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### Authors
Markusen, Ann R.
Clark, Garrette
Curtis, Charmaine
et al.

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# MILITARY SPENDING AND URBAN DEVELOPMENT IN CALIFORNIA

Ann R. Markusen* with
Garrette Clark, Charmaine Curtis, Sabina Deitrick,
Gary Fields, Anne Henny, Eric Ingersoll,
Jeff Levin, Wendy Patton, Jean Ross, and Judy Schneider

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## Overview

One aspect of the current military buildup which has been largely ignored in the controversy over recomposition of the federal budget is its differential effect on communities. Several studies have contended that at the regional level, defense spending is heavily skewed toward sunbelt locations and that only a small number of metropolitan areas, such as Washington, D.C., St. Louis, San Diego, Newport News, Norfolk, Dallas, Hartford, San Antonia and San Jose will receive substantial benefits.[1] In this report, we investigate the ways in which defense spending shapes community growth patterns. Our investigation goes beyond aggregate allocations of defense dollars and direct job creation to look at questions of longer term urban development. We present some conclusions about why defense-related manufacturing and research has chosen to locate where it has and to what extent it has drawn its own labor pool around it. We show that different types of defense-related production exhibit different degrees of volatility in growth patterns

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[1] The most popular of these accounts are Anderson (1982) and Anderson (1983); but these use a somewhat problematic methodology in arriving at their conclusions. See the discussion in Markusen, 1984. She argues that it is more correct to think of the buildup as boosting the fortunes of the "defense perimeter", a series of medium-sized cities and suburban areas from New England through Florida and Texas to California and Seattle.

and of successful diversification of the local economy. We have charted the varieties of occupational, race and gender structure which accompany military dependency. Finally, we include several tentative observations on the ways in which which community culture and politics seem to be shaped by the prominence of military-oriented production.

We chose to concentrate on California and on a number of case studies of California communities. We did so because California is the largest industrial state in the country, one which has been heavily indebted to military-related production for its growth stimulus, especially since World War I. It is also at our doorstep. The second section of the study summarizes the importance of military spending to the California economy and the third compares the findings from the case studies on a number of important issues. Following that is a section on the relationship between defense spending and migration to California in the postwar period; it argues that the commitment to military-related production does seem to have been a very strong factor in the recruitment and relocation of population from other parts of the U. S. to California.

The rest of the report combines the results of four case studies of California defense-related communities. The fifth section is a study of Vallejo, a blue collar community dominated by a naval shipyard of venerable vintage. The sixth presents a study of Los Angeles county, a core but youthful metropolitan area whose unique economy and spatial structure owe much to the aerospace industry. The seventh section covers the famous Silicon Valley, a diversified high tech sector with military-based antecedents and a considerable ongoing attachment to defense con-

tracts. The final section contains a case study of Livermore, the home of a highly specialized nuclear weapons laboratory owned by the federal government and operated by the University of California.

## I. Defense Dependency in California

The California economy, with its diversified manufacturing base, is relatively defense-dependent. California received 19.3 percent of total Department of Defense obligations to fund military contracts in 1980. Unlike other areas of the sunbelt, whose defense dollars go largely for bases and personnel, California's receipts are heavily skewed toward the procurement end; while California does reap 14.8% of DOD payroll obligations, it accounts for 25% of the nation's shipments of defense-oriented industries. Almost 9% of California manufacturing employment in 1978 was working on military projects, before the current buildup started (Parzen, 1982: ii). These figures understate the true proportions of arms-related production in California because they do not include the nuclear warhead and waste activities of the Department of Energy, the defense-related activities of the National Aeronautical and Space Administration, and foreign arms sales. In addition, California garners a disproportionate share of subcontracts (Rees, 1982). An earlier study of the California economy concluded that 40% of all state-wide employment could be directly or indirectly attributed to defense (Tiebout, 1966: 127-31).

Under the Reagan buildup and accompanying promotion of arms sales abroad, the level of defense-related activity will rise dramatically in the state. The Reagan administration anticipates spending $ 81 billion more in the military category by 1986 than Carter slated for 1981;

California will receive $ 13 billion in additional defense funds through 1986. The buildup has been almost exclusively in the "investment accounts" category, which consists of weapons procurement, base construction, and R & D. Because of its leadership, therefore, in sectors like communication equipment, missiles, aircraft, electronics, computers and semiconductors, California will receive an even larger share than in the past. For instance, California's share of ordnance and missiles contracts will be 41% of the country's total. By 1986, some 670,000 jobs will most likely be created by this increment in military spending (Parzen, 1982: ii-iii).

