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ESTIMATES OF THE POPULATION OF THE SAN FRANCISCO-OAKLAND AND SAN JOSE STANDARD METROPOLITAN AREAS: JULY 1, 1956

(Similar estimates for other selected standard metropolitan areas for 1956 are given in
Current Population Reports, Series P-25, Nos. 137, 155, 156, and 181)

This report presents estimates of the population of the standard metropolitan areas of San Francisco-Oakland and San Jose, California, by constituent counties, for July 1, 1956. The estimates relate to the civilian population plus members of the Armed Forces stationed in the area. They were prepared as part of a larger study, sponsored by the U. S. Army Corps of Engineers, San Francisco District, concerned with the development of the San Francisco Bay Area. The San Francisco-

Oakland Standard Metropolitan Area consists of Alameda, Contra Costa, Marin, San Francisco, San Mateo, and Solano Counties. The San Jose Standard Metropolitan Area consists of Santa Clara County.

On July 1, 1956, the population of the San Francisco-Oakland Standard Metropolitan Area is estimated at about 2½ million, compared with 2¼ million in April 1950, representing an increase of about 12 percent in this period. This rate of growth is approximately equal to

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(Each estimate has been independently rounded to the nearest thousand from figures computed to the last digit; hence, the sums of parts may differ slightly from the totals shown. Percentages are based on unrounded numbers)

Standard metropolitan area and constituent counties	Population		Change, 1950 to 1956		Percent distribution	
	July 1, 1956	April 1, 1950 (census)	Number	Per-cent	1956	1950
San Francisco-Oakland Standard Metropolitan Area.....	2,510,000	2,241,000	+269,000	+12.0	100.0	100.0
Alameda County.....	846,000	740,000	+105,000	+14.2	33.7	33.0
Contra Costa County.....	343,000	299,000	+44,000	+14.7	13.7	13.3
Marin County.....	114,000	86,000	+28,000	+32.7	4.5	3.8
San Francisco County ¹	742,000	775,000	-34,000	-4.4	29.5	34.6
San Mateo County.....	346,000	236,000	+111,000	+47.0	13.8	10.5
Solano County.....	119,000	105,000	+15,000	+13.9	4.8	4.7
San Jose Standard Metropolitan Area..	469,000	291,000	+179,000	+61.5	100.0	100.0
Santa Clara County.....	469,000	291,000	+179,000	+61.5	100.0	100.0

¹ Coextensive with the city of San Francisco.

the national average growth rate during the period, but is less than half the rate for California as a whole, which was about 27 percent. Population change within the area varied considerably, ranging from an increase of about 47 percent for San Mateo County to a decrease of about 4 percent for San Francisco. The pattern of growth observed in this metropolitan area (i.e., population declines--or small increases--in the old, central portion of the metropolitan area and relatively large increases in the outlying parts of the area) is not unusual and has occurred in other metropolitan areas during the 1950's (e.g., New Orleans, New York-Northeastern New Jersey, Philadelphia, Providence, St. Louis, and Washington; see Nos. 137, 155, 156, and 181 in this series).

The San Jose Standard Metropolitan Area had an estimated population of 469,000 in July 1956, compared with 291,000 in April 1950. These figures reflect a gain of about 178,000, or 61.5 percent, in the 6½-year postcensal period.

Methodology.---Several procedures were used in developing the current estimates of population shown here. All the methods use the 1950 Census as a base and available current series of figures to estimate the population growth or decline since 1950. The choice of methods was suggested by the scope and quality of the available current data. In order to avoid extreme errors and to reduce the dependence of the results on any one set of indicators, an average of the results of several independent methods was employed.

