Maintaining A Strong Economic Base: Analysis of High Tech Trends, Projections, Primary Industries and Supplier Linkages in City of San Jose

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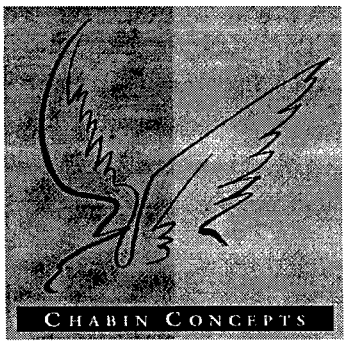
TABLE OF CONTENTS



EXECUTIVE SUMMARY

Project: Maintaining a Strong Economic Base

Project Purpose

Analysis of High Tech Trends, Projections, Primary Industries and Supplier Linkages in City of San Jose

The purpose of this analysis was to assist the City of San Jose in projecting the future need/demand for heavy industrial-zoned land, and understanding the implications of M1/M4 land supply on the City's long term economic vitality:

- Approximately 20 percent of the city's economic employment base is located in M1/M4 zoned areas.
- The primary users of M1/M4 zoned land are suppliers to the high tech industry.
- The proximity of key supplier industries is a critical location factor that has allowed San Jose to attain its position as a premier location for high tech manufacturing.
- This report identified 28 critical suppliers to the high tech industry.

The following conclusions are the results of a detailed analysis of the projected employment growth and corresponding need for additional acreage by M1/M4 industrial users, as defined by the zoning code, in San Jose. These conclusions were supported by a survey to high tech and supplier industries.

Conclusion 1:

There is not enough zoned land available to satisfy the growth needs of high tech suppliers that are restricted to M1/M4 zoned areas.

- The results showed there is a potential for absorption of 132 additional acres of heavy industrial-zoned land in the next five years, compared to the existing inventory of only 120 vacant acres.
- The projected need for 132 acres represents projected growth in 28 selected critical supplier industries that are restricted to M1/M4 areas. There are other current M1/M4

users that will also experience some growth amd require additional acreage for expansion. These other users will compete with the critical supplier industries for the extremely limited supply of remaining developable industrial land.

- Over 53% of the survey respondents felt there would be new critical suppliers over the next five years. These "new technology" suppliers may also need M1/M4 locations.

- The shortage is further aggravated by encroachment of non-profits, churches, high-end housing and other users in lands surrounding M1/M4 areas. Since many of the companies restricted to M1/M4 zoned areas are prohibited from being in close proximity to other "cleaner" uses, the encroachment issue is a serious threat to long-term growth for true M1/M4 uses.

Implications — Conclusion 1

- If nothing is done to preserve M1/M4 land in San Jose for industrial users, the City could risk losing its supplier base, and affect "operational costs" of high tech companies in San Jose. Supplier industries could be forced to move out of the area in order to expand. The result would be increased transportation costs for high tech "buyer" industries.

- Survey indicated 79.4% of the respondents felt a relocation outside San Jose would impact the cost of providing services to customers:

  "Prices will escalate if they leave"
  "Take longer to get repairs done, more costly"
  "Higher delivery cost, reduced services"

- High tech industry will continue to grow in the Bay Area and internationally, regardless of the actions taken by the City. However, if the supplier needs of those industries cannot be met in San Jose in the future, they may migrate to other more compatible locations.

- Careful consideration should be given to the consequences of any future re-zoning of M1/M4 areas in terms of the potential impact on suppliers that serve as a foundation for future growth of the high tech industry in San Jose.

Recommendations — Conclusion 1

Take action to ensure a limited "reserve" of M1/M4 acreage for future development to limit "supplier flight" and the corresponding increases in operating expenses to high tech companies due to greater transportation costs. As a best case scenario, an M1/M4 land reserve would help to limit companies from expanding or relocating in competitive areas outside San Jose.

Establish a program to monitor development and rezoning activity in M1/M4 "buffer zones" to address encroachment issues.

Conclusion 2:

The loss of suppliers in M1/M4 areas would also result in a significant reduction of low and medium skilled job opportunities in the City, which could impact the City's ability to find employment opportunities for individuals in targeted employment programs.

- A total of 67,800 jobs, 13 percent of total employment in San Jose, are suppliers and industries restricted to M1/M4 areas. Twenty-eight supplier industries were identified that are the most critical to the high tech industry in San Jose in terms of local proximity. These industries currently support about 31,200 jobs. An additional 36,600 jobs come from other industries that are limited to M1/M4 areas.

- Significant portions of the jobs created by high tech suppliers are entry level and low skilled positions. Of the 31,200 jobs in critical supplier industries, about 65 percent, are in basic production and material handling, sales, office/clerical, assembly and laborer occupations.

- The supplier base that is exclusive to M1/M4 zoned areas represents a significant portion of the low and medium skilled manufacturing jobs in the City. Maintaining a mix of jobs at different skill levels is particularly important from a community development perspective, given that much of the M1/M4 zoned land that is appropriate for supplier industries is in the city's enterprise zone.

- Over 67% of the supplier industries expected their steady growth to lead to expansion and job creation.

Implications — Conclusion 2

- Further reductions in land designated for heavy industrial uses will reduce the ability of San Jose residents to find entry level and low skilled positions. The lack of these types of job opportunities could have a negative impact on the future economic health of San Jose and the welfare of its residents.

- The supplier industries anticipating expansion could relocate outside of San Jose, losing existing positions as well as new positions for local residents.

Recommendations — Conclusion 2

Careful consideration should be given to the types of jobs being created by development in M1/M4 zoned areas. Job creation needs to also match the skill needs of local residents particularly in areas within the City's enterprise zone. Job creation and workforce development should be a collaborative effort in these areas. Creating employment opportunities for economically disadvantaged residents in these areas will ultimately benefit the whole community.

SECTION 1.0 INTRODUCTION & SUMMARY OF RESULTS

1.1 Introduction

The purpose of this analysis is to assist the City of San Jose in coordinating its long term planning efforts with its economic development objectives as they relate to heavy industrial users.

The City of San Jose is currently recognized as an international leader in the high tech industry. There are many reasons for this preeminence, but one of the more important factors is the local *supplier network*. Many of the suppliers to the high tech industry would themselves be considered more traditional manufacturers except for their support and value to the high tech industry. These supplier industries include such industries as fabricated metal products, chemicals, plastics, printing and packaging, machinery, warehousing, and a variety of other intermediate manufactured products.

The challenge for the City of San Jose, which is a relatively high cost location, is to retain its supplier network of "traditional" manufacturers.

In particular, this analysis seeks to identify which of these suppliers are most critical to the high tech "buyer" industries in San Jose and must be located in close proximity. In order to continue to support the city's position as a leading edge high tech location, these critical support industries should be of highest priority to be retained and expanded in San Jose. Retaining these industries will require preserving suitable land for future expansion, particularly in areas zoned for heavy industrial uses (M1/M4).

1.2 Background

In 1980, the City of San Jose had 2,572 acres that were ~~zoned M1 or M4~~ designated HI for industrial development.

- Due to pressure to ~~re-zone~~ redesignate these areas for R&D, non-profit, commercial and residential uses, the amount of ~~M1/M4~~ land has been reduced to about 1,740 acres. This represents a loss of 32 percent or 830 acres between 1980 and 1998.
- If the city continues to ~~re-zone~~ redesignate industrial land at this rate, it could loose its niche as a supplier location and ultimately undermine the viability of future high tech growth.
- In addition, the types of occupations that are supported by the supplier base are key to providing jobs for San Jose residents at a wide range of skill levels.

1.3 Report Organization

- **Task 1-Economic Base Analysis**

  This analysis begins by quantifying the existing base of supplier industries that are currently in M1/M4 areas. Estimates of employment and number of establishments by 4-digit SIC are described in Section 2.0.

- **Task 2-Business Surveys & Interviews**

  A survey of both high tech industries and supplier industries in San Jose was performed to identify critical location issues as well as identify local suppliers to the high tech cluster. The survey is described in Section 3.0 and copies of the survey instruments and responses are included in the appendix.

- **Task 3-Supplier Linkage Analysis**

  In addition the primary research on suppliers through survey and interviews, a supplier linkages analysis was also performed, as described in Section 4.0. This analysis identified the typical suppliers to the types of industries that are most prominent in San Jose and compared the local demand for supplier products to local supply from existing businesses.

- **Task 4-Occupational Analysis**

  Retaining the existing supplier base is critical to the continued success of local high tech businesses. However, those supplier industries also serve a purpose in providing balance in the local labor market. Many of the M1/M4 areas where these suppliers are located are in the city's Enterprise Zone. Providing jobs at a variety of skill levels that are suitable for Enterprise Zone and other city residents is also important for the city's future economic health. Section 5.0 describes the occupational characteristics of key supplier industries in terms of the number and types of jobs that are currently being supported.

- **Task 5-Final Estimates of Projected Need for M1 & M4 Acreage**

  Finally, Section 6.0 synthesizes the results of the analysis to answer the question of how much additional M1/M4 acreage will be required in San Jose to support the future needs of critical supplier industries. The question was addressed by translating projected growth in these industries into potential demand for M1/M4 land.

1.4 Summary of Results

Based on the survey results and the supplier linkages analysis,

- 28 supplier industries were identified that are the most critical to the high tech industry in San Jose in terms of local proximity (Appendix, Figure 4-1).

- These industries currently support a total of about 31,200 jobs, which is close to half of all the estimated jobs in M1/M4 industries in San Jose.

Future employment in these industries was projected based on annual employment growth rates for California and Santa Clara County from the California Employment Development Department.

- Overall growth in these 28 industries will average 16.1 percent between 2000 and 2005, resulting in projected employment of about 36,200.

The change in employment was converted into the amount of additional M1/M4 acreage required based on a floor area ratio of 0.35, and an average density of 400 square feet per employee.

- The results showed the potential for absorption of 132 additional acres of heavy industrial land in the next five years, compared to the existing inventory of only 120 vacant acres.

While it may be possible for some businesses to intensify the use of their existing land, it is clear that there is an insufficient supply of M1/M4 land to support future growth. This conclusion is further strengthened by the fact that the projected need for 132 acres only covers growth in these selected 28 suppliers industries. There are other current M1/M4 users that will no doubt experience some growth as well, and also businesses with existing operations in heavy industrial areas that were excluded from the analysis because they are not limited to those zoning categories.

- Both of these groups will compete with the critical supplier industries for the extremely limited supply of remaining developable industrial land.

The report concludes that the city should be very selective about the type of development that is approved in the remaining vacant heavy industrial areas. In addition, careful consideration should be given to the consequences of any future re-zoning of M1/M4 areas in terms of the potential impact on suppliers that serve as a foundation for future growth of the high tech industry in San Jose.

- The high tech industry will continue to grow in the Bay Area and internationally, regardless of the actions taken by the city. However, if the needs of those industries cannot be met in San Jose in the future, they will migrate to other more compatible areas.

SECTION 2.0 ESTIMATES OF SAN JOSE ECONOMIC BASE

This section details methodology and results of the estimates of employment by four-digit SIC for industries that are exclusive to M1 or M4 zoning in the City of San Jose.

The employment estimates for selected M1/M4 compatible industries were refined based on current local data using the city's business license database.

- There are an estimated 67,800 people employed in 3,530 establishments in San Jose in industries that are exclusive to M1/M4 zoning.

- Total employment in the City of San Jose is approximately 506,400, so these industries make up about 13 percent of the city's economic base.

2.1 Methodology

- The city's business license database provided the starting point for the revised estimates. This database was defined as the universe of businesses in the city for the purpose of this analysis. Based on a review of the zoning codes and discussions with the Planning Division, a list of SICs was created containing only those that were unique to the M1 or M4 zoning. This list of SICs was then used to extract a subset of records from the business license database.

- Upon review of the business license database, it was observed that a large number of records were only coded at the two digit SIC level (ending in "00"), or they were coded in miscellaneous categories such as 3199 (misc. manufacturing), 5199 (misc. non-durable wholesale), 7399 (misc. business services). In total, there were 1,928 records in the business license database with SIC codes that ended in "00" or "99". For the M1/M4 employment estimates, it is very important that companies are grouped in the correct SIC codes. Therefore, all 1,928 records described above were reviewed and assigned correct four-digit SIC codes.

- Next, 489 records were purchased from Dun & Bradstreet Marketplace, Jan-March 2000 edition, for businesses in the targeted SIC codes in the City of San Jose. These 489 records represented all companies with employment of 25 or more in the selected industries. The purpose of this data was to crosscheck employment and SICs in the business license database.

- Records in the business license database were matched based on business name and address. If employment reported by Dun & Bradstreet was greater than the amount shown in the business license database, the higher number was used.

- There were also 233 records on the Dun & Bradstreet list that were not included in the extract from the business license database due to their SIC code assignments. These records were extracted from the original business license database and added to the M1/M4 list with corrected SICs and employment totals.

- Data provided by the city on businesses in redevelopment areas was also used to crosscheck employment on some larger employers where there were substantial differences between the information reported by Dun & Bradstreet, and the city's business license data. The redevelopment area data was also used to check all records in the business license database with employment of 100 or more that could not be verified using Dun & Bradstreet.

2.2 Employment Estimate Results

The largest industries among those included in the employment estimates were:

- Sheet metalwork (3444)
- Special tools, dies and jigs (3544)
- Special industry machinery (3559)
- Communication equipment (3661 and 3663)
- Magnetic and optical recording media (3695)
- Electrical equipment and supplies (3699)
- Optical instruments and lenses (3827)
- Wholesale computers and peripherals (5045)
- Wholesale electrical equipment (5063)
- Wholesale electronic parts (5065)

Each of the industries listed above has an employment base of more than 1,800 people. A detailed listing of employment by industry is shown in Figure 2-1[1]. In addition, industries that have experienced declining employment from 1990 to 1997 in Santa Clara County are indicated in italics.

[1] Appendix, Figure 2-1, Employment in M4 & M4 Industries, City of San Jose

- **The industries listed above are most at risk relative to future re-zoning of M1/M4 properties**

These employment estimates were further screened to select those industries that are most critical as local suppliers to the high tech industry, as described in Section 5.

SECTION 3.0 BUSINESS SURVEY & INTERVIEWS

The purpose of the business survey and interviews was twofold:

- Verify which supplier industries were most important to the high tech base and which were "critical", needing to be located in close proximity, and
- Correlate the current and future needs of the supplier industries.

3.1 Survey Process

- Two surveys were designed, one for the high tech industries and one for the supplier industries.
- The high tech survey had 13 questions mainly related to suppliers and subcontractors and four questions related to doing business in San Jose.
- The supplier industry survey had eight questions regarding their business as it relates to supply/support of high tech industry and six questions related to doing business in San Jose.
- The Economic Development Department staff selected 277 San Jose businesses, both high tech and supplier, to be targeted for the survey/interviews.
- The surveys were posted on-line at CommunityPoll.com.
- The survey period was from March 21 to April 10, 2000.
- The city mailed letters to the 277 target businesses regarding the purpose of the survey, requesting the company's participation and advising an interviewer would be calling to review the survey with them or they could call an 800-number.
- During the survey period all 277 businesses were contacted. They were given options for participating in the survey; 1) interviewer would survey over phone or 2) use on-line survey.
- A team of four interviewers personally called companies to conduct the survey over the phone. Company representatives who preferred to do the survey on-line were faxed the URL and instructions for the on-line survey. Company representatives who were not available were also faxed a letter and instruction sheet, as well as received a follow-up call to encourage their participation.

