CALTRAIN

Market Demand Study

Final Report

Peninsula Corridor Joint Powers Board
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TABLE OF CONTENTS

APPENDICES

APPENDIX

1 PERFORMANCE EVALUATION -- CALTRAIN CAPACITY

2 DEMOGRAPHIC, SOCIOECONOMIC AND LAND USE

3 TRAVEL CHARACTERISTICS

4 CALTRAIN TRAVEL DEMAND AND FORECASTS

I. PURPOSE

The purpose of the CalTrain Market Demand Study was to develop a tool for the Peninsula Corridor Joint Powers Board to guide future operational and service improvements by identifying the current and potential transit market at a station level. It was not the purpose of this document to provide policy recommendations for those potential improvements.

II. STUDY FINDINGS

As the demographics and travel patterns in the Bay Area continue to evolve, the needs, problems and solutions change as well. The JPB must adapt to past change and anticipate the future to accurately match CalTrain service to market demand. The information contained in this report is crucial because it identified potential needs and problems, and tested service improvements against them. As a result, short- and long-term implications emerged.

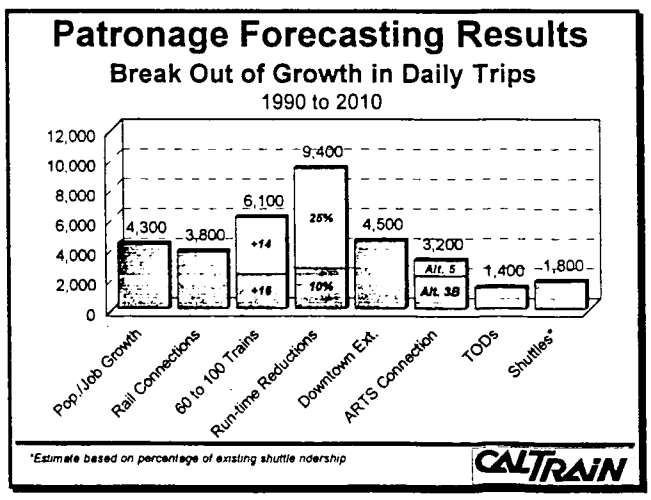
II.A. Short-term Implications

- A great potential to increase CalTrain ridership would involve tapping into the following travel markets:
  - Southbound directional trips
  - To employment sites along Hwy. 101
  - Within Santa Clara County
- An increase in service from the existing 60 to 72-weekday trains would attract approximately 1,700 additional riders, an almost seven percent increase.
- Parking expansion at selected CalTrain stations would compensate for existing parking deficits, thereby attracting latent demand. Currently, CalTrain has a system-wide deficit of almost 900 spaces.
- Expansion of shuttle connections would provide an improved link from CalTrain to existing and planned employment sites that are not within walking distance to stations.
- A land use and transit link through Transit-Oriented Development would promote walking, biking and CalTrain by establishing "pedestrian-friendly" environments within station areas.
- A strategic plan is needed to systematically identify, prioritize and program CalTrain projects and provide policy recommendations to implement them.

II.B. Long-term Implications

- The top three CalTrain origin and destination pairs in 2010, would include the following work trips:
  1) San Mateo County to San Francisco
  2) Santa Clara County to San Francisco
  3) Santa Clara Intra-county
- CalTrain improvement and expansion activities, coupled with other external factors, would more than double CalTrain's current 1997 average weekday ridership of approximately 24,500. The following projects would contribute to this:
  - Rail connections
  - Increase from 60 to 100-weekday trains
  - Run-time reductions (10 and 25 percent)
  - Extension to downtown San Francisco
  - Connections to SF Airport
  - Transit-Oriented Development
  - Shuttle connections to job sites

The table below shows a break out of the ridership growth generated by each project.



- Operational enhancements such as universal (double) crossovers, interlocked switches and third tracks at selected locations would aid reductions in travel time and implementation of enhanced frequencies.

- Parking expansion for long-term deficits is crucial to accommodate projected CalTrain ridership. A deficit of 2,900 spaces is anticipated in the year 2010.

- Since a large portion of the year 2010 projected job growth is not within walking distance to CalTrain stations, expanded shuttle service would be needed to bring passengers to their jobs.

III. BACKGROUND

The ability of the JPB to plan for the future will be critical to CalTrain as it adapts to change, both in the short-term and into the next century. The MDS takes a comprehensive look at the CalTrain system and service area -- enabling the JPB to anticipate changing demographics, commute patterns and employment trends. The MDS evaluated the entire CalTrain system and service area by identifying trends, examining the existing conditions and projecting into the future. The study area, diagrammed in Figure 1, is located in San Francisco, San Mateo and Santa Clara counties.

Work for the MDS was conducted in four phases, as follows:

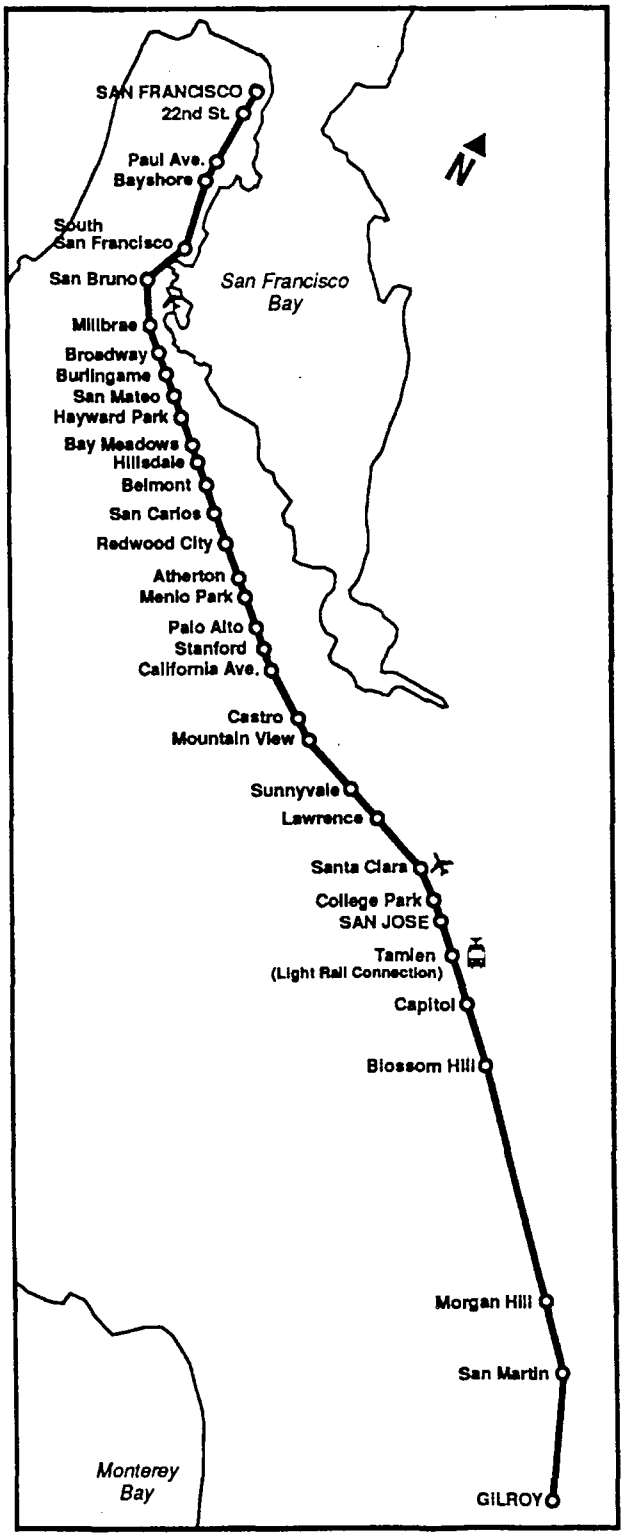
PHASE 1* - *Data Collection
Developed study data base.

PHASE 2* - *Initial Data Analysis
Established system, patronage and service area trends and existing conditions.

PHASE 3* - *Travel Demand & Ridership Forecasts
Utilized model to examine service scenarios and affects on ridership at a station level.

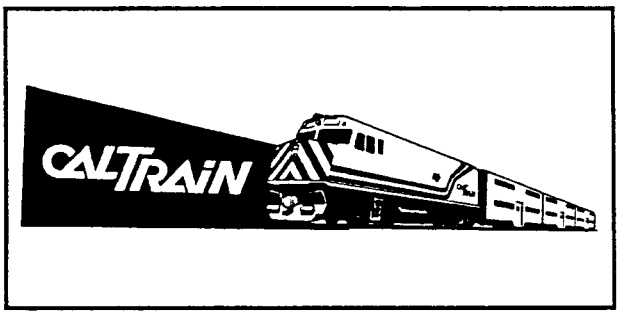
PHASE 4* - *Final Report
Summarized study findings and planning strategies.

Figure 1: CalTrain System Map



The first two phases of the MDS were presented in Working Paper 1 and are summarized in this final report. Some of the detailed analysis is found in the Appendices. The entire working paper is on file in the JPB Planning Department. Phase 1, which involved data collection and establishment of the study data base, included an on-board passenger survey conducted in February 1994, which was subsequently updated in June 1996. The survey results provided key baseline information for the study. Phase 2 consisted of an analysis of the historic trends and existing conditions within the CalTrain service area. This initial data analysis built the framework for the final two phases.

Phase 3 of the MDS utilized a travel demand and patronage forecasting model to test future service scenarios. The forecasting scenarios provide an array of potential plans for the JPB to consider in mapping a blueprint for the future. Detailed results of the model runs are presented in the Appendices.



IV. ABOUT THIS REPORT

The Final Report presented herein contains a summary of the work conducted in all phases of the study by highlighting the key findings of previous working papers. The final results of the MDS were used to shape potential short- and long-term implications and a planning strategy to guide the JPB into the next century and beyond.

After this section, the Final Report is organized under the following headings:

- Data Collection
- Trends and Existing Conditions
- Future Conditions
- Travel Demand and Ridership Forecasts
- Planning Strategy

V. DATA COLLECTION

The preparation of a data base is an important aspect of any study, as the collection of accurate data brings forth reliable analysis and forecasting. To anticipate CalTrain's future, it was crucial to clearly understand the historic trends and existing conditions within the study area. Additionally, the study needed to identify the assumptions that were made about future trends. Thus, the data collection phase involved the steps that fostered the development of the Market Demand Study data base. This first step in the study included a collection of historical, current and projected data, as well as similar studies that related to the CalTrain system.

V.A. On-Board Passenger Survey

An important part in establishing the study data base was the on-board passenger surveys conducted in February 1994 and June 1996. The JPB staff surveyed 100 percent of the weekday riders on all northbound trains because most CalTrain passengers make round trips. In 1994, CalTrain carried approximately 10,500 passengers in the northbound direction, which equaled an average weekday ridership of 21,000. This number increased in 1996 to more than 22,000 weekday passengers. Staff also distributed the survey on nearly all of the Saturday and Sunday trains in both directions. Almost 11,000 people used CalTrain on the weekend in 1994, with an increase to more than 14,000 in 1996.

Key findings from the 1994 survey are outlined below and refer to the *weekday* results, unless specified otherwise:

- Primary CalTrain market was total northbound passengers getting off in San Francisco County, 62 percent; 34 and 28 percent got on in San Mateo and Santa Clara counties, respectively.

- San Francisco terminal station was the top destination: 57 percent of weekday and 38 percent of weekend patrons got off at the Fourth and Townsend Station.

- San Jose Diridon Station was the top point of origin for weekday passengers, with 12 percent of the passengers boarding there.

- Most of San Mateo County residents made inter-county commute trips on CalTrain; only four percent of CalTrain's northbound patronage consisted of San Mateo County residents who used the train for intra-county commuting.

- Of the 62 percent northbound passengers who boarded in Santa Clara County: 15 percent commuted within the county, 19 percent to San Mateo County and the rest to San Francisco.

	Drive	Walk	Transit	Bike
To Station:	41%	26%	16%	3%
From Station:	15%	28%	44%	3%

- Over one-third of weekday patrons were newcomers to the system, riding CalTrain less than a year.

While there was an increase in ridership from 1994 to 1996, CalTrain passenger travel patterns and characteristics remained fairly similar.

VI. TRENDS AND EXISTING CONDITIONS

VI.A. Performance Evaluation

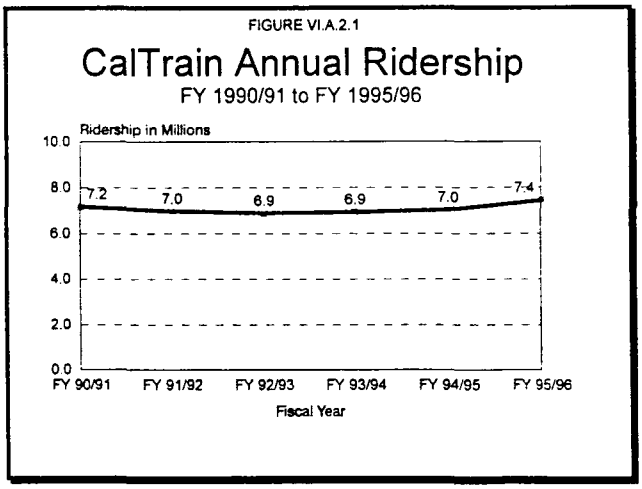
A trend analysis of CalTrain's system performance was conducted using the data from past performance, operational and financial reports, FY 1990/91 to FY 1995/96. CalTrain's service capacity also was reviewed using on/off passenger counts from October 1992 and March 1996. These results were compared with station parking capacities based on a 1993 CalTrain Station Inventory, which was subsequently updated in 1995.

VI.A.1. Service Levels. Two service level increases have been implemented since 1990: (1) an increase from 52 to 54-weekday trains in FY 91/92, and (2) an increase from 54 to 60-weekday trains in FY 92/93. Two weekday, round-trip trains also were extended to Gilroy in July 1992, with two more added in February 1994.

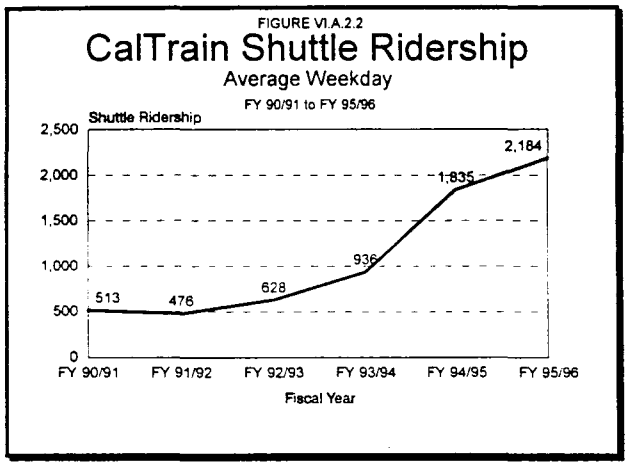
Over the same time period, CalTrain shuttle bus service also was expanded in San Mateo and Santa Clara counties. From 1990 to 1996, shuttle bus routes increased from a total of 7 to 25. Shuttles are crucial to a fixed-route transit system like CalTrain: they offer passengers a means to get from the train to jobs that are not within walking distance to a station. In San Francisco, a similar connection is provided by shuttle bus routes 80X, 81X and 82X at the Fourth and Townsend Station, providing the missing link to the downtown financial district.

VI.A.2. Ridership. Ridership was static in the early 1990s, after some patrons, who started taking CalTrain because of the 1989 Loma Prieta earthquake and the 1990 national Greyhound bus strike, returned to their cars (Figure VI.A.2.1). In addition, the Bay Area economic slowdown in the early 1990s also caused a decrease in ridership, since 82 percent of CalTrain passengers use the train to get to work. However, in recent years, ridership is on the rebound, with annual ridership increasing from 6.9 million in FY 92/93 to 7.4 million in FY 95/96. Average weekday ridership grew from 21,000 to 22,900 over the same time period. This growth was spurred by rising employment and increased special event and shuttle services. Currently, CalTrain daily ridership hit an even higher level in 1997, carrying approximately 24,500 riders per day.

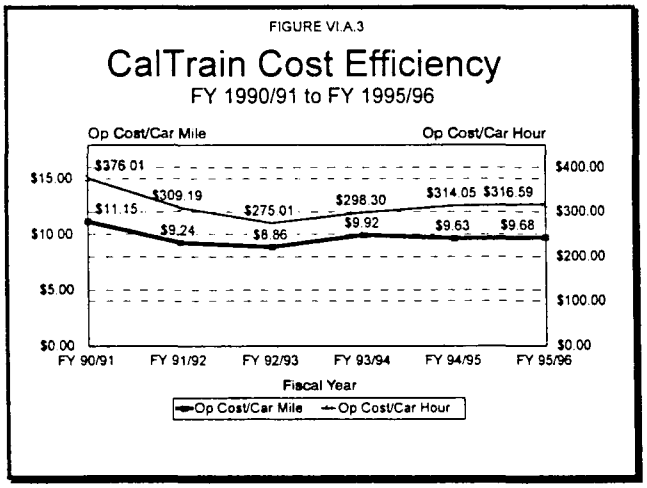
FIGURE VI.A.2.1



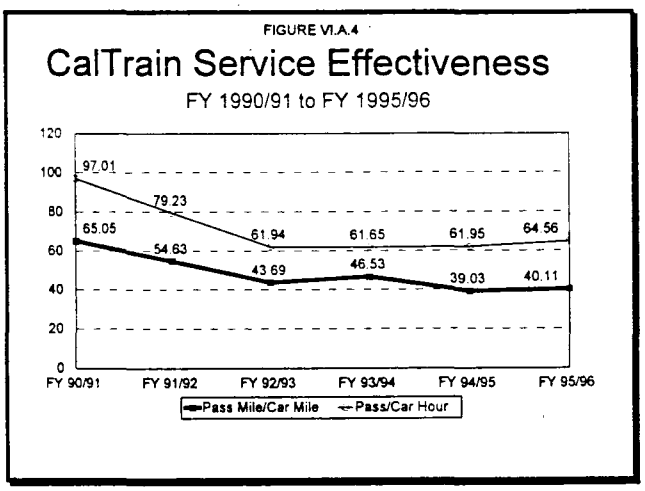
From FY 90/91 to FY 95/96, shuttle ridership grew from more than 500 to 2,000 passengers per day (Figure VI.A.2.2). According to a 1995 shuttle survey, 90 percent of those riders started taking CalTrain due to the shuttle connection.



VI.A.3. Cost Efficiency. CalTrain's operating cost efficiency has improved over the analysis period (Figure VI.A.3). Cost-per-unit indicators, such as operating cost per mile and hour, were less than the increase in the Bay Area Consumer Price Index (CPI). This is largely due to the cost structure of a commuter rail system, where a large proportion of "operating costs" is for relatively fixed activities (e.g., maintenance of way). The result is that, on a percentage basis, the incremental costs to run six additional trains in FY 92/93 were nominal, in comparison to the percentage change in service levels.



VI.A.4. Service Effectiveness. System productivity, on the other hand, dropped due to increased service levels, coupled with stable ridership (Figure VI.A.4). Again, static ridership in the early 1990s was partially attributed to the economic recession. Additionally, when CalTrain service levels were increased in July 1992, six trains were added during the midday, off-peak hours. However, 80 percent of CalTrain passengers typically ride during the peak period. The JPB needs to provide service that matches passenger needs and Peninsula commute patterns.



VI.A.5. CalTrain Capacity. In 1992, CalTrain had an average of 43 percent maximum utilized capacity on weekday trains, with an average of 53 percent during the peak hours. More recent on/off passenger counts taken in 1996, show that maximum loads were at 49 percent utilized capacity during the peak periods and 42 percent all day. This information, which is presented in Appendix 1, is reflective of the way the JPB manages and operates the current fleet to maximize passenger comfort by minimizing overcrowding. To accomplish this, a car is added to a consist if the train is nearing capacity. As a result, room is available for additional patrons.

VI.A.6. Parking Capacity. Based on the 1994 and 1996 passenger surveys, well over one-third of CalTrain passengers drive to their station, with more than 50 percent driving to the station in the morning. However, parking surveys conducted in 1993 and 1995, reveal that limited parking is available at stations from San Francisco to Tamien: 14 of the 22 stations with parking were at 90 to 100 percent capacity. Of the 34 total stations from San Francisco to Gilroy, seven did not have any parking lots. Thus, even if capacity was available on the trains with increased service levels, commuters did not necessarily have access to some stations because parking lots were full. In the future, the JPB should concentrate on meeting parking needs to attract latent demand, thereby adding new riders to CalTrain.

VI.B. Demographic, Socioeconomic & Land Use

The data used for the demographic and socioeconomic analysis was based on the 1980 and 1990 Censuses. The land use portion utilized Association of Bay Area Government *Projections '94*. A Geographic Information System, Atlas GIS, was used as a tool to analyze the information found in Appendix 2.

VI.B.1. Population. Bay Area residents have moved significantly in the last 50 years. Historically, the population was concentrated in San Francisco County, which was the most populated Bay Area county in 1940. However, a shift to the suburbs has been occurring since the 1940s. As a result, despite steady increases in population, San Francisco County's regional share of total Bay Area population has continued to fall behind other counties.

The following table outlines total 1990 population and the growth from 1980 for all three counties:

County	% Growth 1980 to 1990	Total 1990 Population
San Francisco	7%	724,000
San Mateo	11%	649,600
Santa Clara	16%	1,497,600

Leading the way in Bay Area population, Santa Clara County was host to almost 1.5 million inhabitants in 1990. Alameda and Contra Costa counties were second and third, respectively. San Francisco County was fourth in size, with almost 724,000 people, despite an almost seven percent rebound in 1990 over 1980. San Mateo County ranked fifth, just behind San Francisco County, with 649,600 residents.

VI.B.2. Employment. From 1980 to 1990, the total job growth that occurred within the three counties was as follows:

County	% Growth 1980 to 1990	Total 1990 Jobs
San Francisco	5%	582,000
San Mateo	23%	319,100
Santa Clara	23%	864,100

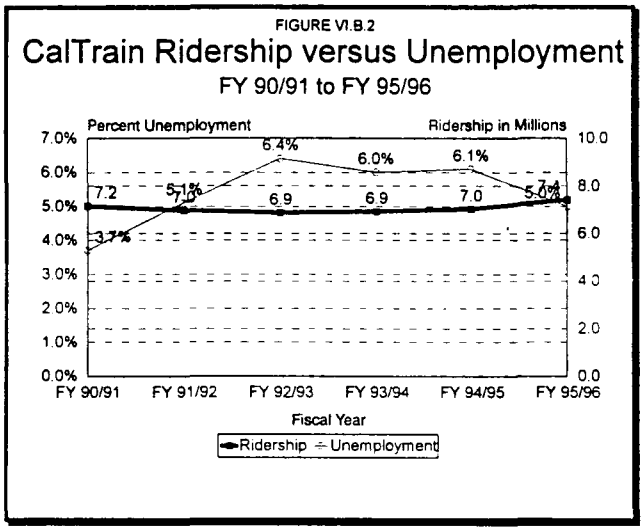
San Francisco had the lowest job growth (+5%), as jobs moved to the suburbs. This has led to negligible growth in the commute from the Peninsula to San Francisco over the past 10 years.

Of San Mateo County's 319,100 jobs in 1990, the greatest percentage was located at San Francisco International Airport and the Oyster Point area in South San Francisco. This reinforces the importance of a transit connection to the airport and shuttle service to places of employment not within walking distance to CalTrain.

In 1990, Santa Clara County led the way in total number of jobs (more than 864,100), in comparison to all other Bay Area counties. Although, some jobs were located near the rail corridor, other high job concentrations were situated outside station areas (i.e., not within walking distance). Again, shuttles provide a vital link from CalTrain to jobs on the Peninsula that are beyond walking distance.

Since the 1990 Census, the Bay Area's thriving economy was adversely affected by a nationwide recession. Regionally, the economy began to decline in 1990, with little or no recovery occurring through 1991. In 1992, the Bay Area showed signs of stabilization with recovery beginning in 1993 and continuing through 1995. Despite a drop in unemployment, San Francisco County is not expected to equal its 1990 economic conditions until 1999. As discussed previously, the economic health of the three Peninsula counties is important to CalTrain because 82 percent of the passengers take the train to get to work, with San Francisco being the top destination for a majority of passengers. Figure VI.B.2 shows the direct correlation between unemployment on the Peninsula and CalTrain ridership over the past five years.

FIGURE VI.B.2



VI.B.4 Land Use. The concept of Transit-Oriented Development focuses on high density, mixed-use development in and around transit stations. This type of "pedestrian-friendly" development occurs within walking distance to stations. Thus, TODs encourage walking, biking or riding transit and minimize reliance on the automobile.

Currently, high density housing, a form of TOD, exists in proximity to some CalTrain stations. Examples include residential developments within the California Avenue and the proposed San Antonio station areas. There also are pockets of commercial TODs near CalTrain stations -- the Redwood City Station is a prime example.

In the future, the JPB should take a proactive approach in working with communities and the private sector to encourage TODs at CalTrain stations. Possible joint ventures could benefit CalTrain with increased ridership and station activity, and communities through enhanced economic development and social environments. The JPB's active involvement in development issues will serve to link land use and transportation along the entire CalTrain corridor.

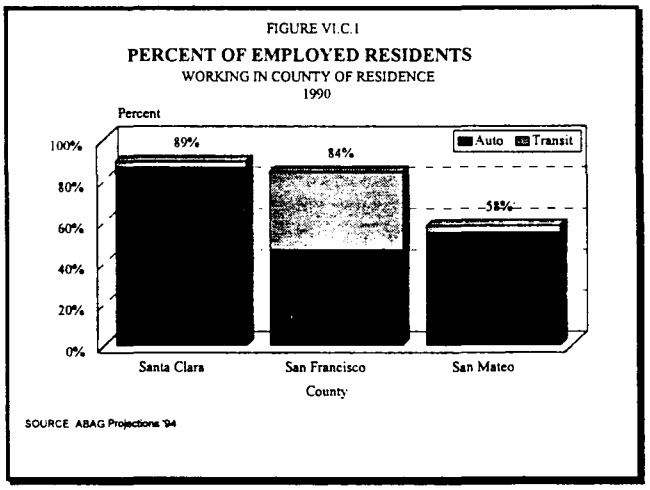
VI.C. Travel Characteristics

Appendix 3 graphically displays the Census Bureau's 1990 Journey to Work data for all three counties. These travel patterns are reflective of the changes in population and job growth discussed earlier. To demonstrate this, the movement and changes in commute patterns on the Peninsula are broken down into two main circulation components: (1) travel within a county and (2) travel between counties. Further evaluation of these components reveals a potential transit market for the JPB to target for ridership gains.

VI.C.1. Intra-County Commute. This type of commute pattern consists of those work trips made within a county.

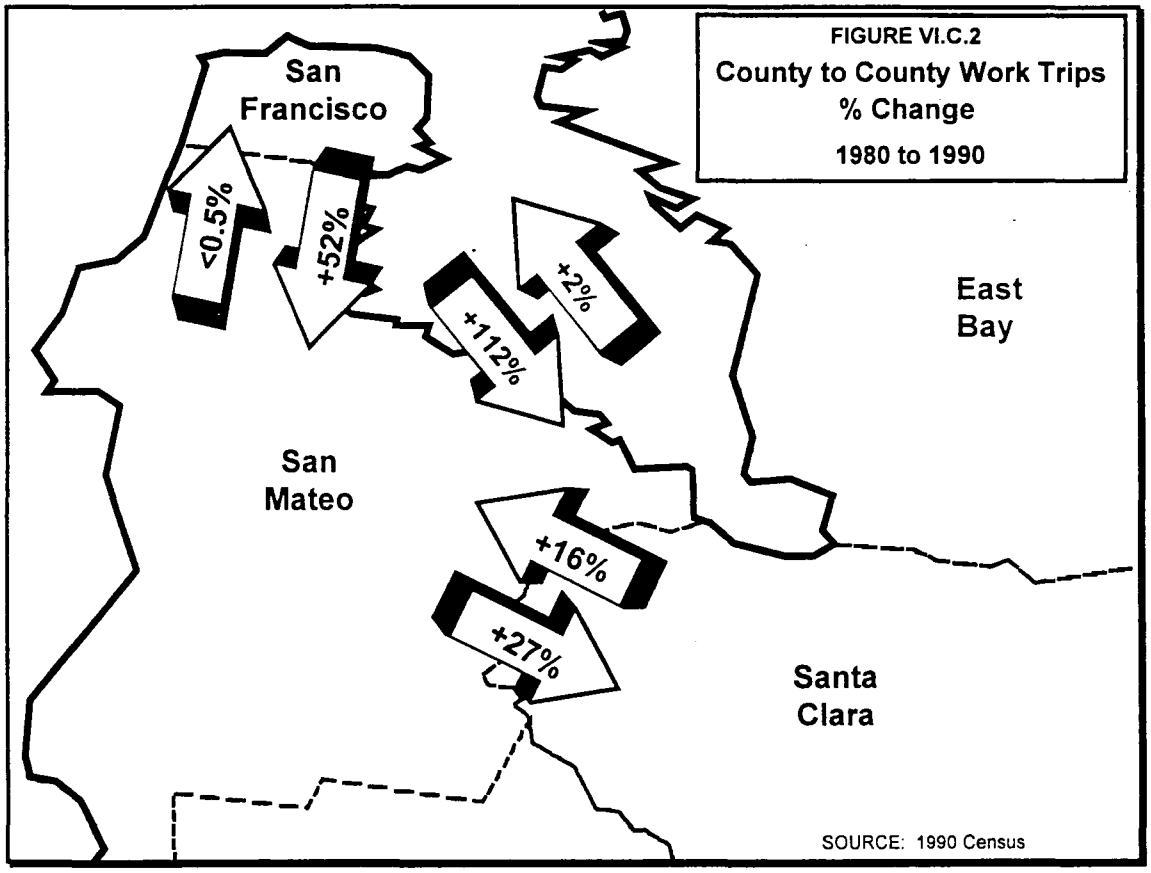
More than 89 percent of the work force in Santa Clara County is employed at jobs within the county, almost 710,400 trips (Figure VI.C.1). Of the total intra-county commuters, less than three percent used some form of transit to get to work in 1990. With the extension of CalTrain service to Gilroy, the intra-county commute pattern could be served in the future with possible "turnback" operations or increased service on the extension.

FIGURE VI.C.1



The percentage of resident workers who filled jobs within San Francisco County also was high. Approximately 84 percent of San Francisco's employed residents traveled to work within that county, 307,400 trips (Figure VI.C.1). This was significantly lower than the corresponding 89 percent figure in 1970, reflecting an out-migration of workers. San Francisco's transit share is the highest of the three counties. A total of 38 percent used transit to travel within the county; however, only a very small portion used CalTrain.

Since San Mateo County has more workers than jobs, many residents commute outside the county to work. In addition, the high cost of housing has made it difficult for residents to live and work within San Mateo County. As a result, more than 201,500 residents worked within San Mateo County



in 1990. This was just 58 percent, with only three percent using transit (Figure VI.C.1). This number is dramatically lower than San Francisco and Santa Clara counties.

VI.C.2. Inter-County Commute. This type of commute pattern consists of those work trips made between counties.

As a result of a labor force deficit within San Francisco and Santa Clara counties, the two counties have imported their labor from neighboring counties. Traditionally, San Mateo County residents commuted to work in those counties to help fill the gap. However, changing trends have emerged over the past decade with shifts in county-to-county commute patterns. This becomes evident when comparing the change in commute patterns from 1980 to 1990 (Figure VI.C.2).

Over the 10-year period, the number of people who commuted north to work in San Francisco stabilized. In 1980, just over 78,700 San Mateo County residents headed to work in San Francisco each weekday. This number was practically identical in 1990, with less than one-half percentage growth.

The same trend was evident in Santa Clara County. More than 7,400 residents in 1980, versus almost 7,600 in 1990, commuted to San Francisco, which was only a two percent increase. However, Santa Clara County had more than 32,000 weekday commuters heading into San Mateo County to work in 1990. This was almost 4,500 additional commute trips, a 16 percent growth over 1980.

Despite the stabilization of northbound travel, passengers who head into San Francisco still remain the foremost travel pattern for CalTrain commuters. Currently, approximately 6,300 riders get off at San Francisco stations daily, which is 57 percent (based on 1996 on/off counts) of CalTrain's northbound patronage.

In addition, the highest percentage of transit users commuted into downtown San Francisco in 1990. Of the total work trips originating in San Mateo and Santa Clara counties, the transit share was 20 and 26 percent, respectively.

Past travel trends also revealed a significant change in the number of reverse commuters. The number of San Francisco residents who commuted to San

Mateo County in 1990 was approximately 32,600. This was 11,100 more than 1980. Additionally, San Francisco work trips to Santa Clara County more than doubled over the 10-year period, with a growth from approximately 3,700 trips to almost 7,900, a 112 percent increase. The number of San Mateo County residents who headed south into Santa Clara County also increased by about 9,200 daily commuters, a 27 percent increase. Overall, roughly 24,800 more weekday workers were commuting in the southbound direction, in comparison to just over 450 additional commuters heading north into San Francisco.

From 1980 to 1990, the number of residents who commuted to jobs outside the Peninsula area had a higher growth rate than north-south commuters. San Mateo and Santa Clara counties had a 110 and 152 percent increase, respectively. The largest number of work trips was mainly to Alameda County, which may spark the need for an improved transbay transit connection. The San Mateo County Transportation Authority is currently studying the feasibility of enhanced transit service within the Dumbarton Corridor as a link in the regional transit network. If feasible, this service would provide a new opportunity for commuters who travel between the East and West Bay.

VI.C.3. Potential Transit Market. CalTrain's potential transit market was based on total work trips minus those residents who were already using some form of transit in 1990. The remaining residents have the potential to use transit to get to work -- revealing the latent demand within the CalTrain service area. In the short-term, the greatest potential for increased CalTrain ridership would involve tapping into the following markets:

- ***Southbound "Reverse-Peak" Direction.*** San Francisco County has residents who live near the Bayshore station that could potentially take transit to commute to work in San Mateo and Santa Clara counties, primarily to San Mateo County. Some areas could possibly generate anywhere from 800 to 1,200 transit trips traveling southbound to San Mateo County. This is a prime market since San Francisco residents have a high propensity to use transit: approximately 18 percent of all San Francisco residents used transit to get to work in 1990. Additionally, a significant number of San Mateo County residents, who principally live in the southern portion of the county, also could potentially use transit to commute to Santa Clara County. Pockets of 900 to 2,000 people who live near CalTrain could potentially use the train to travel south.

- ***To Employment Sites Along The Highway 101 Corridor.*** A high number of potential transit trips could be generated by those people who live in San Francisco and Santa Clara counties and work in San Mateo County. The trips would primarily head to the San Francisco International Airport and the Oyster Point and Redwood Shores areas. This translates into approximately 14,000 to 20,000 potential CalTrain trips from those two counties.

- ***Within Santa Clara County.*** Again, an increasing number of Santa Clara's intra-county commuters could potentially use CalTrain. Of the approximately 710,000 intra-county commute trips in 1990, just over 19,000 residents used transit. This was less than three percent.

CalTrain's latent demand and potential ridership were further analyzed and defined in the patronage forecasting phase of this study. A high precision travel demand model was used to project ridership at a station level.

VII. FUTURE CONDITIONS

To accurately project CalTrain ridership in Phase 3 of the Market Demand Study, the assumptions that were made about future trends in the Bay Area needed to be identified. The Association of Bay Area Governments *Projections '94* were used to accomplish this task. This information established baseline conditions for the year 2010.

VII.A. Population Projections

The San Francisco Bay Region is projected to add about 1.5 million new residents between 1990 and 2010, bringing the region's population to more than 7.5 million people. Over the same time frame, an 18 percent increase in population is projected for the Peninsula corridor.

County	Growth 1990 to 2010	Total 2010 Population
San Francisco	+95,000	819,000
San Mateo	+99,800	749,400
Santa Clara	+315,500	1,813,100

Santa Clara County will lead the region in population growth (+315,500) from 1990 to 2010. This county is projected to account for 21 percent of the entire Bay Area's population growth. The City of San Jose alone is projected to add 170,800 residents in the 20-year projection period.

As for the other two Peninsula counties, San Mateo County is expected to have a moderate increase of 15 percent, about 99,800 new residents. San Francisco is anticipated to have a slightly smaller growth compared to other Bay Area counties. However, a 13 percent projected increase would add almost as many residents as San Mateo County, approximately 95,000.

VII.B. Housing Projections

Over the next 20 years, the total number of households in the Peninsula corridor is expected to increase from 1,068,000 in 1990, to 1,247,000 in 2010. This is a 17 percent growth. Household growth for the three counties is as follows:

County	Growth 1990 to 2010	Total 2010 Households
San Francisco	+36,700	342,300
San Mateo	+33,400	275,300
Santa Clara	+109,400	629,600

The projected residential growth within the three counties can prove to be very beneficial to CalTrain because a vital portion of the planned developments is within the CalTrain service area.

Santa Clara County will have the most significant rise in the Bay Area. More than 109,400 additional housing units are projected, which is a 21 percent increase. Santa Clara County is second behind Contra Costa County in terms of absolute household growth. Within the county, San Jose will comprise the largest portion (51 percent) of the countywide increase. The City of San Jose is rezoning for high density residential in transit corridors. In addition, the cities of Gilroy and Morgan Hill are expected to represent 16 percent of the population growth over the next 20 years. This will greatly benefit the Gilroy extension in the long term.

San Francisco will allow for a 12 percent growth in households over the next 20 years, with 36,700 more housing units. However, San Francisco's regional share will decrease from 15 to 12 percent from 1980 to 2010. San Francisco County's planned Mission Bay project is adjacent to the San Francisco terminal located at Fourth and Townsend streets. In addition, much of San Francisco's housing potential will come from redevelopment of commercial and industrial land. This redevelopable land includes properties in the South of Market area. Again, this area is in close range to CalTrain's terminal.

San Mateo County will allow for a 14 percent growth. From 1990 to 2010, 23 percent of San Mateo County's 33,400 additional households will develop in Redwood City. Similar to San Francisco, a majority of San Mateo County's residential growth also is expected to occur near the CalTrain service area. The cities of Redwood City and San Mateo combined will account for about 50 percent of household growth in the next 20 years. For the long-term, Redwood City will lead the county in household, population and job growth.

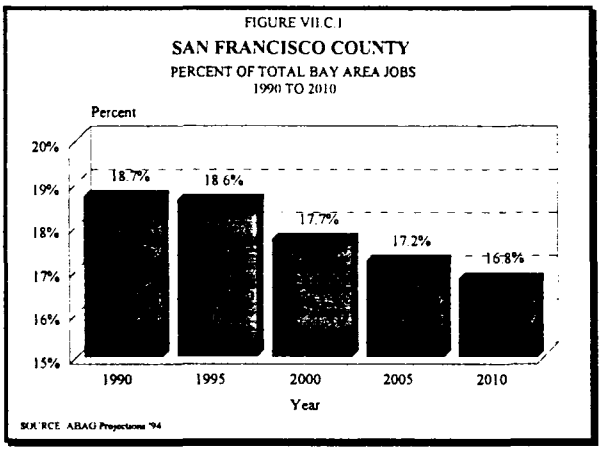
VII.C. Employment Projections

VII.C.1. Job Growth. The Bay Area's economy is projected to generate a demand for about 860,000 jobs over the next 20 years. This is only 62 percent of the job growth that occurred from 1970 to 1990 and reflects the effects of the recent economic slowdown. In the long-term, the Peninsula counties are expected to continue as top economic assets within the entire Bay Area. The following table shows total job growth that is anticipated within the three counties from 1990 to 2010:

County	Growth 1990 to 2010	Total 2010 Jobs
San Francisco	+85,600	667,600
San Mateo	+74,400	393,500
Santa Clara	+182,300	1,046,400

Santa Clara County's economy is an important economic asset to the entire State of California and is essential to the economic health of the Bay Area. From 1990 to 2010, Santa Clara County will continue as the Bay Area's prominent job producer with 182,300 new jobs. More than 25 percent of the Bay Area's jobs, just over one million, are expected to exist in Santa Clara County by 2010. While high job densities will be located near CalTrain in Palo Alto, Sunnyvale and Santa Clara, other employment sites will be dispersed throughout the county - additional shuttles would be needed to provide the missing link.

In 2010, San Francisco County will rank third in the Bay Area in total jobs, with 667,600. This is approximately 85,600 new jobs from 1990, which is a 15 percent projected growth. However, its overall percentage share of total regional jobs will continue to decline from 19 to 17 percent from 1990 to 2010 (Figure VII.C.1). This net job loss reflects the continuation of decentralization. Despite this, downtown San Francisco will continue to have high job concentrations that can easily be served by transit.



San Mateo County's 23 percent increase in jobs from 1980 to 1990 was the highest growth rate on the Peninsula. This growth is attributable to the export of jobs from San Francisco. Since this outward movement is expected to continue, the creation of an additional 74,400 jobs is projected to occur in San Mateo County by the year 2010. For San Mateo County, this represents another 23 percent increase.

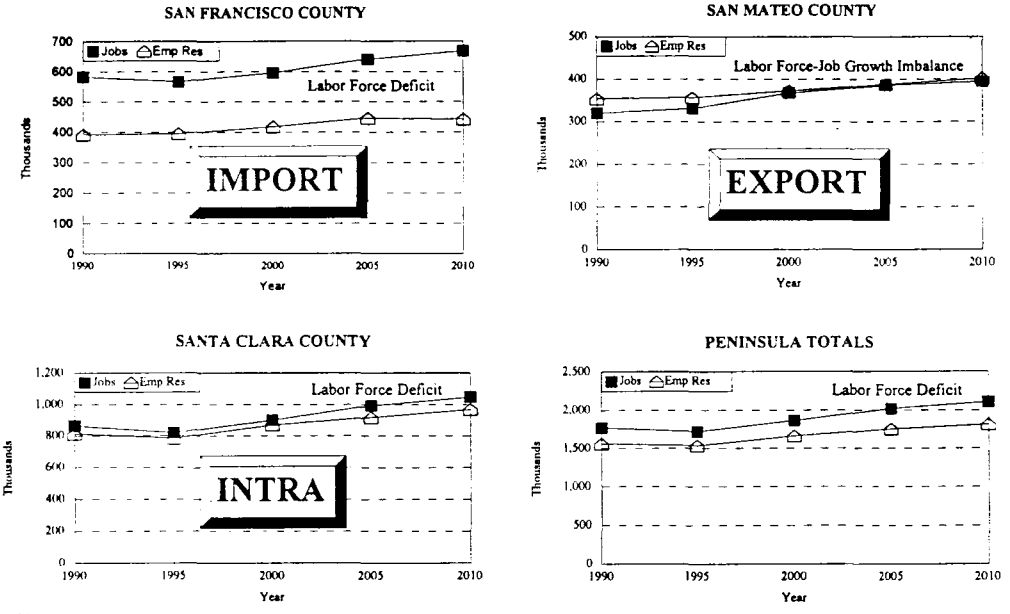
In the southern part of San Mateo County, most of the job growth is expected in the cities of Foster City, Redwood City, and San Mateo. These areas combined are expected to add 24,000 new jobs in the next 20 years. In north San Mateo County, the majority of the job growth will occur in Brisbane, Daly City, San Bruno and South San Francisco. Development of a new Brisbane station is strongly supported by the addition of about 22,500 new jobs within these communities between 1990 and 2010. Also, the San Francisco International Airport is expected to generate an extra 8,200 jobs from 1990 to 2010. Most of San Mateo County's projected job growth is not within walking distance to stations because it is separated from CalTrain by U.S. Highway 101. Expanded shuttle service would be needed to connect CalTrain passengers to their jobs.

VII.C.2. Jobs vs. Employed Residents. In the past, the Peninsula counties have always been a vital part of the Bay Area economy, accounting for 57 percent of the total Bay Area jobs in 1990. Overall, the labor force on the Peninsula is expected to increase by 16 percent from 1990 to 2010: +50,300 in San Francisco, +48,100 in San Mateo and +155,600 in Santa Clara counties (Figure VII.C.2). Despite this increase, the growth in labor is projected to be lower than the growth in job demand, creating a labor force/job growth imbalance. The largest disparity in the entire Bay Area is expected to occur in San Francisco and San Mateo counties.

The labor force/job growth imbalance will fuel a labor force deficit. The greatest shortage will be in San Francisco -- 667,600 jobs against 441,600 employed residents in 2010 -- continuing the need for imported workers. Santa Clara County's anticipated 1,046,400 jobs will almost be met by 967,900 employed residents in 2010, which will continue to support a high percentage of intra-county commuting. However, a growth of 182,300 new jobs, with 155,600 employed residents, also will necessitate imported labor. San Mateo County will continue to have more employed residents than jobs in 2010: 401,700 versus 393,500. Although the gap will decrease by 2010, San Mateo County will continue to export a sizable share of its workforce.

FIGURE VII.C.2

JOBS vs EMPLOYED RESIDENTS
1990 TO 2010



SOURCE: ABAG Projections '94

VIII. TRAVEL DEMAND AND RIDERSHIP FORECASTS

Under Phase 3 of the Market Demand Study, travel demand forecasting scenarios were performed to estimate potential CalTrain ridership under various operating assumptions. The scenarios looked at an incremental approach to service level increases, coupled with changes in the transit network, now and in the year 2010. Table VIII outlines the alternatives that were tested.

TABLE VIII
DEFINITION OF FORECAST ALTERNATIVES

Alternative	Year	# of Daily Trains	CalTrain Service Area
1	1990	52	San Jose to 4th and Townsend
2A	1990	60	Gilroy to 4th and Townsend
2B	1990	72	Gilroy to 4th and Townsend
5A	2010	72	Gilroy to Transbay Terminal
6B	2010	86	Gilroy to Transbay Terminal

VIII.A. Forecasting Methodology and Assumptions

A consulting firm, Korve Engineering, Inc., was hired to conduct the patronage forecasting phase of the study. The San Mateo countywide travel demand and patronage forecasting model was used to test the service scenarios. The model is owned by the City/County Association of Governments and the California Department of Transportation. It also is being used to project forecasts for the San Mateo Countywide Transportation Plan, the Downtown San Francisco Extension and other CalTrain improvement studies. The travel demand model was recalibrated in 1995, to be consistent with the assumptions and procedures established by the Metropolitan Transportation Commission to produce regional travel demand forecasts. MTC has approved the model.

The countywide model is a mode choice model, which provides more robust sensitivity to changes in the transit service and extensions of existing transit service. To support this, forecasts were validated against actual boarding patterns and were within 0.11 percent of actual CalTrain ridership. This was crucial to determine the effect of service level increases on ridership accurately.

TABLE VIII.B CALTRAIN FORECASTING RESULTS SUMMARY					
Weekday Trips	**Alt. 1**	**Alt. 2A**	**Alt. 2B**	**Alt. 5A**	**Alt. 6B**
Peak Hour	16,900	18,600	19,100	27,500	28,200
Midday	4,900	6,300	7,500	11,700	13,700
Air Passenger	-	-	-	1,600	1,900
Total Trips	21,800	24,900	26,600	40,800	43,800
Parking Shortfall	NA	900	1,000	2,500	2,900

All five alternatives assumed no constraints on parking. The 2010 alternatives included a CalTrain base-fare increase from $1.00 in 1990, to $2.00. Future service scenarios also assumed CalTrain operational improvements that effectively increased train speed by 10 percent. All assumptions, including service levels, were developed to provide a yardstick to measure future improvements.

VIII.B. Ridership Forecasting Results

The following model output data was tabulated at a station level for each forecast alternative:

- CalTrain daily and peak-hour ridership
- Boarding and alighting volumes
- Passenger origin & destination
- Trip volumes by walk and drive access
- Daily parking demand estimates

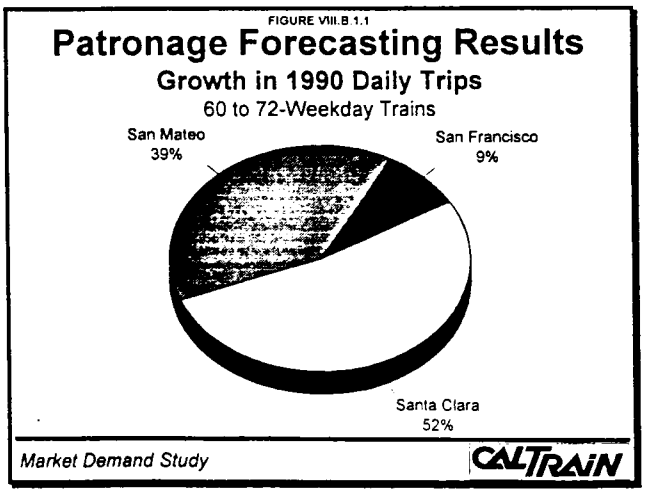
A summary of the forecasting results is provided in Table VIII.B. Detailed model outputs for the service scenarios are found in Appendix 4.

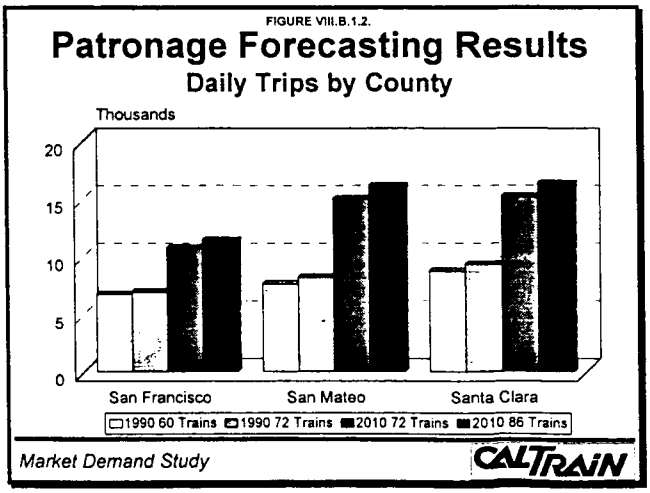
VIII.B.1. Daily Ridership. In the short-term, if the JPB increases service to 72-weekday trains, the model results show that almost 1,700 additional passengers will start using CalTrain daily. This is almost a seven percent growth over a 60-weekday schedule. Of the additional trips, 52 and 39 percent are expected to originate in Santa Clara and San Mateo counties, respectively (Figure VIII.B.1.1).