This job gain not cannot be viewed in isolation. A study by the Office of Economic Policy, Planning and Research in 1982 showed that California will actually be a net job loser under Reagan, because the elimination of jobs due to social services cuts proposed by Reagan outweighs these defense-related gains (Parzen, 1982: 38-46). In other words, the Reagan budget reshuffling dramatically shifts jobs away from some sectors and occupations in the California economy towards others, with considerable and perhaps permanent displacement in the process.

In general, this is a shift toward white male professional labor. The occupations of engineering and technical labor will benefit most; 19% of aerospace employees are engineers, for instance, compared to 8% for all manufacturing. The demand for engineers hits a segment of the workforce which already enjoys relatively low unemployment rates. The result is likely to be inflation of salaries among this strata and high rates of immigration. The OEPPR study demonstrated that 11,500 new electrical engineering graduates would be produced in California univer-

sities between 1981 and 1986, but the demand from increased military spending alone would be for 12,700. Recruitment of this type of labor will put even greater pressure on housing prices in those areas where high tech military production is located.

## II. Urban Growth Dynamics

The allocation of defense contracts is highly concentrated with the state of California. In terms of shipments of defense-oriented industries, Los Angeles County accounts for about 32%, San Diego for 13%, Santa Clara for 12%, Orange County 8%, Sacramento 5%, Alameda 4%, San Bernardino 3% and Solano and San Francisco Counties 3% each (see Ross and Fields below). In addition the composition of the production associated with each area varies dramatically. In order to investigate the ways in which military-related production affects specific communities, we chose a set of four diverse communities, each with a different type of military-related production: Vallejo, Los Angeles, Silicon Valley and Livermore. All were situated within counties with relatively important shares of defense production - in counties ranking 1st, 3rd, 6th and 7th on the list just cited. Our basic intention was to compare a number of features of the workforce and culture of each with those of California as a whole as well as with each other.

To begin with, each community has distinctive form of military-related activity hosted. Vallejo, with the longest history of defense-related activity, harbors a large naval shipyard which once was the site of considerable shipbuilding activity but now operates primarily as a repair and outfitting platform. The facility is government-owned and government-operated (GOGO). Shipbuilding and repair as an activity is

much more heavily dependent upon blue collar, less skilled labor than most other forms of defense-oriented manufacturing.[2]

Los Angeles County is a large metropolitan core area whose rapid growth, while initiated in the late 19th century, received tremendous impetus from military-related activity in both World Wars. Its hallmark is aerospace - that complex set of sectors which began with aircraft and drew around it machinery, communications, electronics and more recently, missiles. Its workforce is relatively mixed - large proportions of engineering labor but substantial numbers of skilled blue collar workers as well, much of which successfully unionized, at least in the assembly end of the industry.

Silicon Valley, coterminous with Santa Clara Valley and the San Jose SMSA, is a more recent growth area. Its widely-envied successes in electronics and computers were heavily dependent at the outset upon military subsidies for research, development and procurement, and the fascination with their recent commercial applications has obscured the continued role of government sponsorship in their evolution.[3] Unlike Los Angeles, Silicon Valley has relatively few skilled blue collar workers, with larger proportions of both engineering and scientific personnel and low skilled assembly labor. Unionization rates are very low, partly

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[2] A recent paper by Markusen (1984) shows that almost all heavily defense- dependent manufacturing sectors are high tech, defined as a larger than average proportion of scientific and technical personnel. Shipbuilding was one of the few sectors not falling within the high tech category.

[3] For instance, in an excellent assessment of the future of the California economy, Teitz (1984) does not mention the past and present role of military demand in stimulating high tech growth. For a critical view of military spending as an implicit industrial policy, see Markusen, 1984.

because the production of semiconductors and computer peripherals is much more mobile than aircraft assembly and has already been shifted abroad or to right-to-work states.

Livermore is perhaps the most youthful of our communities, almost entirely a postwar growth phenomenon and the only one whose growth rate may be if anything accelerating. Its labor force is dominated by the Lawrence Livermore and Sandia National Labs, both of which are engaged in nuclear-related activities owned by the federal government (Department of Energy) and run by the University of California (therefore a government-owned, contractor-operated facility - GOCO). Lab employment is heavily skewed toward very highly educated engineers and physicists, although a fair number of technicians and clerical workers are also employed.

Each of these communities, of course, is not detached from larger urban conurbations. We pondered whether we could draw definitive conclusions about each by comparing military-related employment structures with characteristics of the resident populations. This would be particularly problematic if we thought that there were heavy rates of cross-commuting, so that people who live in the are do not necessarily work there and vice-versa. We concluded that this was not a major problem in three of our cases. It is more problematic in the case of Livermore, which increasingly acts as a bedroom community for other East Bay employment centers. The reader should keep in mind that we are assuming that the characteristics of resident populations can be explained primarily by the structure of jobs available within the same jurisdiction.