- For purposes of completing the report, the survey calls concluded on April 11 and the count was taken at the close of business on April 11, 2000. However, the survey remained opened to businesses that wished to take the survey on line until April 17, 2000.

- During the survey process 2 companies were identified as "at risk", experiencing problems with potential to move from San Jose. These companies were immediately referred to the city's Economic Development Department.

3.2 Survey Participation

- Of the 277 targeted companies, 60 surveys were completed by the April 11 cutoff date.

- Survey resulted in a 21.6% response rate, a response rate higher than 10% is considered very good.

- 26 High Tech companies completed the survey.

- 34 Supplier Industry companies completed the survey.

3.3 Survey Results – High Tech[2]

3.3.1 Business Respondents

- Survey responses were represented by diverse high tech industries, semiconductors to printed circuits boards. Seven of the respondents in this group are no longer manufacturing in San Jose, or are planning to move manufacturing overseas. They mainly conduct R&D, sales and marketing.

3.3.2 Supplier Industry Questions

- Over 51% of the High Tech industries surveyed purchase durable supplies through a local distributor and 44% purchase directly from a supplier.
- Survey asked High Tech industries who they would consider as critical suppliers to their operations, who needed to be in close proximity to operations. Critical supplier ranking included:
  - electronic components and equipment,
  - computer chips, circuit boards,
  - precisions machine shops,
  - metal stamping,
  - special industrial machinery,

[2] Appendix, Survey Responses: San Jose High Tech Report

- dies and tools and boxes,
- chemicals and related products

- Over 80.0% of the high tech respondents outsource or subcontract component manufacturing.
- Outsourced component manufacturing included:
  - Electronic Components
  - Machine Shop
  - Sheet Metal Work
  - Casting
  - Programming
  - Waste disposal and recycling
  - Testing
- The supplier industries listed as most important:
  - Electronic Components
  - Machine Shops
  - Waste Disposal includes hazardous waste
  - Sheet Metal Work
  - Recycling, Waste Materials
  - Semiconductor equipment suppliers and service
  - Printing
  - De-ionized Water
  - General Mechanical Contracting
- Supplier industries which need to be located in close proximity:
  - Electronic Components
  - Sheet Metal
  - Circuit Boards
  - Hardware Components
  - Connectors
  - Heat Exchangers
  - De-ionized Water

- Chemicals and Gases

- Over 55% felt new products and technology would require different suppliers, such as:
  - Laser
  - E-beam
  - Material analysis labs
  - Different machining
  - Packaging
  - Testing
  - Silicon wafer size

3.3.3 High Tech Business Operation Questions

- Spacing requirements over the next five years:
  - 63% would be expanding
  - 33.3% would remain the same
  - "0" indicated decreasing in size, however, 3.7% did not know
- Locations noted for expansion:
  - 44.4% would expand at existing site
  - 22.2% would expand in San Jose
  - 11.1% would expand in Silicon Valley
  - 3.7% would expand in Bay Area
- Expanding Companies not expanding in the Silicon Valley/Bay Area would locate outside of the State.
- Reasons for locating expansion outside of San Jose:
  - No employee base, shortage of technical staff, not enough degreed engineers, engineers too transient
  - Cost of living, housing and space
  - Difficulty of getting building permits
  - Also expanding overseas
  - Insure uninterruptible and redundant site manufacturing
  - Strategically to meet customer demands
  - No available land

- Transportation

- 22.2% would like the city to become involved if they were experiencing problems.

3.4 Survey Results-Supplier Industry[3]

3.4.1 Supplier Business Respondents

- Diverse supplier industries, sheet metal, metal stamping, plating, and metal coatings to construction suppliers represented survey respondents.

- 54.3% of the respondents were manufacturers, subcontractors and job shops and 20.6% represented distribution or wholesale industry.

3.4.2 Supplier Business Operations

- Customers being served by the supplier industry respondents:
  - Computer Equipment Manufacturer
  - Semiconductors
  - Instrument Manufacturers
  - Custom Computer Programming
  - Construction
  - Military

- The supplier industry customer base was located:
  - 40.0% Bay Area
  - 25.7% Silicon Valley
  - 11.4% San Jose
  - 11.4% Out of State
  - 5.7% International & Central California

- 82.9% of the respondents felt their businesses had steady growth over the past five years, 14.3% were stable and 2.9% declined.

- 68.6% indicated their growth would lead to expansion and 2.9% felt they would decrease their size.

- Competitors to local suppliers were located in:
  - 31.4% Bay Area
  - 22.9% San Jose

[3] Appendix, Survey Responses, San Jose Supplier Industry Report

- 20.0% Silicon Valley
- 8.6% Out of State and Southern California
- 2.9% International

3.4.3 Suppliers Doing Business in San Jose

- 80.0% of the respondents felt a relocation outside of San Jose would impact the cost of providing services to customers in San Jose for following reasons:
  - Prices will escalate
  - Take longer to get repairs done for customers
  - Harder to provide customer service
  - Cost of raw materials, transportation
  - Higher delivery cost and reduced services
  - Customers want their resources to be close and accessible
- If an expansion is being planned, reasons the expansion would not occur in San Jose:
  - Cost of land, labor and taxes
  - Customer base in San Jose is moving
  - Ability to get employees
  - Employees not trained in their business
- 28.6% indicated they would like the city to become involved if they were experiencing problems.

The survey responses were used to confirm and verify the linkages between the high tech "buyer" industries and the supplier industries for the remainder of this report.

The Office of Economic Development will use information regarding the specific needs of high tech and supplier industries for program planning.

4.0 SUPPLIER LINKAGES ANALYSIS

The purpose of the supplier linkage analysis was to identify industries that support the high tech cluster in San Jose. The focus was primarily on the types of suppliers that must locate exclusively in M1 or M4 zoned land.

This analysis identified the industries selling products to the high tech cluster. Then, the supplier list was refined to include only industries that would be in M1 or M4 areas. This list of suppliers was then further refined by quantifying the aggregate demand for particular products as compared to estimated production within San Jose.

4.1 Input/Output Analysis

Input/output data allows for identification of the types of inputs that are typically purchased by various industries and the volume of industry-to-industry transactions that occur on a national level.

- First, the 15 SIC codes in San Jose's high tech cluster with the largest amount of local employment were identified. These "buyer" industries are shown in Figure 4-1[4]. Note that some industries may be both buyers and suppliers.

- National input/output data from the Bureau of Economic Analysis was used to identify the types of supplier purchases typically made by these selected buyer industries. The suppliers obtained from the input/output matrix for each buyer industry were sorted in terms of total value of purchases by that industry on a national basis to select the 10 to 15 most significant suppliers to each buyer industry. The suppliers for all of the basic buyer industries are shown in Figure 4-2[5].

- In total Figure 4-2 shows 82 suppliers that were identified for the high tech cluster. Many of these suppliers are utilized by more than one industry. In general, suppliers include:

Paperboard and corrugated boxes	Industrial machinery
Printing	Electrical and electronic equipment
Chemicals	Communication equipment
Rubber and plastic products	Instruments
Flat glass	Aircraft engines and parts
Primary metals	Transportation services
Fabricated metals and forgings	A variety of business services.

[4] Appendix, Figure 4-1, San Jose Primary High Tech Buyer Industries
[5] Appendix, Figure 4-2, Primary Suppliers for High Tech Buyer Industries in San Jose

In terms of suppliers that are common to several buyer industries, the following are major suppliers to nine or more of the buyer industries.

Plastic products	Electric
Semiconductors	Telephone utilities
Advertising	Banking

All of the buyer industries also make purchases from the Wholesale Trade sector, however the input/output matrix does not provide any further detail about the specific types of wholesale industries.

4.2 Local Demand Estimates

The next step is to estimate the local demand for the various suppliers. It is important to account for the volume of purchases made by particular industries, as well as the aggregated effect of multiple industries purchasing the same products. In general, suppliers that serve multiple industries are likely to have greater local demand. However, this will not always be the case. For highly capital-intensive buyer industries, as few as three or four buyer industries purchasing the same inputs may constitute significant local demand. Although it is difficult to accurately estimate local demand based on national purchasing patterns, an order of magnitude estimate is helpful for ranking purposes.

- For each of the supplier industries identified above, national input-output data was used in conjunction with a local concentration index to quantify the level of purchases by the selected buyer industries. Since the data only shows national purchasing patterns for each buyer industry, the results needed to be scaled down to represent the level of purchases from local businesses in the high tech cluster.

- The methodology used to adjust the purchasing data was based on employment. Within a specific industry category, the ratio of employment to output is fairly consistent. Therefore, the percentage of national employment represented locally for each of the respective buyer industries was calculated. Next, this percentage was applied to the volume of national purchases from each of the major suppliers to that industry. The result was an adjusted level of local supplier demand, shown in Figure 4-2.

- Although purchasing patterns of individuals businesses undoubtedly vary somewhat from the national average; these estimates allow for aggregation of local demand for particular suppliers across multiple buyer industries. The final column in the supplier matrix shows the total local demand from the selected buyer industries.

- The largest suppliers to the high tech cluster each have an estimated demand of over $150 million locally.

Wholesale trade	Transportation	Sheet metal work
Printed circuit boards	Utilities	Custom programming
Plastics	Real estate	Banking
Semiconductors	Corrugated boxes	
Electronic components	Relays & industrial controls	

Most of these suppliers are used by multiple buyer industries. Some of these industries are also on the original list of buyer industries, indicating that they are both buyers and suppliers.

- The next step was to narrow the list to supplier industries that would be located in exclusively M1 or M4 areas in San Jose. Note that at this point, not all of these suppliers necessarily exist in the city, although there is demand from local buyer industries. Figure 4-3[6] shows the refined list of industrial suppliers and includes 36 industries. The largest suppliers among this group in terms of local demand include

Wholesale trade	Plating and polishing
Plastics	Switchgear apparatus
Industrial controls	Metal stampings
Boxes	Motors and generators
Sheet metalwork	Nonferrous wiredrawing.

4.3 Local Production Estimates

In order to more accurately identify the industries that are the highest priority in terms of retention targets, it was necessary to estimate local production by supplier industries as compared to local demand.

- In order to estimate local production, national average output per employee by industry, based on data from the Minnesota IMPLAN Group economic impact model was used. The level of output value per employee varies significantly by industry from a high of $526,500 in plastic resins (2821) to $71,124 in plating and polishing (3471), as shown in Figure 4-4[7].

[6] Appendix, Figure 4-3, Supplier Industries, Exclusive to M1 or M4 Zoning
[7] Appendix, Figure 4-4, San Jose Demand for M1 & M4 Supplier Industries/Current Local Employment

- Estimates of national average output per employee were applied to San Jose employment to estimate local production value. This value was then divided by local demand from buyer industries. The resulting percentage indicates those industries where less than 100 percent of local demand is being met by local production. Industries with percentages much greater than 100 percent are those where almost all of the production is exported, or these suppliers are currently being supported by demand from other industries.

- Of the 36 industries on the list, 15 have potential for future growth and strong existing demand. Although there is also unmet demand in plastic resins, nonferrous wiredrawing, industrial valves, wire springs, switchgear, motors and generators, electric lamps, lighting equipment, and laboratory furniture, these *industries may be locationally incompatible since there is currently no local production.*

4.4 Supplier Linkages Analysis Results

The final results of the supplier analysis include 15 manufacturing industries that have the best potential as retention targets, as shown in Figure 4-5[8]. They range from 3 percent to 190 percent in terms of local production as a share of local demand. All of these manufacturers are currently represented in the local economy, and all have strong projected output growth nationally.

The next step was to combine this information with the results of the survey in Section 3.0. This will allow identification of suppliers that are not only supported by local demand, but are also critical in terms of local presence.

[8] Appendix, Figure 4-5, Suppliers with Highest Priority for Retention Based on Local Demand

5.0 OCCUPATIONAL ANALYSIS

Preserving M1/M4 land for key supplier industries is critical to retaining the support structure for high tech industries in San Jose. These supplier industries are also important in terms of creating a balanced mix of jobs at various skill levels for the residents of San Jose.

- Maintaining a mix of jobs at different skill levels for San Jose residents is particularly important from a community development perspective.

- Also, given that much of the M1/M4 zoned land that is appropriate for supplier industries is in the city's Enterprise Zone, these jobs can be targeted to specific individual groups and residents in the Enterprise Zone.

This analysis identifies the specific types of occupations that are important to local supplier industries. First, the analysis shows the percentage distribution of occupational requirements by industry for key suppliers. Then, based on current employment in those industries in San Jose, the number of jobs currently supported by occupation was calculated.

5.1 Refine Target Supplier List

The first step was to select the SIC codes of suppliers to the high tech cluster that are most critical in terms of local presence, and that are exclusive to M1 or M4 land uses. These critical supplier industries are shown in Figure 5-1[9].

- The first three columns show which section of the high tech survey identified these suppliers, with references to the specific question numbers in the survey.
    1. The industries with a mark in the first column were identified as most important in close proximity.
    2. The industries in the second column are services and products that are currently out-sourced to San Jose firms.
    3. The industries in the third column were identified as critical suppliers, but not necessarily critical in terms of close proximity.
    4. The fourth column shows how the survey results compare with supplier industries identified in supplier linkages analysis
    5. The table includes local employment and estimated sales as a reference.

- In total, Figure 5-1 shows 28 critical suppliers that were identified for the high tech cluster. It is interesting to note that this list includes most of the M1/M4 industries that were identified in the refined employment estimates with local employment over

[9] Appendix, Figure 5-1, Critical M1 & M4 Suppliers to High Tech Industry in San Jose Based on Survey Results

about 200. Altogether, these 28 critical suppliers account for an estimated 31,203 local jobs.

- It also appears that the survey results were fairly consistent with the secondary data from the supplier analysis in terms of identifying the most important suppliers to the city's high tech base. There were also other critical suppliers identified in the survey, most notably various electronic components and printed circuit boards, however these industries are not exclusive to M1/M4 land uses, and were therefore excluded from this analysis.

5.2 Occupational Distribution by Industry

Using information from the Bureau of Labor Statistics, the next step was to look at the detailed occupational requirements of the supplier industries. A percentage distribution of the typical work force for each of these industries is shown in Figure 5-2[10]. The final column shows the distribution for the total of all 28 industries combined.

- The largest single occupations in percentage terms fall into two categories at opposite ends of the spectrum in terms of skills:

  Managerial and administrative (8 percent), and
  Handworkers, assemblers and fabricators (11 percent).

- Other key occupations that make up at least 4 percent of the overall work force needs of these industries include:

  Sales and related workers (6 percent)
  Laborers (6 percent)
  Precision metal workers (6 percent)
  Metal and plastic machine tool cut and form setters (6 percent)
  Other machine setters and operators (4 percent)
  Material recording and scheduling occupations (4 percent)
  Printing and binding workers (4 percent)
  Blue collar supervisors (4 percent)
  Metal and plastic processing machine setters (4 percent)

  Most of these occupations are semi-skilled manufacturing jobs.