In 2010, the projections reveal that the greatest ridership potential occurs with the full build out Scenario 6B. This scenario assumes:

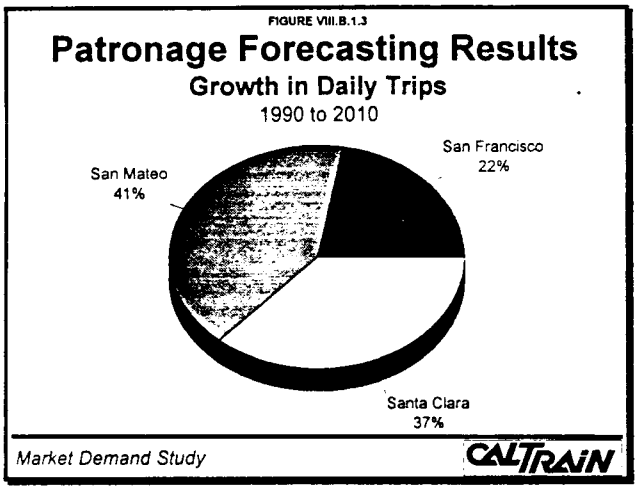
- 86-weekday train schedule
- 10 percent run-time reduction through system electrification or operational improvements
- Connection to Muni Metro Light Rail, BART and VTA Light Rail
- Extension to downtown San Francisco
- Connection to SF Airport
- Operational enhancements such as universal (double) crossovers, interlocked switches and third tracks at selected locations to aid reductions in travel time and implementation of increased frequencies

Based on these improvements, coupled with population growth, a total of 43,800 potential trips is anticipated in 2010, which is almost double CalTrain's 1996 ridership levels. As shown in Figure VIII.B.1.2, an almost equivalent number of passengers is expected to board within Santa Clara and San Mateo counties, with San Francisco County coming in third.

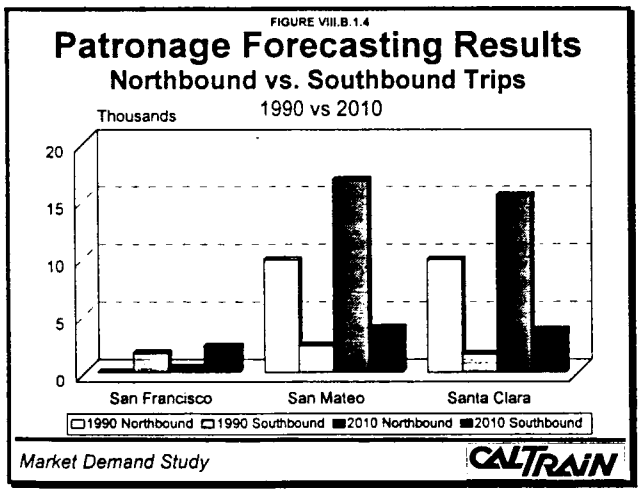




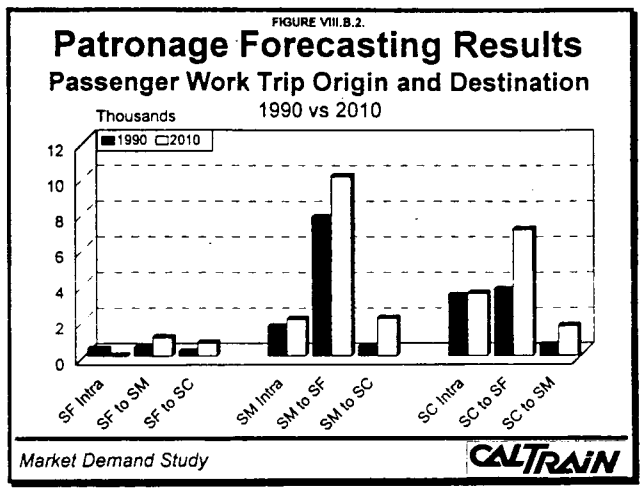
Average weekday ridership growth for the three counties from 1990 to 2010 is: 41 percent for San Mateo, 37 percent for Santa Clara and 22 percent for San Francisco (Figure VIII.B.1.3).



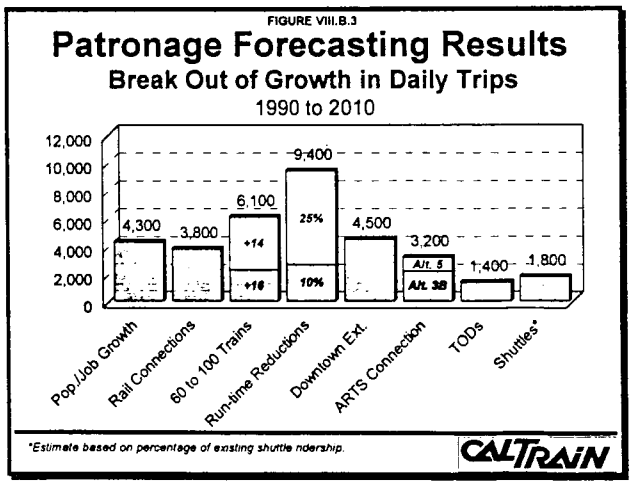
With projected service level increases, operational enhancements and an extension to downtown San Francisco, northbound, peak-period trips prevail as the foremost commute pattern in 2010 (Figure VIII.B.1.4). Almost 77 percent are expected to travel northward in the morning.



VIII.B.2. Passenger Origin and Destination. Figure VIII.B.2 reveals that the highest percentage of CalTrain trips is made by San Mateo County residents who head to work in San Francisco County. In 2010, over 10,000 San Mateo County residents are expected to use CalTrain to get to work in San Francisco. Santa Clara County residents will come in second, with more than 7,000 traveling to work in San Francisco on CalTrain. The third largest origin and destination pair is Santa Clara County patrons using CalTrain within their county, over 3,500 trips.



VIII.B.3. Additional Ridership Information. The patronage forecasting results found in the appendix were supplemented by ridership results from the San Mateo Countywide Transportation Plan and other studies. This offers an incremental approach to CalTrain service level increases, other system enhancements and multi-modal connections. Figure VIII.B.3 identifies CalTrain's 2010 ridership growth generated from each system improvement or multi-modal connection, including: Muni Metro Light Rail at Bayshore, VTA Light Rail at Mountain View and San Jose, and BART at Millbrae and ARTS at San Bruno or west of the airport station.



Reasons for CalTrain's ridership growth identified in Figure VIII.B.3 are further described below:

- If no transportation improvements are implemented in the San Francisco Bay Area by 2010, CalTrain average weekday ridership would still increase by 4,300 due to population and job growth.

- Rail connections to Muni Metro Light Rail at Fourth and Townsend and Bayshore stations, BART at the Millbrae Station and VTA Light Rail Extensions at Mountain View and San Jose stations, would contribute 3,800 daily trips on CalTrain.

- An increase from 60 to 86-weekday trains, with 30-minute headways in the off-peak, would attract 2,300 additional daily trips. However, if CalTrain service levels were brought up to 100-weekday trains by adding 14 primarily in the peak period, 3,800 more daily trips would be drawn to the system. Thus, an expansion from 60 to 100-weekday trains would contribute a total of 6,100 extra daily trips.

- A 10 percent run-time reduction would increase average weekday ridership by 2,700. However, an additional 25 percent decrease in travel times would bring 6,700 added weekday trips. A total increase in average weekday ridership of 9,400 would be realized by speeding up the trains, which could be achieved through system electrification or operational enhancements.

- Extension to downtown San Francisco would add 4,500 daily trips to the CalTrain system.

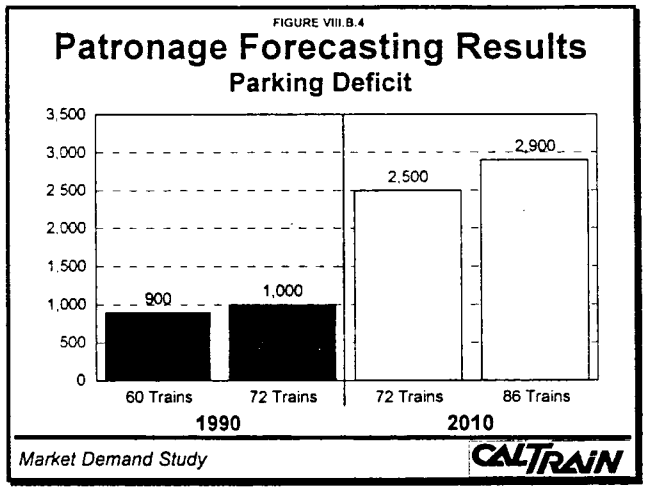
- Airport Rail Transit System connection from a San Bruno Station to the airport would add 2,200 weekday trips. In comparison, an ARTS connection at a station west of the airport would bring 3,200.

- Transit-Oriented Development in San Mateo County would bring 1,400 daily trips to the train. It is anticipated that TODs in San Francisco and Santa Clara counties also could add riders to CalTrain.

- Shuttle connections to employment sites not within walking distance to CalTrain would generate 1,800 more weekday trips.

VIII.B.4. Parking Demand. As discussed in the existing conditions section, parking capacities at CalTrain stations have been a problem -- lots were and continue to be full. Figure VIII.B.4 shows how this will persist in the future if nothing is done; parking deficits are expected to increase from more than 900 to 2,900 spaces in the year 2010. Since passengers typically make round trips, each parking space deficit potentially contributes to two unrealized CalTrain trips. Thus, even if improvements are made to the CalTrain system, some people would not have a place to park, and as a result, potential riders may not come.

FIGURE VIII.B.4



IX. PLANNING STRATEGY

While this report offers findings based on market conditions, additional steps are needed for specific CalTrain rehabilitation, enhancement and expansion projects. This section summarizes a strategic process to systematically identify, prioritize and program CalTrain projects and provide policy recommendations to implement them. This process will build from the Market Demand Study information to fully meet the transit needs on the Peninsula corridor.

In addition to understanding the market, the strategic planning effort will refine the CalTrain Vision Statement, Mission and Goals to set priorities for future improvements. The next step will be to identify the issues, opportunities and constraints facing the JPB over the next 20 years. This effort will focus on the following:

- Service Development – service strategies and levels, fare policy, passenger amenities, transit connections, other studies and projects, etc.

- Fleet Management -- rehabilitation, additional rolling stock, etc.

- Operating Facilities and Equipment -- maintenance facility, storage yard, Centralized Traffic Control system and facility, etc.

- Right of Way Infrastructure -- rehabilitation, upgrades and expansion: third track, interlocked switches, etc.

- Station Improvements - rehabilitation, amenities, access, transit interface, station area development, parking expansion etc.

- Support Equipment -- ticket vending machines, etc.

- Expansion Projects -- downtown San Francisco extension, connection to SFO, system electrification, etc.

- Marketing - paid media and public service announcements, joint venture advertising campaigns, direct mail campaigns, outreach programs, information services, regional coordination, etc.

- Management - institutional arrangements, management issues, etc.

- Financial -- revenue enhancements, dedicated funding source, etc.

Detailed programs with an implementation timeline and financial plan will be developed for each of these components of the CalTrain system. A consolidation of them will formulate a strategic game plan, covering a 20-year time frame. This plan will make policy recommendations for the JPB to consider for adoption in September 1997, as the biannual Short Range Transit Plan. Upon adoption, this SRTP can serve as an implementation strategy for future CalTrain projects and programs over the next 20 years.

APPENDICES

APPENDIX 1

Performance Evaluation – CalTrain Capacity

CALTRAIN
PERFORMANCE EVALUATION

SUMMARY OF
CALTRAIN CAPACITY
FY 1995/96

FY 95/96
BREAKDOWN OF
AVERAGE WEEKDAY TRAVEL

AVERAGE WEEKDAY	# OF TRAINS	# OF CARS	# OF SEATS	MAXIMUM ON BOARD # OF PASS	MAXIMUM ON BOARD PASS/ TRAIN	MAXIMUM ON BOARD PASS/ CAR	% Capacity
AM PEAK	19	80	11072	5415	285.0	67.7	48.91%
PM PEAK	20	84	11624	5676	283.8	67.6	48.83%
MIDDAY	12	48	6624	1771	147.6	36.9	26.74%
OTHER	9	31	4238	1260	140.0	40.6	29.73%
TOTAL:	**60**	**243**	**33558**	**14122**	**235.4**	**58.1**	**42.08%**

FY 95/96
TOTAL SCHEDULED
AVERAGE WEEKDAY TRAVEL

	# OF TRAINS	PEAK TRAINS	# OF CARS	# OF PEAK CARS	# OF SEATS	# OF PEAK SEATS	MAXIMUM ON BOARD TOTAL PASS	MAXIMUM ON BOARD PEAK PASS	TOTAL MAX ON BOARD PASS/ TRAIN	TOTAL MAX ON BOARD PASS/ CAR	PEAK MAX ON BOARD PASS/ TRAIN	PEAK MAX ON BOARD PASS/ CAR	% Total Capacity	% Peak Capacity
AVG. WKDY:	60	39	243	164	33558	22696	14122	11091	235.4	58.1	284.4	67.6	42.08%	48.87%

CALTRAIN
PERFORMANCE EVALUATION
WEEKDAY CAPACITY
FY 1995/96

SAN FRANCISCO TO SAN JOSE/GILROY

TRAIN	PEAK TRAIN	# OF CARS	# OF SEATS	MAXIMUM PASS ON BOARD PER TRAIN	MAXIMUM PASS ON BOARD PER CAR	* TOTAL CAPACITY
22		4	552	103	25.8	18.66%
24	P	4	552	234	58.5	42.39%
26	P	4	552	268	67.0	48.55%
28	P	4	552	322	80.5	58.33%
30	P	4	552	194	48.5	35.14%
32	P	4	552	272	68.0	49.28%
34	P	5	698	150	30.0	21.49%
36	P	4	552	248	62.0	44.93%
38		4	552	173	43.3	31.34%
40		4	552	122	30.5	22.10%
42		4	552	117	29.3	21.20%
SUBTOTAL:						
11	7	45	6218	2203	49.0	35.43%
44		4	552	174	43.5	31.52%
46		4	552	131	32.8	23.73%
48		4	552	160	40.0	28.99%
50	P	4	552	261	65.3	47.28%
52	P	5	698	323	64.6	46.28%
54	P	4	552	384	96.0	69.57%
56	P	4	552	181	45.3	32.79%
58	P	5	698	286	57.2	40.97%
60	P	4	552	188	47.0	34.06%
62	P	4	552	402	100.5	72.83%
64	P	4	552	319	79.8	57.79%
66	P	5	698	393	78.6	56.30%
68	P	4	552	229	57.3	41.49%
70	P	5	698	469	93.8	67.19%
72	P	4	552	311	77.8	56.34%
74		4	552	273	68.3	49.46%
76		3	406	177	59.0	43.60%
78		3	406	96	32.0	23.65%
80		3	406	99	33.0	24.38%
SUBTOTAL:						
19	12	77	10634	4856	63.1	45.66%
TOTAL:						
30	**19**	**122**	**16852**	**7059**	**57.9**	**41.89%**

AM PEAK = 5:30 TO 8:45 AM
PM PEAK = 4:00 TO 6:30 PM

*BASED ON FEBRUARY/MARCH 1996 ON/OFF COUNTS.

SAN JOSE/GILROY TO SAN FRANCISCO

TRAIN	PEAK TRAIN	# OF CARS	# OF SEATS	MAXIMUM PASS ON BOARD PER TRAIN	MAXIMUM PASS ON BOARD PER CAR	* TOTAL CAPACITY
23		4	552	193	48.3	34.96%
25	P	4	552	320	80.0	57.97%
27	P	5	698	474	94.8	67.91%
29	P	4	552	189	47.3	34.24%
31	P	4	552	270	67.5	48.91%
33	P	4	552	355	88.8	64.31%
35	P	4	552	301	75.3	54.53%
37	P	5	698	535	107.0	76.65%
39	P	4	552	391	97.8	70.83%
41	P	5	698	211	42.2	30.23%
43	P	4	552	260	65.0	47.10%
45	P	4	552	269	67.3	48.73%
47	P	4	552	152	38.0	27.54%
49		4	552	207	51.8	37.50%
51		4	552	160	40.0	28.99%
SUBTOTAL:						
15	12	63	8718	4287	68.0	49.17%
53		4	552	131	32.8	23.73%
55		4	552	133	33.3	24.09%
57		4	552	123	30.8	22.28%
59		4	552	140	35.0	25.36%
61	P	4	552	222	55.5	40.22%
63	P	5	698	144	28.8	20.63%
65	P	4	552	235	58.8	42.57%
67	P	4	552	309	77.3	55.98%
69	P	4	552	372	93.0	67.39%
71	P	4	552	205	51.3	37.14%
73	P	3	406	267	89.0	65.76%
75	P	4	552	176	44.0	31.88%
77		4	552	120	30.0	21.74%
79		3	406	99	33.0	24.38%
81		3	406	100	33.3	24.63%
SUBTOTAL:						
15	8	58	7988	2776	47.9	34.75%
TOTAL:						
30	**20**	**121**	**16706**	**7063**	**58.4**	**42.28%**

AM PEAK = 5:30 TO 8:45 AM
PM PEAK = 4:00 TO 6:30 PM

*BASED ON FEBRUARY/MARCH 1996 ON/OFF COUNTS.

CALTRAIN
PERFORMANCE EVALUATION

SUMMARY OF
CALTRAIN CAPACITY
FY 1992/93

FY 92/93
BREAKDOWN OF
AVERAGE WEEKDAY TRAVEL

AVERAGE WEEKDAY	# OF TRAINS	# OF CARS	# OF SEATS	MAXIMUM ON BOARD # OF PASS	MAXIMUM ON BOARD PASS/ TRAIN	MAXIMUM ON BOARD PASS/ CAR	% Capacity
AM PEAK	19	72	10494	5501	305.6	76.4	52.42
PM PEAK	20	78	11364	5994	299.7	76.8	52.75
MIDDAY	12	48	6256	1744	145.3	40.6	27.88
OTHER	10	40	5830	1360	136.0	34.0	23.33
TOTAL:	60	238	33944	14599	243.3	62.7	43.01

FY 92/93
TOTAL SCHEDULED
AVERAGE WEEKDAY TRAVEL

	# OF TRAINS	PEAK TRAINS	# OF CARS	# OF PEAK CARS	# OF SEATS	# OF PEAK SEATS	MAXIMUM ON BOARD TOTAL PASS	MAXIMUM ON BOARD PEAK PASS	TOTAL MAX ON BOARD PASS/ TRAIN	TOTAL MAX ON BOARD PASS/ CAR	PEAK MAX ON BOARD PASS/ TRAIN	PEAK MAX ON BOARD PASS/ CAR	% Total Capacity	% Peak Capacity
AVG. WKDY:	60	38	233	150	33944	21858	14599	11495	243.3	62.7	302.5	76.6	43.01	52.59

CALTRAIN
PERFORMANCE EVALUATION
WEEKDAY CAPACITY
FY 1992/93

SAN FRANCISCO TO SAN JOSE/GILROY

TRAIN	PEAK TRAIN	# OF CARS	# OF SEATS	MAXIMUM PASS ON BOARD PER TRAIN	PER CAR	* TOTAL CAPACITY
22		5	731	57	11.4	7.80%
24	P	3	435	112	37.3	25.75%
26	P	3	435	175	58.3	40.23%
28	P	4	583	268	67.0	45.97%
30	P	3	435	274	91.3	62.99%
32	P	3	435	212	70.7	48.74%
34	P	4	583	159	39.8	27.27%
36	P	4	583	196	49.0	33.62%
38		4	583	121	30.3	20.75%
40		4	583	111	27.8	19.04%
42		3	435	91	30.3	20.92%
SUBTOTAL:						
11	7	40	5821	1776	44.4	30.51%
44		4	583	154	38.5	26.42%
46		3	435	110	36.7	25.29%
48		4	583	207	51.8	35.51%
50	P	3	435	292	97.3	67.13%
52	P	4	583	340	85.0	58.32%
54	P	4	583	446	111.5	76.50%
56	P	3	435	216	72.0	49.66%
58	P	4	583	250	62.5	42.88%
60	P	4	583	336	84.0	57.63%
62	P	6	879	528	88.0	60.07%
64	P	5	731	455	91.0	62.24%
66	P	5	731	415	83.0	56.77%
68	P	3	435	327	109.0	75.17%
70	P	5	731	567	113.4	77.56%
72	P	4	583	237	59.3	40.65%
74		4	583	332	83.0	56.95%
76		4	583	249	62.3	42.71%
78		3	435	140	46.7	32.18%
80		5	731	121	24.2	16.55%
SUBTOTAL:						
19	12	77	11225	5722	74.3	50.98%
TOTAL:						
30	19	117	17046	7498	64.1	43.99%

AM PEAK = 5:30 TO 8:45 AM
PM PEAK = 4:00 TO 6:30 PM

*BASED ON OCTOBER 1992 ON/OFF COUNTS.

SAN JOSE/GILROY TO SAN FRANCISCO

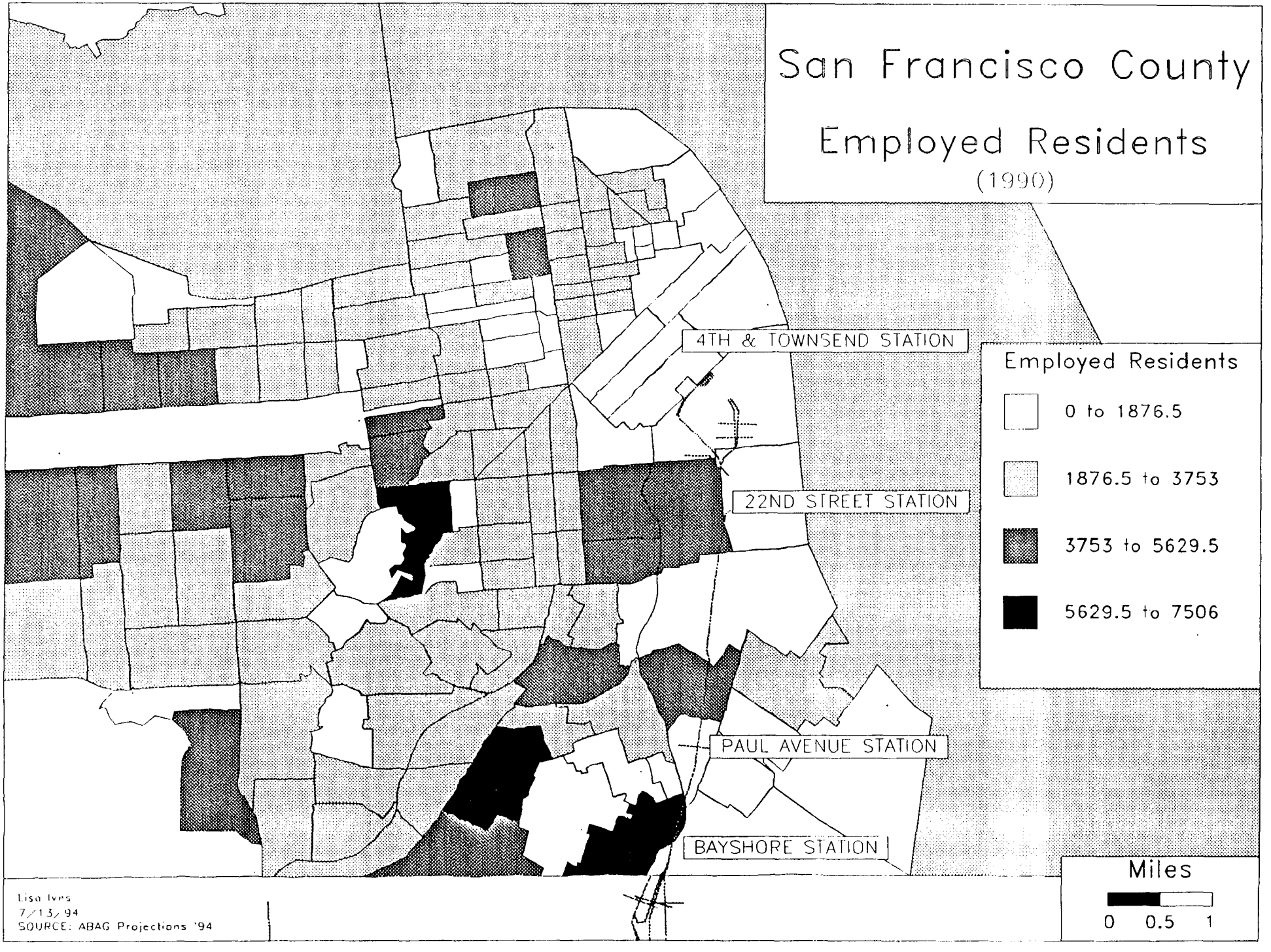
TRAIN	PEAK TRAIN	# OF CARS	# OF SEATS	MAXIMUM PASS ON BOARD PER TRAIN	PER CAR	* TOTAL CAPACITY
23		3	435	206	68.7	47.36%
25	P	4	583	252	63.0	43.22%
27	P	5	731	541	108.2	74.01%
29	P	4	583	300	75.0	51.46%
31	P	4	583	275	68.8	47.17%
33	P	4	583	387	96.8	66.38%
35	P	6	879	554	92.3	63.03%
37	P	5	731	457	91.4	62.52%
39	P	4	583	296	74.0	50.77%
41	P	4	583	332	83.0	56.95%
43	P	5	731	474	94.8	64.84%
45	P	3	435	237	79.0	54.48%
47		3	435	219	73.0	50.34%
49		4	583	213	53.3	36.54%
51		4	583	129	32.3	22.13%
SUBTOTAL:						
15	11	62	9041	4872	78.6	53.89%
53		4	583	164	41.0	28.13%
55		3	435	97	32.3	22.30%
57		3	435	128	42.7	29.43%
59	P	3	435	192	64.0	44.14%
61	P	3	435	122	40.7	28.05%
63	P	4	583	212	53.0	36.36%
65	P	4	583	205	51.3	35.16%
67	P	4	583	341	85.3	58.49%
69	P	3	435	142	47.3	32.64%
71	P	3	435	238	79.3	54.71%
73	P	4	583	133	33.3	22.81%
75		3	435	71	23.7	16.32%
77		5	731	46	9.2	6.29%
79		5	731	68	13.6	9.30%
81		3	435	70	23.3	16.09%
SUBTOTAL:						
15	8	54	7857	2229	41.3	28.37%
TOTAL:						
30	19	116	16898	7101	61.2	42.02%

AM PEAK = 5:30 TO 8:45 AM
PM PEAK = 4:00 TO 6:30 PM

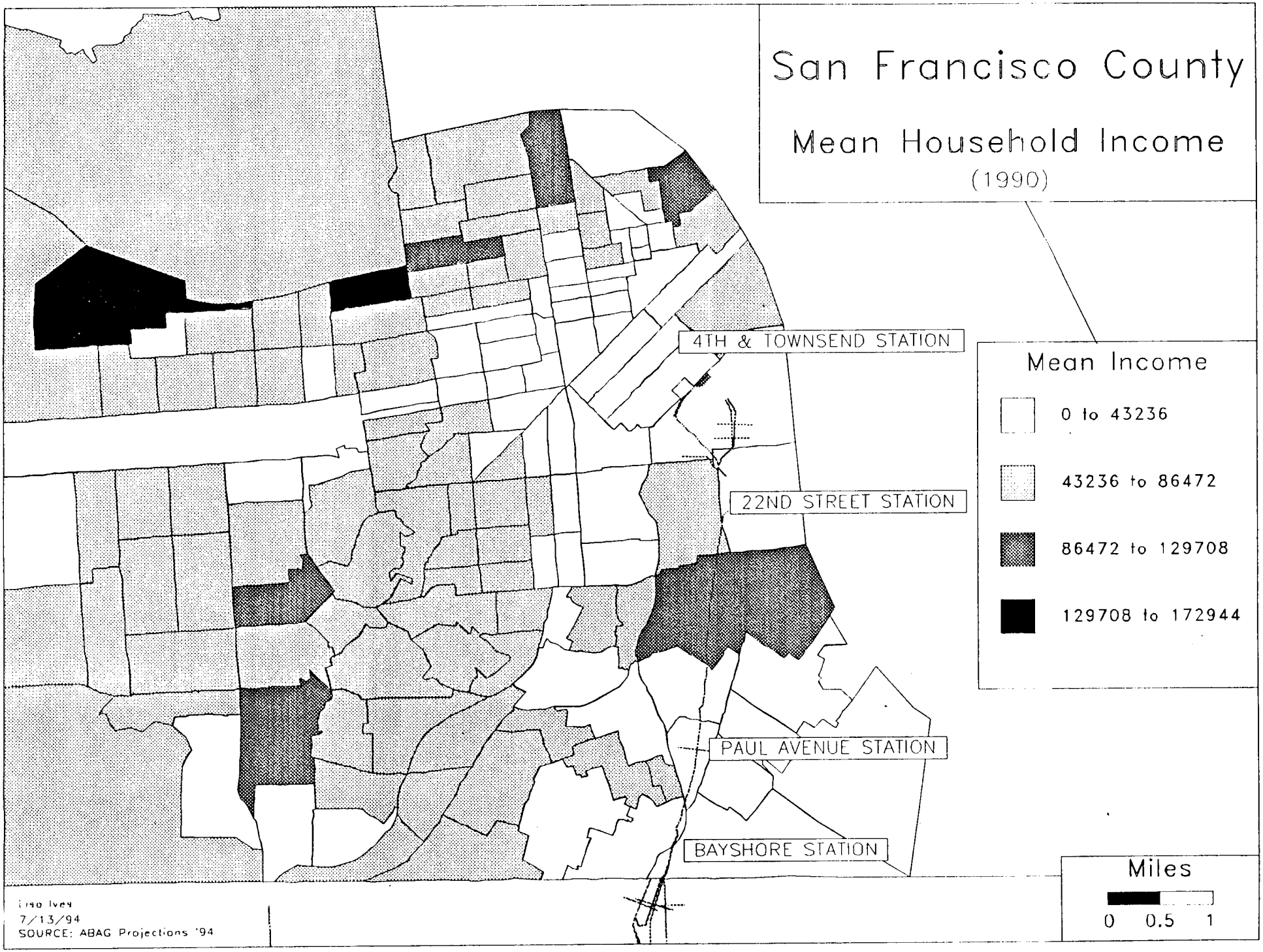
*BASED ON OCTOBER 1992 ON/OFF COUNTS.

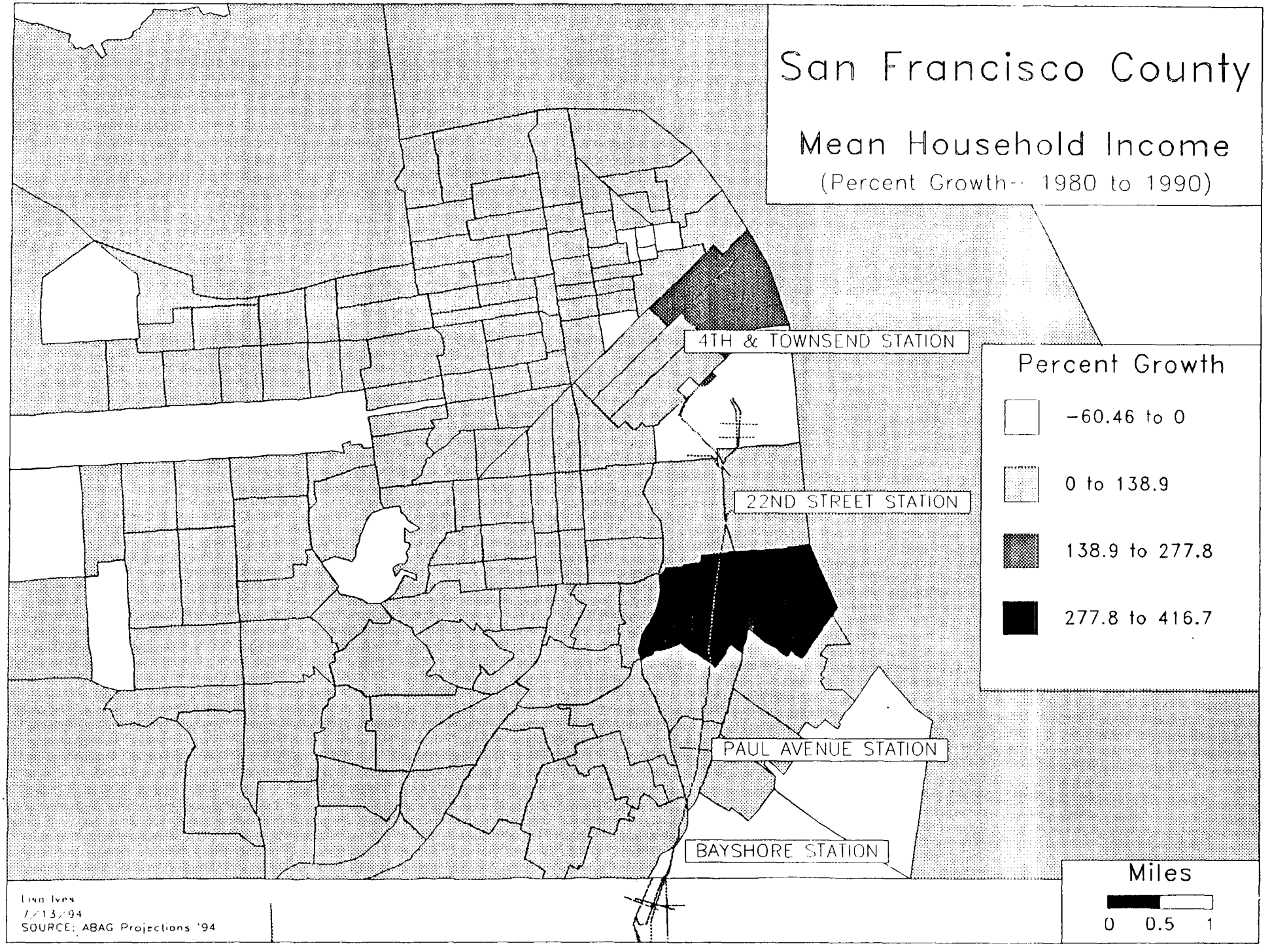
APPENDIX 2

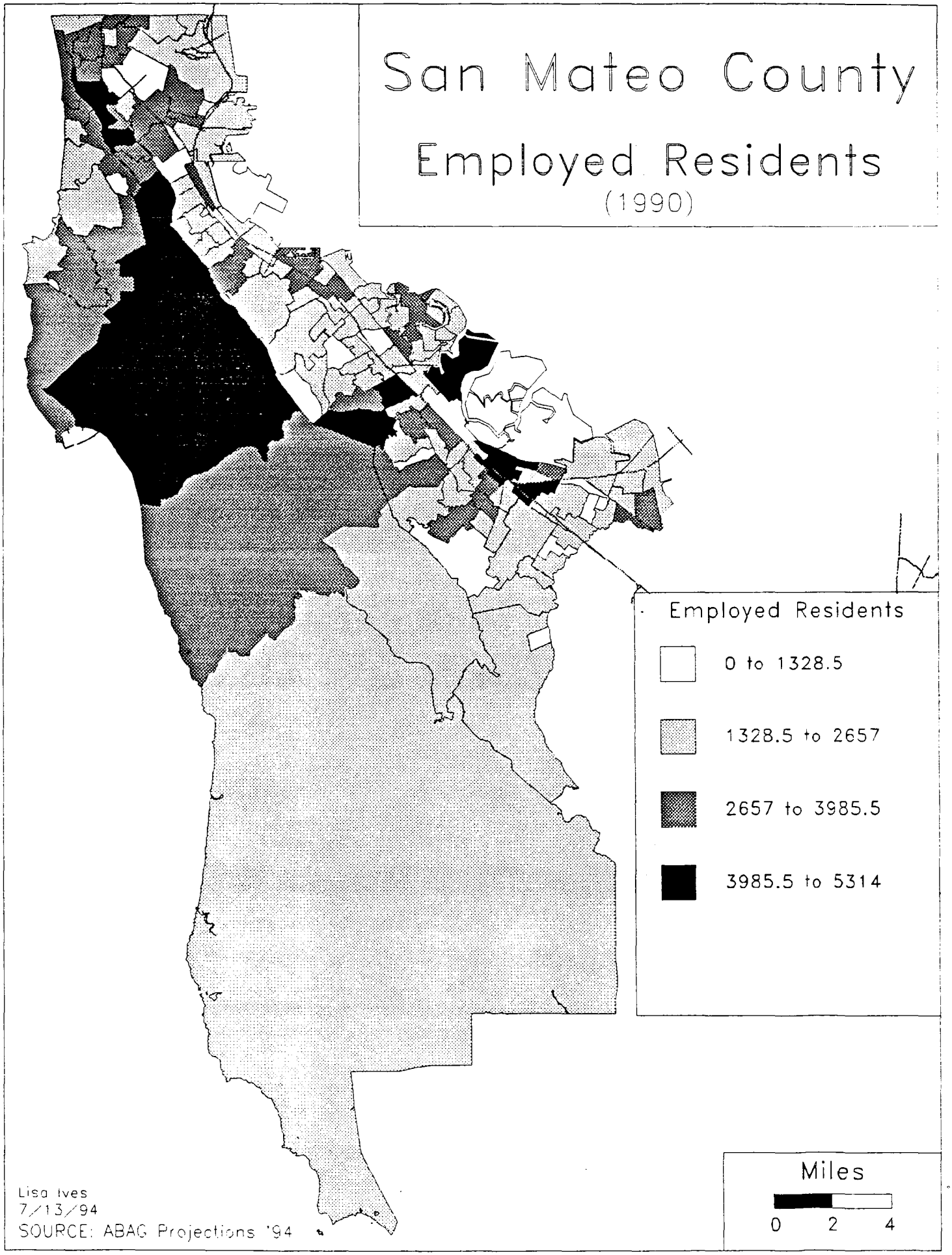
Demographic, Socioeconomic and Land Use

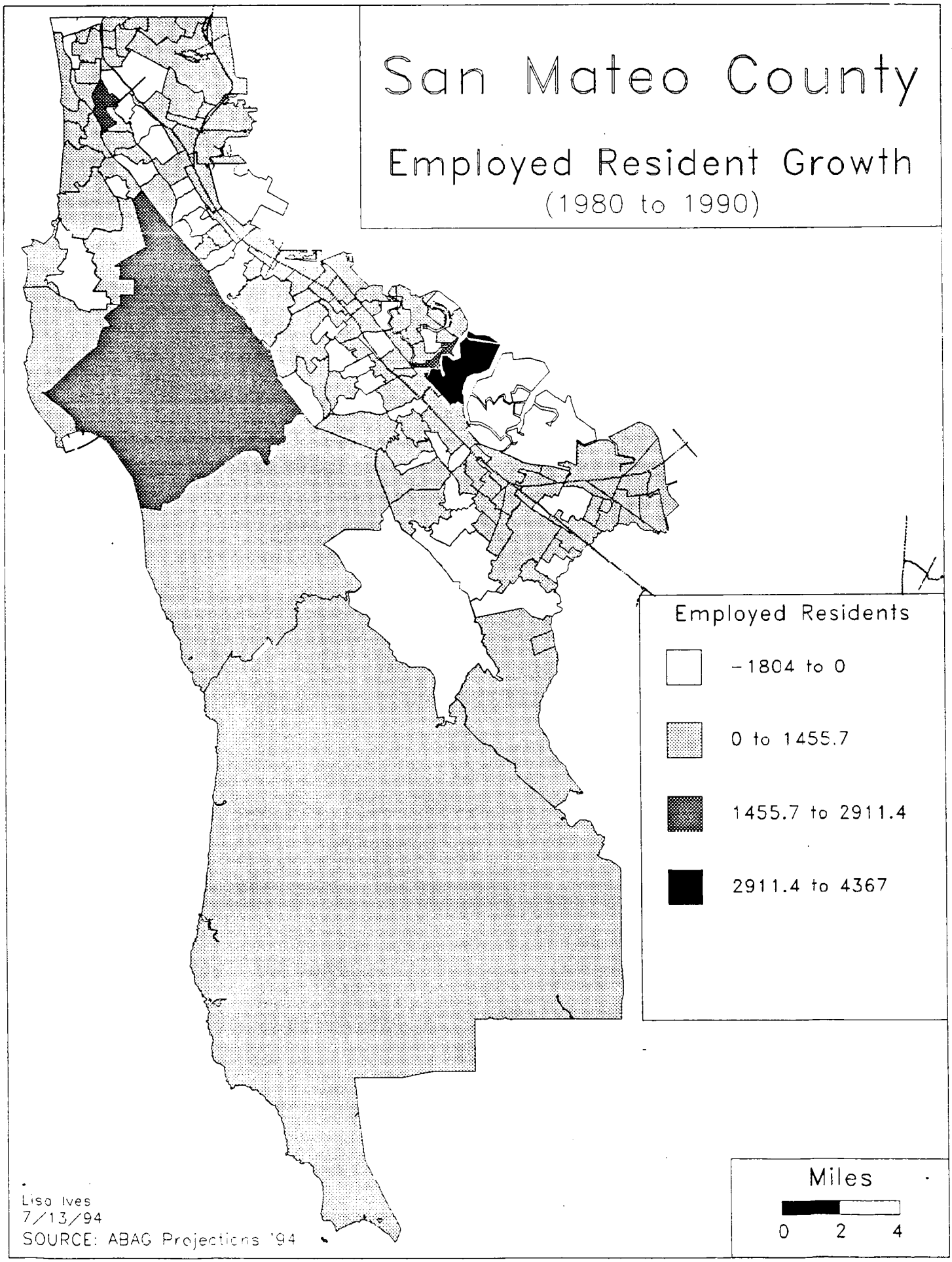

San Francisco County
Employed Residents
(1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Employed Residents
0 to 1876.5
1876.5 to 3753
3753 to 5629.5
5629.5 to 7506
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94

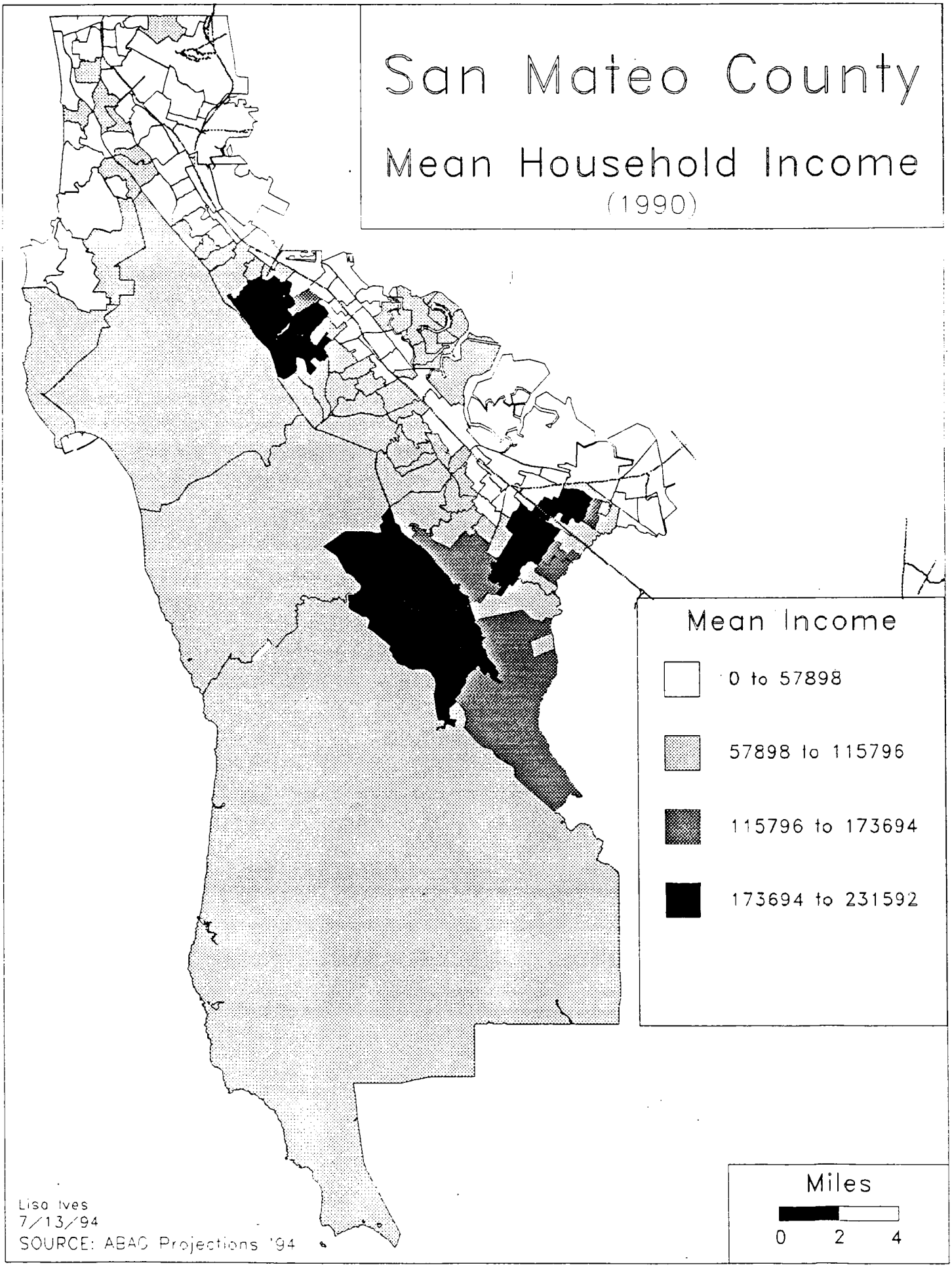

San Francisco County
Employed Resident Growth
(1980 to 1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Employed Residents
-505 to 0
0 to 630.7
630.7 to 1261.4
1261.4 to 1892
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Francisco County
Mean Household Income
(1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Mean Income
0 to 43236
43236 to 86472
86472 to 129708
129708 to 172944
Miles
0 0.5 1
7/13/94
SOURCE: ABAG Projections '94


San Francisco County
Mean Household Income
(Percent Growth-- 1980 to 1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Percent Growth
-60.46 to 0
0 to 138.9
138.9 to 277.8
277.8 to 416.7
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Mateo County
Employed Residents
(1990)
Employed Residents
0 to 1328.5
1328.5 to 2657
2657 to 3985.5
3985.5 to 5314
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94

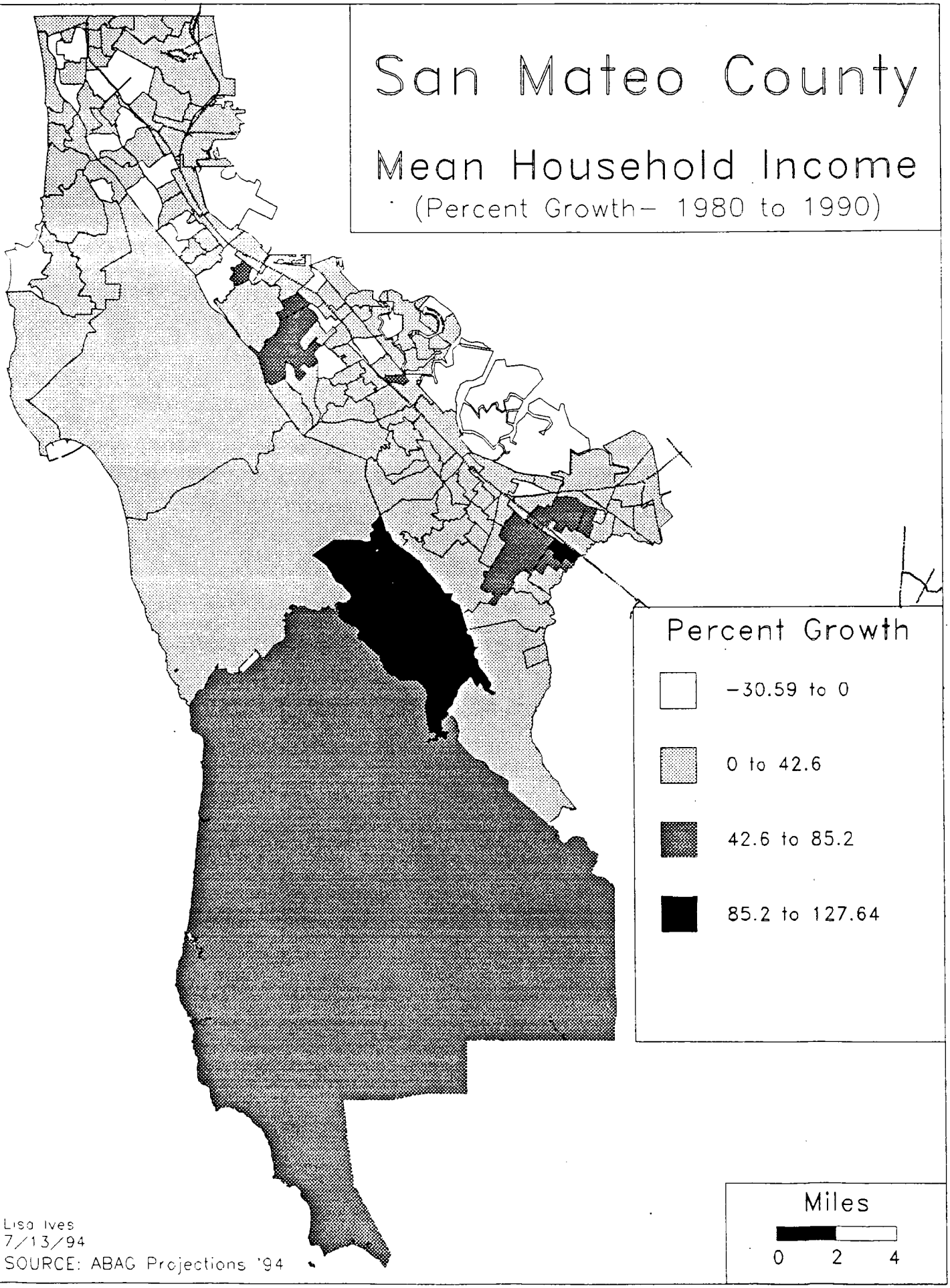

San Mateo County
Employed Resident Growth
(1980 to 1990)
Employed Residents
-1804 to 0
0 to 1455.7
1455.7 to 2911.4
2911.4 to 4367
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Mateo County
Mean Household Income
(1990)
Mean Income
0 to 57898
57898 to 115796
115796 to 173694
173694 to 231592
Miles
0
2
4
Lisa Ives
7/13/94
SOURCE: ABAC Projections '94

San Mateo County

Mean Household Income

(Percent Growth– 1980 to 1990)