A. Location Decisions and Community Formation

In each of our cases, the basis for the original decision to locate the military-related activity in the area consisted of one or several unique attributes of the place. Availability of extensive, inexpensive land seems to have been important in the cases of Los Angeles and Silicon Valley. The attractiveness of a specific site was important in the founding of the Mare Island Naval Shipyard. A location decision for a prior military use - in this case a Naval Air Station - played a key role in the siting of the Livermore labs; availability of extensive land thus played an indirect role.

While all of the activities are heavily labor-intensive, none can be said to have been attracted solely by an existing skilled labor force. All recruited and drew a pool of labor around them over the years, particularly during wartime military buildups. The initial relocation of the airframe industry away from the northeast in the 1930s was made possible by the pre-existence of a skilled labor force, but over the longer term the industry assembled a large migratory labor pool around itself on the outer edges of Los Angeles county. Military-related sectors may have been aided in their recruiting by the ability to pass on recruitment and moving costs to the Department of Defense and/or to draw upon service personnel retiring from military bases in the nearby area (see Deitrick below).

Entrepreneurship also explains the specific locations of some industries. Ernest Lawrence, a University of California physicist, Frederick Terman, Jr., a Stanford Dean of Engineering, and Donald Douglas, a Los Angeles aeronautical engineer, all were pivotal in locating defense-oriented facilities nearby their home bases.

B. Sensitivity to Cycles in Military Spending

Each of our communities displayed different degrees of sensitivity to postwar cycles in military spending. Vallejo showed the greatest vulnerability to wartime booms and peacetime busts (see Schneider and Patton, Figure 4 below). Livermore Labs lost a substantial number of jobs during the years of detente, SALT and a relative decline in U.S. nuclear weapons programs, and did not regain Vietnam-era employment levels until the late 1970s. Los Angeles County suffered a dramatic increase in its unemployment rate, far above that for the nation, as a result of the post-Vietnam military cutbacks, and its unemployment rate fluctuated more than that of the state of California as a whole. Los Angeles' unemployment rate only dipped below the national rate again in 1979, at the beginning of the present military build-up, for the first time since 1964. Only Silicon Valley, where dramatic breakthroughs in commercial electronics generated continuously high rates of job growth, has the local economy appeared to be relatively immune from changes in defense policy.

C. Diversification vs. Defense Dependency

Vulnerability on the part of a local economy to changes in national political sentiment or international bellicosity is a sign of lack of industrial diversity. Military dependency is greatest when local sectors relying upon defense dollars do not spawn related activities which will help to carry the local economy in times if shrinking military outlays. Our communities exhibited differential degrees of successful diversification. In Livermore, the Lab has not generated a single identifiable related manufacturing establishment (see Levin below). In

Vallejo, despite a long presence, the Naval Shipyards have not attracted any related economic base sectors; indeed, manufacturing in the county accounts for 44% less of total employment than it does in the state overall (see Schneider and Patton: 5, below).

Los Angeles County and Silicon Valley, on the other hand, do seem to be diversified enough to weather periodic changes in military/non-military priorities. Yet they represent two very different types of diversification. Los Angeles is diversified more narrowly, because its more youthful sectors remain very tied to military demand. For instance, the TV and radio communications equipment sector sells 58% of its output to the Department of Defense (and surely additional amounts to NASA), a higher ratio even than the aircraft and missile equipment sectors (41%).[4] The electronics industry in Los Angeles and Orange Counties is Heavily dependent upon defense sales. Yet the longstanding presence of defense commitments has promoted the growth of the financial and business services sectors in Los Angeles, which has helped the area become more like a major metropolitan center than it was prior to World War II.

In Silicon Valley, the sectors present are fewer in number. Because of the significance of electronics and computers in the County, as well as aerospace and ordnance, about 40% of the area's workforce is in manufacturing, almost double that of the nation. But internally, these "high tech" sectors have managed to pioneer products and create markets for nondefense applications which their aerospace counterparts

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[4] Henry, 1985. These ratios will rise by 1987, with the Reagan build-up, to 63% and 44% respectively. Complete missiles, a Los Angeles specialty, will sell 79% of their output to DOD in 1987.

in Los Angeles have not managed (see Clark, Curtis, Henny and Ingersoll, Figures 2 and 3, below). Thus they are diversified in a different way - capable of turning to commercial clients when the military demand wanes. (This may be more true at the countywide level than for individual firms, who often find it difficult to serve both masters at once.) As a result, Silicon Valley has enjoyed a unique self-propelled form of growth because of its critical role as chief beneficiary of the semiconductor and computer revolutions.[5] Nevertheless, recently controversy has arisen within the Valley over the Reagan buildup. Commercially-oriented firms in the throes of national and international competition find themselves raided by defense-flushed contractors willing to bid away scarce engineering and management talent.