5.3 Local Employment Estimates by Occupation

The next step was to apply the percentage distributions to the current employment in these supplier industries in San Jose. This allowed calculation of the number of jobs, by occupation and by industry that are currently being supported by these suppliers. It also allows quantification of the number and types of jobs that could be lost if adequate land for these industries cannot be preserved. Although the specific employment mix of individual

[10] Appendix, Figure 5-2, Occupational Distribution of Critical Supplier Industries

companies will vary, this analysis is a good indicator as to the types of occupations that are most commonly employed by these suppliers.

- The numbers of jobs by occupation that are supported by local suppliers are shown in Figure 5-3[11]. The final column shows the total and the distribution by occupation. Note that this distribution is different than the one in Figure 5-2. This is because the total number of jobs in each industry in this table is specific to San Jose, so some industries make up a larger share of the total than others, due to their relative size.

- The largest number of jobs supported by critical suppliers are in:

  Managerial and administrative occupations
  Engineers
  Engineering technicians
  Sales and related workers
  Material recording and scheduling
  Other clerical and administrative support
  Blue collar supervisors
  Precision metal workers
  Metal tool cut and form setters
  Precision assemblers
  Hand workers
  Helpers, laborers and material movers

  Each of these occupational categories accounts for between 1,000 and 4,000 people currently working in San Jose.

5.4 Occupations Suitable for Target Populations in the Enterprise Zone

Since many of the M1/M4 areas in San Jose are located in the city's Enterprise Zone, one of the results of this analysis was to identify specific occupations and numbers of jobs that are most compatible with the employment needs of economically disadvantaged residents in the Enterprise Zone.

- In terms of specific occupations, there are a number of jobs that would be potentially suitable for persons in the Enterprise Zone in retail occupations including:

  Salespersons (151 jobs),
  Stock clerks (72 jobs), and
  All other sales workers (2,307 jobs).

[11] Appendix, Figure 5-3, Number of Jobs by Occupation Supported by Critical Supplier Industries

The job totals represent the estimated number of jobs in these occupations that are currently supported by critical suppliers. These are also jobs that could potentially be lost to other communities if these suppliers are forced to relocate.

- Opportunities in office occupations include

  Records processing (927 jobs),
  Financial records processing (742 jobs),
  Information clerks (111 jobs),
  Material recording,
  Scheduling and distributing (1,292 jobs), and
  Other clerical and administrative occupations (1,003 jobs).

- There are also a number of jobs that are currently being supported in manufacturing and production occupations that may be a good match for individuals in the Enterprise Zone including:

  Machinery mechanics (752 jobs)
  Mobile equipment mechanics (606 jobs)
  Other mechanics (258 jobs)
  Precision metal workers (1,729 jobs)
  Machine tool cut and form setters (1,392 jobs)
  Metal fabricating machine setters (336 jobs)
  Metal and plastic processing machine setters (615 jobs)
  Other machine setters and operators (772 jobs)
  Precision assemblers (1,233 jobs), and
  Motor vehicle operators (443 jobs)

  Some of these jobs in precision manufacturing may require more training and may not be immediately suitable for the target population in the Enterprise Zone. However, semi-skilled and skilled manufacturing jobs are a critical component of the local workforce.

- Finally, there are a large number of jobs in less skilled manufacturing occupations. These include:

  Handworkers and fabricators (4,093 jobs), and
  Helpers, laborers and material movers (1,369 jobs).

The next step is to combine the information from the previous sections to develop the final projected need for M1/M4 acreage for these critical suppliers in San Jose.

SECTION 6.0 FINAL ESTIMATES OF PROJECTED NEED FOR M1/M4 ACREAGE

In this portion of the analysis, the refined estimates of projected need for M1/M4 land in San Jose are presented based on the final list of supplier targets that are most critical in terms of retention, and refined estimates of current local employment.

Using current employment and projected employment in the selected supplier industries, estimated density assumptions are applied to determine how much additional M1/M4 acreage will be needed in the city to support these industries.

For the purpose of the analysis, it is assumed that other types of industries that are currently located in M1 or M4 zoning will remain, however, no additional land requirements for growth in these other industries are factored into the results. *The analysis simply focuses on the amount of additional acreage that would be necessary to support suppliers that have been specifically targeted for retention and expansion based on their critical importance to the high tech industry.*

6.1 Current and Projected Employment

- The final list of 28 industries and other industries that are most *critical to be in close proximity to local high tech manufacturers* employ about 31,200 people in San Jose currently, and account for about 46 percent of total current employment in M1/M4 industries in the city, Figure 6-1[12].

- Given San Jose's position in the global marketplace, it is reasonable to assume that these supplier industries to the high tech cluster will grow at least at the average rate for their industry.

- In order to calculate employment by industry for 2005, statewide annual employment growth rates projected by the California Employment Development Department (EDD) are applied to current local employment by industry. In a few cases where projections were available at the three digit SIC level for Santa Clara County, local growth rates were substituted for statewide average growth rates.

- These projected growth rates from the EDD should take into account macroeconomic trends in California and nationally that will alter demand for the types of products produced by these supplier industries. In addition, they should account for technological changes within these industries that may alter the future mix of labor versus capital.

[12] Appendix, Figure 6-1, Critical M1 & M4 Suppliers in San Jose

- Total employment in the 28 target suppliers in 2005 is expected to grow to 36,450, which represents a 16.1 percent increase Figure 6-2[13]. The industries with the largest amount of absolute growth, those with a combination of large current employment and high growth rates, are:

  Special industry machinery (3559)
  Magnetic and optical recording media (3695)
  Electrical equipment (3699)
  Optical instruments and lenses (3827)
  Wholesale electrical equipment (5063), and
  Wholesale electronic components (5065)

6.2 Projected Acreage Requirements

The next step was to convert the change in employment into additional acreage required by 2005.

- Since the analysis was limited to industries that are exclusive to M1 or M4 areas, expansion in these suppliers will require additional M1 or M4 acreage, increased densities on existing developed parcels, or alternatively these businesses may be forced to relocate outside of San Jose.

- Based on the projected employment growth, as much as 132 acres of M1 or M4 zoned land could be absorbed through growth in this subset of existing supplier industries in the next five years, as shown in Figure 6-2. Currently, there are only about 120 acres vacant.

- This calculation of future acreage requirements assumes a floor area ratio of 35 percent and 400 square feet of built space per employee. This ratio is applied to all industries except recycling which is likely to be lower density. For recycling, a ratio of 750 square feet per employee was applied. Although actual employment densities vary, these averages provide an estimated acreage requirement that can be used to guide land planning policy decisions.

- It is not the intent of this analysis to imply that the city has targeted specific density ratios for these types of heavy manufacturing industries. The assumptions used here are simply a guide to convert employment by industry into acreage. Some industries may be able to intensify the use of existing property, while others may require additional acreage. Over the longer term, as new establishments develop to support growth in demand for these supplier products, additional acreage will no doubt be needed to support the city's heavy industrial base.

[13] Appendix, Figure 6-2, Projected Employment Growth

6.3 Summary

- If the city's goal is to 1) maintain its competitive advantage as a location for high tech manufacturing, and 2) provide a balanced mix of jobs for its residents, continued re-zoning of M1/M4 areas which will prohibit critical supplier location does not support these goals.

- There is potential to absorb at least 132 acres of heavy industrial land based on projected employment growth in the next five years, and only 120 acres are currently vacant in the city. This projection of future land requirements is very conservative given that only projected employment growth for selected high tech supplier industries were incorporated. All other current users in M1/M4 areas are assumed constant in terms of land requirements.

- In addition, there are businesses that are currently located in M1/M4 areas that are not exclusive to those zoning categories, but nonetheless could require additional land near their existing facilities to accommodate growth, and would directly compete for the limited supply of vacant heavy industrial land.

- If appropriately zoned land is not available in San Jose to support high tech suppliers, it is possible that the projected employment growth in these manufacturing industries could be captured by other cities in and around Santa Clara County. In the event that other cities do not have sufficient designated space and land to accommodate this growth, these companies would be forced to locate elsewhere. In either case, the loss of these jobs could have a negative impact on the future economic health of San Jose.

APPENDIX

FIGURE 2-1

EMPLOYMENT IN M1 AND M4 INDUSTRIES
CITY OF SAN JOSE

SIC	Description	Estimated Employment 2000	Number of Establishments 2000
	TOTAL	**67,802**	**3,530**
20	Food and Kindred Products		
2022	*Cheese, natural and processed*	*265*	*1*
2033	*Canned fruits and vegetables*	*742*	*3*
2034	*Dehydrated fruits, vegetables, soups*	*50*	*1*
2051	*Bread, cake, and related products*	*136*	*3*
2052	Cookies and crackers	106	2
2053	*Frozen bakery products, except bread*	*207*	*1*
2064	Candy & other confectionery products	23	1
2096	*Potato chips and similar snacks*	*199*	*3*
2098	Macaroni and spaghetti	12	1
2099	*Food preparations, nec*	*51*	*2*
27	Printing & Publishing		
2711	Newspapers	1,714	13
2721	Periodicals	124	11
2732	Book printing	45	1
2752	Commercial printing lithographic	109	3
2759	*Commercial printing nec*	*865*	*21*
2761	*Manifold business forms*	*14*	*1*
2782	Blankbooks and looseleaf binders	8	1
2791	*Typesetting*	*19*	*7*
2796	Platemaking services	40	1
	All Other Manufacturing		
2329	Men's and boys' clothing, nec	25	1
2339	Women's and misses' outerwear, nec	30	1
2391	*Curtains and draperies*	*16*	*2*
2399	Fabricated textile products, nec	9	1
2434	*Wood kitchen cabinets*	*197*	*9*
2448	*Wood pallets and skids*	*10*	*1*
2449	Wood containers, nec	29	1
2499	Wood products, nec	16	2
2511	*Wood household furniture*	*134*	*5*
2512	Upholstered household furniture	30	1
2519	*Household furniture nec*	*15*	*1*
2521	*Wood office furniture*	*20*	*2*
2522	*Office furniture except wood*	*8*	*1*
2541	Wood partitions and fixtures	34	4
2591	*Drapery hardware and window blinds and shades*	*306*	*2*
2653	Corrugated and solid fiber boxes	234	4
2657	Folding paperboard boxes	8	1
2675	Die-cut paper and board	80	1
2813	*Industrial gases*	*20*	*2*
2822	Synthetic rubber	350	1
2891	*Adhesives and sealants*	*36*	*2*
3081	Unsupported plastics film and sheet	7	1
3083	*Laminated plastics plate and sheet*	*150*	*1*
3085	Plastics bottles	229	3
3086	Plastics foam products	6	1
3087	Custom compound purchased resins	16	2
3089	Plastics products nec	857	10
3211	*Flat glass*	*14*	*1*
3229	Pressed and blown glass nec	50	2
3231	Products of purchased glass	18	1
3299	Nonmetallic mineral products	80	2
3363	*Aluminum die-castings*	*28*	*1*
3399	Primary metal products	33	2
3429	Hardware, nec	281	2

FIGURE 2-1

EMPLOYMENT IN M1 AND M4 INDUSTRIES
CITY OF SAN JOSE

SIC	Description	Estimated Employment 2000	Number of Establishments 2000
3441	Fabricated structural metal	46	3
3444	*Sheet metalwork*	*2,341*	*30*
3446	Architectural metal work	34	1
3451	Screw machine products	11	1
3469	Metal stampings, nec	259	4
3471	Plating and polishing	276	8
3479	Metal coating and allied services	227	12
3492	Fluid power valves & hose fittings	60	1
3496	*Misc. fabricated wire products*	*13*	*1*
3499	Fabricated metal products, nec	497	7
3535	Conveyors and conveying equipment	26	1
3541	*Machine tools metal cutting type*	*60*	*1*
3542	Machine tools metal forming type	7	1
3544	Special dies tools jigs and fixtures	1,804	291
3555	Printing trades machinery	30	1
3556	Food products machinery	36	1
3559	Special industry machinery nec	3,535	16
3561	Pumps and pumping equipment	120	1
3564	Blowers and fans	46	2
3566	Speed changers drives and gears	46	1
3569	General industrial machinery nec	389	3
3589	*Service industry machinery nec*	*305*	*6*
3599	Industrial machinery nec	159	5
3612	*Transformers except electric*	*25*	*1*
3625	*Relays and industrial controls*	*295*	*4*
3643	Current-carrying wiring devices	702	4
3651	Household audio and video equipment	454	5
3661	Telephone and telegraph apparatus	1,821	15
3663	Radio and t.v. communications equipment	3,169	13
3669	Communications equipment nec	856	10
3694	*Engine electrical equipment*	*10*	*1*
3695	*Magnetic and optical recording media*	*2,434*	*4*
3699	*Electrical equipment and supplies nec*	*1,795*	*7*
3724	Aircraft engines and engine parts	650	1
3728	Aircraft parts and equipment nec	31	1
3751	Motorcycles bicycles and parts	398	1
3792	*Travel trailers and campers*	*12*	*1*
3812	Search and navigation equipment	1,335	8
3822	Environmental controls	356	2
3826	Analytical instruments	636	6
3827	Optical instruments and lenses	3,685	5
3829	Measuring and controlling devices nec	327	10
3841	Surgical and medical instruments	1,573	4
3842	Surgical appliances and supplies	65	1
3845	Electromedical equipment	228	2
3861	*Photographic equipment and supplies*	*125*	*2*
3873	*Watches clocks watchcases and parts*	*32*	*1*
3911	Jewelry precious metal	28	20
3944	Games toys and children's vehicles	275	184
3949	*Sporting and athletic goods nec*	*277*	*8*
3993	Signs and advertising specialties	217	49
3995	Burial caskets	17	1
3999	Manufacturing industries nec	884	136
	Warehouses, Storage Facilities		
4225	General warehousing and storage	437	12
4226	*Special warehousing and storage nec*	*97*	*3*