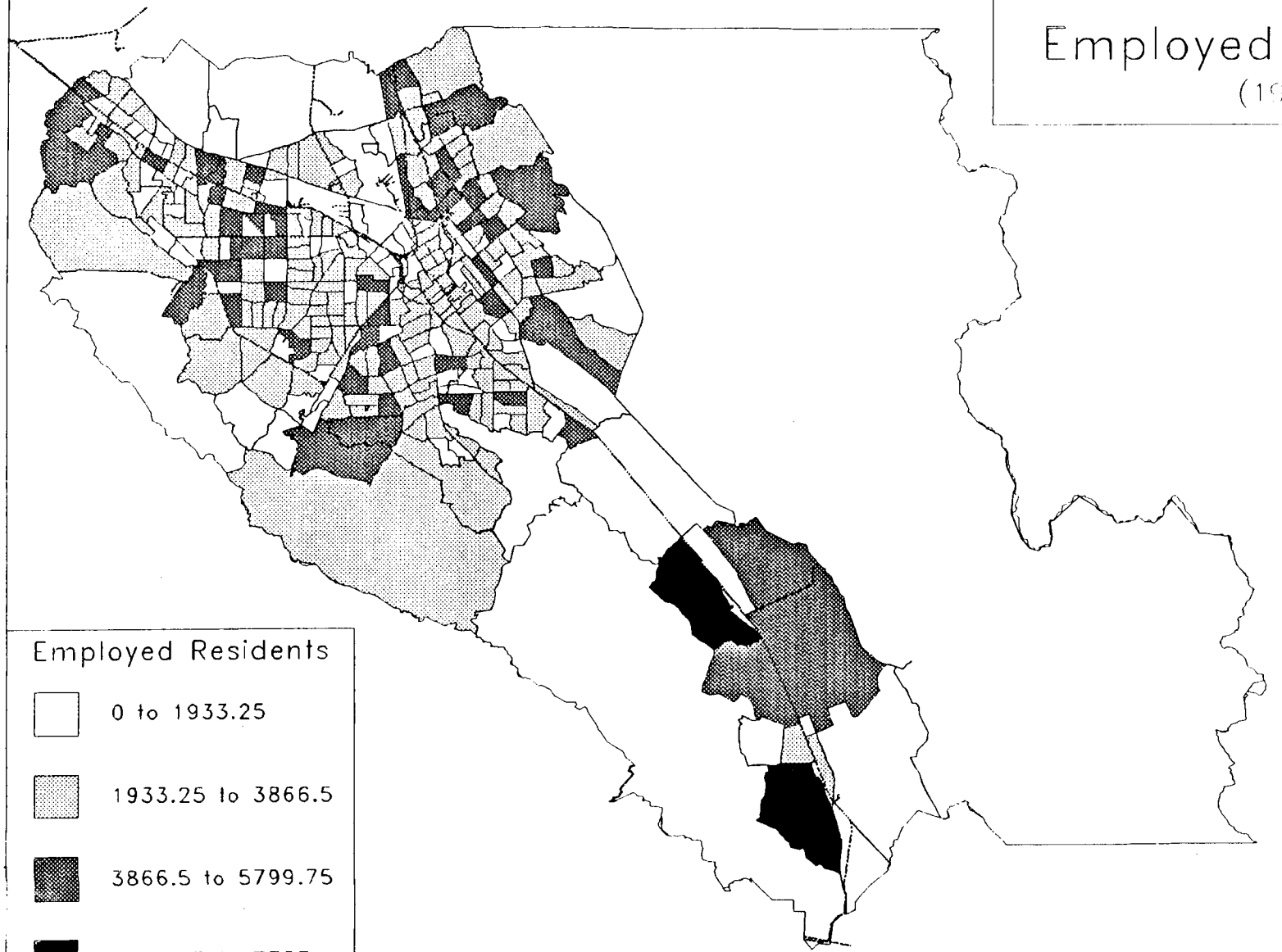


Lisa Ives
7/13/94
SOURCE: ABAG Projections '94

Santa Clara County

Employed Residents

(1990)



Employed Residents

- 0 to 1933.25
- 1933.25 to 3866.5
- 3866.5 to 5799.75
- 5799.75 to 7733

Lisa Ives
7/08/94
SOURCE: ABAG Projections '94

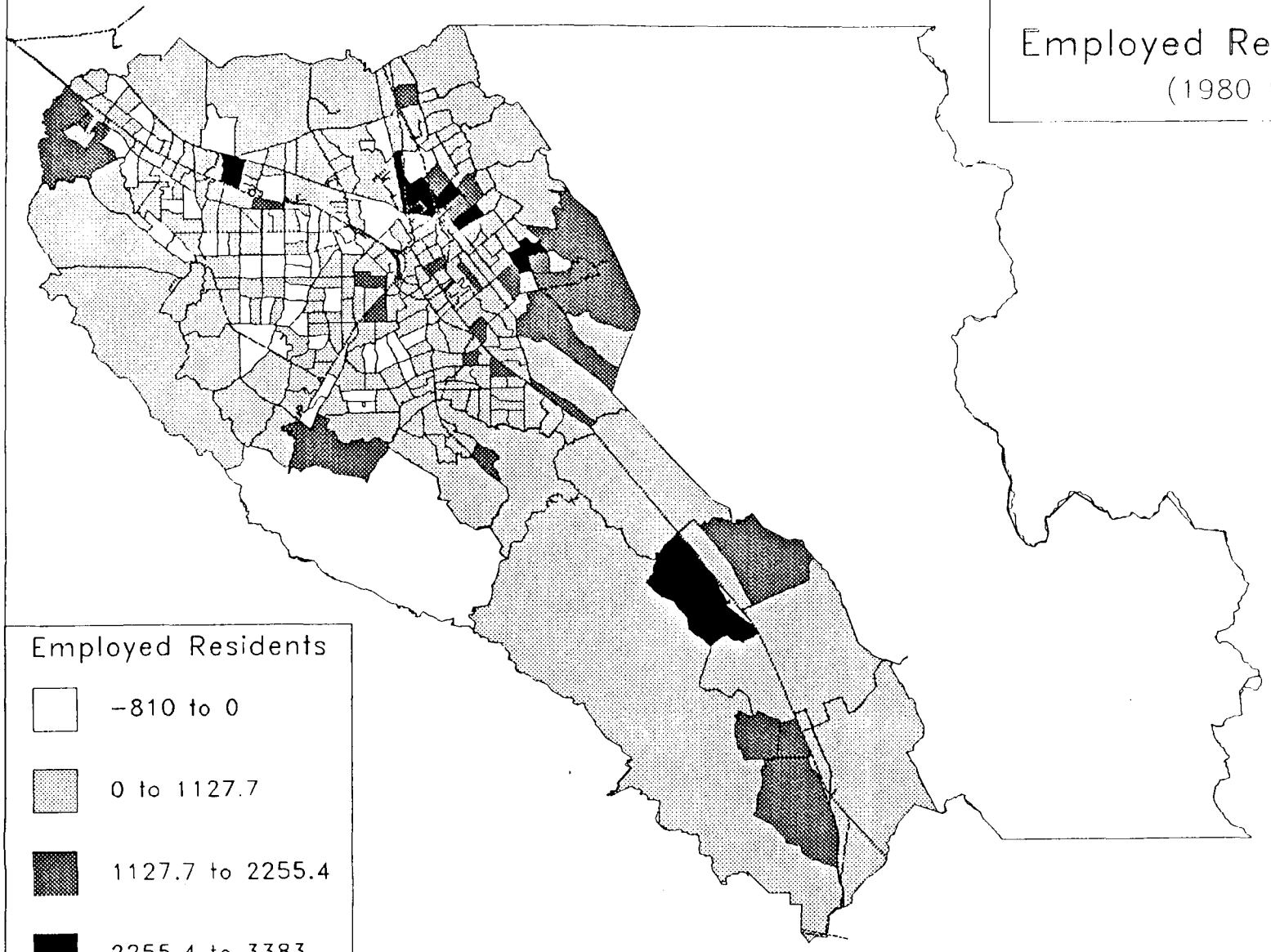
Miles

0 2 4

Santa Clara County

Employed Resident Growth

(1980 to 1990)



Employed Residents

- −810 to 0
- 0 to 1127.7
- 1127.7 to 2255.4
- 2255.4 to 3383

Miles

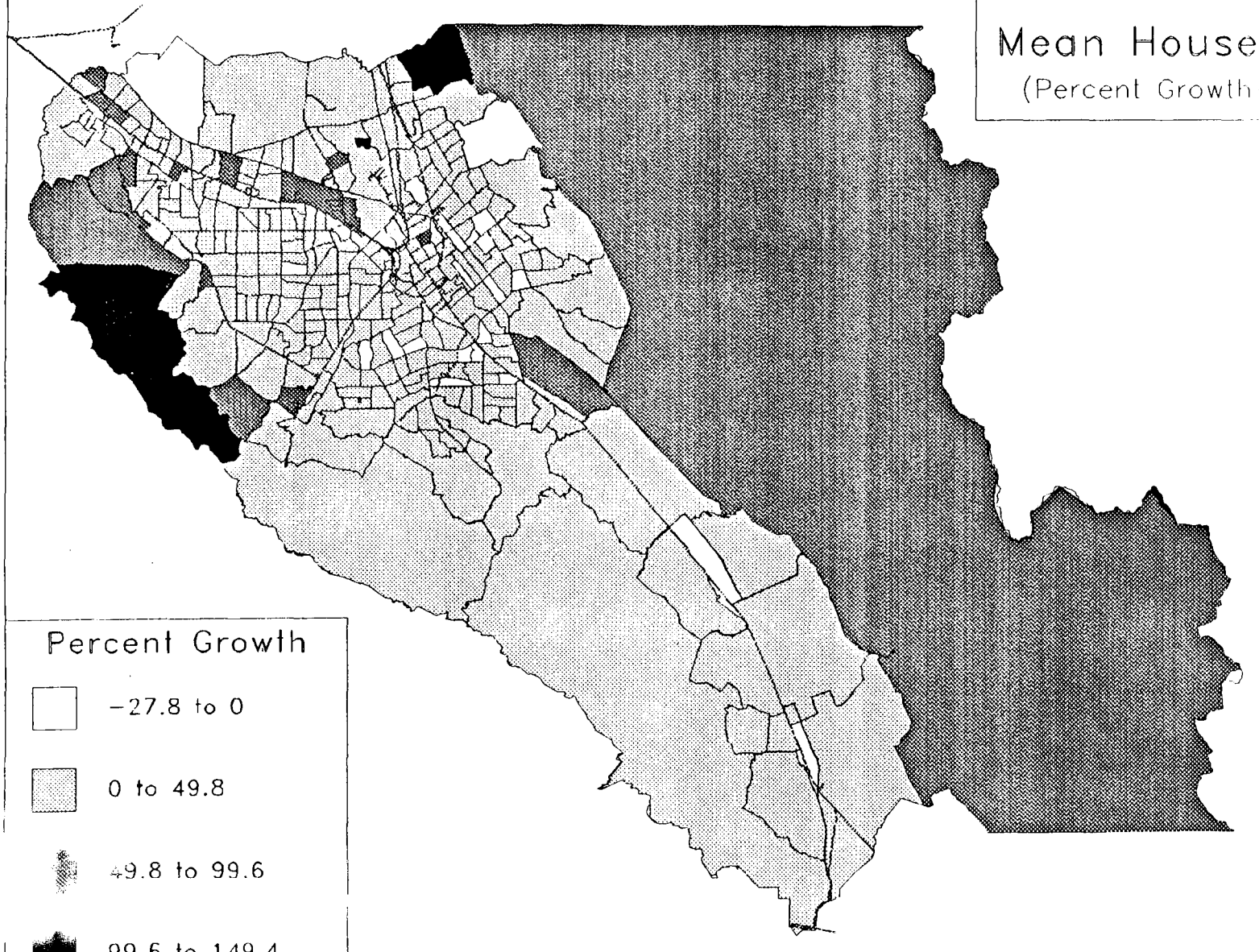
0 2 4

SOURCE: ABAG Projections '94

Santa Clara County

Mean Household Income

(Percent Growth- 1980 to 1990)



Percent Growth

- −27.8 to 0
- 0 to 49.8
- 49.8 to 99.6
- 99.6 to 149.4

Miles

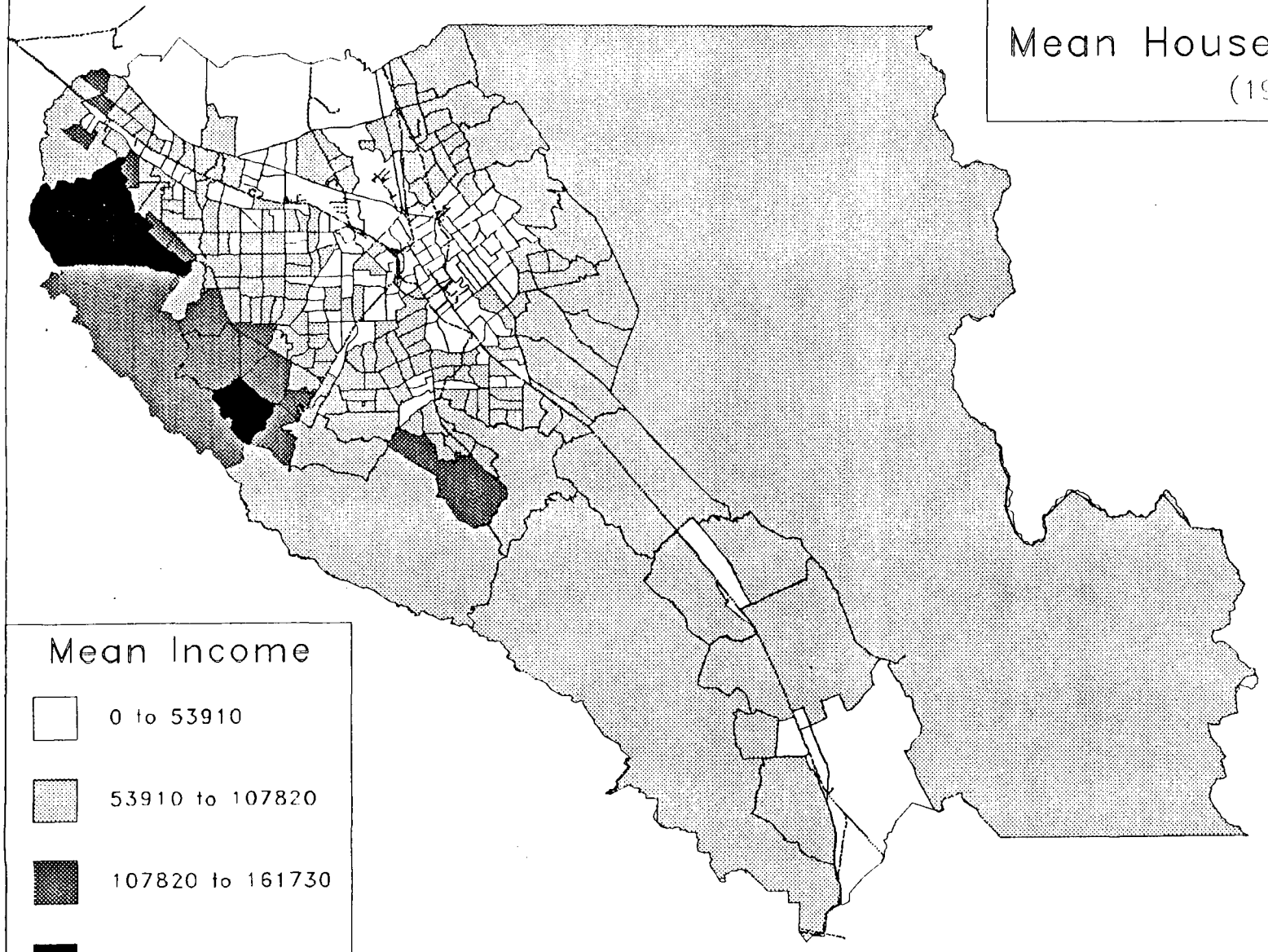
0 2 4

Lisa Ives
7/08/94
SOURCE: ABAG Projections '94

Santa Clara County

Mean Household Income

(1990)



Mean Income

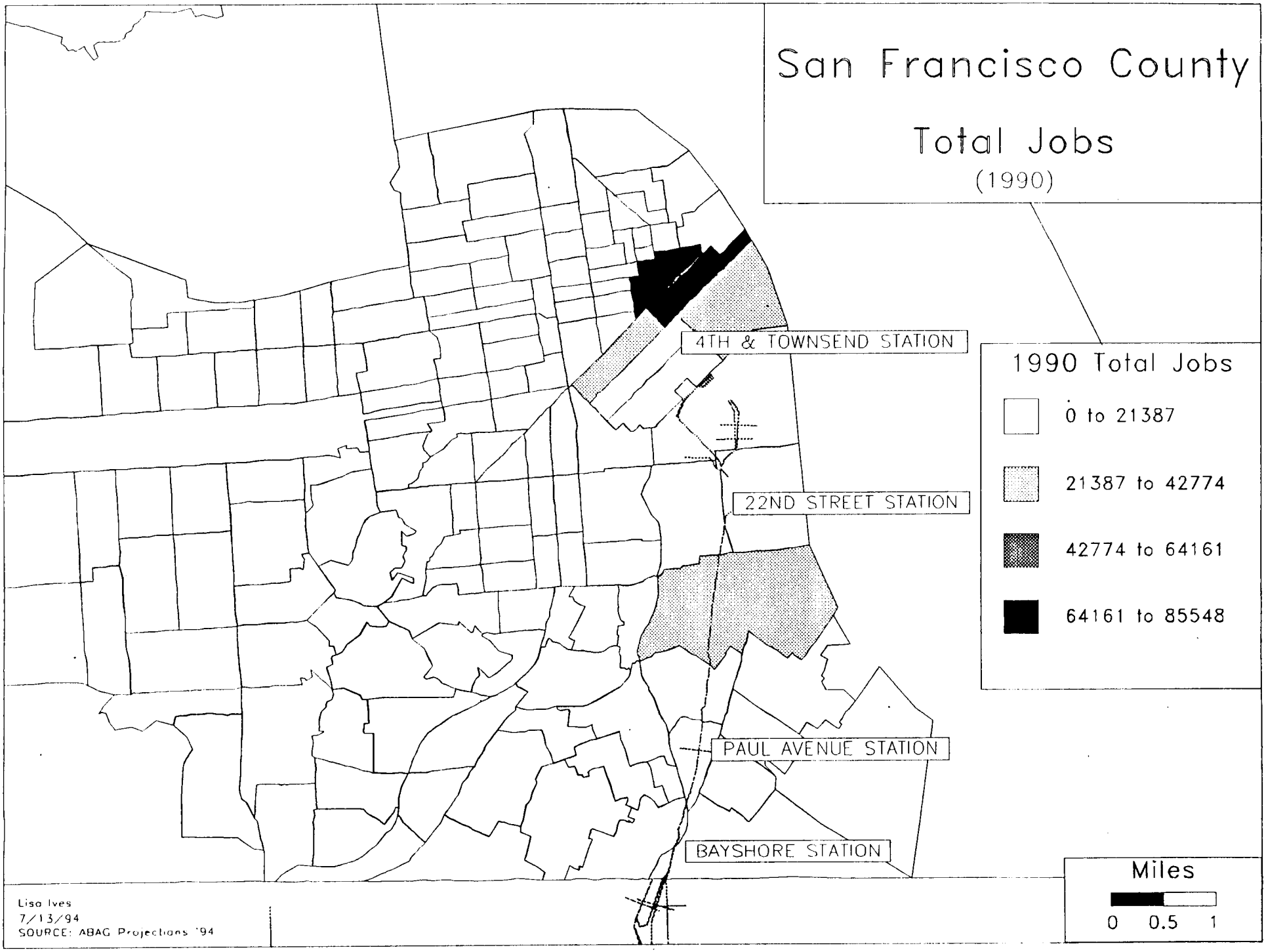
- 0 to 53910
- 53910 to 107820
- 107820 to 161730
- 161730 to 215640

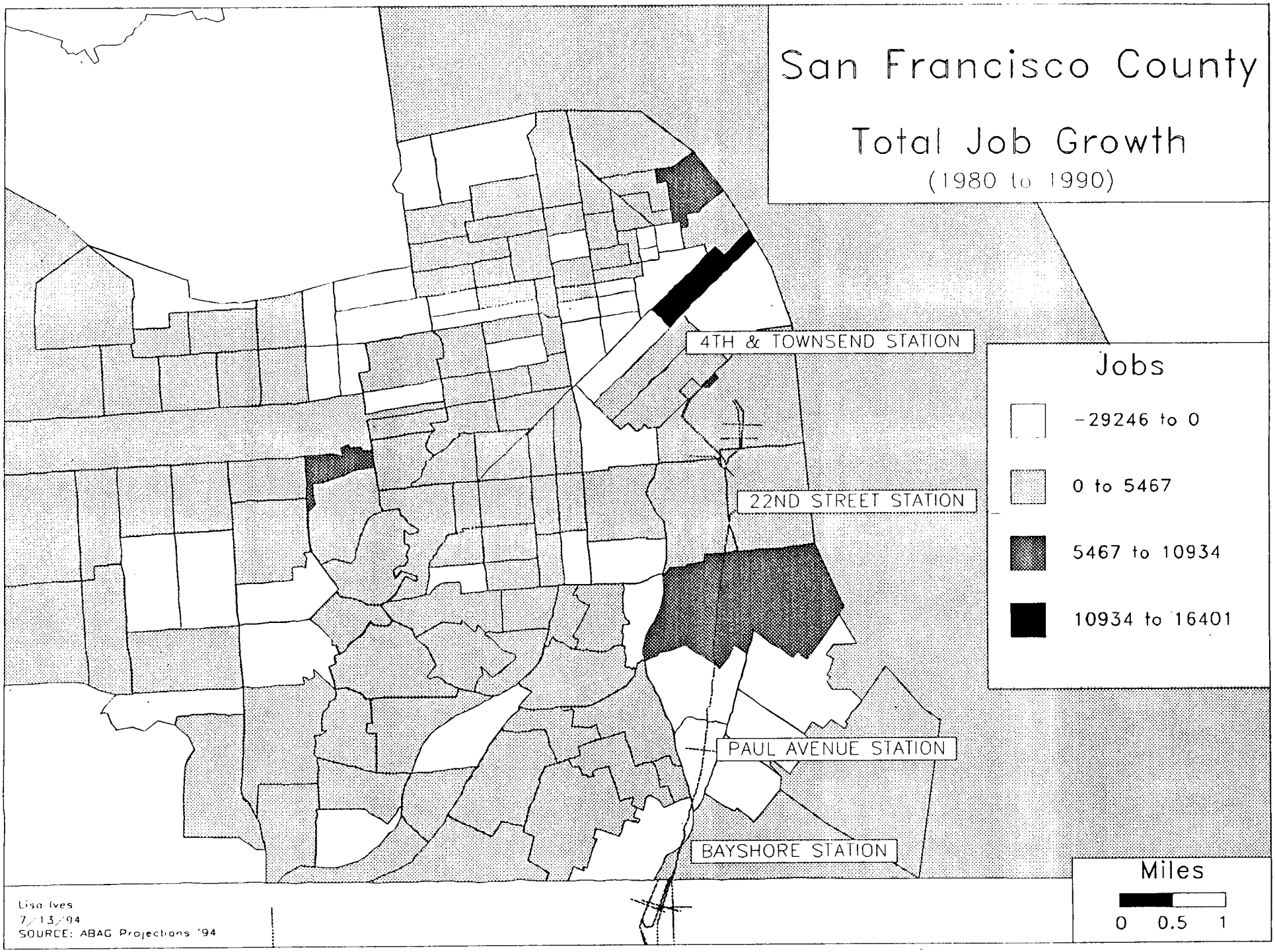
Miles

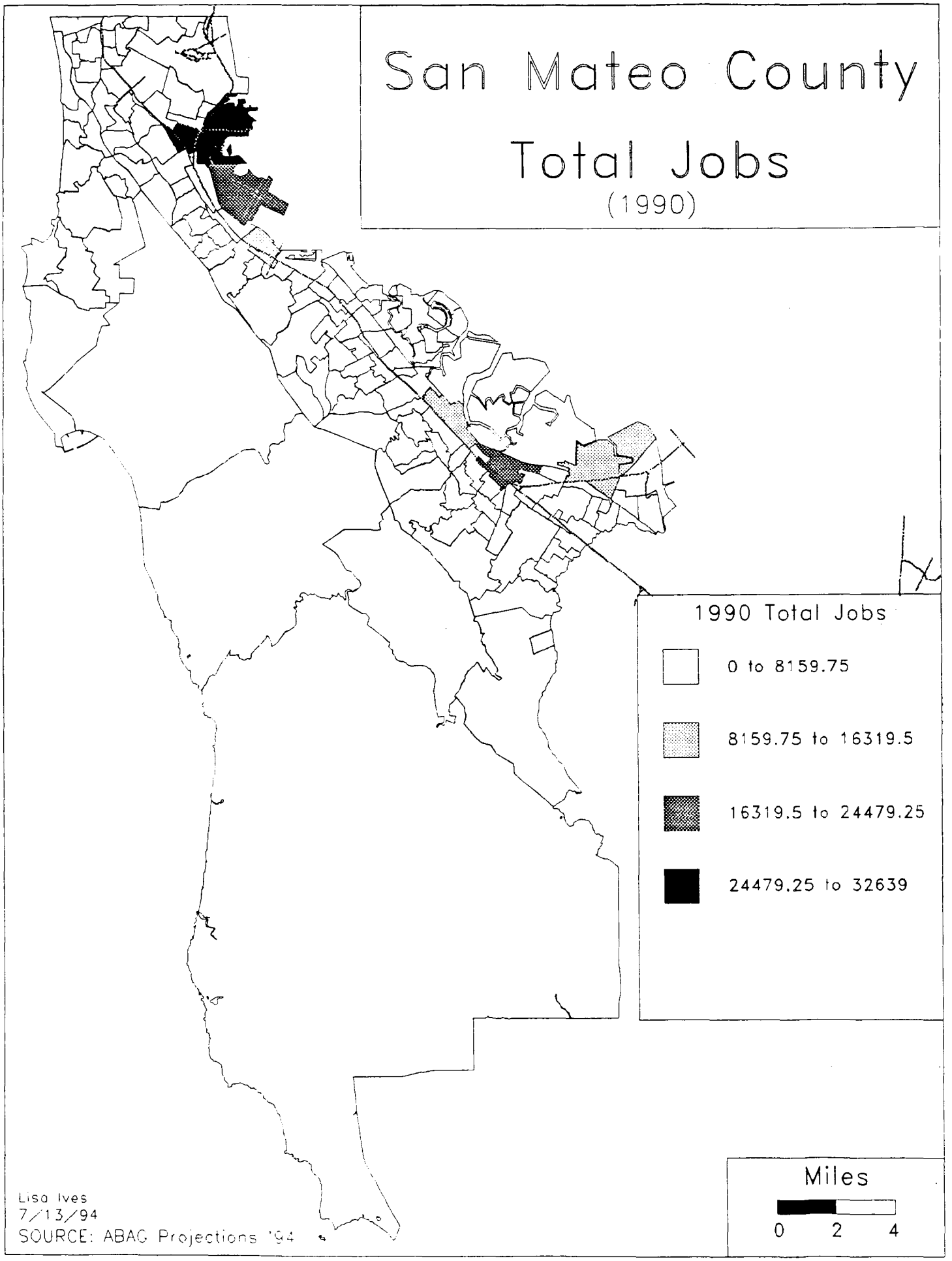
0 2 4

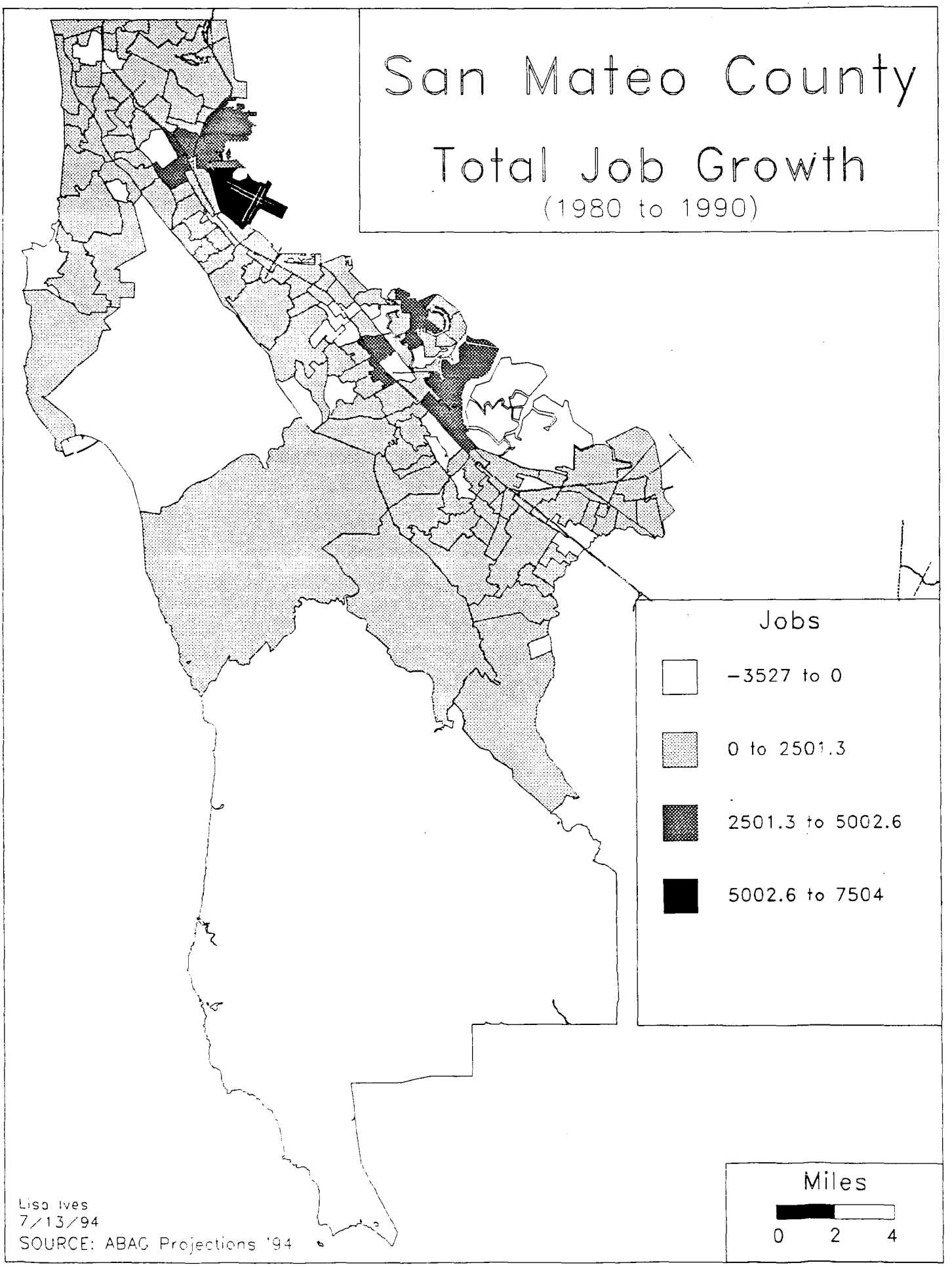
Lisa Ives
7/08/94

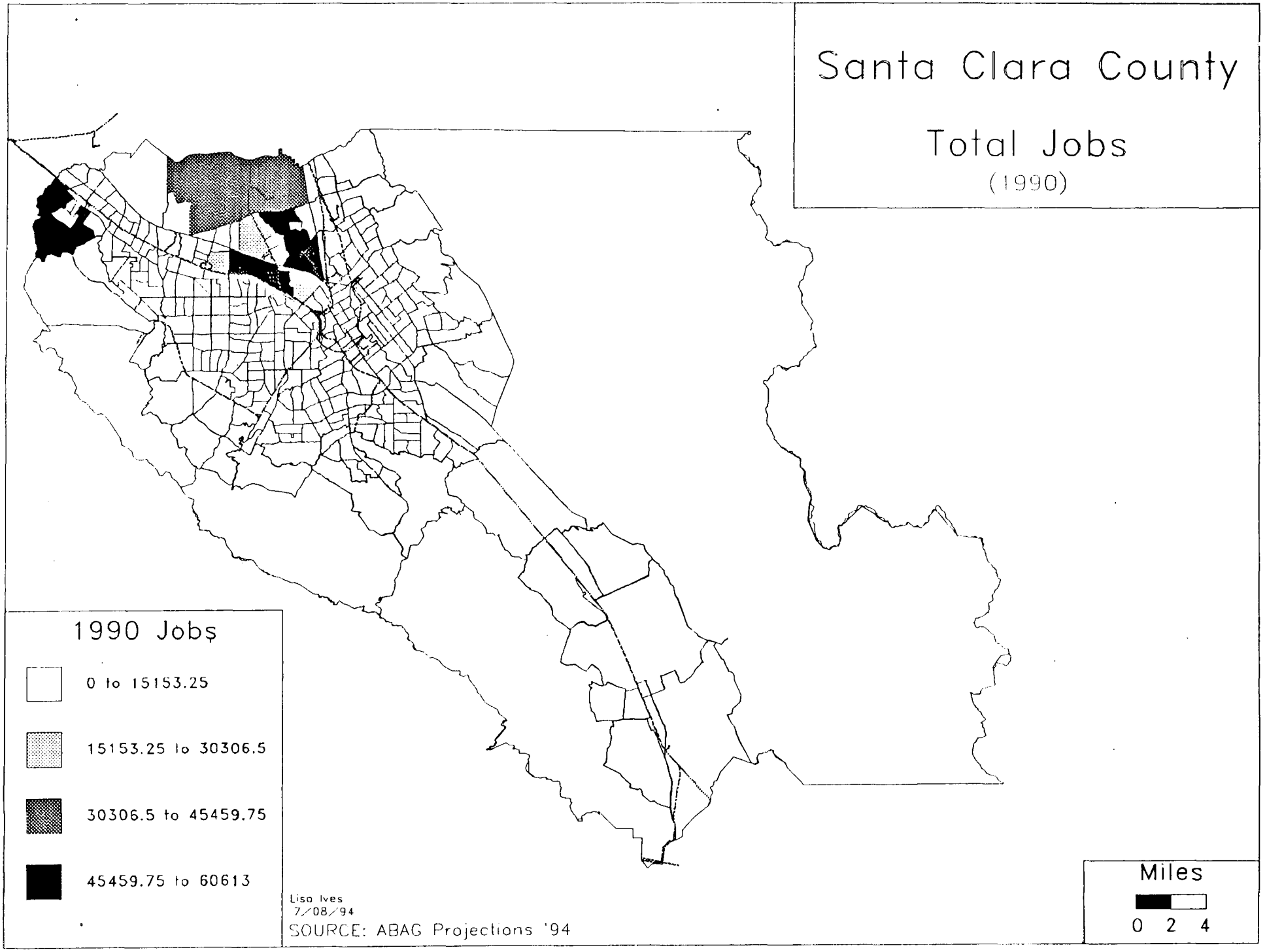
SOURCE: ABAG Projections '94


San Francisco County
Total Jobs
(1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
1990 Total Jobs
0 to 21387
21387 to 42774
42774 to 64161
64161 to 85548
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Francisco County
Total Job Growth
(1980 to 1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Jobs
-29246 to 0
0 to 5467
5467 to 10934
10934 to 16401
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Mateo County
Total Jobs
(1990)
1990 Total Jobs
0 to 8159.75
8159.75 to 16319.5
16319.5 to 24479.25
24479.25 to 32639
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94

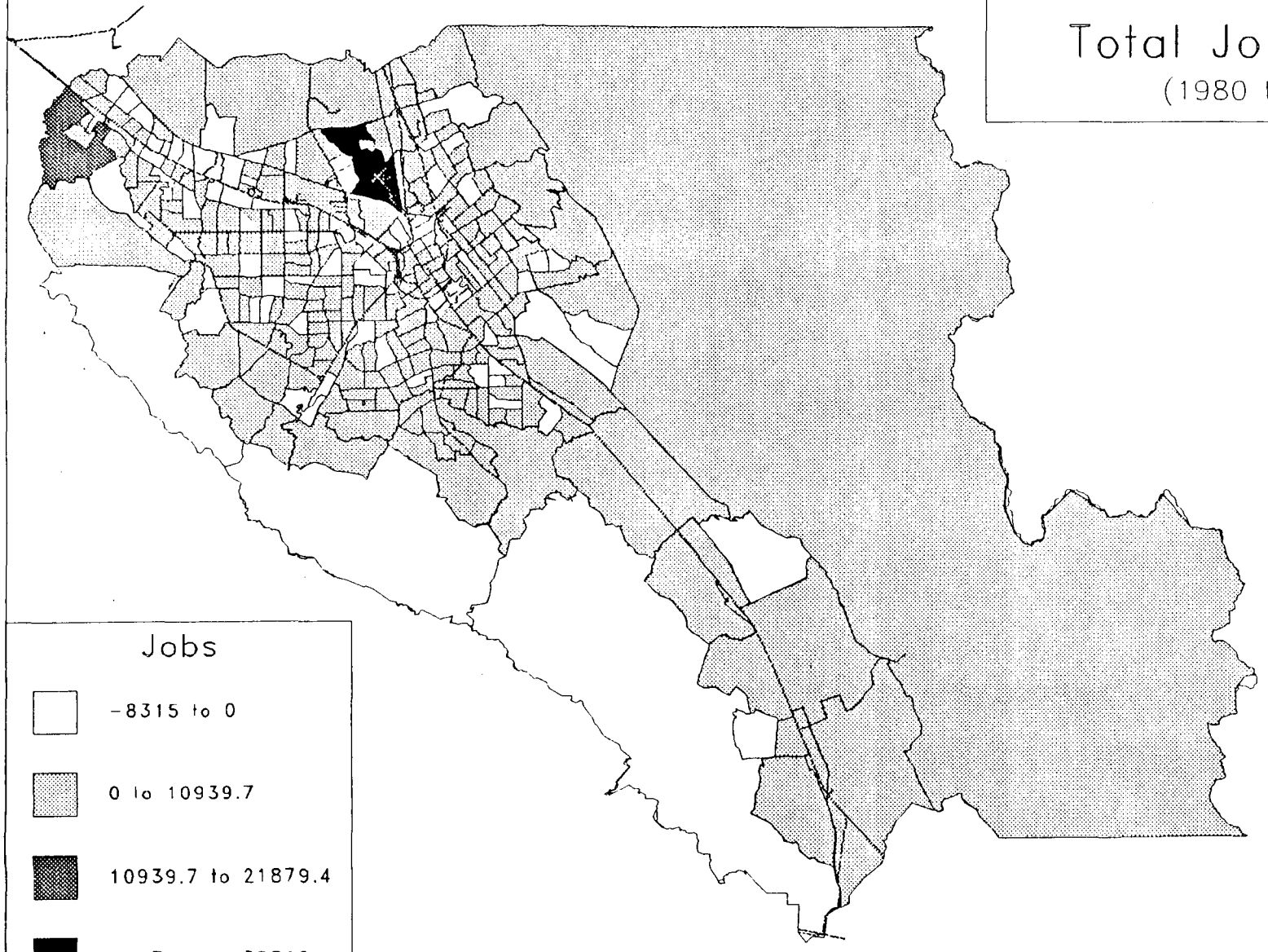

San Mateo County
Total Job Growth
(1980 to 1990)
Jobs
-3527 to 0
0 to 2501.3
2501.3 to 5002.6
5002.6 to 7504
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


Santa Clara County
Total Jobs
(1990)
1990 Jobs
0 to 15153.25
15153.25 to 30306.5
30306.5 to 45459.75
45459.75 to 60613
Lisa Ives
7/08/94
SOURCE: ABAG Projections '94
Miles
0 2 4

Santa Clara County

Total Job Growth

(1980 to 1990)



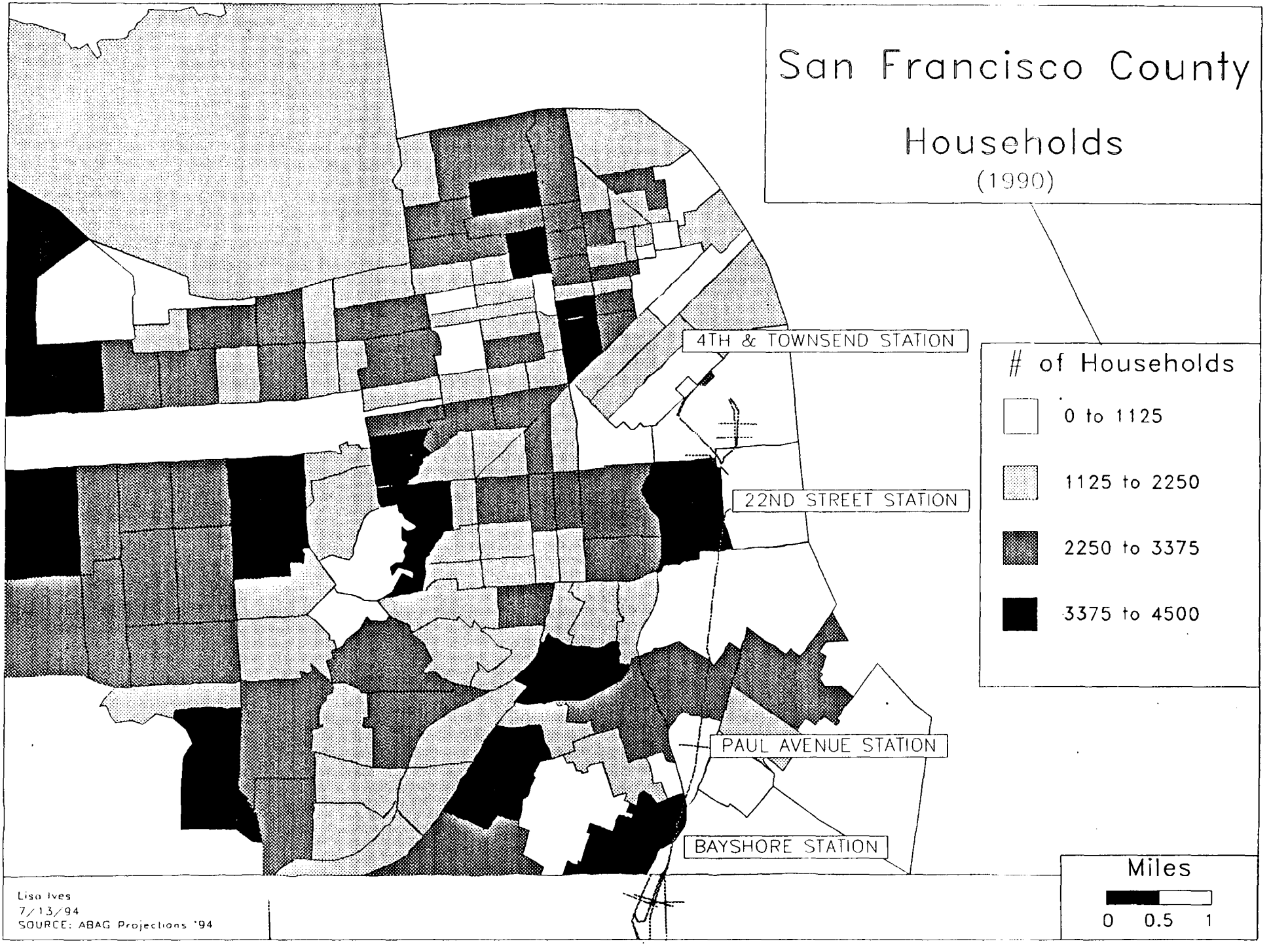
Jobs

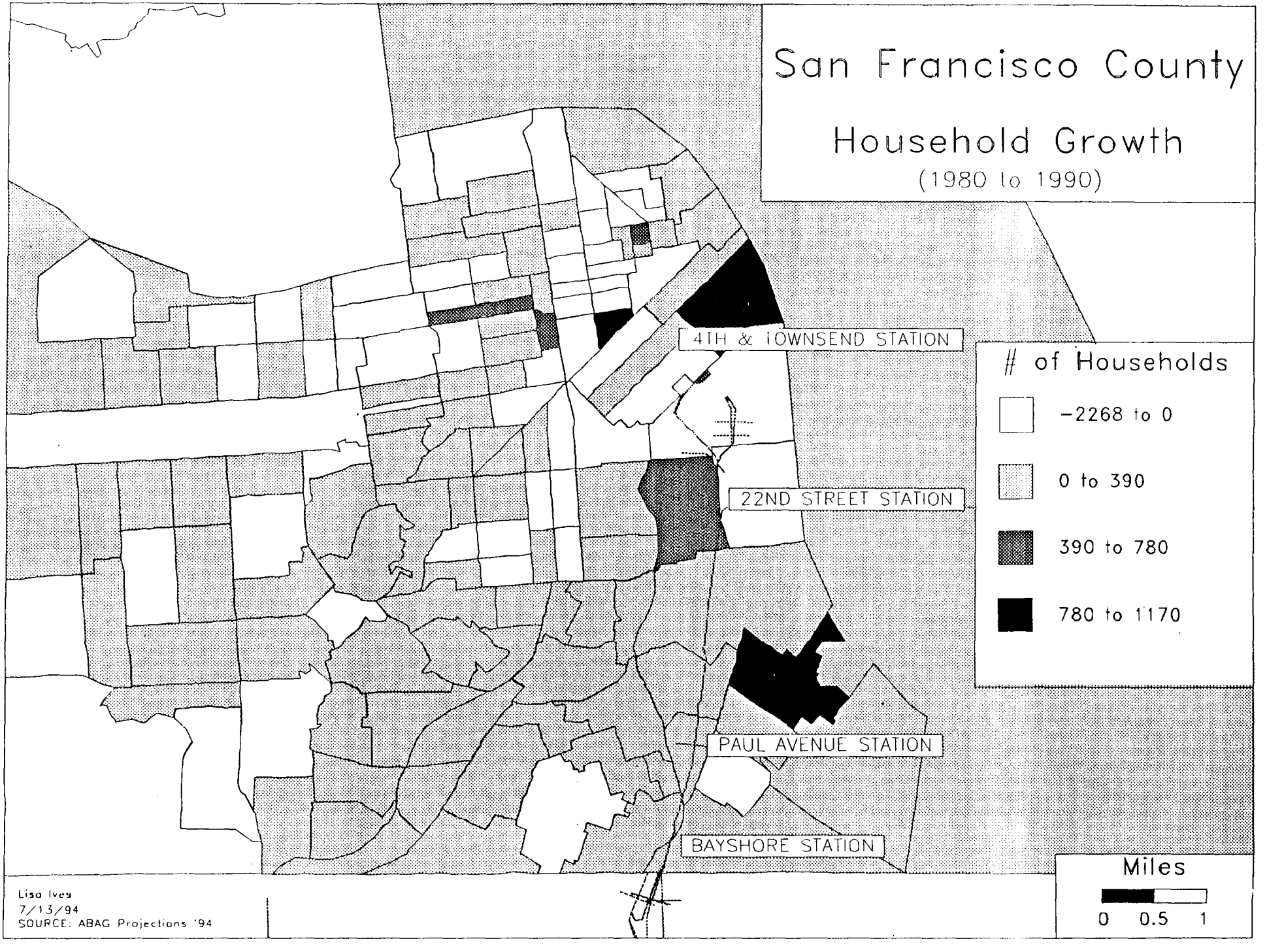
- -8315 to 0
- 0 to 10939.7
- 10939.7 to 21879.4
- 21879.4 to 32819