In all of our cases, then, military spending has been and remains a catalyst form growth. But that growth is not necessarily long-term, diversifying, nor self-sustaining. Furthermore, given the OEPPR study cited above, it is likely that nonmilitary spending would have created more jobs in the local economies involved in the short term and might produce a more "normal" pattern of economic evolution in the long run.

## III. Community Structure

Generally in the U. S. we think of diversified urban economies as supporting racially and ethnically diverse, multi-class cities with a lively cosmopolitan culture and embattled local politics. Here again, our communities provided interesting contrasts across the set. In terms

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[5] See Markusen, 1984, for evidence that the semiconductor and computer industries in California managed not only to growing absolutely in the 1960s and 1970s, but actually increased their shares of employment nationally, at least up through 1977.

of class structure, for instance, a community like Vallejo is much more working class, with a liberal sprinkling of blue collar institutions like bars, than Livermore, which is heavily professional/ technical in its class structure, and offers greater opportunities for cultural activities such as theatre and the Arts.[6] Vallejo is conspicuously below the state average for shares of professional, technical and managerial workers - it houses 15% more blue collar workers, 31% more service workers, and 32% fewer managers and administrators than California overall. In contrast, Livermore has extraordinarily high proportions of professional and technical workers. Silicon Valley displays a relatively bifurcated class structure, with an elite of professional/technical labor well represented (and living along the western edge of the Valley) and large segments of minority, especially Latino and Filipino, workers (largely located along the eastern edge of the Valley). Skilled blue collar workers are relatively underrepresented in the Valley. Los Angeles County, because of the largely unconnected apparel and entertainment industries, displays a much more diversified class structure than any of the other communities.

The role of women and minorities in defense-oriented communities is also variegated. Vallejo and Los Angeles have afforded blacks, in particular, greater opportunities for work than the other two areas. In large part, this is the legacy of massive recruitment campaigns during World War II for blue collar workers. In Los Angeles aerospace, blacks are found in proportions higher than their presence in the areawide workforce. In Vallejo, blacks account for 19% of the population,

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[6] More colorfully, the researchers involved compared notes on Bud's Bar vs. Brecht.

compared to 8% statewide. But in both places, black men are favored over black women; in Vallejo, black women have endured both lower than average labor force participation rates and higher unemployment rates. Livermore has not attracted black residents - its black population is a miniscule 1%. Blacks are also underrepresented in Silicon Valley, where they form 3.4% of the population.

Hispanics have generally not shared in the largesse of defense-generated jobs. Especially in Los Angeles, where they form a large portion of the workforce, their participation in the aerospace industry is markedly below that of other groups. Within the County, defense dollars are spatially concentrated far from the largest Hispanic communities. Silicon Valley offers relatively greater job opportunities for Hispanics, but these jobs are largely in the low-paid activities of assembly of nonmilitary products, rather than in the defense plants directly. Livermore also has an Hispanic population which is heavily concentrated in blue-collar occupations and which confronts higher unemployment and poverty rates than does the white population.

The impact of defense spending on women in these communities is also mixed. In both Los Angeles and Livermore, women are more apt to participate in the labor force than is true statewide. In Vallejo, stable blue collar incomes for men appear to have retarded the labor force participation of women, although over time, their rates are converging with those of women in other parts of the state. But the evidence is clear that women do not participate equally in the jobs created by defense work. In aerospace in Los Angeles, they account for a much lower percentage of the workforce then they do citywide. Furthermore,

the wages that they receive when they do work in the defense related industries average far lower than those of men. Women's earnings averaged 61% in aerospace and 51% in communications equipment of men's. In Silicon Valley, women's earnings in the high tech industries fell as low as 42% of men's.

The dramatic wage gap between men and women in these communities is largely due to occupational segregation. While this is an economywide problem, it seems to be even worse in defense-related activities. For instance, the proportion of working women in Livermore who are engineers is only one third as high as it is for the state as a whole; at the same time, the proportion of men is double the statewide average. Apparently the Labs employ disproportionately large numbers of male engineers. Similarly, women comprise 43% of the Los Angeles workforce, but only 26% of the aerospace workforce, largely because they are discouraged from entering both skilled blue collar jobs and the engineering occupations. This is true, too, in Vallejo, where women account for less than 7% of the crafts workforce, while men account for the other 93%.

It is difficult to draw conclusions about cultural differences with the same precision. The more blue collar of our communities - Los Angeles and Vallejo - do seem to vote Democratic more often than their counterparts, although Congressional representatives from these districts tend to be hawkish on defense spending issues. Hobbies, sports and political issues appear to vary with each type of community. Arts and theatre have become major local interests in Livermore, yet the annual rodeo is still a major community event. In both Livermore and Silicon Valley, engineers and their families have been very active in

environmental and growth control movements. Yet all of these communities are relatively suburban in form and lifestyle.

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