FIGURE 2-1

EMPLOYMENT IN M1 AND M4 INDUSTRIES
CITY OF SAN JOSE

SIC	Description	Estimated Employment 2000	Number of Establishments 2000
	Recycling		
4953	Refuse systems	717	8
	Wholesale Trade		
5012	*Automobiles and other motor vehicles*	*462*	*72*
5013	Motor vehicle supplies and new parts	156	10
5014	*Tires and tubes*	*38*	*1*
5021	Furniture	386	4
5023	*Homefurnishings*	*201*	*6*
5031	Lumber plywood and millwork	361	9
5032	*Brick stone and related material*	*204*	*6*
5033	Roofing siding and insulation	84	2
5039	*Construction materials nec*	*88*	*3*
5043	*Photographic equipment and supplies*	*30*	*1*
5044	Office equipment	92	2
5045	Computers peripherals and software	4,462	39
5046	*Commercial equipment nec*	*15*	*2*
5047	Medical and hospital equipment	100	2
5049	Professional equipment nec	40	1
5051	Metals service centers and offices	14	2
5063	Electrical apparatus and equipment	2,192	11
5064	Electrical appliances television and radio	440	2
5065	Electronic parts and equipment nec	3,911	57
5074	*Plumbing and hydronic heating supplies*	*91*	*3*
5075	Warm air heating and air conditioning	21	2
5078	*Refrigeration equipment and supplies*	*79*	*4*
5084	Industrial machinery and equipment	323	11
5085	Industrial supplies	145	6
5087	Service establishment equipment	233	4
5091	Sporting and recreation goods	8	1
5092	*Toys and hobby goods and supplies*	*229*	*6*
5094	*Jewelry and precious stones*	*6*	*1*
5099	Durable goods nec	163	4
5111	*Printing and writing paper*	*200*	*1*
5112	*Stationery and office supplies*	*115*	*4*
5113	Industrial and personal service paper	193	2
5122	*Drugs proprietaries and sundries*	*225*	*4*
5139	Footwear	6	1
5141	*Groceries general line*	*177*	*7*
5144	*Poultry and poultry products*	*180*	*2*
5145	*Confectionery*	*7*	*1*
5146	Fish and seafoods	85	1
5147	Meats and meat products	125	1
5148	Fresh fruits and vegetables	140	4
5149	Groceries and related products nec	310	5
5162	Plastics materials and basic shapes	26	2
5181	Beer and ale	106	1
5182	*Wine and distilled beverages*	*90*	*1*
5191	Farm supplies	26	2
5192	Books periodicals and newspapers	57	2
5198	Paints varnishes and supplies	6	1
5199	Nondurable goods nec	1,839	514
	Catalog and Mail Order Establishmennts		
5961	Catalog and mail-order houses	1,092	194
	Photographic Processing and Developing		
7384	*Photofinish laboratories*	*70*	*2*
	Vehicle Repair, Cleaning or Leasing		
7513	Truck rental and leasing no drivers	93	2

FIGURE 2-1

EMPLOYMENT IN M1 AND M4 INDUSTRIES
CITY OF SAN JOSE

SIC	Description	Estimated Employment 2000	Number of Establishments 2000
7514	Passenger car rental	174	8
7532	Top & body repair & paint shops	885	220
7537	Automotive transmission repair shops	13	1
7538	General automotive repair shops	225	3
7539	Automotive repair shops, nec	1,453	513
7549	Automotive services, nec	599	199
	Equipment Repair and Service		
7623	Refrigeration service and repair	830	5
7641	*Reupholstery and furniture repair*	*139*	*45*
7692	Welding repair	70	40
7699	*Repair services nec*	*1,277*	*389*

Source: City of San Jose Business License Database; CA Employment Development Dept.- Projected Employment Growth for Santa Clara County, Dun & Bradstreet Marketplace.

Note: Italics indicates industries that have declined by 25 percent or more in employment in Santa Clara County from 1990 to 1997.

FIGURE 4-1

SAN JOSE PRIMARY HIGH TECH BUYER INDUSTRIES*

SIC	Industry Name	Employment		San Jose Share
		San Jose	U.S.	
3674	Semiconductors and related devices	17,793	242,681	7.33%
3672	Printed circuit boards	7,372	154,974	4.76%
7372	Prepackaged software	4,595	289,428	1.59%
3827	Optical instruments and lenses	3,685	37,485	9.83%
3559	Special industry machinery	3,535	139,136	2.54%
3663	Communications equipment	3,169	219,498	1.44%
3577	Computer peripheral equipment	2,564	186,015	1.38%
3695	Magnetic and optical recording media	2,434	36,333	6.70%
3571	Electronic computers	2,254	194,774	1.16%
8731	Commercial physical research	2,232	496,467	0.45%
3679	Electronic components	2,150	224,978	0.96%
3841	Surgical and medical instruments	1,573	233,748	0.67%
3825	Instruments to measure electricity	1,550	90,687	1.71%
3812	Search and navigation equipment	1,335	214,666	0.62%
3724	Aircraft engines and parts	650	121,719	0.53%

Source: Dun & Bradstreet Marketplace, 2000.

*largest industries in employment terms excluding wholesale and retail trade

FIGURE 4-2

PRIMARY SUPPLIERS FOR HIGH TECH INDUSTRIES IN SAN JOSE

		San Jose Buyer Industries							
SIC	Supplier Industry Name	3674 Semiconductors & Related Devices	3672 Printed Circuit Boards	7372 Prepackaged Software	3827 Optical Instruments	3559 Special Ind. Machinery	3663 Communications Equipment	3577 Computer Peripherals	3695 Magnetic & Optical Media
1540	Maintenance and repair of buildings						$2,928,960	$9,124,560	$44,300,400
2435	Hardwood veneer and plywood					$1,772,920	$3,739,680		
2652	Setup paperboard boxes					$8,242,300		$16,406,820	$79,656,300
2653	Corrugated and solid fiber boxes	$68,865,350	$18,863,880		$13,201,690				
2657	Folding paperboard boxes			$12,095,130					
2759	Commercial printing, nec			$5,716,050					
2761	Manifold business forms								
2819	Industrial inorganic chemicals, nec	$12,805,510							
2821	Plastics materials and resins		$18,030,880						
2869	Industrial organic chemicals, nec	$43,921,360							
2891	Adhesives and sealants								
2899	Chemical preparations, nec	$16,008,720						$8,689,860	$42,189,900
3053	Gaskets, packing and sealing devices								
3069	Fabricated rubber products, nec								
3089	Plastics products, nec	$26,571,250	$384,331,920	$8,190,090	$68,377,480	$3,276,600		$57,649,500	$279,892,500
3211	Flat glass	$38,783,030			$13,054,240				
3312	Blast furnaces and steel mills					$7,205,980			
3325	Steel foundries, nec					$1,602,740			
3331	Primary copper								
3339	Primary nonferrous metals, nec	$11,126,940	$31,444,560						
3351	Copper rolling and drawing		$24,780,560						
3353	Aluminum sheet, plate, and foil		$22,857,520				$2,515,680		
3354	Aluminum extruded products					$1,303,020			
3356	Nonferrous rolling and drawing, nec	$51,603,200							
3357	Nonferrous wiredrawing & insulating	$37,947,410	$18,516,400					$8,520,120	$41,365,800
3363	Aluminum die-castings								
3369	Nonferrous foundries, nec					$1,651,000			
3443	Fabricated plate work (boiler shops)							$23,072,220	$112,017,300
3444	Sheet metalwork						$2,538,720		
3451	Screw machine products								
3462	Iron and steel forgings								
3463	Nonferrous forgings							$8,462,160	$41,084,400
3469	Metal stampings, nec	$14,044,280	$25,989,600		$20,308,780				
3471	Plating and polishing	$28,081,230	$99,331,680						
3479	Metal coating and allied services		$24,285,520						
3491	Industrial valves					$1,628,140			
3495	Wire springs								
3519	Internal combustion engines, nec					$1,391,920			
3544	Special dies, tools, jigs & fixtures								
3559	Special industry machinery, nec	$16,111,340				$2,184,400			
3561	Pumps and pumping equipment					$1,351,280			
3571	Electronic computers			$9,640,170			$2,783,520		
3599	Industrial machinery, nec					$3,088,640			
3613	Switchgear and switchboard apparatus		$19,368,440			$2,997,200		$16,845,660	$81,786,900
3621	Motors and generators					$2,512,060		$17,404,560	$84,500,400

FIGURE 4-2

PRIMARY SUPPLIERS FOR HIGH TECH INDUSTRIES IN SAN JOSE

		San Jose Buyer Industries							
SIC	Supplier Industry Name	3674 Semiconductors & Related Devices	3672 Printed Circuit Boards	7372 Prepackaged Software	3827 Optical Instruments	3559 Special Ind. Machinery	3663 Communications Equipment	3577 Computer Peripherals	3695 Magnetic & Optical Media
3625	Relays and industrial controls					$1,717,040	$2,607,840	$42,964,920	$208,597,800
3641	Electric lamps				$11,835,320				
3648	Lighting equipment, nec								
3651	Audio and video equipment						$12,647,520		
3669	Communications equipment						$2,799,360		
3671	Electron tubes			$7,563,630			$64,975,680	$152,629,380	$741,026,700
3672	Printed circuit boards	$441,082,750	$41,012,160	$4,765,230	$10,282,180		$22,289,760		
3674	Semiconductors and related devices	$52,226,250	$317,806,160		$57,141,790				
3679	Electronic components, nec								
3691	Storage batteries								
3694	Engine electrical equipment								
3724	Aircraft engines and engine parts								
3728	Aircraft parts and equipment, nec						$2,253,600		
3821	Laboratory apparatus and furniture								
3825	Instruments to measure electricity				$7,952,470				
3827	Optical instruments and lenses								
3842	Surgical appliances and supplies	$27,282,260							
4011	Rail transportation			$3,383,520			$2,767,680		
4311	U.S. Postal Service	$13,472,540	$21,591,360				$2,689,920		
4512	Air transportation, scheduled							$39,027,780	$189,482,700
4513	Air courier services	$17,071,570	$23,914,240	$18,491,700	$6,428,820		$6,855,840	$21,470,040	$104,238,600
4813	Telephone communications	$28,638,310	$35,899,920	$3,180,000	$5,721,060	$1,846,580	$7,022,880	$21,126,420	$102,570,300
4911	Electric services	$127,014,240	$252,832,160	$6,924,450	$41,197,530	$11,976,100	$27,833,760	$241,453,080	$1,172,272,200
5000	Wholesale			$6,078,570			$2,891,520	$21,229,920	$103,072,800
5812	Eating places	$23,961,770	$24,599,680	$4,895,610	$5,868,510	$1,366,520	$3,767,040	$28,859,940	$140,117,100
6029	Commercial banks, nec		$17,621,520	$15,578,820			$4,932,000	$26,313,840	$127,755,600
6510	Real Estate							$30,818,160	$149,624,400
7011	Hotels and motels	$15,033,830	$33,377,120	$7,911,840		$2,585,720	$14,171,040	$8,449,740	$41,024,100
7311	Advertising agencies				$9,810,340				
7322	Adjustment & collection services			$5,663,580			$4,286,880		
7359	Equipment rental & leasing, nec			$74,865,150			$2,586,240	$9,476,460	$46,008,900
7371	Computer programming services			$7,406,220					
7699	Repair services, nec			$3,975,000			$2,309,760	$16,634,520	$80,761,800
8111	Legal service						$2,432,160		
8711	Engineering services			$4,246,890				$14,920,560	$72,440,400
8744	Facilities support services				$41,374,470				
8999	Services, nec								

Sources: Bureau of Economic Analysis Input Output Matrix; Applied Economics.

FIGURE 4-2

PRIMARY SUPPLIERS FOR HIGH TECH INDUSTRIES IN SAN JOS

		San Jose Buyer Industries							
SIC	Supplier Industry Name	3571 Electronic Computers	8731 Comm. Physical Research	3679 Electronic Components	3841 Surgical Instruments	3825 Elec. Measuring Instruments	3812 Search & Nav. Equipment	3724 Aircraft Engines & Parts	Total
1540	Maintenance and repair of buildings	$7,669,920						$672,040	$64,695,880
2435	Hardwood veneer and plywood						$631,160		$631,160
2652	Setup paperboard boxes					$3,922,740			$9,435,340
2653	Corrugated and solid fiber boxes	$13,791,240		$3,804,480					$209,630,370
2657	Folding paperboard boxes								$13,201,690
2759	Commercial printing, nec								$12,095,130
2761	Manifold business forms								$5,716,050
2819	Industrial inorganic chemicals, nec								$12,805,510
2821	Plastics materials and resins			$3,636,480	$1,022,420				$22,689,780
2869	Industrial organic chemicals, nec								$43,921,360
2891	Adhesives and sealants				$1,076,020				$1,076,020
2899	Chemical preparations, nec						$1,354,080	$707,550	$18,070,350
3053	Gaskets, packing and sealing devices	$7,304,520			$1,158,430				$59,342,710
3069	Fabricated rubber products, nec				$11,699,540		$337,900		$12,037,440
3089	Plastics products, nec	$48,459,000		$77,512,320	$1,955,730				$956,216,390
3211	Flat glass				$6,334,850		$363,320		$58,535,440
3312	Blast furnaces and steel mills						$362,700	$1,626,040	$9,194,720
3325	Steel foundries, nec							$720,800	$2,323,540
3331	Primary copper				$3,142,300				$3,142,300
3339	Primary nonferrous metals, nec			$6,341,760					$48,913,260
3351	Copper rolling and drawing			$4,997,760					$29,778,320
3353	Aluminum sheet, plate, and foil			$4,609,920					$29,983,120
3354	Aluminum extruded products								$1,303,020
3356	Nonferrous rolling and drawing, nec								$51,603,200
3357	Nonferrous wiredrawing & insulating			$3,734,400					$60,198,210
3363	Aluminum die-castings	$7,161,840						$782,280	$57,830,040
3369	Nonferrous foundries, nec							$1,433,650	$1,433,650
3443	Fabricated plate work (boiler shops)								$1,651,000
3444	Sheet metalwork	$19,394,040				$993,510			$155,477,070
3451	Screw machine products								$2,538,720
3462	Iron and steel forgings							$3,228,230	$3,228,230
3463	Nonferrous forgings							$2,189,960	$2,189,960
3469	Metal stampings, nec	$7,113,120		$5,241,600	$1,245,530				$123,489,470
3471	Plating and polishing			$20,033,280		$1,152,540			$148,598,730
3479	Metal coating and allied services			$4,897,920					$29,183,440
3491	Industrial valves								$1,628,140
3495	Wire springs				$1,478,690				$1,478,690
3519	Internal combustion engines, nec								$1,391,920
3544	Special dies, tools, jigs & fixtures				$5,366,030		$261,020		$5,627,050
3559	Special industry machinery, nec								$18,295,740
3561	Pumps and pumping equipment								$1,351,280
3571	Electronic computers								$12,423,690
3599	Industrial machinery, nec				$1,001,650		$445,160	$1,113,530	$5,648,980
3613	Switchgear and switchboard apparatus	$14,160,120		$3,906,240					$139,064,560
3621	Motors and generators	$14,629,920							$119,046,940