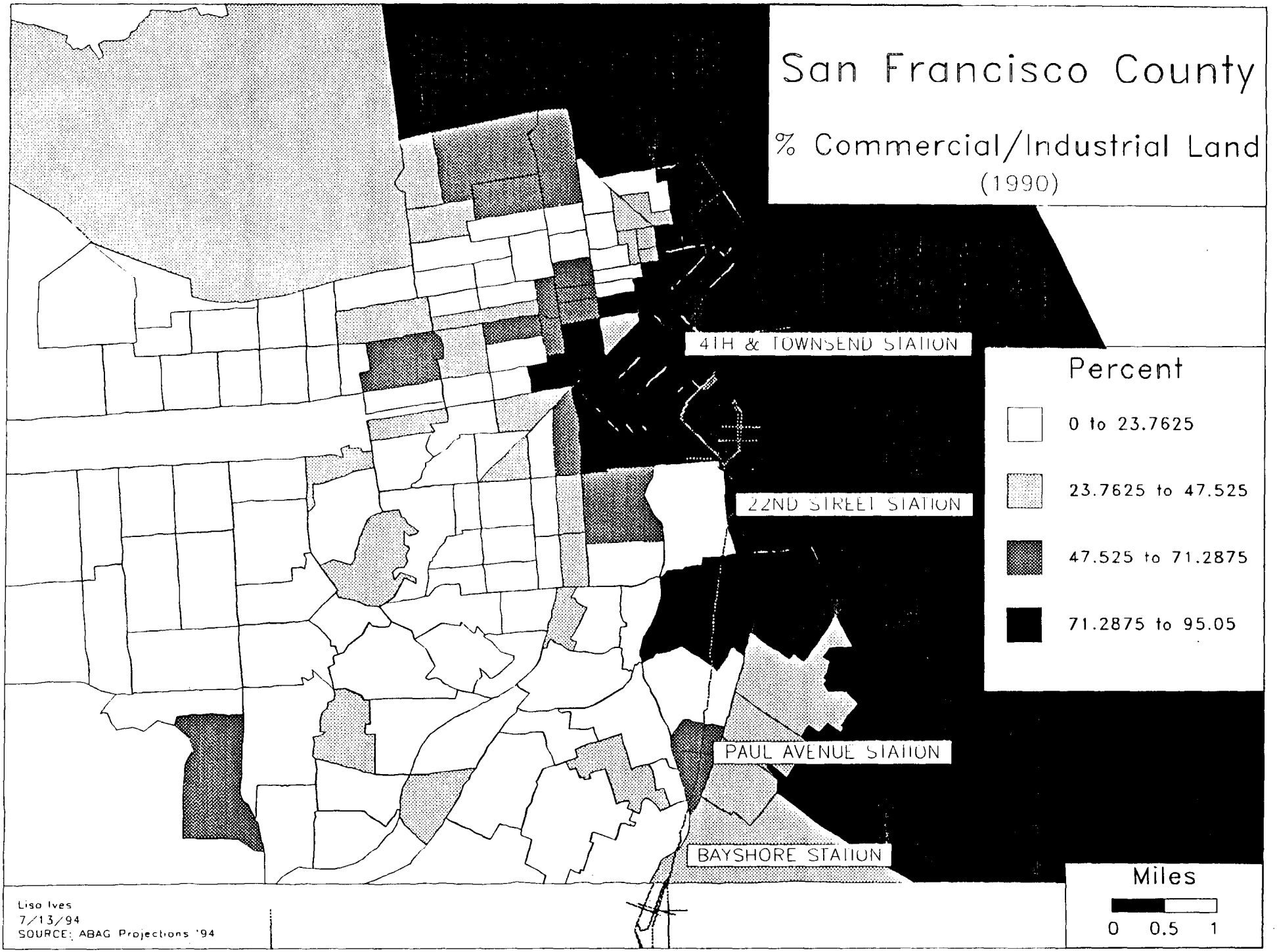
Miles

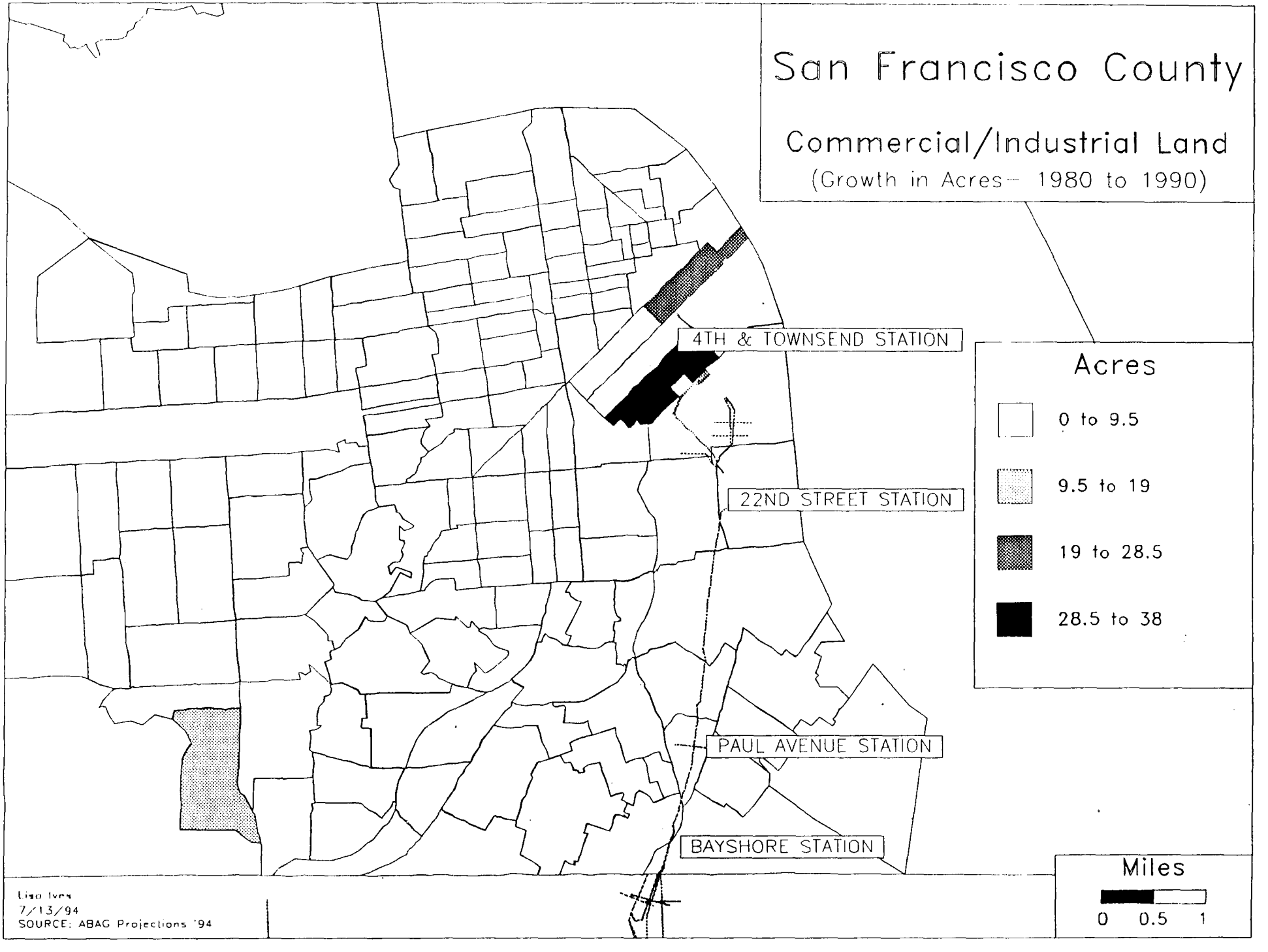
0 2 4

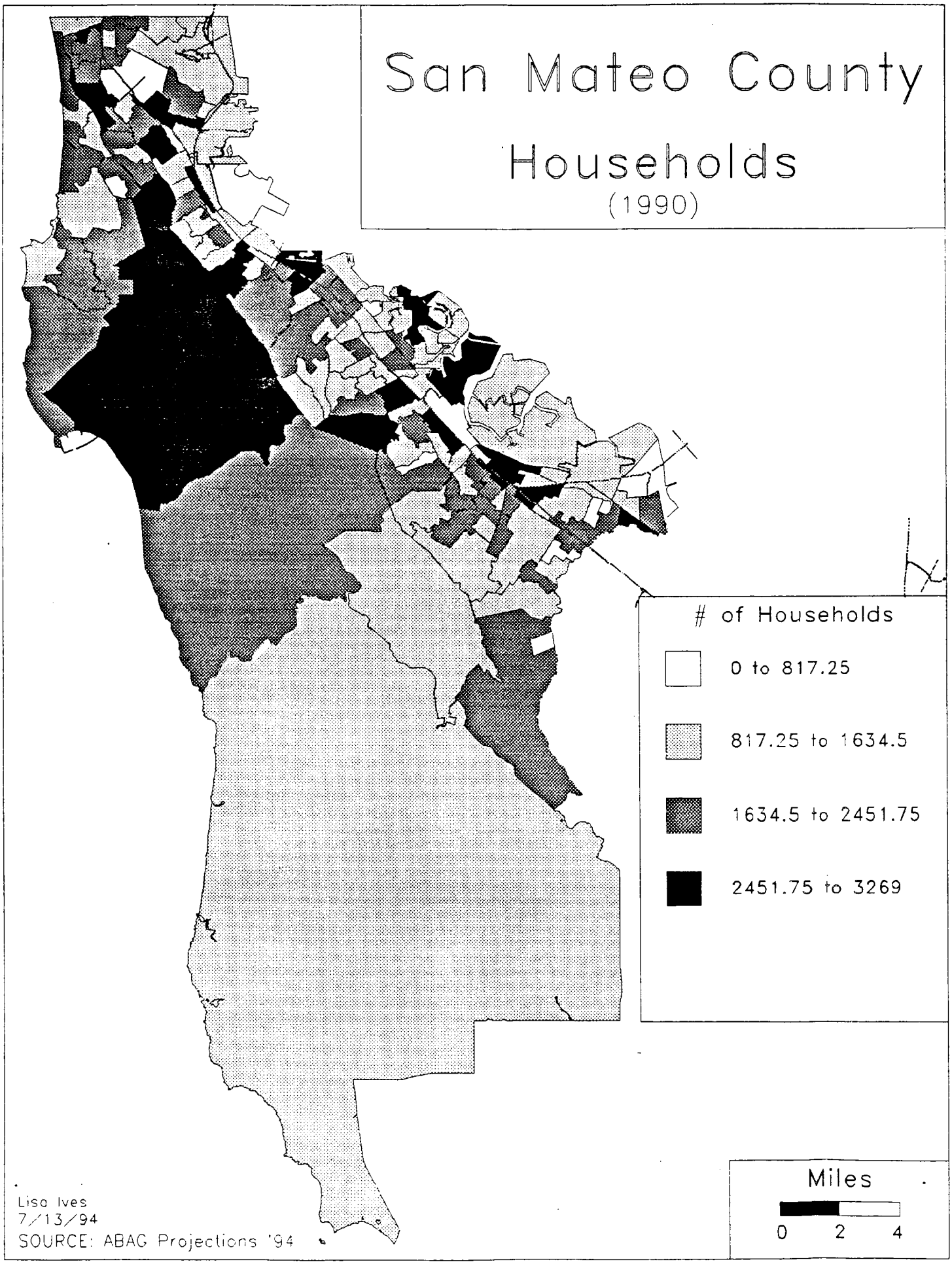
Lisa Ives
7/08/94
SOURCE: ABAG Projections '94


San Francisco County
Households
(1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
# of Households
0 to 1125
1125 to 2250
2250 to 3375
3375 to 4500
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Francisco County
Household Growth
(1980 to 1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
# of Households
-2268 to 0
0 to 390
390 to 780
780 to 1170
Miles
0 0.5 1
Lisa Ivey
7/13/94
SOURCE: ABAG Projections '94


San Francisco County
% Commercial/Industrial Land
(1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Percent
0 to 23.7625
23.7625 to 47.525
47.525 to 71.2875
71.2875 to 95.05
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94

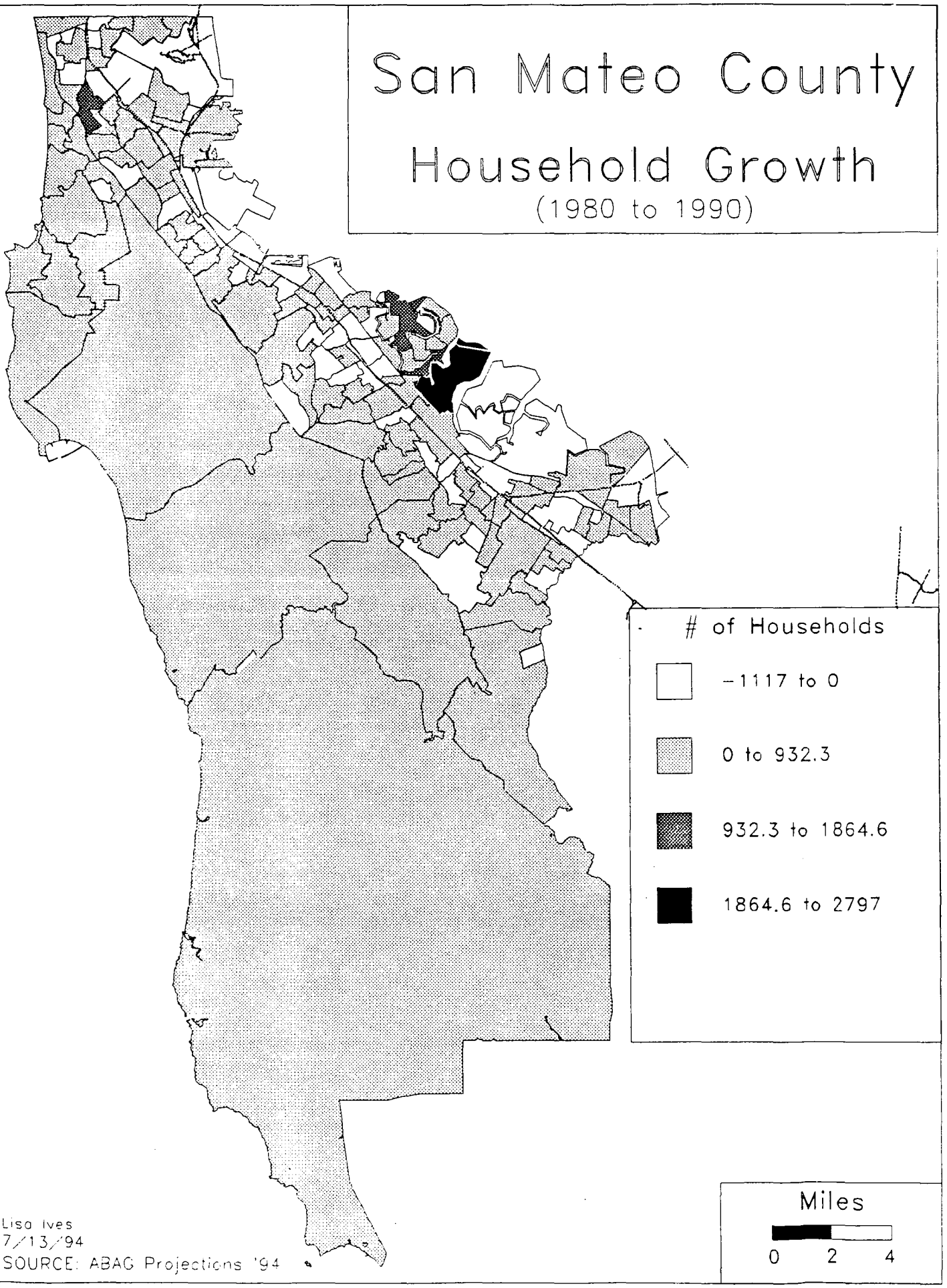

San Francisco County
Commercial/Industrial Land
(Growth in Acres-- 1980 to 1990)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Acres
0 to 9.5
9.5 to 19
19 to 28.5
28.5 to 38
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Mateo County
Households
(1990)
# of Households
0 to 817.25
817.25 to 1634.5
1634.5 to 2451.75
2451.75 to 3269
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94

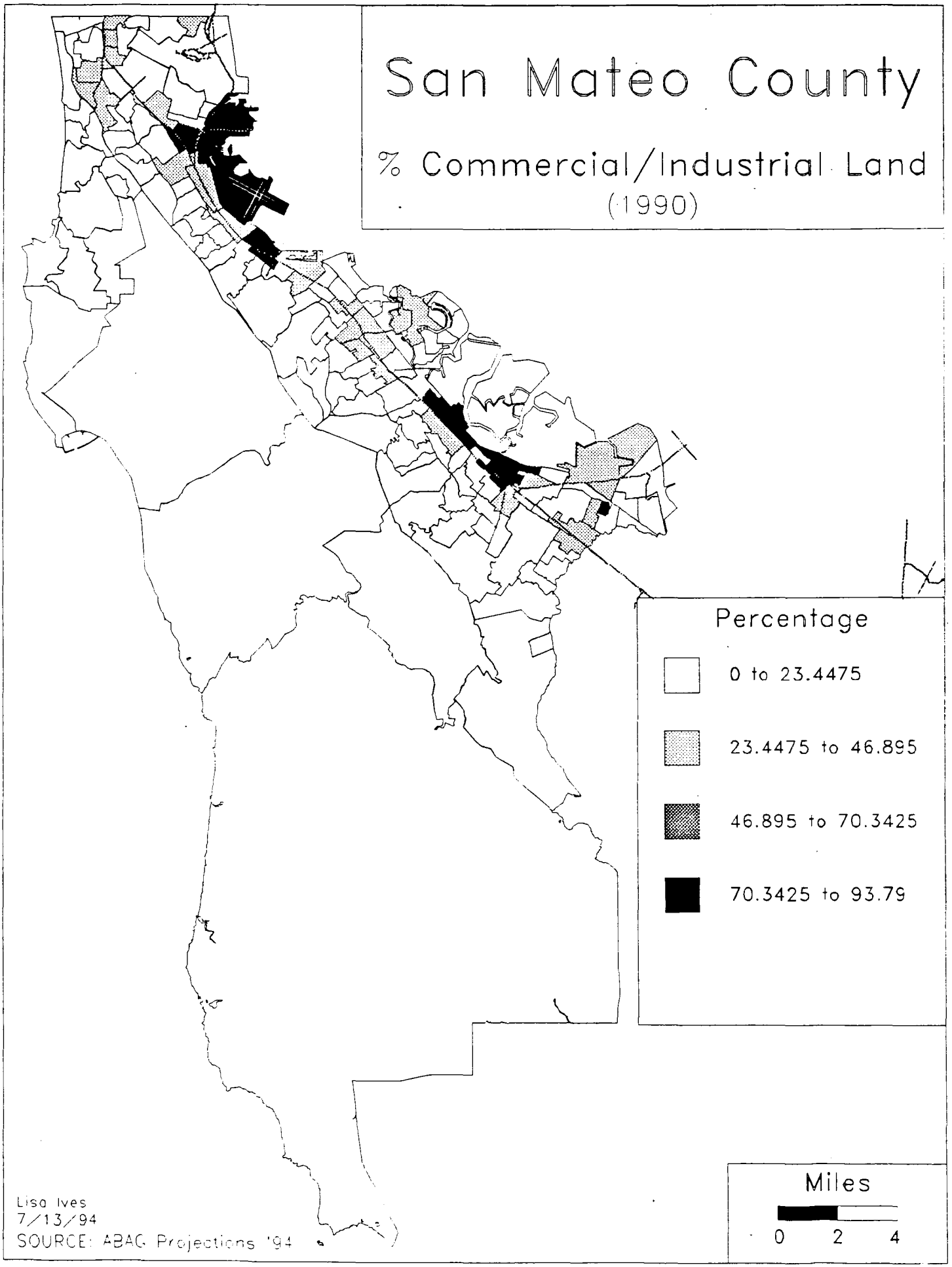
San Mateo County

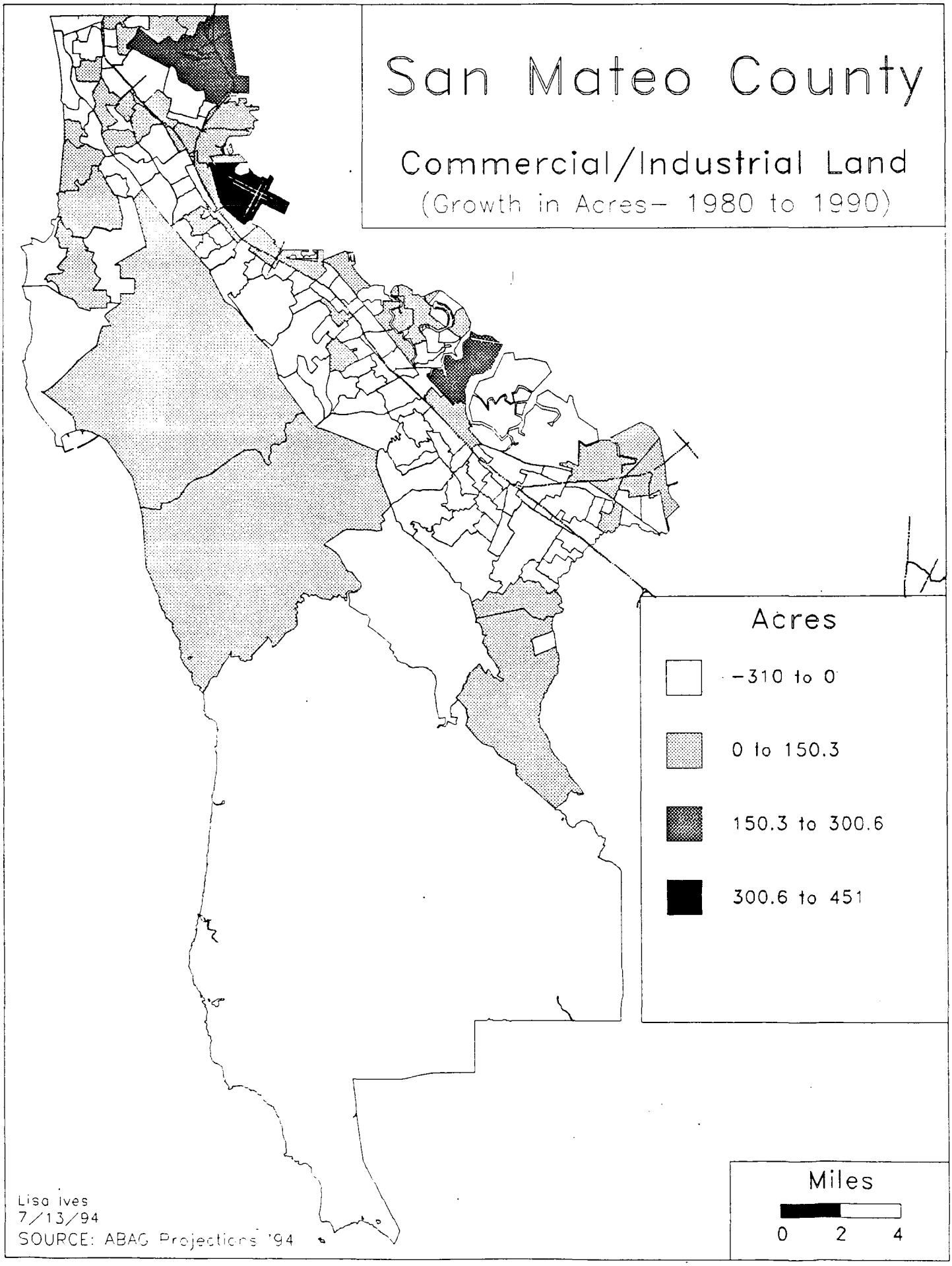
Household Growth

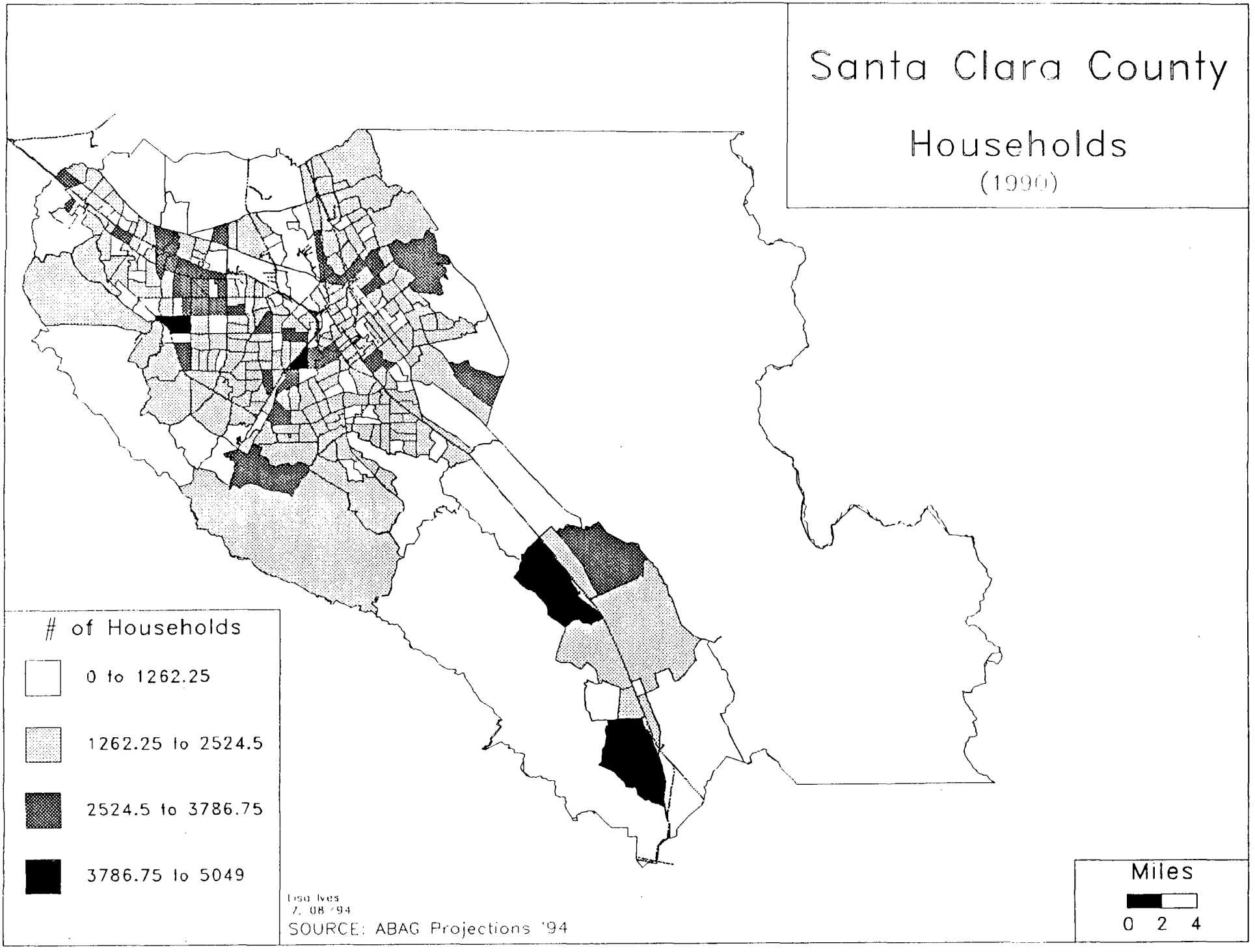
(1980 to 1990)

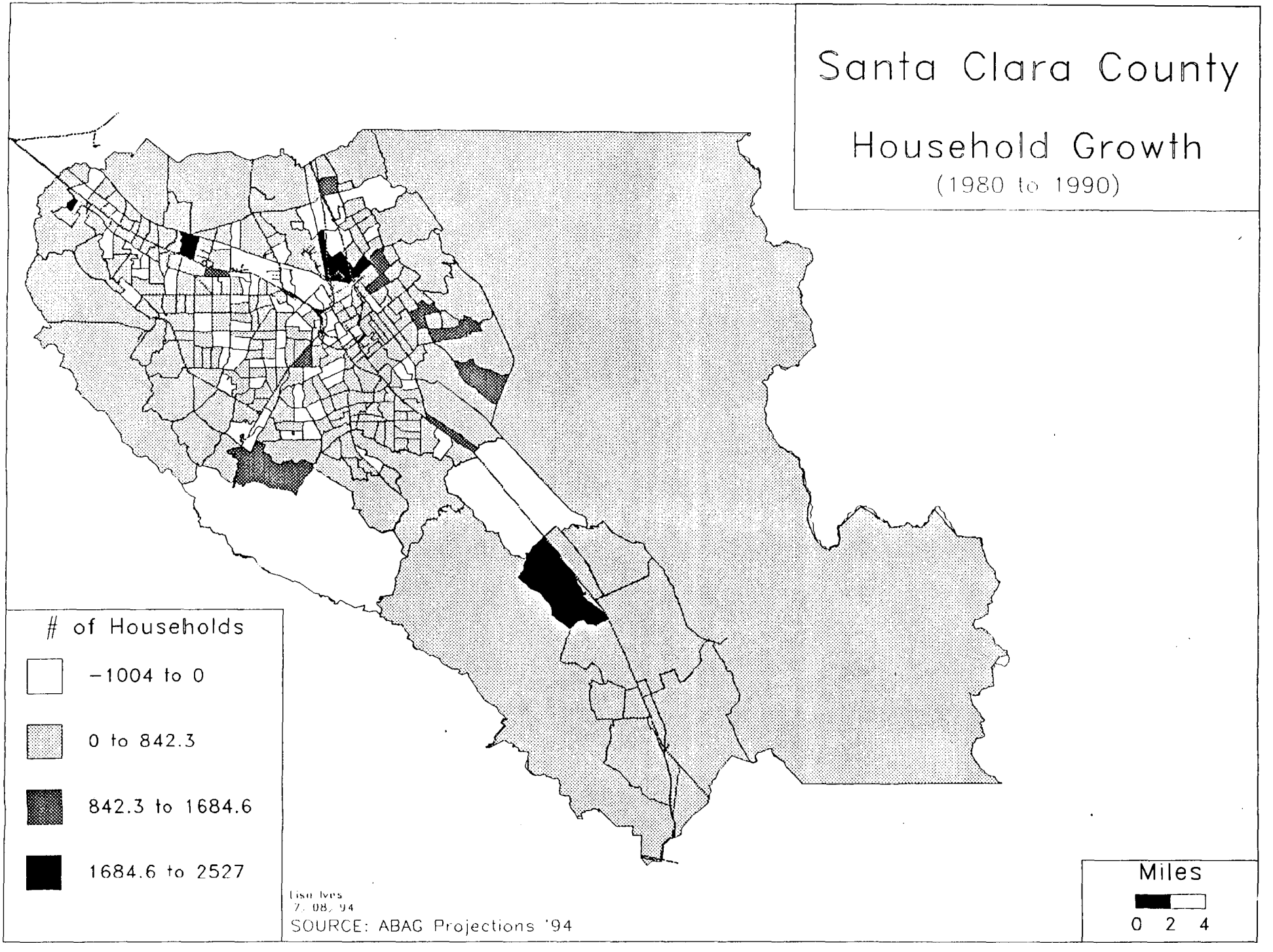


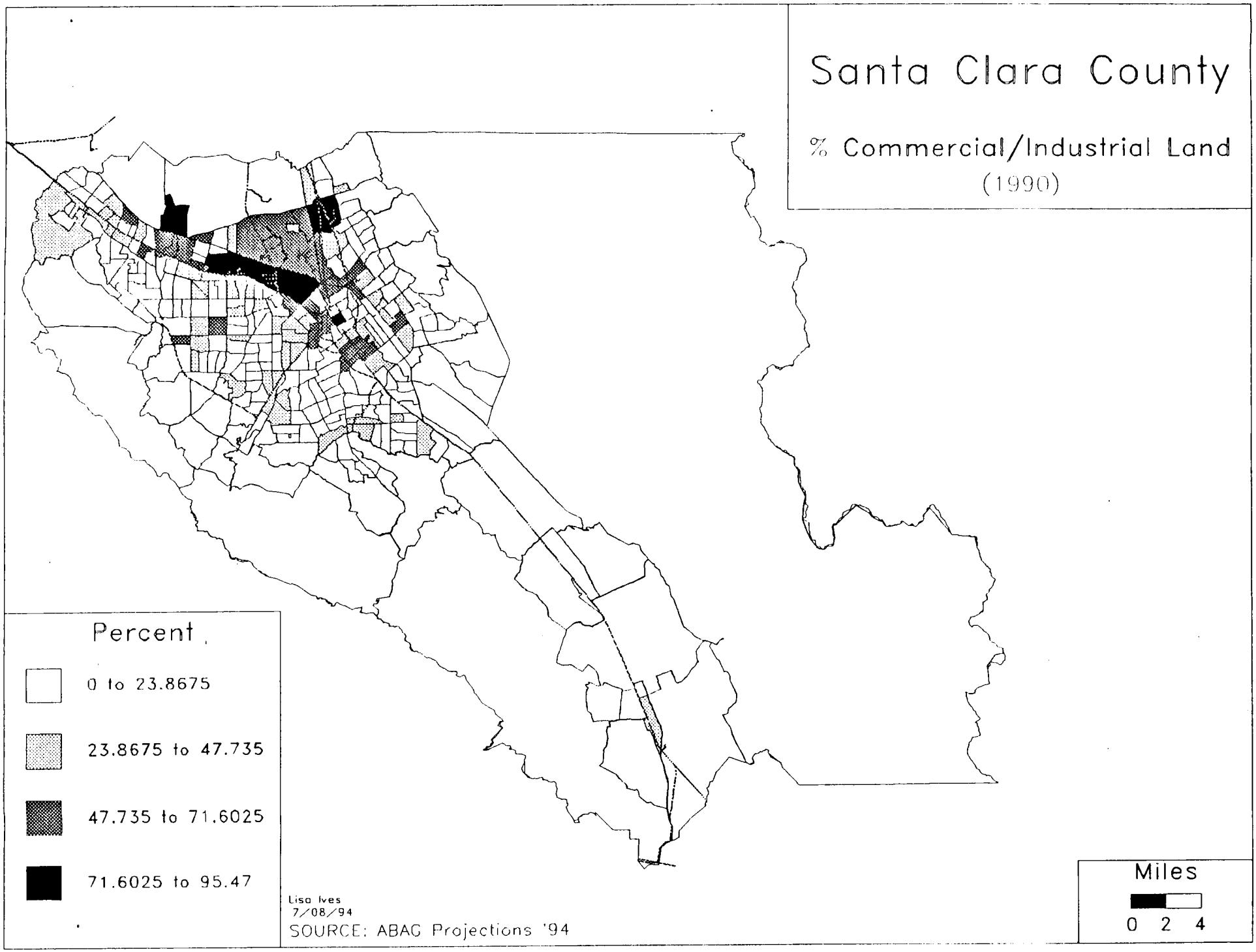
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Mateo County
% Commercial/Industrial Land
(1990)
Percentage
0 to 23.4475
23.4475 to 46.895
46.895 to 70.3425
70.3425 to 93.79
Miles
0
2
4
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


San Mateo County
Commercial/Industrial Land
(Growth in Acres- 1980 to 1990)
Acres
-310 to 0
0 to 150.3
150.3 to 300.6
300.6 to 451
Miles
0
2
4
Lisa Ives
7/13/94
SOURCE: ABAG Projections '94


Santa Clara County
Households
(1990)
# of Households
0 to 1262.25
1262.25 to 2524.5
2524.5 to 3786.75
3786.75 to 5049
Lisa Ives
7, 08 '94
SOURCE: ABAG Projections '94
Miles
0 2 4

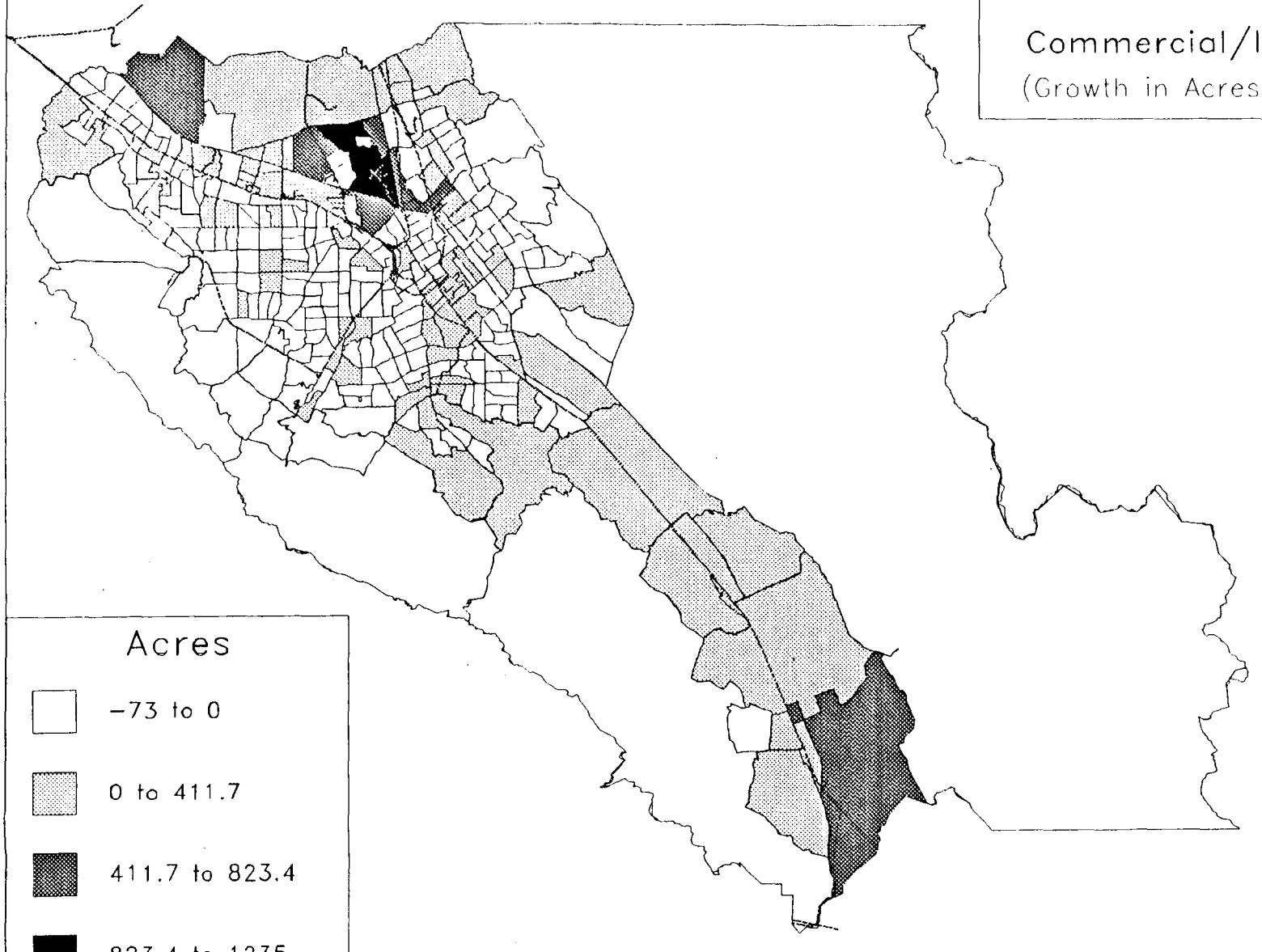

Santa Clara County
Household Growth
(1980 to 1990)
# of Households
-1004 to 0
0 to 842.3
842.3 to 1684.6
1684.6 to 2527
Miles
0 2 4
SOURCE: ABAG Projections '94


Santa Clara County
% Commercial/Industrial Land
(1990)
Percent
0 to 23.8675
23.8675 to 47.735
47.735 to 71.6025
71.6025 to 95.47
Lisa Ives
7/08/94
SOURCE: ABAG Projections '94
Miles
0 2 4

Santa Clara County

Commercial/Industrial Land

(Growth in Acres– 1980 to 1990)