The methods used were (a) the Census Bureau's component method II, which employs vital statistics to measure natural increase and school enrollment (or school census data) as a basis for estimating net migration, (b) the vital rates method, which employs data on births and deaths as direct indicators of total population change, (c) the dwelling unit method, in which the change in the number of occupied dwelling units since the last census is estimated from one or more series and this, in turn, is used to estimate the change in the population of the area, and (d) the composite method, which involves the use of school data and vital statistics to measure the size of different age groups which are then summed to obtain an estimate of total population.¹

The Census Bureau's component method II involves adding to the 1950 population of the area the natural increase (excess of births over deaths) between April 1, 1950, the date of the last census, and the estimate date, and adding or subtracting an estimate of the net migration for the same period. The estimate of net migration is obtained by a comparison of the estimated number of children of elementary school age on the estimate date, based on school enrollment (or school census data), with the number of children of this same age expected to survive from the appropriate age groups of 1950. The comparison yields an estimate of a net migration rate for children of school age; and this rate, in turn, becomes the basis for estimating net migration for the population of all ages. This method is used by the Bureau of the Census in preparing its annual series of current estimates of State population.² A detailed description of this method was published in Current Population Reports, Series P-25, No. 133.

The vital rates method of estimating current population is based on the assumption that changes in the number of births and deaths in an area reflect changes in the size of the population in which the births and deaths occur. To compute estimates by this procedure, the ratio of the area death rate to the United States rate in 1950 is applied to the United States rate at the estimate date to obtain an estimate of the area death rate at the estimate date. This procedure assumes that the area death rate changed by the same percentage between 1950 and the estimate date as the national death rate. The estimated death rate for the current year is then divided into the current number of deaths of residents of the area to provide a tentative current population estimate for the area. A corresponding

¹ For an evaluation of several methods of preparing population estimates, including the Census Bureau's component method II and the vital rates method, see: Jacob S. Siegel, Henry S. Shryock, Jr., and Benjamin Greenberg, "Accuracy of Postcensal Estimates of Population for States and Cities," American Sociological Review, Vol. 19, No. 4, August 1954, pp. 440-446; and Henry S. Shryock, Jr., "Development of Postcensal Population Estimates for Local Areas," Regional Income, Vol. 21 in Studies in Income and Wealth, National Bureau of Economic Research, Inc., N. Y., Princeton University Press, 1957.

² See, for example, Current Population Reports, Series P-25, No. 186, "Estimates of the Population of States and Selected Outlying Areas: July 1, 1957," October 27, 1958.

figure is derived by a similar type of manipulation of births and birth rates. These two population estimates are then averaged to obtain the final population estimate.³

The dwelling unit method of estimating population rests on the assumption that changes in the number of dwelling units in an area reflect changes in the number of inhabitants. The estimate of change in the number of dwelling units between 1950 and the estimate date is usually derived from data on building permits issued and demolitions and conversions authorized, supplemented by data on electric and gas utility connections in residential units when available. (In some instances, it may also be possible to include data obtained from land use surveys and from tax assessment records.) For the areas included in this report only data on building permits were available. Rough allowances for demolitions and conversions were made on the basis of the components of change in the number of dwelling units in the country as a whole, as shown by the National Housing Inventory of 1956.⁴

To measure changes in the population by the dwelling unit method, it is necessary to consider not only changes in the number of dwelling units but also changes in vacancy rates and in the number of persons per occupied dwelling unit. Allowances were made for postcensal changes in the number of persons per occupied dwelling unit on the basis of figures for the urban population of the United States obtained from the Current Population Survey.⁵ These figures indicate a decline in the average size of households between 1950 and 1956. The Bureau's National Housing Inventory indicated a small increase in the national vacancy rate between 1950 and 1956. In view, however, of the considerable variation among the counties in the vacancy rate in 1950, the close relation between changes in local vacancy rates and the particular conditions prevailing in the local area, and the absence

³ A more detailed discussion of this method is given in: Donald J. Bogue, "A Technique for Making Extensive Population Estimates," *Journal of the American Statistical Association*, Vol. 45, No. 250, June 1950, pp. 149-163, and U. S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 97, p. 2, August 6, 1954.