FIGURE 4-2

PRIMARY SUPPLIERS FOR HIGH TECH INDUSTRIES IN SAN JOS

		San Jose Buyer Industries							
		3571	8731	3679	3841	3825	3812	3724	
		Electronic	Comm. Physical	Electronic	Surgical	Elec. Measuring	Search &	Aircraft Engines	Total
SIC	Supplier Industry Name	Computers	Research	Components	Instruments	Instruments	Nav. Equipment	& Parts	
3625	Relays and industrial controls	$36,115,440				$5,583,150			$297,586,190
3641	Electric lamps				$3,926,200				$11,835,320
3648	Lighting equipment, nec				$3,643,460				$3,926,200
3651	Audio and video equipment								$3,643,460
3669	Communications equipment								$12,647,520
3671	Electron tubes								$2,799,360
3672	Printed circuit boards	$128,297,160				$10,550,700			$1,105,043,250
3674	Semiconductors and related devices		$2,882,700	$8,271,360		$4,218,570	$300,080		$535,104,790
3679	Electronic components, nec			$64,095,360	$1,024,430		$742,140		$493,036,130
3691	Storage batteries				$1,537,650				$1,537,650
3694	Engine electrical equipment				$16,352,020				$16,352,020
3724	Aircraft engines and engine parts							$7,534,480	$7,534,480
3728	Aircraft parts and equipment, nec							$2,469,270	$2,469,270
3821	Laboratory apparatus and furniture						$1,792,420		$4,046,020
3825	Instruments to measure electricity					$6,388,560	$321,780		$6,710,340
3827	Optical instruments and lenses								$7,952,470
3842	Surgical appliances and supplies				$1,715,870				$1,715,870
4011	Rail transportation				$5,784,780				$33,067,040
4311	U.S. Postal Service		$1,678,500						$7,829,700
4512	Air transportation, scheduled		$5,803,650	$4,354,560				$1,114,590	$49,026,620
4513	Air courier services	$32,805,960							$261,316,440
4813	Telephone communications	$18,047,280	$4,178,700	$4,823,040		$1,178,190			$226,698,020
4911	Electric services	$17,758,440		$7,240,320		$1,220,940		$1,241,790	$233,466,960
5000	Wholesale	$202,960,560	$1,843,200	$50,991,360	$2,373,140	$7,467,570	$1,166,220	$2,366,450	$2,150,672,020
5812	Eating places	$17,845,440	$3,900,600			$779,760			$155,798,610
6029	Commercial banks, nec	$24,259,080	$1,792,800	$4,961,280				$1,721,970	$266,171,300
6510	Real Estate	$22,118,880	$6,450,750	$3,553,920		$998,640			$225,323,970
7011	Hotels and motels	$25,905,120	$1,485,000					$1,908,530	$209,741,210
7311	Advertising agencies	$7,102,680	$2,319,750	$6,731,520	$1,340,670	$2,672,730	$480,500	$3,337,940	$146,539,180
7322	Adjustment & collection services								$9,810,340
7359	Equipment rental & leasing, nec		$1,703,700					$913,190	$12,567,350
7371	Computer programming services	$7,965,720	$9,149,850						$150,052,320
7699	Repair services, nec								$7,406,220
8111	Legal service	$13,982,640	$2,859,750						$120,523,470
8711	Engineering services						$677,660		$3,109,820
8744	Facilities support services	$12,541,920	$4,376,700						$108,526,470
8999	Services, nec		$1,651,050						$43,025,520

Sources: Bureau of Economic Analysis Input Output Matrix; Applied Econor

FIGURE 4-3

SUPPLIER INDUSTRIES EXCLUSIVE TO M1 OR M4 ZONING

		San Jose Buyer Industries							
SIC	Supplier Industry Name	3674 Semiconductors & Related Devices	3672 Printed Circuit Boards	7372 Prepackaged Software	3827 Optical Instruments	3559 Special Ind. Machinery	3663 Communications Equipment	3577 Computer Peripherals	3695 Magnetic & Optical Media
5000	Wholesale	$127,014,240	$252,832,160	$6,924,450	$41,197,530	$11,976,100	$27,833,760	$241,453,080	$1,172,272,200
3089	Plastics products, nec	$26,571,250	$384,331,920	$8,190,090	$68,377,480	$3,276,600		$57,649,500	$279,892,500
3625	Relays and industrial controls					$1,717,040	$2,607,840	$42,964,920	$208,597,800
2653	Corrugated and solid fiber boxes	$68,865,350	$18,863,880			$8,242,300		$16,406,820	$79,656,300
3444	Sheet metalwork							$23,072,220	$112,017,300
3471	Plating and polishing	$28,081,230	$99,331,680						
3613	Switchgear and switchboard apparatus		$19,368,440			$2,997,200		$16,845,660	$81,786,900
3469	Metal stampings, nec	$14,044,280	$25,989,600		$20,308,780			$8,462,160	$41,084,400
3621	Motors and generators					$2,512,060		$17,404,560	$84,500,400
3357	Nonferrous wiredrawing & insulating	$37,947,410	$18,516,400						
3211	Flat glass	$38,783,030			$13,054,240			$8,520,120	$41,365,800
3363	Aluminum die-castings		$24,285,520						
3479	Metal coating and allied services		$18,030,880						
2821	Plastics materials and resins					$2,184,400			
3559	Special industry machinery, nec	$16,111,340							
3694	Engine electrical equipment				$13,201,690				
2657	Folding paperboard boxes						$12,647,520		
3669	Communications equipment			$12,095,130					
2759	Commercial printing, nec				$11,835,320				
3641	Electric lamps				$7,952,470				
3827	Optical instruments and lenses								
3724	Aircraft engines and engine parts			$7,406,220					
7699	Repair services, nec			$5,716,050					
2761	Manifold business forms					$3,088,640			
3599	Industrial machinery, nec								
3544	Special dies, tools, jigs & fixtures						$2,253,600		
3821	Laboratory apparatus and furniture								
3648	Lighting equipment, nec								
3651	Audio and video equipment						$2,538,720		
3451	Screw machine products								
3728	Aircraft parts and equipment, nec								
3842	Surgical appliances and supplies					$1,628,140			
3491	Industrial valves								
3495	Wire springs					$1,351,280			
3561	Pumps and pumping equipment								
2891	Adhesives and sealants								

Sources: Bureau of Economic Analysis Input Output Matrix; Applied Economics; City of San Jose.

FIGURE 4-3

SUPPLIER INDUSTRIES EXCLUSIVE TO M1 OR M4 ZONIN

		San Jose Buyer Industries						
		3571	8731	3679	3841	3825	3812	3724	Total
		Electronic	Comm. Physical	Electronic	Surgical	Elec. Measuring	Search &	Aircraft Engines	
SIC	Supplier Industry Name	Computers	Research	Components	Instruments	Instruments	Nav. Equipment	& Parts	
5000	Wholesale	$202,960,560	$1,843,200	$50,991,360	$2,373,140	$7,467,570	$1,166,220	$2,366,450	$2,150,672,020
3089	Plastics products, nec	$48,459,000		$77,512,320	$1,955,730				$956,216,390
3625	Relays and industrial controls	$36,115,440				$5,583,150			$297,586,190
2653	Corrugated and solid fiber boxes	$13,791,240		$3,804,480					$209,630,370
3444	Sheet metalwork	$19,394,040				$993,510			$155,477,070
3471	Plating and polishing			$20,033,280		$1,152,540			$148,598,730
3613	Switchgear and switchboard apparatus	$14,160,120		$3,906,240					$139,064,560
3469	Metal stampings, nec	$7,113,120		$5,241,600	$1,245,530				$123,489,470
3621	Motors and generators	$14,629,920							$119,046,940
3357	Nonferrous wiredrawing & insulating			$3,734,400					$60,198,210
3211	Flat glass				$6,334,850		$363,320		$58,535,440
3363	Aluminum die-castings	$7,161,840						$782,280	$57,830,040
3479	Metal coating and allied services			$4,897,920					$29,183,440
2821	Plastics materials and resins			$3,636,480	$1,022,420				$22,689,780
3559	Special industry machinery, nec								$18,295,740
3694	Engine electrical equipment				$16,352,020				$16,352,020
2657	Folding paperboard boxes								$13,201,690
3669	Communications equipment								$12,647,520
2759	Commercial printing, nec								$12,095,130
3641	Electric lamps								$11,835,320
3827	Optical instruments and lenses								$7,952,470
3724	Aircraft engines and engine parts							$7,534,480	$7,534,480
7699	Repair services, nec								$7,406,220
2761	Manifold business forms								$5,716,050
3599	Industrial machinery, nec				$1,001,650		$445,160	$1,113,530	$5,648,980
3544	Special dies, tools, jigs & fixtures				$5,366,030		$261,020		$5,627,050
3821	Laboratory apparatus and furniture						$1,792,420		$4,046,020
3648	Lighting equipment, nec				$3,926,200				$3,926,200
3651	Audio and video equipment				$3,643,460				$3,643,460
3451	Screw machine products								$2,538,720
3728	Aircraft parts and equipment, nec							$2,469,270	$2,469,270
3842	Surgical appliances and supplies				$1,715,870				$1,715,870
3491	Industrial valves								$1,628,140
3495	Wire springs				$1,478,690				$1,478,690
3561	Pumps and pumping equipment								$1,351,280
2891	Adhesives and sealants				$1,076,020				$1,076,020

Sources: Bureau of Economic Analysis Input Output Matrix; Applie

FIGURE 4-4

SAN JOSE DEMAND FOR M1 AND M4 SUPPLIER INDUSTRIES AND CURRENT LOCAL EMPLOYMENT

SIC	Supplier Industry Name	Total San Jose Buyer Industry Purchases	Current San Jose Employment	National Average Output per Employee	Estimated San Jose Production	Percent of Buyer Industry Purchases
2821	Plastics materials and resins	$22,689,780	0	$526,452	$0	0%
3357	Nonferrous wiredrawing & insulating	$60,198,210	0	$241,528	$0	0%
3491	Industrial valves	$1,628,140	0	$225,241	$0	0%
3495	Wire springs	$1,478,690	0	$100,194	$0	0%
3613	Switchgear and switchboard apparatus	$139,064,560	0	$170,758	$0	0%
3621	Motors and generators	$119,046,940	0	$148,354	$0	0%
3641	Electric lamps	$11,835,320	0	$131,528	$0	0%
3648	Lighting equipment, nec	$3,926,200	0	$155,023	$0	0%
3821	Laboratory apparatus and furniture	$4,046,020	0	$241,231	$0	0%
3211	Flat glass	$58,535,440	14	$135,283	$1,893,962	3%
3363	Aluminum die-castings	$57,830,040	28	$122,799	$3,438,372	6%
3694	Engine electrical equipment	$16,352,020	10	$136,886	$1,368,860	8%
2657	Folding paperboard boxes	$13,201,690	8	$180,996	$1,447,968	11%
3471	Plating and polishing	$148,598,730	276	$71,124	$19,630,224	13%
3089	Plastics products, nec	$956,216,390	857	$158,670	$135,980,190	14%
3625	Relays and industrial controls	$297,586,190	295	$180,698	$53,305,910	18%
2653	Corrugated and solid fiber boxes	$209,630,370	234	$173,793	$40,667,562	19%
3469	Metal stampings, nec	$123,489,470	259	$136,689	$35,402,451	29%
2761	Manifold business forms	$5,716,050	14	$159,512	$2,233,168	39%
3451	Screw machine products	$2,538,720	11	$113,835	$1,252,185	49%
5000	Wholesale	$2,150,672,020	18,487	$108,425	$2,004,452,975	93%
3479	Metal coating and allied services	$29,183,440	227	$152,441	$34,604,107	119%
3728	Aircraft parts and equipment, nec	$2,469,270	31	$142,102	$4,405,162	178%
3444	Sheet metalwork	$155,477,070	2,341	$125,925	$294,790,425	190%
3599	Industrial machinery, nec	$5,648,980	159	$155,464	$24,718,776	438%
3842	Surgical appliances and supplies	$1,715,870	65	$169,140	$10,994,100	641%
2759	Commercial printing, nec	$12,095,130	865	$108,546	$93,892,290	776%
2891	Adhesives and sealants	$1,076,020	36	$266,257	$9,585,252	891%
3669	Communications equipment	$12,647,520	856	$148,635	$127,231,560	1006%
7699	Repair services, nec	$7,406,220	1,277	$71,677	$91,531,529	1236%
3724	Aircraft engines and engine parts	$7,534,480	650	$192,470	$125,105,500	1660%
3561	Pumps and pumping equipment	$1,351,280	120	$213,955	$25,674,600	1900%
3544	Special dies, tools, jigs & fixtures	$5,627,050	1,804	$84,658	$152,723,032	2714%
3651	Audio and video equipment	$3,643,460	454	$251,105	$114,001,670	3129%
3559	Special industry machinery, nec	$18,295,740	3,535	$273,634	$967,296,190	5287%
3827	Optical instruments and lenses	$7,952,470	3,685	$141,694	$522,142,390	6566%

Source: Bureau of Economic Analysis; Minnesota IMPLAN; Applied Economics.

FIGURE 4-5

SUPPLIERS WITH HIGHEST PRIORITY FOR RETENTION BASED ON LOCAL DEMAND

SIC	Supplier Industry Name	Local Output/ Buyer Industry Purchases	Current San Jose Employment	Projected Annual U.S. Output Growth 1999-2006
3211	Flat glass	3%	14	0.40%
3363	Aluminum die-castings	6%	28	1.10%
3694	Engine electrical equipment	8%	10	4.40%
2657	Folding paperboard boxes	11%	8	3.00%
3471	Plating and polishing	13%	276	2.60%
3089	Plastics products, nec	14%	857	4.50%
3625	Relays and industrial controls	18%	295	0.90%
2653	Corrugated and solid fiber boxes	19%	234	3.00%
3469	Metal stampings, nec	29%	259	0.10%
2761	Manifold business forms	39%	14	2.40%
3451	Screw machine products	49%	11	0.10%
5000	Wholesale	93%	18,487	3.80%
3479	Metal coating and allied services	119%	227	2.60%
3728	Aircraft parts and equipment, nec	178%	31	2.50%
3444	Sheet metalwork	190%	2,341	1.00%

Source: Bureau of Economic Analysis; Minnesota IMPLAN; Bureau of Labor Statistics; Applied Economics.

Criteria: Local production less than local buyer purchases. San Jose employment of 10 or more, positive projected national output growth.

FIGURE 5-1

CRITICAL M1 AND M4 SUPPLIERS TO THE HIGH TECH INDUSTRY IN SAN JOSE BASED ON SURVEY RESULTS

SIC	Industry	Critical Close Proximity Suppliers (Ques 11 to 13)	Products Out-Sourced Locally (Ques 9 & 10)	Critical Suppliers Overall (Ques 6 & 7)	Key Industries from Supplier Analysis	Local Employment	Local Sales
2653	Corrugated and Solid Fiber Boxes			X	X	234	$14,464,008
2759	Commercial Printing, nec		X	X	X	865	$42,468,040
2813	Industrial Gases	X				20	$530,900
3089	Plastic Products, nec			X	X	857	$66,709,737
3429	Hardware, nec	X				281	$8,438,711
3444	Sheet Metalwork	X	X	X	X	2,341	$254,220,895
3469	Metal Stampings			X	X	259	$20,398,840
3471	Plating & Polishing			X	X	276	$15,650,028
3479	Metal Coating Services			X	X	227	$11,921,813
3492	Fluid Power Valves			X	X	60	$6,000,000
3499	Fabricated Metal Products, nec			X	X	497	$8,310,337
3544	Special Dies, Tools, Jigs	X		X	X	1,804	$29,922,948
3559	Special Industry Machinery	X	X	X	X	3,535	$3,272,087,910
3599	Industrial Machinery nec	X	X	X		159	$18,950,574
3612	Transformers			X	X	25	$381,950
3625	Relays and Industrial Controls			X	X	295	$14,037,280
3661	Telephone Apparatus			X	X	1,821	$345,631,263
3695	Magnetic and Optical Recording Media			X		2,434	$192,536,702
3699	Electrical Equipment and Supplies	X		X	X	1,795	$289,454,520
3822	Environmental Controls			X		356	$27,357,532
3826	Analytical Instruments			X		636	$105,044,304
3827	Optical Instruments and Lenses			X	X	3,685	$1,214,657,070
3829	Measuring and Controlling Devices			X	X	327	$84,714,582
3841	Surgical and Medical Instruments			X	X	1,573	$120,325,062
4953	Refuse Systems and Recycling	X	X			717	$61,690,680
5063	Electrical Equipment	X		X	X	2,192	$348,826,112
5065	Electronic Parts and Equipment	X		X	X	3,911	$1,790,526,198
5075	Wholesale Heating Exchangers	X			X	21	$2,977,065

Source: San Jose High Tech Survey; Dun & Bradstreet Marketplace, 2000.