Acres

- −73 to 0
- 0 to 411.7
- 411.7 to 823.4
- 823.4 to 1235

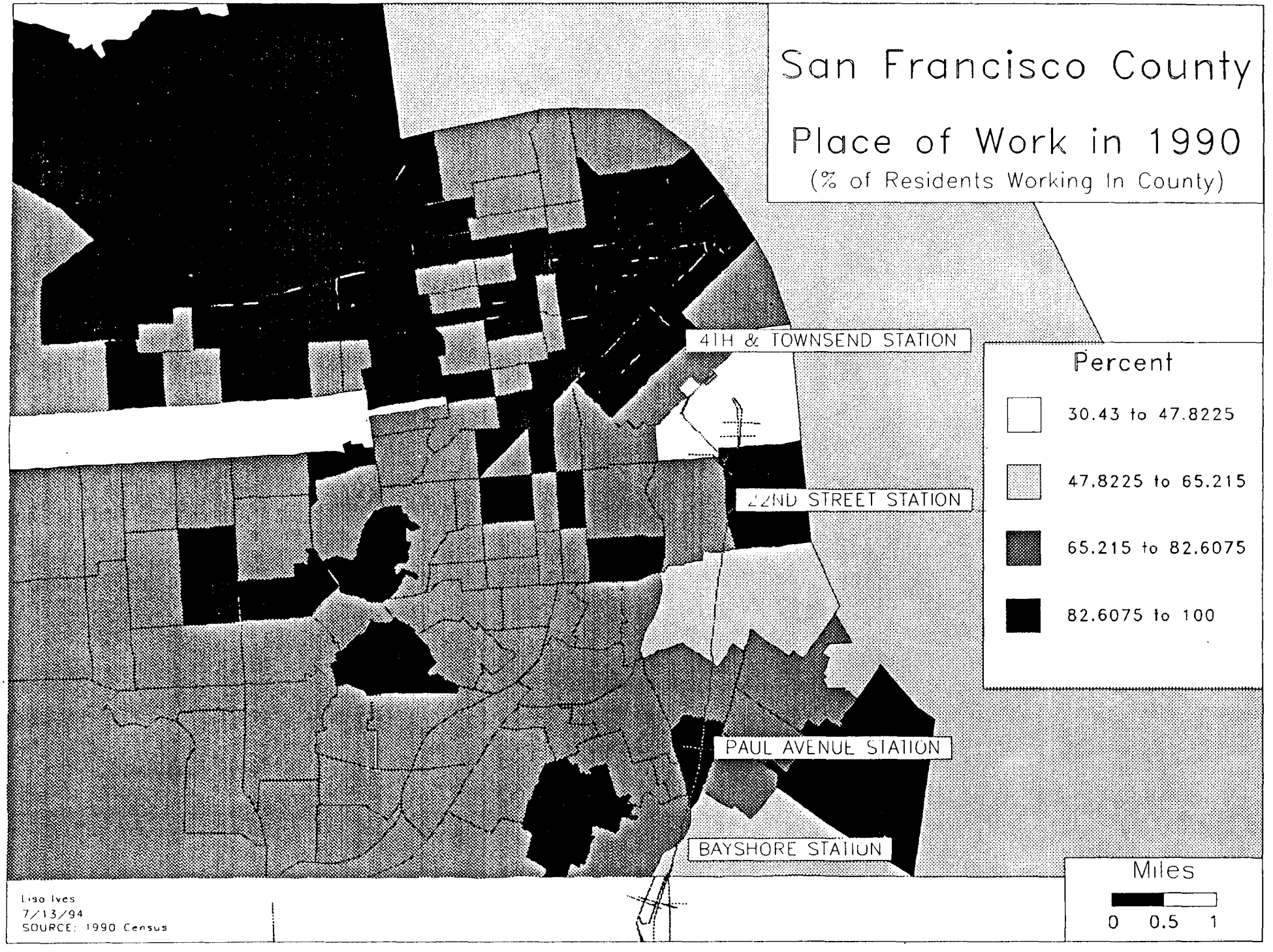
Miles

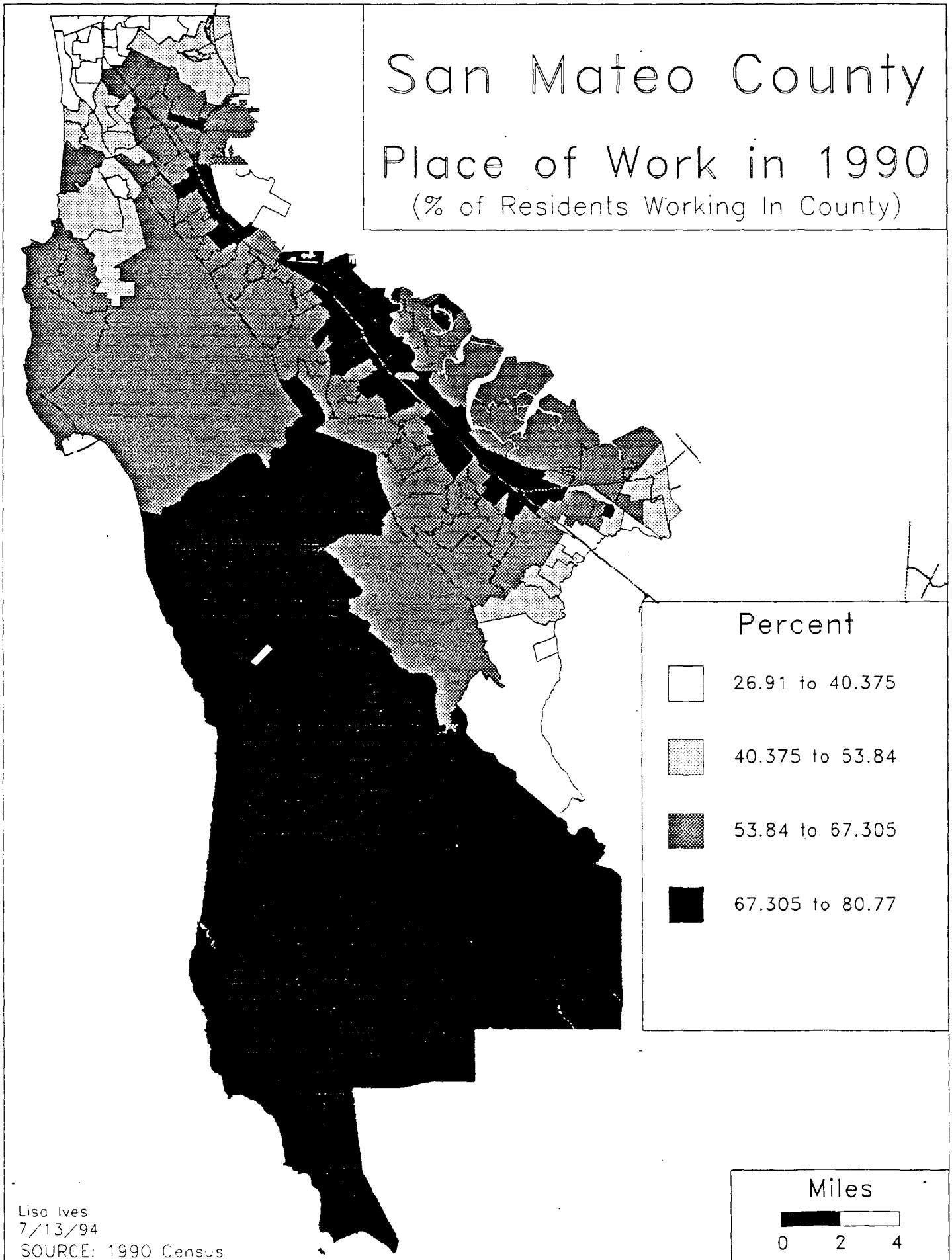
0 2 4

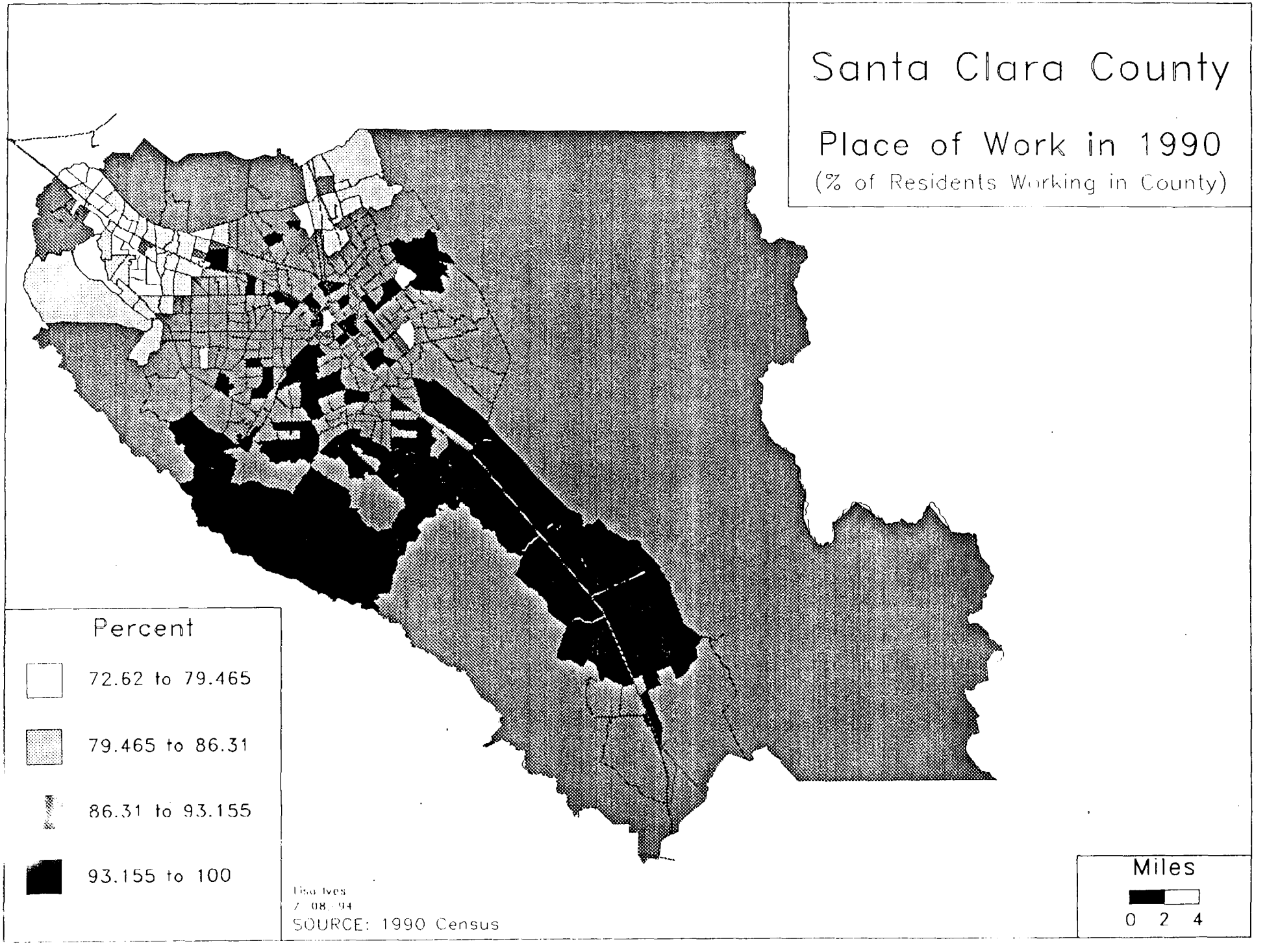
SOURCE: ABAG Projections '94

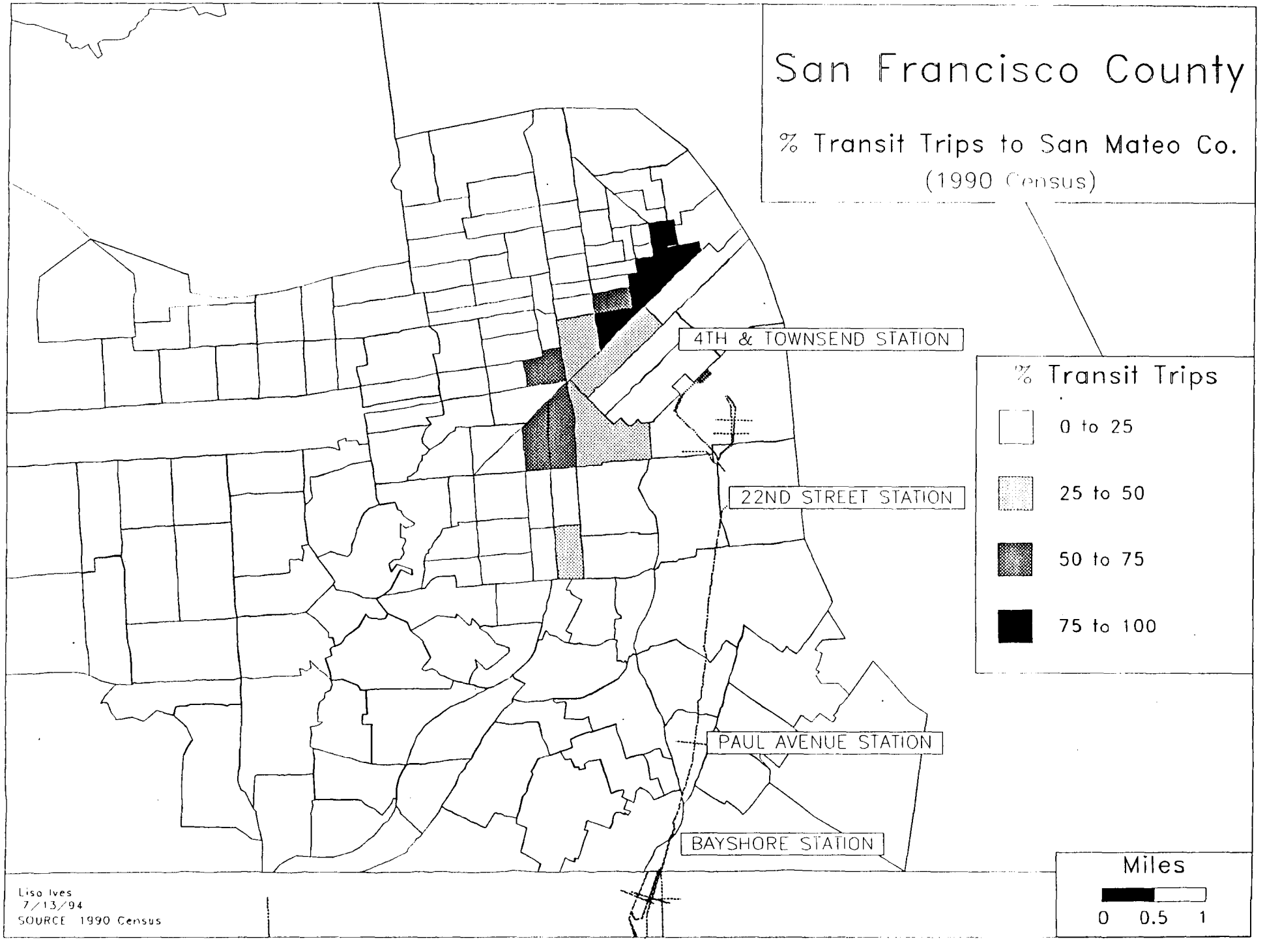
APPENDIX 3

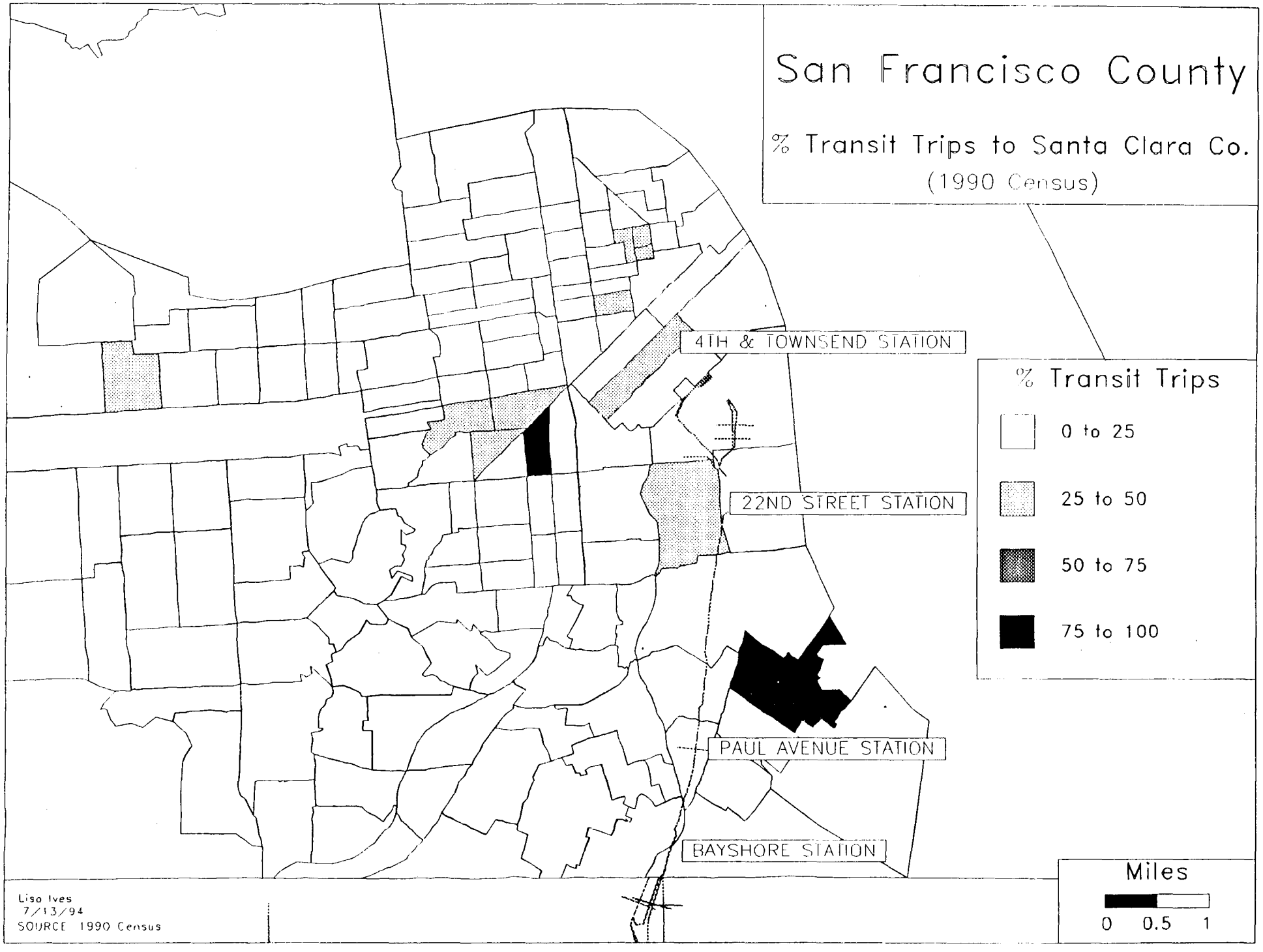
Travel Characteristics

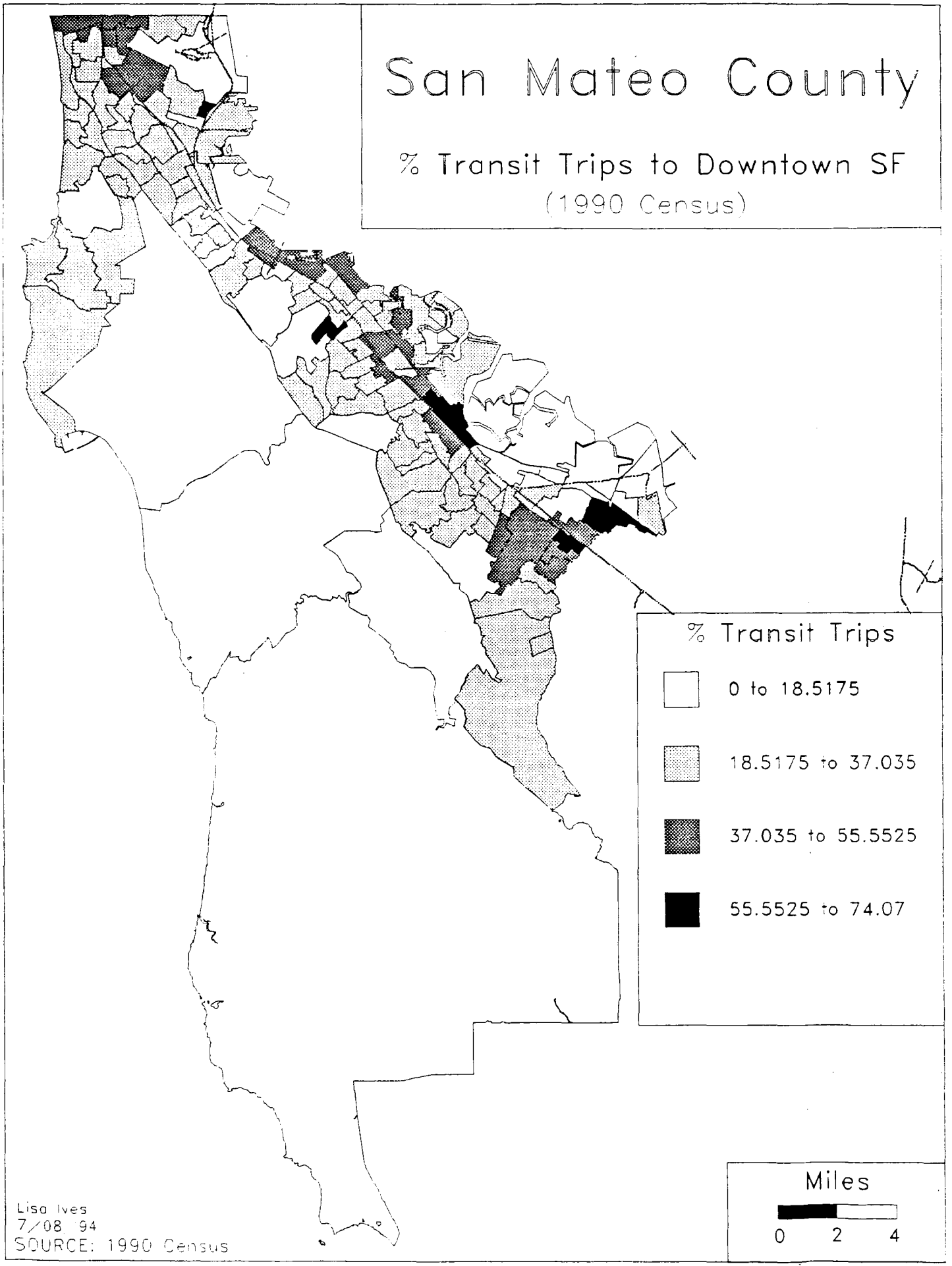

San Francisco County
Place of Work in 1990
(% of Residents Working In County)
41H & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Percent
30.43 to 47.8225
47.8225 to 65.215
65.215 to 82.6075
82.6075 to 100
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: 1990 Census

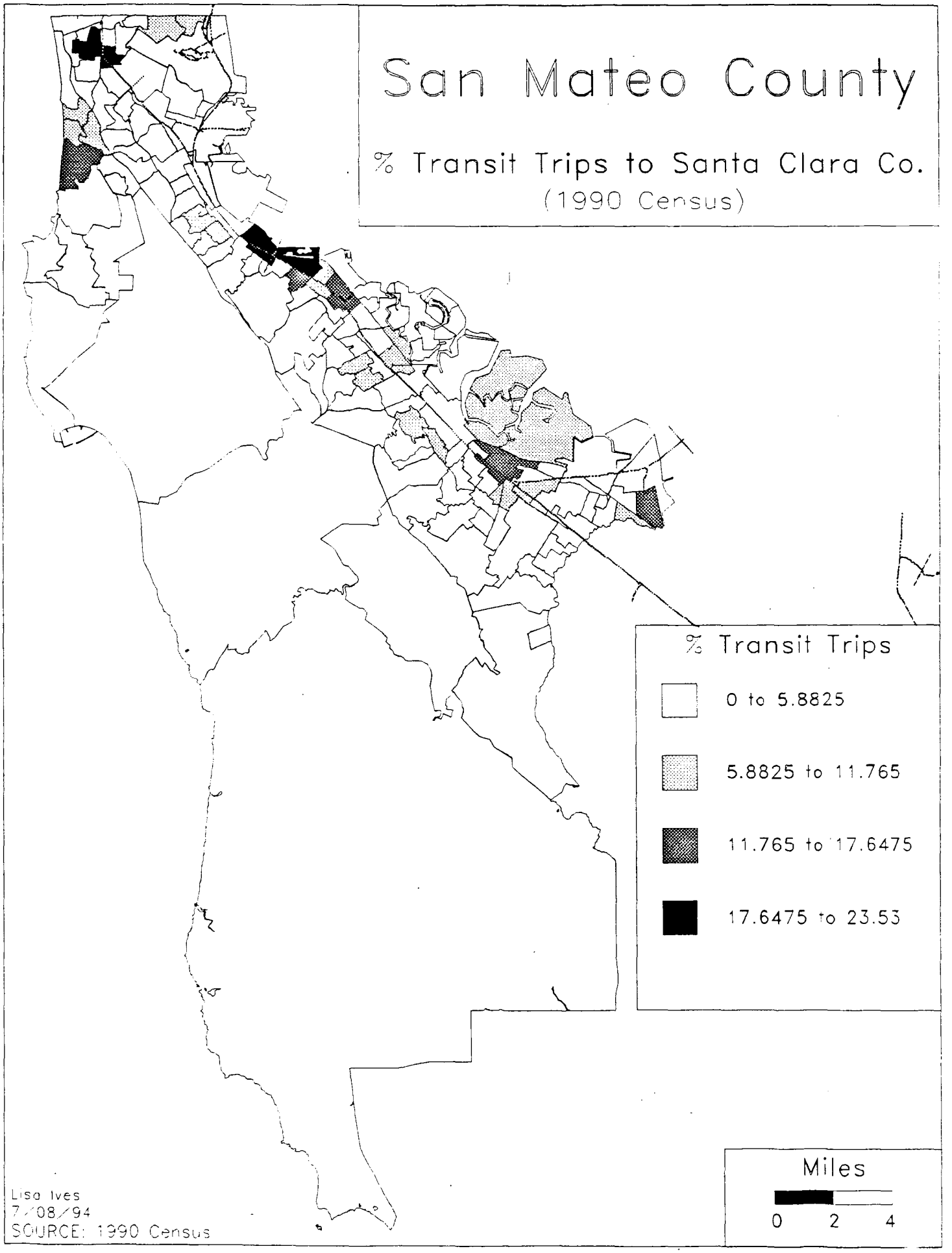

San Mateo County
Place of Work in 1990
(% of Residents Working In County)
Percent
26.91 to 40.375
40.375 to 53.84
53.84 to 67.305
67.305 to 80.77
Miles
0
2
4
Lisa Ives
7/13/94
SOURCE: 1990 Census

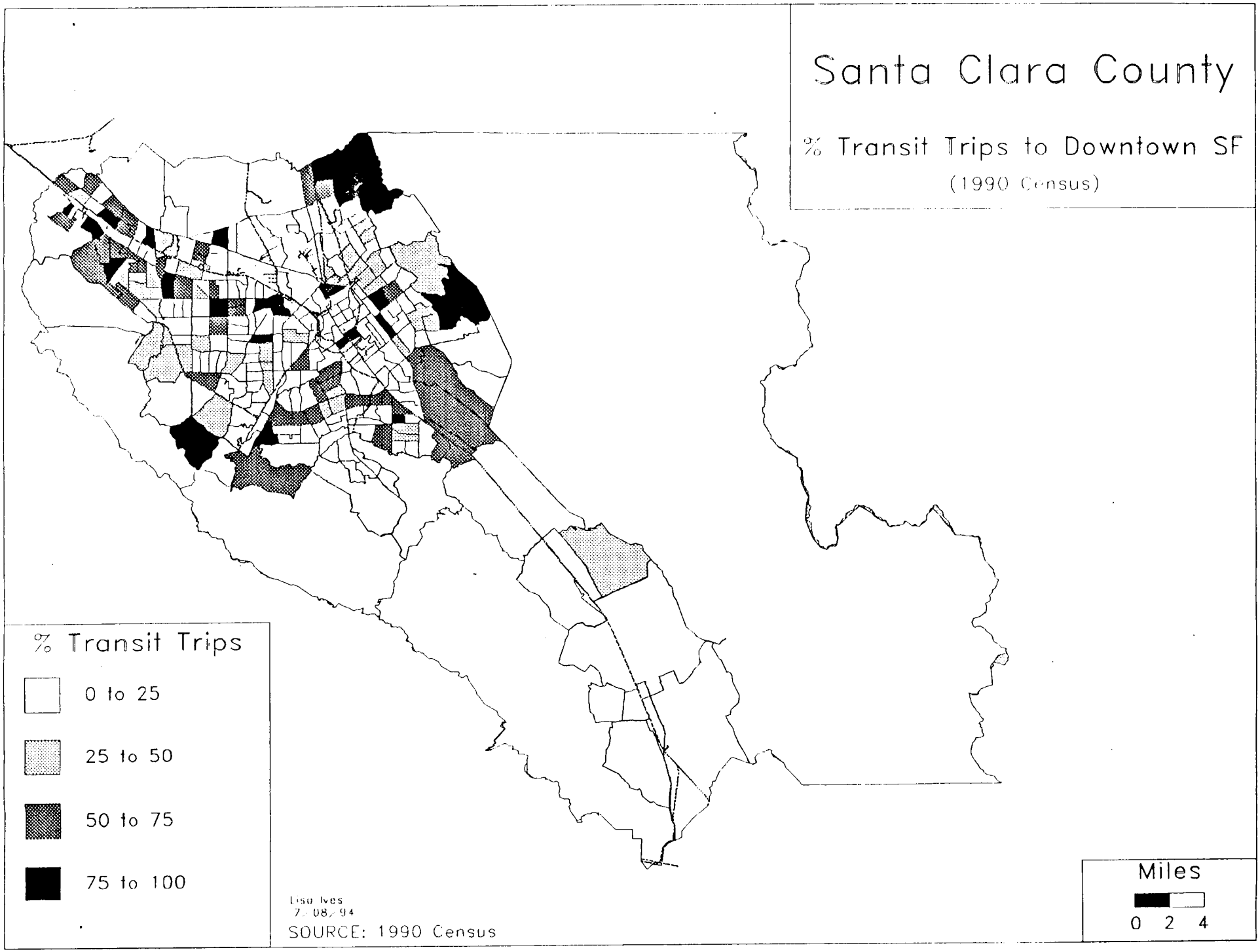

Santa Clara County
Place of Work in 1990
(% of Residents Working in County)
Percent
72.62 to 79.465
79.465 to 86.31
86.31 to 93.155
93.155 to 100
Lisa Ives
7/08/94
SOURCE: 1990 Census
Miles
0 2 4

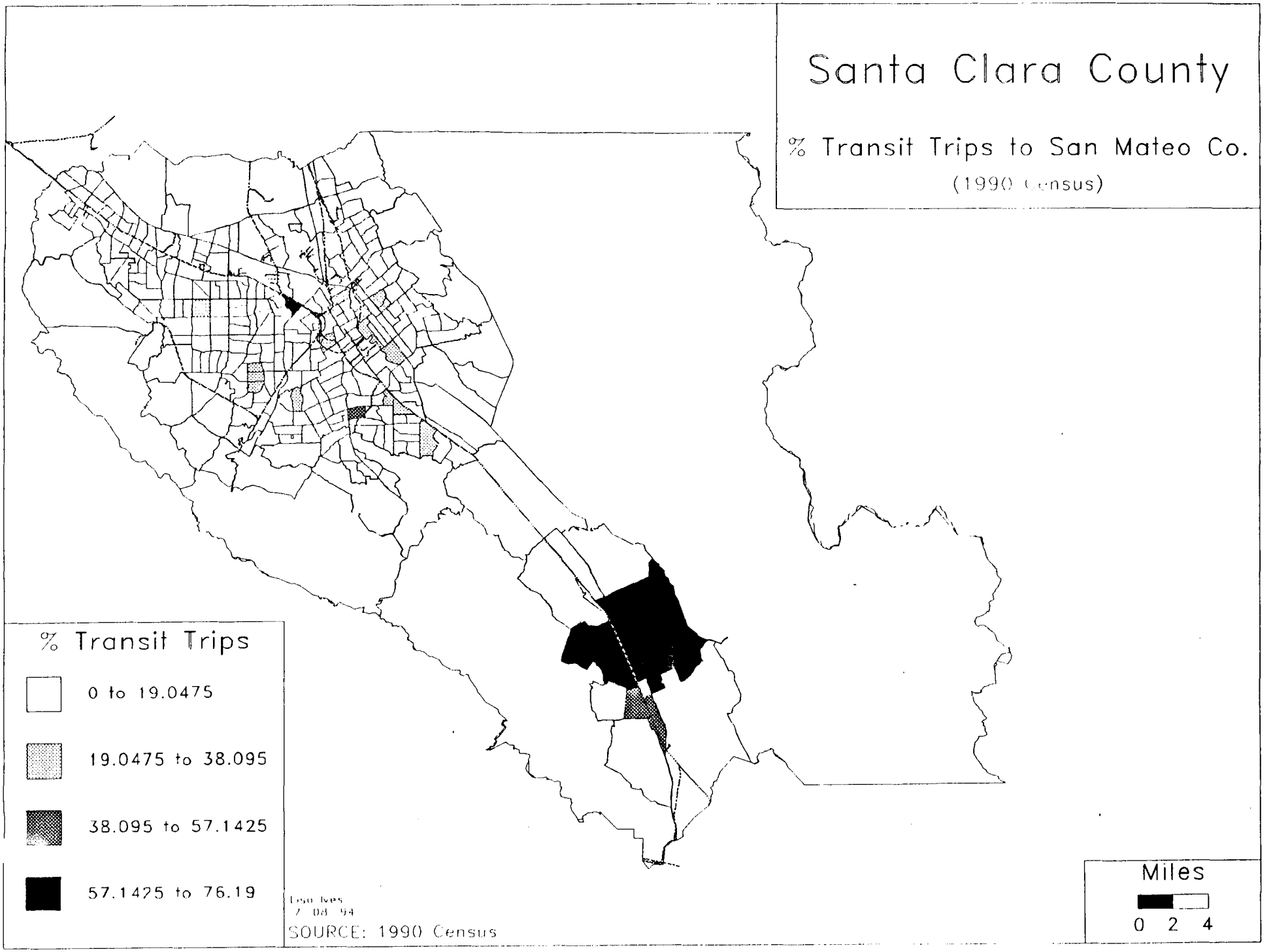

San Francisco County
% Transit Trips to San Mateo Co.
(1990 Census)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
% Transit Trips
0 to 25
25 to 50
50 to 75
75 to 100
Miles
0 0.5 1
Liso Ives
7/13/94
SOURCE 1990 Census

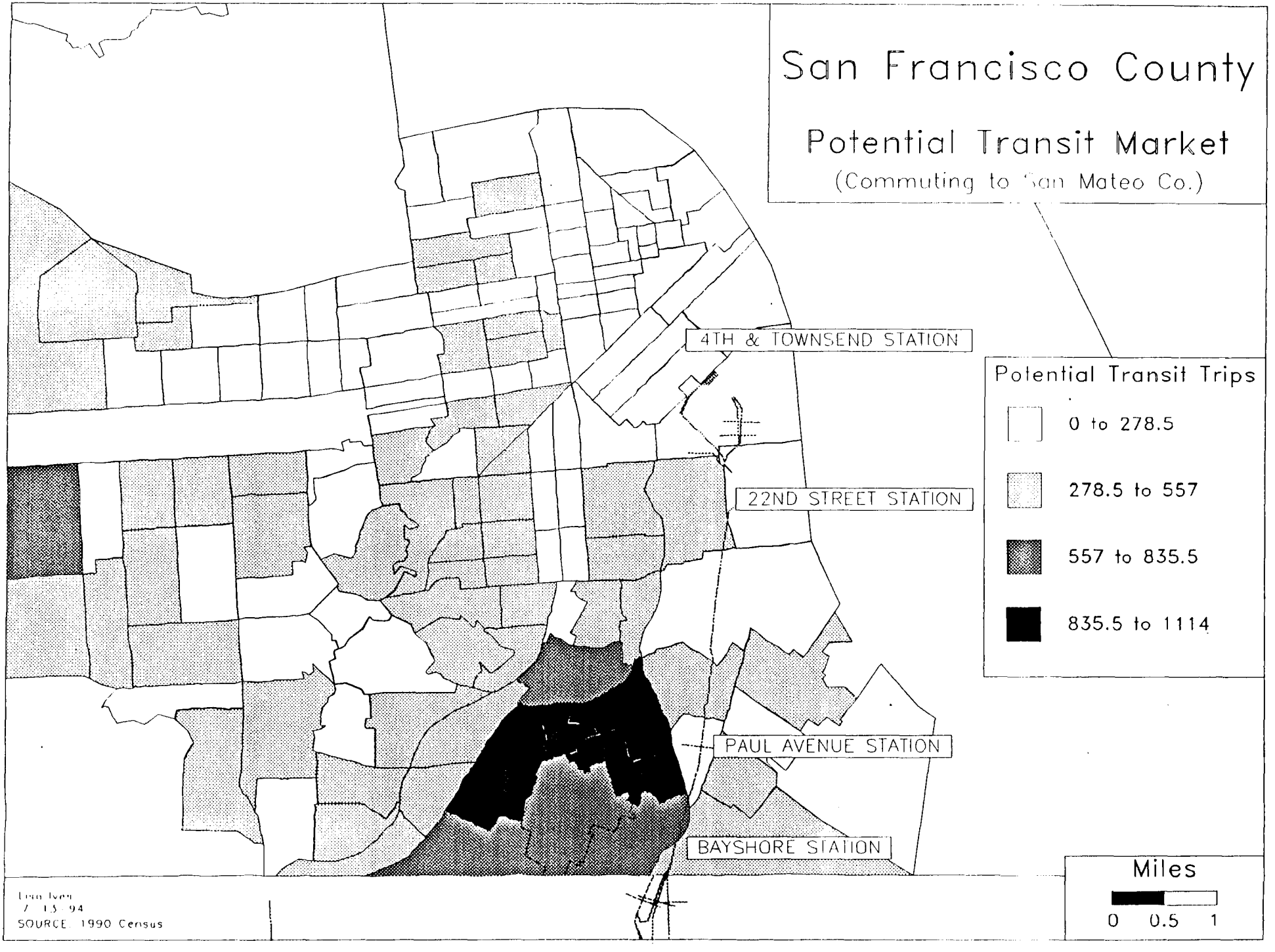

San Francisco County
% Transit Trips to Santa Clara Co.
(1990 Census)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
% Transit Trips
0 to 25
25 to 50
50 to 75
75 to 100
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE 1990 Census

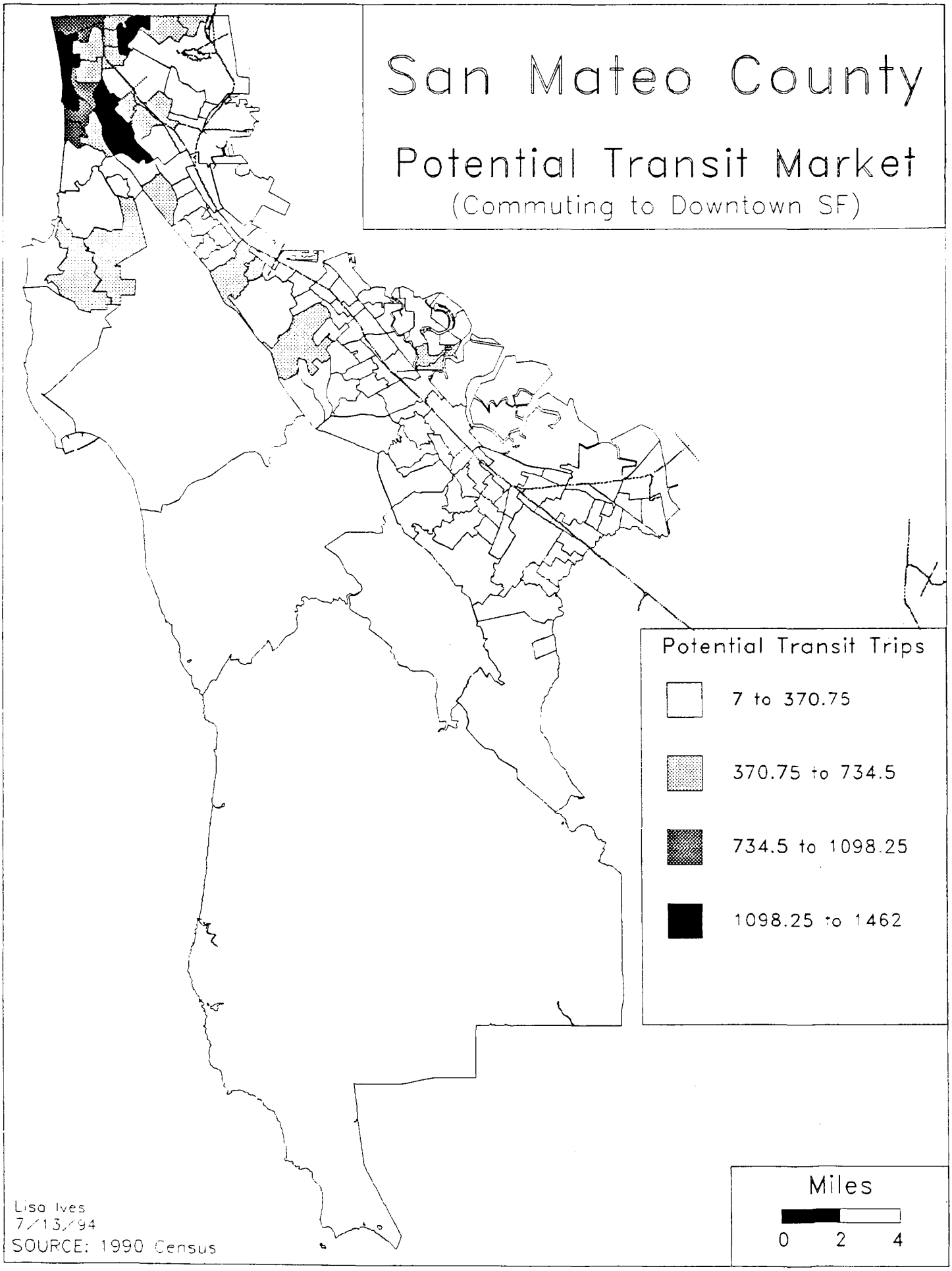

San Mateo County
% Transit Trips to Downtown SF
(1990 Census)
% Transit Trips
0 to 18.5175
18.5175 to 37.035
37.035 to 55.5525
55.5525 to 74.07
Miles
0 2 4
Lisa Ives
7/08 94
SOURCE: 1990 Census

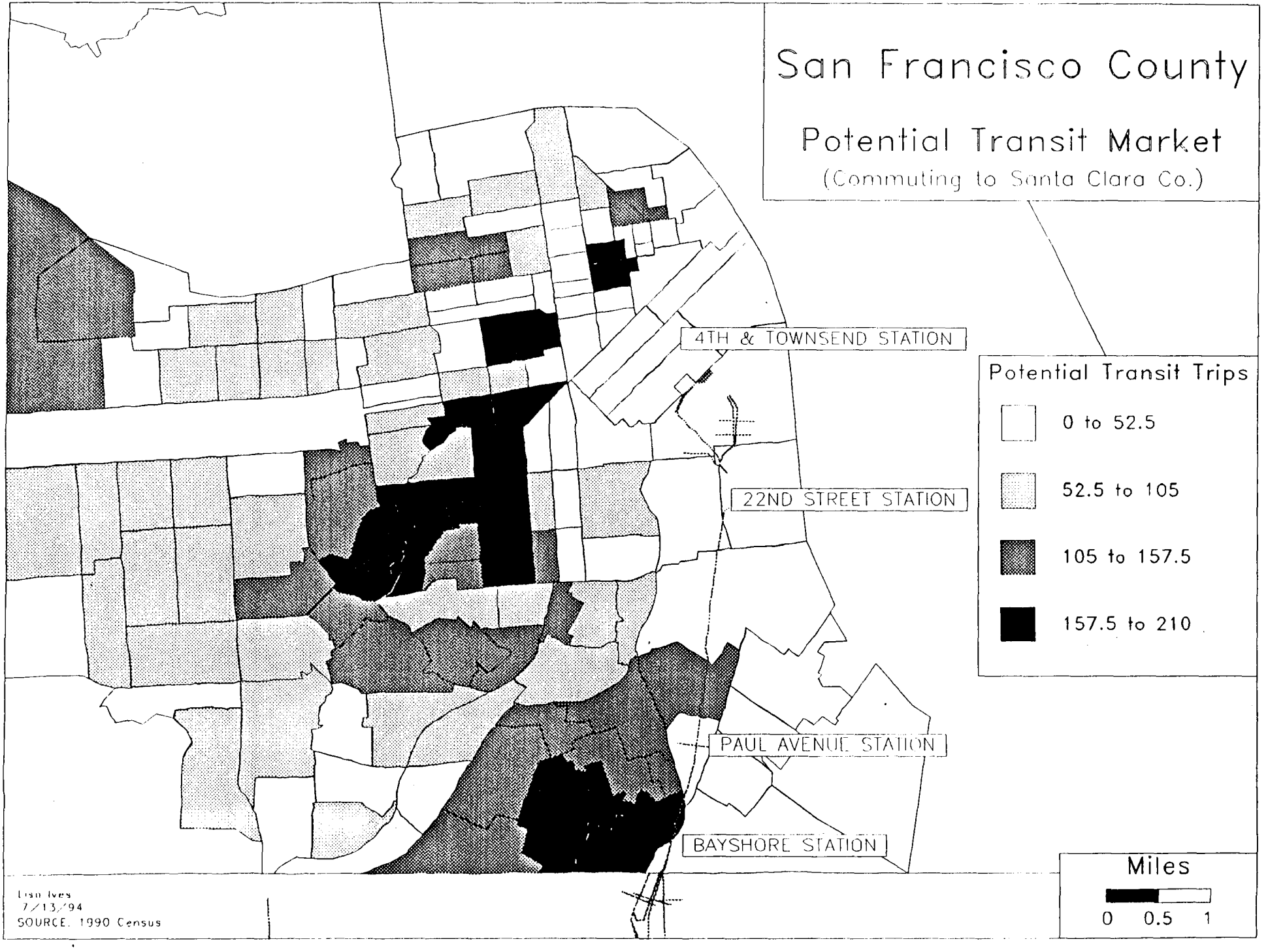

San Mateo County
% Transit Trips to Santa Clara Co.
(1990 Census)
% Transit Trips
0 to 5.8825
5.8825 to 11.765
11.765 to 17.6475
17.6475 to 23.53
Miles
0
2
4
Lisa Ives
7/08/94
SOURCE: 1990 Census

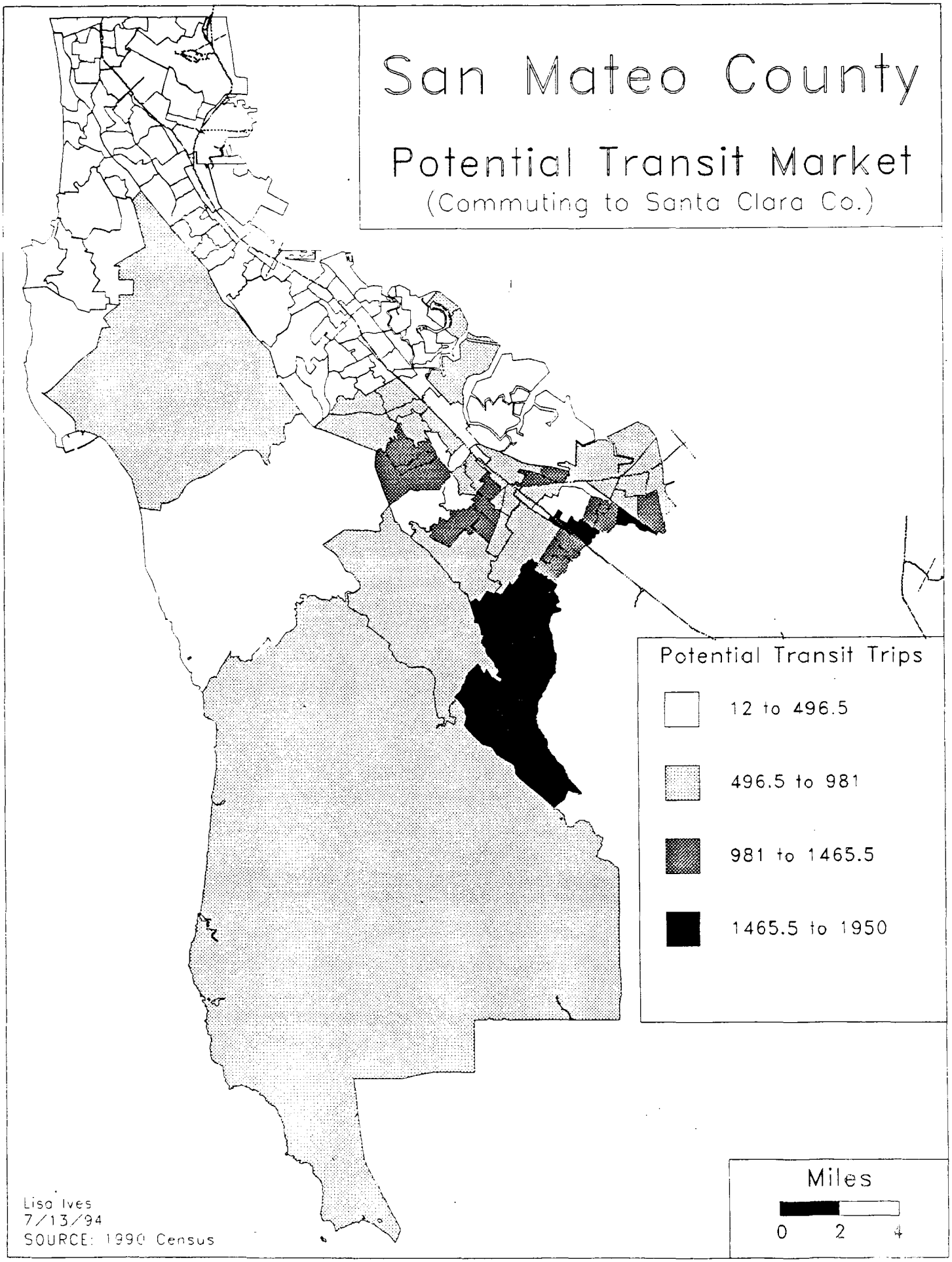

Santa Clara County
% Transit Trips to Downtown SF
(1990 Census)
% Transit Trips
0 to 25
25 to 50
50 to 75
75 to 100
Lisa Ives
7/08/94
SOURCE: 1990 Census
Miles
0 2 4

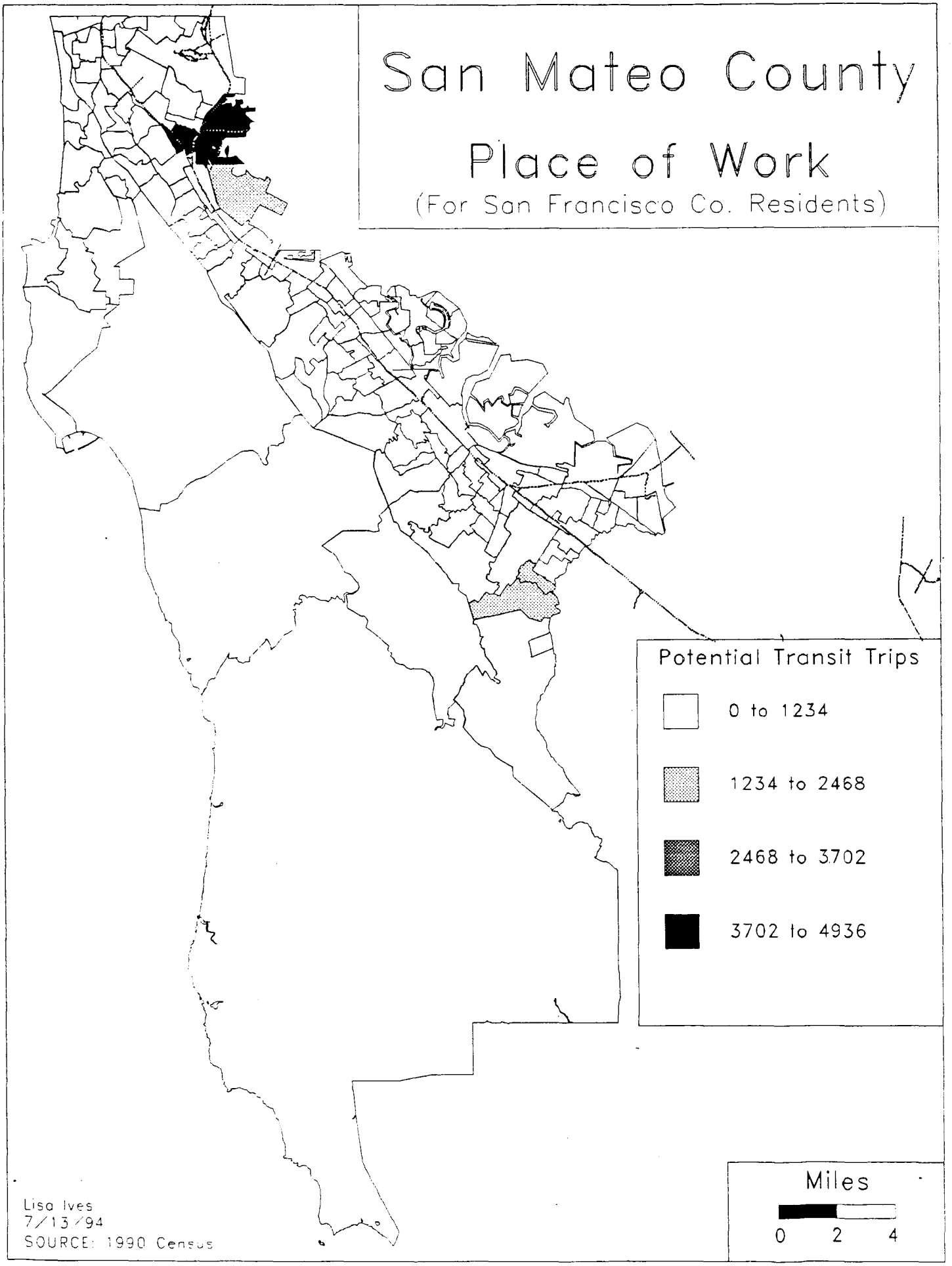

Santa Clara County
% Transit Trips to San Mateo Co.
(1990 Census)
% Transit Trips
0 to 19.0475
19.0475 to 38.095
38.095 to 57.1425
57.1425 to 76.19
SOURCE: 1990 Census
Miles
0 2 4

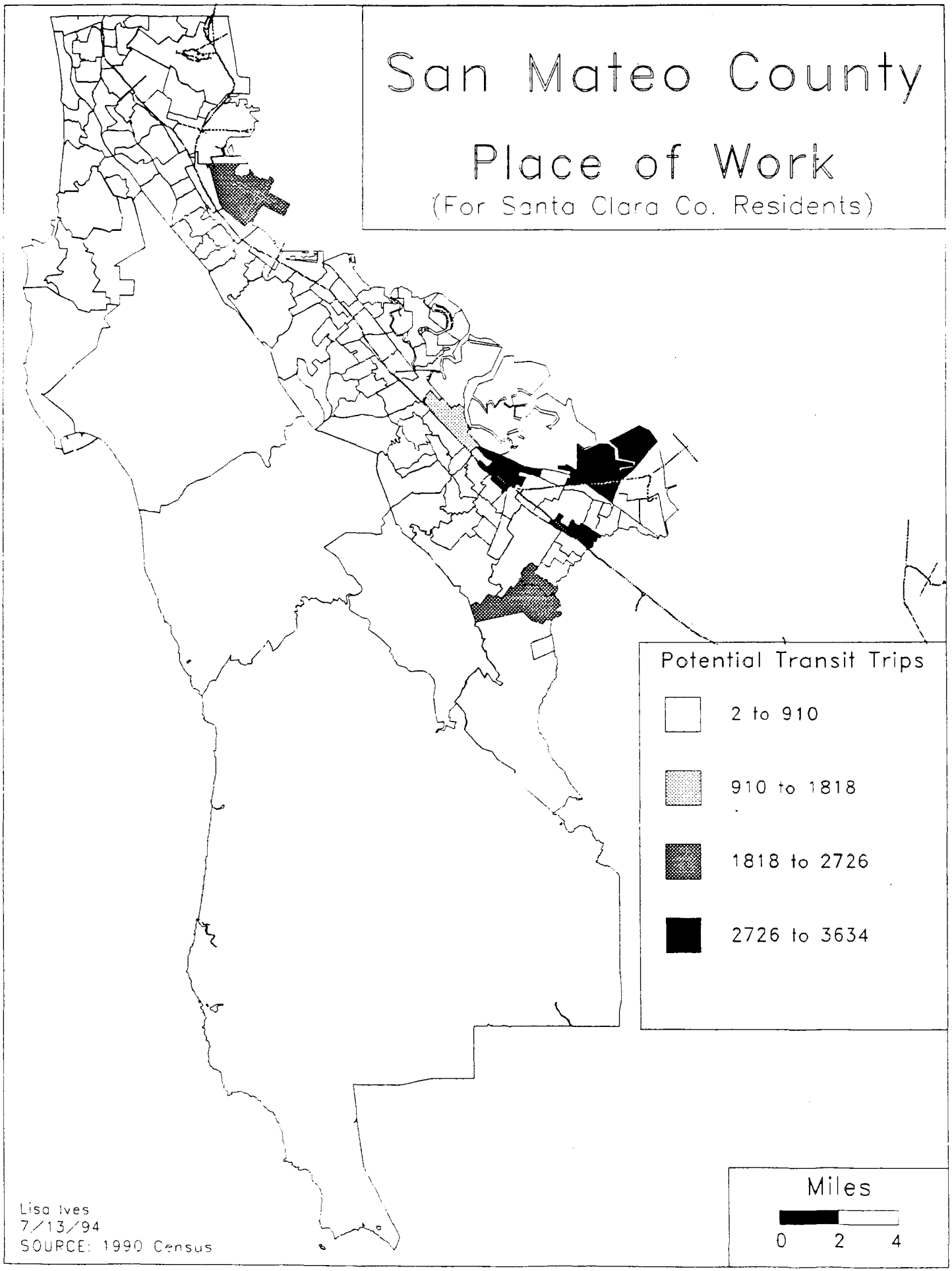

San Francisco County
Potential Transit Market
(Commuting to San Mateo Co.)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Potential Transit Trips
0 to 278.5
278.5 to 557
557 to 835.5
835.5 to 1114
Miles
0 0.5 1
Lisa Ives
7 13 94
SOURCE 1990 Census


San Mateo County
Potential Transit Market
(Commuting to Downtown SF)
Potential Transit Trips
7 to 370.75
370.75 to 734.5
734.5 to 1098.25
1098.25 to 1462
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: 1990 Census


San Francisco County
Potential Transit Market
(Commuting to Santa Clara Co.)
4TH & TOWNSEND STATION
22ND STREET STATION
PAUL AVENUE STATION
BAYSHORE STATION
Potential Transit Trips
0 to 52.5
52.5 to 105
105 to 157.5
157.5 to 210
Miles
0 0.5 1
Lisa Ives
7/13/94
SOURCE: 1990 Census


San Mateo County
Potential Transit Market
(Commuting to Santa Clara Co.)
Potential Transit Trips
12 to 496.5
496.5 to 981
981 to 1465.5
1465.5 to 1950
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: 1990 Census

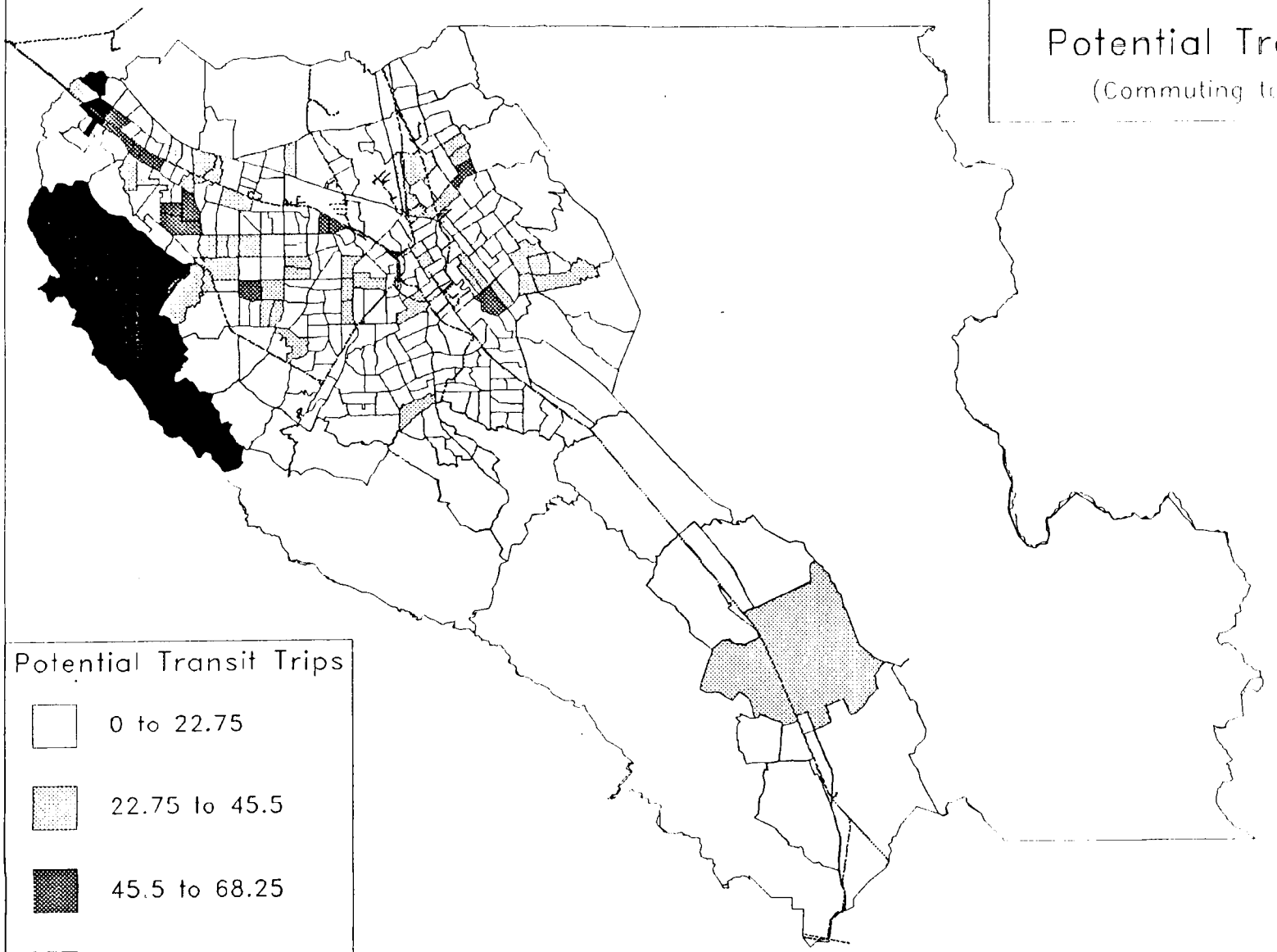

San Mateo County
Place of Work
(For San Francisco Co. Residents)
Potential Transit Trips
0 to 1234
1234 to 2468
2468 to 3702
3702 to 4936
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: 1990 Census


San Mateo County
Place of Work
(For Santa Clara Co. Residents)
Potential Transit Trips
2 to 910
910 to 1818
1818 to 2726
2726 to 3634
Miles
0 2 4
Lisa Ives
7/13/94
SOURCE: 1990 Census

Santa Clara County

Potential Transit Market

(Commuting to Downtown SF)



Potential Transit Trips

- 0 to 22.75
- 22.75 to 45.5
- 45.5 to 68.25
- 68.25 to 91

Lisa Ives
7/08/94
SOURCE: 1990 Census

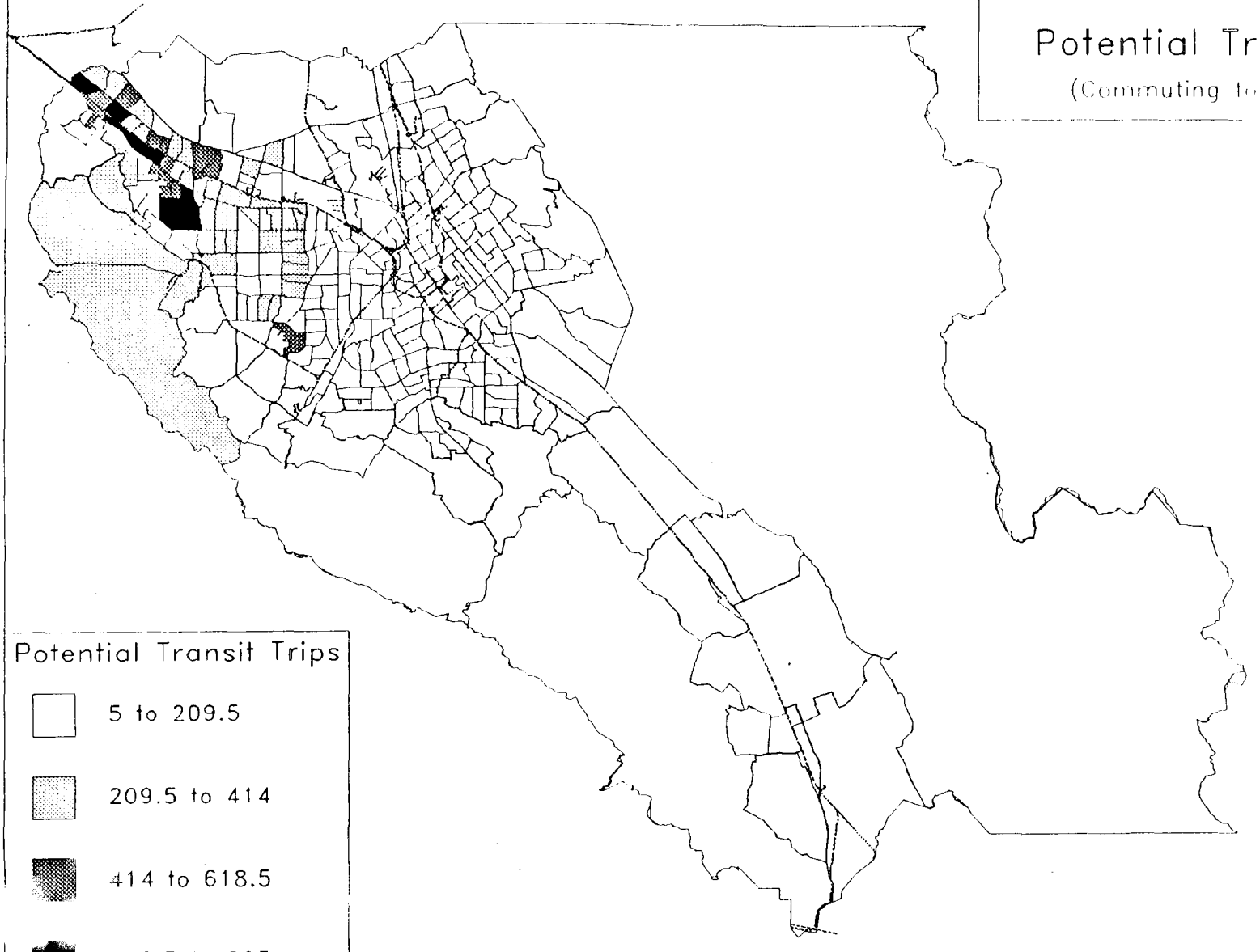
Miles

0 2 4

Santa Clara County

Potential Transit Market

(Commuting to San Mateo Co.)