⁴ U. S. Bureau of Census, *1956 National Housing Inventory*, Vol. I, *Components of Change, 1950 to 1956*, Part I (to be published).

⁵ See *Current Population Reports*, Series P-20, Nos. 71 and 75.

of information on changes in vacancy rates relating directly to these areas, the 1950 vacancy rates were used without adjustments.

Multiplying the estimated number of occupied dwelling units on the estimate date by the estimated number of persons per occupied dwelling unit gives the estimated population in households on the estimate date. It was necessary as a final step to add in an allowance for the population in quasi households (hotels, large rooming houses, institutions, and the like). The 1950 quasi-household population was used, since there was no indication that any substantial change had occurred in the size of this segment of the population since 1950. An independent allowance was made, however, for the change in the size of the military stationed in each area since 1950.

The method just described was used to develop estimates of the population 15 years old and over. For the population under 15 years of age, the figures used were those developed by the composite method described below (items 1 and 2). In view of the pronounced shifts in the birth rate in the last few decades, it is believed that the average size of the adult population in households has been somewhat more stable than the average total size. Consequently, this variation of the dwelling unit method should tend to give more accurate estimates of local population than the conventional form of the method.

The composite method of estimating population makes use of three series of data--births, deaths, and school enrollment--to estimate the population of the various age segments to which these basic indicators are most applicable. School enrollment is used to estimate the population of school age, the number of births is used to estimate the number of females 15 to 44 years of age, and the number of deaths is used to measure the size of the population 45 and over. Thus, each series covers a particular age group, and summing the separate age estimates yields an estimate of the total population.

A brief description of the method, as applied here, is as follows:

1. Population under 5 years: This estimate is based on the number of births for the 5-year period preceding the estimate date, adjusted for deaths by use of appropriate survival rates and for net migration using the "school age" migration rate as a guide. (This

migration rate was obtained in connection with the computation of component method II described above.)

2. Population 5 to 14 years: The procedure described above under component method II, involving school enrollment data, was used.

3. Population 15 to 44 years: An estimate of the female population 15 to 44 years of age was obtained by the use of data on births and birth rates, roughly along the lines of the vital rates method outlined above. In this instance, however, the births are related to the female population 15 to 44 years of age rather than to the total population, and estimates of the number of females in this age group are obtained. The corresponding number of males 15 to 44 years was obtained by applying the sex ratio (ratio of males to females) of this group, as shown by the 1950 Census, to the estimated number of females 15 to 44 years on the estimate date.

4. Population 45 years and over: Deaths of persons 45 and over, by age, and death rates for the corresponding ages were used to derive the estimates for this group. Current death rates were developed and applied along the lines of the vital rates method. Computations were made separately for the age groups 45 to 54 years, 55 to 64 years, and 65 years and over.⁶

The estimate for each of the counties shown was obtained by averaging the results of all four procedures described above. Estimates were first developed separately for each of the constituent parts of the metropolitan area and then summed to obtain an estimate for the standard metropolitan area as a whole.

Sources of data.--The basic data necessary to prepare the population estimates presented here were provided by Federal, State, and local agencies. Thus, school enrollment data were obtained from the State and local departments of education and from the appropriate Catholic school officials. Vital statistics were provided by State and local departments of health. Data on residential building permits were obtained from the U. S. Bureau of Labor Statistics, and figures on military station strength were obtained from the Department of Defense.

⁶ A detailed discussion of the composite method is given in: Donald J. Bogue and Beverly Duncan, A Composite Method for Estimating Postcensal Population of Small Areas, by Age, Sex, and Color, paper read at the Third Annual Conference on Business Research, Chicago, Ill., April 13-14 (unpublished). A detailed application of the method is illustrated in: State of Illinois, Department of Public Health, Bureau of Statistics, Health Statistics Bulletin, Special Release No. 23, Springfield, Ill., September 1956.

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