FIGURE 5-2

OCCUPATIONAL DISTRIBUTION OF CRITICAL SUPPLIER INDUSTRIES

Occupational Title	2653 Corrugated Boxes	2759 Commercial Printing	2813 Industrial Gases	3089 Plastic Products	3429 Misc. Hardware	3444 Sheet Metalwork	3469 Metal Stampings	3470 Plating & Polishing
Managerial and administrative occupations	4.82%	7.74%	8.46%	6.01%	5.78%	6.87%	5.15%	7.35%
Management support occupations	1.73%	1.90%	3.24%	1.45%	1.73%	2.89%	1.94%	1.15%
Engineers	0.45%	0.17%	7.10%	1.39%	1.86%	1.59%	1.93%	0.56%
Architects and surveyors	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Physical scientists	0.00%	0.01%	2.90%	0.09%	0.00%	0.02%	0.00%	0.14%
Life scientists	0.00%	0.00%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%
Computer, mathematical, and operations research analysts	0.13%	0.24%	0.97%	0.11%	0.27%	0.17%	0.18%	0.10%
Lawyers and judicial workers	0.00%	0.00%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%
Teachers, librarians, and counselors	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%
Health assessment and treating occupations	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%
Health technicians and technologists	0.03%	0.01%	0.07%	0.02%	0.08%	0.02%	0.07%	0.00%
Writers, artists, and entertainers	0.71%	1.72%	0.38%	0.11%	0.08%	0.05%	0.05%	0.00%
Engineering and science technicians and technologists	0.21%	0.14%	4.80%	1.07%	1.00%	3.03%	0.94%	0.56%
Technicians, except health and engineering and science	0.14%	0.29%	0.52%	0.15%	0.32%	0.30%	0.31%	0.09%
All other professional workers	0.04%	0.07%	1.97%	0.08%	0.11%	0.16%	0.16%	0.00%
Salespersons, retail	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Counter and rental clerks	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Stock clerks, sales floor	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cashiers	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All other sales and related workers	4.75%	6.01%	1.92%	2.10%	2.82%	2.89%	1.37%	2.02%
Adjusters, investigators, and collectors	0.81%	0.87%	0.29%	0.43%	0.64%	0.30%	0.24%	0.16%
Records processing occupations, except financial	0.75%	1.34%	0.72%	0.69%	0.71%	0.39%	0.33%	0.19%
Secretaries, stenographers, and typists	1.08%	1.96%	4.00%	1.49%	1.53%	2.03%	1.19%	1.81%
Financial records processing occupations	1.65%	2.79%	1.31%	1.45%	1.64%	1.99%	1.11%	1.94%
Information clerks	0.20%	0.78%	0.12%	0.19%	0.12%	0.17%	0.14%	0.15%
Computer operators and peripheral equipment operators	0.11%	0.18%	0.31%	0.11%	0.23%	0.17%	0.12%	0.07%
Communications equipment operators	0.24%	0.18%	0.15%	0.17%	0.19%	0.17%	0.16%	0.08%
Mail clerks and messengers	0.00%	0.51%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%
Material recording, scheduling, dispatching, and distributing occupations	2.73%	3.92%	2.37%	3.28%	4.33%	2.80%	3.13%	3.23%
Other clerical and administrative support workers	1.51%	5.05%	2.80%	1.42%	1.81%	1.98%	1.48%	2.32%
Protective service occupations	0.09%	0.04%	1.08%	0.12%	0.20%	0.12%	0.24%	0.08%
Food preparation and service occupations	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cleaning and building service occupations	0.64%	0.71%	0.95%	0.79%	0.84%	0.69%	1.14%	0.85%
All other service workers	0.17%	0.07%	0.32%	0.14%	0.14%	0.14%	0.14%	0.23%
All other agricultural, forestry, fishing, and related workers	0.00%	0.00%	0.00%	0.01%	0.00%	0.02%	0.00%	0.00%

FIGURE 5-2

OCCUPATIONAL DISTRIBUTION OF CRITICAL SUPPLIER INDUSTRIES

Occupational Title	2653 Corrugated Boxes	2759 Commercial Printing	2813 Industrial Gases	3089 Plastic Products	3429 Misc. Hardware	3444 Sheet Metalwork	3469 Metal Stampings	3470 Plating & Polishing
Blue collar worker supervisors	4.95%	3.12%	5.41%	4.96%	3.88%	4.19%	4.41%	4.98%
Inspectors, testers, and graders, precision	1.35%	0.80%	2.36%	3.11%	2.06%	1.41%	3.84%	3.18%
Machinery and related mechanics, installers, and repairers	4.05%	1.06%	6.94%	3.62%	2.18%	1.91%	4.87%	2.81%
Vehicle and mobile equipment mechanics and repairers	0.08%	0.00%	0.58%	0.00%	0.06%	0.10%	0.14%	0.05%
Electrical and electronic equipment mechanics, installers, and repairers	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other mechanics, installers, and repairers	0.05%	0.03%	1.75%	0.20%	0.24%	0.39%	0.84%	0.10%
Construction trades	0.49%	0.20%	3.65%	0.42%	0.60%	0.82%	1.60%	0.22%
Extractive and related workers, including blasters	0.03%	0.00%	0.09%	0.04%	0.00%	0.39%	0.00%	0.00%
Metal workers, precision	0.98%	0.14%	1.13%	2.27%	7.56%	11.49%	11.27%	1.89%
Woodworkers, precision	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Printing workers, precision	0.12%	12.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Food workers, precision	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other precision workers	0.35%	0.16%	0.00%	0.26%	0.14%	0.07%	0.25%	0.19%
Machine tool cut and form setters, operators, and tenders, metal and plastic	0.37%	0.00%	0.00%	6.88%	17.07%	8.80%	24.00%	4.75%
Numerical control machine tool operators and tenders, metal and plastic	0.00%	0.00%	0.00%	0.13%	0.47%	0.28%	0.31%	0.00%
Combination machine tool setters, set-up operators, operators, and tenders	0.00%	0.00%	0.00%	0.64%	2.58%	1.10%	1.33%	0.16%
Metal fabricating machine setters, operators, and related workers	0.00%	0.00%	0.00%	0.00%	1.37%	7.64%	3.16%	0.65%
Metal and plastic processing machine setters, operators, and related workers	0.38%	0.00%	0.00%	19.21%	3.68%	0.95%	2.60%	20.86%
Woodworking machine setters, operators, and other related workers	0.00%	0.00%	0.00%	0.15%	0.00%	0.05%	0.00%	0.00%
Printing, binding, and related workers	8.62%	31.23%	0.00%	1.10%	0.16%	0.04%	0.18%	0.34%
Textile and related setters, operators, and related workers	0.04%	0.00%	0.06%	0.50%	0.00%	0.00%	0.00%	0.00%
Other machine setters, set-up operators, operators, and tenders	25.28%	2.52%	13.81%	7.49%	4.47%	2.15%	2.49%	8.92%
Assemblers, precision	0.00%	0.00%	0.00%	0.00%	0.58%	2.31%	0.28%	0.18%
Hand workers, including assemblers and fabricators	4.30%	1.84%	1.22%	11.94%	17.83%	18.16%	7.27%	9.18%
Plant and system occupations	0.09%	0.02%	7.66%	0.21%	0.06%	0.02%	0.08%	0.12%
Motor vehicle operators	2.52%	1.37%	2.49%	0.79%	0.29%	1.83%	0.57%	1.97%
Water transportation and related workers	0.08%	0.02%	0.06%	0.04%	0.00%	0.04%	0.06%	0.00%
Material moving equipment operators	4.75%	0.84%	1.99%	1.81%	1.22%	1.50%	3.07%	1.56%
All other transportation and material moving equipment operators	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Helpers, laborers, and material movers, hand	18.16%	7.39%	3.09%	11.34%	7.05%	5.39%	5.88%	14.80%

Source: Bureau of Labor Statistics.

FIGURE 5-2

OCCUPATIONAL DISTRIBUTION OF CRITICAL SUPPLIER INDUSTRIES

Occupational Title	3490 Valves & Metal Pdts	3544 Special Tools & Dies	3559 Special Ind. Machinery	3599 Industrial Machinery	3612 Transformers	3625 Relays & Ind. Controls	3661 Telephone Apparatus
Managerial and administrative occupations	6.74%	7.62%	8.11%	8.37%	5.64%	5.74%	9.64%
Management support occupations	2.13%	2.08%	2.87%	2.24%	2.53%	2.23%	4.96%
Engineers	1.99%	3.49%	5.57%	2.59%	5.62%	5.95%	14.09%
Architects and surveyors	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Physical scientists	0.05%	0.00%	0.12%	0.00%	0.00%	0.00%	0.07%
Life scientists	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Computer, mathematical, and operations research analysts	0.23%	0.24%	0.34%	0.18%	0.81%	0.33%	1.04%
Lawyers and judicial workers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%
Teachers, librarians, and counselors	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Health assessment and treating occupations	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Health technicians and technologists	0.04%	0.02%	0.03%	0.02%	0.00%	0.07%	0.08%
Writers, artists, and entertainers	0.15%	0.21%	0.51%	0.12%	0.28%	0.33%	1.51%
Engineering and science technicians and technologists	1.62%	2.34%	4.67%	1.45%	3.96%	4.45%	8.18%
Technicians, except health and engineering and science	0.32%	0.81%	0.74%	0.54%	0.70%	0.55%	1.41%
All other professional workers	0.05%	0.16%	0.25%	0.11%	0.10%	0.08%	0.63%
Salespersons, retail	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Counter and rental clerks	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Stock clerks, sales floor	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cashiers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All other sales and related workers	3.05%	2.59%	4.09%	1.74%	2.27%	2.12%	2.48%
Adjusters, investigators, and collectors	0.38%	0.18%	0.35%	0.12%	0.25%	0.28%	0.40%
Records processing occupations, except financial	0.60%	0.71%	0.94%	0.42%	0.61%	0.63%	0.68%
Secretaries, stenographers, and typists	1.80%	2.42%	2.76%	2.65%	1.88%	2.13%	3.26%
Financial records processing occupations	1.82%	1.66%	1.89%	1.85%	1.18%	1.22%	1.40%
Information clerks	0.19%	0.17%	0.25%	0.14%	0.16%	0.14%	0.18%
Computer operators and peripheral equipment operators	0.22%	0.15%	0.28%	0.09%	0.24%	0.22%	0.40%
Communications equipment operators	0.19%	0.14%	0.20%	0.09%	0.15%	0.17%	0.21%
Mail clerks and messengers	0.00%	0.00%	0.08%	0.02%	0.09%	0.10%	0.20%
Material recording, scheduling, dispatching, and distributing occupations	4.14%	2.96%	4.82%	2.80%	3.61%	3.48%	4.23%
Other clerical and administrative support workers	2.14%	2.30%	2.83%	2.95%	1.49%	1.46%	2.68%
Protective service occupations	0.19%	0.05%	0.10%	0.07%	0.11%	0.18%	0.24%
Food preparation and service occupations	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.05%
Cleaning and building service occupations	0.77%	1.20%	0.76%	1.25%	0.49%	0.71%	0.47%
All other service workers	0.15%	0.08%	0.18%	0.05%	0.07%	0.12%	0.17%
All other agricultural, forestry, fishing, and related workers	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%

FIGURE 5-2

OCCUPATIONAL DISTRIBUTION OF CRITICAL SUPPLIER INDUSTRIES

Occupational Title	3490 Valves & Metal Pdts	3544 Special Tools & Dies	3559 Special Ind. Machinery	3599 Industrial Machinery	3612 Transformers	3625 Relays & Ind. Controls	3661 Telephone Apparatus
Blue collar worker supervisors	4.44%	3.18%	3.73%	3.61%	3.54%	3.27%	2.58%
Inspectors, testers, and graders, precision	2.91%	1.91%	1.85%	2.77%	3.93%	3.97%	5.33%
Machinery and related mechanics, installers, and repairers	2.82%	1.74%	2.47%	1.70%	1.56%	1.87%	0.89%
Vehicle and mobile equipment mechanics and repairers	0.03%	0.04%	0.00%	0.06%	0.00%	0.00%	0.00%
Electrical and electronic equipment mechanics, installers, and repairers	0.00%	0.00%	0.03%	0.00%	0.26%	0.54%	1.03%
Other mechanics, installers, and repairers	0.16%	0.23%	0.47%	0.22%	0.08%	0.26%	0.83%
Construction trades	0.56%	0.48%	1.13%	0.40%	0.89%	0.62%	0.34%
Extractive and related workers, including blasters	0.02%	0.02%	0.00%	0.03%	0.00%	0.03%	0.06%
Metal workers, precision	8.35%	25.29%	10.96%	23.28%	3.20%	3.99%	1.46%
Woodworkers, precision	0.00%	1.68%	0.11%	0.04%	0.00%	0.00%	0.00%
Printing workers, precision	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Food workers, precision	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other precision workers	0.17%	0.45%	0.30%	0.08%	0.00%	0.05%	0.07%
Machine tool cut and form setters, operators, and tenders, metal and plastic	14.10%	13.57%	8.50%	15.13%	4.33%	5.78%	0.67%
Numerical control machine tool operators and tenders, metal and plastic	0.93%	2.76%	1.58%	4.01%	0.49%	0.81%	0.10%
Combination machine tool setters, set-up operators, operators, and tenders	2.12%	1.78%	0.79%	2.95%	0.69%	0.90%	0.15%
Metal fabricating machine setters, operators, and related workers	4.36%	0.64%	1.83%	1.90%	1.47%	0.71%	0.40%
Metal and plastic processing machine setters, operators, and related workers	5.06%	1.57%	1.19%	0.95%	1.63%	2.38%	0.63%
Woodworking machine setters, operators, and other related workers	0.00%	0.00%	0.11%	0.02%	0.00%	0.05%	0.00%
Printing, binding, and related workers	0.15%	0.00%	0.00%	0.00%	0.11%	0.05%	0.18%
Textile and related setters, operators, and related workers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other machine setters, set-up operators, operators, and tenders	2.65%	1.39%	2.00%	1.20%	2.10%	1.87%	0.91%
Assemblers, precision	0.90%	2.96%	6.14%	1.46%	11.06%	5.40%	10.19%
Hand workers, including assemblers and fabricators	13.41%	5.95%	10.67%	7.44%	28.29%	30.52%	12.91%
Plant and system occupations	0.04%	0.02%	0.00%	0.00%	0.00%	0.10%	0.05%
Motor vehicle operators	0.60%	0.28%	0.29%	0.35%	0.28%	0.21%	0.11%
Water transportation and related workers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Material moving equipment operators	1.28%	0.47%	0.51%	0.52%	0.98%	0.97%	0.13%
All other transportation and material moving equipment operators	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Helpers, laborers, and material movers, hand	6.00%	2.03%	2.55%	2.02%	2.90%	2.89%	2.24%

Source: Bureau of Labor Statistics.