Potential Transit Trips

- 5 to 209.5
- 209.5 to 414
- 414 to 618.5
- 618.5 to 823

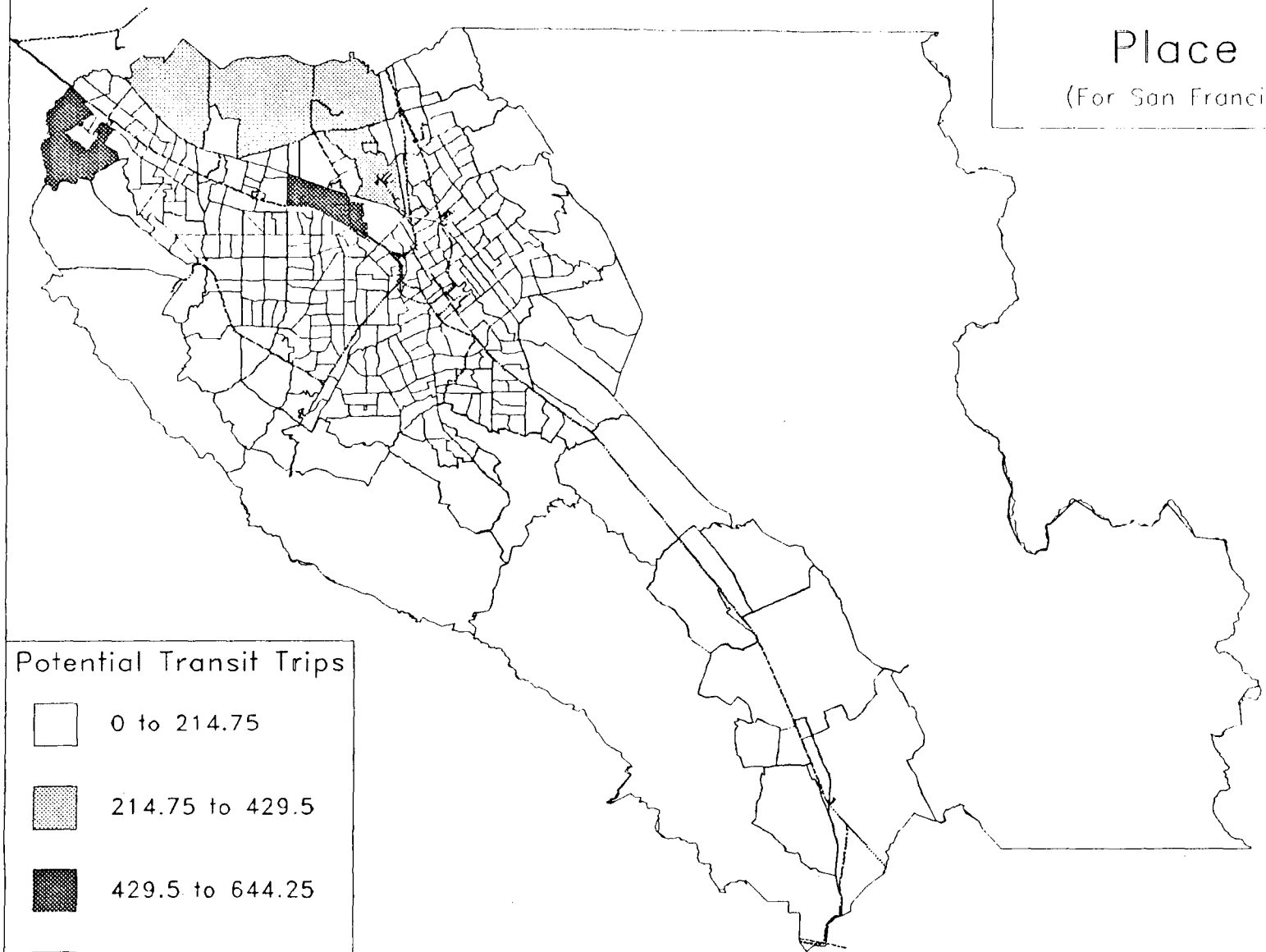
Lisa Ives
7/08/94
SOURCE: 1990 Census

Miles
0 2 4

Santa Clara County

Place of Work

(For San Francisco Co. Residents)



Potential Transit Trips

- 0 to 214.75
- 214.75 to 429.5
- 429.5 to 644.25
- 644.25 to 859

Miles

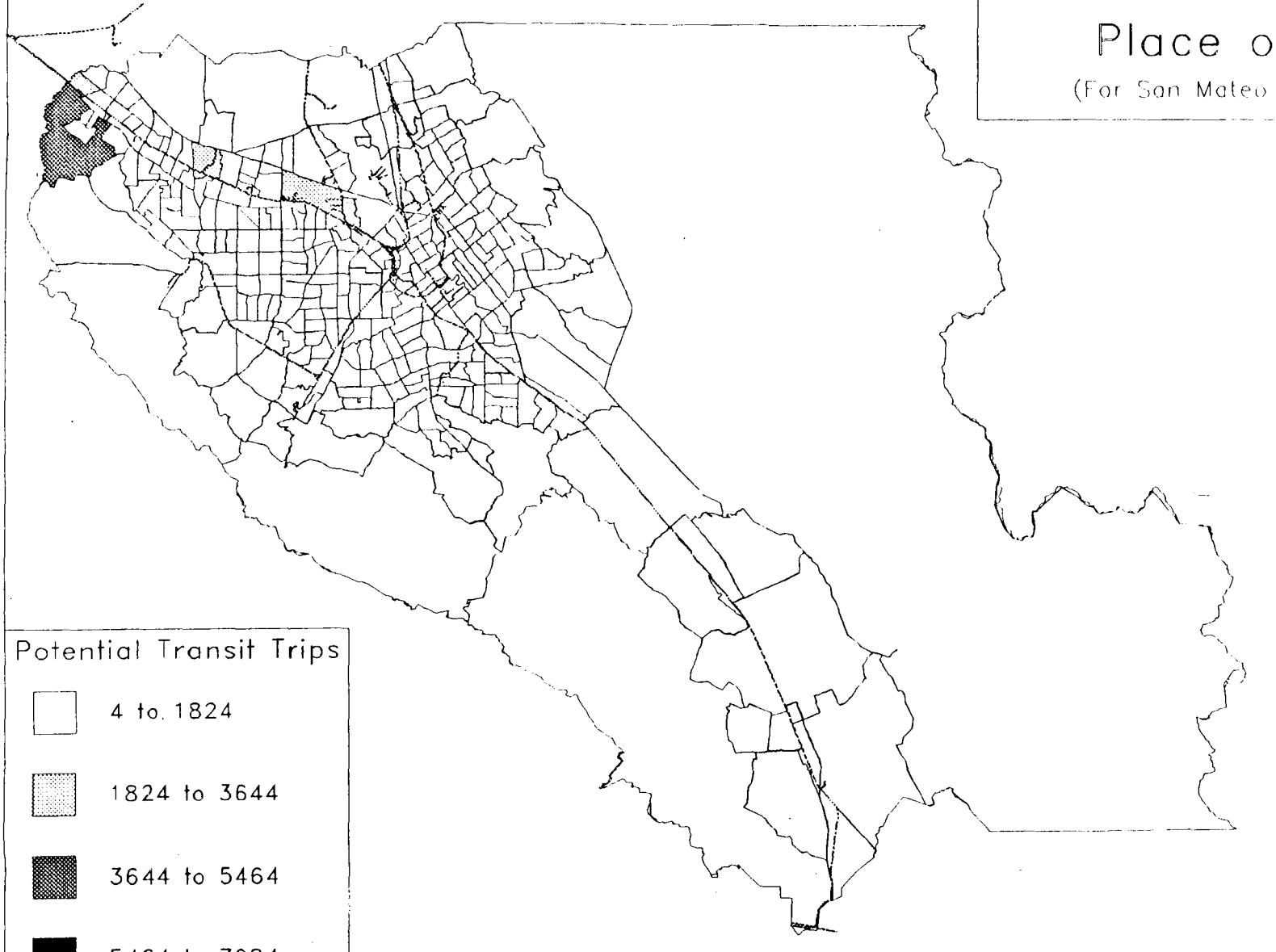
0 2 4

SOURCE: 1990 Census

Santa Clara County

Place of Work

(For San Mateo Co. Residents)



Potential Transit Trips

- 4 to 1824
- 1824 to 3644
- 3644 to 5464
- 5464 to 7284

Lisa Ives
7/08/94
SOURCE: 1990 Census

Miles
0 2 4

APPENDIX 4

CalTrain Travel Demand Forecasts

CalTrain Travel Demand Forecasts for the CalTrain Market Demand Study

Technical Memorandum

Submitted to

The Joint Powers Board

by

Korve Engineering

April 5, 1996

Table of Contents

List of Tables

This technical memorandum presents the results of the CalTrain Travel Demand and Patronage Forecasts for the CalTrain Market Demand Study. The memorandum is organized with an introduction, followed by the results, and ending with some brief conclusions.

1.0 Introduction

In response to various planning and operational issues that need to be addressed by the Joint Powers Board (JPB), a set of CalTrain travel demand forecasts was prepared using the San Mateo Countywide Travel Demand Model. This model was recalibrated in 1995 and met with the Metropolitan Transportation Commission (MTC) model consistency requirements. While the model was consistent with the Regional model maintained by MTC, there were several key enhancements incorporated in the model that improved its effectiveness and sensitivity for planning on a county wide level and for long-range planning for CalTrain. These features are:

Nested Logit Home-Based Work (HBW) Mode Choice Model - The structure of the nested logit mode choice model for HBW trips recognizes the competition between transit modes using calibrated mathematical relationships of the utilities of these transit modes. The previous structure resulted in the choice between transit modes to be made without any consideration other than total expected travel time using different paths. In reality, the choice is a function of many other variables.

Integration of the San Francisco Air Passenger Model - The integration of the San Francisco Air Passenger Model enables the forecasting of air passengers using transit under various transit service scenarios

Modeling of School Trips - The inclusion of a set of models for school trips is of key importance in that a significant travel market can be modeled directly. This capability is particularly important for transit, since school trips account for a significant number of average weekday boardings on Samtrans buses.

Increased Zonal Detail Along Key Transit Corridors - Many of the traffic analysis zones along the entire CalTrain corridor, particularly in San Francisco and Santa Clara, were disaggregated to more accurately portray the patterns of land uses in the vicinities of these rail stations.

Increased Transit Network Detail - Several aspects of the transit network, such as waiting times and boarding times were enhanced to reflect the coordination of bus feeder service to CalTrain.

CalTrain travel demand forecasts were performed for four CalTrain service scenarios, two for 1990 conditions and two for 2010 conditions. The model was calibrated against ridership in 1990, at which time CalTrain operated 52 daily trains. The forecast scenarios were designed to test the effect of operating 72 and 86 daily trains. All of the forecast scenarios were designed to include 8 weekday trains on the Gilroy extension. The base-year validation alternative and the four scenarios tested were:

Table 1 Definition of Forecast Alternatives

Alternative	Year	Number of Daily Trains	CalTrain Service Area
1	1990	52	San Jose Cahill[1] to 4th and Townsend
2A	1990	60	Gilroy to 4th and Townsend
2B	1990	72	Gilroy to 4th and Townsend
5A	2010	72	Gilroy to Transbay Terminal
6B	2010	86	Gilroy to Transbay Terminal

2.0 Forecast Assumptions

All five alternatives assumed no constraints on parking. The 2010 alternatives (Alternatives 5A and 6B) were assumed to include CalTrain base-fare increases of 100 per cent (i.e., from $1.00 to $2.00) and CalTrain operational improvements that effectively increased the train speed by 10 per cent.

The schedule variation for each of the alternatives was defined by the JPB and is included in Appendix A. During the time period from 1990 to 1995, some schedule variations were designed for testing with the model with the possibility of implementing them in the short term. Consequently, Alternatives 1, 2A, and 2B each had unique, though not dramatically different schedule variations, as well as different headway assumptions. The schedule variations for Alternatives 5A and 6B were the same, with differences in headways to reflect the appropriate number of daily trains.

3.0 Model Outputs

A variety of model outputs was reported for each CalTrain travel forecast in order to address the needs of JPB planning staff, as follows:

- CalTrain daily and peak hour ridership
- Boarding and alighting volumes at each station
- Passenger origin and destination by station
- Boardings and alightings by walk and drive access

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1 The name of the San Jose Cahill station has since been changed to "San Jose Diridon". For purposes of consistency, this document refers to it as "Cahill".

- Boardings and alightings by direction

- Estimates of daily parking demand by station

Post-Processing Adjustments

In order to compensate for the difference between estimated and observed passenger entries and exits at the station level, a normalization procedure was employed. Adjustment factors were developed for each station and were applied to the forecasted daily entries and exits for the corresponding stations. The two basic steps involved in this process were:

- compute the ratio of 1990 observed total ons and offs to 1990 estimated total ons and offs

- multiply the forecast total ons and offs by the computed ratio, yielding the normalized forecast total ons and offs

The adjustment factor reflects the ratio of the observed station "on+off" to the estimated station "on+off". For example, the Cahill station in San Jose had 1990 observed ons and offs totaling 3,747 and base-year estimated ons and offs totaling 3,252, a difference of approximately 13 per cent of the observed (3,747 - 3,252 = 495; 495 / 3,747 = 0.13). A factor of 3,747 / 3,252 = 1.1522 for the Cahill station was applied to all forecasts of Cahill station ons plus offs to reflect the noted deviation, in this case under-estimation, in the base-year calibration. Stations that were over-estimated in the base year had corresponding adjustment factors less than 1. Adjustment factors were developed for each 1990 station and applied for each forecast. The resulting normalized station entries and exits were always within 1 per cent of the raw (prior to adjustment) station entries and exits, on a system-wide basis.

The normalized drive-access and walk-access entries that appear in the detailed tables within the appendices were normalized using data from the CalTrain On-Board Passenger Survey from February 1994 to adjust the base-year (Alternative 1) drive-access and walk-access entries. The normalized drive-access and walk-access entries for the forecast alternatives were normalized by estimating the change in drive-access demand between the forecast alternative (2A, 2B, 5A, or 6B) and the base-year alternative (Alternative 1), and pivoting on the normalized Alternative 1 home-based work drive-access entries described previously. The normalized home-based work drive-access entries by alternative were used as input to the parking demand estimates which embody several key assumptions as follows:

- convert the HBW drive-access productions into HBW drive-access origins, and to convert these HBW drive-access origins, which are person trips, into HBW drive-access origins that represent vehicle trips.

- In converting person trips to vehicle trips, the level of ride-sharing was assumed to be negligible, however the component of drop-off (or kiss-ride) was taken into account, since not all vehicles that arrive at the station wish to park.

- The additional aspect of parking demand by non-work trips was also factored into the analysis by assuming that the ratio of non-work parkers to home-based work parkers is approximately 6 per cent.

- The capacity of CalTrain parking was used in two forms, "Parking Capacity" and "Utilized Capacity", the latter representing the reported parking capacity minus the reported vacant spaces.

- The approximate status of the parking supply versus the parking demand was estimated by subtracting demand from supply, so that negative numbers represent a parking shortage and positive numbers represent a parking surplus.

There is some disparity between the model estimated (Alternative 1) supply versus demand and the utilized parking measured in the field, because 1) the model was not validated at the station level to specifically reflect directionality, the percentage that drive to the station, and the percentage of drivers that park at the station, 2) the normalization of the drive versus walk modes deals with surveyed relative percentages rather than absolute values combined with the fact that the survey was unweighted and not expanded and 3) the utilized parking measured in the field was based on measurements collected for a single observation (day).

An order-of-magnitude estimate of how parking demand will be impacted by the forecast alternatives is indicated by inspecting how supply and demand changes from the base-year alternative (Alternative 1) to the forecast alternative. The following section summarizes each of the alternatives.

Production-Attraction Format

The assignment of CalTrain trips is based on daily home-based work (HBW) and non-work (NW) CalTrain transit trips in production-attraction format in conjunction with AM and mid-day transit networks, respectively. The effect of assigning a production-attraction trip table is illustrated by the following general example. The HBW boardings at the Hillsdale (or any other) station consist of trips being made from home to work and from work to home, because of the convention for defining HBW trips. Likewise, some of the HBW alightings at Hillsdale are trips being made from home to work and from work to home, again because of the convention for defining HBW trips. In fact, all of these trips occur during the course of the day, and are not necessarily tied to a specific period of the day. This issue becomes important in using CalTrain boarding or alighting data separately.

Parking Demand Estimates

Some caution should be used in using the data on estimated parking demand. The total estimated parking demand included a component of parking demand for non work trip purposes, which is assumed to occur in the off peak. Rather than using the tables of estimated parking demand to decide that for example, 600 spaces need to be added at Hillsdale to meet projected demand by 2010 under Alternative 6B, the trends should be examined between the base-year and the forecast year, combined with an understanding of the level of parking that is

occurring off-site (i.e., other parking facilities nearby and/or on-street parking), and finally, examining the parking issues at adjacent CalTrain stations. The Hillsdale station is projected to experience a parking shortfall of 600 under Alternative 6B, compared with a shortfall of 180 in the base year, representing more than a two-fold increase. The projected parking status at the adjacent stations of Belmont and Bay Meadows also indicate projected parking shortages. The JPB is currently conducting a study that examines potential off-site parking supply for CalTrain riders. Once this information is known, reasonable conclusions can be made about the level of parking increases that should be planned for all three stations in order to satisfy demand. The level of off-peak parking demand to be accommodated also needs to be addressed, either on an individual station basis or on a station group basis. The notion of addressing the parking issue by groups of stations is important because the model was not validated at the station level, particularly at stations with low activity.

Passenger Origin and Destination

The data on passenger origin and destination by station reflects daily origin-destination format, rather than production-attraction format. Consequently, the total daily entries at Hillsdale will equal the total daily exits at Hillsdale, because of the inherent assumption that a CalTrain patron uses the same two stations, though in opposite order, on a daily basis. In fact, this assumption holds true a large majority of the time, based on empirical data. Because the models were not calibrated on a station origin-destination level, these numbers should be used with caution. It is recommended that the station-to-station data be aggregated before using the results so that the data reflects passenger origin and destination by station group. Possible grouping strategies might be based on fare zones or county boundaries.

4.0 Forecast Results

The detailed model outputs outlined in Section 3.0 are presented in Appendices B through E (one for each alternative). The CalTrain results for each alternative are summarized below.

Table 2 CalTrain Results Summary

Summary Item	Alt 1	Alt 2A	Alt 2B	Alt 5A	Alt 6B
Total HBW Entries & Exits	33,849	37,137	38,108	55,080	56,370
Total HBW System Entries	16,924	18,569	19,054	27,540	28,185
Total NW Entries & Exits	9,703	12,690	15,044	23,427	27,412
Total NW System Entries	4,852	6,345	7,522	11,713	13,706
Total Air Passenger Entries & Exits	-	-	-	3,158	3,825
Total Daily Entries & Exits	43,552	49,828	53,152	81,665	87,606
Total System Entries	21,776	24,914	26,576	40,833	43,803
Estimated Total Parking Shortfall	N/A	872	986	2,526	2,919

As shown in the above table, Alternatives 5A and 6B resulted in 3,000 to 4,000 air passenger trips on CalTrain because of the provision of a Bart shuttle connection to the San Francisco Airport (SFO). By contrast, few air passengers used transit of any form to get to SFO, as estimated by the model and as measured by air passenger surveys in the years from 1990 to 1992.

Also shown in Table 2 are increases in CalTrain ridership resulting from increasing the number of daily trains, both for the home-based work trips (which are assumed to occur in the peak hours of approximately 6 AM to 9 AM) and the non-work trips (which are assumed to occur in the off peak hours of approximately 9 AM to 4 PM).

It should be noted that the non-work mode choice and non-work transit models inherently preclude the drive-access mode, placing in effect a level of parking constraint on all park-and-ride facilities. The drive-access mode includes demand for parking and getting dropped off at the station. This procedure is consistent with the structure of the MTC regional model. Consequently, all results regarding drive access were limited to home-based work boardings and alightings on CalTrain.

Detailed information is provided for each alternative, including entries and exits by direction and by purpose, normalized home-based work entries by access mode, and normalized parking demand estimates, in Appendices B through E. The following paragraphs summarize each of the alternatives.

Alternative 2A

Alternative 2A tested 60 daily trains as compared with Alternative 1, the base-year validation scenario, which was based on 52 daily trains. Alternative 2A resulted in the addition of two peak and six mid-day trains, to be consistent with the 60-weekday train schedule operated in 1995. This alternative was projected to result in approximately 3,138 additional system entries, as shown in the corresponding Table. These 3,138 system entries equate to 6,276 ons and offs. Of the 6,276 additional ons and offs, 2,200 are directly associated with the stations in South Santa Clara County (from Tamien to Gilroy station), 1,965 are associated with non-work ons and offs at the stations from Cahill to San Francisco due to increased levels of service in the off-peak, and 2,110 are associated with home-based work ons and offs that are attracted to the system because of an additional train operating in the peak and increased opportunities for express service.

There are a few instances of decreased activity at stations in going from 52 to 60 daily trains. The reductions in station activity are mostly associated with fewer trains serving the stations compared with the schedule in 1990. A reduction of about 10 per cent is projected to occur at the Cahill station, although the combined activity at Cahill and Tamien is projected at 4,997 daily ons and offs, which represents more than a 33 per cent increase over 1990. The high activity at the Tamien station, with ons and offs of 1,628 (which is comparable to Sunnyvale and Mountain View) suggests that a substantial market is being served by the Tamien station and that some passengers using the Cahill station prior to opening Tamien are now choosing the

Tamien station. Other stations that experience drops in activity are San Carlos, Bayshore, and 22nd Street. Stations that indicate increases include College, Santa Clara, Lawrence, Sunnyvale, Mountain View, Castro, California, Palo Alto, Menlo Park, Atherton, Belmont, Hillsdale, Hayward Park, Burlingame, Broadway, Millbrae, and Paul Avenue. The changes in the stopping patterns of the trains between the two alternatives (1 and 2A) are consistent with these patterns and explain the shifts in station activities.

The 60-train alternative (Alternative 2A), with 49,828 daily system entries, projected a 14.4 per cent increase in system entries from the 52-train scenario (Alternative 1), with 43,552 daily system entries. This level of ridership is higher than was actually observed in 1994 when 60 daily trains were operating. The difference between that which was projected by the model and that which actually occurred under the 60-train scenario can be attributed to several factors, including:

- Fewer jobs in San Francisco in 1994 compared with 1990 due to the economic recession in the Bay Area during the early 1990's

- Temporary closure of key highway facilities due to October 1989 earthquake, resulting in higher CalTrain ridership in 1990 than that which would occur following re-opening of highways

- Two fare increases, one in September 1991, the second in July 1993

While fares were not changed between Alternative 1 and Alternative 2A, two fare increases had been instituted between 1990 and 1994, resulting in a 21 per cent total fare increase. Data on fare elasticity provided by the JPB, indicated a system-wide fare elasticity of 0.37. Given a 21 per cent increase in fare, the system ridership would decrease by approximately 7.8 per cent, all else constant. If the 1994 fare level had prevailed in 1990, the estimated system entries would have been 20,077 (because 21,776 * (1 - 0.078) = 20,077). Assuming an increase in ridership of 14.4 per cent due to increased service levels gives 22,970 (because 20,077 * 1.144 = 22,970). The increase from Alternative 1 to Alternative 2A, adjusted for the effects of fare increases, would then be approximately 5.5 per cent (because (22,970 / 21,776) - 1 = 0.055).

The effects of differences in demographics is significant although they cannot be readily quantified. The economic profile during this time period was characterized by a decrease in jobs and a shift from full-time to part-time/temporary jobs for a percentage of workers due to the economic recession. Since 82 per cent of CalTrain riders use the train to get to work, both of these changes would be expected to result in lower CalTrain patronage.

Since the increase in ridership from 52 to 60 trains is roughly 5.5 per cent when fare increases are taken into account, it is reasonable to conclude that the change in demographics combined with the modal shifts due to the earthquake explain a portion of the remaining difference. Another aspect of CalTrain ridership estimated by the model is the implicit unconstrained parking supply which in reality is very limited at stations such as Hillsdale, Hayward Park, and Burlingame. In other words, if demographics had remained unchanged and parking had been

constrained, the estimated increase in ridership from 52 to 60 trains would have been closer to 5 per cent than 14 per cent (given that fares increased).

Alternative 2B

Alternative 2B tested 72 daily trains as compared with Alternative 1, the base-year validation scenario, which was based upon 52 daily trains. This scenario introduces increased levels of service in both the peak and mid-day periods, with increased opportunities for express service. This alternative was projected to result in approximately 4,800 additional system entries or 21 percent, as shown in Table 2. These 4,800 system entries equate to 9,600 ons and offs. Of the 9,600 additional ons and offs, 2,585 are directly associated with new stations in South Santa Clara County (from Tamien to Gilroy station), 4,319 are associated with non-work ons and offs at the stations from Cahill to San Francisco, due to increased levels of service in the off-peak, and 2,696 are associated with home-based work ons and offs that are attracted to the system (from Cahill to San Francisco) because of an additional train operating in the peak and increased opportunities for express service.

The activity at the Tamien and Cahill stations, with combined ons and offs of 5,978, compared with 4,997 in Alternative 2A suggests that service at the two stations is better overall in the 72-daily train scenario. The distribution of ons and offs at the two stations suggests that Alternative 2B provides for enhanced travel opportunities at Cahill compared with Alternative 2A. The station boarding summary for Alternative 2B shows similar station activities for the South Santa Clara (Tamien through Gilroy) stations and proportional increases in station activities for all other stations except College, Castro, Atherton, Hayward Park and Paul Avenue. The increases in station entries and exits are consistent with the increased frequency associated with a 72-train versus 60-train schedule. The decreases in station entries and exits at College, Castro, Atherton, Hayward Park and Paul Avenue are explained by the changes in the stopping patterns of the trains between the two alternatives.

A shortage of parking is projected to occur at several stations, however, large deficits are not projected at any station. The increase in parking demand for the CalTrain system is projected to increase by approximately 21 per cent. CalTrain stations that are projected to have parking surpluses are Gilroy, San Martin, Morgan Hill, Blossom Hill, Capitol, Tamien, Atherton, and Redwood City. Parking surpluses for stations on the Gilroy extension could be due to the limited service south of Tamien under this scenario, namely eight weekday trains out of a total of 72.

Alternative 5A

Alternative 5A tested 72 daily trains in the year 2010, with CalTrain extended to the Transbay Terminal and Bart extended to SFO and a Bart shuttle providing service between CalTrain at Millbrae and SFO. This alternative is projected to result in approximately 40,850 total system entries (after normalization), or 81,700 total system entries and exits. This scenario introduces

increased levels of service in both the peak and mid-day periods, with increased opportunities for express service.

Compared with the base-year validation, Alternative 1, the 2010 ridership on CalTrain with 72 trains operating, is projected to increase by more than 87 per cent. The projected increase in CalTrain ridership with Alternative 5 compared with Alternative 2A is more than 63 per cent. These increases reflect increases in jobs and housing in the CalTrain corridor by the year 2010, better access to downtown San Francisco, and enhanced levels of service on CalTrain.

A shortage of parking is projected to occur at several stations. Large increases in estimated parking demand are projected for San Carlos, Belmont, Hillsdale, San Mateo, Burlingame and Millbrae. The increase in parking demand for the CalTrain system is projected to increase by approximately 76 per cent. CalTrain stations that are projected to have parking surpluses are Gilroy, San Martin, Morgan Hill, Blossom Hill, Capitol, Tamien, Atherton, and Redwood City.

Alternative 6B

Alternative 6B tested 86 daily trains in the year 2010, with Bart extended to SFO and a Bart shuttle providing between CalTrain at Millbrae and SFO. This alternative is projected to result in approximately 43,800 total system entries (after normalization), or 87,600 total system entries and exits. This scenario introduces increased levels of service in both the peak and mid-day periods, including increased opportunities for express service. CalTrain headways are slightly improved during both the peak and the mid-day period and in both directions as compared with Alternative 5A. The AM southbound (reverse peak) express service is identical for both alternatives, while the AM northbound (peak) express service is slightly improved for Alternative 6B.

A shortage of parking is projected to occur at several stations. Large increases in estimated parking demand are projected for Sunnyvale, San Carlos, Belmont, Hillsdale, San Mateo, Burlingame and Millbrae. The increase in parking demand for the CalTrain system is projected to increase by approximately 84 per cent. CalTrain stations that are projected to have parking surpluses are Gilroy, San Martin, Morgan Hill, Blossom Hill, Capitol, Tamien, Atherton, and Redwood City.

In comparing Alternative 6B to Alternative 5A, the increases in ridership are fairly evenly distributed among the stations. Practically all of the zones are connected with drive-access links to more than one station, and there are instances where the choice between stations will differ as a results of rounding during the transit assignment process. The sum of the home-based work "entries+exits" for a group of adjacent stations is higher than the corresponding value for Alternative 5B, suggesting that this type of rounding is occurring. Almost all stations experience increases in home-based work "entries+exits" with the overall increase of about 2.3 per cent. The increase in total system-wide non-work "entries+exits" is approximately 17 per

cent. Much of the improvement in train frequency in going from 72 to 86 trains occurs in the off peak, supporting the projections of higher percentage increases in the off-peak than in the peak, with Alternative 5A compared to Alternative 6B.

5.0 Conclusions

The CalTrain travel demand forecasts provide the JPB with an informative database by which to proceed with planning activities that ensure the success of CalTrain by maximizing its ridership potential. Some guidelines should be employed, however, in using this data.

The CalTrain travel demand forecasts provide the JPB with useful information based on a common set of background assumptions, such as land use projections from ABAG projections '94 series, the most recent locally preferred alternative for an intermodal station at SFO, and state-of-the-practice forecasting techniques with the home-based work nested logit mode choice model.

Model enhancements that could be considered in the future would be the development of income-stratified home-based work models for trip generation and trip distribution. This type of structure recognizes potential imbalances in jobs and housing in situations where the total jobs and total households may compare reasonably well, but the types of housing are not necessarily affordable by the employees that would fill those jobs.

Appendix A
CalTrain Schedules for Forecast Alternatives

APPENDIX A

CalTrain Market Demand Study
Summary of Travel Demand and Patronage Forecasting Scenarios
1990 & 2010

Year	Alternative	Run #	Frequency	Base Fare	Unconstrained Parking	Service Scenarios: Schedule Variation (A)	Operational Improvements (B)	CalTrain Extensions (C&D)	BART Extensions (E&F)	Other Extensions (G&H)
1990	1 Baseline	1	52	$1.00	YES	---	---	---	---	---
	2 Service Enhancements "Short-Term"	2A	60	$1.00	YES	Pattern changes - (See Appendix A1)	---	- Extension to Gilroy (C)	---	---
		2B	72	$1.00	YES	Pattern changes - (See Appendix A2)	Signaling improvements	- Extension to Gilroy (C)	---	---
2010	5 Service Expansion	5A	72	$2.00	YES	Pattern changes - (See Appendix A3)	Signaling improvements 10% run time reduction	- Extension to Gilroy (C) - Extension to Downtown San Francisco (D)	- Extension to Colma (E) - Extension to SFO (F)	- Muni Metro Ext. (G) - Tasman Extension (H)
	6 Service Expansion w/ Added Frequency	6B	86	$2.00	YES	Pattern changes - (See Appendix A3)	Signaling improvements & third track option 10% run time reduction	- Extension to Gilroy (C) - Extension to Downtown San Francisco (D)	- Extension to Colma (E) - Extension to SFO (F)	- Muni Metro Ext. (G) - Tasman Extension (H)

(A) Vary travel times by adding express, limited or local trains

(B) Signaling improvements and third track option to achieve run time reduction, run time reduction also can be achieved through system electrification

(C) CalTrain extended to Gilroy with new stations at Tamien, Capitol, Blossom Hill, Morgan Hill, San Martin and Gilroy.

(D) CalTrain extended to Downtown San Francisco with a new Transbay Terminal station relocation

(E) BART extended to a new Colma BART station

(F) BART extended to a SFO station with new stations at Hickey, Tanforan and Millbrae; All San Mateo County BART station fares include a 60-cent surcharge.

(G) Muni Metro Light Rail extended near Fourth and Townsend

(H) Tasman Light Rail extended to Mountain View

LI
F:\SCENSUM.WK3
08-Jul-96

Other Assumptions

Land Use: Based on 2010 Base Case Scenario #1 from San Mateo Countywide Transportation Plan; This scenario utilized ABAG Projections '94, which were adjusted based on information provided by local jurisdictions

Parking Cost: Based on MTC's 2010 rates.

Automobile Cost: 1990 auto operating costs is estimated at 10 cents/mile in 1980 dollars; 2010 is estimated at 9.5 cents/mile in 1980 dollars.

Bridge Tolls: Assumed to be $3.00 in 2010

APPENDIX A1

CalTrain Market Demand Study
Service Scenarios

Alternative 2A: Weekday Schedule for 60 Trains in 1990

Northbound Trains						Southbound Trains					
Leave	San Jose		Arrive San	Non-Stop	Special	Leave San	San Jose		Arrive	Non-Stop	Special
Gilroy	Tamien	Diridon	Francisco	Trips	Stops	Francisco	Diridon	Tamien	Gilroy	Trips	Stops
	04:43	04:50	06:16			05:00	06:29	06:35			CP
	05:28	05:35	06:46		CP,C,P	06:00	07:32	07:38			P,C,CP
	05:33	05:40	07:08			06:30	08:02	08:08			C,CP
	05:48	05:55	07:12	HX		06:55	08:17				C,CP
		06:05	07:29		P	07:00	08:32	08:38			C,CP
05:26	06:03	06:10	07:15	SX	P	07:25	08:47				C
	06:13	06:20	07:35	MPX	CP,C	07:30	09:01	09:07			P,C
05:51	06:28	06:35	07:40	SX	P	08:00	09:30	09:36			P,C
		06:50	08:00	HX		09:00	10:27	10:35			
		07:00	08:21		C	10:00	11:28	11:34			
06:26	07:03	07:10	08:42		CP,C,P	11:00	12:28	12:34			
	07:23	07:30	08:48	HX		12:00	01:28	01:34			
07:16	07:53	08:00	09:31			01:00	02:28	02:34			
	08:53	09:00	10:28			02:00	03:28	03:34			CP
	09:53	10:00	11:28			03:00	04:31	04:36	05:15		C,CP
	10:53	11:00	12:28			03:45	05:16	05:21	06:00		P,C,CP
	11:53	12:00	01:28			04:25	05:45	05:52		HX	C
	12:53	01:00	02:29		CP	04:45	05:55	06:00	06:39	SX	
	01:53	02:00	03:28			04:50	06:09			HX	C
	02:53	03:00	04:30		CP,P	04:55	06:23				P,C,CP
		03:30	05:00		CP,P	05:20	06:30	06:35	07:14	PX	CP
	03:53	04:00	05:32		CP,C	05:25	06:41			HX	
	04:23	04:30	06:03		CP,C,P	05:30	06:50	06:57		BX	C
	04:53	05:00	06:22		C	05:40	07:13				P,C
		05:15	06:46		CP,C,P	06:00	07:23	07:30			C
	05:38	05:45	07:07		CP,C	06:20	07:48	07:54			P,C
	06:08	06:15	07:46		CP,C,P	07:00	08:28	08:34			P
	06:53	07:00	08:28		C	08:00	09:28	09:34			
	07:53	08:00	09:28			09:00	10:28	10:34			
		10:00	11:28			10:00	11:28	11:34			
						12:01	01:28	Friday only			

Non-Stop Trips
BX = Burlingame & Hayward/SF
HX = Hillsdale/SF
PX = Palo Alto/SF
MPX = Menlo Park/SF
XX = Palo Alto/Hillsdale
SX = Atherton/San Jose

Special Stops
CP = Stop at College Park
C = Stop at Castro
P = Stop at Paul Avenue

APPENDIX A2

CalTrain Market Demand Study
Service Scenarios

Alternative 2B: Weekday Schedule for 72 Trains in 1990

Northbound Trains						Southbound Trains					
Leave	San Jose		Arrive San	Non-Stop	Special	Leave San	San Jose		Arrive	Non-Stop	Special
Gilroy	Tamien	Diridon	Francisco	Trips	Stops	Francisco	Diridon	Tamien	Gilroy	Trips	Stops
	04:53	05:00	06:28			05:00	06:28	06:34			CP
		05:25	06:42	HX		05:30	07:00	07:06			P,C,CP
	05:23	05:30	06:58			06:00	07:30	07:36			P,C,CP
		05:55	07:12	HX		06:30	08:00				C,CP
	05:53	06:00	07:30		C	06:45	08:15				C,CP
05:36	06:13	06:20	07:38	HX	CP	07:00	08:30	08:36			P,C,CP
		06:25	07:54		C	07:25	08:42	08:48		HX	
06:06	06:43	06:50	07:58	PX		07:30	09:00				C
		06:55	08:13	HX	C	08:00	09:30	09:36			P,C
	06:53	07:00	08:30		C	08:30	10:00	10:06			P,C,CP
06:41	07:18	07:25	08:43	HX	CP	09:00	10:28	10:34			
		07:30	09:00		C	10:00	11:28	11:34			
07:16	07:53	08:00	09:30		CP	11:00	12:28	12:34			
	08:23	08:30	10:00		C	12:00	01:28	01:34			
	08:53	09:00	10:28			01:00	02:28	02:34			
		09:30	11:00		CP,C,P	02:00	03:28	03:34			
	09:53	10:00	11:28			02:30	03:58	04:04			
	10:53	11:00	12:28			03:00	04:31	04:36	05:15		CP
	11:53	12:00	01:28			03:30	05:01	05:07			C
	12:53	01:00	02:28			04:00	05:31	05:36	06:15		CP
	01:53	02:00	03:28			04:25	05:43			HX	C
		02:30	03:58			04:30	06:01	06:06	06:45		CP
	02:53	03:00	04:30		CP,P	04:55	06:13			HX	C
		03:30	05:00		CP,C	05:00	06:25	06:31		XX	
	03:53	04:00	05:30		CP,C,P	05:20	06:30	06:35	07:14	PX	
		04:25	05:42	HX		05:25	06:43			HX	C
	04:23	04:30	06:00		CP,C	05:30	06:50			BX	
		04:55	06:12	HX		05:35	07:06	07:12			C
		05:00	06:30		CP,C,P	06:00	07:18			HX	C
	05:23	05:30	07:00		CP,C	06:05	07:35	07:41			
		06:00	07:30		CP,C	06:30	07:58	08:04			C
		06:30	07:58		CP,C	07:00	08:28	08:34			
	06:53	07:00	08:28		C	08:00	09:28	09:34			
	07:53	08:00	09:28			09:00	10:28	10:34			
	08:53	09:00	10:28			10:00	11:28	11:34			
	09:53	10:00	11:28			12:01	01:29	Friday only			

Non-Stop Trips
BX = Burlingame & Hayward/SF
HX = Hillsdale/SF
PX = Palo Alto/SF
MPX = Menlo Park/SF
XX = Palo Alto/Hillsdale
SX = Atherton/San Jose

Special Stops
CP = Stop at College Park
C = Stop at Castro
P = Stop at Paul Avenue

CalTrain Market Demand Study
Service Scenarios

Alternative 5A: Weekday Schedule for 72 Trains in 2010
Alternative 6B: Weekday Schedule for 86 Trains in 2010

Northbound Trains							Southbound Trains						
	Leave	San Jose		Arrive San	Non-Stop	Special		Leave San	San Jose		Arrive	Non-Stop	Special
Alternative	Gilroy	Tamien	Diridon	Francisco	Trips	Stops	Alternative	Francisco	Diridon	Tamien	Gilroy	Trips	Stops
5A,6B		04:45	04:50	06:09		L	5A,6B	05:00	06:19	06:25			L
6B		05:25	05:30	06:34	HX		5A,6B	05:30	06:49	06:55			L
5A,6B	05:00	05:35	05:40	06:52	MX		5A,6B	06:00	07:19	07:25			L
5A,6B		05:45	05:50	07:09		L	5A,6B	06:25	07:29	07:35		HX	
5A,6B		06:00	06:05	06:07	PX		5A,6B	06:30	07:49	07:55			L
5A,6B	05:30	06:05	06:10	07:22	MX		5A,6B	06:55	07:59	08:05		HX	
5A,6B		06:10	06:15	07:34		L	5A,6B	07:00	08:19	08:25			L
5A,6B		06:25	06:30	07:34	HX		5A,6B	07:25	08:29	08:35		HX	
5A,6B	05:55	06:30	06:35	07:47	MX		5A,6B	07:30	08:49	08:55			L
5A,6B		06:45	06:50	07:52	PX		5A,6B	08:00	09:19	09:25			L
5A,6B		06:55	07:00	08:19		L	6B	08:15	09:34	09:40			L
5A,6B	06:30	07:05	07:10	08:22	MX		5A,6B	08:30	09:49	09:55			L
6B		07:25	07:30	08:34	HX		5A,6B	09:00	10:19	10:25			L
5A,6B		07:30	07:35	08:54		L	6B	09:30	10:49	10:55			L
5A,6B	07:15	07:50	07:55	09:07	MX		5A,6B	10:00	11:19	11:25			L
5A,6B		07:55	08:00	09:19		L	5A,6B	11:00	12:19	12:25			L
5A,6B		08:25	08:30	09:49		L	5A,6B	12:00	01:19	01:25			L
5A,6B		08:55	09:00	10:19		L	5A,6B	01:00	02:19	02:25			L
6B		09:25	09:30	10:49		L	6B	01:30	02:49	02:55			L
5A,6B		09:55	10:00	11:19		L	5A,6B	02:00	03:19	03:25			L
6B		10:25	10:30	11:49		L	6B	02:30	03:49	03:55			L
5A,6B		10:55	11:00	12:19		L	5A,6B	03:00	04:12	04:18	04:53	MX	
6B		11:25	11:30	12:49		L	5A,6B	03:30	04:49	04:55			L
5A,6B		11:55	12:00	01:19		L	5A,6B	03:55	05:07	05:13	05:48	MX	
6B		12:25	12:30	01:49		L	5A,6B	04:00	05:19	05:25			L
5A,6B		12:55	01:00	02:19		L	5A,6B	04:25	05:29	05:35		HX	
6B		01:25	01:30	02:49		L	5A,6B	04:30	05:49	05:55			L
5A,6B		01:55	02:00	03:19		L	5A,6B	04:45	05:57	06:03	06:38	MX	
6B		02:25	02:30	03:49		L	5A,6B	04:55	05:57	06:03		PX	
5A,6B		02:55	03:00	04:19		L	5A,6B	05:00	06:19	06:25			L
5A,6B		03:25	03:30	04:49		L	5A,6B	05:20	06:22	06:28		PX	
5A,6B		03:55	04:00	05:19		L	5A,6B	05:25	06:37	06:43	07:18	MX	
5A,6B		04:25	04:30	05:49		L	5A,6B	05:30	06:34	06:40		HX	
5A,6B		04:50	04:55	05:59	HX		5A,6B	05:35	06:54	07:00			L
5A,6B		04:55	05:00	06:19		L	5A,6B	05:55	07:07	07:13	07:48	MX	
5A,6B		05:20	05:25	06:29	HX		5A,6B	06:00	07:19	07:25			L
5A,6B		05:25	05:30	07:49		L	5A,6B	06:30	07:49	07:55			L
5A,6B		05:55	06:00	08:19		L	5A,6B	07:00	08:19	08:25			L
5A,6B		06:25	06:30	08:49		L	5A,6B	07:30	08:49	08:55			L
5A,6B		06:55	07:00	09:19		L	5A,6B	08:00	09:19	09:25			L
5A,6B		07:55	08:00	10:19		L	6B	09:00	10:19	10:25			L
5A,6B		08:55	09:00	11:19		L	5A,6B	10:00	11:19	11:25			L
5A,6B		09:55	10:00	12:19		L	5A,6B	12:01	01:19	Friday only			L

Non-Stop Trips
MX = Millbrae/SF non-stop; then local to Gilroy, but skips Hayward Park, Atherton, Castro, College Park
HX = Hillsdale/SF non-stop; then local to Tamien, but skips Castro, Lawrence, Santa Clara, College Park
PX = Palo Alto/SF
MPX = Menlo Park/SF
XX = Palo Alto/Hillsdale
SX = Atherton/San Jose

Special Stops
L = Local train; All stops

Appendix B
Alternative 2A Detailed Model Outputs

Caltrain Market Demand Study: Alternative 2A
Caltrain Station-Level Boardings Summary (Normalized)

Node	Station Name	HBW Ent+Exit	Non-Work Ent+Exit	Daily Ent+Exit
9627	Gilroy	124	8	132
9626	San Martin	0	0	0
9625	-	-	-	-
9624	Morgan Hill	165	1	166
9623	-	-	-	-
9621	-	-	-	-
9622	Blossom Hill	62	3	65
9620	Capitol	209	0	209
9619	Tamien	618	1010	1628
9618	-	-	-	-
9617	-	-	-	-
9616	Cahill	1846	1522	3369
9599	College Park	735	99	834
9604	Santa Clara	1015	386	1402
9606	-	-	-	-
9607	Lawrence	651	712	1363
9608	-	-	-	-
9611	Sunnyvale	1188	794	1982
9612	Mt View	1421	677	2098
9614	Castro	514	43	556
9615	California	1616	756	2371
14933	Stanford	0	0	0
14683	Palo Alto	1449	1174	2623
14684	Menlo Pk	1194	557	1751
14685	Atherton	391	156	547
14686	-	-	-	-
14687	-	-	-	-
14688	Redwood City	1699	221	1920
14689	-	-	-	-
14690	-	-	-	-
13827	San Carlos	1031	219	1250
13774	Belmont	996	217	1213
13763	-	-	-	-
13639	Hillsdale	1421	631	2052
13626	Bay Meadows	0	0	0
13601	Hayward Park	989	397	1386
13593	-	-	-	-
13598	San Mateo	835	311	1146
13599	-	-	-	-
13535	Burlingame	895	341	1236
13510	Broadway	493	315	808
11312	Millbrae	770	421	1191
13079	-	-	-	-
11311	San Bruno	859	125	984
13496	-	-	-	-
13497	-	-	-	-
11310	-	-	-	-
13132	South SF	819	138	957
13131	-	-	-	-
13130	-	-	-	-
13129	-	-	-	-
16349	Bayshore	170	160	330
16348	Paul Ave	339	78	417
16347	22nd St	351	44	395
16346	San Francisco	12272	1175	13447
	Entries+Exits	37137	12690	49828
	Total Entries	18569	6345	24914

