. Particular emphasis is placed on the potential of defense workers for reintegration into the nondefense economy. The spatial labor markets of these technopoles are documented. The distribution and characteristics of defense-dependent communities are traced. Findings suggest that like their predecessors, the decline of new industrial districts is likely to impose profound impacts on local workers, urban communities, and the region as a whole.

Mangum, Stephen, and David Ball. "The Transferability of Military-Provided Occupational Training in the Post Draft Era." *Industrial and Labor Relations Review* 42(2) (January 1989): 230-245.

This is the publication of the New York State School of Industrial & Labor Relations at Cornell Univ., Ithaca, NY.

Mueller, Elizabeth J., et al. *Retraining for What? Displaced Defense Workers Come Up Against EDWAA.*

Piscataway: Center for Urban Policy Research, Project on Regional and Industrial Economics, State University of New Jersey, Working Paper No. 57, September 1993.

The paper is a case study of the experience of 650 displaced workers from a defense contractor (Unisys, a producer of personal computers for the airforce) in trying to make use of the Department of Labor's Economic Dislocation and Worker Adjustment Assistance (EDWAA) program and the Trade Adjustment Assistance (TAA) program. Problems reported range from identifying and accessing the proper sources of assistance funds to finding an effective way to use funds to help displaced workers. Researchers reported both inadequate levels of funding for the EDWAA program and poor quality of assistance from the better funded TAA program, as well as inappropriate limits on the types of services offered by TAA. Once identified, training programs (for low-wage, entry-level positions) were often a poor fit for the characteristics of the displaced workers (older, with manufacturing experience). Eventually, the Unisys workers developed a strategy to link themselves and their funding, to expanding or start-up firms. Nevertheless, nearly three-fourths of the displaced workers remained unemployed one-and-one-half years after losing their jobs, and half of the reemployed workers took jobs paying lower wages. The report ends with recommendations on improving response times and linking worker retraining to job development.

Nyman, Keith O. *Re-Entry: Turning Military Experience into Civilian Success.* Harrisonburg: Stackpole Books, 1990.

Ong, Paul M., and Janette R. Lawrence. *The Unemployment Crisis in Aerospace.* Los Angeles: Graduate School of Architecture and Urban Planning, University of California at Los Angeles, June 1993.

This paper describes job losses in aerospace in California, the impacts on total employment and income, and the reemployment experience of workers. The authors emphasize that job loss effects from aerospace are particularly high because the related industries have among the highest paid workers in the state. They estimate that job losses in the industry are responsible for direct earning losses of \$5.1 billion annually, with an additional ripple effect of at least \$4 billion. The analysis of worker impacts is based on samples of data from unemployment insurance administrative files for 1989 (full year) and 1992 (second quarter). The authors found that layoffs were higher (relative to distribution of jobs) among blue collar workers than among engineers, but that the number of layoffs of engineers rose in the later period. Blacks were heavily overrepresented in the earlier period, while both blacks and Latinos were somewhat overrepresented in the 1992 period. Of the 1992 group, approximately one-third were unemployed at least six months after first receiving benefits. Long-term unemployment was highest for workers 55 and older, especially engineers, scientists, and managers. Of laidoff workers in 1989, only 17 percent were reemployed in aerospace in 1992. These workers maintained earnings close to their previous level. Of the remaining workers, only 36 percent were employed in 1992-2, and these workers were earning 33 percent less than in their previous jobs. Engineers and scientists were *less likely* to be reemployed in aerospace than blue collar workers and were more likely to be off the California UI records entirely by 1992. Bay Area workers had the lowest levels of reemployment in aerospace but the highest shares of reemployment in other industries, while the opposite was true for the north Los Angeles County area. Very few workers 55 and older were reemployed in any sector in 1992, while 78 percent were off the UI records entirely. The authors emphasize that downward mobility is occurring not only for aerospace workers but in the California economy more broadly, as high-wage industries are replaced by lower-wage industries. The authors urge a response strategy that looks at the broader context of education and training programs and that links economic development to reemployment of displaced workers.

—. *Time of Crisis: Unemployment in Aerospace Industry.* Los Angeles: Graduate School of Urban Planning, University of California at Los Angeles, 1993.

Rothstein, Lawrence E. "Labor-Management Relations." *Society* 30(4) (May/June 1993): 12.

Silver, Hilary. "The Demand for Homework: Evidence from the U.S. Census." In *Homework: Historical and Contemporary Perspectives on Paid Labor at Home*, Eileen Boris and Cynthia R. Daniels, eds., Urbana: University of Illinois Press, 1989.

U.S. Department of Defense, Base Realignment & Closure Commission. *Retirement Near Air Force Installations.* Washington, D.C.: U.S. Department of Defense, Base Realignment & Closure Commission, January 1989.

Wolch, Jennifer R., Robin Law, and Lois Takahashi. *Defense Industries, Workers, and Communities in Los Angeles County.* Los Angeles: Los Angeles Homelessness Project, Department of Geography, University of Southern California, Working Paper No. 28, 1990.

This report examines the effect on the community of defense industry layoffs in L.A. County. According to this study, the average defense worker is an older, white, married male. The average defense worker was more affluent, better educated, and more likely to be in medium- or high-skill occupations. They also tended to be more generously remunerated than county workers in similar occupations employed outside of the defense sector. The impact of defense worker layoffs will impact L.A. County in several ways: loss of local government revenues, small business failures due to shrinking expenditures by laid-off workers, defense subcontractor firm losses, and loss of low-skill/wage positions in retail and services.