FIGURE 5-2

OCCUPATIONAL DISTRIBUTION OF CRITICAL SUPPLIER INDUSTRIES

Occupational Title	3690 Optical Media & Electrical Equip	3820 Instruments & Lenses	3841 Medical Instruments	4953 Refuse & Recycling	5060 Wholesale Electrical	Total
Managerial and administrative occupations	5.80%	9.56%	9.07%	8.47%	10.36%	7.72%
Management support occupations	2.31%	3.78%	2.82%	1.39%	2.59%	2.40%
Engineers	5.57%	10.46%	4.71%	0.74%	0.57%	3.16%
Architects and surveyors	0.00%	0.00%	0.00%	0.06%	0.00%	0.00%
Physical scientists	0.11%	0.25%	0.33%	0.48%	0.02%	0.14%
Life scientists	0.00%	0.09%	0.52%	0.04%	0.00%	0.04%
Computer, mathematical, and operations research analysts	0.34%	0.91%	0.65%	0.08%	0.17%	0.32%
Lawyers and judicial workers	0.00%	0.00%	0.00%	0.08%	0.00%	0.01%
Teachers, librarians, and counselors	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%
Health assessment and treating occupations	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Health technicians and technologists	0.11%	0.12%	0.24%	0.00%	0.01%	0.04%
Writers, artists, and entertainers	0.28%	0.70%	0.43%	0.09%	0.35%	0.47%
Engineering and science technicians and technologists	3.59%	7.28%	4.56%	1.03%	1.72%	2.51%
Technicians, except health and engineering and science	0.31%	0.89%	0.54%	0.14%	0.51%	0.47%
All other professional workers	0.27%	0.88%	0.57%	0.33%	0.17%	0.26%
Salespersons, retail	0.00%	0.00%	0.00%	0.04%	2.46%	0.34%
Counter and rental clerks	0.00%	0.00%	0.00%	0.00%	0.08%	0.01%
Stock clerks, sales floor	0.00%	0.00%	0.00%	0.00%	1.18%	0.16%
Cashiers	0.00%	0.00%	0.00%	0.60%	0.26%	0.06%
All other sales and related workers	1.97%	4.05%	5.59%	2.16%	24.23%	6.10%
Adjusters, investigators, and collectors	0.27%	0.35%	0.97%	1.21%	0.62%	0.49%
Records processing occupations, except financial	0.49%	1.06%	1.15%	0.26%	1.78%	0.88%
Secretaries, stenographers, and typists	1.80%	2.86%	3.27%	3.17%	5.13%	2.61%
Financial records processing occupations	1.15%	1.76%	2.00%	3.46%	4.99%	2.26%
Information clerks	0.18%	0.22%	0.23%	0.26%	0.92%	0.35%
Computer operators and peripheral equipment operators	0.19%	0.37%	0.32%	0.14%	0.53%	0.24%
Communications equipment operators	0.11%	0.27%	0.27%	0.12%	0.10%	0.17%
Mail clerks and messengers	0.09%	0.00%	0.00%	0.04%	0.04%	0.08%
Material recording, scheduling, dispatching, and distributing occupations	3.29%	4.33%	4.34%	3.17%	5.46%	3.78%
Other clerical and administrative support workers	1.45%	3.04%	2.88%	6.45%	5.86%	3.08%
Protective service occupations	0.21%	0.25%	0.15%	0.30%	0.00%	0.14%
Food preparation and service occupations	0.00%	0.03%	0.03%	0.04%	0.00%	0.01%
Cleaning and building service occupations	0.81%	0.71%	0.83%	1.62%	0.80%	0.84%
All other service workers	0.10%	0.21%	0.19%	0.90%	0.09%	0.15%
All other agricultural, forestry, fishing, and related workers	0.00%	0.00%	0.02%	0.35%	0.01%	0.01%

FIGURE 5-2

OCCUPATIONAL DISTRIBUTION OF CRITICAL SUPPLIER INDUSTRIES

Occupational Title	3690 Optical Media & Electrical Equip	3820 Instruments & Lenses	3841 Medical Instruments	4953 Refuse & Recycling	5060 Wholesale Electrical	Total
Blue collar worker supervisors	3.69%	3.10%	3.25%	3.28%	2.13%	3.61%
Inspectors, testers, and graders, precision	3.48%	3.42%	3.43%	0.31%	0.12%	2.23%
Machinery and related mechanics, installers, and repairers	3.24%	1.13%	1.56%	4.67%	3.47%	2.60%
Vehicle and mobile equipment mechanics and repairers	0.00%	0.00%	0.00%	3.94%	9.36%	1.44%
Electrical and electronic equipment mechanics, installers, and repairers	0.47%	0.07%	0.00%	0.08%	0.64%	0.18%
Other mechanics, installers, and repairers	0.53%	1.05%	0.97%	1.18%	1.73%	0.62%
Construction trades	0.67%	0.41%	0.24%	2.55%	0.18%	0.61%
Extractive and related workers, including blasters	0.03%	0.08%	0.04%	0.16%	0.10%	0.07%
Metal workers, precision	2.41%	3.72%	2.51%	0.00%	1.36%	6.05%
Woodworkers, precision	0.00%	0.03%	0.02%	0.00%	0.00%	0.11%
Printing workers, precision	0.00%	0.00%	0.00%	0.00%	0.00%	1.32%
Food workers, precision	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%
Other precision workers	0.12%	0.80%	2.49%	0.00%	0.07%	0.30%
Machine tool cut and form setters, operators, and tenders, metal and plastic	2.90%	3.05%	2.42%	0.00%	0.00%	5.93%
Numerical control machine tool operators and tenders, metal and plastic	0.11%	0.47%	0.58%	0.00%	0.00%	0.61%
Combination machine tool setters, set-up operators, operators, and tenders	0.28%	0.00%	0.37%	0.00%	0.00%	0.71%
Metal fabricating machine setters, operators, and related workers	0.67%	0.00%	0.00%	0.00%	0.00%	1.19%
Metal and plastic processing machine setters, operators, and related workers	3.03%	0.72%	1.44%	0.00%	0.00%	3.51%
Woodworking machine setters, operators, and other related workers	0.04%	0.00%	0.00%	0.00%	0.00%	0.03%
Printing, binding, and related workers	0.16%	0.00%	0.00%	0.00%	0.00%	3.76%
Textile and related setters, operators, and related workers	0.00%	0.00%	1.21%	0.00%	0.00%	0.11%
Other machine setters, set-up operators, operators, and tenders	4.76%	1.98%	4.56%	0.37%	0.00%	3.79%
Assemblers, precision	5.10%	8.43%	3.59%	0.00%	0.00%	2.25%
Hand workers, including assemblers and fabricators	30.25%	15.24%	18.99%	0.80%	2.84%	10.45%
Plant and system occupations	0.15%	0.06%	0.05%	4.30%	0.03%	0.36%
Motor vehicle operators	0.78%	0.13%	0.17%	9.85%	3.73%	1.48%
Water transportation and related workers	0.00%	0.02%	0.03%	1.02%	0.04%	0.05%
Material moving equipment operators	1.34%	0.16%	0.29%	4.25%	0.40%	1.20%
All other transportation and material moving equipment operators	0.00%	0.00%	0.00%	0.68%	0.02%	0.02%
Helpers, laborers, and material movers, hand	4.99%	1.51%	5.09%	25.35%	2.73%	6.12%

Source: Bureau of Labor Statistics.

FIGURE 5-3

NUMBER OF JOBS BY OCCUPATION SUPPORTED BY CRITICAL SUPPLIER INDUSTRIES

Occupational Title	2653 Corrugated Boxes	2759 Commercial Printing	2813 Industrial Gases	3089 Plastic Products	3429 Misc. Hardware	3444 Sheet Metalwork	3469 Metal Stampings	3470 Plating & Polishing
Total	234	865	20	857	281	2341	259	503
Managerial and administrative occupations	11	67	2	52	16	161	13	37
Management support occupations	4	16	1	12	5	68	5	6
Engineers	1	1	1	12	5	37	5	3
Architects and surveyors	0	0	0	0	0	0	0	0
Physical scientists	0	0	1	1	0	0	0	1
Life scientists	0	0	0	0	0	0	0	0
Computer, mathematical, and operations research analysts	0	2	0	1	1	4	0	0
Lawyers and judicial workers	0	0	0	0	0	0	0	0
Teachers, librarians, and counselors	0	0	0	0	0	0	0	0
Health assessment and treating occupations	0	0	0	0	0	0	0	0
Health technicians and technologists	0	0	0	0	0	0	0	0
Writers, artists, and entertainers	2	15	0	1	0	1	0	0
Engineering and science technicians and technologists	0	1	1	9	3	71	2	3
Technicians, except health and engineering and science	0	3	0	1	1	7	1	0
All other professional workers	0	1	0	1	0	4	0	0
Salespersons, retail	0	0	0	0	0	0	0	0
Counter and rental clerks	0	0	0	0	0	0	0	0
Stock clerks, sales floor	0	0	0	0	0	0	0	0
Cashiers	0	0	0	0	0	0	0	0
All other sales and related workers	11	52	0	18	8	68	4	10
Adjusters, investigators, and collectors	2	8	0	4	2	7	1	1
Records processing occupations, except financial	2	12	0	6	2	9	1	1
Secretaries, stenographers, and typists	3	17	1	13	4	48	3	9
Financial records processing occupations	4	24	0	12	5	47	3	10
Information clerks	0	7	0	2	0	4	0	1
Computer operators and peripheral equipment operators	0	2	0	1	1	4	0	0
Communications equipment operators	1	2	0	1	1	4	0	0
Mail clerks and messengers	0	4	0	0	0	0	0	0
Material recording, scheduling, dispatching, and distributing occupations	6	34	0	28	12	66	8	16
Other clerical and administrative support workers	4	44	1	12	5	46	4	12
Protective service occupations	0	0	0	1	1	3	1	0
Food preparation and service occupations	0	0	0	0	0	0	0	0
Cleaning and building service occupations	2	6	0	7	2	16	3	4

FIGURE 5-3

NUMBER OF JOBS BY OCCUPATION SUPPORTED BY CRITICAL SUPPLIER INDUSTRIES

Occupational Title	2653 Corrugated Boxes	2759 Commercial Printing	2813 Industrial Gases	3089 Plastic Products	3429 Misc. Hardware	3444 Sheet Metalwork	3469 Metal Stampings	3470 Plating & Polishing
All other service workers	0	1	0	1	0	3	0	1
All other agricultural, forestry, fishing, and related workers	0	0	0	0	0	0	0	0
Blue collar worker supervisors	12	27	1	42	11	98	11	25
Inspectors, testers, and graders, precision	3	7	0	27	6	33	10	16
Machinery and related mechanics, installers, and repairers	9	9	1	31	6	45	13	14
Vehicle and mobile equipment mechanics and repairers	0	0	0	0	0	2	0	0
Electrical and electronic equipment mechanics, installers, and repairers	0	0	0	0	0	0	0	0
Other mechanics, installers, and repairers	0	0	0	2	1	9	2	0
Construction trades	1	2	1	4	2	19	4	1
Extractive and related workers, including blasters	0	0	0	0	0	9	0	0
Metal workers, precision	2	1	0	19	21	269	29	10
Woodworkers, precision	0	0	0	0	0	0	0	0
Printing workers, precision	0	108	0	0	0	0	0	0
Food workers, precision	0	0	0	0	0	0	0	0
Other precision workers	1	1	0	2	0	2	1	1
Machine tool cut and form setters, operators, and tenders, metal and plastic	1	0	0	59	48	206	62	24
Numerical control machine tool operators and tenders, metal and plastic	0	0	0	1	1	7	1	0
Combination machine tool setters, set-up operators, operators, and tenders	0	0	0	6	7	26	3	1
Metal fabricating machine setters, operators, and related workers	0	0	0	0	4	179	8	3
Metal and plastic processing machine setters, operators, and related workers	1	0	0	165	10	22	7	105
Woodworking machine setters, operators, and other related workers	0	0	0	1	0	1	0	0
Printing, binding, and related workers	20	270	0	9	0	1	0	2
Textile and related setters, operators, and related workers	0	0	0	4	0	0	0	0
Other machine setters, set-up operators, operators, and tenders	59	22	3	64	13	50	6	45
Assemblers, precision	0	0	0	0	2	54	1	1
Hand workers, including assemblers and fabricators	10	16	0	102	50	425	19	46
Plant and system occupations	0	0	2	2	0	1	0	1
Motor vehicle operators	6	12	0	7	1	43	1	10
Water transportation and related workers	0	0	0	0	0	1	0	0
Material moving equipment operators	11	7	0	16	3	35	8	8
All other transportation and material moving equipment operators	0	0	0	0	0	0	0	0
Helpers, laborers, and material movers, hand	43	64	1	97	20	126	15	74

Source: Bureau of Labor Statistics.