Notes:
Estimated Entries represent total Caltrain Boardings (SB+NB) from assignment of caltrain walk and drive access transit trips
Air Passengers are not included in the above station and system boardings

Caltrain Station-Level Alternative 2A Forecasts (Normalized) /1/
Entries and Exits by Direction and Purpose in AM

		Home-Based Work							Non-Work							Daily						
		Northbound		Southbound		Total	Total	Entries +	Northbound		Southbound		Total	Total	Entries +	Northbound	Southbound	Total	Northbound	Southbound	Total	Entries +
Node	Station Name	Entries	Exits	Entries	Exits	Entries	Exits	Exits	Entries	Exits	Entries	Exits	Entries	Exits	Exits	Entries	Entries	Entries	Exits	Exits	Exits	Exits
9627	Gilroy	124	0	0	0	124	0	124	0	0	0	8	0	8	8	124	0	124	0	8	8	132
9626	San Martin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	162	3	0	0	162	3	165	0	0	0	1	0	1	1	162	0	162	3	1	4	166
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	57	5	0	0	57	5	62	0	0	0	3	0	3	3	57	0	57	5	3	8	65
9620	Capitol	207	2	0	0	207	2	209	0	0	0	0	0	0	0	207	0	207	2	0	2	209
9619	Tamien	339	7	0	272	339	279	618	997	0	0	13	997	13	1010	1336	0	1336	7	285	292	1628
9618	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1524	47	22	254	1546	300	1846	1290	18	0	215	1290	233	1522	2814	22	2836	65	468	533	3369
9599	College Park	429	55	3	247	433	302	735	0	0	3	96	3	96	99	429	7	436	55	343	398	834
9604	Santa Clara	776	66	92	82	868	148	1015	108	149	5	125	113	274	386	884	97	980	215	207	421	1402
9606	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
9607	Lawrence	305	175	43	128	348	303	651	103	336	81	192	183	529	712	407	124	531	512	321	832	1363
9608	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
9611	Sunnyvale	737	166	133	152	870	318	1188	222	247	254	72	476	318	794	958	387	1345	413	224	637	1982
9612	Mt View	855	238	149	179	1003	417	1421	128	319	211	20	338	338	677	982	360	1342	557	199	756	2098
9614	Castro	269	118	80	46	349	164	514	0	0	43	0	43	0	43	269	123	392	118	46	164	556
9615	California	750	409	153	303	903	712	1616	39	615	102	0	141	615	756	789	255	1044	1024	303	1328	2371
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	248	640	105	456	353	1096	1449	106	916	112	40	218	956	1174	354	217	571	1556	496	2052	2623
14684	Menlo Pk	695	145	173	181	868	326	1194	377	0	0	181	377	181	557	1072	173	1245	145	361	506	1751
14685	Atherton	274	34	78	5	352	39	391	131	0	0	25	131	25	156	405	78	483	34	30	64	547
14686	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
14687	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
14688	Redwood City	1019	213	254	213	1273	426	1699	0	11	0	210	0	221	221	1019	254	1273	224	423	647	1920
14689	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
14690	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13827	San Carlos	665	138	142	86	807	224	1031	81	40	12	86	93	126	219	745	155	900	178	172	350	1250
13774	Belmont	735	36	174	52	908	88	996	74	32	28	83	102	115	217	808	202	1010	68	135	203	1213
13763	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13639	Hillsdale	1017	145	159	101	1176	246	1421	252	83	109	187	361	270	631	1268	288	1537	228	288	515	2052
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	547	152	162	128	709	281	989	145	60	75	116	220	177	397	692	237	929	213	244	457	1386
13593	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13598	San Mateo	544	108	114	69	658	177	835	129	54	59	70	188	124	311	673	173	846	162	138	300	1146
13599	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13535	Burlingame	613	84	146	52	759	136	895	161	55	73	52	234	107	341	774	219	993	139	104	243	1236
13510	Broadway	322	68	76	27	398	95	493	110	42	140	23	250	65	315	433	215	648	110	49	159	808
11312	Millbrae	476	182	74	38	551	220	770	130	94	130	66	260	161	421	606	204	811	277	104	380	1191
13079	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
11311	San Bruno	629	110	91	29	720	139	859	0	87	0	38	0	125	125	629	91	720	197	67	264	984
13498	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13497	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
11310	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13132	South SF	649	89	46	34	695	124	819	1	79	2	57	2	136	138	650	48	697	168	91	259	957
13131	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13130	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13129	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
16349	Bayshore	0	170	0	0	0	170	170	0	160	0	0	0	160	160	0	0	0	330	0	330	330
16348	Paul Ave	0	21	311	7	311	28	339	0	0	78	0	78	0	78	0	389	389	21	7	28	417
16347	22nd St	0	0	351	0	351	0	351	0	16	27	0	27	16	44	0	379	379	16	0	16	395
16346	San Francisco	0	11910	362	0	362	11910	12272	0	623	552	0	552	623	1175	0	914	914	12533	0	12533	13447
	Entries+Exits							37137							12690							49828
	Total Entries	14965		3494		18460			4582		2094		6676			19547	5589	25136				
	Total Exits		15537		3141		18678			4037		1977		6014					19574	5118	24692	

/1/ Normalized with respect to October 1990 counts, using ratios

/2/ Split between Entries and Exits derived from the model and are in production-attraction format

/3/ Peak Periods approximated by Home-Based Work; Off-peak approximated by Non-Work

Caltrain Market Demand Study: Alternative 2A
Caltrain Station-Level Alternative 2A Forecasts (Normalized)
Home-Based Work Access Mode in AM

		Home-Based Work - 2A							Home-Based Work - 1			Alt 2A	Normalized	
		Northbound Entrie		Southbound Entrie		Total	Total		Total	Total		- Alt 1	Alt 1	Alt 2A
Node	Station Name	Drive	Walk	Drive	Walk	Drive	Walk	Total	Drive	Walk	Total	Drive	Drive	Drive
9627	Gilroy	89	35	0	0	89	35	124	0	0	0	89	0	89
9626	San Martin	0	0	0	0	0	0	0	0	0	0	0	0	0
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	88	74	0	0	88	74	162	0	0	0	88	0	88
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	0	57	0	0	0	57	57	0	0	0	0	0	0
9620	Capitol	0	207	0	0	0	207	207	0	0	0	0	0	0
9619	Tamien	124	215	0	0	124	215	339	0	0	0	124	0	124
9618	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1168	356	22	0	1190	356	1546	1222	533	1755	0	1170	1170
9599	College Park	24	405	0	3	24	409	433	0	0	0	24	0	24
9604	Santa Clara	626	150	88	4	714	154	868	659	262	921	55	733	788
9606	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9607	Lawrence	246	59	37	5	283	64	348	272	71	343	11	199	210
9608	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9611	Sunnyvale	375	362	71	62	445	424	870	428	431	859	17	635	652
9612	Mt View	515	340	90	59	604	399	1003	577	320	897	27	527	554
9614	Castro	104	165	17	63	121	228	349	111	211	322	10	112	122
9615	California	448	302	67	86	515	388	903	468	349	817	47	414	461
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	83	164	51	54	134	219	353	123	191	314	11	91	102
14684	Menlo Pk	573	122	118	55	691	177	868	660	135	795	31	457	488
14685	Atherton	191	83	57	21	248	103	352	211	94	305	37	237	274
14686	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14687	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14688	Redwood City	741	277	109	145	850	423	1273	742	349	1091	108	640	748
14689	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14690	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13827	San Carlos	583	82	104	38	687	120	807	859	130	989	0	589	589
13774	Belmont	655	80	121	53	776	133	908	807	119	926	0	686	686
13763	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13639	Hillsdale	835	182	106	53	941	235	1176	952	241	1193	0	900	900
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	373	174	68	94	440	269	709	542	152	694	0	463	463
13593	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13598	San Mateo	393	152	56	59	448	210	658	465	237	702	0	432	432
13599	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13535	Burlingame	270	344	33	113	303	457	759	318	446	764	0	452	452
13510	Broadway	170	153	20	56	190	208	398	181	195	376	9	247	256
11312	Millbrae	429	47	33	41	462	88	551	471	58	529	0	362	362
13079	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11311	San Bruno	397	232	19	72	416	304	720	429	317	746	0	573	573
13496	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13497	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11310	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13132	South SF	549	100	22	24	571	125	695	599	137	736	0	236	236
13131	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13130	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13129	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16349	Bayshore	0	0	0	0	0	0	0	60	2	62	0	48	48
16348	Paul Ave	0	0	0	311	0	311	311	0	0	0	0	0	0
16347	22nd St	0	0	0	351	0	351	351	2	410	412	0	206	206
16346	San Francisco	0	0	0	362	0	362	362	0	250	250	0	77	77
	Total Entries	10047	4918	1307	2187	11354	7105	18460	11158	5640	16798	689	10486	11175

NOTES.

All station entries are in production-atttraction format

Station entries are approximate; they have been normalized with respect to October 1990 station activity, using ratios

Drive-Access assumed to occur for Home-Based Work Trips only

Change in drive-access demand from Alt 1 to Alt 2 ("Alt 2A - Alt 1 Drive") constrained to be 0 or greater

Alternative 1 Normalized Demand based on walk/drive splits in Caltrain On-Board Passenger Survey, February 1994

Alternative 2A Normalized Demand based on Alternative 1 Normalized Demand plus change in modeled drive-access demand between base year (Alt 1) and forecast year (Alt 2A)

Caltrain Market Demand Study: Alternative 2A
Caltrain Station-Level Boardings (Normalized)
Estimated Parking Demand

Node	Station Name	Normalized HBW Drive-Access Prods Alt 1	Normalized HBW Drive-Access Prods Alt 2A	Normalized HBW AM Station Arrivals/1/ Alt 1	Normalized HBW AM Station Arrivals/1/ Alt 2A	1990 % Drop-off/2/	HBW Vehicles Arriving in AM/3/ Alt 1	HBW Vehicles Arriving in AM/3/ Alt 2A	NW Vehicles Arriving in AM/4/ Alt 1	NW Vehicles Arriving in AM/4/ Alt 2A	Total Demand Arriving in AM/5/ Alt 1	Total Demand Arriving in AM/5/ Alt 2A	1990 Utilized Parking/6/	1995 Parking Capacity/6/	Alt 1 Supply - Demand/7/	Alt 2A Supply - Demand/8/
9627	Gilroy	0	89	0	45	0.1392	0	36	0	2	0	38	0	233	0	195
9626	San Martin	0	0	0	0	0.2258	0	0	0	0	0	0	0	120	0	120
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	0	88	0	44	0.2632	0	35	0	2	0	37	0	524	0	487
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	0	0	0	0	0.3953	0	0	0	0	0	0	0	407	0	407
9620	Capitol	0	0	0	0	0.7778	0	0	0	0	0	0	0	317	0	317
9619	Tamien	0	124	0	62	0.1348	0	50	0	3	0	53	0	400	0	347
9618	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1170	1170	585	585	0.3000	410	468	25	28	434	496	328	645	-106	149
9599	College Park	0	24	0	12	0.0000	0	10	0	1	0	10	0	0	0	-10
9604	Santa Clara	733	788	367	394	0.1880	298	315	18	19	315	334	244	330	-71	-4
9606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9607	Lawrence	199	210	100	105	0.2208	78	84	5	5	82	89	95	120	13	31
9608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9611	Sunnyvale	635	652	318	326	0.2240	246	261	15	16	261	277	196	204	-65	-73
9612	Mt View	527	554	264	277	0.3125	181	222	11	13	192	235	234	250	42	15
9614	Castro	112	122	56	61	0.3750	35	49	2	3	37	52	0	0	-37	-52
9615	California	414	461	207	230	0.2150	163	184	10	11	172	195	136	188	-36	-7
14933	Stanford	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	91	102	46	51	0.3077	32	41	2	2	33	43	297	364	264	321
14684	Menlo Pk	457	488	229	244	0.3182	156	195	9	12	165	207	147	147	-18	-60
14685	Atherton	237	274	119	137	0.2895	84	110	5	7	89	116	237	286	148	170
14686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14687	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14688	Redwood City	640	748	320	374	0.2471	241	299	14	18	255	317	625	703	370	386
14689	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13827	San Carlos	589	589	295	295	0.2330	226	236	14	14	239	250	211	244	-28	-6
13774	Belmont	686	686	343	343	0.1959	276	274	17	16	292	291	146	203	-146	-88
13763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13639	Hillsdale	900	900	450	450	0.2675	330	360	20	22	349	382	170	170	-179	-212
13626	Bay Meadows	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	463	463	232	232	0.2917	164	185	10	11	174	196	13	21	-161	-175
13593	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13598	San Mateo	432	432	216	216	0.2375	165	173	10	10	175	183	201	205	26	22
13599	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13535	Burlingame	452	452	226	226	0.1818	185	181	11	11	196	192	57	58	-139	-134
13510	Broadway	247	256	124	128	0.2857	88	102	5	6	94	108	111	146	17	38
11312	Millbrae	362	362	181	181	0.2600	134	145	8	9	142	153	184	200	42	47
13079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11311	San Bruno	573	573	287	287	0.2410	217	229	13	14	231	243	109	169	-122	-74
13496	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13132	South SF	236	236	118	118	0.1600	99	94	6	6	105	100	49	51	-56	-49
13131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13129	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16349	Bayshore	48	48	24	24	0.2000	19	19	1	1	20	20	14	41	-6	21
16348	Paul Ave	0	0	0	0	0.5000	0	0	0	0	0	0	0	0	0	0
16347	22nd St	206	206	103	103	0.2609	76	82	5	5	81	87	15	24	-66	-63
16346	San Francisco	77	77	39	39	0.3220	26	31	2	2	28	33	0	0	-28	-33
	Total Entries	10486	11175	5243	5588	0.2609	3927	4470	236	268	4163	4738	3819	6770	-344	2032

Notes:

/1/ "Normalized HBW AM Station Arrivals" reflect HBW drive-access productions converted to trip origins

/2/ "1990 % Drop-Off" tabulated from Caltrain On-Board Passenger Survey, February 1994

/3/ "HBW Vehicles Arriving in AM" reflects subtraction of station-specific drop-off % in 1990 and system-wide factor of 20% in future

/4/ "NW Vehicles Arriving in AM" reflects 5% of HBW trips occurring in AM Peak according to 1994 Caltrain On-Board Survey

/5/ "Total Demand Arriving in AM" consists of sum of HBW and NW

/6/ 1995 JPB Caltrain Parking Survey (Caltrain lots only)

/7/ "Alt 1 Supply-Demand" calculated as "1990 Utilized Parking" minus "Total Vehicles Arriving in AM, Alt 1"

/8/ "Alt 2A Supply-Demand" calculated as "1990 Parking Capacity" minus "Total Vehicles Arriving in AM, Alt 2A"; Shaded cells indicate parking shortfalls that cannot be accommodated at adjacent stations, except Sunnyvale where 58 out of 73 and Burlingame where 96 out of 134 are unaccommodated. Sum of unaccommodated parking demand=872.

Caltrain Market Demand Study - Alternative 2A

Caltrain Home-Based Work Station-to-Station Data (Origin-Destination Format)

		Gilroy	San Mart	Morgan	Blossom	Capitol	Tamien	Cahill	Coll Pk	Santa Cl	Lawrenc	Sunnyval	Mt View	Castro	California	Palo Alto	Menlo Pk	Atherton	Redwood	San Carl	Belmont	Hillsdale	Hayward	San Mat	Burlinga	Broadwa	Millbrae	San Brun	South SF	Bayshor	Paul	22nd St	4th/Townsend	
	Sum																																
	FROM	9627	9626	9624	9622	9620	9619	9616	9599	9604	9607	9611	9612	9614	9615	14683	14684	14685	14688	13827	13774	13639	13601	13598	13535	13510	11312	11311	13132	16349	16348	16347	16346	Grand Tot
Gilroy	9627	0	0	2	1	0	0	40	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	3	0	3	0	0	1	57
San Martin	9626	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan	9624	2	0	0	1	1	1	56	0	3	2	3	2	0	1	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	6	83
Blossom	9622	1	0	1	0	0	0	0	0	1	5	4	3	0	2	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	9	30
Capitol	9620	0	0	1	0	0	0	28	0	9	9	0	0	0	0	0	2	4	8	1	0	3	0	0	0	0	0	0	0	0	0	0	39	104
Tamien	9619	0	0	1	0	0	0	27	115	2	23	6	0	0	0	13	4	0	6	2	0	3	0	0	0	0	1	1	1	4	2	0	101	309
Cahill	9616	40	0	56	0	28	27	0	7	51	79	99	37	2	68	168	9	4	7	4	18	7	18	1	0	0	3	4	1	33	0	11	148	925
Coll Pk	9599	0	0	0	0	0	115	7	31	5	20	10	46	18	35	43	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	24	370
Santa Clara	9604	1	0	3	1	9	2	51	5	0	12	36	20	0	24	56	5	0	4	3	0	8	3	0	0	0	1	1	1	1	0	3	269	515
Lawrence	9607	1	0	2	5	9	23	79	20	12	0	23	7	0	12	29	3	2	2	1	0	9	1	0	0	0	0	0	0	1	0	0	90	329
Sunnyvale	9611	1	0	3	4	0	6	99	10	36	23	0	9	31	32	64	3	0	6	2	1	5	1	1	0	0	2	1	1	1	0	0	258	597
Mt View	9612	1	0	2	3	0	0	37	46	20	7	9	0	36	53	79	18	5	15	7	1	29	5	2	1	1	2	1	1	0	0	9	324	709
Castro	9614	1	0	0	0	0	0	2	18	0	0	31	36	0	12	32	2	0	4	2	0	3	2	0	0	0	1	0	0	0	0	10	109	265
California	9615	0	0	1	2	0	0	68	35	24	12	32	53	12	0	43	27	16	27	13	4	72	9	1	3	1	3	2	2	0	0	4	343	808
Palo Alto	14683	1	0	2	5	0	13	168	43	56	29	64	79	32	43	0	3	0	7	5	1	9	7	3	3	1	3	3	4	1	2	17	129	726
Menlo Pk	14684	0	0	0	0	2	4	9	9	5	3	3	18	2	27	3	0	0	16	14	8	78	11	6	2	1	3	2	2	0	0	7	362	597
Atherton	14685	0	0	0	0	4	0	4	0	0	2	0	5	0	16	0	0	0	2	1	0	2	0	1	0	0	0	0	0	0	0	0	158	195
Redwood	14688	0	0	4	1	8	8	7	0	4	2	6	15	4	27	7	16	2	0	17	15	69	68	9	5	2	11	8	4	1	0	0	533	850
San Carlos	13827	0	0	0	0	1	2	4	0	3	1	2	7	2	13	5	14	1	17	0	2	64	13	6	3	2	6	3	3	1	0	5	355	535
Belmont	13774	0	0	0	0	0	0	18	0	0	0	1	1	0	4	1	8	0	15	2	0	23	11	5	2	1	5	2	2	1	0	0	402	502
Hillsdale	13639	0	0	0	0	3	3	7	0	8	9	5	29	3	72	9	78	2	69	64	23	0	30	30	35	25	40	33	35	15	0	17	67	712
Hayward Pk	13601	0	0	0	0	0	0	18	0	3	1	1	5	2	9	7	11	0	68	13	11	30	0	15	8	5	2	4	4	4	0	8	267	495
San Mateo	13598	0	0	0	0	0	0	1	0	0	0	1	2	0	1	3	6	1	9	6	5	30	15	0	6	3	2	3	3	5	0	8	315	426
Burlingame	13535	0	0	0	0	0	0	0	0	0	0	0	1	0	3	3	2	0	5	3	2	35	8	6	0	2	1	2	3	5	0	3	367	450
Broadway	13510	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	2	2	1	25	5	3	2	0	0	1	1	2	0	2	199	249
Millbrae	11312	1	0	0	0	0	1	3	0	1	0	2	2	1	3	3	3	0	11	6	5	40	2	2	1	0	0	1	2	1	0	20	271	384
San Bruno	11311	3	0	0	0	0	1	4	0	1	0	1	1	0	2	3	2	0	8	3	2	33	4	3	2	1	1	0	3	1	10	3	339	433
South SF	13132	0	0	0	0	0	1	1	0	1	0	1	1	0	2	4	2	0	4	3	2	35	4	3	3	1	2	3	0	1	0	3	341	417
Bayshore	16349	3	0	0	0	0	4	33	0	1	1	1	0	0	0	1	0	0	1	1	1	15	4	5	5	2	1	1	1	0	0	2	4	85
Paul	16348	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	1	148	162
22nd St	16347	0	0	0	0	0	0	11	10	3	0	0	9	10	4	17	7	0	0	5	0	17	8	8	3	2	20	3	3	2	1	0	35	172
4th/Townsend	16346	1	0	6	9	39	101	148	24	269	90	258	324	109	343	129	362	158	533	355	402	67	267	315	367	199	271	339	341	4	148	35	0	6006
	Grand	57	0	83	30	104	309	925	370	515	329	597	709	265	808	726	597	195	850	535	502	712	495	426	450	249	384	433	417	85	162	172	6006	18497

Appendix C
Alternative 2B Detailed Model Outputs

Caltrain Market Demand Study: Alternative 2B
Caltrain Station-Level Boardings Summary (Normalized)

Node	Station Name	HBW Ent+Exit	Non-Work Ent+Exit	Daily Ent+Exit
9627	Gilroy	67	8	75
9626	San Martin	19	0	19
9625	-	-	-	-
9624	Morgan Hill	118	1	119
9623	-	-	-	-
9621	-	-	-	-
9622	Blossom Hill	157	3	160
9620	Capitol	617	0	617
9619	Tamien	585	1010	1595
9618	-	-	-	-
9617	-	-	-	-
9616	Cahill	2283	2100	4383
9599	College Park	245	120	364
9604	Santa Clara	1128	327	1456
9606	-	-	-	-
9607	Lawrence	706	805	1511
9608	-	-	-	-
9611	Sunnyvale	1195	981	2177
9612	Mt View	1392	848	2240
9614	Castro	528	0	528
9615	California	1643	914	2558
14933	Stanford	0	0	0
14683	Palo Alto	1429	1307	2736
14684	Menlo Pk	1192	656	1847
14685	Atherton	299	184	483
14686	-	-	-	-
14687	-	-	-	-
14688	Redwood City	1675	261	1937
14689	-	-	-	-
14690	-	-	-	-
13827	San Carlos	1272	317	1589
13774	Belmont	1044	317	1361
13763	-	-	-	-
13639	Hillsdale	1610	754	2364
13626	Bay Meadows	0	0	0
13601	Hayward Park	747	493	1241
13593	-	-	-	-
13598	San Mateo	859	407	1266
13599	-	-	-	-
13535	Burlingame	892	414	1306
13510	Broadway	488	364	852
11312	Millbrae	766	581	1347
13079	-	-	-	-
11311	San Bruno	926	158	1084
13496	-	-	-	-
13497	-	-	-	-
11310	-	-	-	-
13132	South SF	897	152	1049
13131	-	-	-	-
13130	-	-	-	-
13129	-	-	-	-
16349	Bayshore	121	179	300
16348	Paul Ave	106	0	106
16347	22nd St	315	566	881
16346	San Francisco	12785	816	13602
	Entries+Exits	38108	15044	53152
	Total Entries	19054	7522	26576

Notes:
Estimated Entries represent total Caltrain Boardings (SB+NB) from assignment of caltrain walk and drive access transit trips
Air Passengers are not included in the above station and system boardings

Caltrain Market Demand Study: Alternative 2B
Caltrain Station-Level Alternative 2B Forecasts (Normalized)
Entries and Exits by Direction and Purpose in AM

		Home-Based Work							Non-Work							Daily					
		Northbound		Southbound		Total	Total	Entries +	Northbound		Southbound		Total	Total	Entries +	Northbound	Southbound	Total	Northbound	Southbound	Total	Entries +
Node	Station Name	Entries	Exits	Entries	Exits	Entries	Exits	Exits	Entries	Exits	Entries	Exits	Entries	Exits	Exits	Entries	Entries	Entries	Exits	Exits	Exits	Exits
9627	Gilroy	67	0	0	0	67	0	67	0	0	0	8	0	8	8	67	0	67	0	8	8	75
9626	San Martin	19	0	0	0	19	0	19	0	0	0	0	0	0	0	19	0	19	0	0	0	19
9625	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-	
9624	Morgan Hill	114	4	0	0	114	4	118	0	0	0	1	0	1	1	114	0	114	4	1	5	119
9623	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-	
9621	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-	
9622	Blossom Hill	153	4	0	0	153	4	157	0	0	0	3	0	3	3	153	0	153	4	3	7	160
9620	Capitol	607	10	0	0	607	10	617	0	0	0	0	0	0	0	607	0	607	10	0	10	617
9619	Tamien	513	2	0	70	513	72	585	997	0	0	13	997	13	1010	1510	0	1510	2	83	85	1595
9618	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
9617	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
9616	Cahill	1879	98	22	285	1901	382	2283	1851	0	0	248	1851	248	2100	3730	22	3752	98	533	631	4383
9599	College Park	0	0	32	213	32	213	245	0	0	2	118	2	118	120	0	33	33	0	331	331	364
9604	Santa Clara	823	136	89	81	911	217	1128	146	46	8	128	154	174	327	968	97	1065	182	209	390	1456
9606	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
9607	Lawrence	303	251	39	113	342	364	706	126	363	111	205	237	568	805	428	150	578	614	318	932	1511
9608	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
9611	Sunnyvale	739	182	128	146	867	329	1195	312	266	308	95	621	361	981	1051	436	1487	448	241	689	2177
9612	Mt View	812	270	137	173	949	443	1392	191	372	258	27	449	399	848	1003	395	1398	642	200	842	2240
9614	Castro	283	131	70	44	353	174	528	0	0	0	0	0	0	0	283	70	353	131	44	174	528
9615	California	735	481	143	284	878	765	1643	47	697	170	0	217	697	914	782	313	1095	1179	284	1463	2558
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	224	669	95	441	319	1110	1429	123	984	158	42	281	1025	1307	347	253	601	1652	483	2135	2736
14684	Menlo Pk	689	163	165	175	854	338	1192	455	0	0	200	455	200	656	1144	165	1309	163	375	538	1847
14685	Atherton	221	5	69	5	290	9	299	156	0	0	28	156	28	184	377	69	446	5	32	37	483
14686	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
14687	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
14688	Redwood City	963	268	229	216	1192	484	1675	0	17	0	244	0	261	261	963	229	1192	285	460	745	1937
14689	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
14690	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13827	San Carlos	889	146	153	83	1042	230	1272	126	49	25	118	150	167	317	1015	178	1193	196	201	397	1589
13774	Belmont	839	38	140	28	979	66	1044	99	47	49	122	148	169	317	938	189	1127	84	150	235	1361
13763	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13639	Hillsdale	1196	161	155	99	1350	260	1610	313	92	112	238	425	329	754	1509	266	1775	253	336	589	2364
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	389	162	87	109	477	271	747	179	87	87	140	266	227	493	568	174	743	249	249	498	1241
13593	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13598	San Mateo	571	118	103	67	674	185	859	158	70	92	86	250	156	407	729	195	924	188	153	342	1266
13599	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13535	Burlingame	650	95	105	42	755	137	892	178	72	108	56	286	128	414	828	213	1041	167	98	265	1306
13510	Broadway	342	74	50	21	392	96	488	133	52	155	23	288	76	364	476	205	681	127	45	172	852
11312	Millbrae	510	191	38	28	547	219	766	154	176	185	66	339	243	581	663	223	886	367	94	462	1347
13079	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
11311	San Bruno	683	116	97	29	780	146	926	0	113	0	45	0	158	158	683	97	780	230	75	304	1084
13496	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13497	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
11310	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13132	South SF	710	99	50	39	760	138	897	1	85	1	65	2	150	152	711	51	762	184	104	288	1049
13131	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13130	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
13129	-	-	-	-	-	0	-		-	-	-	-	-	-		-	-	-	-	-	-	
16349	Bayshore	2	116	2	0	5	116	121	0	179	0	0	0	179	179	2	2	5	295	0	295	300
16348	Paul Ave	14	64	21	7	35	71	106	0	0	0	0	0	0	0	14	21	35	64	7	71	106
16347	22nd St	0	7	308	0	308	7	315	0	15	551	0	551	15	566	0	859	859	22	0	22	881
16346	San Francisco	0	12458	327	0	327	12458	12785	0	212	605	0	605	212	816	0	932	932	12670	0	12670	13602
	Entries+Exits							38108							15044							53152
	Total Entries	15939		2852		18791			5746		2985		8731			21685	5837	27522				
	Total Exits		16519		2798		19316			3994		2319		6314					20513	5117	25630	

/1/ Normalized with respect to October 1990 counts, using ratios

/2/ Split between Entries and Exits derived from the model and are in production-attraction format

/3/ Peak Periods approximated by Home Based Work. Off peak approximated by Non Work

Caltrain Market Demand Study: Alternative 2B
Caltrain Station-Level Forecasts (Normalized)
Home-Based Work Access Mode in AM

		Home-Based Work:2B							Home-Based Work:1			Alt 2B	Normalized	
		Northbound Entries		Southbound Entries		Total	Total		Total	Total		- Alt 1	Alt 1	Alt 2B
Node	Station Name	Drive	Walk	Drive	Walk	Drive	Walk	Total	Drive	Walk	Total	Drive	Drive	Drive
9627	Gilroy	27	40	0	0	27	40	67	0	0	0	27	0	27
9626	San Martin	13	6	0	0	13	6	19	0	0	0	13	0	13
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	58	56	0	0	58	56	114	0	0	0	58	0	58
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	94	59	0	0	94	59	153	0	0	0	94	0	94
9620	Capitol	273	334	0	0	273	334	607	0	0	0	273	0	273
9619	Tamien	193	320	0	0	193	320	513	0	0	0	193	0	193
9618	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1448	430	22	0	1470	430	1901	1222	533	1755	248	1170	1418
9599	College Park	0	0	0	32	0	32	32	0	0	0	0	0	0
9604	Santa Clara	642	181	84	5	726	186	911	659	262	921	67	733	800
9606	-	0	0	0	0	0	0	0	-	-	-	-	-	-
9607	Lawrence	237	66	34	5	270	71	342	272	71	343	0	199	199
9608	-	0	0	0	0	0	0	0	-	-	-	-	-	-
9611	Sunnyvale	375	364	70	58	444	422	867	428	431	859	16	635	651
9612	Mt View	505	307	87	50	592	357	949	577	320	897	15	527	542
9614	Castro	111	172	16	54	128	226	353	111	211	322	17	112	129
9615	California	358	377	65	78	423	455	878	468	349	817	0	414	414
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	78	146	45	50	123	196	319	123	191	314	0	91	91
14684	Menlo Pk	567	122	120	45	687	167	854	660	135	795	27	457	484
14685	Atherton	154	67	53	16	207	83	290	211	94	305	0	237	237
14686	-	0	0	0	0	0	0	0	-	-	-	-	-	-
14687	-	0	0	0	0	0	0	0	-	-	-	-	-	-
14688	Redwood City	693	270	110	119	803	388	1192	742	349	1091	61	640	701
14689	-	0	0	0	0	0	0	0	-	-	-	-	-	-
14690	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13827	San Carlos	796	93	108	45	904	138	1042	859	130	989	45	589	634
13774	Belmont	750	89	102	38	852	127	979	807	119	926	45	686	731
13763	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13639	Hillsdale	984	211	103	52	1087	264	1350	952	241	1193	135	900	1035
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	172	218	34	53	206	271	477	542	152	694	0	463	463
13593	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13598	San Mateo	405	166	50	53	455	219	674	465	237	702	0	432	432
13599	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13535	Burlingame	287	364	25	80	312	444	755	318	446	764	0	452	452
13510	Broadway	182	161	16	34	198	195	392	181	195	376	17	247	264
11312	Millbrae	459	51	29	9	488	59	547	471	58	529	17	362	379
13079	-	0	0	0	0	0	0	0	-	-	-	-	-	-
11311	San Bruno	424	259	20	77	444	336	780	429	317	746	15	573	588
13496	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13497	-	0	0	0	0	0	0	0	-	-	-	-	-	-
11310	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13132	South SF	604	106	25	25	629	131	760	599	137	736	30	236	266
13131	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13130	-	0	0	0	0	0	0	0	-	-	-	-	-	-
13129	-	0	0	0	0	0	0	0	-	-	-	-	-	-
16349	Bayshore	2	0	2	0	5	0	5	60	2	62	0	48	48
16348	Paul Ave	0	14	0	21	0	35	35	0	0	0	0	0	0
16347	22nd St	0	0	4	304	4	304	308	2	410	412	2	206	208
16346	San Francisco	0	0	0	327	0	327	327	0	250	250	0	77	77
	Total Entries	10892	5047	1222	1630	12114	6677	18791	11158	5640	16798	1415	10486	11901

NOTES:

All station entries are in production-attraction format

Station entries are approximate; they have been normalized with respect to October 1990 station activity, using ratios

Drive-Access assumed to occur for Home-Based Work Trips only

Change in drive-access demand from Alt 1 to Alt 2B ("Alt 2B - Alt 1 Drive") constrained to be 0 or greater

Alternative 1 Normalized Demand based on walk/drive splits in Caltrain On-Board Passenger Survey, February 1994

Alternative 2B Normalized Demand based on Alternative 1 Normalized Demand plus change in modeled drive-access demand between base year (Alt 1) and forecast year (Alt 2B)

Caltrain Market Demand Study: Alternative 2B
Caltrain Station-Level Boardings (Normalized)
Estimated Parking Demand

Node	Station Name	Normalized HBW Drive-Access Prods Alt 1	Normalized HBW Drive-Access Prods Alt 2B	Normalized HBW AM Station Arrivals/1/ Alt 1	Normalized HBW AM Station Arrivals/1/ Alt 2B	1990 % Drop-off/2/	HBW Vehicles Arriving in AM/3/ Alt 1	HBW Vehicles Arriving in AM/3/ Alt 2B	NW Vehicles Arriving in AM/4/ Alt 1	NW Vehicles Arriving in AM/4/ Alt 2B	Total Demand Arriving in AM/5/ Alt 1	Total Demand Arriving in AM/5/ Alt 2B	1990 Utilized Parking/6/	1995 Parking Capacity/6/	Alt 1 Supply - Demand/7/	Alt 2B Supply - Demand/8/
9627	Gilroy	0	27	0	14	0.1392	0	11	0	1	0	11	0	233	0	222
9626	San Martin	0	13	0	7	0.2258	0	5	0	0	0	6	0	120	0	114
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	0	58	0	29	0.2632	0	23	0	1	0	25	0	524	0	499
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	0	94	0	47	0.3953	0	38	0	2	0	40	0	407	0	367
9620	Capitol	0	273	0	137	0.7778	0	109	0	7	0	116	0	317	0	201
9619	Tamien	0	193	0	97	0.1348	0	77	0	5	0	82	0	400	0	318
9618	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1170	1418	585	709	0.3000	410	567	25	34	434	601	328	645	-106	44
9599	College Park	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
9604	Santa Clara	733	800	367	400	0.1880	298	320	18	19	315	339	244	330	-71	-9
9606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9607	Lawrence	199	199	100	100	0.2208	78	80	5	5	82	84	95	120	13	36
9608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9611	Sunnyvale	635	651	318	326	0.2240	246	261	15	16	261	276	196	204	-65	-72
9612	Mt View	527	542	264	271	0.3125	181	217	11	13	192	230	234	250	42	20
9614	Castro	112	129	56	64	0.3750	35	51	2	3	37	55	0	0	-37	-55
9615	California	414	414	207	207	0.2150	163	166	10	10	172	176	136	188	-36	12
14933	Stanford	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	91	91	46	46	0.3077	32	37	2	2	33	39	297	364	264	325
14684	Menlo Pk	457	484	229	242	0.3182	156	194	9	12	165	205	147	147	-18	-58
14685	Atherton	237	237	119	119	0.2895	84	95	5	6	89	100	237	286	148	186
14686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14687	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14688	Redwood City	640	701	320	351	0.2471	241	281	14	17	255	297	625	703	370	406
14689	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13827	San Carlos	589	634	295	317	0.2330	226	254	14	15	239	269	211	244	-28	-25
13774	Belmont	686	731	343	365	0.1959	276	292	17	18	292	310	146	203	-146	-107
13753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13639	Hillsdale	900	1035	450	517	0.2675	330	414	20	25	349	439	170	170	-179	-269
13626	Bay Meadows	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	463	463	232	232	0.2917	164	185	10	11	174	196	13	21	-161	-175
13593	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13598	San Mateo	432	432	216	216	0.2375	165	173	10	10	175	183	201	205	26	22
13599	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13535	Burlingame	452	452	226	226	0.1818	185	181	11	11	196	192	57	58	-139	-134
13510	Broadway	247	264	124	132	0.2857	88	106	5	6	94	112	111	146	17	34
11312	Millbrae	362	379	181	189	0.2600	134	152	8	9	142	161	184	200	42	39
13079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11311	San Bruno	573	588	287	294	0.2410	217	235	13	14	231	249	109	169	-122	-80
13496	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13132	South SF	236	266	118	133	0.1600	99	106	6	6	105	113	49	51	-56	-62
13131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13129	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16349	Bayshore	48	48	24	24	0.2000	19	19	1	1	20	20	14	41	-6	21
16348	Paul Ave	0	0	0	0	0.5000	0	0	0	0	0	0	0	0	0	0
16347	22nd St	206	208	103	104	0.2609	76	83	5	5	81	88	15	24	-66	-64
16346	San Francisco	77	77	39	39	0.3220	26	31	2	2	28	33	0	0	-28	-33
	Total Entries	10486	11901	5243	5950	0.2609	3927	4760	236	286	4163	5046	3819	6770	-344	1724

Notes.

/1/ "Normalized HBW AM Station Arrivals" reflect HBW drive-access productions converted to trip origins

/2/ "1990 % Drop-Off" tabulated from Caltrain On-Board Passenger Survey, February 1994

/3/ "HBW Vehicles Arriving in AM" reflects subtraction of station-specific drop-off % in 1990 and system-wide factor of 20% in future

/4/ "NW Vehicles Arriving in AM" reflects 5% of HBW trips occurring in AM Peak according to 1994 Caltrain On-Board Survey

/5/ "Total Demand Arriving in AM" consists of sum of HBW and NW

/6/ 1995 JPB Caltrain Parking Survey (Caltrain lots only)

/7/ "Alt 1 Supply-Demand" calculated as "1990 Utilized Parking" minus "Total Vehicles Arriving in AM, Alt 1"

/8/ "Alt 2B Supply-Demand" calculated as "1990 Parking Capacity" minus "Total Vehicles Arriving in AM, Alt 2B": Shaded cells indicate parking shortfalls that cannot be accommodated at adjacent stations, except Sunnyvale where 52 out of 72 Castro where 43 out of 55 and Burlingame where 100 out of 134 are unaccommodated. Sum of unaccommodated parking demand=986.

Caltrain Market Demand Study - Alternative 2B
Caltrain Home-Based Work Station-to-Station Data (Origin-Destination Format)

		Gilroy	San Mart	Morgan	Blossom	Capitol	Tamien	Cahill	Coll Pk	Santa Cl	Lawrenc	Sunnyval	Mt View	Castro	California	Palo Alto	Menlo Pk	Atherton	Redwood	San Carl	Belmont	Hillsdale	Hayward	San Mat	Burlinga	Broadwa	Millbrae	San Brun	South SF	Bayshore	Paul	22nd St	4th/Townsend	
	Sum																																	
	FROM	9627	9626	9624	9622	9620	9619	9616	9599	9604	9607	9611	9612	9614	9615	14683	14684	14685	14688	13827	13774	13639	13601	13598	13535	13510	11312	11311	13132	16349	16348	16347	16346	Grand Tot
Gilroy	9627	0	0	2	1	1	0	17	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	3	0	3	0	0	1	34
San Martin	9626	0	0	0	0	0	0	4	0	1	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10
Morgan	9624	2	0	0	1	3	1	31	0	3	2	3	2	0	1	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	6	61
Blossom	9622	1	0	1	0	1	0	45	0	5	5	4	3	0	2	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	9	81
Capitol	9620	1	0	3	1	0	0	83	0	33	29	26	19	0	13	33	2	3	8	1	0	3	0	0	0	0	0	0	0	0	0	0	55	312
Tamien	9619	0	0	1	0	0	0	9	27	6	20	30	10	0	29	54	4	0	6	2	0	3	0	0	0	0	1	1	1	4	2	0	88	295
Cahill	9616	17	4	31	45	83	9	0	1	46	79	49	22	2	44	103	9	0	7	4	1	7	3	1	0	0	3	4	1	5	0	11	568	1157
Coll Pk	9599	0	0	0	0	0	27	1	0	7	3	10	12	18	18	11	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	124
Santa Clara	9604	1	1	3	5	33	6	46	7	0	37	36	20	0	24	56	5	0	4	3	0	8	3	0	0	0	1	1	1	1	0	3	269	570
Lawrence	9607	1	0	2	5	29	20	79	3	37	0	23	7	0	12	29	3	0	2	1	0	9	1	0	0	0	0	0	0	1	0	0	90	353
Sunnyvale	9611	1	0	3	4	26	30	49	10	36	23	0	9	31	32	64	8	0	6	2	1	5	1	1	0	0	2	1	1	1	0	0	258	602
Mt View	9612	1	0	2	3	19	10	22	12	20	7	9	0	36	53	79	18	5	15	7	4	37	5	2	1	1	2	1	1	0	0	9	324	701
Castro	9614	1	0	0	0	0	0	2	18	0	0	31	36	0	12	32	2	0	4	2	0	3	2	0	0	0	1	0	0	0	0	6	109	261
California	9615	0	0	1	2	13	29	44	18	24	12	32	53	12	0	43	27	11	27	13	9	87	9	4	3	1	3	2	2	0	0	4	343	825
Palo Alto	14683	1	1	2	5	33	54	103	11	56	29	64	79	32	43	0	3	0	7	5	2	9	7	3	3	1	3	3	4	1	2	20	129	708
Menlo Pk	14684	0	0	0	0	2	4	9	9	5	3	8	18	2	27	3	0	0	16	14	8	78	11	6	2	1	3	2	2	0	0	7	362	601
Atherton	14685	0	0	0	0	3	0	0	0	0	0	0	5	0	11	0	0	0	2	1	0	2	0	1	0	0	0	0	0	0	0	0	128	152
Redwood	14688	0	2	4	1	8	6	7	0	4	2	6	15	4	27	7	16	2	0	17	15	129	18	9	5	2	11	8	4	1	0	16	499	843
San Carlos	13827	0	0	0	0	1	2	4	0	3	1	2	7	2	13	5	14	1	17	0	2	64	13	6	3	2	6	3	3	1	0	5	465	645
Belmont	13774	0	0	0	0	0	0	1	0	0	0	1	4	0	9	2	8	0	15	2	0	27	11	5	2	1	5	2	2	1	0	0	432	528
Hillsdale	13639	0	0	0	0	3	3	7	0	8	9	5	37	3	87	9	78	2	129	64	27	0	30	36	35	25	40	33	35	15	0	17	67	804
Hayward Pk	13601	0	0	0	0	0	0	3	0	3	1	1	5	2	9	7	11	0	18	13	11	30	0	10	8	5	2	4	4	4	0	8	209	367
San Mateo	13598	0	0	0	0	0	0	1	0	0	0	1	2	0	4	3	6	1	9	6	5	36	10	0	6	3	2	3	3	5	0	8	315	429
Burlingame	13535	0	0	0	0	0	0	0	0	0	0	0	1	0	3	3	2	0	5	3	2	35	8	6	0	2	1	2	3	5	0	3	367	450
Broadway	13510	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	2	2	1	25	5	3	2	0	0	1	1	2	0	2	199	249
Millbrae	11312	1	0	0	0	0	1	3	0	1	0	2	2	1	3	3	3	0	11	6	5	40	2	2	1	0	0	1	2	1	0	20	271	384
San Bruno	11311	3	0	0	0	0	1	4	0	1	0	1	1	0	2	3	2	0	8	3	2	33	4	3	2	1	1	0	3	1	31	3	349	465
South SF	13132	0	0	0	0	0	1	1	0	1	0	1	1	0	2	4	2	0	4	3	2	35	4	3	3	1	2	3	0	1	0	3	375	452
Bayshore	16349	3	0	0	0	0	4	5	0	1	1	1	0	0	0	1	0	0	1	1	1	15	4	5	5	2	1	1	1	0	0	5	4	62
Paul	16348	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	1	18	53
22nd St	16347	0	0	0	0	0	0	11	10	3	0	0	9	6	4	20	7	0	16	5	0	17	8	8	3	2	20	3	3	5	1	0	0	156
4th/Townsen	16346	1	2	6	9	55	88	568	0	269	90	258	324	109	343	129	362	128	499	465	432	67	209	315	367	199	271	349	375	4	18	0	0	6304
	Grand	34	10	61	81	312	295	1157	124	570	353	602	701	261	825	708	601	152	843	645	528	804	367	429	450	249	384	465	452	62	53	156	6304	19038

Appendix D
Alternative 5A Detailed Model Outputs

Caltrain Market Demand Study: Alternative 5A
Caltrain Station-Level Boardings Summary (Normalized)

Node	Station Name	HBW Ent+Exit	Non-Work Ent+Exit	Daily Ent+Exit
9627	Gilroy	171	0	171
9626	San Martin	46	0	46
9625	-	-	-	-
9624	Morgan Hill	157	0	157
9623	-	-	-	-
9621	-	-	-	-
9622	Blossom Hill	99	3	102
9620	Capitol	636	3	639
9619	Tamien	972	1304	2276
9618	-	-	-	-
9617	-	-	-	-
9616	Cahill	3316	2098	5414
9599	College Park	468	661	1129
9604	Santa Clara	1621	568	2189
9606	-	-	-	-
9607	Lawrence	1082	1008	2090
9608	-	-	-	-
9611	Sunnyvale	1915	1549	3464
9612	Mt View	1794	959	2753
9614	Castro	749	374	1123
9615	California	1917	1016	2932
14933	Stanford	0	0	0
14683	Palo Alto	3333	1803	5136
14684	Menlo Pk	1582	848	2430
14685	Atherton	177	437	614
14686	-	-	-	-
14687	-	-	-	-
14688	Redwood City	2260	400	2659
14689	-	-	-	-
14690	-	-	-	-
13827	San Carlos	1628	765	2392
13774	Belmont	1697	830	2526
13763	-	-	-	-
13639	Hillsdale	2771	1393	4164
13626	Bay Meadows	0	0	0
13601	Hayward Park	1021	849	1870
13593	-	-	-	-
13598	San Mateo	1541	753	2294
13599	-	-	-	-
13535	Burlingame	1179	656	1835
13510	Broadway	649	486	1135
11312	Millbrae	2444	1876	4320
13079	-	-	-	-
11311	San Bruno	708	205	913
13496	-	-	-	-
13497	-	-	-	-
11310	-	-	-	-
13132	South SF	906	194	1100
13131	-	-	-	-
13130	-	-	-	-
13129	-	-	-	-
16349	Bayshore	105	95	200
16348	Paul Ave	375	19	394
16347	22nd St	51	7	58
16346	San Francisco	2194	1027	3221
11820	-	-	-	-
11822	TBT	15519	1241	16760
	Entries+Exits	55080	23427	78507
	Total Entries	27540	11713	39254

Notes:

/1/ Estimated Entries represent total Caltrain Boardings (SB+NB) from assignment of caltrain walk and drive access transit trips

/2/ BART operations split at Tanforan for HBW, with one half of the trains proceeding to Millbrae, and one half to SFO

/3/ BART operations split at Tanforan for NW, with trains alternating between SFO and Millbrae

/4/ Air Passengers are not included in the above station and system boardings

Caltrain Market Demand Study: Alternative 5A
Caltrain Station-Level Boardings (Normalized)
Entries and Exits by Direction and Purpose in AM