FIGURE 5-3

NUMBER OF JOBS BY OCCUPATION SUPPORTED BY CRITICAL SUPPLI

Occupational Title	3490 Valves & Metal Pdts	3544 Special Tools & Dies	3559 Special Ind. Machinery	3599 Industrial Machinery	3612 Transformers	3625 Relays & Ind. Controls	3661 Telephone Apparatus
Total	557	1804	3535	159	25	295	1821
Managerial and administrative occupations	38	138	287	13	1	17	175
Management support occupations	12	38	102	4	1	7	90
Engineers	11	63	197	4	1	18	257
Architects and surveyors	0	0	0	0	0	0	0
Physical scientists	0	0	4	0	0	0	1
Life scientists	0	0	0	0	0	0	0
Computer, mathematical, and operations research analysts	1	4	12	0	0	1	19
Lawyers and judicial workers	0	0	0	0	0	0	1
Teachers, librarians, and counselors	0	0	0	0	0	0	0
Health assessment and treating occupations	0	0	0	0	0	0	0
Health technicians and technologists	0	0	1	0	0	0	2
Writers, artists, and entertainers	1	4	18	0	0	1	28
Engineering and science technicians and technologists	9	42	165	2	1	13	149
Technicians, except health and engineering and science	2	15	26	1	0	2	26
All other professional workers	0	3	9	0	0	0	12
Salespersons, retail	0	0	0	0	0	0	0
Counter and rental clerks	0	0	0	0	0	0	0
Stock clerks, sales floor	0	0	0	0	0	0	0
Cashiers	0	0	0	0	0	0	0
All other sales and related workers	17	47	144	3	1	6	45
Adjusters, investigators, and collectors	2	3	12	0	0	1	7
Records processing occupations, except financial	3	13	33	1	0	2	12
Secretaries, stenographers, and typists	10	44	98	4	0	6	59
Financial records processing occupations	10	30	67	3	0	4	25
Information clerks	1	3	9	0	0	0	3
Computer operators and peripheral equipment operators	1	3	10	0	0	1	7
Communications equipment operators	1	2	7	0	0	1	4
Mail clerks and messengers	0	0	3	0	0	0	4
Material recording, scheduling, dispatching, and distributing occupations	23	53	170	4	1	10	77
Other clerical and administrative support workers	12	42	100	5	0	4	49
Protective service occupations	1	1	3	0	0	1	4
Food preparation and service occupations	0	0	0	0	0	0	1
Cleaning and building service occupations	4	22	27	2	0	2	9

FIGURE 5-3

NUMBER OF JOBS BY OCCUPATION SUPPORTED BY CRITICAL SUPPLI

Occupational Title	3490 Valves & Metal Pdts	3544 Special Tools & Dies	3559 Special Ind. Machinery	3599 Industrial Machinery	3612 Transformers	3625 Relays & Ind. Controls	3661 Telephone Apparatus
All other service workers	1	1	6	0	0	0	3
All other agricultural, forestry, fishing, and related workers	0	0	1	0	0	0	0
Blue collar worker supervisors	25	57	132	6	1	10	47
Inspectors, testers, and graders, precision	16	35	66	4	1	12	97
Machinery and related mechanics, installers, and repairers	16	31	87	3	0	6	16
Vehicle and mobile equipment mechanics and repairers	0	1	0	0	0	0	0
Electrical and electronic equipment mechanics, installers, and repairers	0	0	1	0	0	2	19
Other mechanics, installers, and repairers	1	4	17	0	0	1	15
Construction trades	3	9	40	1	0	2	6
Extractive and related workers, including blasters	0	0	0	0	0	0	1
Metal workers, precision	46	456	387	37	1	12	27
Woodworkers, precision	0	30	4	0	0	0	0
Printing workers, precision	0	0	0	0	0	0	0
Food workers, precision	0	0	0	0	0	0	0
Other precision workers	1	8	11	0	0	0	1
Machine tool cut and form setters, operators, and tenders, metal and plastic	79	245	300	24	1	17	12
Numerical control machine tool operators and tenders, metal and plastic	5	50	56	6	0	2	2
Combination machine tool setters, set-up operators, operators, and tenders	12	32	28	5	0	3	3
Metal fabricating machine setters, operators, and related workers	24	11	65	3	0	2	7
Metal and plastic processing machine setters, operators, and related workers	28	28	42	2	0	7	11
Woodworking machine setters, operators, and other related workers	0	0	4	0	0	0	0
Printing, binding, and related workers	1	0	0	0	0	0	3
Textile and related setters, operators, and related workers	0	0	0	0	0	0	0
Other machine setters, set-up operators, operators, and tenders	15	25	71	2	1	6	17
Assemblers, precision	5	53	217	2	3	16	186
Hand workers, including assemblers and fabricators	75	107	377	12	7	90	235
Plant and system occupations	0	0	0	0	0	0	1
Motor vehicle operators	3	5	10	1	0	1	2
Water transportation and related workers	0	0	0	0	0	0	0
Material moving equipment operators	7	8	18	1	0	3	2
All other transportation and material moving equipment operators	0	0	0	0	0	0	0
Helpers, laborers, and material movers, hand	33	37	90	3	1	9	41

Source: Bureau of Labor Statistics.

FIGURE 5-3

NUMBER OF JOBS BY OCCUPATION SUPPORTED BY CRITICAL SUPPLI

Occupational Title	3690 Optical Media & Electrical Equip	3820 Instruments & Lenses	3841 Medical Instruments	4953 Refuse & Recycling	5060 Wholesale Electrical	Total Jobs	Total Distribution
Total	4229	5004	1573	717	6124	31,203	
Managerial and administrative occupations	245	478	143	61	634	2,589	8.30%
Management support occupations	98	189	44	10	158	869	2.79%
Engineers	236	523	74	5	35	1,490	4.78%
Architects and surveyors	0	0	0	0	0	0	0.00%
Physical scientists	5	12	5	3	1	35	0.11%
Life scientists	0	4	8	0	0	13	0.04%
Computer, mathematical, and operations research analysts	14	46	10	1	10	128	0.41%
Lawyers and judicial workers	0	0	0	1	0	2	0.01%
Teachers, librarians, and counselors	0	0	0	0	1	1	0.00%
Health assessment and treating occupations	0	0	0	0	0	0	0.00%
Health technicians and technologists	5	6	4	0	0	20	0.06%
Writers, artists, and entertainers	12	35	7	1	21	146	0.47%
Engineering and science technicians and technologists	152	364	72	7	105	1,173	3.76%
Technicians, except health and engineering and science	13	45	8	1	31	183	0.59%
All other professional workers	11	44	9	2	10	107	0.34%
Salespersons, retail	0	0	0	0	151	151	0.48%
Counter and rental clerks	0	0	0	0	5	5	0.02%
Stock clerks, sales floor	0	0	0	0	72	72	0.23%
Cashiers	0	0	0	4	16	21	0.07%
All other sales and related workers	83	203	88	15	1,484	2,307	7.39%
Adjusters, investigators, and collectors	12	18	15	9	38	141	0.45%
Records processing occupations, except financial	21	53	18	2	109	299	0.96%
Secretaries, stenographers, and typists	76	143	51	23	314	927	2.97%
Financial records processing occupations	49	88	31	25	306	742	2.38%
Information clerks	8	11	4	2	56	111	0.36%
Computer operators and peripheral equipment operators	8	18	5	1	32	95	0.30%
Communications equipment operators	5	13	4	1	6	54	0.17%
Mail clerks and messengers	4	0	0	0	3	18	0.06%
Material recording, scheduling, dispatching, and distributing occupations	139	217	68	23	335	1,292	4.14%
Other clerical and administrative support workers	61	152	45	46	359	1,003	3.21%
Protective service occupations	9	12	2	2	0	42	0.14%
Food preparation and service occupations	0	1	0	0	0	3	0.01%
Cleaning and building service occupations	34	35	13	12	49	249	0.80%

FIGURE 5-3

NUMBER OF JOBS BY OCCUPATION SUPPORTED BY CRITICAL SUPPLI

Occupational Title	3690 Optical Media & Electrical Equip	3820 Instruments & Lenses	3841 Medical Instruments	4953 Refuse & Recycling	5060 Wholesale Electrical	Total Jobs	Total Distribution
All other service workers	4	11	3	6	5	49	0.16%
All other agricultural, forestry, fishing, and related workers	0	0	0	2	0	5	0.02%
Blue collar worker supervisors	156	155	51	24	131	1,021	3.27%
Inspectors, testers, and graders, precision	147	171	54	2	7	714	2.29%
Machinery and related mechanics, installers, and repairers	137	56	24	34	212	752	2.41%
Vehicle and mobile equipment mechanics and repairers	0	0	0	28	573	606	1.94%
Electrical and electronic equipment mechanics, installers, and repairers	20	3	0	1	39	85	0.27%
Other mechanics, installers, and repairers	22	53	15	8	106	258	0.83%
Construction trades	28	21	4	18	11	176	0.57%
Extractive and related workers, including blasters	1	4	1	1	6	24	0.08%
Metal workers, precision	102	186	40	0	84	1,729	5.54%
Woodworkers, precision	0	2	0	0	0	36	0.12%
Printing workers, precision	0	0	0	0	0	108	0.35%
Food workers, precision	0	0	0	0	0	0	0.00%
Other precision workers	5	40	39	0	5	118	0.38%
Machine tool cut and form setters, operators, and tenders, metal and plastic	122	153	38	0	0	1,392	4.46%
Numerical control machine tool operators and tenders, metal and plastic	5	24	9	0	0	169	0.54%
Combination machine tool setters, set-up operators, operators, and tenders	12	0	6	0	0	143	0.46%
Metal fabricating machine setters, operators, and related workers	28	0	0	0	0	336	1.08%
Metal and plastic processing machine setters, operators, and related workers	128	36	23	0	0	615	1.97%
Woodworking machine setters, operators, and other related workers	2	0	0	0	0	9	0.03%
Printing, binding, and related workers	7	0	0	0	0	314	1.01%
Textile and related setters, operators, and related workers	0	0	19	0	0	23	0.07%
Other machine setters, set-up operators, operators, and tenders	201	99	72	3	0	772	2.47%
Assemblers, precision	216	422	56	0	0	1,233	3.95%
Hand workers, including assemblers and fabricators	1,279	763	299	6	174	4,093	13.12%
Plant and system occupations	6	3	1	31	2	49	0.16%
Motor vehicle operators	33	6	3	71	228	443	1.42%
Water transportation and related workers	0	1	0	7	2	13	0.04%
Material moving equipment operators	57	8	5	30	25	253	0.81%
All other transportation and material moving equipment operators	0	0	0	5	1	6	0.02%
Helpers, laborers, and material movers, hand	211	76	80	182	167	1,369	4.39%

Source: Bureau of Labor Statistics.

FIGURE 6-1

CRITICAL M1 AND M4 SUPPLIERS IN SAN JOSE

SIC	Industry	2000 San Jose Employment	Estimated Local Sales	Average Annual Wages	California Projected Annual Emp. Growth	2005 San Jose Employment	Employment Growth 2000-2005 Absolute	Employment Growth 2000-2005 Percent
	Total	31,203	$8,368,235,061	$62,170		36,219	5,016	16.08%
2653	Corrugated and Solid Fiber Boxes	234	$14,464,008	$38,318	1.69%	254	20	8.74%
2759	Commercial Printing, nec	865	$42,468,040	$34,677	2.33%	971	106	12.21%
2813	Industrial Gases	20	$530,900	$59,120	1.38%	21	1	7.09%
3089	Plastic Products, nec	857	$66,709,737	$40,791	1.92%	942	85	9.98%
3429	Hardware, nec	281	$8,438,711	$40,253	1.41%	301	20	7.25%
3444	Sheet Metalwork	2,341	$254,220,895	$34,610	-0.21%	2,317	-24	-1.05%
3469	Metal Stampings	259	$20,398,840	$36,608	2.36%	291	32	12.37%
3471	Plating & Polishing	276	$15,650,028	$28,739	1.42%	296	20	7.30%
3479	Metal Coating Services	227	$11,921,813	$31,722	1.42%	244	17	7.30%
3492	Fluid Power Valves	60	$6,000,000	$56,268	0.72%	62	2	3.65%
3499	Fabricated Metal Products, nec	497	$8,310,337	$25,215	0.72%	515	18	3.65%
3544	Special Dies, Tools, Jigs	1,804	$29,922,948	$52,178	1.82%	1,974	170	9.44%
3559	Special Industry Machinery	3,535	$3,272,087,910	$99,886	4.10%	4,322	787	22.25%
3599	Industrial Machinery nec	159	$18,950,574	$42,768	4.10%	194	35	22.25%
3612	Transformers	25	$381,950	$59,969	2.22%	28	3	11.60%
3625	Relays and Industrial Controls	295	$14,037,280	$46,287	1.69%	321	26	8.74%
3661	Telephone Apparatus	1,821	$345,631,263	$78,718	2.96%	2,107	286	15.69%
3695	Magnetic and Optical Recording Media	2,434	$192,536,702	$46,971	3.07%	2,831	397	16.33%
3699	Electrical Equipment and Supplies	1,795	$289,454,520	$62,452	4.67%	2,255	460	25.64%
3822	Environmental Controls	356	$27,357,532	$60,389	2.30%	399	43	12.04%
3826	Analytical Instruments	636	$105,044,304	$59,580	2.30%	713	77	12.04%
3827	Optical Instruments and Lenses	3,685	$1,214,657,070	$80,370	2.30%	4,129	444	12.04%
3829	Measuring and Controlling Devices	327	$84,714,582	$63,858	2.30%	366	39	12.04%
3841	Surgical and Medical Instruments	1,573	$120,325,062	$64,226	3.52%	1,870	297	18.88%
4953	Refuse Systems and Recyling	717	$61,690,680	$45,138	3.37%	846	129	18.02%
5063	Electrical Equipment	2,192	$348,826,112	$48,171	4.56%	2,739	547	24.96%
5065	Electronic Parts and Equipment	3,911	$1,790,526,198	$70,684	4.56%	4,887	976	24.96%
5075	Wholesale Heating Exchangers	21	$2,977,065	$52,838	1.81%	23	2	9.38%

Source: Dun & Bradstreet Marketplace, 2000; Minnesota IMPLAN Group; California Employment Development, March 1997 benchmark.

FIGURE 6-2

PROJECTED EMPLOYMENT GROWTH AND M1 AND M4 LAND REQUIREMENTS

SIC	Industry	San Jose Employment 2000	San Jose Employment 2005	Employment Growth 2000-2005 Absolute	Employment Growth 2000-2005 Percent	Additional Acres Required by 2005
	Total	31,203	36,219	5,016	16.08%	131.6
2653	Corrugated and Solid Fiber Boxes	234	254	20	8.74%	0.5
2759	Commercial Printing, nec	865	971	106	12.21%	2.8
2813	Industrial Gases	20	21	1	7.09%	0.0
3089	Plastic Products, nec	857	942	85	9.98%	2.2
3429	Hardware, nec	281	301	20	7.25%	0.5
3444	Sheet Metalwork	2,341	2,317	-24	-1.05%	-0.6
3469	Metal Stampings	259	291	32	12.37%	0.8
3471	Plating & Polishing	276	296	20	7.30%	0.5
3479	Metal Coating Services	227	244	17	7.30%	0.4
3492	Fluid Power Valves	60	62	2	3.65%	0.1
3499	Fabricated Metal Products, nec	497	515	18	3.65%	0.5
3544	Special Dies, Tools, Jigs	1,804	1,974	170	9.44%	4.5
3559	Special Industry Machinery	3,535	4,322	787	22.25%	20.6
3599	Industrial Machinery nec	159	194	35	22.25%	0.9
3612	Transformers	25	28	3	11.60%	0.1
3625	Relays and Industrial Controls	295	321	26	8.74%	0.7
3661	Telephone Apparatus	1,821	2,107	286	15.69%	7.5
3695	Magnetic and Optical Recording Media	2,434	2,831	397	16.33%	10.4
3699	Electrical Equipment and Supplies	1,795	2,255	460	25.64%	12.1
3822	Environmental Controls	356	399	43	12.04%	1.1
3826	Analytical Instruments	636	713	77	12.04%	2.0
3827	Optical Instruments and Lenses	3,685	4,129	444	12.04%	11.6
3829	Measuring and Controlling Devices	327	366	39	12.04%	1.0
3841	Surgical and Medical Instruments	1,573	1,870	297	18.88%	7.8
4953	Refuse Systems and Recyling	717	846	129	18.02%	6.4
5063	Electrical Equipment	2,192	2,739	547	24.96%	14.4
5065	Electronic Parts and Equipment	3,911	4,887	976	24.96%	25.6
5075	Wholesale Heating Exchangers	21	23	2	9.38%	0.1

Source: Applied Economics.