		Home-Based Work							Non-Work							Daily						
		Northbound		Southbound		Total	Total	Entries +	Northbound		Southbound		Total	Total	Entries +	Northbou	Southbou	Total	Northboun	Southboun	Total	Entries +
Node	Station Name	Entries	Exits	Entries	Exits	Entries	Exits	Exits	Entries	Exits	Entries	Exits	Entries	Exits	Exits	Entries	Entries	Entries	Exits	Exits	Exits	Exits
9627	Gilroy	171	0	0	0	171	0	171	0	0	0	0	0	0	0	171	0	171	0	0	0	171
9626	San Martin	45	1	0	0	45	1	46	0	0	0	0	0	0	0	45	0	45	1	0	1	46
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	140	17	0	0	140	17	157	0	0	0	0	0	0	0	140	0	140	17	0	17	157
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	85	14	0	0	85	14	99	0	0	0	3	0	3	3	85	0	85	14	3	17	102
9620	Capitol	626	10	0	0	626	10	636	0	0	0	3	0	3	3	626	0	626	10	3	13	639
9619	Tamien	838	27	0	107	838	134	972	1231	0	0	73	1231	73	1304	2069	0	2069	27	180	207	2276
9618	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	2393	265	26	632	2419	897	3316	1425	14	1	658	1426	672	2098	3818	27	3845	280	1290	1569	5414
9599	College Park	179	46	5	238	184	284	468	376	40	2	244	378	284	661	555	7	562	86	482	567	1129
9604	Santa Clara	917	269	187	249	1104	517	1621	263	137	7	162	270	299	568	1180	194	1373	405	410	816	2189
9606	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
9607	Lawrence	394	348	85	255	479	603	1082	168	476	145	220	312	696	1008	562	229	791	823	476	1299	2090
9608	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
9611	Sunnyvale	941	317	204	452	1145	770	1915	459	450	494	146	952	597	1549	1400	697	2097	768	599	1366	3464
9612	Mt View	994	244	252	304	1246	548	1794	114	478	332	35	446	513	959	1108	584	1692	723	338	1061	2753
9614	Castro	335	134	135	145	471	279	749	14	248	111	0	125	248	374	349	247	596	382	145	527	1123
9615	California	876	573	163	305	1038	878	1917	90	692	234	0	324	692	1016	966	397	1363	1265	305	1570	2932
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	1144	1033	675	480	1820	1513	3333	183	1277	250	93	434	1369	1803	1328	925	2253	2310	573	2883	5136
14684	Menlo Pk	903	344	161	175	1064	518	1582	603	0	2	243	605	243	848	1506	163	1669	344	418	762	2430
14685	Atherton	25	34	101	16	126	51	177	391	0	5	41	395	41	437	416	106	522	34	57	92	614
14686	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
14687	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
14688	Redwood City	1421	376	266	196	1687	573	2260	7	40	6	346	13	386	400	1428	273	1701	417	542	959	2659
14689	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
14690	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13827	San Carlos	1372	88	119	49	1491	137	1628	521	41	75	127	596	168	765	1893	194	2087	129	176	305	2392
13774	Belmont	1286	194	100	117	1386	311	1697	279	120	55	376	334	495	830	1565	155	1720	313	493	806	2526
13763	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13639	Hillsdale	2112	291	137	230	2249	522	2771	614	116	142	521	756	637	1393	2726	279	3005	408	751	1159	4164
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	479	179	102	261	581	440	1021	353	99	131	266	484	365	849	832	232	1064	278	527	806	1870
13593	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13598	San Mateo	1140	168	141	92	1281	260	1541	264	131	164	194	429	325	753	1404	305	1709	299	286	585	2294
13599	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13535	Burlingame	868	123	115	73	983	196	1179	309	110	131	107	440	217	656	1177	246	1423	233	180	413	1835
13510	Broadway	443	84	40	82	483	165	649	184	103	149	51	333	154	486	627	189	816	187	132	319	1135
11312	Millbrae	1276	846	273	50	1549	895	2444	394	531	831	121	1224	652	1876	1669	1104	2773	1376	171	1547	4320
13079	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
11311	San Bruno	417	167	59	64	477	231	708	0	163	0	42	0	205	205	417	59	477	330	106	436	913
13496	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13497	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
11310	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13132	South SF	664	110	25	107	689	217	906	7	102	6	80	13	181	194	671	31	701	212	186	399	1100
13131	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13130	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
13129	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
16349	Bayshore	0	44	60	0	60	44	105	0	95	0	0	0	95	95	0	60	60	140	0	140	200
16348	Paul Ave	283	11	74	6	357	18	375	0	19	0	0	0	19	19	283	74	357	31	6	37	394
16347	22nd St	0	4	47	0	47	4	51	0	4	4	0	4	4	7	0	51	51	7	0	7	58
16346	San Francisco	0	1956	238	0	238	1956	2194	0	988	39	0	39	988	1027	0	276	276	2944	0	2944	3221
11820	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11822	TBT	0	14655	864	0	864	14655	15519	0	501	740	0	740	501	1241	0	1604	1604	15156	0	15156	16760
	Entries+Exits							55080							23427							78507
	Total Entries	22769		4653		27422			8247		4056		12302			31016	8709	39725				
	Total Exits		22972		4686		27658			6974		4150		11124					29947	8836	38782	

/1/ Normalized with respect to October 1990 counts, using ratios

/2/ Split between Entries and Exits derived from the model and are in production-attraction format

/3/ Peak Periods approximated by Home-Based Work; Off-peak approximated by Non-Work

Caltrain Market Demand Study: Alternative 5A
Caltrain Station-Level Boardings (Normalized)
Home-Based Work Access Mode in AM

		Home-Based Work - 5A							Home-Based Work - 1			Alt 5A	Normalized	
		Northbound Entne		Southbound Entrie		Total	Total		Total	Total		- Alt 1	Alt 1	Alt 5A
Node	Station Name	Drive	Walk	Drive	Walk	Drive	Walk	Total	Drive	Walk	Total	Drive	Drive	Drive
9627	Gilroy	127	44	0	0	127	44	171	0	0	0	127	0	127
9626	San Martin	40	5	0	0	40	5	45	0	0	0	40	0	40
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	87	53	0	0	87	53	140	0	0	0	87	0	87
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	0	85	0	0	0	85	85	0	0	0	0	0	0
9620	Capitol	0	626	0	0	0	626	626	0	0	0	0	0	0
9619	Tamien	402	436	0	0	402	436	838	0	0	0	402	0	402
9618	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1631	762	25	1	1655	763	2419	1222	533	1755	433	1170	1603
9599	College Park	0	179	0	5	0	184	184	0	0	0	0	0	0
9604	Santa Clara	674	244	161	26	834	270	1104	659	262	921	175	733	908
9606	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9607	Lawrence	317	77	70	15	387	92	479	272	71	343	115	199	314
9608	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9611	Sunnyvale	435	506	113	91	548	597	1145	428	431	859	120	635	755
9612	Mt View	367	627	153	99	521	726	1246	577	320	897	0	527	527
9614	Castro	28	307	24	111	52	419	471	111	211	322	0	112	112
9615	California	511	364	81	82	592	446	1038	468	349	817	124	414	538
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	617	527	435	240	1052	768	1820	123	191	314	929	91	1020
14684	Menlo Pk	756	147	118	43	874	190	1064	660	135	795	214	457	671
14685	Atherton	18	7	55	46	74	53	126	211	94	305	0	237	237
14686	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14687	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14688	Redwood City	1104	317	120	146	1224	463	1687	742	349	1091	482	640	1122
14689	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14690	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13827	San Carlos	1250	122	90	29	1340	150	1491	859	130	989	481	589	1070
13774	Belmont	1184	102	84	15	1268	117	1386	807	119	926	461	686	1147
13763	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13639	Hillsdale	1770	343	95	41	1865	384	2249	952	241	1193	913	900	1813
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	341	138	36	65	377	203	581	542	152	694	0	463	463
13593	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13598	San Mateo	809	331	54	87	863	418	1281	465	237	702	398	432	830
13599	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13535	Burlingame	514	355	33	82	547	437	983	318	446	764	229	452	681
13510	Broadway	327	117	16	24	342	141	483	181	195	376	161	247	408
11312	Millbrae	1193	83	121	152	1314	235	1549	471	58	529	843	362	1205
13079	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11311	San Bruno	302	116	13	47	315	162	477	429	317	746	0	573	573
13496	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13497	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11310	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13132	South SF	612	52	8	17	620	69	689	599	137	736	21	236	257
13131	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13130	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13129	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16349	Bayshore	0	0	0	60	0	60	60	60	2	62	0	48	48
16348	Paul Ave	0	283	0	74	0	357	357	0	0	0	0	0	0
16347	22nd St	0	0	0	47	0	47	47	2	410	412	0	206	206
16346	San Francisco	0	0	0	238	0	238	238	0	250	250	0	77	77
11820	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11822	TBT	0	0	75	789	75	789	864	0	0	0	0	0	0
	Total Entries	15417	7353	1979	2674	17396	10026	27422	11158	5640	16798	6757	10486	17243

NOTES

All station entries are in production-attraction format

Station entries are approximate; they have been normalized with respect to October 1990 station activity, using ratios

Drive-Access assumed to occur for Home-Based Work Trips only

Change in Drive-Access Demand constrained to be positive or zero

Alternative 1 Normalized Demand based on walk/drive splits in Caltrain On-Board Passenger Survey, February 1994

Alternative 5A Normalized Demand based on Alternative 1 Normalized Demand plus change in modeled drive-access demand between base year (Alt 1) and forecast year (Alt 5A)

Caltrain Market Demand Study: Alternative 5A
Caltrain Station-Level Boardings (Normalized)
Estimated Parking Demand

Node	Station Name	Normalized HBW Drive-Access Prods Alt 1	Normalized HBW Drive-Access Prods Alt 5A	Normalized HBW AM Station Arrivals/1 Alt 1	Normalized HBW AM Station Arrivals/1 Alt 5A	1990 % Drop-off/2/	HBW Vehicles Arriving in AM/3/ Alt 1	HBW Vehicles Arriving in AM/3/ Alt 5A	NW Vehicles Arriving in AM/4/ Alt 1	NW Vehicles Arriving in AM/4/ Alt 5A	Total Demand Arriving in AM/5/ Alt 1	Total Demand Arriving in AM/5/ Alt 5A	1990 Utilized Parking/6/	1995 Parking Capacity/6/	Alt 1 Supply - Demand/7/	Alt 5A Supply - Demand/8
9627	Gilroy	0	127	0	64	0.1392	0	51	0	3	0	54	0	233	0	17
9626	San Martin	0	40	0	20	0.2258	0	16	0	1	0	17	0	120	0	10
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	0	87	0	44	0.2632	0	35	0	2	0	37	0	524	0	48
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	0	0	0	0	0.3953	0	0	0	0	0	0	0	407	0	40
9620	Capitol	0	0	0	0	0.7778	0	0	0	0	0	0	0	317	0	31
9619	Tamien	0	402	0	201	0.1348	0	161	0	10	0	170	0	400	0	23
9618	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1170	1603	585	802	0.3000	410	641	25	38	434	680	328	645	-106	-3
9599	College Park	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
9604	Santa Clara	733	908	367	454	0.1880	298	363	18	22	315	385	244	330	-71	-5
9606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9607	Lawrence	199	314	100	157	0.2208	78	125	5	8	82	133	95	120	13	-1
9608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9611	Sunnyvale	635	755	318	378	0.2240	246	302	15	18	261	320	196	204	-65	-11
9612	Mt View	527	527	264	264	0.3125	181	211	11	13	192	223	234	250	42	2
9614	Castro	112	112	56	56	0.3750	35	45	2	3	37	47	0	0	-37	-4
9615	California	414	538	207	269	0.2150	163	215	10	13	172	228	136	188	-36	-4
14933	Stanford	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	91	1020	46	510	0.3077	32	408	2	24	33	432	297	364	264	-6
14684	Menlo Pk	457	671	229	335	0.3182	156	268	9	16	165	284	147	147	-18	-13
14685	Atherton	237	237	119	119	0.2895	84	95	5	6	89	100	237	286	148	18
14686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14687	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14688	Redwood City	640	1122	320	561	0.2471	241	449	14	27	255	476	625	703	370	22
14689	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13827	San Carlos	589	1070	295	535	0.2330	226	428	14	26	239	454	211	244	-28	-21
13774	Belmont	686	1147	343	574	0.1959	276	459	17	28	292	487	146	203	-146	-28
13763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13639	Hillsdale	900	1813	450	906	0.2675	330	725	20	44	349	769	170	170	-179	-59
13626	Bay Meadows	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
13601	Hayward Par	463	463	232	232	0.2917	164	185	10	11	174	196	13	21	-161	-17
13593	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13598	San Mateo	432	830	216	415	0.2375	165	332	10	20	175	352	201	205	26	-14
13599	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13535	Burlingame	452	681	226	340	0.1818	185	272	11	16	196	289	57	58	-139	-23
13510	Broadway	247	408	124	204	0.2857	88	163	5	10	94	173	111	146	17	-2
11312	Millbrae	362	1205	181	603	0.2600	134	482	8	29	142	511	184	200	42	-31
13079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11311	San Bruno	573	573	287	287	0.2410	217	229	13	14	231	243	109	169	-122	-7
13496	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13132	South SF	236	257	118	128	0.1600	99	103	6	6	105	109	49	51	-56	-5
13131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13129	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16349	Bayshore	48	48	24	24	0.2000	19	19	1	1	20	20	14	41	-6	2
16348	Paul Ave	0	0	0	0	0.5000	0	0	0	0	0	0	0	0	0	0
16347	22nd St	206	206	103	103	0.2609	76	82	5	5	81	87	15	24	-66	-6
16346	San Francisc	77	77	39	39	0.3220	26	31	2	2	28	33	0	0	-28	-3
11820	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11822	TBT	0	0	0	0	0.2563	0	0	0	0	0	0	0	0	0	0
	Total Entries	10486	17243	5243	8621	0.2609	3927	6897	236	414	4163	7311	3819	6770	-344	-54

Notes:

/1/ "Normalized HBW AM Station Arrivals" reflect HBW drive-access productions converted to trip ongins

/2/ "1990 % Drop-Off" tabulated from Caltrain On-Board Passenger Survey, February 1994

/3/ "HBW Vehicles Arriving in AM" reflects subtraction of station-specific drop-off % in 1990 and system-wide factor of 20% in future

/4/ "NW Vehicles Arriving in AM" reflects 5% of HBW trips occuring in AM Peak according to 1994 Caltrain On-Board Survey

/5/ "Total Demand Arriving in AM" consists of sum of HBW and NW

/6/ 1995 JPB Caltrain Parking Survey (Caltrain lots only)

/7/ "Alt 1 Supply-Demand" calculated as "1990 Utilized Parking" minus "Total Vehicles Arriving in AM, Alt 1"

/8/ "Alt 5A Supply-Demand" calculated as "1990 Parking Capacity" minus "Total Vehicles Arriving in AM, Alt 5A". Shaded cells indicate parking shortfalls that cannot be accommodated at adjacent stations, except Sunnyvale where 89 out of 116 are unaccommodated. Sum of unaccommodated parking demand=2,526.

Caltrain Market Demand Study: Alternative 5A
Caltrain Station-Level Boardings Summary of Air Passenger Trips (Normalized)

Node	Station Name	HBW Ent+Exit	Non-Work Ent+Exit	Daily Ent+Exit
9627	Gilroy	9	0	9
9626	San Martin	1	0	1
9625	-	-	-	-
9624	Morgan Hill	7	0	7
9623	-	-	-	-
9621	-	-	-	-
9622	Blossom Hill	10	0	10
9620	Capitol	12	0	12
9619	Tamien	11	53	64
9618	-	-	-	-
9617	-	-	-	-
9616	Canill	40	81	121
9599	College Park	0	0	0
9604	Santa Clara	43	50	93
9606	-	-	0	-
9607	Lawrence	42	12	54
9608	-	-	0	-
9611	Sunnyvale	31	17	48
9612	Mt View	41	32	73
9614	Castro	0	5	5
9615	California	31	118	149
14933	Stanford	0	0	0
14683	Palo Alto	11	72	83
14684	Menlo Pk	49	59	108
14685	Atherton	0	32	32
14686	-	-	0	-
14687	-	-	0	-
14688	Redwood City	13	0	13
14689	-	-	0	-
14690	-	-	0	-
13827	San Carlos	15	23	38
13774	Belmont	16	20	36
13763	-	-	0	-
13639	Hillsdale	16	32	49
13626	Bay Meadows	0	0	0
13601	Hayward Park	0	36	36
13593	-	-	0	-
13598	San Mateo	0	40	40
13599	-	-	0	-
13535	Burlingame	0	34	34
13510	Broadway	5	5	11
11312	Millbrae	325	1038	1364
13079	-	-	0	-
11311	San Bruno	0	0	0
13496	-	-	0	-
13497	-	-	0	-
11310	-	-	0	-
13132	South SF	0	0	0
13131	-	-	0	-
13130	-	-	0	-
13129	-	-	0	-
16349	Bayshore	0	0	0
16348	Paul Ave	0	87	87
16347	22nd St	0	22	22
16346	San Francisco	0	258	258
11820	-	-	-	-
11822	TBT	0	303	303
	Entries+Exits	729	2429	3158
	Total Entries	365	1215	1579

Notes:

/1/ Estimated Entries represent total Caltrain Boardings (SB+NB) from assignment of air passenger transit trips

/2/ BART operations split at Tanforan for HBW, with one half of the trains proceeding to Millbrae, and one half to SFO

/3/ BART operations split at Tanforan for NW, with trains alternating between SFO and Millbrae

Caltrain Market Demand Study - Alternative 5A
Caltrain Home-Based Work Station-to-Station Data (Origin-Destination Format)

		Gilroy	San Mart	Morgan	Blossom	Capitol	Tamien	Cahill	Coll Pk	Santa Cl	Lawrenc	Sunnyval	Mt View	Castro	Californi	Palo Alto	Menlo P	Atherton	Redwoo	San Carl	Belmont	Hillsdale	Hayward	San Mat	Burlinga	Broadwa	Millbrae	San Bru	South S	Bayshor	Paul	22nd St	4th/Town	TBT	
	Sum																																	
	FROM	9627	9626	9624	9622	9620	9619	9616	9599	9604	9607	9611	9612	9614	9615	14683	14684	14685	14688	13827	13774	13639	13601	13598	13535	13510	11312	11311	13132	16349	16348	16347	16346	11822	Grand Tot
Gilroy	9627	0	0	9	4	0	7	14	0	0	0	30	0	0	0	18	6	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	89
San Martin	9626	0	0	0	3	0	2	1	0	0	0	11	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Morgan	9624	9	0	0	0	1	3	0	0	0	0	33	0	0	0	14	3	0	5	0	5	2	0	0	4	0	0	0	0	0	0	0	0	0	79
Blossom	9622	4	3	0	0	0	0	0	0	0	0	20	0	0	0	9	2	0	5	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2	49
Capitol	9620	0	0	1	0	0	5	0	0	0	0	134	2	2	11	79	19	0	37	0	18	7	0	0	5	0	0	0	0	0	0	0	0	0	318
Tamien	9619	7	2	3	0	5	0	13	141	210	27	11	2	5	18	4	3	1	6	2	2	3	2	2	1	1	6	1	1	1	1	0	3	8	489
Cahill	9616	14	1	0	0	0	13	0	29	19	232	93	14	29	43	140	50	29	88	38	40	18	45	41	11	10	51	10	3	6	3	3	72	515	1658
Coll Pk	9599	0	0	0	0	0	141	29	0	19	0	2	0	1	3	3	0	1	3	2	0	5	2	0	0	0	1	1	0	0	0	0	3	23	239
Santa Clara	9604	0	0	0	0	0	210	19	19	0	44	18	1	2	15	56	7	3	25	2	9	28	14	8	4	7	14	4	2	0	0	0	25	275	810
Lawrence	9607	0	0	0	0	0	27	232	0	44	0	2	0	1	8	11	4	3	13	1	5	3	8	5	2	5	6	2	2	0	0	0	18	140	541
Sunnyvale	9611	30	11	33	20	134	11	93	2	18	2	0	0	0	3	29	32	17	2	25	9	9	7	14	12	4	5	12	3	3	0	0	0	34	388	955
Mt View	9612	0	0	0	0	2	2	14	0	1	0	0	0	22	8	45	62	19	41	10	20	23	30	8	18	10	23	5	1	3	21	2	49	446	888
Castro	9614	0	0	0	0	2	5	29	1	2	1	3	22	0	0	0	5	10	22	4	11	3	14	6	1	1	5	5	4	1	16	1	19	171	383
California	9615	0	0	0	0	11	18	43	3	15	8	29	8	0	0	0	2	5	40	18	24	12	24	32	6	3	27	17	2	6	47	4	53	485	941
Palo Alto	14683	18	3	14	9	79	4	140	3	56	11	32	45	0	0	0	0	0	81	34	56	23	51	30	22	13	61	34	4	10	58	4	81	684	1658
Menlo Pk	14684	6	0	3	2	19	3	50	0	7	4	17	62	5	2	0	0	6	43	17	25	25	35	20	11	11	28	17	11	2	14	1	32	309	789
Atherton	14685	0	0	0	0	0	1	29	1	3	3	2	19	10	5	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	7	89
Redwood	14688	0	3	5	5	37	6	88	3	25	13	25	41	22	40	81	43	0	0	3	16	25	56	27	19	11	66	18	2	4	0	0	43	404	1129
San Carlos	13827	0	0	0	0	0	2	38	2	2	1	9	10	4	18	34	17	0	3	0	0	1	8	9	8	8	33	10	8	1	8	1	48	534	812
Belmont	13774	2	0	5	1	18	2	40	0	9	5	9	20	11	24	56	25	0	16	0	0	0	0	16	11	8	31	16	2	0	0	0	41	478	844
Hillsdale	13639	0	0	2	1	7	3	18	5	28	3	7	23	3	12	23	25	0	25	1	0	0	27	0	15	22	44	27	8	9	22	5	82	949	1397
Hayward Pk	13601	0	0	0	0	0	2	45	2	14	8	14	30	14	24	51	35	0	56	8	0	27	0	0	0	0	0	13	4	4	2	0	16	144	510
San Mateo	13598	0	0	0	0	0	2	41	0	8	5	12	8	6	32	30	20	0	27	9	16	0	0	0	0	5	18	6	2	7	0	0	54	478	785
Burlingame	13535	0	0	4	1	5	1	11	0	4	2	4	18	1	6	22	11	0	19	6	11	15	0	0	0	0	1	0	1	0	0	0	48	397	590
Broadway	13510	0	0	0	0	0	1	10	0	7	5	5	10	1	3	13	11	0	11	8	8	22	0	5	0	0	0	0	2	0	0	0	29	174	325
Millbrae	11312	0	0	0	0	0	6	51	1	14	6	12	23	5	27	61	28	0	66	33	31	44	0	18	1	0	0	34	76	0	0	4	247	438	1227
San Bruno	11311	0	0	0	0	0	1	10	1	4	2	3	5	5	17	34	17	3	18	10	16	27	13	6	0	0	34	0	15	3	0	0	23	89	355
South SF	13132	0	0	0	0	0	1	3	0	2	2	3	1	4	2	4	11	0	2	6	2	8	4	2	1	2	76	15	0	0	0	1	75	226	450
Bayshore	16349	0	0	0	0	0	1	6	0	0	0	0	3	1	6	10	2	0	4	1	0	9	4	7	0	0	0	3	0	0	0	0	0	0	55
Paul	16348	0	0	0	0	0	1	3	0	0	0	0	21	16	47	58	14	0	0	8	0	22	2	0	0	0	0	0	0	0	0	0	0	0	193
22nd St	16347	0	0	0	0	0	0	3	0	0	0	0	2	1	4	4	1	0	0	1	0	5	0	0	0	0	4	0	1	0	0	0	0	0	27
4th/Townsend	16346	0	0	0	0	0	3	72	3	25	18	34	49	19	53	81	32	0	43	48	41	82	16	54	48	29	247	23	75	0	0	0	0	0	1098
TBT	11822	0	0	0	2	0	6	515	23	275	140	386	446	171	485	684	309	7	404	534	478	949	144	478	397	174	438	89	226	0	0	0	0	0	7756
	Grand	89	22	79	49	318	489	1658	239	810	541	955	888	383	941	1658	789	89	1129	812	844	1397	510	785	590	325	1227	355	450	55	193	27	1098	7756	27528

Appendix E
Alternative 6B Detailed Model Outputs

Caltrain Market Demand Study: Alternative 6B
San Mateo Countywide Transportation Plan: Alternative 6
Caltrain Station-Level Boardings Summary (Normalized)

Node	Station Name	HBW Ent+Exit	Non-Work Ent+Exit	Daily Ent+Exit
9627	Gilroy	147	0	147
9626	San Martin	44	0	44
9625	-	-	-	-
9624	Morgan Hill	148	0	148
9623	-	-	-	-
9621	-	-	-	-
9622	Blossom Hill	97	2	99
9620	Capitol	609	2	611
9619	Tamien	1026	1464	2490
9618	-	-	-	-
9617	-	-	-	-
9616	Cahill	3389	2396	5786
9599	College Park	459	805	1264
9604	Santa Clara	1598	710	2308
9606	-	-	-	-
9607	Lawrence	1073	1204	2277
9608	-	-	-	-
9611	Sunnyvale	2160	1719	3880
9612	Mt View	1926	1117	3043
9614	Castro	714	498	1212
9615	California	2132	1364	3496
14933	Stanford	0	0	0
14683	Palo Alto	3071	2052	5124
14684	Menlo Pk	1572	925	2497
14685	Atherton	182	660	841
14686	-	-	-	-
14687	-	-	-	-
14688	Redwood City	2271	513	2784
14689	-	-	-	-
14690	-	-	-	-
13827	San Carlos	1621	744	2365
13774	Belmont	1687	938	2625
13763	-	-	-	-
13639	Hillsdale	2831	1575	4406
13626	Bay Meadows	0	0	0
13601	Hayward Park	1028	1069	2097
13593	-	-	-	-
13598	San Mateo	1659	894	2552
13599	-	-	-	-
13535	Burlingame	1206	800	2006
13510	Broadway	698	530	1228
11312	Millbrae	2629	2096	4725
13079	-	-	-	-
11311	San Bruno	727	252	980
13496	-	-	-	-
13497	-	-	-	-
11310	-	-	-	-
13132	South SF	856	257	1114
13131	-	-	-	-
13130	-	-	-	-
13129	-	-	-	-
16349	Bayshore	105	105	209
16348	Paul Ave	365	21	386
16347	22nd St	53	144	197
16346	San Francisco	2241	1145	3385
11820	-	-	-	-
11822	TBT	16044	1412	17456
	Entries+Exits	56370	27412	83781
	Total Entries	28185	13706	41891

Notes:

/1/ Estimated Entries represent total Caltrain Boardings (SB+NB) from assignment of caltrain walk and drive access transit trips

/2/ BART operations split at Tanforan for HBW, with one half of the trains proceeding to Millbrae, and one half to SFO

/3/ BART operations split at Tanforan for NW, with one third of trains to SFO and two thirds to Millbrae

/4/ Air Passengers are not included in the above station and system boardings

Caltrain Market Demand Study: Alternative 6B
Caltrain Station-Level Boardings (Normalized) /1/
Entries and Exits by Direction and Purpose in AM

		Home-Based Work/3/							Non-Work/4/							Daily						
		Northbound		Southbound		Total	Total	Entries +	Northbound		Southbound		Total	Total	Entries +	Northbound	Southbound	Total	Northboun	Southboun	Total	Entries +
Node	Station Name	Entries/2/	Exits/2/	Entries/2/	Exits/2/	Entries/2/	Exits/2/	Exits	Entries/2/	Exits/2/	Entries/2/	Exits/2/	Entries/2/	Exits/2/	Exits	Entries/2/	Entries/2/	Entries/2/	Exits/2/	Exits/2/	Exits/2/	Exits
9627	Gilroy	147	0	0	0	147	0	147	0	0	0	0	0	0	0	147	0	147	0	0	0	147
9626	San Martin	43	1	0	0	43	1	44	0	0	0	0	0	0	0	43	0	43	1	0	1	44
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	131	17	0	0	131	17	148	0	0	0	0	0	0	0	131	0	131	17	0	17	148
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	83	14	0	0	83	14	97	0	0	0	2	0	2	2	83	0	83	14	2	16	99
9620	Capitol	599	10	0	0	599	10	609	0	0	0	2	0	2	2	599	0	599	10	2	12	611
9619	Tamien	890	26	0	110	890	136	1026	1362	0	0	102	1362	102	1464	2252	0	2252	26	212	238	2490
9618	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	2475	256	26	632	2501	888	3389	1589	33	3	772	1591	805	2396	4064	29	4093	289	1404	1693	5786
9599	College Park	169	42	5	244	174	285	459	413	68	4	319	417	388	805	582	9	591	110	563	673	1264
9604	Santa Clara	886	268	196	250	1081	517	1598	323	159	20	208	343	366	710	1209	216	1425	426	457	884	2308
9606	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
9607	Lawrence	388	345	78	262	466	607	1073	192	553	226	232	419	785	1204	580	304	885	898	494	1392	2277
9608	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
9611	Sunnyvale	1084	315	209	552	1293	868	2160	544	491	514	170	1058	661	1719	1628	723	2351	806	723	1529	3880
9612	Mt View	1116	240	258	313	1374	553	1926	146	540	384	47	530	587	1117	1261	642	1903	780	360	1140	3043
9614	Castro	302	132	135	146	437	277	714	49	293	143	12	192	306	498	351	278	629	425	158	583	1212
9615	California	1070	568	167	327	1237	895	2132	168	834	308	54	476	888	1364	1239	475	1713	1401	381	1783	3496
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	1001	892	684	494	1685	1386	3071	197	1436	323	96	520	1532	2052	1198	1007	2205	2328	591	2919	5124
14684	Menlo Pk	876	344	165	188	1040	532	1572	663	2	2	257	665	259	925	1539	167	1706	345	446	791	2497
14685	Atherton	28	34	103	16	131	51	182	501	0	9	149	510	149	660	529	113	641	34	165	200	841
14686	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
14687	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
14688	Redwood City	1415	375	271	210	1687	585	2271	44	56	42	371	87	426	513	1460	313	1773	431	580	1011	2784
14689	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
14690	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13827	San Carlos	1361	88	122	51	1483	138	1621	460	49	94	141	554	190	744	1821	216	2037	137	191	328	2365
13774	Belmont	1284	192	102	109	1386	302	1687	314	128	70	425	385	553	938	1598	172	1771	320	534	854	2625
13763	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13639	Hillsdale	2132	274	140	284	2272	559	2831	669	153	155	598	824	751	1575	2801	295	3097	427	883	1310	4406
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Park	479	179	104	266	583	445	1028	406	148	189	327	595	474	1069	885	293	1178	327	593	919	2097
13593	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13598	San Mateo	1164	168	142	185	1306	353	1659	298	158	188	249	486	407	894	1462	331	1792	326	434	760	2552
13599	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13535	Burlingame	869	123	113	101	982	224	1206	338	140	202	121	540	261	800	1207	315	1522	263	222	485	2006
13510	Broadway	443	82	40	134	482	215	698	208	118	149	56	356	174	530	650	189	839	200	190	389	1228
11312	Millbrae	1240	894	439	56	1679	950	2629	422	597	918	159	1340	756	2096	1662	1357	3019	1491	215	1706	4725
13079	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
11311	San Bruno	413	166	69	79	482	245	727	7	191	6	49	13	239	252	420	75	495	357	127	484	980
13496	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13497	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
11310	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13132	South SF	663	107	26	60	689	167	856	23	108	41	86	64	193	257	687	66	753	215	146	361	1114
13131	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13130	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
13129	-	-	-	-	-	0	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-
16349	Bayshore	0	42	63	0	63	42	105	0	105	0	0	0	105	105	0	63	63	146	0	146	209
16348	Paul Ave	285	10	63	8	348	18	365	0	21	0	0	0	21	21	285	63	348	31	8	38	386
16347	22nd St	0	4	49	0	49	4	53	144	0	0	0	144	0	144	144	49	193	4	0	4	197
16346	San Francisco	0	1997	244	0	244	1997	2241	0	1104	41	0	41	1104	1145	0	284	284	3101	0	3101	3385
11820	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11822	TBT	0	15012	1032	0	1032	15012	16044	0	646	766	0	766	646	1412	0	1798	1798	15658	0	15658	17456
	Entries+Exits							56370							27412							83781
	Total Entries	23034		5043		28078			9482		4797		14279			32516	9840	42357				
	Total Exits		23217		5075		28292			8128		5005		13133					31344	10080	41425	

/1/ Normalized with respect to October 1990 counts, using ratios
/2/ Split between Entries and Exits derived from the model and are in production-attraction format
/3/ Peak Period approximated by Home-Based Work; Off-peak approximated by Non-Work

Caltrain Market Demand Study: Alternative 6B
Caltrain Station-Level Boardings (Normalized)
Home-Based Work Entries and Exits by Access Mode in AM

		Home-Based Work - Alt 6B							Home-Based Work - 1			Alt 6B	Normalized	
		Northbound Entrie		Southbound Entrie		Total	Total		Total	Total		- Alt 1	Alt 1	Alt 6B
Node	Station Name	Drive	Walk	Drive	Walk	Drive	Walk	Total	Drive	Walk	Total	Drive	Drive	Drive
9627	Gilroy	110	37	0	0	110	37	147	0	0	0	110	0	110
9626	San Martin	38	5	0	0	38	5	43	0	0	0	38	0	38
9625	-	-	-	-	-	-	-	-	-	-	-	-	0	-
9624	Morgan Hill	82	49	0	0	82	49	131	0	0	0	82	0	82
9623	-	-	-	-	-	-	-	-	-	-	-	-	0	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	0	-
9622	Blossom Hill	0	83	0	0	0	83	83	0	0	0	0	0	0
9620	Capitol	0	599	0	0	0	599	599	0	0	0	0	0	0
9619	Tamien	394	496	0	0	394	496	890	0	0	0	394	0	394
9618	-	-	-	-	-	-	-	-	-	-	-	-	0	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	0	-
9616	Cahill	1864	611	25	1	1889	612	2501	1222	533	1755	667	1170	1837
9599	College Park	0	169	0	5	0	174	174	0	0	0	0	0	0
9604	Santa Clara	648	238	167	29	815	267	1081	659	262	921	156	733	889
9606	-	-	-	-	-	-	-	-	-	-	-	-	0	-
9607	Lawrence	308	80	71	7	379	87	466	272	71	343	107	199	306
9608	-	-	-	-	-	-	-	-	-	-	-	-	0	-
9611	Sunnyvale	665	419	116	93	781	512	1293	428	431	859	353	635	988
9612	Mt View	644	472	158	100	801	572	1374	577	320	897	224	527	751
9614	Castro	27	275	24	110	51	385	437	111	211	322	0	112	112
9615	California	580	490	85	82	665	572	1237	468	349	817	197	414	611
14933	Stanford	0	0	0	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	649	352	439	245	1088	597	1685	123	191	314	965	91	1056
14684	Menlo Pk	732	143	120	45	852	188	1040	660	135	795	192	457	649
14685	Atherton	23	5	57	46	80	51	131	211	94	305	0	237	237
14686	-	-	-	-	-	-	-	-	-	-	-	-	0	-
14687	-	-	-	-	-	-	-	-	-	-	-	-	0	-
14688	Redwood City	1096	319	121	150	1218	469	1687	742	349	1091	476	640	1115
14689	-	-	-	-	-	-	-	-	-	-	-	-	0	-
14690	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13827	San Carlos	1245	116	92	30	1336	146	1483	859	130	989	477	589	1066
13774	Belmont	1180	103	86	16	1266	120	1386	807	119	926	459	686	1145
13763	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13639	Hillsdale	1770	363	98	42	1868	405	2272	952	241	1193	916	900	1816
13626	Bay Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0
13601	Hayward Par	341	138	39	65	380	203	583	542	152	694	0	463	463
13593	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13598	San Mateo	809	354	53	89	863	443	1306	465	237	702	398	432	830
13599	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13535	Burlingame	514	356	31	82	545	438	982	318	446	764	227	452	678
13510	Broadway	327	116	15	25	341	141	482	181	195	376	160	247	407
11312	Millbrae	1193	47	282	157	1475	204	1679	471	58	529	1004	362	1366
13079	-	-	-	-	-	-	-	-	-	-	-	-	0	-
11311	San Bruno	302	111	13	56	315	167	482	429	317	746	0	573	573
13496	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13497	-	-	-	-	-	-	-	-	-	-	-	-	0	-
11310	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13132	South SF	612	51	8	18	620	69	689	599	137	736	21	236	257
13131	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13130	-	-	-	-	-	-	-	-	-	-	-	-	0	-
13129	-	-	-	-	-	-	-	-	-	-	-	-	0	-
16349	Bayshore	0	0	0	63	0	63	63	60	2	62	0	48	48
16348	Paul Ave	0	285	0	63	0	348	348	0	0	0	0	0	0
16347	22nd St	0	0	0	49	0	49	49	2	410	412	0	206	206
16346	San Francisco	0	0	0	244	0	244	244	0	250	250	0	77	77
11820	-	-	-	-	-	-	-	-	-	-	-	-	0	-
11822	TBT	0	0	60	972	60	972	1032	0	0	0	0	0	0
	Total Entries	16153	6882	2159	2885	18311	9766	28078	11158	5640	16798	7622	10486	18108

NOTES:

All station entries are in production-attraction format

Station entries are approximate; they have been normalized with respect to October 1990 station activity, using ratios

Drive-Access assumed to occur for Home-Based Work Trips only

Change in Drive-Access Demand constrained to be positive or zero

Alternative 1 Normalized Demand based on walk/drive splits in Caltrain On-Board Passenger Survey, February 1994

Alternative 6 Normalized Demand based on Alternative 1 Normalized Demand plus change in modeled drive-access demand between base year (Alt 1) and forecast year (Alt 6)

Caltrain Market Demand Study: Alternative 6B
San Mateo Countywide Transportation Plan: Alternative 6
Caltrain Station-Level Boardings (Normalized)
Estimated Parking Demand

Node	Station Name	Normalized HBW Drive-Access Prods Alt 1	Normalized HBW Drive-Access Prods Alt 6B	Normalized HBW AM Station Arrivals/1/ Alt 1	Normalized HBW AM Station Arrivals/1/ Alt 6B	1990 % Drop-off/2	HBW Vehicles Arriving in AM/3/ Alt 1	HBW Vehicles Arriving in AM/3/ Alt 6B	NW Vehicles Arriving in AM/4/ Alt 1	NW Vehicles Arriving in AM/4/ Alt 6B	Total Demand Arriving in AM/5/ Alt 1	Total Demand Arriving in AM/5/ Alt 6B	1990 Utilized Parking/6/	1995 Parking Capacity/6/	Alt 1 Supply - Demand/7/	Alt 6B Supply - Demand/8/
9627	Gilroy	0	110	0	55	0.1392	0	44	0	3	0	47	0	233	0	186
9626	San Martin	0	38	0	19	0.2258	0	15	0	1	0	16	0	120	0	104
9625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9624	Morgan Hill	0	82	0	41	0.2632	0	33	0	2	0	35	0	524	0	489
9623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9622	Blossom Hill	0	0	0	0	0.3953	0	0	0	0	0	0	0	407	0	407
9620	Capitol	0	0	0	0	0.7778	0	0	0	0	0	0	0	317	0	317
9619	Tamien	0	394	0	197	0.1348	0	158	0	9	0	167	0	400	0	233
9618	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9617	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9616	Cahill	1170	1837	585	919	0.3000	410	735	25	44	434	779	328	645	-106	-134
9599	College Park	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
9604	Santa Clara	733	889	367	444	0.1880	298	355	18	21	315	377	244	330	-71	-47
9606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9607	Lawrence	199	306	99	153	0.2208	77	122	5	7	82	130	95	120	13	-10
9608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9611	Sunnyvale	635	988	318	494	0.2240	247	395	15	24	261	419	196	204	-65	-215
9612	Mt View	527	751	263	376	0.3125	181	300	11	18	192	318	234	250	42	-68
9614	Castro	112	112	56	56	0.3750	35	45	2	3	37	47	0	0	-37	-47
9615	California	414	611	207	306	0.2150	163	245	10	15	172	259	136	188	-36	-71
14933	Stanford	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
14683	Palo Alto	91	1056	46	528	0.3077	32	422	2	25	33	448	297	364	264	-84
14684	Menlo Pk	457	649	229	325	0.3182	156	260	9	16	165	275	147	147	-18	-128
14685	Atherton	237	237	118	118	0.2895	84	95	5	6	89	100	237	286	148	186
14686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14687	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14688	Redwood City	640	1115	320	558	0.2471	241	446	14	27	255	473	625	703	370	230
14689	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13827	San Carlos	589	1066	294	533	0.2330	226	426	14	26	239	452	211	244	-28	-208
13774	Belmont	686	1145	343	572	0.1959	276	458	17	27	292	485	146	203	-146	-282
13763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13639	Hillsdale	900	1816	450	908	0.2675	330	726	20	44	350	770	170	170	-180	-600
13626	Bay Meadows	0	0	0	0	0.0000	0	0	0	0	0	0	0	0	0	0
13601	Hayward Par	463	463	231	231	0.2917	164	185	10	11	174	196	13	21	-161	-175
13593	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13598	San Mateo	432	830	216	415	0.2375	165	332	10	20	175	352	201	205	26	-147
13599	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13535	Burlingame	452	678	226	339	0.1818	185	271	11	16	196	288	57	58	-139	-230
13510	Broadway	247	407	123	203	0.2857	88	163	5	10	93	173	111	146	18	-27
11312	Millbrae	362	1366	181	683	0.2600	134	546	8	33	142	579	184	200	42	-379
13079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11311	San Bruno	573	573	287	287	0.2410	218	229	13	14	231	243	109	169	-122	-74
13496	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13132	South SF	236	257	118	129	0.1600	99	103	6	6	105	109	49	51	-56	-58
13131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13129	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16349	Bayshore	48	48	24	24	0.2000	19	19	1	1	20	20	14	41	-6	21
16348	Paul Ave	0	0	0	0	0.5000	0	0	0	0	0	0	0	0	0	0
16347	22nd St	206	206	103	103	0.2609	76	82	5	5	81	87	15	24	-66	-63
16346	San Francisco	77	77	39	39	0.3220	26	31	2	2	28	33	0	0	-28	-33
11820	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11822	TBT	0	0	0	0	0.2563	0	0	0	0	0	0	0	0	0	0
	Total Entries	10486	18108	5243	9054	0.2609	3927	7243	236	435	4163	7678	3819	6770	-344	-908

Notes:

/1/ "Normalized HBW AM Station Arrivals" reflect HBW drive-access productions converted to trip origins

/2/ "1990 % Drop-Off" tabulated from Caltrain On-Board Passenger Survey, February 1994

/3/ "HBW Vehicles Arriving in AM" reflects subtraction of station-specific drop-off % in 1990 and system-wide factor of 20% in future

/4/ "NW Vehicles Arriving in AM" reflects 6% of HBW trips occuring in AM Peak according to 1994 Caltrain On-Board Survey

/5/ "Total Demand Arriving in AM" consists of sum of HBW and NW

/6/ 1995 JPB Caltrain Parking Survey (Caltrain lots only)

/7/ "Alt 1 Supply-Demand" calculated as "1990 Utilized Parking" minus "Total Vehicles Arriving in AM, Alt 1"

/8/ "Alt 6 Supply-Demand" calculated as "1990 Parking Capacity" minus "Total Vehicles Arriving in AM, Alt 6B": Shaded cells indicated parking shortfalls that cannot be accommodated at adjacent stations. Sum of shaded cells=2,919

Caltrain Market Demand Study - Alternative 6B
Caltrain Home-Based Work Station-to-Station Data (Origin-Destination Format)

	Sum	Gilroy	San Marti	Morgan	Blossom	Capitol	Tamien	Cahill	Coll Pk	Santa Cla	Lawrence	Sunnyval	Mt. View	Castro	Californa	Palo Alto	Menlo Pk	Atherton	Redwood	San Carlo	Belmont	Hillsdale	Hayward	San Mate	Burlinga	Broadway	Millbrae	San Brun	South SF	Bayshore	Paul	22nd St	4th/Town	TBT	
	FROM	9627	9626	9624	9622	9620	9619	9616	9599	9604	9607	9611	9612	9614	9615	14683	14684	14685	14688	13827	13774	13639	13601	13598	13535	13510	11312	11311	13132	16349	16348	16347	16346	11822	Grand Tot
Gilroy	9627	0	0	9	4	0	7	8	0	0	0	30	0	0	0	13	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	77
San Martin	9626	0	0	0	3	0	2	1	0	0	0	11	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Morgan	9624	9	0	0	0	1	3	0	0	0	0	33	0	0	0	10	3	0	5	0	5	2	0	0	4	0	0	0	0	0	0	0	0	0	75
Blossom	9622	4	3	0	0	0	0	0	0	0	0	20	0	0	0	9	2	0	5	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2	49
Capitol	9620	0	0	1	0	0	5	0	0	0	0	134	2	2	11	70	19	0	37	0	18	7	0	0	5	0	0	0	0	0	0	0	0	0	309
Tamien	9619	7	2	3	0	5	0	13	141	233	27	11	2	5	18	4	3	1	8	2	2	3	2	2	1	1	6	1	1	1	1	0	3	7	512
Cahill	9616	8	1	0	0	0	13	0	39	0	235	130	14	29	45	109	51	30	83	38	41	19	46	42	12	13	52	11	3	6	3	3	75	544	1692
Coll Pk	9599	0	0	0	0	0	141	39	0	0	0	2	0	1	3	3	0	1	3	2	0	5	2	1	0	0	1	1	0	0	0	0	3	23	230
Santa Clara	9604	0	0	0	0	0	233	0	0	0	44	23	1	2	13	56	7	3	25	2	9	28	14	8	4	9	15	4	0	0	0	0	25	275	799
Lawrence	9607	0	0	0	0	0	27	235	0	44	0	2	0	1	8	11	4	3	13	1	5	3	8	5	2	5	6	2	0	0	0	0	13	140	537
Sunnyvale	9611	30	11	33	20	134	11	130	2	23	2	0	0	1	33	34	18	2	34	10	8	9	17	13	4	8	13	4	0	0	0	0	36	439	1079
Mt. View	9612	0	0	0	0	2	2	14	0	1	0	0	0	22	9	42	62	19	46	10	19	23	32	14	19	11	24	5	1	3	21	2	54	504	962
Castro	9614	0	0	0	0	2	5	29	1	2	1	1	22	0	0	0	5	10	16	4	10	3	14	4	1	1	5	5	1	1	12	1	14	182	353
Californta	9615	0	0	0	0	11	18	45	3	13	8	33	9	0	0	0	2	5	43	16	25	13	26	34	7	4	30	18	2	6	47	4	59	585	1066
Palo Alto	14683	13	3	10	9	70	4	109	3	56	11	34	42	0	0	0	0	0	68	18	39	20	46	30	21	14	58	33	4	10	58	4	77	670	1533
Menlo Pk	14684	5	0	3	2	19	3	51	0	7	4	18	62	5	2	0	0	6	43	15	25	25	35	20	11	12	28	17	2	2	14	1	28	317	783
Atherton	14685	0	0	0	0	0	1	30	1	3	3	2	19	10	5	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	7	90
Redwood	14688	0	3	5	5	37	6	83	3	25	13	34	46	16	43	68	43	0	0	3	16	25	58	36	19	13	66	18	2	4	0	0	43	404	1135
San Carlos	13827	0	0	0	0	0	2	38	2	2	1	10	10	4	16	18	15	0	3	0	0	1	8	16	11	10	33	10	2	1	8	1	48	537	807
Belmont	13774	2	0	5	1	18	2	41	0	9	5	8	19	10	25	39	25	0	16	0	0	0	0	26	15	10	31	16	2	0	0	0	41	478	844
Hillsdale	13639	0	0	2	1	7	3	19	5	28	3	9	23	3	13	20	25	0	25	1	0	0	27	0	15	25	44	27	8	9	22	5	87	957	1414
Hayward Pk	13601	0	0	0	0	0	2	46	2	14	8	17	32	14	26	46	35	0	56	8	0	27	0	0	0	0	0	13	4	4	2	0	16	144	514
San Mateo	13598	0	0	0	0	0	2	42	1	8	5	13	14	4	34	30	20	0	36	16	26	0	0	0	0	7	18	6	2	7	0	0	58	478	826
Burlingame	13535	0	0	4	1	5	1	12	0	4	2	4	19	1	7	21	11	0	19	11	15	15	0	0	0	0	1	0	1	0	0	0	47	397	601
Broadway	13510	0	0	0	0	0	1	13	0	9	5	8	11	1	4	14	12	0	13	10	10	25	0	7	0	0	0	0	1	0	0	0	29	174	345
Millbrae	11312	0	0	0	0	0	6	52	1	15	6	13	24	5	30	58	28	0	66	33	31	44	0	18	1	0	0	51	79	0	0	4	272	477	1315
San Bruno	11311	0	0	0	0	0	1	11	1	4	2	4	5	5	18	33	17	3	18	10	16	27	13	6	0	0	51	0	0	3	0	0	23	89	360
South SF	13132	0	0	0	0	0	1	3	0	0	0	0	1	1	2	4	2	0	2	2	2	8	4	2	1	1	79	0	0	0	0	1	71	238	424
Bayshore	16349	0	0	0	0	0	1	6	0	0	0	0	3	1	6	10	2	0	4	1	0	9	4	7	0	0	0	3	0	0	0	0	0	0	55
Paul	16348	0	0	0	0	0	1	3	0	0	0	0	21	12	47	58	14	0	0	8	0	22	2	0	0	0	0	0	0	0	0	0	0	0	189
22nd St	16347	0	0	0	0	0	0	3	0	0	0	0	2	1	4	4	1	0	0	1	0	5	0	0	0	0	4	0	1	0	0	0	0	0	27
4th/Townsen	16346	0	0	0	0	0	3	75	3	25	13	36	54	14	59	77	28	0	43	48	41	87	16	58	47	29	272	23	71	0	0	0	0	0	1122
TBT	11822	0	0	0	2	0	7	544	23	275	140	439	504	182	585	670	317	7	404	537	478	957	144	478	397	174	477	89	238	0	0	0	0	0	8064
	Grand	77	22	75	49	309	512	1692	230	799	537	1079	962	353	1066	1533	783	90	1135	807	844	1414	514	826	601	345	1315	360	424	55	189	27	1122	8064	28212

Caltrain Market Demand Study: Alternative 6B
San Mateo Countywide Transportation Plan: Alternative 6
Caltrain Station-Level Boardings Summary (Normalized) of Air Passenger Trips

Node	Station Name	HBW Ent+Exit	Non-Work Ent+Exit	Daily Ent+Exit
9627	Gilroy	9	0	9
9626	San Martin	1	0	1
9625	-	-	-	-
9624	Morgan Hill	7	0	7
9623	-	-	-	-
9621	-	-	-	-
9622	Blossom Hill	10	0	10
9620	Capitol	12	0	12
9619	Tamien	11	55	66
9618	-	-	-	-
9617	-	-	-	-
9616	Cahill	40	70	111
9599	College Park	0	0	0
9604	Santa Clara	43	41	84
9606	-	-	-	-
9607	Lawrence	42	10	52
9608	-	-	-	-
9611	Sunnyvale	31	18	49
9612	Mt View	41	35	76
9614	Castro	0	4	4
9615	California	31	71	102
14933	Stanford	0	0	0
14683	Palo Alto	11	43	54
14684	Menlo Pk	49	45	94
14685	Atherton	0	41	41
14686	-	-	-	-
14687	-	-	-	-
14688	Redwood City	13	0	13
14689	-	-	-	-
14690	-	-	-	-
13827	San Carlos	15	22	37
13774	Belmont	16	19	35
13763	-	-	-	-
13639	Hillsdale	16	29	45
13626	Bay Meadows	0	0	0
13601	Hayward Park	0	24	24
13593	-	-	-	-
13598	San Mateo	0	34	34
13599	-	-	-	-
13535	Burlingame	0	33	33
13510	Broadway	5	8	13
11312	Millbrae	325	1358	1683
13079	-	-	-	-
11311	San Bruno	0	0	0
13496	-	-	-	-
13497	-	-	-	-
11310	-	-	-	-
13132	South SF	0	0	0
13131	-	-	-	-
13130	-	-	-	-
13129	-	-	-	-
16349	Bayshore	0	0	0
16348	Paul Ave	0	113	113
16347	22nd St	0	18	18
16346	San Francisco	0	238	238
11820	-	-	-	-
11822	TBT	0	767	767
	Entries+Exits	729	3096	3825
	Total Entries	365	1548	1913

/1/ Estimated Entries represent total Caltrain Boardings (SB+NB) from assignment of air passenger transit trips

/2/ BART operations split at Tanforan for HBW, with one half of the trains proceeding to Millbrae, and one half to SFO

/3/ BART operations split at Tanforan for NW, with trains alternating between SFO and Millbrae